

## **Factors Controlling the Economic Development of Patheingyi Township**

Moh Moh Khaing\*

### **Abstract**

The purpose of the research is to investigate factors controlling of economic development in Patheingyi Township. Patheingyi Township is the capital of Ayeyarwady Region in Myanmar. These economic activities depend on physical, social, cultural, institutional factors and government policy factors. Economic activities in Patheingyi Township vary spatially from place to place. Most of the economic activities are found urban area and the rest are rural area. The economic condition is mainly based on the agriculture, industry and services. 31 variables that influence on the existing economic activities are accessed by Factor Analysis. The most dominant basic factors in influencing the economic development on physical, socio-economic and farming processes.

### **Introduction**

Patheingyi, being the capital city of Ayeyarwady Region, it is relatively most developed in socio-economic status among the townships of the region. Agriculture is still the most dominant economic sector, although secondary and tertiary economic sectors have been expanding. Agricultural land use occupies 32 percent of the total area of the township, representing 26 percent of the total value of GDP. Most manufacturing industries are agro-based. In this study, the primary economic sector is mainly focused together with other economic sectors. The temporal and spatial changes of agricultural sector is highlighted for the period from 1999-2000 to 2009-10 and that of secondary and tertiary in the period from 2006 to 2011.

### **Research Problem**

There are several factors controlling factors in Patheingyi Township. Most of the economic activities are concentrated in urban area and some are dispersed in rural area. The economic development of Patheingyi Township varies spatially from place to place.

### **Research Hypotheses**

Physical, social, cultural, economic and institutional factors influence the spatial variation of economic activities. The relationships between the economic activities and controlling factors have been studied.

### **Aim**

To identify the chief causes of spatial variations in the economic development of the study area and to provide feasible suggestions for future development

### **Objectives**

The objectives are analyzing the controlling factors of the spatial variation of economic activities. Recommend practicable advice to help enhance the development momentum of economic activities.

### **Sources of Data and Methodology**

Primary data are field surveys and questionnaires. Secondary data and relevant information are acquired from Libraries, Immigration and National Registration Department, Land Records Department, Township General Administration Office, Custom Department, Planning Department, Meteorology and Hydrology Department, Land Use Department, Forestry Department and Fishery Department.

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\* Dr., Lecturer, Department of Geography, Dagon University

## Factors Controlling the Economic Development of Patheingyi Township

### Physical Factors

As in most townships of Myanmar, the economic development of Patheingyi Township is more or less controlled by physical, social and economic factors.

Patheingyi Township occupies the western part of Ayeyarwady Region located in the western part of Myanmar. It lies between North latitudes  $16^{\circ} 34' 50''$  and  $16^{\circ} 59' 39''$  and between East longitudes  $94^{\circ} 42' 45''$  and  $95^{\circ} 02' 55''$ . Latitudinally it falls within the tropics. The township is bounded by Thabaung Township 25.75 kilometres (16 miles) on the north, Kangyidaunt Township 24.14 kilometres (15 miles) on the east, Ngaputaw Township 32.19 kilometres (20 miles) on the south and the Bay of Bengal on the west.

The area of Patheingyi Township is 1670.2 square kilometres (644.88 square miles), sharing 4.77 percent of Ayeyarwady Region. The township comprises Ngwe Hsaung Sub-Township, Shwe Thaung Yan Sub-Township, 15 wards and 53 village tracts made up of 272 villages. The length from north to south is 69.23 kilometres (43 miles) and the breadth from east to west is 54.74 kilometres or 34 miles. Generally the shape is slightly elongated tapering towards the north.

Patheingyi Township is one of the 26 townships of Ayeyarwady Region and it is flanked by the Bay of Bengal in the west. It is easily accessible by roads to Monywa, Yangon and other towns and also by railroad along Patheingyi-Hinthada-Kyangin, in addition to waterway. Thus, it has comparatively locational advantage. As it occupies, the fertile alluvial land of delta, agriculture is well developed. (Figure 1 & 2)

Although Patheingyi is located in the Ayeyarwady deltaic region, the relief of the entire township is not flat, owing to the southern continuation of mountain spurs, low hill and ridges of Rakhine Yoma and ranges. Physiographically it can be divided into three parts as: the Delta and River Plains, the Mountain Spurs of Rakhine Yoma, and the Western Narrow Intermountain Valleys.

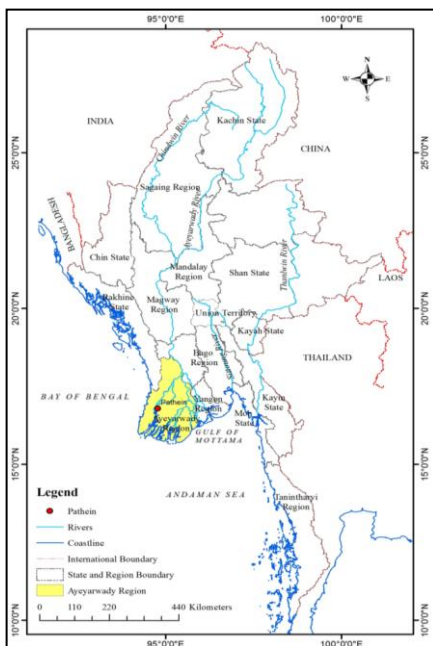


Figure 1. Location of Ayeyarwady Region in Myanmar

Source: Survey Department, Yangon

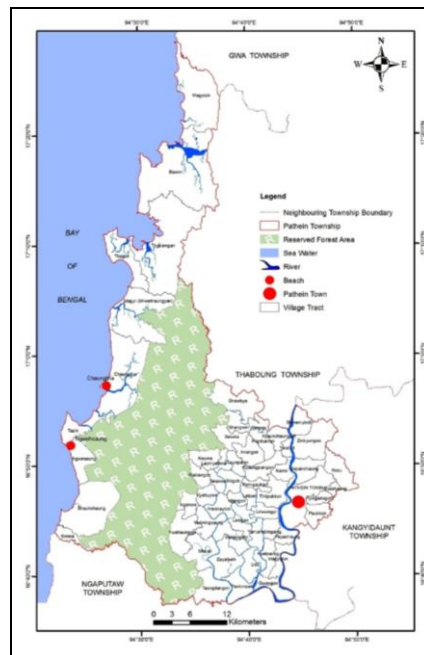


Figure 2. Location of Village Tracts in Patheingyi Township

Source: Survey Department, Patheingyi

Being part of the deltaic area, the streams are criss-crossing, forming a complex channel network. The Ngawun River and its tributaries have the appearance of dendretic pattern. The river which flows from north to south with a length of about 322 kilometres (200 miles) before entering into the sea is the most important river in the study area. A number of small streams flow into the river of which the Thandwe River, Byainphyu and Kyaukchaungkye Creeks are more useful. The Thandwe River is 40.23 kilometres (25 miles) long into which Yankyaw, Thalathwar and Maezali creeks flow. The Byaingphyu Creek flows from north to south about 4.82 kilometres (3 miles) to the west of the confluence of Byaingphyu Creek and Thandwe River.

The existing rock series within the study area were formed in Eocene, Holocene, Miocene, and Miocene-Pliocene. Rocks of Eocene age include Zeechaing Formation, Mawtin Formation and Taungale Formation and they are found in the western and northern parts of the township. Rocks formed in Holocene age are distinguished into old alluvium and young alluvium occupying the eastern part and along the Ngawun and its tributaries and other streams. Upper Pegu Group of Miocene age is identified in the southwestern part of the township. Rock of Irrawaddy Formation that formed in Miocene-Pliocene includes essentially sedimentary rocks and they are found along banks of both the Ngawun River and extensively along the foot slope of Rakhine Yoma. The rocks included in Irrawaddy Formation are sandstone, bluish shale and pebbles. On the young and old alluvium in the topmost layer, the successful cultivation of field crops is observed.

The climate of the study area has three distinct seasons i.e, the rainy season from the third week of May to the end of October, the cool dry season from November to the end of February and the hot dry season from March to the second week of May. With the temperature of coldest month over 18°C (64.4°F) and annual rainfall of 2824.3 mm (111.27 inches), the study area experiences Tropical Monsoon Climate (Am) according to Koppen's Climatic Classification.

The average annual temperature is 27.5° C (81.5 °F). It is hottest in April with 30.5°C (86.9 °F) and is coldest in January with 24.5°C (76.1 °F) and thus the annual range of temperature is 6 °C (42.8 °F) . The low annual range is due to the moderating effect of the sea. The mean monthly maximum temperatures are fairly high with over 30 °C (86 °F) and highest in April with 36.5 °C (97.7 °F). High daytime temperature and intense heat increase the evapotranspiration rate and hence soil moisture deficit.

There are ten main soil types recognized in the study area.

- (1) Meadow Alluvial Soil (Fluvisols)
- (2) Brown Meadow Soils (Gleysols)
- (3) Light Brown Meadow Soils (Ferrasols-Xanthic)
- (4) Meadow Gley Soils (Gleysols)
- (5) Meadow Gley Swampy Soils (Gleysols)
- (6) Swampy Soils (Gleysols-Humic)
- (7) Light Red Brown Forest Soils (Ferrasols-Rhodic)
- (8) Light Red Brown Forest Lateritic at Base Soils (Ferrasol-Plinthic)
- (9) Red Brown Forest Soils (Ferrasols-Rhodic)
- (10) Meadowish Red Brown Forest Soils (Ferrosols-Rhodic)

Generally meadow soil group serve as the ideal medium for growing paddy in the rainy season and pulses, oil-seed crops and others in the cool dry season. Such social factor as population growth, density and distribution and institutional factor influence the economy of the township directly or indirectly.

## Social Factors

The population distribution pattern of an area is greatly influenced by the relief. Most people settle in places where they can earn their living and thus most rural people settled in village units near the transport routes with vast area of fertile farmland. Therefore, population is generally sparse in areas with less job opportunity.

In 2010, Pathein Township had a total population of 373113 persons of which 147003 or 39.34 percent were living in the urban area which covers only 66.8 sq kms (25.79 sq miles) or 3.99 percent of the township area. High population concentration in the urban area is due to high employment opportunity.

The spatial variation of population distribution is mainly on account of economic activities upon which people earn their living and thus people are more concentrated in areas where employment opportunity is high and vice versa. The urban population depends mostly on secondary or manufacturing and tertiary or service activities, where as the rural population relies on the primary production activities, particularly on agriculture and fishery.

After 1988, the government has adopted market- oriented economic policy. In accordance with the policy, some restrictions on the growing, selling, buying and processing of crops have been relaxed, as the economy of the country still rests heavily on agriculture. The farmers have easy access to both domestic and foreign markets. As more farmers have realized the benefit of the use of farm machinery, farm mechanization is gaining its momentum essentially by the help of the Agriculture Mechanization Department which provides land-preparing service by lending state-owned tractors to farmers, selling tractors on installment, disseminating farm-equipment usage technique training and short course. As regard with scientific farming methods, the departments concerned are taking effort to educate farmers, through radio and television, newspapers and journals, in addition to direct educative talks to the farmers. The Department of Agriculture grows high-yield quality strain at their experiment farm and distributes the seeds to the farmers.

Besides, non-governmental organizations are also getting involved in rural development programmes, particularly in education, health and certain economic activities. Therefore, the economic development of the study area is to some extent related to the existing institutions.

The most well-know traditional culture of the study area is the production of umbrella (Pathein Hti) and sweetmeat made of flour (Halawar) as home industries. These traditions are carried down from older generation to younger generations which are important economic activities for some households. With the advance of farming techniques, unlike in the past, the farmers are increasingly using the farm machines, chemical fertilizers and pesticides. Water is pumped from the nearby streams to grow crops in the dry season, increasing the cropping intensity of the study area. The improvement of transportation infrastructures gives access to the attractive beach which induces the development of tourism industry. The spread of information technology helps develop the business of internet café and accelerates the flow of commodity in and out of the study area.

## Economic Factors

Types of agricultural land differ depending largely on relief, climate and soils and partly on the tradition of the local inhabitants. The existing agriculture land in Pathein Township can be classified into 4 types and these are '*le*' land, garden land, *kaingkyun* land (riparian) and *dhani* land.

Type of crops grown varies from place to place depending upon relief, drainage, climate, soils, and availability of water during the dry season and tradition of local populace. As the township occupies both low flatland and higher slope land, annual or field crops and perennial crops are extensively grown.

Paddy is a staple food crop of the country and the most important agricultural product of the entire Ayeyarwady deltaic region known as the “rice bowl” of Myanmar. As Pathein is one of the townships that occupy part of productive, fertile alluvial land of the delta, paddy is by far the most dominant among the major crops grown within the township. Formerly, as in most other townships with high amount of annual rainfall, paddy was grown only in the rainy season. With the encouragement of the government, the growing practice of summer paddy has become widespread where irrigation water is available in the recent years, particularly after 1988.

Pulses are the second most important crops within the study area, next to paddy. The common pulses grown are *bocate* (cow pea), *matpe* (black gram), *pedisein* (green gram), and *pesingon* (pegon pea). The increase was mainly due to high foreign market demand. Accordingly, some of these pulses have become exportable crops and the growers earn much profit from these crops, as the cost of production is relatively low. Pulses are grown on ‘*le*’ land after the harvest of paddy. The successes of pulses depend on the soils that can retain moisture for long and the climate condition in the post-monsoon period.

Maize is grown both in the rainy season and cool season on *le* land and garden land, essentially for local consumption. However, the sown area is rather limited due to being unable to compete with other crops.

The oil-seed crops grown in Pathein Township are groundnut, sesamum and sunflower. Sunflower is more suitable to the existing soils of the study area. The oil-seed crops are usually grown mixed with pulses. Sunflower is grown in nearly all the village tracts. Groundnut cannot be grown successfully in every village tract. Sesame is also grown for local consumption and the sown area is small due to less suitability to physical conditions of the study area.

Generally the physical conditions are not suitable for growing Chillies. It is grown on some *le* land and garden land, *kaing* land. The increase in the sown area was due to the rising price.

Vegetables are grown both for local consumption and for sale at Pathein Town. They are grown within the house compound and ‘*Le*’ land after the harvest of paddy. In the dry season, the water from wells and lakes are used for growing vegetables in the home gardens. The most common types of vegetables grown in the study area are tomato, gourd, pumpkin, cabbage and radish. Tapioca and sweet potato are also cultivated on small plots for home consumption.

Perennial crops are grown on garden land with yellow brown forest soils or alluvial soils. Depending on relief and soil rubber, coconut, palm, plantain, betel-nut, mango, marian, jack-fruit, papaya, cashew, and pepper are grown. Every village tract has more or less perennial trees. Coconut trees are more widespread in village tracts frequented by salty tidal water. The village tracts with relatively large area of coconut plantations are located in the western part of the township.

The fisheries sector is of considerable importance in the township’s economy as fish is a major source of animal protein in the diet. Pathein Township possesses both fresh water fisheries and marine fisheries. As Pathein Township occupies part of the Ayeyarwady deltaic region, it is replete with a number of perennial streams where freshwater fishing can be carried out. The township is also fronted by the Bay of Bengal, and thus marine fishery is also

important for those living near the coast. Accordingly the value of GDP generated from fishery accounted for 15.96 percent in 2008.

There are 3 ‘inns’ occupying about 4.04 hectares (10 acres). The authority concerned issues permit to the fishermen for legal right of fishing. The late development in the fishery sector is fish and prawn ponds. Practically nearly all the fish and prawn culture businesses belong to the government organizations, companies or military corps. Private companies include Yuzana, Shwe Family, Shwekhyay, Max Myanmar, May Flower, Ayeyarwady Development, Annawar Theikpan and Star Ayeyarwady.

Secondary activities are those that add value to materials by changing their form or combining them into more useful, and therefore more valuable, commodities. Like most other townships of the country, the economy of Patheingyi depends largely on agriculture and the existing industries are mostly agro-based. In 2011, the township had 544 industries including 347 (63.79 %) food and beverage industries, 72 (12.87 %) metal industries and 51 (9.38%) saw mill industries 74 (13.60%) other industries.

The secondary economic activities of Patheingyi Township can be classified into four main types and these are: (1) food and beverage industries, (2) saw-mill industries, (3) metal industries and (5) others. (Plate 1, 2, 3 & 4)

They constitute the vital link between producer and consumer. Market is directly related to the number of population and socio-economic status of the population. The products produced from the primary, secondary and tertiary sectors are partly consumed through the markets located within the township and the surplus is sent to the markets in Yangon, Mandalay and other large towns.

Quaternary is applied to the fourth class of economic activities, which is composed entirely on services rendered by white-collar professionals working in education, government, management, information processing and research. The number of services increased to 1371 in 2011. The increase in education service is vital for the economic development in the near future. The increase in the number of service activities is also related to tourism as more hotels, rest houses and restaurants have been opened with the gaining momentum of tourism of Chaungtha and Ngwe Hsaung Beach Resort. (Plate 5 & 6)

Economic activities of village tracts in Patheingyi Township are varied from one village to another. These variations are mainly related to physical features, social and economic conditions of the village tracts.

Among the variables, one variable of physical factor, 5 variables of social factors, 25 variables of economic factor are selected to apply factor analysis (Table 2.1). Therefore 31 variables from 55 village tracts and town are defined to measure the socio-economic variations of village tracts in Patheingyi Township.

Figure 3 shows the three levels of “Index of Basic Geographic Factor”. It is the first factor in the Factor Analysis. The town area of Patheingyi, Shwe Thaung Yan Sub-Township, Ngwe Hsaung Sub-Township and Chaungtha have good in such basic geographic factors as physical, social and economic. Figure 4 shows areas of different level of index of Other Crops Score of Second Factor. Zinpyunkon village tract in the east, Shwe Thaung Yan and Ngwe Hsaung Sub Townships in the west are developed in other crops, largely due to wide garden land and the cultivation of oil seeds crops. Figure 5 shows variation in the Score Index of Paddy Cultivation. The score index is high in village tracts located in the eastern and southern parts of the township.

Table 1. Rotated Factor Loading Matrix Rotated Component Matrix (a)

Variable	Component		
	1	2	3
Town and Village Tract Area	0.790	- 0.011	0.505
Household	0.991	- 0.009	0.103
Population	0.989	- 0.014	0.112
Population Density	0.902	0.149	- 0.149
Male	0.991	- 0.013	0.107
Female	0.991	- 0.017	0.107
Farmer	0.493	- 0.036	0.680
Le (Net Sown)	0.294	- 0.391	0.827
Le (Fallow Land)	- 0.016	0.081	- 0.102
Kaing (Net Sown)	- 0.010	- 0.135	0.032
Garden (Net Sown)	0.156	0.710	- 0.186
Dhani (Net Sown)	- 0.194	- 0.114	0.796
Forest Land	0.023	0.475	- 0.115
Culturable Waste Land	- 0.048	- 0.155	- 0.111
Summer Paddy (Cultivated Land)	0.114	- 0.550	0.682
Monsoon Paddy (Cultivated Land)	0.264	- 0.373	0.855
Maize (Cultivated Land)	- 0.032	0.850	- 0.174
Groundnut (Cultivated Land)	- 0.001	0.892	- 0.121
Sesamum (Cultivated Land)	- 0.033	0.876	- 0.115
Sunflower (Cultivated Land)	0.185	- 0.152	0.077
Pulses (Cultivated Land)	0.033	- 0.093	- 0.004
Chilli (Cultivated Land)	- 0.051	0.343	0.132
Vegetable (Cultivated Land)	0.315	0.319	- 0.015
Food and beverage industries	0.982	- 0.082	0.123
Saw Mill	0.986	- 0.065	0.102
Metal Mill	0.985	- 0.058	0.110
Other Industries	0.986	- 0.056	0.112
General Services	0.991	- 0.027	0.089
Educational Services	0.963	0.085	0.098
Personal Services	0.990	- 0.038	0.095
Tourism Services	0.645	0.175	- 0.109

Source: Extraction Method Principal Component Analysis

a. Rotation converged in 6 iterations

### Findings and Suggestions

The economy of the study area rests (depends) heavily on agriculture and partly on agro-based industries and tertiary economic activities. Generally spatial variation of economic activities is influenced by physical, social and institutional factors, government policy, transportation and market demand.

The chief and basic driving force that initiates and gives impetus for the economic development of the study area is physical factors, particularly, relief and climate. About 90 percent of the study area is low and flat favourable for the extensive and intensive growing of various kinds of crops. Others are mostly forest land and land used for recreation and human habitation.

As social factor, the Pathein Myoma area is densely populated with diverse economic activities of secondary and tertiary sectors and with high accessibility. The area to the east of the Pathein River is more developed than the western part.

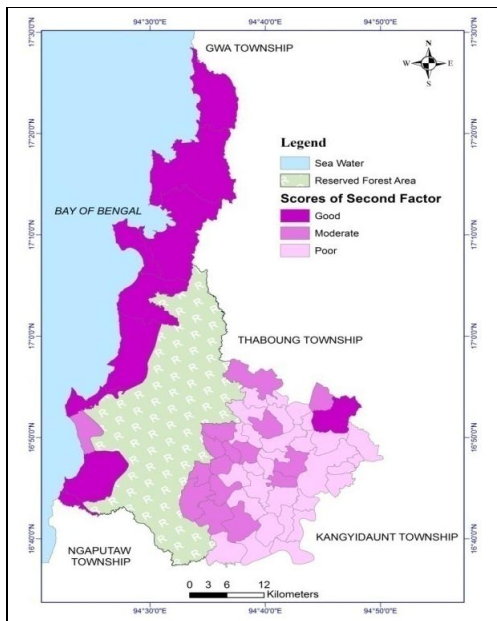


Figure: 3 Scores of first factor

Source: Based on Table 1

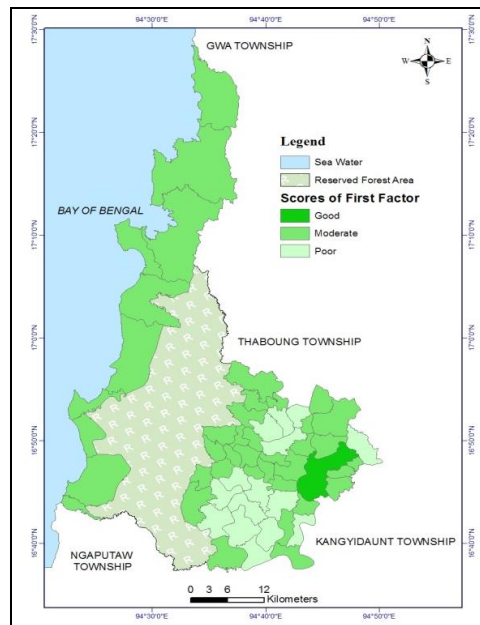


Figure: 4 Scores of second factor

Source: Based on Table 1

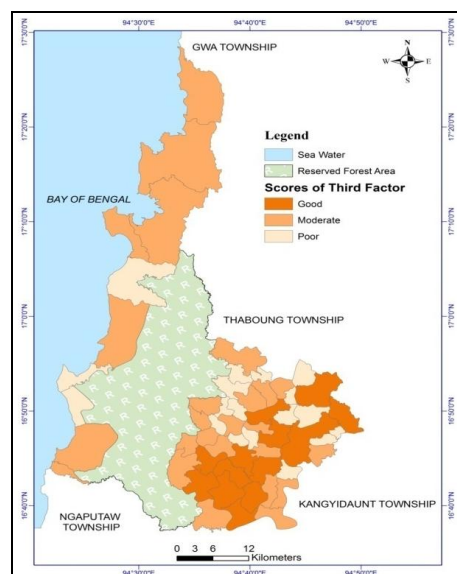


Figure: 5 Scores of third factor

Source: Based on Table 1

As regard with institution factors, the development of agriculture within the study area is also the result of availability of agricultural loans from the Rural Development Bank and from certain companies as well. Within the study area, fish and prawn culture has become an important economic activity since recent years. Fish, prawn and crab are raised not only for local consumption but also for export.

Pathein has been famous since decades ago for its beautiful Pathein Hti (umbrella) and delicious Pathein Halawar (sweetmeat made of flour, butter, sugar, etc.) Some colourful Pathein Hti are produced for export, while Pathein Halawa is purchased by the visitors to be given as present.



Small scale metal industries are found in the industrial zone and Myoma area, Myoma area is the center of tertiary economic activity, although there are a few in rural area. As the study area has Chaungtha Beach and Ngwe Hsaung Beach, tourism industry is well developed. A great number of visitors frequently visit to these beach resorts, especially to Chaungtha Beach. Such tourism related activities as lodging (hotel, motel and rest house), food and beverages industries (restaurants, foodstalls) and souvenir industry can offer jobs to the local inhabitants.

As the township is highly accessible by road, railroad, waterway and air service, the surplus items can easily be distributed to different parts of the country and the necessary items can be brought in within a short span of time.

The intensification of agriculture in the future depends on the increase in yield or marketability through the introduction of more improved varieties and the expansion of local adaptive research. For the extension of summer paddy area such irrigation facilities as dams, canals and drains are necessary to be built. The availability of hybrid quality seeds depends on the Agriculture Department. The spread of scientific farming methods is still limited among the local farmers and educative talk should be arranged more often. These methods usually demand large amount of inputs and should be considered cost effectiveness. Thus the authority concerned should somehow manage to regulate the prices of crops for the benefit of producers and end users and for further development.

Manufacturing industry is not so developed within the study area, and the existing ones are largely agro-based with less sophisticated machinery and low installed capacity. Nevertheless, some local manufactured goods can be extended by intensive search for markets, both domestic and foreign, by the industrialists and exporters of the items concerned with the aid of the government.

The development of the tertiary sector depends on the infrastructural facilities, especially for the upgrading of education level, public health care and tour services. The environmental quality control depends largely on the directive of the authority concerned and local inhabitants.

This paper work focuses mainly factors controlling of economic activities and development momentum of economic activities in the future.

### **Conclusion**

Pathein Township which occupies the western part of Ayeyarwady Region lies between North latitudes 16° 34' 50" and 16° 59' 30" between East longitudes 94° 42' 45" and 95° 02' 55". Pathein Township comprises Pathein Myoma, Shwe Thaung Yan Sub-township, Ngwe Hsaung Sub-township and 53 village tracts. People are more concentrating in the low and flatland area with vast tract of farmland and high accessibility, and population is sparse in the upland area of Rakhine Yoma in the west.

The majority of the people earn their living on agriculture. Fishing, fish-prawn culture and extraction of forest products are also important economic development of the township.

Secondary and tertiary economic activities are mostly carried out in the urban area and scattered in the rural area. This clearly shows that the agriculture sector is by far the most important in the economy of the study area.

Marketing businesses are also important and the collection and distribution of agricultural produces and others are carried out by Myoma Market, other small markets and warehouses.

The presence of road, rail, water and air transports enhances smooth and speedy flow of people and commodities. Institutional factors such as Myanmar Agriculture Development Bank, private companies and NGOs are also supportive for rural economic development.

The State is now implementing Poverty Alleviation Program, focusing on the rural area where living standard is relatively low. Extension and upgrading of existing road and bridges, constructing new ones and installing necessary facilities for the other modes of transportation, will accelerate the pace of development, as good transport can help exploit the existing complementarities between urban and rural areas of the township and with other regions as well.

As this study cannot convey the detailed and in depth information of the economic and comprehensive understanding of these components further researches should be undertaken to be able to give more practicable suggestion for further economic development of the area.

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Plate 1. Shwe Myin Pyan (Harlarwar)



Plate 2. Pathein Umbrella



Plate 3. Yuzana Refrigerated Fish Factory



Plate 4. Glass Factory



Plate 5. Chaungtha Beach



Plate 6. Ngwe Hsaung Beach