

---

## Changing faces of the Ayeyarwady (Irrawaddy) Delta (1850-2000)

---

Mya Than<sup>1</sup>

### 1 Introduction:

The Ayeyarwady River, the longest river and main transportation route in Myanmar, has flowed into the country for several milleniums witnessing the physical and socio-economic changes along its banks and delta. The purpose of this study is to explore and examine the changes that took place during the last one and a half centuries in the Ayeyarwady delta. That is, this study will discuss the political, social, economic and environmental changes that were taken place during the period from 1850 to 2000. It seems that political, particularly leadership, and environmental changes are more apparent than any other.

To evaluate these changes, this study will take the chronological approach. Since the period of study is long, it will be divided into four sections. The first section will describe and analyze the changes in the pre-British period (under the rules of Myanmar kings) up to 1852. Changes in the Ayeyarwady Delta during nearly one hundred years of colonial rule (1852-1947) will be assessed in the second section and the third section will examine the post-independence period (1948-2000). As the post-independence saw several changes in political leadership, it can be divided again into three sub-periods; democracy period, Burma Socialist Program Party (BSPP) period, and the present State Peace and Development Council period (SPDC).

For this study, the author has sourced mainly from the studies of J. S. Furnivall (1953), Willem van Schendel (1991), Michael Adas (1974), Cheng S. H. (1968), U Tun Wai (1961), McCrae and Prentice (1978), Mya Than (1984, 1987, 1990), Nishizawa (1991), and various IMF and World Bank reports, among others. Because the Ayeyarwady delta occupies most of the "Lower Burma" (as used by the British which refers to the area between Pyay and the Gulf of Martaban), these two terms will be used interchangeably in the first two sections.

**The Ayeyarwady River.** The Ayeyarwady is the main river of Myanmar/Burma, traversing the country from north to south (from Himalayan slopes to the Bay of Bengal) for about 1,350 miles. However, the river is navigable by steamers for about 900 miles up to Bhamo and by launches up to Myitkyina. It has its source at the confluence of two rivers, the Maykha (N'mai

---

<sup>1</sup> Institute of Southeast Asian Studies, Singapore

Hka) and Malikha (Mali Hka), both of which have their beginnings in the Himalayan slopes. They join about thirty miles north of Myitkyina to become the Ayeyarwady.

The melting snow from these Himalayan peaks brings about the phenomenon that the Ayeyarwaddy begins its early annual rise during the month of April at the heart of Myanmar's driest season. It is the main communication route of Myanmar as it flows southward through Myitkyina, Bhamo, Mandalay, Pakokku, Yenangyaung, and Pyay before it enters the vast delta at Hinthada. The river is joined by Chindwin, a main tributary, and Myitnge rivers below Mandalay. In its northern part, the river has three defiles.

The southwest monsoon rains reach the lower part of Myanmar around June and the upper part around April. These rains add to the already swollen river until October when its water level starts to fall. It reaches its lowest level between December and April. In the northern part of the river, the average rainfall during the months of April to October is about 80 inches, in the central dry zone only, 25 to 40 inches and in the delta area 100 inches or more.

During the low water season the level of the Ayeyarwady river drops 80 to 100 feet in the First Defile below Myitkyina, while over the 750 miles between Bhamo and Hinthada the drop is on average about 40 feet. "At Henzada (now called Hinthada - author), 150 miles from the sea (where Irrawaddy is four miles wide) the first branches of the delta break out east and west and from there south the whole country is flat and alluvial, with no defined or measurable rise and fall of the river" (Irrawaddy Flotilla, 1978, p.26).

It is to be noted that although the river has an exceptionally small contour drop of only some 500 feet in the 1350 miles from the beginning of the river to the sea, the current speed is maintained even during the low water season, often at modest levels where the river widens. However, the current is at a greater velocity where a narrowing of the natural banks occurs.

As the sedimentation of the river is very significant for agriculture, it is well described in McCrae and Prentice (1978) as follows:

"With huge sediment deposits suspended by the current, silt and sand dictate the nature of the river bed. The sand is of the finest texture and almost white in colour, but where the river is subject to the tidal influence of the delta area it can only be described as muddy, and seasonal flooding there accounts for the remarkable fertility of the delta paddy growing land. The quantity of alluvial deposit is so immense that delta extends further and further into the Bay of Bengal each year; geological evidence has shown that the town of Prome, now some 250 miles from the sea, was once close to the seaboard" (p. 26).

In the delta area, low water season defined creeks are transformed by high water into many vast, lake-like surfaces. Below Henzada (Hinthada) the ever increasing branches which form the delta spread east and west until, finally, across a land space of more than 100 miles between the Bassein (Patheingyi) River to the west and the Rangoon River to the east, the Irrawaddy pours out its muddy waters over a wide expanse of the ocean" (p. 26).

This process of sedimentation of the Ayeyarwaddy, to some extent, is contributing to the socio-economic changes in its delta area.

**The Ayeyarwady Delta:** The Ayeyarwady delta consists of the interminable and fertile plain of southern part of Myanmar which is 180 miles long and 150 miles wide. When the British occupied the lower part of the country in 1852, the delta was tall jungle and high grass. During the period, native colonists from the parched fields in the formerly Upper Burma became attracted by the delta and started clearing the jungle because of the regularity of its fertilizing rain and unfailing monsoon. Many of those pioneers died due to harsh conditions but their descendents benefited by staying. The colonial government encouraged the immigration from Upper Burma by adopting “*dama-u-gya*” system which had allowed any person to clear and cultivate any land to which no previous occupant laid claim. Thus the land became the private property of the cultivator which he could mortgage, sell or bequeath to his descendents. Actually, under the British rule there were five different systems of occupying land have been recognized. (For details, refer Furnivall, 1953, p. 51).

Most of the delta area falls under the present Ayeyarwady Division which lies west and northwest of Yangon, Yangon Division, and Pegu (Bago) Division. The Ayeyarwaddy Division includes the mouth of the Ayeyarwady River and the area upriver to Kyangin, south of Pyay and Patheingyi District spanning from the eastern side of the Rakhine Yoma (Arakan Yoma Range). Yangon Division includes former Hanthawaddy District, south of Yangon up to the mouth of the Ayeyarwady. The area between Bago Yoma and Sittoung River from the south of Taungtha up to the Bay of Martaban (Motetama) is known as the Bago Division.

Majority of the inhabitants in the Delta are Bamar (Burman). Minorities like Kayahs (Karens) and some Rakhines (Arakans) and Shans can be found in the delta area. The dominant crops in the area are rice, sugar cane and jute and most of the agricultural processing industry is concentrated in this part of the country. In other words, the delta bustles with various types of commercial activities.

As far as the present farming system in the Ayeyarwady Delta is concerned, the World Bank study (August, 1999) described it concisely as follows:

“The Ayeyarwady Delta of southern Myanmar is a fragile and intricate ecosystem of mangrove swamps and tidal estuaries. Non saline arable areas are limited and becoming scarce due to the erosion of riverbanks, saltwater intrusion, and increasing soil salinity. Poor water control and drainage works contribute to periodic flooding and crop losses. Most poor households cultivate a single crop of traditional monsoon paddy. Better-off farmers able to grow early maturing, high-yielding varieties of paddy benefit from an additional winter crop such as groundnuts or soybeans. In the very few areas where irrigation facilities are available, summer paddy is grown. Marginal farm households cannot afford to use chemical fertilizer or manure and suffer from declining crop yields. In some townships such as Laputta, Bogalay and Mawlamyaingyun, it is estimated that more than half of the population is landless. Many marginal farmers engage in fishing and crabbing. Those who fish typically do not own fishing gear or boats and depend on fish traders for such resources. Some households raise pigs, chickens, or ducks. Others crop during the slack growing season by borrowing from more well-off farmers; loans are paid back through labour or through a portion of paddy crop. The effective interest rate charged by fish traders, rice traders and others in these loan arrangements typically amount to 10 per cent a month” (p. 40).

## 2 Feudal Delta (Until 1852)

The history of old Burma could be described as one long series of internecine warfare. There were independent kingdoms at Arakan (Rakhine), Pegu (Bago), Tavoy (Dawei), Prome (Pyay), Toungoo and Ava (Innwa). The stronger and dominant kingdom varied from time to time. Only under the King Anawrahta of Bagan (1044-1077), Myanmar was united for the first time. The second unification was occurred in 1539 under the Toungoo King Tabinshwehti, and the third and the last dynasty was founded by King Alaungpaya which lasted from 1755 to 1855 when the British occupied the whole country. This dynasty was known as the Konbaung Dynasty and its last king, Thibaw, was deported to India after the British conquest.

**Economic system:** During the period of Konbaung Dynasty, it is obvious that the political system was feudal which was different from the one that existed in Europe. "As in Europe, there was the usual obligation of the chieftain to produce the required number of men in times of war, and the same kind of tithes and dues that had to be paid by peasants to the overlord. But unlike the feudal society which existed in Europe or the caste system in India, the one in Burma was elastic in nature" (U Tun Wai, p.1). Another difference was that there was not the same connection between the land and serfs as in Europe. According to Furnivall (1936), under Burmese rule the relation between rulers and the ruled was personal. A man did not live in a village because he owned land there, but owned land because he lived in the village (p.85). Moreover, a man could migrate from one village to another, and still owe allegiance to the same captain (usually township chief – Myo Wun or Myo Sa). More importantly, the economic policy of Burmese kings was very akin to the mercantilist philosophy.

At the beginning of the 19th Century, it was estimated that the population in Lower Burma was about 1.2 million out of the country total of 4.7 million. In other words, the population of Lower Burma was only about one quarter of the total population (U Tun Wai, p. 5). This low level of population could be attributed to the internecine war since this part of the country used to be battlegrounds. As far as literacy is concerned, "The Burmese are a well educated people, at least the male part of the community, the boys throughout the empire being taught by the priests both to read and write" (ibid., p. 65).

It is interesting to note that Burmese kings did not encourage their subjects to emigrate. Even if men were allowed to emigrate, the women were not. On the contrary immigration was encouraged.

**Agrarian system:** There were four kinds of land during the feudal days; Crown lands (lands belonging to the king), lands held under various kinds of services tenures (similar to the land tenure of feudal Europe with the concept of overlord), waste land, and land under allodial title (dama-u-gya land for which the owner had to pay the share of the produce to the king).

People working on the crown land had to pay rent to the king and the right to collect rents were sold to the collector (Ayadaw-ok) who would collect for the king. "On land under various kinds of services tenure and allodial title, land revenue had to be paid to the king. On the latter it was one-tenth of the produce and payment was in kind"(ibid., p. 8).

During the feudal period, the main crops grown in Upper Burma were rice, wheat, tobacco, pulses, and maize whereas rice, sugar cane, cotton and indigo were grown in Lower Burma. As far as technique was concerned, it was better in Upper Burma than in Lower Burma, particularly the usage of irrigation due to poor soil and scarce rain fall. In the Ayeyarwady delta, the plough was seldom used; instead a rude harrow and the treading of cattle was used. Instead of transplanting, broadcasting method was used in the monsoon season. On the other hand, plough and transplanting methods were used in paddy cultivation due to availability of irrigation system.

Lifting of the ban on paddy exports helped the delta area increase in income. During the first years of the British annexation of the Lower Burma, Lower Burma exported rice to Upper Burma. But by 1855-86, half of 127,000 tons of rice was exported to Upper Burma and the rest to overseas.

The agriculture system in this period, with the exception of cotton, was for domestic consumption and hence credit was not necessary. Credit was necessary only in the cases of crop failure due to droughts or warfare or wild pigs. In such cases, the neighbours in the village would be sources of credit (Furnivall, 1936, p. 118). Agricultural activities were mainly a domestic affair using family labour and in the case of transplanting and harvesting, farmers would help each other.

**Industry:** There was a flourishing ship building industry due to the existence of teak forests. U Tun Wai (1961), quoting Symes, mentioned that the cost of building a ship in Rangoon river was one third less than the cost in Ganges and about half that at Bombay (p.11). However, the technique used for the industry was very primitive and wasteful since the axe was used instead of the saw.

The salt industry also flourished in the delta area along the sea coast. In Upper Burma, the cotton industry and oil industry existed although techniques used were outdated. Most oil wells were located in Yenangyaung township from where oil was transported by boat to all parts of the kingdom.

One popular industry during the period was mining industry in which rubies, iron, lead, tin and zinc were produced. All the mining industry was located in Upper Burma. Processing of agriculture products such as rice, sugar cane and sessamum oil as expected was also found mostly in Upper Burma.

In short, most industries using primitive techniques were located in the upper part of the country and products were mainly for domestic market.

**Economic conditions of the people:** Let us start with the revenue system. Revenues were collected by chieftains by taxing the people in their jurisdiction and they, in turn had to pay the king as tributes. The king also obtained revenues from various duties, taxes on mines, oils, fisheries, salt, on exports and imports, land revenue and rent in the sense of one tenth of the produce.

For ordinary people, according to colonial officers such as Crawford, the standard of living in Myanmar at that time was better than India due to higher wages and lower cost of living (op.cit., p.27). However, housing conditions were inferior to those in Europe since Myanmar houses were constructed with bamboo and wood peculiarly adapted for countries subject to earthquakes and hot weather. To conclude, compared to Upper Burma, the standard of living in the delta area during the time of Myanmar kings was low. This was because most of the people in the delta area were subsistence cultivators, fishermen, salt manufacturers and dhani palm gatherers. Of course there were administrators but their community was quite small.

### 3 Colonial Delta (1852-1947)

As a result of the First and the Second Anglo-Burmese war, the British annexed Lower Burma in 1852 while the Upper Burma was still ruled by Myanmar kings. The last two Myanmar kings were King Mindon (1852-1878) and King Thibaw (1878-1885). In 1886, the British again annexed the Upper Burma after the third war between the two countries. The excuses were the growing influence of France on Myanmar, the massacres at the royal court regarding the accession of the throne, and the dispute between the king and the Bombay Burma Trading Company and the resulting fine, among others. The country gained its independence from the British in January 1948 after the Second World War. In between, Japanese occupied the country from 1943 to 1945.

The conquest of the British marked the end of feudal system in the Ayeyarwady delta. The political and economic institutions of Lower Burma were transformed as the area was rapidly drawn into a capitalistic, commercially oriented global economy (Adas, 1974, p. 28). Thus, the feudal lands had become the private property and the commercialization of the country's agriculture and globalization started to work. (For details, refer to Furnivall (1957) and U Tun Wai (1961).

Since the colonial rule lasted for about 100 years, it can be divided into two parts; the period from the annexation of Lower Burma to that of Upper Burma (1852-1885) and the period when the whole country was under the British rule until the country gained its independence (1886-1947). However, due to limited time, both sub-period will be examined at the same time.

**Economic System:** The British annexation of Lower Burma resulted in a significant change in the economic system in the delta. The Myanmar kings' had had a closed door system but now the country was thrown open to the outside world. The economic policy was for development and to a certain extent the principles of "free trade" as practiced in England were applied and economic forces were given full play. At the same time in Upper Burma, the Myanmar kings were still attached to mercantilist philosophy in spite of closer relations with Lower Burma and there were monopolies in trading. (U Tun Wai, p. 30). On the other hand, even though market economy was working, there existed monopolies such as Steel Brothers which handled three quarters of the total European rice trade.

With the opening of the economy and foreign trade, many banks were established in Myanmar; most of them were opened in seaports and Yangon. However, the money link between the cultivators and money market was served by Chettiers.

The feudal system in the whole country was came to an end as a result of the annexation of Upper Burma by the British in 1886. Along with feudalism, also gone were the mercantilist policy and economic controls such as state trading and price controls. Thus, the economy of the country was again integrated and the structure of the economy had changed significantly. A new type of economy known as plural economy in which foreigners played very significant role, started to take place in the Lower Burma. In short, the earlier stage of market economy was working in the whole country which was brought into closer contact with materialistic civilization (Ibid., p. 63). There was no change in overall economic structure between 1930 and 1940 just before the Japanese occupation.

The worst case for the Delta towards the end of the colonial period was the Japanese occupation period during the Second World War which resulted in very extensive damages. The whole economy was seriously affected due to British and Japanese scorched-earth policies. Furthermore, cultivators abandoned almost half of the land.

**Agrarian System:** The objective of the British government regarding the agrarian system was to strive to make rights to land easily attainable and at the same time to ensure that holdings came to be controlled by agriculturists and not by speculators and moneylenders. Under the British rule five different systems of occupying land have been recognized; (a) the squatter system, (b) the patta system, (c) the lease system, (d) the Grant system, and (d) the colony system (Furnivall, 1957, p. 51). Two dominant types of land system out of the five introduced during the period were patta system and squatter type. Under the patta system, the government granted tenure before the cultivator cleared his land. "Grants were made by local Thugyis, or district officers, depending on the size of the holding. Only persons who were able to prove that they are bonafide agriculturists could obtain patta grants" (Adas, 1974, p.32). On the other hand, "squatter" type land was similar to dama-u-gya system in the feudal days in which most cultivators became landholders by the act of clearing and cultivating a patch of jungle or scrub. Either form of tenure gave the landholder a permanent and heritable title to his land which he could sell, mortgage or transfer. To promote immigration into the Delta, the government waived payment of the capitation tax for the first two years after a migrant's arrival. (Ibid. p.34).

During earlier colonial period, land revenue was assessed at 10 per cent and then 20 per cent of gross produce. Then in later days it was changed to one half of the net profits, and net profit was defined as gross produce less cost of cultivation and cost of living (U Tun Wai, p. 69).

As a result of the colonization of the Delta, the cultivated land had increased from 600 thousand acres in 1852-53 to 6.7 million acres in 1902-03 and then to 8.9 million acres in 1922-23. This was the equivalent of ten times increase within the first 50 years of the colonial rule in Myanmar and 14.5 times within the first 70 years. This was due to increase in immigration from Upper Burma and expansion of rice cultivation. This was due to increase in immigration from Upper Burma and expansion of rice cultivation. At the same time, area of

rice grew from 5.5 million acres in 1896 to 11.6 million in 1926 – more than two times increase in 30 years. A remarkable increase in rice cultivation area in the Delta was due to increase in population and export demand which was spurred by the opening of the Suez Canal, the outbreak of civil war in the US and the subsequent decline of the Carolina as a source of rice for Europe, and Sepoy Mutiny and famines in India in the 1870s.

In the earlier colonial period, agriculture techniques used in the Delta were inferior to those in Upper Burma. However, in the later years, techniques in the Delta were improved as many canals were constructed for irrigation and embankments were built by the government on the Ayeyarwady and Sittaung rivers to floods and soil prevention. During this period, ploughs were used in the Delta.

With the colonization of Delta, came commercialization of rice cultivation which was meant for market rather than domestic consumption. Subsequently, processing of agriculture products were carried out by rice mills, saw mills and sugar mills for which machinery were imported. However, due to migration of Indians labourers, unlike in the US, the development of processing industry was very marginal. However, it should be noted that all the Indians immigrants were not labourers. There were also capitalists, traders and money lenders too and this created problems in rural Myanmar.

One of the bad products of the colonization of the Delta was indebtedness. The failure of the government to create a class of peasants proprietors resulted in agriculture indebtedness. (Details of causes for indebtedness are discussed in U Tun Wai, p. 73-75, and Binns, 1948.) Here Chettiars, who were moneylenders, also played a part in this issue as they charged high rates of interests.

**Industry:** During this period the majority of industries were agriculture industries such as rice mills, saw mills, oil mills, and sugar mills. However, rice mills topped the industry in terms of numbers. It increased from 3 steam mills in 1867 to 26 in 1872 and then to 657 in 1929 with small increase in 1940. Of this, 19 were large mills employing more than 500 labourers in one shift. Rice milling was responsible for the employment of one-third to one-half of the industrial workers (Ibid, p. 19). This occurrence of processing industry created the division of labour and change from the old domestic economy. Sugar refining industry was the late comer during the colonial period. The output of sugar met the domestic consumption. Out of two sugar mills, one in the lower part of the country was owned by an Indian. In general, most firms in industry were owned by the British, and the Indians to a lesser extent controlled the industry and trade.

There was a significant improvement in transportation industry as well, especially, waterways, railways and roads which helped the economy grew. This also had changed the economy and social life of the population and gave foreigners the opportunity to exploit country's resources. Canals were constructed in the Delta; the Irrawaddy Flotilla Company ran its steamers along the Ayeyarwady River and between Yangon and cities like Prome, Henzada, Bassein and between various towns in the Delta. Railways lines were built in the Delta; from between Yangon and Pyay, Hinthada, Pathein, Bago, Mawlamyine, among others. Exports of agriculture products, mainly rice, shipped from Yangon, Pathein, Mawlamyine and Sitway (Akyab) ports.



**Economic conditions of the people:** During the earlier colonial period, when natural economic (barter) system was transformed into market (money) economy, Myanmar cultivators in the Delta were most probably well-off and prosperous. This was evident when U Tun Wai (1961) quoted Geary that “Lower Burma has advanced in prosperity with rapid growth usually associated with American cities” (p. 60). This rapid growth was because the paddy price rose from Rs16 per basket in 1852 to RS100-110 in 1900 while wages fell 20 per cent during the period between 1870 and 1930. However, as prices of basic goods increased during the period, industrial workers had suffered. This indicates that cultivators were better off than labourers. However, pioneers who turned the Delta into inhabitable localities had to struggle for survival and face epidemics, cattle disease, and fever. Since cultivators were more tempted to borrow money from Chettyars and when there were crop failures, indebtedness became a widespread phenomenon. At the same time, the index of imports and exports prices showed a rise of about 150 per cent.

During the Great Depression in the early 1930s, there was a decline in Indian immigration, decline in rice production (more because of the weather than the fall in prices), and a big decline in timber extraction. In the processing industry mainly rice mills in terms of operating mills and workers had not been affected much although there was a decline in charges. However, in saw mills, many workers were laid off. More importantly, because of the decline in prices and crop failures, many cultivators lost their land to the Chettiers because of heavy indebtedness. The amount of the total occupied area in Lower Burma held by nonagriculturists rose from 31 per cent in 1929-30 to nearly 50 per cent by 1934-35 (Adas, p.188). And as a result, the standard of living of cultivators fell.

These worsening agrarian conflicts led the peasant rebellion against the British government had occurred in the 1930s followed later by bloody anti-Indians riots.

Towards the end of the colonial period and before the Japanese occupation, the standard of living in towns in the Delta might have been rising as the cost of living (at least in Yangon) was declining. The cost of living index in Yangon showed that it fell from 100 in 1931 to 88 in 1938. Even though workers were protected by laws, there was no compulsory type of insurance for them.

One significant factor during the colonial period was that population in the Delta increased significantly. The density of population in the Delta rose from 45 per sq mile in 1852 to 152 in 1930. In Lower Burma, the population increased from 7.8 million in 1931 to 8.9 million in 1941. As noted before, the British and Indians had a major control in industry and trade and “There is not a single banking, insurance, shipping, manufacturing or import firm of any size that is owned or managed by Burmese” (Christian, 1942, p. 128).

As far as social activities were concerned Myanmar agriculturists enjoyed themselves by holding pagoda festivals, ox-cart races, *pwes* (theatres), and village feasts during religious activities such as *shinbyus* (initiation ceremonies of Buddhist monks) and taking rest during the off-season. However, some of these were lacking in the Delta as a result of economic decline during the 1930s and the years following the Japanese Occupation.

## 4 Mixed-economy Delta (1948 – 1988)

Many political, social and economic development changes have taken place since Myanmar gained its Independence from the British in January 1948. Civil war broke out soon after the Independence and many ethnic armed separatist movements occurred. There was a military coup in 1962 after a decade of democratic governments. The “Burmese Way to Socialism” was introduced and experimented since the military took over power in 1962 to 1988. A new “socialist” constitution was introduced in 1973 and general elections were held. Another military was carried out in 1988 and socialism was discarded since then. Free and fair elections were held in 1990 and the results are still yet to be announced as the Elections Commission is still working on ten years later.

During the period under the democratic governments, the administration was similar to that of the British. However, under the military rule, government appointed committees at various levels of administration with the exception of the period under Burmese Socialist Programme Party period where members of administrative bodies at various levels were elected.

**Economic system:** Economic systems also have changed. Up to 1962, mixed economy with dominant private sector was practiced. Despite of civil wars and political upheavals, economic growth of about 4-6 per cent was attained during the period under the democratically elected governments, that is, from 1948 to 1961. However, the economic performance has declined during the period between 1962 to 1988, when the country experimented with the Burmese Way to Socialism, a cocktail of socialism, nationalism and Buddhism, .

As far as economic performance is concerned, the country’s economy recovered, in terms of GDP index, only in 1959-60 compared with that of 1938-39. Paddy production and rice exports still lagged behind the pre-war level. The average annual growth rate of GDP from 1951-61 was 5.3 per cent and that of between 1962 and 1988 was 3.5 per cent. However, the growth rate of GDP between 1989 and 1999 averaged 5.9 per cent as the government policy changed to be market-oriented since 1988. The difference was due to market-hostile and trade prohibiting policies. However, there was no significant change in economic structure. The pre-war level of paddy production reached only in 1971-72 and the post war exports level still could not catch up with the 1938-39 level of 3.3 million ton.

**Agrarian System:** Since independence, successive Myanmar governments have introduced pro-socialist agrarian reforms with the aim of uplifting the well-being and standards of living of rural people in the name of equity with the slogan of “Land to the tillers”. The post-independence agrarian reform started with the Land Nationalization Act of 1948. However, due to political hostilities during the period, the Act was not implemented. Then the government implemented an expanded version of the Act of 1948 in 1953-54. However, it was a disappointment. Contrary to the aim of the agrarian reform, the land owned by the non-agriculturists had even increased and it was obvious that the land reform did not benefit the poor small farmers. The implementation of the land reform had to stop in 1958-59 due to dissatisfaction among the peasantry. As a result, the socio-politico-economic position in the rural sector was not strong as in the colonial days. The conditions of the agricultural

labourers was worse than that of tenants, although wages were about two times higher than in pre-war days. Technology was almost the same as in pre-war days and agriculture production was achieved through land expansion. The system benefited mostly the urban and rural bourgeoisie.

Under the rule of the military regime (1962-1988), many measures were introduced to raise the standard of living of the rural population and to protect them from losing the land or livelihood. Since 1963 the government introduced four laws and decrees were passed as measures towards the abolition of land ownership by tenanted owners. Moreover, a new constitution was promulgated. As in the 1948 Constitution, the 1974 Constitution confirmed that ownership of the land was vested in the State. However, the slogan of the agrarian reform in the military government changed from "Land to the tiller" to "Right to cultivate to the tiller" since the land belongs to the state. (For details, refer Mya Than 1984, p. 741-761). As in the past, average farm size was declining due to inheritance and population pressure. As a result, the profit margin became smaller for cultivators as the compulsory sale of the agricultural produce (particularly paddy) to the state was introduced. During the period, agricultural workers were most of the time worse off than small farmers. However, during 1971-72, when the free market price of paddy was raised, they were better off than small owner-cultivators because agricultural workers were usually paid in kind.

Although there was no data on indebtedness, it was estimated that 60-80 per cent of the farmers were in debt. One reason was that government's credit was not enough to cover even the labour cost as the amount of credit was one third of the cost of cultivation. After raising the paddy price, the extent of indebtedness was not as acute as in the colonial days.

Land fragmentation also has taken place all over the years due to the land policy loopholes and the law of inheritance. However, land-man ratio is still better than in neighbouring countries.

In short, the state became the landlord since it monopolized the rice export and cultivators have to sell a certain percent of their produce to the state at the government fixed procurement price which is much lower than the government price.

**Industry:** During this period, the government followed an inward-looking import-substitution policy. In the Delta, many of private and government owned industries mushroomed, mainly around Yangon since independence. Processing industries such as rice mills, oil mills, saw mills, jute mills, textile and garment mills, pulps and paper mills, and so on. Even a glass factory was established near Patheingyi. There existed heavy industry in the Delta such as motor industry, oil and gas industry. However, most private-owned industries were nationalized in the 1960s along with banks and trading companies. In short, people in the Ayeyarwady Delta had more work opportunities than in colonial days.

**Economic Conditions of the People:** In terms of per capita income in constant price (1985-86 prices), it increased from 1095 kyats in 1961-62 to 1885 kyats in 1973-74 and again to 1905 kyats in 1999-2000. Compared to other developing countries in the region this increase in per capita income is not impressive. The social and economic conditions of the Delta up to 1962, had improved slightly, compared with the colonial period, as a result of the agricultural

development. Also in the period between 1962 to 1988, social indicators such as literacy rate, school enrolment ratios, teacher-student ratios, number of hospitals and medical staff, infant mortality rate, life expectancy, etc., showed some improvements due to the socialist policy which gave priority to social sector.

## 5 Market-oriented Ayeyarwady Delta (1988 – 2000)

### 5.1 Capitalists are coming !

After the mass demonstrations and riots, sparked by the demonetization of 25-, 35-, and 75-kyat notes without any compensation, the military again took over power in 1988 and named themselves as the State Law and Order Restoration Council (SLORC). Soon after the coup, the SLORC (later it was changed to the State Peace and Development Council (SPDC) in 1997) announced that it would open up the economy by transforming from the command control economy into the market-oriented system. It was obvious that the continued deterioration of the economy since 1962 became the motivating factor for Myanmar's economic transition. However, purely economic aspects of a nation's life are by no means the only motivating forces for the transition to a market-oriented economy. The international scene at the time – economic reforms in China, people's power movement in the Philippines, *perestroika* and *glasnost* in the Soviet Union and the Eastern Europe, the success of the newly industrialized countries (NICs) – all these must also have had some influence in uplifting the aspirations of the Myanmar people and determining the decision of their leaders (Myat Thein and Mya Than, 1995, p. 215). One of the most important measures taken by the SLORC was the official revocation in 1989 of the 1965 Law of Establishment of Socialist Economic System. Around the same time, there was the changing of the country's name from the "Socialist Republic of the Union of Burma" to the "Union of Burma" then to the "Union of Myanmar". However, many economic activities are still under government control.

With the opening of the economy, many investors, foreign and local, rushed into the Ayeyarwaddy Delta where many of not-fully exploited resources are located, such as agriculture, fisheries, forestry, processing industries, etc. And thus, the Ayeyarwady Delta shares the consequences of this transition process with other parts of the country.

**Agrarian System:** Along with the opening of the economy, many significant reform measures were introduced during the late 1980s, including decontrol of prices and domestic trade in rice and other crops and formalization of the border trade. "These reforms brought about impressive short-term supply responses from farmers, with average growth of over 7 per cent a year between 1992/93 and 1995/96" (World Bank, August, 1999, p. 50). However, during the second half of the 1990s, the reforms seemed to have lost steam as there was stagnation in paddy output and the yields. This stagnation was attributable to severe droughts and flooding, decrease in fertilizer use due to price increase, high and persistent inflation, lack of access to credit and continued suppressing of farm-gate prices (ibid, p. 50).

Liberalization of the agricultural sector gained back its momentum in the second half of the 1990s; farmers are relatively free to make their own cropping choices, liberalization in cultivation and export of some crops such as beans and pulses, reduction of fertilizer

subsidies, and partial privatization of fertilizer provision. However, there remain many distortions in policy environment in the agriculture sector. The most glaring distortion is the compulsory sale of a portion of paddy production to the government at the price lower than the market price, which can be considered as implicit tax. Moreover, the philosophy of self-sufficiency in key food crops also contributed in banning on export of rice and other crops. In fact, continuation of the compulsory quota delivery of rice also inhibits the development of agriculture production.

A detailed study of how capitalists are working in the development of agriculture Ayeyarwady Delta will be presented below.

## 5.2 Capitalist agriculture in the Delta: a case study

The agrarian system in Myanmar has changed from subsistence economy to commercialization and recently to capital intensive system to some extent. Successive governments tried to introduce measures to improve agriculture production by using political, institutional, social, economic, and technical factors.

The present government applies land expansion method since the other option to use the yield-raising method needs foreign exchange which is scarce. Thus the government started the land reclamation program in 1998 to develop large tracts of land of about 22 million acres to be farmed by private entrepreneurs. The land includes deep water or wet land, coastal land, and dry zone land not under cultivation. In the Delta, which comprises Ayeyarwady Division, Yangon Division and Pegu Division, there are two types of such land, wet land and coastal land. This is remarkable and historic in the sense that big private business firms are being allowed to get involved in agriculture production. In other words, this is the first time that non-resident capitalists are being allowed to be directly involved in agriculture production.

As of June, 1999, a total of about 1.2 million acres have been allocated to some 80 business groups in the whole country (see Table I). That is, 35 per cent of total leased land is from the Delta, mostly from Yangon and Ayeyarwaddy Divisions. Up to February, 1999, there were 24 business groups which also include a local military unit and Yangon City Development Corporation. Most holdings are around 3000 to 5000 acres and the largest of which is 72,000 acres.

There are incentives given to these groups. According to Warr (2000, p. 232-233), the government provides assistance for these projects in the following ways.

- The land is made available in a 30 year lease, provided free of charge, under the condition that the land be developed for agriculture production within three years.
- The public work required for flood control, drainage, and irrigation are provided free of charges.
- Government agencies assist in supplying the heavy earth moving machinery used to create the level fields to be used for paddy production. They do this under contract with the developer, but at subsidized rates.

- The government assists in providing technical assistance in developing the project, free of charge.
- Local private banks are encouraged to provide loans to the projects on a preferential basis.
- Fuel required for project construction and land preparation is provided at the government price of 160 kyats per gallon.
- Project investors may export 50 per cent of the rice they produce and are exempted from the rice procurement program operated by the government agency, the Agricultural Produce Trading (MAPT).
- Preferential provision of telephone services, including cellular phones and land-based phone lines.
- Provision of security services to protect project staff and equipment, free of charge.
- Permission to import equipment, including water pumps, tractors, bulldozers excavators, duty free and without limit, and without the need to demonstrate foreign exchange earnings through approved channels.

The majority of those business firms involved in the program are real estate developers who were caught up in the bubble economy when the regional crisis occurred in 1997-98. Many critics are saying that this program is aimed to help the developers who are losing money due to the decline in prices of real estates. Some said banks are asked to provide loans at the interest rate of around 10 per cent whereas inflation is around 30-40 per cent. At the same time, the interest rate at the market is around 30-40 per cent on collateral basis. There have been rumors of selling of fuel provided by the government at the official price in the market where the price was about 2 – 3 times higher. According to local critics, there may be cheating of the production figures by buying paddy from the farmers and exporting to get much needed foreign earnings. Worries coming out of this program were that those firms have no experience nor basic knowledge of cultivation and are profit motivated.

Out of 24 business groups, as of February, 1999, involved in this program in Delta, 18 are in the Ayeyarwady Division and only 4 in the Yangon Division (Appendix I). The largest firms are Myanmar Billion Group (38,141 acres), Ayeyar Shwewar (36,695), Yuzana Group (21,880 acres) and Olympic Group (20,650 acres). The Billion Group's lands are located in Nyaungdon Island, Nyaungdon Township, Bawdi East in Pantanaw Township, and the west bank of Ayerwaddy in Naungdon Township, Ayeyarwaddy Division.

**Table I: Myanmar's Land Reclaiming Scheme**

Land Reclamation (acres)

	Total area leased	Total area developed
Region	June 1999)	(June 1999)
Ayeyarwaddy Division	246,366	65,456
Yangon Division	58,368	22,134
Bago Division	101,890	6,835
<b>Delta Region Total</b>	<b>406,624</b>	<b>94,425</b>
Magwe Division	233,037	3,625
<b>Dry Region Total</b>	<b>233,037</b>	<b>3,625</b>
Tanintharyi Division	464,744	415
<b>Coastal Region Total</b>	<b>464,744</b>	<b>415</b>
Shan State	21,675	15,017
Kachin State	33,027	1,409
Kayin State	1,000	400
<b>Upland Region Total</b>	<b>55,711</b>	<b>16,826</b>
<b>Union Total</b>	<b>1,160,116</b>	<b>115,291</b>

Source: Warr, 2000, Table 6

Peter Warr discussed about the largest firm “Myanmar Billion Group” in the Appendix I of his chapter (p.236-237). He argued that in purely economic terms the social costs of the project exceed its social value in that the combined social opportunity cost of the publicity supplied or subsidized inputs used by the projects exceeds the value of the reclaimed land “produced”, even if it is assumed that the land would have had zero social value in the absence of the project. “In addition, the social implications of the project are potentially significant. Local communities lose access to the wet lands being drained. In place of these wetlands, very large, capital-intensive agricultural enterprises are created which are more typical of Latin America than Asia. The long-term social and environmental consequences of these developments could be even more costly than the purely economic considerations..” (p. 234). (For details, please refer Appendix II).

The wetland project the author visited in February is located about 70 km south of Yangon. The firm operating there belongs to Yangon City Development Corporation. Land reclaiming process was almost finished at the time of the visit. The place used to be the natural reservoir located between the Hlaing River, a tribute of the Ayeyar River and the Bago Yoma (Pegu Mountain Range). Whenever the river floods, the reservoir collects the water or whenever there were heavy rains on the Bago Yoma, waters run into this reservoir so that there is no flood in the river. Once this reservoir is gone, the community is worried about coming flood from both the river and the nearby mountain range. This will definitely affect the

environment as there may be permanent ecological damage caused by this land reclaiming projects.

For the villages around the place, this wetland provides them fish and fishery products and cheaper transportation mode. In the summer, when the water dries up in some parts of the wetland, farmers grow rice for their consumption and use small deepwater trees as fuel wood. Moreover, thatch which grows naturally provides them with roof for their houses. Now, the livelihood of the villagers around the area has gone as they become wage labour at the big enterprise in place of the wetland. Now, for fish and rice, they have to commute to nearby towns and buy them at high prices. Also they will have to buy fuel wood and thatch for their households which they may no longer be able to afford with their daily wages.

In short, many worry that there may be social conflict between the local groups now denied access to this wetland and the business groups which established large agricultural enterprises in near future. Since the impact of land reclamation on agricultural production takes time, it is early to assess the impact of establishing large enterprises in the Delta on agricultural development.

**Industry:** Since the present State Peace and Development Council (formerly the SLORC) opened up the economy, foreign as well as local investors are allowed to invest in the country. Since the Delta is endowed with natural resources and infrastructure is relatively better than other areas, many industries are established. To accommodate the investors several "industrial estates" are established providing better infrastructure. Processing industry, light industry, oil and gas industry, and even heavy industry are located in the Delta. Most of the foreign investment projects of US\$7.2 billion (as of end January 2000) flow into the Ayeyarwaddy Delta. Most of these industries are labour-intensive. Moreover, some of state owned industries such as garment industry, food processing industry and entertainment industry (mainly cinema halls) are being nationalized in the Delta. This also indicates that capitalism is already starting to take place in the Delta.

**Economic Conditions of the People:** Myanmar is a low-income country, according to UN classification. However, because of abundance of natural resources and self sufficiency in basic food, most people do not think that Myanmar is poor. Since the introduction of a series of economic reforms in 1988, average income has increased in both urban and rural areas. The Delta is more fortunate than other parts of the country. When the government decontrolled the prices, cultivators were better off, especially those who cultivate cash crops. However, after reforms were slowed down in the mid 1990s, and during the late 1990s when the Asian Crisis hit the country, income of the people, particularly from urban areas were affected. Inflation is highly persist. However, the authorities had reacted with various measures such as a sharp increase in salaries of the government servants including the armed forces.

However, recently, UN reports indicated that there has been a lackluster performance of the social sector compared with other neighbouring countries which could be attributed to low budget allocations, including to some extent the poor allocation of the public expenditure that was designated for those areas. Household surveys conducted by the World Bank revealed that about 13 million people had expenditures below minimum subsistence levels in 1997.



However, people from the Delta are relatively fortunate than their counterparts in the other areas of the country in the sense that they are sitting on the “rice bowl” of the country. However, the shadow of the big capital-intensive agricultural enterprises is haunting them.

## 6 Conclusion: economic development vs environmental costs

As mentioned above, the Ayeyarwaddy Delta has changed its hardware as well as software sides; physical landscape and political, social, and economic systems through out the one and a half century period of study. Physical landscape has changed due to natural causes through erosion and salination, deterioration of marine ecosystem, and man-made deforestation. On the software side, the Delta witnessed Myanmar’s feudal system, British and Japanese colonial system, nationalist democratic system, nationalist socialist system, and military authoritarian system. It also saw several types of economic systems experimented with and practiced on feudal tribute system, plural economy, commercialization and export-oriented free market system, mixed-economy, centrally planned command/controlled economic system, and market-oriented transitional economy.

There was, to some extent, an improvement in living standard of the people in the Delta due to increase in market price of rice in the 1990s. In 1993-94, according to the official statistics, income in terms of total crop value per rural population, the Delta, including Ayeyarwaddy Division, Yangon Division and Bago Division) out performed other states and divisions in Myanmar (Dapice, 1995, Appendix I).

However, in a study of a Delta village called Mayin near Bago, by Mya Than (1987), it was found that, between 1960 and 1980 the village has borne witness to some progress in fulfilling basic needs. But the author summarized that “if the aim (of the successive governments) was to increase real income and to create more employment opportunities then, thus far, Mayin’s has been an unsuccessful story” (p. 87). Anyway, the standard of living of the inhabitants should have been better if not for exploitation of feudal lords, colonialists, foreign capitalists, landlords, and local capitalists; and economic mismanagement. Once the right policy reforms are implemented consistently with right sequencing and right coordination, more benefit for the Delta region as well as its inhabitants will be achieved.

What is more worrisome is the ecological damage caused by man-made environmental degradation such as deterioration of agricultural soil by soil erosion, forest depletion, and water pollution. According to the UNDP Report (1995), the huge areas of mangroves in the Ayeyarwady Delta have been totally destroyed, with untold damage to brackish water ecology and coastal fisheries, as well as heavy erosion of delta lands due to the constant shift of the river’s channels (p. 42).

Dapice added in another study of his, “landless and land poor households in the Delta commented on increasing scarcity of fish, crabs, firewood, and even vegetables. Goods that had been collected “free”, or for only an investment of time, were progressively less available. Water supply was also deteriorating, as increasing amount of fresh water were drawn out of wells, and increasingly rain was running off land that had been cleared of

mangrove and other trees. Salty water intrusion was seen as an issue both for crops and drinking water" (1998, p. 9).

Unless proper measures are taken to prevent the further degradation of environment by over-logging (legal and illegal), over-fishing, improper mining, and misuse of water sources, the impact to the Delta and its inhabitants would be enormous and most probably irreparable. The government of Myanmar is aware of this situation and has tried to introduce several measures to protect environment. However, the IMF report noted that "while past piece meal efforts have contributed somewhat in preserving natural resources, these gains have been mostly offset by the rapid growth of the economy and the population. These problems threaten to swamp Myanmar's environmental policies and programs, and pose a major challenge for sustainable development in the future" (February, 1999, p. 57).

## References

- Adas, Michael, *The Burma Delta*, University of Wisconsin Press, Wisconsin, 1974.
- Binns, B. O., *Agricultural Economy in Burma*, Government printing, Rangoon, 1948.
- Burmese Socialist Program Party, *Myanmah Leyarmyay Thamine* (Myanmar's Agrarian History), Vol. I and II, Rangoon, June, 1971.
- Cheng, S. H., *The Rice Industry of Burma (1852-1940)*, University of Malaya Press, Kuala Lumpur, 1968.
- Dapice, D., "Accelerating Progress Among the Rural Poor in Myanmar", a report to the UNDP, September, 1995, New York, 1995.
- Furnivall, J. S., *An Introduction to the Political Economy of Burma*, Third Edition, Burmese Advertising press, Rangoon, 1957.
- IMF, Myanmar: Recent Economic Development, Washington, February, 1997.
- Lin Wai Myaing, "Yaynetkwin Saba" (Deep Water Rice), in *Kyaw Hya Lan Hnun (Living Color)*, No. 45, February, 1999.
- McCrae, A. and Prentice, A., *Irrawaddy Flotilla*, James Patton Ltd, Paisley, PA, 1978.
- Mya Than, "Burma's Agriculture since 1962 – From Stagnancy to Breakthrough", in *Unreal Growth: Critical Studies in Asian Development*, by Ngo Manh-Lan (ed.), Hindustan Publishing Corporation (India), Delhi, 1984.
- Mya Than, "Little Change in Rural Burma". In *SOJOURN*, Vol. 2, No. 2, 1987, ISEAS, Singapore, 1987.
- Mya Than & Nishizawa, N., "Agricultural Policy Reforms and Agricultural Development in Myanmar", in *Myanmar Dilemmas and Options*, edited by Mya Than & Tan, J.L.H., ISEAS, Singapore, 1990.
- Nishizawa, N., *Economic Development of Burma in Colonial Times*, Research Report No. 15, Institute for Peace Science, Hiroshima University, Hiroshima, June, 1991.
- U Tun Wai, *Economic Development of Burma: from 1800 till 1940*, Dept. of Economics, University of Rangoon, Rangoon, 1961.
- UNDP, *Myanmar Human Development initiative: An assessment*, 1995, New York, 1995.

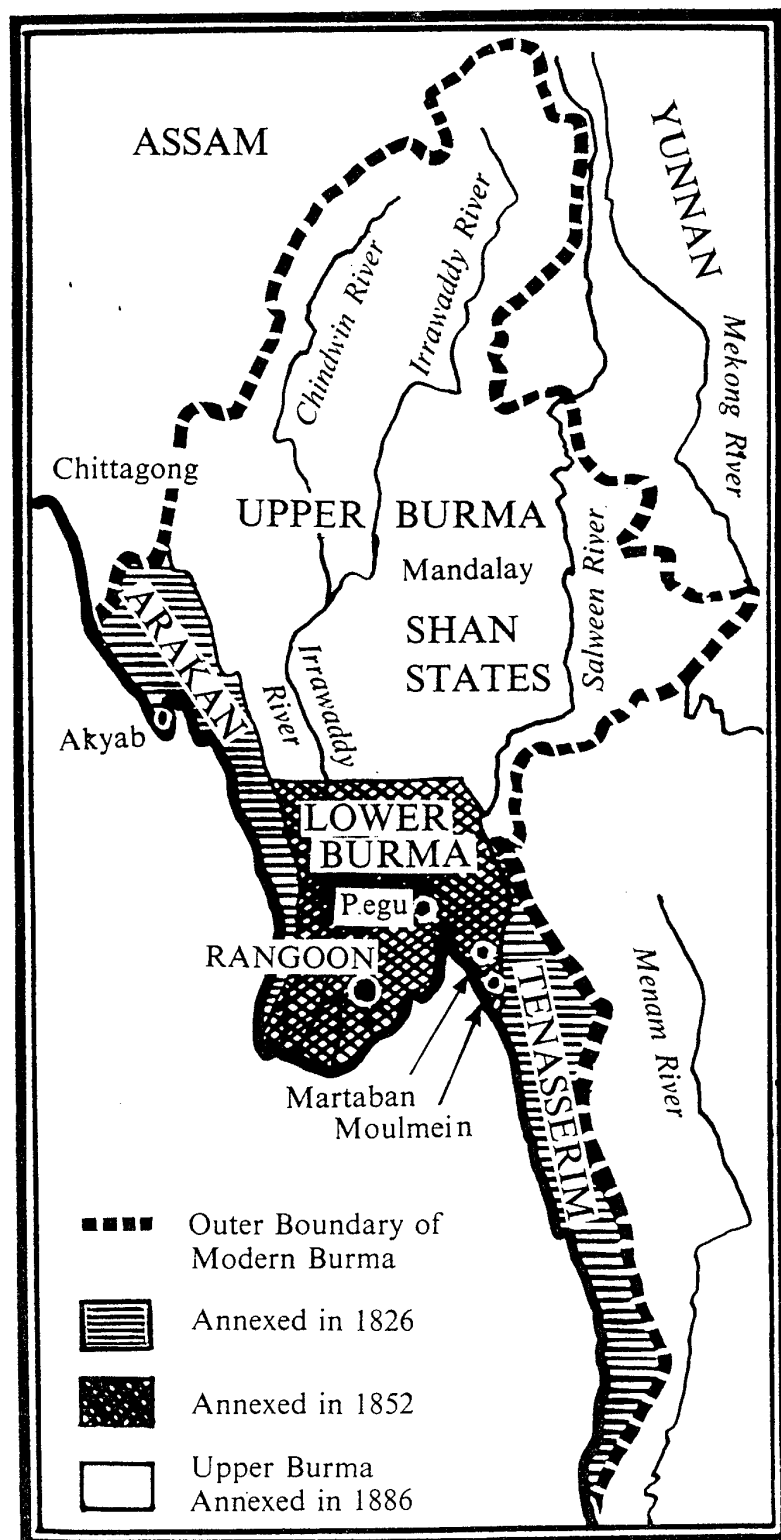
van Schendel, W., *Three Deltas: Accumulation and Poverty in Rural Burma, Bengal and South India*, Sage Publications, New Delhi, 1991.

Warr, P. G., The Failure of Myanmar's Agricultural Policies, in *Southeast Asian Affairs 2000*, ISEAS, Singapore, 2000.

### **Appendix I. Business Groups Granted for Cultivation in the Ayeyarwady Delta (As of February, 1999)**

<u>Enterprises</u>	<u>Township</u>	<u>Granted Acres</u>
<b>Ayeyarwady Division (Total)</b>		<b>196,362</b>
1. Myanmar Billion Group	Nyaungdone	38,141
2. Yuzana Group	Pantanaw/Nyaungdone	21,880
3. Olympic	Pantanaw/Danubyu	20,650
4. Wawawin	Ma-U-Bin	13,880
5. SI Group	Nyanungdone/Danubyu	3,000
6. Ayeyar Shwewar	Thabaung/Yegyi	36,695
	Kyaungkone/Kangyidaunt	
7. Seintrafu	Ma-U-Bin	460
8. Myanmar Golden Star	Ma-U-Bin	5,600
9. Orchard	Nyaungdone/Ma-U-Bin	2,250
10. Shwenagamin	Ma-U-Bin	1,000
11. Arkar-Oo	Pantanaw	5,080
12. Myanmar Rice Traders Asson.	Pantanaw	5,082
13. Toetetaung Co.	Pantanaw	470
14. Golden Green	Kyaungkone	5,556
15. Klosein Co.	Ingapur	5,858
16. Military Unit	Thabaung	2,175
17. U Saw Win	Thabaung	1,000
18. U Tin Shwe	Ma-U-Bin	585
<b>Yangon Division(Total)</b>		<b>29,880</b>
1. Dagon Agriculture Group	Tikekyi/Htatabin	14,300
2. Yangon City Development	Tikekyi	1,500
3. Ministry of Interior	Tikekyi	2,000
4. Dagon Agriculture	Htantabin/Tikekyi	5,000
5. Golden Plough	Tikekyi	2,080
6. Steel Stone	Hmwabi/Tikekyi/Htantabin	5,000
<b>All Areas Total</b>		<b>225,242</b>

Source: *Kyawnyar Lanhnyun*, No.45, February 1999 and *Myanmah Alin* (10/2/99)



ap I. Myanmar in Colonial Days (McCrae and Pentice, 1978)

## Appendix II. (Source: Warr, 2000, p. 55)

**Box 4.3: The Costs of Reclamation the case of MBG**

This project, being developed by a group of local entrepreneurs, covers a total of 72,000 acres, divided into two parts, one of 40,000 and the other 32,000 acres. The mission visited the first of these. Myanmar Billion Group (MBG) aims to develop the entire area within three years. The area is low lying wetlands and during the monsoon season it is submerged under more than 10 feet of water. The project involves draining the wetlands, building bunds and dykes to prevent inflow of water during the monsoon, leveling the fields for paddy production and installing irrigation facilities for dry season production.

One paddy crop of 1,729 acres was harvested in early 1999 and a similar sized crop is planned for the current year. Highly mechanized methods of cultivation are in use, including large, heavy duty tractors for cultivation, mechanical rice planters and weeders and mechanical rice harvesters. Because the drained soil is highly fertile, with high organic matter content, low levels of fertilizer input are sufficient to obtain high yields.

The private costs of the development, incurred by MBG, include (i) Cleaning and establishing bunds, 10,000 Kyats per acre, paid to Agricultural Mechanization Department of the Ministry of Agriculture and Irrigation, which arranged the work; and (ii) Further earth moving work conducted by MBG itself, including land leveling, consolidation and establishment of irrigation system, 70,000 Kyats per acre.

The social costs evaluated at market prices exceed these costs because the inputs are priced below market prices. For example, the earth moving work uses large quantities of diesel fuel, which is provided to the Agricultural Mechanization Department and the MBG project itself at below its market value. The bund establishment required 80,000 gallons of diesel for a 6,000 acre site, which implies that the social cost of the diesel fuel alone exceeded the private cost by 2133 Kyats per acre. Applying a similar calculation to the second item of cost above (incurred directly by MBG) suggests an additional divergence between social and private costs of around 15,000 Kyats per acre, a total of 17,200 Kyats per acre, raising the social cost of the land development at the site itself to at least 97,200 Kyats per acre. It should be emphasized that these calculations make no allowance for divergence between the accounting cost of machinery supplied to the government and its social opportunity cost, allowance for which would raise further the divergence between social and private costs.

In addition to the costs incurred on-site the Ministry of Construction, provides irrigation and drainage facilities to the project through the development of the Nyaundone Island area. The public investment in this development has to date been 645 million Kyats, with an output of 90,000 acres of cultivable land, including the MBG site described above. The cost per acre is thus 7,200 Kyats, of which 30 percent are again fuel costs, implying a market equivalent social cost of not less than 9,300 Kyats, again making no allowance for divergence between the accounting cost of machinery supplied to the Government and its social opportunity cost.

The above calculations imply that the aggregate social cost of developing the land for agricultural use is not less than 106,400 Kyats per acre, considering only the sources of social cost mentioned above and disregarding public provision of technical support, security, improved roads, and so forth. We now estimate the value of the project.

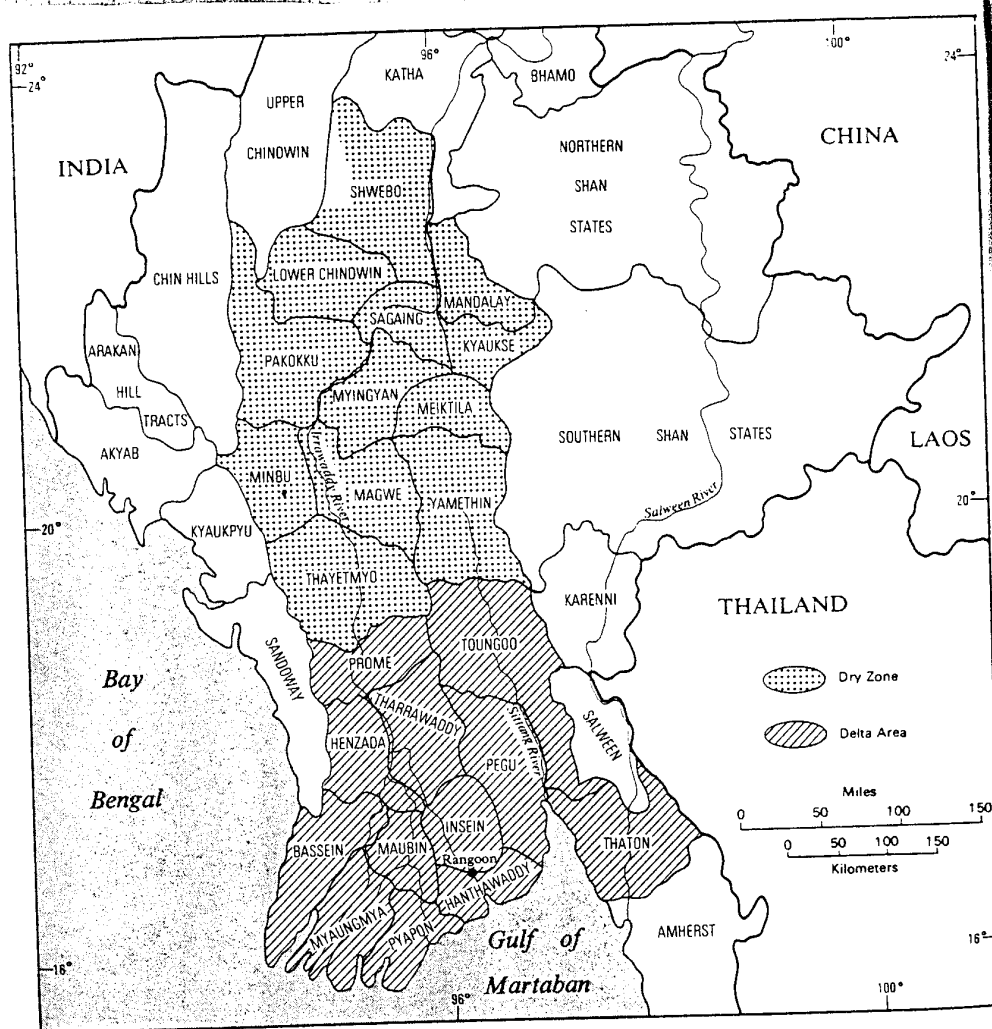
Suppose, initially, that in the absence of the project the social value of the land under development would have been zero. Under this assumption, the project creates usable agricultural land from an area which would have otherwise have been wasteland. Land of a quality similar to that developed by the project has a market value of 100,000 Kyats if directly adjacent to the sealed road. Land further distant from the road has a market value of 50,000 to 70,000 Kyats per acre depending on the distance. The agricultural land established by the MBG project includes areas close to and distant from the sealed road. The mean market value of this land would be thus no more than 85,000 Kyats per acre.

That is, the project 'creates' agricultural land worth, say, 85,000 Kyats per acre at a social cost of at least 106,400 Kyats per acre. The project is privately profitable because of the special privileges extended to the project, but without these implicit subsidies the project could not be viable. It should be recalled that the above calculations assume that in the absence of the project the land would have no value. This is clearly not the case. Allowance for the social value of the wetlands drained by the project, and therefore lost to the people Myanmar because of it, in terms of fishing, wildlife habitat, hydrological value in terms of water course movement and other ecological values, will increase the social cost of the project further, reinforcing the above conclusions.

*Source: Bank mission with acknowledgment of assistance from the staff of the Myanmar Billion Group.*

## Map 2: Myanmar: Delta and Dry Zone Areas

Source: Adas, 1974, p 2.



University of Wisconsin Cartographic Laboratory

Map. 1. Political Divisions of the Province of Burma in the Twentieth Century. Source: J. R. Andrus, *Burmese Economic Life* (Stanford, 1948).