

## **Industrial Crop Farming and the Process of Agricultural Transformation in Bago Division (West)**

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### **Abstract**

Major economic policy changed since the practicing of market oriented economy in 1988. Since Myanmar shifted to market oriented economic system, distinguished policy changes were carried out in the agriculture sector. Spatial impacts of government policy on the economic factors, input costs and market opportunities. Farm size, land tenure systems, labour supply, farmers' decision-making are also influenced. Industrial crop farming of Bago Division (West) changed after 1988 in the transformation of agriculture. In this research, the controlling factors that caused changes of industrial crops farming are studied. This research also tried to analyze the agricultural land use and changes of agriculture pattern, and studied on the constraints in the development of the industrial crop farming in Bago Division (West) area by the case study on industrial crop farming villages of Pyay Township, Paukkaung Township and Monyo Township.

**Key words:** industrial crop farming, market oriented economy system, Bago Division (West)

### **Introduction**

Agricultural practices are in a process of transformation due to increasing population pressure, decreasing availability of agricultural lands, environmental constraints (such as climate change), increasing market demands and globalization processes.

Agricultural transformation is the process by which individual farms shift from highly diversified, subsistence-oriented production towards more specialized production oriented towards the market or other systems of exchange (e.g., long-term contracts). The process involves a greater reliance on input and output delivery systems and increased integration of agriculture with other sectors of the domestic and international economies (Staatz, 1998).

Agriculture is the key sector of the Myanmar's economy, contributing for 40.2 per cent of GDP, 12.14 per cent of total export earning in 2005-06 whilst employing 69 per cent of the active labour force (Soe Soe Aye, 2006). The State has laid down 12 political, economic and social, objectives in its endeavours to establish a peaceful, modern and developed nation. One of the major economic objectives is "development of agriculture as a base and all round development of other sectors of the economy as well". Since 1992-93 the Economic Development Year, integrated development strategy has been applied for agricultural development, with specific sector-objectives and policies. The main strategies of the plan relating to the agricultural and agro-processing sectors are to increase production of primary food crops to achieve regional self-sufficiency, to extend cultivation of industrial crops to fulfil domestic raw material requirements, to promote the diversification and expansion of exports, to achieve effective mobilization and utilization of productive resources, to increase the efficiency of investments and to improve production efficiency and cost effectiveness.

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changes were carried out in the agriculture sector. Private companies are allowed to import pesticides and fertilizers. Many land development permission were given to private companies. Farm products are allowed to trade more freely than before as a part of market economy (Aung Kyaw *et al.*, 2007).

Spatial impacts of government policy on the economic factors, input costs and market opportunities. Farm size, land tenure systems, labour supply, farmers' decision-making are also influenced.

The above agriculture policy changes could generate some pattern of agriculture changes in the industrial crop farming areas. This thesis tried to analyze the agriculture and land use and agriculture pattern changes of Bago Division (West) area by the case study on each industrial crop farming villages as sample area.

## **Research Scenario**

### **Study area**

Bago Division (West) is located in the western part of Bago Yoma and it is between the Dry Zone in the north and wet climate region of Ayeyarwady Delta in the south. It is composed with two districts, Pyay and Thayarwady. Pyay District consists of six townships and Thayarwady District consists of eight townships. The northern part of this region is broad. All of them, only Pandaung Township is located in the western bank of Ayeyarwady River. The flat plain between the Bago Yoma in the east and Rakhine Yoma in the west are fertile soil. It is very good condition for agriculture. Between 1988 and 2005, average maximum temperature of Pyay District is 40°C and Thayarwady District is 41°C. Maximum total rainfall of Pyay District is 1570.74 mm and Thayarwady is 2684.27 mm. Annual rainfall of Pyay District is about 1168.4 mm. Thus, the cultivation of jute, which like more temperature and rain is less than sugarcane and cotton. Sugarcane and cotton are best growing plants in Pyay District. Similarly, the rainfall of Thayarwady District is more than Pyay District. Therefore, jute and rice cultivation is the highest in that area. But cotton and sugarcane cultivation of Thayarwady District is less than in Pyay District. The rest townships are best growing area for cotton except from Zigon and Monyo. Pyay Township is maximum cultivation area of long-staple cotton in Bago Division (West). Paukkaung Township is maximum cultivation area of sugarcane because the rainfall of Paukkaung is about 50 inches and it has the sandy soil or unconsolidated sandy loam. Monyo Township is maximum cultivated area of jute in Bago Division (West) because it receives 2286 mm of rainfall and it gets necessary water from river and creeks (Lwin Naing Oo, 2004; Than Than Htay *et al.*, 2003).

### **Research questions**

In this research, the role of industrial crops farming in the process of agricultural transformation is empirically investigated for Bago Division (West). The research questions are:

- (1) How industrial crops farming of Bago Division (West) changed after 1988 in the transformation of agriculture?
- (2) What are the controlling factors that caused changes of industrial crops farming?

## Methodology

In this research work, the secondary data and information are collected from respective offices. Based on those data, selected the representative villages for each crops and made interview with crop cultivators about the controlling factors based on stratification of farm size. To solve the above research questions, some villages located in Bago Division (West) where the industrial crops of sugarcane, jute and kenaf, and cotton are cultivated, are selected as a case study. Open interviews and structured interviews were conducted to farmers who are working on the industrial crops.

## Industrial crop farming

The main economy of Bago Division (West) is agriculture. Bago Division is the second most producer of rice. The other crops are oilseeds such as groundnut, sesame, sunflower and industrial crops such as jute, sugarcane and cotton. These are also important in Bago Division's economy. According to the agricultural census in 2001-2002, Bago Division is the most sugarcane net sown area as 25 per cent of net sown area of the sugarcane farming in Myanmar. Bago Division (West) has 11 per cent of net sown area in Myanmar (FAO, 2005). In cotton farming, Bago Division (West) stands on fourth place after Magway, Mandalay and Sagaing Divisions. Jute is cultivated mainly in the delta region. Ayeyarwady Division, currently, accounts for some 85 per cent of total crop production, with Bago and Yangon Divisions contributing around 14 per cent and 1 per cent respectively (Soe Soe Aye, 2006).

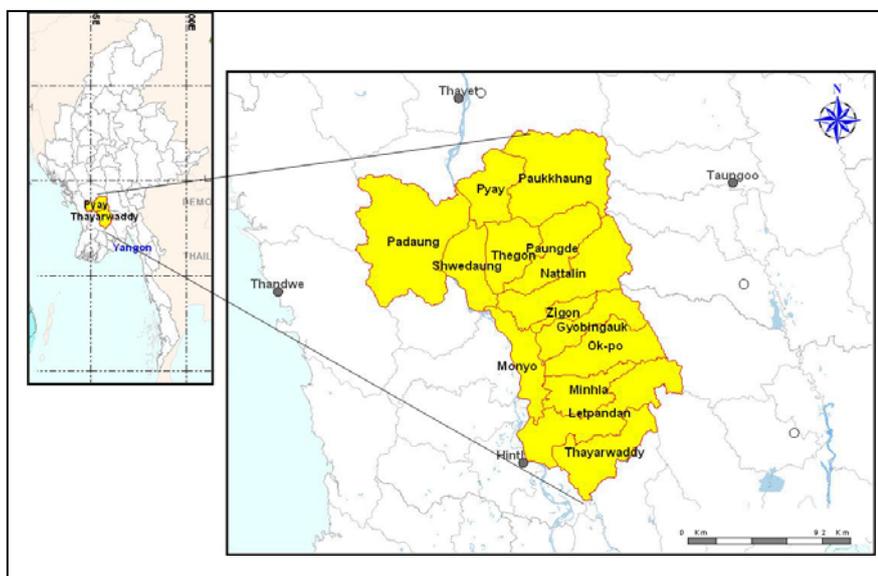


Figure 1. Location of the Bago Division (West)

Source: Based on Survey Department

In Bago Division (West), industrial crop farming is fourth important crop in their economy after the farming of cereal, pulses and beans and oilseeds. Industrial crops are cultivated mainly in the flat and undulated area of the Bago Division (West). Sugarcane, currently, accounts for some 45 per cent of total net sown area of industrial crop, with Cotton and Jute contributing around 33 per cent and 22 per cent respectively.

## Changes in Sugarcane Farming

Record of earliest sugarcane cultivation in Myanmar dates back to AD 800 and the art of manufacture of jaggery became well established during Inn-wa era in the 15<sup>th</sup> century. Crude sugar was manufactured in the 18<sup>th</sup> century and the first white sugar mill was established in Kyaik-kha-me in 1840. After subsequent attempts, modern sugar factories were firmly set from the year 1926 onwards. With the aim of scrutinizing both the sugarcane production and sugar processing by one sole agency, the Myanma Sugarcane Enterprise (MSE) was organized in 1994 under Ministry of Agriculture and Irrigation (MOAI) and it took over all the responsibilities involved in sugar industry.

### Changes in cultivated area and yield

According to the Myanma Sugarcane Enterprise, Pyay data, all townships are growing sugarcane, Paukkhaung, Thegon and Pyay Townships have large cultivated area. Paukkhaung Township is largest in acreage in Bago Division (West). Within the year of 1988-2006, Paukkhaung Township occupied 40-60 per cent of the region's net sown acreages. There have fluctuation of net sown area as from 1988 to 1994 increased due to high price of jaggery, doesn't need to care than other crops, less infect in disease. In 1994-95, Paukkhaung Township cultivated more than 90 per cent of Bago Division (West) acreage because replaced to other crop area and the other townships could not grown sugarcane in the irrigated area as policy factors. After 1999, establishment of sugar mill, there have high acreage as 48,489 acres in region.

Yield is changing from 1988 to 2006, in 1988-89 here have 48500 kg/ha and in 1996-97 there have 48930 kg/ha. In 1999-2000, there have 37480 kg/ha and 45630 kg/ha in 2005-06. Generally the yield was decreasing because the soil was exhausted and lack of interest of farmer who more interested in other cash crops as pulses.

Within the Paukkaung Township, 22 village tracts are practising the sugarcane cultivation. In those village tracts, Dha-ma-thaw village tract cover large acreage as 20-25 per cent of the township net sown area. Therefore, Dha-ma-thaw village have long history and it is suitable for study to consider the sugarcane farming in transformation of agriculture.

### A case of Dha-ma-thaw Village

Dha-ma-thaw village tract is located on north of Paukkhaung Town, mostly flat and rolling topography and there have nearly 40 years experience for sugarcane. Average annual rainfall is 1206.5 mm. Average maximum temperature is 34.9°C and minimum is 21.6°C in that area. Most of the areas have silt, alluvium, cinnamon and dark brown savanna soil. Area of Dha-ma-thaw village tract is 3548.29 hectares and composed with six villages. There have 923.09 hectares of arable land. Sugarcane is mainly cultivated as 48 per cent in this village tract. Within the six villages, Dha-ma-thaw village has conducted to study the controlling factors in transformation of agriculture.

In Dha-ma-thaw Village, there have 290 households and population is 1,450 in 2006. There has 467 hectares of Le land, 456.08 hectares of Ya land and the main growing crops are rice, groundnut, green gram, sesame, sunflower, long-staple cotton, sugarcane and vegetables. Until 1988, there have about 32.37 hectares for sugarcane. After 1989 the village place has moved to present area and there have more than 242.8 hectares. Although sugarcane grower population is changing as over 100 farmers before 1988, 60 farmers in 2004-05 and now there are 86 farmers.

Sugarcane cultivator grows not only sugarcane but also other crops for their subsistence because sugarcane is perennial crop. Only about the fifty percent of their farms is devoted to sugarcane and other crops are cultivated on the rest.

Until 1999 there were making jaggery, sugarcane syrup and alcohol only and after the sugar mills opened as In-nga-gwa and Nawaday, farmers have to send their cane to mill from 2000-2001. Since MSE was established in 1994, MSE operated up to 17 sugar mills in Myanmar and now 12 sugar mills are being operated.

In-nga-gwa mill and Nawaday mill (Joint-Venture Corporate with Thailand) separately collect the cane from Pauk-khaung Township as areas demarcated by authorities. Although Dha-ma-thaw village is located near In-nga-gwa mill (12.87 km distance) but the framers must transport their sugarcanes to Nawaday mill (64.37 km distance) that is located in Pyay Township. Thus, cane growers face high production costs by addition of transportation problem. Net profit from sugarcane is lower than that of other crops as groundnut. Labour for harvesting season is not sufficient because it coincides with other crop growing season. Thus, labour cost is also higher than other crops (Table 1). Reduction of small farm size owner is caused by high production cost and they stop to grow sugarcane. Yield per acre is 30000-75000 kg/ha, because of land condition, lesser utilization of expansive inputs and decreasing of soil fertility. Furthermore, irrigation during hot season is not easily accessible. Government and private company's assistance, price incentive and subsidies or credit system becomes paramount importance to boost the cane production.

Table 1. Differences between returns of sugarcane and groundnut 2006-2007 (in kyats) (assuming an average yield of 62500 kg/ha for sugarcane and 4167 kg/ha for groundnut)

| 2006- 2007                | Sugarcane   | Groundnut   |
|---------------------------|-------------|-------------|
| Input material costs      | 77600       | 14400       |
| Labour costs              | 71400       | 15600       |
| Total estimated costs     | 149000      | 30000       |
| Sold price                | 287500      | 250000      |
| Projected return          | 138500      | 220000      |
| <b>Benefit-cost ratio</b> | <b>0.93</b> | <b>7.33</b> |

Source: based on interviewed data.

### Changes in Jute and Kenaf Farming

Myanmar is an agrarian country and its economy is largely dependent on agricultural produce such as rice, pulses, etc. In order to export them, the farmers and producers need packaging materials such as gunny bags, hessian and twine. In the past, these packaging materials were all imported from India and East Pakistan. After making market surveys, it was found that it would be more beneficial to cultivate jute and establish a jute mill in Myanmar.

Jute is cultivated mainly in the delta region. Ayeyarwady Division, currently, accounts for some 85 per cent of total jute production, with Bago and Yangon Divisions contributing around 14 per cent and 1 per cent respectively. Paddy is the primary crop in the Delta region, with jute cultivated as one of the secondary crops. It is commonly sown as pre-

monsoon and monsoon crop. The two varieties of Jute are *Corchorus capsularis* (White Jute) (Thelonpu/short-pod) and *Corchorus olitorius* (Tossa Jute) (Thedaungshe/long-pod), *C. capsularis* is mainly grown in low-land area and *C. olitorius* is cultivated in up-land area. Maximum Jute Production was recorded in 1988 was 98643.16 tons.

In Bago Division (West), two kinds of jute are growing as pre-monsoon jute and monsoon jute. Thayarwady District has more jute growing acres than Pyay District in Bago Division (West). Because of the necessary mean annual rainfall for jute is 90 inches and there have more area of *Kaing land* in Thayarwady District than Pyay District. Although Thelonpu and Thedaungshe varieties are grown in Bago Division (West), Thedaungshe which can tolerate the waterlogged condition is mostly cultivated because the area is the lowland and only grows the monsoon jute.

### **Changes in cultivated area and yield**

In this study discussed the more cultivated area of Thayarwady District. The jute growing areas in Thayarwady District was 7386.33 hectares in 1988-89 and increased 8458.75 hectares in 1995-96 because the jute growing area is increasing due to the pump irrigation with supplement of government. It decreased to 6001.90 hectares in 1999-2000 due to the less interest of farmers and the competition of other cash crops such as corn, sesame, pulses, etc. In 2004-05, the jute cultivation dropped to 4711.36 hectares by the river flooding.

In 1989-90, the production of jute was 8112.32 tons and yield is 1142 kg/ha. The yield has decreased in 2005-06 as 3776.86 tons and 647 kg/ha. The rate of yield per hectare, the total production and the quality of jute depend on the use of fertilizer and pesticides, harvesting and retting of jute.

In Thayarwady District, jute cultivated area is found in every townships. Among these townships, Monyo Township has large cultivated area. This township gets enough rainfall for jute cultivation and has meadow soil, meadow gley soil and meadow alluvial soil.

### **A case of Pat-taw Village Tract**

In Monyo Township, with 404.69 hectares and more cultivated village tract, Pat-taw Village Tract is studied to know the changes in agriculture and control factors of changing.

Pat-taw village tract has experienced jute cultivation from 1963. This village tract composed of 6 villages. It is located in Myitmakha basin area and rich in alluvium soil and cinnamon soil. Average annual rainfall is 2133.6 mm and average maximum temperature is 38.8°C and minimum is 17.5°C.

In Pat-taw village, there has 800 households and population is 3,500. Jute growing area is 809.37 hectares, and sesame is 283.28 hectares. There are 300 jute growers. Thedaungshe is cultivated in pre-monsoon and Thelonpu is cultivated in monsoon. Large farm size was 7.28 hectares before 1988 but now it reduces to 3.24 hectares caused by reducing of government support, high cost of production (especially in after harvesting), construction of levee for protection of flooding. Ten acres are changed to other crops as sesame and paddy. After 2000, jute area declined since the supply of government was reducing. In 2004-05, jute growing areas are replaced with sesame.

Number of jute farmers and cultivated acreage from Pat-taw village were decreasing. All villages from Pat-taw Village Tract's monsoon jute acreage is dramatically decreased in 2006-07 due to the construction of embankment for prevention of flood and profit from jute is relatively less than other cash crops.

Table 2. Benefit Cost Ratio of Jute/Kenaf and other competitive crops

| Crops              | Benefit Cost Ratio |
|--------------------|--------------------|
| Paddy              | 1.85               |
| Black gram         | 4.17               |
| Green gram         | 1.94               |
| Maize              | 1.60               |
| Sesame             | 1.69               |
| Chilli             | 8.97               |
| Pre-monsoon jute   | 0.91               |
| Monsoon kenaf      | 1.13               |
| Kenaf (Bast fibre) | 0.98               |
| Jute (Whole plant) | 1.10               |

Source: Soe Soe Aye, Myanmar Jute Industries, 2007

Therefore, Jute/Kenaf area has been decreased is critical issue for the study area. The major problem is the imbalance in the relative advantages of other competitive cash crops. The cost and returns of jute and major crops are compared in Table 2.

In coming crop season 2007-2008, purchasing prices of Jute and Kenaf are going to increase encouraging farmers to produce more quantity as well as high quality.

Due to the higher wages of labour, farmers can hardly offered to hire labour for cultivation and post harvesting, consequently resulting in shrinkage of area only remaining smaller plots that could be managed by family labour alone. Hence it can be reviewed that situation could have been better, if yield per unit area is improved.

Pat-taw's Jute is collected from Myanmar Jute Industries (MJI) and transported to Okkyin Jute Mill until 1972. After that, there are being transported to Pyay Jute Grading and Baling Factory. All of markets for jute are only controlled by government enterprise. Even the farmers got an incentive of high price but still they have faced with the quality issue.

### Changes in Cotton Farming

In Bago Division (West), there are two cotton growing zone; Pyay District and Thayarwady District. Pyay District has more cotton growing areas than Thayarwady District because Pyay District gets mean annual rainfall of 1270 mm, and being irrigated areas of North Nawin Dam and South Nawin Dam. Thayarwady District has a mean annual rainfall of 2286 mm and thus cotton cannot thrive there. Cotton can only be grown in *Ya* land.

#### Change in cultivated area, seeds, crop pattern and yield

Cotton cultivated areas in Pyay District increased from 1988-89 to 2005-06. In 1989-90 the cotton cultivated areas were 4869.19 hectares and in 1995-96 these reached double (12128.04 hectares). Because of the plan, government made a policy to grow cotton in cultivatable land. In that time farmers received government supply such as fertilizer, good quality seed and pesticides, and technology and method for growing cotton from the staff of responsible department. Therefore, the farmers were interested in long-staple cotton cultivation. In that year, cotton production was 9841.24 tons. The cultivated areas decreased to 4980.47 hectares in 1996-97 due to irregular rain occurred. The cultivated area increased to 12043.06 hectares in 2005-06 due to the replacement of long-staple cotton and mix farming with groundnuts, sesame and pulses. Wagyi (short-staple cotton) need long growing season and thus double crop cannot be grown. Long-staple cotton can be cultivated by irrigation in pre-monsoon period before paddy and other crops are grown in rainy season. Besides, it can

be cultivated as double crop with sesame, pedesein and other crops which are short growing season.

In 1988-89, the cotton yield was 1946.68 tons and the yield per hectare was 449 kg. The highest cotton production was in 1995-96 with 9841.24 tons and the yield per hectare was 820.96 kg. It was due to the selection of good quality seeds, using the fertilizers, pesticides and method of cultivation. The townships which have the high cotton yield in Pyay District are Pyay, Paukhaung and Pandaung townships and Nattalin and Minhla townships in Thayarwady District.

### **A case of Thit-cho-pin Village Tract**

Based on the Myanma Cotton and Sericulture Enterprise (MCSE) of Pyay's statistics, the representative village was chosen to study on agricultural changing pattern and factors of changing. The selection was based on the 100 acres and more cultivated village tracts. In Bago Division (West), Thit-cho-pin village tract grows nearly 202.34 hectares and there have received the government award for high production.

This village tract is located between North Nawin and South Nawin drainage area and within the Pyay Township. Average annual rainfall is 1206.5 mm. Average maximum temperature is 34.9°C and minimum is 21.6°C and have silt, alluvium, cinnamon and dark brown savanna soil. Thus, the soil and climate of this village tract is suitable for cotton cultivation. It is composed of 6 villages. In those villages, Kan-su and Ein-kone villages are most favourable for cotton. The main crop of these villages is cotton and the secondary crop is pulses. Thit-cho-pin village tract has experienced cotton cultivation from 1978-79. Farmers grew cotton as planned crop since 1977. In that time, farm size was 4.05 hectares and yield was 1155 kg/ha. Farmers received the supply of loans, fertilizers, good quality seeds and pesticides from government. The common fertilizers are Urea, T-Super and Phosphate. After 1988, they changed to use fertilizers as compound and pesticides from private companies. According to decrease of soil fertility and cannot use high cost agro-input materials, the yield of cotton was decreased to around 660 kg/ha.

The size of farm is reduced from 4.05 hectares to 2.43 hectares as large farm size, from 2.02 hectares to 1.21 hectares in middle farm size and from 1.21 hectares to 0.8 hectares in small farm size. In this condition, beans and sesame replaced to cotton growing area and most of the cotton land changed to pulses growing area which get high profit (Table 3). There have an issue that impure seeds that procured from farmers and imported seed cannot use easily. After 2002-03, cotton can be traded freely in domestic market. From that time, supply of government is reduced and private sector is invading.

Table 3. Differences between returns of cotton and mixed with groundnut in 2006-2007 (in kyats)(assuming an average yield of 1649 kg/ha for cotton (only), 1237 kg/ha for (mixed) and 4167 kg/ha for groundnut)

| <b>2006- 2007</b>         | <b>Cotton(only)</b> | <b>Cotton (mixed with groundnut)</b> |
|---------------------------|---------------------|--------------------------------------|
| Input material costs      | 26150               | 13450                                |
| Labour costs              | 60000               | 27500                                |
| Total estimated costs     | 86150               | 40950                                |
| Sold price                | 200000              | 400000                               |
| Projected return          | 113850              | 329050                               |
| <b>Benefit-cost ratio</b> | <b>1.32</b>         | <b>8.40</b>                          |

Source: based on interviewed data

Since 1977, cotton was planning crop and these period cotton was sold to government procurement centres at Wethhtikan, Pyay and Paungtale. In 1988, private merchants registered in MCSE and they are permitted to procurement of cotton and 50 per cent of their cotton has to sell government and the rest are traded in domestic market. In 2002-03, cotton was liberalized as freely trade commodity in domestic market. Cotton grower got more profit from that time. MCSE also have to change their procurement price with competition of private merchants. After 2002-03, the supply of government such as fertilizers and pesticides are reducing and irregular, thus cotton growers rely on the private companies.

At present farmers faced to the competition of other crops and difficulties in availability of pure seeds. Some farmers got pure seed and increased in yield per acre. If farmers in Thit-cho-pin village tract can get pure seeds, high price of cotton and government supply, they want to grow cotton.

### Conclusion

After 1988, the cultivation of industrial crops from regions in Bago Division (West) is changed depend on agricultural policy, kinds of crop, situation of markets and the decision making of farmers. After 2002, industrial crops are replaced by other crops according to market oriented economy. Before 1988, there are double crops in this region, for example, the farmer grown cotton after rice. The farmer gained many profit in this period because more use of natural fertilizer and labour costs was less than after 2002 price. After 1988, pattern of agriculture was changed like changing market economy of the country. Therefore, farmer of industrial crop are substituted with other cash crops such as pulses. In addition, after 2002 the fertility of soil is degraded. Thus, the farmers use more chemical fertilizer for high yield. In addition, the farmers faced with high labour costs, high input material costs (fertilizer, pesticides), and problem of seeds and difficulty of transportation. No. (12) Sugar Mill (Nawaday) was constructed in 1997 in Pyay Township and No. (11) Sugar Mill (In-nga-gwa) was constructed in 1998 in Paukhaung Township. Here, the farmers were faced with many problems. These are transportation problem for selling sugarcane to these sugar mills and the cost of labour is high. The shortage of labour is the one of the problems because the growing season of summer rice and harvest period of sugarcane is coincided.

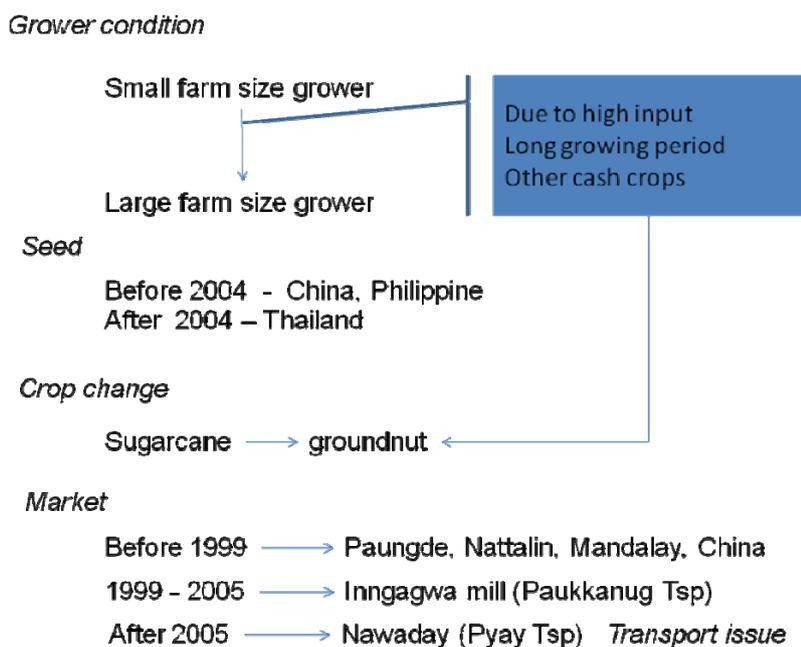


Figure 2. Changing sugarcane farming and control factors

Cotton is permitted to free trading in domestic market from the year of 2002-2003. The cotton was procured by Myanma Cotton and Sericulture Enterprise and transported to cotton mill in Aunglan. These were re-contributed to Meikhtila. After 2002-2003, private merchants send the products to Mandalay, Meikhtila, Pakokku and Shwedaung.

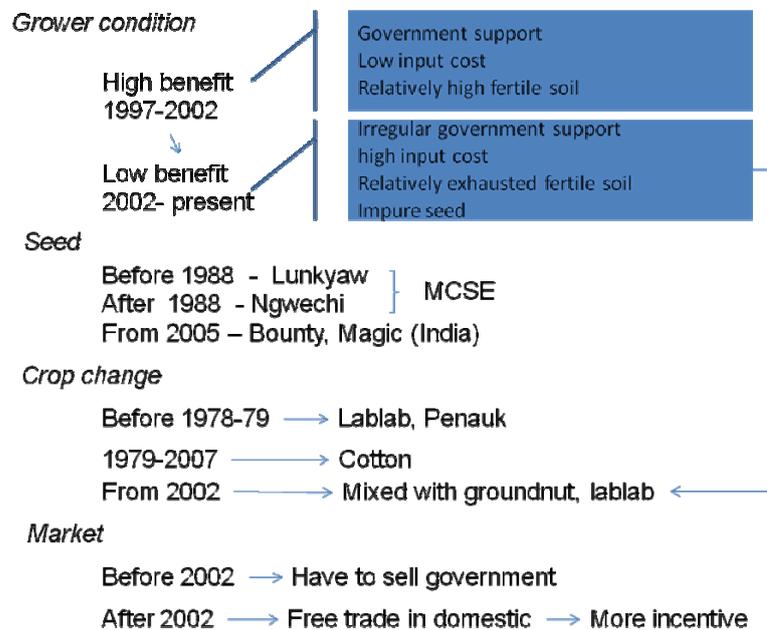


Figure 3. Changing cotton farming and control factors

Cotton growing farmers followed the land and growing intensively in cotton. If government is contributing the pure seeds and necessary inputs, the acreage of cotton will be increase again.

In the growing of sugarcane, the contribution of high yield species, new method of growing and harvesting, the solving the labour shortage and transportation for sugarcane, are the ways to more interesting in sugarcane and more successful.

In jute cultivation, the first problem is higher labour price, second is less contribution of fertilizer, third is the difficulty of diesel for pump, and the last is decreasing of cultivated area since some areas are constructed as embankment to prevent flooding. If the necessities for jute cultivation are provided well, the farmer will try to increase the cultivated areas for jute.

Jute is the second highest production cost after sugarcane. The price of industrial crops is fluctuated year by year. Before 1988, the government provided the necessary inputs for agriculture. At present the inputs are more necessary since many farmers worked double cropping and the degradation of soil for long growing period of crops. Contribution of government support is decreasing and the role of private shops becomes more important. After 2000 the farmers changed to grow pulses, sesame and groundnut which are good returns. The decision of farmers for production of crops depends on the labour price and input for industrial crops.

The government serves carefully to gain profits, to get high yield and to raise the production. The areas of industrial crops in Bago Division (West) will rise as other regions. Similarly, the control of government on price should change and modify according to modern system and modern living standard.

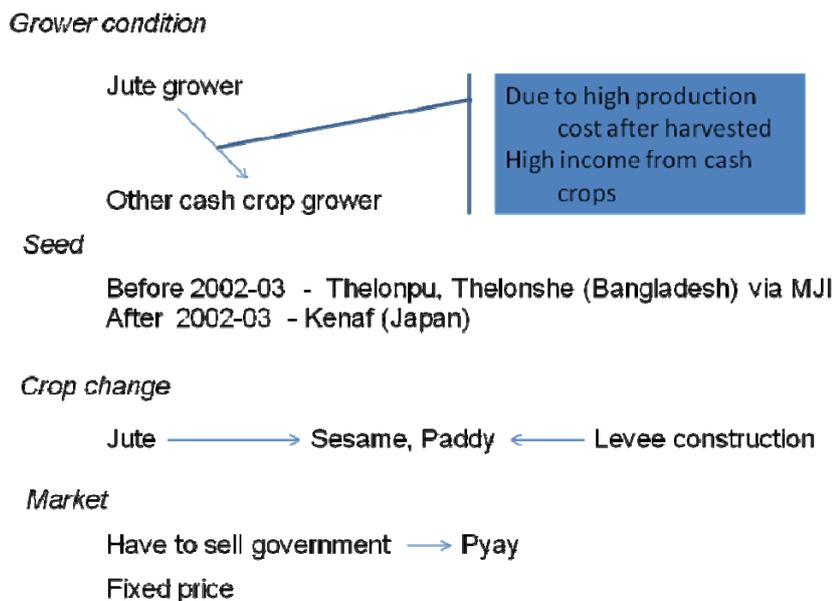


Figure 4. Changing jute and kenaf farming and control factors

From the study on the constraints in the development of the industrial crop farming in Bago Division (West), as well as other relevant issues affecting the agriculture sector, it is necessary to push for production of high-demand and high-value crops, to liberalize the trade, to let the state owned enterprises for free competition with the private enterprises, to upgrade the administrative and institutional efficiency and to build up capacity.

#### Acknowledgements

We are greatly indebted to U Mya Win (Retired Rector), Pro-Rector U Win Myint and Pro-Rector Dr. Tin Maung Hla of Pyay University (now University of Distance Education Mandalay) for their permission on this research work. We also wish to express our thanks to Departmental personnel for their help in collection of the data and also many thanks to villagers in the study areas for their helping.

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