

Chapter 5

Emerging Agribusiness: Ayutthaya to the Early Twentieth Century

Consolidation of Thai agricultural knowledge is most evident from the period of Ayutthaya, partly due to availability of historical opinions. Development to this time had followed trends of Southeast Asia, where the ecological fragility of cleared rainforested areas, and traditions of most ethnic groups, had restricted population expansion to alluvial riverbanks and volcanic loam soils. Alluvial areas benefited from silt deposition to maintain a level of fertility along the Mekong, Chaophraya, Irrawady, and Red River plains.¹ With the emergence of Tai groups as controllers of rice surpluses, significant States arose, including Chiang Mai, Luang Prabang, Sukhothai and Ayutthaya. Expansion of international trade from around the fourteenth century then contributed to economic growth that further consolidated power of the better located States.

The period of Ayutthaya through to the first quarter of twentieth century contains major changes in the role of agriculture and Thai approaches to environmental management. Continued dependence on military capture of labour resources dominated politics and warfare in a region which was predominantly hinterlands with few, small States and settlements in favourable lowland areas. This economic base remained essentially the same from the fifteenth century through to the late Ayutthaya period, when the Thai small-holder became a central economic figure; the Crown favouring the opening of new lands, gave small-holders sufficient encouragement to begin the conversion of the natural environment to agricultural fields. The frontier mentality so created assisted in an early form of democratic development as self-sufficient small-holders in remote areas sought independence from central power and taxation. It also contributed to an approach to environmental exploitation through land accumulation that continues to the present day.

¹ Steinberg, D.J. (1987)

Ayutthaya may have been a contemporary Tai power with Sukhothai if it had the benefit of a similar existing infrastructure developed under Khmer rule. Certainly its influence overlapped with that of Sukhothai, and was possibly constrained or halted in its development by a major epidemic,² and the effects of significant changes in rainfall patterns.³ In terms of agricultural techniques, the Ayutthaya community differed from that of Sukhothai in being able to thrive in the aquatic Chaophraya flood plains; at Sukhothai, the high costs of maintaining a State system including ritual water supply systems appears to have exceeded the management capabilities of that new Tai State. At Ayutthaya, a strong orientation to wet rice led to forested areas being regarded as ungovernable and inhabited by persons who should be persuaded to join the Crown-controlled wet rice lands.⁴ The sparsely populated land is described in the Sunthorn Phu *nirat*;⁵

*I see villagers sinning as fishermen;
they ensnare birds and hunt animals besides.
Where ricefields stand against a background of woods,
these forest villagers erect their houses.*

Through the development of the Ayutthaya Kingdom, and especially from the seventeenth century, Thai texts seek to separate the Kingdom's history from that of Buddhism, in common with the preferred historical perspectives of other regional States at that time;⁶ hence there remain conflicting views of the strength and technological capability of the realm. Consistent with this creation of a national history was a gradual drift to assume sustainability of the Kingdom and rice harvests with rice no longer attaining primacy in governance concerns. Periodic weakness in political affairs has been linked to variations in morality of the Kingdom deriving from, or evident in, poor resource management, including both human and natural resources. Community and leadership lapses from religious principles have been associated with poor agricultural practices, and consequent domination by the Burmese.⁷

The rise of Ayutthaya in an aquatic and changing environment defined

² Terwiel, B.J. (1997)

³ Reid, A. (1992)

⁴ Geswick, L.M. (1976)

⁵ Umavijani, Montri. (1986)

⁶ Andaya, B.W. (1992)

⁷ Kathirithamby-Wells, J. (1992)

subsequent agricultural development, particularly agribusiness trading. The Kingdom's demise, likewise confirms the central role of agriculture; neglect of food production led to economic and political vulnerability. Consistent with cyclical worldviews, the fall of Ayutthaya prophesied at the height of its prosperity by a late seventeenth century poet, possibly King Narai, was apparently fulfilled a century later. Pali writings of a Buddhist monk of that time describe persons wandering in search of food and dying of starvation, both uncommon views of the Thai identity.⁸

The combined effects of Western contact, international trade, the continual development of new legislation to meet new developments, expansion of rice growing and associated agribusiness, and neglect of the management of resources both natural and human, contrived to finally and irreparably weaken the Kingdom. In its demise, the Thai learned the importance of ensuring adequate manpower for rice production, and the central importance of a firm foundation in agriculture on which to build other Crown developments. A wider world then influenced subsequent agriculture through immigration, trade, and modernisation creating the Kingdom of Siam of the early twentieth century.

Agriculture, Environment and Morality

Economic development relied on expertise in wet rice production. The Ayutthaya Kingdom was established on modified water recession from flooded areas on the delta; minor earth-works slowed natural drainage according to the stage of rice maturity. Supplementary water was drawn from some canals that served agriculture after their primary transportation purpose and symbolic functions that recalled something of Mon-Khmer traditions.

The Tai attitude to the natural environment, one of fear of the unknown non-rice producing areas, included willing manipulation of the natural environment to create paddy fields, weirs, dams, and canals. However, the impact of such a production system on the environment was minimal due to the low population pressures and the vast extent of the unused forested and upland areas. With Western contact, views about the natural environment derived from the Buddhist religion, if extant, would have been seriously challenged. Western colonialists brought

⁸ Wyatt, D.K. and Woodside, A. (1982)

technologies, and a desire, to exploit forests among other resources. This provided a welcome stream of income to the Crown and contributed to a rising interest in trade above agricultural production.

The small ice age of the seventeenth century, which created famines in Europe, was only experienced in Southeast Asia in the form of reduced rainfall; teak tree ring analyses from 1514 to 1929 in Java⁹ indicate that the years 1645 to 1672 each received less rain than the average of the four centuries. With such longer dry seasons, crop failures were common and populations declined in many Asian communities. In Ayutthaya, the ease of moving closer to the river in dry years and of exploiting gradients rising away from the river to ensure at least some production, provided advantages over the swamp and lake wet rice systems. Nevertheless, the Kingdom experienced some hardship, which reinforced the centrality of agriculture in its security and prosperity. While European agriculture through this period shifted from cash to food crops¹⁰ until food security and confidence was regained,¹¹ Ayutthaya maintained some export of rice throughout.

By the 1840s, settlements were small core communities or States with small outlying provinces, all in the lowlands where rice culture required minimal effort and provided greatest reliability. Even the delta Kingdom of Ayutthaya extended complete influence only some ten kilometres until the early nineteenth century, when the population was estimated to be three million for the whole of what is now Thailand. Estimates of population in the period 1820 to 1840 indicate around 500,000 persons in the delta area of Bangkok and surrounds, with the next most populous centre being Chiang Mai with some 30,000, and other centres on rivers and along the coast supporting populations of 5,000 to 15,000.¹²

Forests dominated the landscape. A herd of wild elephants roamed and resided in the area of Bang Kapi, even up until the last quarter of the nineteenth century.¹³ Traditional Thai medicines were based predominantly on herbs until foreign demand introduced markets for such products as rhinoceros and deer horns,

⁹ Lamb, H.H. (1977)

¹⁰ Reid, A. (1992)

¹¹ Sternstein, L. (1993)

¹² Terweil, B.J. (1989)

¹³ Sukwong, Somsak. (1989)

gall bladders of wild animals, and tiger bones, teeth, claws, and pizzlies.¹⁴ The environmental impact of Thai agriculture remained low as did population density; this was to change quickly with the expansion of agriculture in response to international trade.

Manpower had long been a preoccupation of the Burmese and Thai Crowns, and the ultimate demise of Ayutthaya may be traced to moral decline¹⁵ causing a failure to maintain labour for rice growing and military action, rather than a failure of administrative systems alone.¹⁶ Thus the Mon conquest of 1752, and Ayutthaya's own weakness in the period 1733-1767 associated with a decentralisation of power to Phitsanulok, Sawanakhlok, Nakorn Si Thammarat, Pimai, and Chantaburi, probably reflect declining control over agricultural labour and hence rice surpluses.

Western contact brought a view of technological dominance of the environment¹⁷ that probably contrasted with views of small-holder farmers¹⁸ more than with the Palace classes involved with trading. In any case, teak forests attracted the interests of colonial groups to the extent that, by the nineteenth century, Western political ends were subjugated to trading benefits gained from guaranteed access to valuable forests. Prior to this time, teak had been less valuable as the Chinese market required relatively little timber for construction, the Indians had their own sources of teak, and Western powers controlled the forests of Myanmar and Lao-PDR. As a resource of the Thai Crown, taxes on Thai teak were imposed when neighbouring States became less desirable sites for Westerners.¹⁹ Beginning in the late period of Ayutthaya, large scale forest exploitation continued into the twentieth century. Numerous reports imply the rapid demise of not only northern teak forests; for example, the area from Bangkok to Ayutthaya was noted to be all forest in 1690.²⁰

Thai administration of environmental management is sometimes traced

¹⁴ Buri, Rachit. (1989)

¹⁵ Wyatt, D.K. (1967)

¹⁶ Wyatt, D.K. (1984a)

¹⁷ Croll, E. and Parkin, D. (1992)

¹⁸ Tanabe, S. (1994a)

¹⁹ Thomson, V. (1967)

²⁰ Kaempfer, E. (1727)

to the licensing of teak concessionaires in the nineteenth century. In fact, effective forest protection legislation is only a very recent occurrence.²¹ British, French, and Danish domination of the teak industry stimulated the Crown to assume greater control, notwithstanding the substantial revenue it received from these efficient concessionaires. The motivations to establish the Royal Forestry Department in 1896, which seem to have been fiscally driven, led to British foresters serving as the first three Directors General who were succeeded by British-India trained Thai foresters. The establishment of the Phrae Forestry School and the Kasetsart University Faculty of Forestry, similarly seems to have been oriented to enhancing revenues derivable from logging.²²

In reestablishing the Thai power at Thonburi after the fall of Ayutthaya, King Taksin re-established rice exports, drained marshes, and introduced double rice cropping into hitherto untamed flood plains. By 1780 the Thonburi Kingdom was exporting rice to China. The reformation of the Thai State again relied on sound agricultural policy, although the cash crops that helped independent Siam to maintain an economic parity of sorts with its colonized neighbours had definitively moved Thailand into international agribusiness,²³ with its continued demands for expansion. Notwithstanding agricultural successes, one poor rice harvest in 1821 was sufficient to precipitate a crisis.

Until the end of the nineteenth century, rice and fish continued to be the main Thai foodstuffs, and houses continued to be constructed of wood, bamboo, attap, grass, and wooden and earthenware tiles, all of local origin. Agricultural and domestic implements supporting economic and social life were likewise all of local construction. Imports consisted of small lengths of Indian cloth, Chinese silk, porcelain, and jewellery for aristocrats. Thailand was characterised as a frugal country that supplied rather than demanded trade. Even the Dutch East India Company's factories were small compared to those in neighbouring countries, and monopolies extended by the Crown probably impeded expansion of trade. Inevitably demand for foreign items rose. With rice being the continuing source of export income, production rose to pay for foreign manufactured goods demanded by the privileged classes. The natural canals that formed with expansion of the

²¹ Sadoff, C.W. (1992)

²² Ramitanondh, Shalardchai. (1989)

²³ Kathirithamby-Wells, J. (1992)

delta facilitated expansion of rice with minimal investment, while the drier hill regions supporting teak forests similarly proved an attractant of export income.²⁴

Expanded rice production from the river and coastal basins was complemented by the gathering of valuable items from the hinterland to provide industrial, nutritional supplement, and medical products for lifestyle and export. Thus the Ayutthayan economy represented the arrival of Thais as international producers and traders of primary commodities. Limited in expansion by regular wars and diseases of the forested lands, the rise of the Kingdom required an innovative taxation system supplemented by regular and successful military action to harvest additional manpower resources. Governance of Ayutthaya reflected these needs of warfare, trade, and labour management, and began to overshadow agriculture which was assumed to be catered for through labour inputs and trade outlets.²⁵ Such a change in attitude in a period of international contact led to agriculture inevitably being affected by foreign approaches to cash cropping and environmental management. Rama I's response to this changing world confirmed a new direction for Thai agriculture.²⁶ Nevertheless, rice remained the primary focus as the staple.

Export Rice

During the Ayutthaya period, rice gradually changed from a solely domestic, to an export crop. Under colonial influences, trade stimulated widespread city expansion in Asia fed from the granaries of Thailand, Myanmar, and Indochina. In Thailand, the requisite incremental manpower increasingly came from Chinese immigrants. By the 1930s, around 80 percent of the Thai population were engaged in some aspect of rice agribusiness, and rice constituted about 60 percent of exports.²⁷

Rather than represent a new period of international influence in the agriculture of Thailand, this followed an established trend of trade, exchange of technologies, and development of market demand that spanned centuries. Nakhon

²⁴ van der Heide, J.H. (1906)

²⁵ Phongpaichit, Pasuk. and Baker, C. (1997)

²⁶ Wyatt, D.K. (1982)

²⁷ Phongpaichit, Pasuk. and Baker, C. (1998)

Si Thammarat has long been a consolidation and trading point for agricultural and other commerce.²⁸ Cambodia exported cotton to Pattani in the fifteenth century. Sugar cane processing was introduced from China in the seventeenth century, transforming a chewing confectionery to a saleable product via Chinese and Dutch traders to Japan. Rice from Pattani was sold to other southern centres via foreign traders from the sixteenth century.²⁹ The two significant changes in the Ayutthaya and early Bangkok period were, the increasing involvement of the Crown in trade as a revenue raising activity, and a further shift in the ethnic composition of the Thai population with a concomitant increase in trading skills.

Expansion of rice production and introduction of other cash crops took place on accessible sites of an apparently endless supply of arable land. Opening an undeveloped area to agriculture solved problems of small-holder landlessness or inheriting a poor lot. Reasonable security of tenure was provided by the slow introduction of a land administration system in the Kingdom, which rendered the mercantile classes unwilling to speculate in property that they could not demonstrably own. However, farmers were limited in their access to capital, new technologies, and additional labour. Chinese middlemen provided many of these services at margins appropriate to financial risks while serving as links to international markets.³⁰ Such a system might have been more precarious to objectives of national independence had not the agricultural bounty³¹ of the Thai soil made it attractive as a trading partner and host to favourable foreign investment. The slow rate of population increase in this late-settled region of Asia similarly assisted Thailand to avoid the civil conflict which gripped the erstwhile home of the Tai along the Yangtse region in the mid 1800s.³²

From the North with its durable *muang fai* irrigation system, to the Indian-influenced rice production systems of the South, to the rainfed and receding swamp systems of the Northeast, and the rivers and flood plains of the delta, Thai rice agriculture came of age in the nineteenth century. Adequate production for domestic requirements in all but exceptional years, is echoed in the numerous reports which

²⁸ Wyatt, D.K. (1968)

²⁹ Reid, A. (1992)

³⁰ Phongpaichit, Pasuk. and Baker, C. (1998)

³¹ Neale, F.A. (1852)

³² Evans, L.T. (1998)

emanated from the exploring, proselytising, and trading Europeans.³³ Tai technologies of these times can still be observed in some regions of Lao-PDR, including labour intensive and yield enhancing seedling production in nurseries for transplanting, and broadcast sowing in areas where labour is more limiting than land. Rice varieties have changed as a result of diffusion of high yielding types, although local variations are retained, particularly for glutinous types cultivated without chemical fertiliser or pesticide inputs. However, such areas are few, remote, and disappearing as each country in which Tai reside seeks to modernise agriculture. Such was the rice culture of Thailand through the nineteenth century until it was perceived that declining average yields should be addressed through improvements to irrigation and varietal selection. The need to open up new lands of lower general fertility was offset partially through such technological innovations. With a demonstrated Thai preference to produce rice rather than engage in other economic pursuits, non-agricultural wages in Thailand were relatively higher than in other countries.

Through the period 1870 to 1934, rice exports increased 20 fold, the population doubled, and the area planted to rice rose several fold.³⁴ Such increases indicate much more than an economy seeking to export occasional surpluses of its staple. Indeed the influence of foreign traders in freer trade through the 1855 Bowring Treaty encouraged the production of a surplus as a means for Crown revenue raising through taxation to purchase more readily available foreign goods. However, the decision to expand production was ultimately made by the individual rice farmers themselves, and it would seem that the ending of the mild form of Thai indentured-slavery, debt-bondage, and forced labour allowed small-holders to focus on their main preoccupation, rice production. Having introduced these freedoms, it took the Crown some time to develop new effective means of collecting revenues from the small-holders, during which period the rural population increased and dispersed widely.³⁵

Rural expansion proceeded along the rivers and swamps lands, and eventually into the uplands where earth tanks could hold supplemental water. Areas missed previously were developed through small canals and contour barriers to

³³ Ingram, J.C. (1971)

³⁴ Sukwong, Somsak. (1989)

³⁵ Wyatt, D.K. (1984)

facilitate drainage on a small scale.³⁶ At first these developments were primitive and temporary in the manner of frontier agriculturists, but successive generations and migrants improved these systems to their full capacity under a human and draught animal powered agriculture. Crown-instigated poll and land taxes remained collectable only in near major centres as they were widely resented as an unfair impost on the risks, work, and limited rewards of the frontier agriculturists. Thus taxes stimulated further movement to, and development of, remote areas producing over the 150 years to 1950 some 20 million hectares of new agricultural land.

Based on low technology,³⁷ exports seem to have been dependant on assured domestic supply of rice up to about 1850 when rice represented less than three percent of the Kingdom's exports. This had risen to 41 percent by 1867 and 78 percent by 1888³⁸ with concomitant increases in farm sizes for those oriented to export production. Farms in the Central region were, on average, four times larger and produced cash incomes more than three times higher than those of the Northeast in the 1930s,³⁹ probably reflecting a higher degree of parity than existed in the twentieth century.

Famines induced by war-time burning of rice crops and labour losses in the 1700s had been mitigated by the simple delta production systems which spilled much grain during harvest and allowed the modified swamps to grow rice without tending in the subsequent year.⁴⁰ With increasing sophistication in agriculture, such natural assistance could not be expected; prescriptive tax collection systems could intensify the effects of poor harvests.⁴¹ Tax collection was improved through King Taksin's foreign awareness in the early Bangkok era when reserves and foreign assistance were used to assist the populace through the 1768 famine.⁴² Notwithstanding such events, the food production capacity of the country exceeded domestic demand through most periods. However, reliance on rainfall and simple supplementary irrigation reached a limit for an export production system; rainy days variations of up to 30 days, and rainfall variations of up to 1000 mm in the

³⁶ Phongpaichit, Pasuk. and Baker, C. (1998)

³⁷ Gordon, R. (1891)

³⁸ Owen, N.G. (1971)

³⁹ Silcock, T.H. (1970)

⁴⁰ Turpin, F.H. (1771)

⁴¹ Terwiel, B.J. (1991)

⁴² Wyatt, D.K. (1984)

Central plain and 500 mm in the Northeast, indicated a need for a new era in Thai water control.⁴³

Cash Crops

Trade which stimulated rice export led to the introduction of other cash crops, which were controlled primarily by the foreign trading interests.⁴⁴ The Bowring Treaty facilitated such foreign trade and investment in crops introduced from neighbouring colonised countries. The separation of rice from other cash crops between the Crown and foreign trading powers led to differing development paths. Rice at first glance appears to have suffered from a constrained view of agricultural technology and irrigation investment on the part of the Crown,⁴⁵ although conservative views of the domestic role of rice and variations in the international market may have been a more significant influence.⁴⁶ Allowing foreign control of exported crops other than the national staple is the type of policy which, combined with favourable external circumstances, allowed retention of an independent Kingdom between the competing colonial interests in the region.⁴⁷

Other products introduced in this period included rubber, teak, sugar cane, and a range of minor crops. In the case of rubber, Thailand began production outside the Stevenson Plan and expanded plantings whenever prices were high. Subsequently joining the Plan, Thailand appears to have followed a system maintained until recent times of periodically seeking special considerations to its own advantage as it grew to dominate world production.⁴⁸ The teak industry developed from Chinese sawmills to large-scale extraction using Burmese workers under European colonial control, while sugar was to lose various parties' investments over successive decades. Tobacco, chillies, onions, pepper, cotton, dried fish, timber other than teak, pickled tea, and opium were all traded in small amounts through the period.⁴⁹

⁴³ Tanabe, S. (1994a)

⁴⁴ Yuthavong, Yongyuth. and Wojcik, A.M. (1997)

⁴⁵ Feeny, D. (1982)

⁴⁶ Manarungsan, S. (1989)

⁴⁷ Farmer, E.L. et al (1986)

⁴⁸ Ingram, J.C. (1971)

⁴⁹ Silcock, T.H. (1970)

While the country modernised, pockets of the older forms of agriculture continued, and in the case of shifting cultivation, increased among marginalised immigrants in the northern highlands.⁵⁰ A sustainable system under low population densities even on the granite derived soils of Mae Hong Son which have been continuously used for more than 100 years, sedentary shifting agriculture was ignored through the period except in terms of its valued opium crop.⁵¹ Even hunters and gatherers survived in remote locations, although the seeds of uniformity in agriculture were already sown through Crown policies of modernisation in the face of foreign influence.

Foreign Influence

Europeans followed the Persians⁵² and Chinese who had established influential roles in the growing Ayutthaya Kingdom, with Chinese influence being enhanced in an unpredicted manner through trading and cultural assimilation. The development of the Kingdom relied on the inputs of these foreigners; in accepting this developmental path, Thai approaches to agriculture and technology transfer were consolidated. In agriculture, the significant shift was from national interest in food production to trading. New technologies which entered agriculture were often coincidental benefits rather than conscious technology transfers in this trade oriented world, although small-holder Chinese agricultural skills infiltrated with the entry of some Chinese to fruit and vegetable production. Foreign ownership of new crops led to new technologies being deliberately introduced.

Of the foreigners who arrived in Ayutthaya by sea, it was the Chinese who were to have the largest influence on the Thai State. The first European awareness of the Kingdom appears to be in 1502,⁵³ and the first European written reference is a letter from the Portuguese Governor of India in 1510, after which the Portuguese monopolised European trade until the rise of Manila in 1565.⁵⁴ Drawing on such information as Marco Polo⁵⁵, Nicolo Conti⁵⁶ and Vasco de Gama, the

⁵⁰ Bessaint, W.Y. (1981)

⁵¹ Kinke, P.J. et al (1978)

⁵² Ibrahim, M. (1972)

⁵³ Mouhet, M.H. (1864)

⁵⁴ Lourido, R.A. (1996)

⁵⁵ Yule and Cordier (1903)

⁵⁶ Major, R.H. (1957)

Portuguese preceded the English, Dutch, and Danes by a century. Arabic references to the region also contain records of traders from Thailand frequenting a port in the Persian Gulf⁵⁷ where contact with Portuguese and Spanish was likely. However, Portuguese contact effectively began with a conquest of Malacca in 1511 when Albuquerque sent an ambassador to the King of Ayutthaya. A subsequent ambassador was commissioned to document the merchandise, dress, and customs of Ayutthaya, and by 1518 the Portuguese sought a pact allowing trade. The Portuguese, in treating the Monarch according to his elevated station, maintained cordial relations.

With the Dutch entering Thailand in 1604, the English in 1612, the Danes in 1621, and the Spanish like the French delayed until the 1660s through their assistance to the Cambodians in their attacks on Siam, European influence began to be conspicuously dualistic; mercantile and missionary.⁵⁸ A period of rapid technological and cultural transfer continued until the demise of Ayutthaya at the hands of the Burmese. High level European influence from that date of 1767 until the ascent of King Rama II in 1809 was minimal. Once again the first significant input was from Portugal through the Portuguese Governor of Macau who sent an envoy in 1818. Portuguese language had been retained among descendants who had stayed in Thailand and the subsequent European group to reestablish a presence was French missionaries. Relations with Britain were resumed in 1822 through the British East India Company establishing their first treaty in 1825, which was recorded in Siamese, English, Malay, and Portuguese languages because neither the English nor the Siamese understood the language of the other. American missionaries arrived in 1828 to work with immigrant Chinese, and assisted in the printing of Siamese language utilising an East Indian Company employee's invention of a Siamese character printing device.

Portuguese, French, Dutch, Greek, and other nationalities were involved in the active foreign life that developed around the main city of Ayutthaya,⁵⁹ reflecting a preference for this Kingdom as a trading centre above other local possibilities including Vietnam.⁶⁰ The arrival of Europeans is associated with a

⁵⁷ de Campos, J. (1940)

⁵⁸ Rajanubhab, Damrong (1925)

⁵⁹ Hutchinson, E.W. (1940)

⁶⁰ Anon, (1884)

marked increase in the documentation about the country, in both Thai and European languages, in the western style of recording trade, exploits, and accomplishments. Some romantic views of Thai origins and national development⁶¹ may be traced to this period when the aristocracy, as the emerging Thai intelligencia, assimilated and promulgated such histories.

Also associated with European contact was a sharp increase in population growth rate. Prior to 1600, labour requirements for the Crown and periodic wars limited the number of children that could be cared for while working in the fields, and post-partum amenorrhoea probably extended through late weaning.⁶² The trading era freed labour from corvee and indentured slavery, producing widespread economic opportunities. By the time of the fall of Ayutthaya, the population which probably exceeded one million, was reduced to around 10,000 through casualties, refugees, abandonment of the site, and capture of labour by the Burmese.⁶³ The loss of labour and guaranteed food supply preoccupied the successors who would reestablish the next Thai State.

During the Ayutthaya period, the culture contained three classes; commoner rice growers, noble bureaucrats, and foreign traders. Skilled management of these groups is evident in the symbiotic relations that pervaded the era. Observing the shift of power in capital accumulation that trading caused, the Crown sought to increase its tax and trading revenue.⁶⁴ Any ambiguity with erstwhile advocacy of Regal frugality was easily accommodated with the same dualistic tolerance which the Ayutthaya Kingdom had demonstrated in its expansion; a factor absent in the Pagan Kingdom which crumbled from unmanageable cultural diversity. This Thai characteristic⁶⁵ may be inherited from the Mon or even owe something to Persian influence in religious, fiscal, and moral matters in the court.⁶⁶

Chinese influence is mentioned less in European accounts of Ayutthaya. With major concentrations in Batavia, Manila, and Ayutthaya at the time, Chinese maintained access to markets, trade routes, and supplies. In the case of Ayutthaya

⁶¹ Freeman, J.H. (1910)

⁶² Reid, A. (1992)

⁶³ Donner, W. (1978)

⁶⁴ Tingsabadh, Charit. (1989)

⁶⁵ Taylor, K.W. (1992)

⁶⁶ Wyatt, D.K. (1974)

they became the deputised traders of the Crown. Such influence was to become evident in the resurrection of the Thai Kingdom at Thonburi under the leadership of Taksin, the son of a Chinese trader from Chaozhou.⁶⁷ King Taksin rectified gross labour shortages by importing poor Chinese males. Thus the early Bangkok period, beginning in Thonburi, differed from the Ayutthaya period in the expanded role of the Chinese, which influenced agriculture markedly through contact between Thai and Chinese small-holder farmers, notwithstanding the primary role of Chinese migrants in providing labour for Crown projects. With 6,000 to 8,000 Chinese immigrants each year about half of whom stayed, orchards, agro-processing, and livestock enterprises, among other aspects of agriculture advanced considerably.

By 1890, European observers were outspoken about the unrealised potential of Thailand compared to Myanmar due to lack of investment in agriculture and transportation infrastructure.⁶⁸ However, administration of the taxable small-holder farmer was a continuing concern of the Crown, and infrastructure development had to suit this primary revenue raising orientation to gain priority.

Administering the Small-holders

The administrative system of Ayutthaya began with a more autocratic approach than is claimed for the Sukhothai State. Chiefs of province became hereditary lords who were required to swear allegiance to the King twice each year,⁶⁹ and to expand the taxation net of the Crown as small-holders, given relative freedom to open new lands to agriculture, created surpluses. However, tax collection was only effective in accessible areas around the capital. Later, in the 1890s, Bangkok completed the tax and registration system by using local headmen as agents, as part of a program that also included introduction of a standard central Thai language across the country, and uniform religious activities.⁷⁰

Land ownership was vested in the Ayutthaya Crown with usage rights granted on the basis of near continual cultivation. Abandoned plots reverted to the Crown in an uncontested system until land gained value with the expanding trading

⁶⁷ Andaya, B.W. (1992)

⁶⁸ Gordon, R. (1891)

⁶⁹ Donner, W. (1978)

⁷⁰ Phongpaichit, Pasuk. and Baker, C. (1998)

market. Small-holders in the areas surrounding the capital were required to pay tax at about 10 percent of their rice crop to feed the royal household, while those in the provinces were taxed to create supplies for military campaigns. Labour contributions of up to six months per year were also required for royal projects; war captives used to supplement labour received no access to land or social advancement. While labour was deployed to extract forest products for export, the Crown preferred taxation in kind through provincial Lords to whom the King judiciously dispensed honours and military spoils. Agriculture was the preserve of the small-holder.

The hierarchical system *sakdina* linked 'power over fields' to status, although land was not the limiting input, rankings simply institutionalised the King as the principle controller of labour, the most valuable resource. From such an administrative orientation, the Ministry of Interior was created to oversee Palace administration, agriculture, the capital, and treasury functions. Meanwhile, in the northern Lanna Kingdom, a similar revenue system had evolved,⁷¹ perhaps predating and providing a model for Ayutthaya legislators,⁷² as a convenient means of apportioning revenue collections, and assessing the relative strengths and tributary obligations of principalities.

Building on this administrative system in the Bangkok period favoured taxation over investment in agricultural infrastructure. Excluding irrigation, which was supported in a piecemeal manner, new agricultural technologies were to await the emergence of a generation of more internationally aware Thai in the early 1900s. Agriculture in neighbouring countries at this time was already benefiting from such inputs through colonial governments. Such observations fuel the view that the Thai State has seldom been the source of technological innovation.⁷³ Nevertheless, the faster growth of the Burmese economy for example, proved to be unstable politically while the gradual pace of development of Thailand appears to have provided longer term benefits.⁷⁴ By contrast, the hierarchical system of rights, while creating a security of place in society, proved to be the foundation of inequities which were exacerbated through the period of modernisation of Rama V.⁷⁵

⁷¹ Wyatt, D.K. (1984)

⁷² Wyatt, D.K. (1984)

⁷³ Brown, I. (1988)

⁷⁴ Johnston, D.B. (1975)

⁷⁵ Wyatt, D.K. (1984)

An earlier influx of Tai from Lao-PDR, added the Northeast to areas largely beyond the governance of the Ayutthaya administrative system. Local rulers acted as agents of the King, as in outlying areas of the Central Plain, while in the North and South, tributary arrangements remained largely symbolic as Ayutthaya failed to extend its influence. The taxation orientation of the Crown, combined with limited direct control suggests that the purveyors of new ideas in Thai agriculture were traders in the new crops, and small-holder initiatives. Minority groups in the Central Plain were absorbed as Thai through a process of appeasing local leaders until their demise when the standard taxation system on labour and rice was applied.⁷⁶ So the Thai nation was slowly being formed on an agricultural base which was assumed to be capable of ever expanding international trade and taxation.

Exiting from trading in favour of taxation to raise revenue, the Crown appointed collection agents with rights to also collect their own compensation. Such rights extended across fishing, gardens, coconut oil, opium, pepper, cotton, tobacco, molasses, sugar, pork, poultry, beans, and rattan. Promotion of new crops such as sugar was closely tied to the raising of Crown monies through taxes on products, and shipping. However, large-scale plantations were prohibited in contrast to developments in colonially dominated neighbouring countries. Teak concessions were confined to specific areas. The role of foreigners in the Bangkok period was limited in much the same way as in Ayutthaya after initial freedoms, with the eventual outcome that foreign investors in agriculture preferred to allocate their resources elsewhere. The taxation net extended with the Kingdom's authority, and included exemptions on new lands in acknowledgement of small-holder risks.

Small-holders had enjoyed the right to use land without the ability to mortgage or sell it. With the introduction of a Department of Survey in 1883 and the first issuance of titles in 1890, land was expected to assume value; this proved erroneous until the value of associated infrastructure such as irrigation and roads was realised. The first land auction was held in 1912 by the Ministry of Finance,⁷⁷ reflecting policies associated with the wave of modernisation which aimed to create a powerful Monarchy and independent small-holders financially linked through a taxation system. However, by the 1930s, large-landlord and tenant relationships

⁷⁶ Phongpaichit, Pasuk, and Baker, C. (1998)

⁷⁷ Thomson, V. (1967)

dominated land tenure in intensively developed areas such as the Rangsit irrigation scheme. In areas with less security over water, small-holders expressed concern over more than just the ubiquitous risk of varying rice prices. Small-holders were no longer the sustainable agriculturists of the thirteenth century; they required income, not the least to meet financial taxation obligations to the Crown.

An experimental farm at Khlong Rangsit led to the formation of a Bureau of Agricultural Science in 1923 to assess insects, fertilisers, soils, and implements; a foreshadowing of the green revolutionary changes that would later impact on Thai agriculture. Production of the agricultural journal *Kasikorn* by Prince Sithiporn in 1927 heralded a new era in governmental approaches to agriculture. The Ministry assumed a role in combating animistic associations of crop pests with spirits, and a research department was planned until budget cuts forced closure of the Bangkok Noi Fruit Farm and cessation of tobacco research in Chiang Mai. Other infrastructure supportive of agricultural reform had also been introduced in the form of farmer cooperatives, in that case in response to rising indebtedness.⁷⁸ Departments of Forestry and Lands were established in 1896 and 1901 respectively. An extensive irrigation plan drawn up by the Dutch expert van der Heide attracted attention and praise, before finally being rejected as too expansive and expensive, although much of it was subsequently implemented on a project by project basis.

The economic and social well-being of Thai small-holders in the nineteenth and early twentieth centuries appears to have been less than the popular view of a happy, egalitarian subsistence economy protected by the aristocracy. Rather it was probably a struggle for subsistence within a highly stratified rural populace requiring hard work and conformity with complex patterns of exchange.⁷⁹ Small-holder rice production systems yielded poorly throughout the period. Notwithstanding the eulogised fertility of the Thai environment, yields had not previously been a preoccupation in the emerging subsistence economy when enforced labour was applied to extend areas under production. Entering a rice trading marketplace with a defined land rights system meant that small-holders and landlords sought to maximise returns to land rather to labour. In the period from 1860 to 1900, output per capita increased by some 10 percent, reflecting

⁷⁸ Thomson, V. (1967)

⁷⁹ Bowie, K. A. (1992)

increased efficiencies in the production of starchy traditional rice varieties, and perhaps use of fertiliser.⁸⁰ Privy Purse Bureau investment in the rice sector at this time reflects interest in the possible higher returns associated with such new technologies.

The period's conflicting objectives of national security and economic development⁸¹ on the one hand, and between the private sector, elite decision makers, and social objectives on the other,⁸² were to pervade Thai policy through to the 1970s. Increased administrative efficiency in agriculture from Ayutthaya times was necessary and reflected internationalisation of the Thai State. However, administrative organisation for agriculture served the Ayutthaya and Bangkok attitudinal shift from production to taxation. In common with many other countries, the separation of the small-holder farmer from the Crown was a by-product of the nation's first steps to becoming part of an international world. In this scenario, Crown investment in infrastructure was oriented to enhancing taxation revenues or national security.

State Irrigation Development

Wet rice cultivation had, until the expansion into the delta, been restricted to those areas naturally suited to water retention and recession, and areas made thus by supplementary irrigation. The delta required drainage works before it could be reliable for rice production because the wet season caused these low lying flood plains to become lakes and seas. Canal building technology lent itself to the task, with Ayutthaya's construction expertise from communication canals providing a by-product of drainage and communication to remote lands for new rice fields adjacent to canals. By the 1850s canal developers, frequently nobles, were assuming usage rights over such lands and reallocating them to their wider families, thereby perpetuating an aristocratic control over a critical economic resource.

Floods had rendered rice production tenuous prior to the Bangkok drainage innovations. Rice shortages occurred following major floods, such as

⁸⁰ Phongpaichit, Pasuk. and Baker, C. (1998)

⁸¹ Feeny, D. (1983a)

⁸² Feeny, D. (1979)

⁸³ Thomson, V. (1967)

those of 1785 and 1831.⁸³ These shortages were not the result of rice export policies as rice storage was legislated and the extent of rice cultivation, even at that time, would have been much less without the stimulus of the rice export market. After the 1831 flood, a stone pillar was erected at Ayutthaya to measure water levels, and has indicated that subsequent floods have not been as severe despite their major impacts; a flood in 1917 destroyed more than 450,000 hectare of rice, equivalent to 21 percent of the crop.⁸⁴ Subsequent floods may have reached lower peaks but with rising population and rice production intensity, the damage caused continued to rise through the twentieth century. That floods and their associated risks and costs were tolerated in a country dependant on rice exports, even beyond the period when abatement technologies were being applied widely throughout the world, highlights the extent to which investment in agriculture had been allocated a low State priority.

The postponement of major irrigation and drainage works in Thailand limited overall development.⁸⁵ Advice that water control works were critical was overshadowed by other priorities. Ayutthayan water technologies had been a simple extension of those practiced elsewhere in earlier centuries with small-scale embankments and canal works and storages added to suit isolated aquatic environments of the flood plain. In the nineteenth century, trunk canals from the Suphanburi River were constructed and the new Ministry of Agriculture dredged the Khanomehin canal. Such works opened new areas and enhanced communication while, in some cases, impeding drainage from other low lying areas.⁸⁶

The Rangsit Project of the 1890s was designed to expand rice production in the depression areas near Bangkok. The first comprehensive irrigation scheme, it included 1,600 kilometres of waterways and large mechanised dam gates to control water flows (Figure 5.1). A monopoly was granted to a Thai and Italian group registered as the Siam Land, Canals, and Irrigation Company to develop, use and sell the agricultural land created by the scheme.⁸⁷ By 1900, the government rescinded the monopoly that was in fact determining settlement patterns around

⁸⁴ van Beek, S. (1995)

⁸⁵ Ingram, J.C. (1971)

⁸⁶ van der Heide, J.H. (1903)

⁸⁷ van Beek, S. (1995)

the capital. Prior to this scheme smaller versions had shown the power of tradeable land rights created by such developments, thereby stimulating legislation enabling the Crown to oversee all such developments. By beginning with a private monopoly, it is unsurprising that the problems of those recent decades would persist, even if the Privy Purse Bureau was a significant investor in the Company.⁸⁸

The formation of the Royal Irrigation Department in 1903, under the name of the Department of *Khlong*, reflected the primary function of canals in its charter to maintain inland water ways for transportation, and to also plan irrigation projects. To this department came the Dutch expert, van der Heide who conceived the comprehensive barrage system for the Chao Phraya River. Rejected officially due to its cost, it may have represented an excessive emphasis on agriculture when the Crown preferred modernisation of transport away from water to rail in order to



Figure 5.1 Overview of the Rangsit Irrigation Project of the 1890s⁸⁹

⁸⁸ Phongpaichit, Pasuk, and Baker, C. (1998)

⁸⁹ van Beek, S. (1995)

widen access across the country. Droughts in 1911 and 1914 stimulated a review of the irrigation proposal for Chainat which, while affirming its viability, led to no action. The Department changed its name to the Water Diversion (*Thod Nam*) Department and in 1927 changed again to its present name, the Royal Irrigation Department.⁹⁰ An indication of the low investment priority accorded agriculture was the Ministry of Agriculture's primary focus not on technical or economic matters, but ceremonial tasks, such as enactment of a Brahmin Ploughing Ceremony.⁹¹

Van der Heide presented three plans over the more than six years that he worked on irrigation designs for Thailand, the latter two being scalings down of his initial comprehensive plan. None were accepted at any stage, with the most consistent reason given being the lack of population to utilise the new agricultural lands that the scheme would create.⁹² Following floods in 1912 and 1913, the Minister of Agriculture appointed a British adviser who accommodated criticisms and strengths of the van der Heide scheme to produce an acceptable plan that was partially implemented. Opposition to further irrigation schemes continued, notwithstanding the banning of food exports in response to the 1918 flood and the 1919 drought. Rejecting expansion of rice area and security of production when it was the primary source of critical foreign exchange to modernise the country, in a period of rising global financial uncertainty, suggests significant ideological discrepancies within government in the first quarter of the twentieth century.⁹³

Ayutthaya began with a reliance on captured labour and evolved to a system of taxation of trade without major investment in the sector producing the taxed wealth.⁹⁴ By the early Bangkok period, Chinese labour proved a more valuable resource for Crown schemes such as canals than the outmoded corvee system.⁹⁵ Thus Thailand emerged as a country espousing modernisation while harbouring fantastic views of its global economic role and the quality of life of its small-holders. By the dawn of the twentieth century, the country had built only two dams; one in the thirteenth century west of Sukhothai, and another in the

⁹⁰ Arbhahirama, A. et al (1987)

⁹¹ Thomson, V. (1967)

⁹² Brown, I. (1988)

⁹³ Phongpaichit, Pasuk. and Baker, C. (1998)

⁹⁴ Chakrabongse, Chula. (1967)

⁹⁵ Phongpaichit, Pasuk. and Baker, C. (1998)

seventeenth century near Phra Buddhabaht.⁹⁶ Traders and business were determining the agricultural scene of Thailand more than the State.

Traders and Early Agribusiness

As foreign contact rose, demand for forest products and rice expanded and eventually led to the introduction of cash cropping and associated processing and marketing. Services for agriculture developed by foreigners willingly filled local voids in the agribusiness sector, including credit, transportation of produce, establishment of mills and storage facilities, and forward contracting. The Crown sought to balance external forces and to raise revenue from taxes on these entrepreneurs, while continuing to tax small-holders through rice prices. As the Chinese moved to dominate domestic fields of agribusiness such as credit and consolidating goods for export, Europeans moved to dominate the full chain of non-rice processed agricultural products. Success attracted the concern of the Crown, but periodic policy reversals generally failed to attract the full benefits sought, as the technology, markets, and expertise essential to this new era of agribusiness relied on foreign inputs.

In political terms, the era began with the Lanna Kingdom surpassing the strength of Ayutthaya, and the less developed Lang Xang Kingdom identifying more with Lanna than Ayutthaya.⁹⁷ Ayutthaya rose over Lanna after it had been vassalised by Myanmar, although the trading advantages offered by the Ayutthaya site may well have led to the same end without the Burmese intervention. The economic strength of the sea port with its own rice production capability, and a penchant to integrate with foreign cultures, produced a Kingdom that could easily dominate the smaller river valley States of the North. Through periods of turmoil for the Thai Crown, internal coherence was maintained by withdrawing from international commerce and reasserting bureaucratic control over agriculture.⁹⁸

Regional trade continued throughout the period in the form of valuable forest products including animal parts, herbs, barks, hides, resins, timber, thatch, spices, and ritual items. Control of trade in these products as well as a secure

⁹⁶ van Beek, S. (1995)

⁹⁷ Taylor, K.W. (1992)

⁹⁸ Reid, A. (1992)

domestic supply of rice determined economic power. Trade routes linked Chiang Mai, Luang Prabang, and Kengtung to coastal trade through major centres at Vientiane, Sukhothai, and Ayutthaya, thereby providing Ayutthaya with the major market force for much of the hinterland. By the beginning of the Bangkok period (1782), hinterland trade was waning in importance as the influence of sedentary agriculture across the delta impacted. However, the trade was later revived under Bangkok control with markets in China, which in turn encouraged a new influx of Chinese as traders.⁹⁹

Forest product exports to China dominated trade until the market collapsed in the 1840s in response to the Chinese opium wars. The growing trade with European ships seeking sugar, pepper, tobacco, and rice for colonies whose economies had shifted from food to cash crop production replaced the China market in significance. The Chinese in Bangkok, seeking other means of economic survival, found niches in money lending for crop expansion and in taking the risk of accumulating product for transport to market from remote regions. Chinese migrants also were brought to meet the growing demand for wage labour and expertise in these exportable food crops.

By 1850, exports were estimated to total some 4.3 million baht against imports of 5.6 million baht. Major export items were; sugar; hides, horns and skins; raw cotton, sapan wood, sticklac, tin, fish, cotton products, iron, birds' nests, rice, lard and fat, cardamom, dried meat, oil, tobacco, agilawood, pepper, ivory, and gamboge.¹⁰⁰ Before the cost of sea transport fell with new European ship technology, high value per weight items were the major income earners. Rice was primarily a regionally traded commodity with Ayutthaya being the major, and in terms of quality, preferred supplier to the major trading centre of Malacca,¹⁰¹ and considered at the time to be second in production capacity only to Bengal.¹⁰² Annual rice exports at this time were of the order of 15,000 ton having risen from almost nothing 50 years earlier, and were similar to the levels exported three centuries earlier from Ayutthaya. Exports continued to rise through to 1935. With a decline in receipts from many products in the 1860s as colonies of wealthier

⁹⁹ Phongpaichit, Pasuk. and Baker, C. (1998)

¹⁰⁰ Ingram, J.C. (1971)

¹⁰¹ Wyatt, D.K. (1984)

¹⁰² Cruford, J. (1828)

countries competed for a slower rising demand, rice and teak became Thailand's main agricultural exports, to which rubber was later added.¹⁰³ Rice once more proved itself the centre of the Thai economy, to the extent that pressure on rice producers to increase exportable surpluses may have even caused periodic reductions in local consumption levels.¹⁰⁴

With the final domination of the northern Kingdom in the 1880s, the rail link to Chiang Mai from Bangkok was completed in 1921, and rice exports increased markedly with the North contributing nine percent of exports. Agribusiness boomed through rice mill investment and expansion of middlemen credit and crop consolidation services while in the Central Plain, Chinese rice businesses had built up enormous commercial power.

The first steam-powered rice mill in mainland Southeast Asia was an American built machine erected in Bangkok in 1858. It was followed by British versions installed in Rangoon and Bangkok in 1869 and 1870,¹⁰⁵ and by 1900 there were some 50 rice mills and 20 sawmills in Bangkok, mainly associated with the port and Chinese labour.¹⁰⁶ Rice exports as a proportion of total production varied through the period 1907 to 1935 from 39 percent in post war five year period to 50 percent in 1907 and 1935.¹⁰⁷

Other primary exports, mainly teak, rubber, and tin, were important in terms of value but relatively less important than rice in socio-economic terms. Rubber grew from its small beginnings in the 1920s to 13 percent of exports by 1935. Teak varied in contribution according to official figures, providing between six and 18 percent of exports over the period 1867 to 1935, with a low in 1903 and a high in 1935; however, such figures omit teak floated down the Salween River into Myanmar, and the Mekong into Indochina. Three overwhelming characteristics of Thai exports at this time were:

- primary commodities were exported without value-added processing

¹⁰³ Terwiel, B.J. (1991)

¹⁰⁴ Ingram, J.C. (1971)

¹⁰⁵ Owen, N.G. (1971)

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

¹⁰⁷ Ingram, J.C. (1971)

- exports relied on a narrow base of four major commodities; rice, teak, rubber, and tin
- trade of rice, and the overall conduct of the other three major export industries, were largely in the hands of foreigners.¹⁰⁸

With the exception of rice, these were new industries for Thailand. Domestic industries such as textiles had suffered a slow demise under pressure from Chinese and other imports since the seventeenth century, despite small exports of silk and cotton cloth from the North and Northeast.¹⁰⁹ Processes were simple and slow, yields were low, and imported cloth appealed more for its colours and versatility, if not durability.

The Thai sugar industry, on the other hand, was a direct product of the Bowring Treaty, which had emphasised the potential for the crop. Attracted by the natural advantages of Thailand's environment, foreign investment stimulated an industry that in 1859 exported some 204,000 piculs (less than four ton). Steam-powered mills were built through the 1860s and investors negotiated large tracts of adjacent lands for plantations. Some government reductions in duties also favoured the industry, but these factors were insufficient to halt the industry's demise with a 60 percent fall in world sugar prices, and an overall higher tax regime than those of competing colonial producers, particularly the Philippines and Java. By the 1880s, exports of sugar were negligible and sugar lands had been converted to rice which was experiencing a rising market price. A revival of sugar in 1921 led to outputs of about half the 1859 peak and the industry continued with government support, never meeting domestic demand. Traditional sugars from palmyra and coconut, and crude cane sugar industries continued on a small scale throughout.¹¹⁰

The Chinese had proven innovative in providing essential service in trade and government, obtaining monopolies and engaging in barter arrangements which placed them in a better position than the colonially oriented Europeans. In particular, tax collection agencies provided Chinese with not only income, but contact with the production base of the country and control over local trade. Provision of both credit to produce a crop, and acting as the purchaser, gave power to Chinese

¹⁰⁸ Ingram, J.C. (1971)

¹⁰⁹ Bowring, J. (1857)

¹¹⁰ Ingram, J.C. (1971)

middlemen who accepted the lack of small-holder security over land. In and around Bangkok, the Chinese population exceeded 10 percent of the total and dominated retail and rice trading, and became an essential resource in plantations, market gardens, mining, and the urban workforce.¹¹¹ Denounced by the King in 1915, the Chinese again adapted to the environment, becoming Thai in the process.¹¹²

Agribusiness made its entry to Thailand through trading, processing, and vertically integrated industries, and was always associated with, or controlled by, foreigners. Through the period to 1932, major European firms such as the Borneo Company, Windsor Redlich, Markwald, Arracan, and Franklin Blake thrived in the Thai economy. Chinese agribusiness captains dominated rice processing and trading until the 1920s when the major players failed in an attempt to regulate trade and prices, and became post-war and depression casualties. By the 1930s, a new type of Chinese family company emerged to dominate the rice trade in the form the Thai-integrated grandchildren of mid-nineteenth century immigrants, as distinct from the old tax collector, middleman, and merchant fortunes. These groups were and are known by the family names of; Wanglee, Lamsam, Bulasuk, Bulakun (later Mahboonkrong), Iamsuri, Setthapakdi, and Bunyarak.¹¹³ Such European and Chinese groups came to dominate the export economy and influence development of the country through schemes like the Rangsit Project, the introduction of new industries, and in providing the base for the Crown's own tax collection. The openness of the mainly agriculturally based Thai economy to foreigners was essential, unique and related to the country's political, but not economic, independence.

Summary

Key points pertinent to Thai agriculture that may be elicited from the period from Ayutthaya to 1932 Bangkok include:

- Notwithstanding floods and droughts, and an association between rice agriculture and the security, development of a Thai State isolated small-holders from the Crown's primary focus on war, labour, and later, trade, and gradually relegated rice to an exportable and taxable commodity to fuel expansion of the State.

¹¹¹ Trocki, C.A. (1992)

¹¹² Vella, W.F. (1978)

¹¹³ Phongpaichit, Pasuk. and Baker, C. (1998)

- Small-holder agriculture expanded under market forces and relaxed labour laws and produced a shift from returns to labour towards returns to land area, with environmental costs, as land assumed a value around the end of the nineteenth century.
- The Chinese and European domination of the narrow export base of raw agricultural commodities led to agribusiness development being left to foreigners with minimal State interest in technology transfer, and to an environmental exploitation ethic which encouraged small-holder opening of new agricultural lands for rice and widespread harvesting of timber.