YANGON UNIVERSITY OF ECONOMICS
DEPARTMENT OF ECONOMICS
MASTER OF ECONOMICS

A STUDY OF INFRASTRUCTURE DEVELOPMENT ON RURAL SOCIETY IN TAIKKYI TOWNSHIP (2009-2018)

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SEPTEMBER, 2019

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A thesis submitted as a partial fulfillment towards the requirements for the degree of Master of Economics, M.Econ (Economics)

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ABSTRACT

For a nation's development, the main factor such as natural resources, physical resources and human resources, technological improvement, efficient institution and infrastructure development are essential. The infrastructures is important for economic growth and regional development, and these are also essential for rural development and their livelihoods. Every nation need basic infrastructure such as rural roads, tracks, bridges, irrigation schemes, water supplies and schools, health centers and market that are mostly need for people who live in rural areas. This study analyzes the effects of infrastructure development on rural society in Taikkyi Township. The survey is conducted in Taikkyi Township as a case study. It is found that there is an improvement of rural infrastructures and rural development in Taikkyi Township. It is also found that transportation costs and commuting times are reduced, and outputs to markets are quickly distributed because of the development of transportation sector. Therefore, construction sector is a main source for rural development because this can create the job opportunities and brings other positive impacts.

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ABBREVIATIONS

ARI	Acute Respiratory Infection
BOT	Build Operate Transfer
CBR	Crude Birth Rate
CDR	Crude Death Rate
CNG	Compressed Natural Gas\
DRD	Department of Rural Development
IATA	International Air Transport Association
IMR	Infant Mortality Rate
JICA	Japan International Cooperation Agency
MPHC	Myanmar Population and Housing Census
PSI	Population Services International
RHC	Rural Health Centre
U5MR	Under 5 Mortality Rate
WEF	World Enabling Forum

CHAPTER I
INTRODUCTION

1.1 Rationale of Study

In developing countries, most of the people live in rural area. Through investment in rural roads and other infrastructures and social programs, the government can make effort to improve the level of the rural population. The government has initiated several efforts to improve the quality of the people's life in the urban or rural areas. There is a huge gap between the population living in the urban and rural areas. Geographical, educational, income, gender and ages, as well as language and race gaps are some of the gaps between areas. The infrastructure development in the rural areas is also an evidence of the government commitment in bridging the gaps between the rural and urban areas. These investments have provide access to facilitated markets, lowered costs of production and consumption. This investment have directly effect on poverty reducing by increasing access to living standards and economic opportunities.

Infrastructural investment as an investment that can contribute the increase of economic growth. Infrastructure development is none other than a mechanism that increases the living quality of a society. In terms of economy, infrastructure development can impact the employment rate, productivity, and income as well as give an added value. Infrastructure development can also boost political integration and reduce societal geographical gaps. Today, infrastructure development has become a much-debated topic since scholars from various countries have utilized the aspect of infrastructure development as a parameter and index to measure the ability of each country to complete globally. This is mainly access to basic, adequate facilities is viewed as strongly related to the wellbeing of general population in any country.

Better road access would contribute to economic growth by reducing transportation costs, travel times and vehicle costs. The number of vehicles, and passengers and agricultural products are quickly moved to another because of

improved transportation. With the improvement of transportation infrastructure, and growth of the farmer's income, more rural household purchased motors and vehicles to undertake their business, agriculture or non-agriculture firms. Road can increase rural households' access to agricultural inputs and product markets. The improvement of infrastructure can transfer to develop from growth. The lack of funds is the key factor restricting the development of infrastructure. Poor infrastructure is an important cause of poverty. To promote socio-economic development in rural or poor areas, construction of transportation infrastructure should be accelerated to improve the living conditions of the poor. Poverty reduction is widely accepted as a key issue in sustainable development. Poverty reduction is a main objective in the developing countries. Poverty is mainly located in rural areas, and it related with rural development. Thus, rural people need infrastructure investments for their opportunities.

Improving the access of rural poor to asset which includes human assets like education and health but also productive assets, mainly land and water. Improving the access of the rural poor to new technologies. Improving the access of the rural poor to fair and functioning markets, this includes inputs, products but also finances and last but not least labor. Decentralization of institutions in order to make these institutions accessible to the poor and in order to directly link them to the institutions of the poor. In transport, improved roads mean less time to reach markets and services, reduced costs, and increased quality and frequency of services. In agriculture, they mean increased overall levels of agriculture activity and a land-use ship by farmers from low value cereals toward high value fruits and orchards. In health and education, improved roads have resulted in double enrollment in primary education over ten years a significant increase in visits to primary health care facilities and clinics. The quality of education and health services also improved, as greater accessibility made it easier to recruit teachers and medical staff.

The basic physical development mentioned is considered important as it serves as an indicator to the progress and developmental process of a particular country. Lack of basic facilities shows that the country or region can be categorized as under-developed and is left behind by progress and modernization. Efficient transportation infrastructure lowers the costs of labor-market participation, that is, travel time and cost, including search cost and thus, eliminates an important barrier to labor market

entry. Better physical infrastructure helps lower food costs for urban dwellers and allows rural labor to seek higher paying jobs in the urban areas. Thus, the provision of roads and human capital investment has a positive impact on the welfare of poor households.

Infrastructure is the fundamental facilities and system serving a country, city, urban or rural areas including the services and facilities necessary for their economy growth or development. Therefore, when the infrastructure development in rural areas including transportation, health buildings and services, education schools and systems, water supplies and etc. That can improve the living standard of rural people and rural conditions and this can achieve the rural development by infrastructure development. This paper attempt to express the infrastructure development and effects of infrastructure development on rural society in rural areas. Infrastructure is the fundamental part of rural development.

1.2 Objective of the Study

The objective of the study is to analyze the infrastructure development and to access the effects of infrastructure development on rural society in Taikkyi Township.

1.3 Scope and Limitation of the Study

This study is focused on rural infrastructure development conditions and impacts on rural areas according to the available facts and figures from 2009 to 2018 in Taikkyi Township and does not include the poverty.

1.4 Method of Study

This study used descriptive methods and secondary data for achieving the objective of the study, and used other facts, data and figures from government offices, organizations and key informal interview (KII) with responsible people in Taikkyi Township. For literature review, relevant books, research papers, and online and Yangon University of Economics' library. Available data and information from official reports of government department, library and research studies are collected.

1.5 Organization of the Study

This study is divided into five chapters. The first chapter includes the rationale of the study, objective of the study, method of study, scope and limitation and organization of the study. The second chapter is literature review. The third chapter is presented overview of infrastructure development and rural development in Myanmar. The fourth chapter described the case study for infrastructure development concerned with rural society. The fifth chapter is conclusion chapter of the study which consists of findings and suggestions.

CHAPTER II
LITERATURE REVIEW

2.1 Concept of Infrastructure

For a nation's economic development, the main factor such as natural resources, physical resources and human resources, technological improvement, efficient institution and infrastructure development are essential. Infrastructure development has always been critical to developing countries and developed economies. Infrastructure can deliver major benefit in economic growth, poverty alleviation and environmental sustainability, but only when it provides services that respond to effective demand and does so efficiently. Thus, infrastructure development is an essential wheel to generate to generate economic activities of all nations. Infrastructure are the basic physical and organizational structures and facilities that are needed for the operation of a society or enterprise which are also called the social and economic infrastructure of a country. Infrastructure is the system of public works of a country state or region, the resources required for an activity and the underlying foundation or basic framework (Merriam-Webster).

According to the World Bank's classification of infrastructure, it can be classified into two; economic infrastructure and social infrastructure. Social infrastructure is crucial not only for human resource development but also for economic development. Infrastructure development is combination of two words 'Infra' mean below 'Structure' mean form and development means to bring the change of structure. Infrastructure is baseline for overall development of a region. It is structure or foundation of development before starting any types of activities. Infrastructure could be defined as organizational structure and physical amenities that are needed by the community in general. These infrastructures include industries, buildings, roads, bridges, health services, governance, and many others. Infrastructure development is needed as economically it affects the demand and supply as well buy and sell activities (sheffrin, 2003). The infrastructure is important for faster economic growth and alleviation of poverty in the country. The adequate infrastructure in the

form of road and railway transport system, ports, power, airports and their efficient working is also needed for integration of the World Economy (Ayesha.J, 2013).

Infrastructure is a basic physical, organizational and geographical structure of the environment. Infrastructure development is needed for the operation of a society, human-natural interaction and socio-economic development (Samil, 2009). Infrastructure development bring change in society, transfer the natural structure, set new structure by replacing the old structure and eventually establishes the new modern facilities. It is used to change the social, economic geographical and natural setting of an area. Infrastructure development and facilities are essential for production, distribution, exchange of good and services. Hence, for any region's overall development with an effective service delivery mechanism infrastructure plays a crucial role. A country's infrastructure is a key issue with respect to that country's growth plans.

Infrastructure is the essence of economic activity and countries cannot succeed without a supportive infrastructure in their trade strategies and competitive advantages building efforts as well as in their domestic growth. Thus, infrastructure is the essence of marketing, international trade, and quality of life enhancement. If the infrastructure is not good enough, the country may not be adequate in meeting their economic goals. Infrastructure is the fundamental facilities and systems serving a country, city, or other area. Infrastructure is composed of public and private physical improvements such as roads, bridges, tunnels, water supply, sewers, electrical grids, and telecommunications including internet connectivity and broadband speeds. In general, it has also been defined as the physical components of interrelated systems providing commodities and services essential to enable, sustain, or enhance societal living conditions (Smith, 1970).

2.1.1 Differences between Hard and Soft Infrastructure

Infrastructure systems are important in maintaining and advancing economic growth, and paramount to global sustainability. From transport systems to communication lines, all facets of the economy are affected by the availability and reliability of its infrastructure systems. Since the end of World War II, infrastructure has progressed significantly and contributed positively to development. However, the quantity and quality of the world's infrastructure in general has been lower than what is actually required. Weak infrastructure has become a "constraint" in the future

development of most regions. One notable challenge is the lack of infrastructure finance. Infrastructure requires significant investment that not many countries can afford. As infrastructure is usually considered a public good, the responsibility for its provision rests on the public sector. Unfortunately, government revenues are severely limited in most countries; this leaves open an avenue for forging solutions with private enterprises, not only for financial support but also for technical management and operational expertise for large-scale projects. However, to ensure the successful implementation of public-private partnerships (PPP), other complementary institutions become necessary pre-conditions (Qingyang.Gu, 2017).

There are general two main types of ways to view infrastructure, hard and soft infrastructure. Hard infrastructure are the large physical networks necessary for the functioning of a industrial nation and supporting information technologies that provide basic services that are essential to economic activity and quality of life. Hard infrastructure is the physical infrastructure such as roads, bridges, etc. Physical infrastructure refers to the basic structure required for an economy to function and survive, such as transportation networks, a power grid and sewerage and waste disposal systems (Hamutalk.Luta, 2019). These systems tend to be high-cost investments and are vital to a country's economic development and prosperity. Projects related to infrastructure improvement may be funded publicly, privately, or through public-private partnership (Chappelow, 2019).

Soft infrastructure are all the institutions which are require to maintain the economic conditions, health care, education system, cultural standard of the country, the system of government, official statistics, park and recreational facilities, law enforcement agencies, and emergency services (Hamutalk.Luta, 2019). In economic infrastructure often involves the production of public goods or production process that support natural monopolies. It is very typical to see public financing, control, supervision, or regulation of infrastructure. This usually takes the form of direct government production or production by a closely regulated, legally sanctioned, and often subsidized monopoly. That can provided within the context of a private firm producing infrastructure for use within the firm or provided by localized arrangements of formal or informal collective action (Chappelow, 2019).

Infrastructure services are central to the activities of households and to economic production and providing infrastructure services to meet the demand of businesses, households, and other economic development. Development of

infrastructure has been seen in most developing countries as these countries are on its way to develop the economy and to raise the living conditions of the people. Government plays an essential role to promote efficient or responsive delivery of these services. Public investments in transport and communications infrastructure support the economy to grow especially in developing countries. Three layers of infrastructure can be identified. First is basic infrastructure including water supply, energy, maintained roads, and communication capabilities. Second is partially tangible or physical infrastructure, including roads, airports, seaports, energy, and education for support of special industries or economic projects. Third, mostly intangible infrastructures, including information communication and information technology. In the short run, infrastructures are support to economic growth, which does not mean an equitable increase in prosperity. In the long run, it is necessary to develop an infrastructure that will facilitate an equitable increase in prosperity. There is a trade-off between growth and equity (Samil, 2009).

2.2 Concept of Rural Development

In many developing countries, food security and rural development are ongoing challenges. Most poor people in the world live in rural regions. Based on years of experience and comprehensive know-how, the government adapted strategies to secure the right to food and make rural development a driver for economic takeoff. This is the only way to give poor people in rural areas access to land, water, loans and training (Incham manggat, Rajwani Zain and Zakiyah Jamaluddin, 2017). In cooperation with academic institutions and the private sector, for increasing production and income under changing conditions in agriculture and fishing, in ways which do not burden the environment or reduce biodiversity. It is important to develop rural infrastructure and create access to markets.

The concept of rural development is a comprehensive aspect, which takes into consideration, number of factors. The term ‘rural development’ is of major concern, particularly when one is focused upon promoting effective growth and development of the country. The development of all aspects within rural communities is education, employment opportunities, infrastructure, housing, civil amenities and the environmental conditions. Rural development need to be aware of all modern and innovative methods and techniques that are vital to augment productivity. Due to these factors, they are unable to sustain their living conditions in appropriate manner.

Rural development involves the building of human life, which includes social, cultural, religious, political and economic conditions. (Kapur, 2019).

Rural development is the process of improving the quality of life and economic well-being of people living in rural areas, often relatively isolated and sparsely populated areas. Rural development has traditionally centered on the exploitation of land-intensive natural resources such as agriculture and forestry. However, changes in global production networks and increased urbanization have changed the character of rural areas. Increasingly tourism, niche manufacturers, and recreation have replaced resource extraction and agriculture as dominant economic drivers. The need for rural communities to approach development from a wider perspective has created more focus on a broad range of development goals rather than merely creating incentive for agricultural or resource based businesses. Education, entrepreneurship, physical infrastructure, and social infrastructure all play an important role in developing rural regions. Rural development is also characterized by its emphasis on locally produced economic development strategies. In contrast to urban regions, which have many similarities, rural areas are highly distinctive from one another.

Rural development essentially focuses on action for the development of areas outside the mainstream urban economic system. Rural development is needed because modernization of village leads to urbanization and village environment disappears. Rural development actions are intended to further the social and economic development of rural communities. Rural development programs have historically been top-down from local or regional authorities, regional development agencies, NGOs, national governments or international development organizations. Local populations can also bring about endogenous initiatives for development. The term is not limited to issues of developing countries. In fact many developed countries have very active rural development programs. Rural development aims to improve rural lives with participation of rural people themselves, so as to meet the required needs of rural communities. Rural infrastructure leads to agricultural expansion by increasing yields, farmers' access to markets and availability of institutional finance. Most of the poor are live in rural areas and the growth of farm productivity and non-farm rural employment is linked closely to infrastructure provision (World Bank, 1994)

Rural development is a strategy to enable a specific group of individuals to acquire opportunities for themselves for the purpose of sustaining better livelihoods

for themselves and their families. They do need help and support from other individuals, organizations, agencies and programs. Rural development is a comprehensive and a multi-dimensional concept. In the rural development tasks, primary concerning the alleviation of poverty, training schemes have been acquiring significance. In rural communities, health care facilities too are not in a well-developed state. When the individual experience any health problems and illnesses, then they are required to transfer to distance regions or cities to obtain medical facilities. Due to the lack of health facilities the rural individuals normally remain of approaches and strategies that are necessary to take of health and well-being. (Kapur, 2019).

2.2.1 Main Indicators for Rural Development

Indicators that help to explain relatively good or poor economic performance in the rural or urban, region, state or nation, since both tangible and less tangible factors are involved, as well as the interaction among factors (Bryden, 2011). Infrastructure assets such as rural roads, tracks, bridges, irrigation and water supplies, schools, health center and markets are needed in rural areas for the local population to fulfill their basic needs and live a social and economic productive life (ILO, 2007). Infrastructure is a fundamental part of mitigating and adapting to climate change. Without good infrastructure, the private sector will not become an engine of growth (Rural infrastructure Development, 2017). Infrastructure investment has an exponential impact.

Rural development is a multidimensional and complex process to transform rural areas. To systematically monitor rural development it is necessary to have clear definitions of the borders of the geographical areas to which the concept ‘rural’ is applied and of the specificities which determine the differences between rural and urban areas. Given that rural areas are often more economically backward than urban areas, economic revitalization of rural areas is a national development priority. Many authors have researched different aspects of rural development. The main important of rural development indicator are rural economic performance, natural resource of management, rural well-being at agriculture, human assets such as education and health, physical asset such as infrastructure and communities, and income poverty and food security (Rural Development Indicators Handbook From the World Development indicators, 2002).

In the EU, the renewed interest in rural development is generating increasing demands for the measurement of:

(i) The rural situation, its structure and its problem

(ii) Progress, trends, and "development" in this situation; and

(iii)The level of well-being of rural citizens

2.3 Impact of Infrastructure Development

Infrastructures services are central to the activities of households and to economic production and providing infrastructure services to meet the demand of businesses, households. Infrastructures are not as well developed as compared to the urban or outskirts areas. This has affected the quality of life of the community that lives in the rural areas in the country. Infrastructure development also refers to the provision of fundamental infrastructure facilities such as the construction of roads and highways, availability of transportation, bridges, and ports and telecommunication systems. The rapid growth in the rural economies is determined by the accessibility and the delivery of essential infrastructures such as fine roads. The importance of road infrastructure to thrive the economy in certain areas has been emphasized specifically in the rapidly developing areas. The investments in the land transport infrastructure can give a significant impact on the country's long term economic growth.

The development in infrastructure in thriving several important sectors in the country such as manufacturing, service, international trade, production and agriculture sectors. Infrastructure plays a key role in facilitating trade that improvements in transport infrastructure, such as the road density network, air transport, railways, ports, and logistics, have resulted in increased trade flows. Information and communications technology (ICT) infrastructure has also enhanced trade, as the numbers of telephone lines, mobile phones, broadband access, internet users, and secure internet servers. Infrastructure services impact on growth and social development. Infrastructure is a key element of poverty alleviation. Development and enhances the impact of infrastructure to improve the poor's access to other assets, such as human, social, financial, and natural assets. Its impact is felt both on the economic and social sectors. Without roads, the poor are not able to sell their output on the market. Without electricity, the industrialization process, which provides the poor an important source of employment is unlikely to take off. Without potable water and sanitation health is at risk.

The process of infrastructure investments and policies lead to improvement in the standard of living of the low-income groups often involves many links, transportation and agriculture. Investment in the transport sector improves access to economic opportunities by reducing transport costs. Provided transport market structure are reasonably competitive, this will be reflected in a reduction in prices for both freight and passenger services. Road connectivity is essential to bring food, materials and agricultural inputs, or spares for the water well motor, at affordable prices, and to provide access to more social and administrative services. The improvement in the roads resulted in a significant reduction in the cost of operating vehicles, often leading to lower transport rates offered by commercial trucking services. Another benefit was an increase in the quality and frequency of commercial transport services. Enrollment in primary education increased throughout all areas which are impacts of improved in transportation.

2.3.1 Impacts on Transportation

Sustained economic growth generally contributes to the alleviation of absolute poverty. Transport provides services to facilitated interaction between productive activities. Transport investment are translated into income growth are quite well recognized. Transport investment reduces the cost of assembling intermediate inputs for production, raw materials, energy, labor, other intermediate products, and information from different locations, directly reducing the cost of production. Reduced cost and improved quality in transport services also reduced the delivered price of products and hence promotes regional and international trade.

Transport has direct impacts on the personal welfare of all income groups. Improvement in transport not only provide people with more convenient access to a broad range of socio-economic opportunities, but also have strong income effects by lowering transport cost and the prices of consumer goods and services. Thus, transport can contribute to the improvement in personal welfare. People make trips to workplace, to school and to the locations of social services. As improvement in transport sector, falling costs and times, and other, rising their income than initial stage. As incomes are grow, people are able to afford to access more choice between consumer goods and services, and improvement their living standard such as health, education, culture, others.

Lack investment in infrastructure for poor or rural people who live in rural areas, they will be lack of affordable to achieve their ability. Reliable access to schools and health services for the poor contributed directly to their accumulation of human capital, which is a key factor in sustainable poverty alleviation. Infrastructure investments can create the jobs for unemployment people. Improvement in transport condition can have greater welfare implication for the poor than for the rich. The kind of infrastructure put in place also determines whether growth does all that it can to reduce poverty. Most of the poor are in rural areas, and the growth of farm productivity and non-farm rural employment is links closely to infrastructure provision. Infrastructure services that help the poor also contribute to environmental benefit for all income groups.

In developing countries, government own, operate, and finance nearly all infrastructure, primarily because its production characteristics and the public interest involved were thought to require monopoly and hence government provision. In recent decades, developing countries have made substantial investments in infrastructure, achieving dramatic investments in infrastructure, achieving dramatic gain for households and producers by expanding their access to services such as safe water, sanitation, electric power, telecommunications, and transport. Even more infrastructure investment and expansion are need in order to extend the reach of services, especially to people living in rural areas and to the poor.

2.3.2 Impact on Agriculture

The development of rural infrastructure is highly related to agricultural production. Rural infrastructure not only provides essential agricultural production conditions such as roads, telecommunications, powers and irrigation systems, but also provides education and medical services related to enhancing the quality of rural labors such as cultural and educational facilities, vocational and technical schools, and medical institutes etc. Complete rural infrastructure can boost regional economic development. The development of rural infrastructure not only influence agricultural production and operation modes directly, but also improve the living standards for rural people and enhance the quality of rural labor. Deficient rural infrastructure may hinder agricultural production and induce poor technical performance. Rural infrastructure is considered to have an effect on agricultural production efficiency and is regarded as a strategic variable.

The rural infrastructures such as irrigations, transportation, storages, primary products market and weather forecasting service can decrease production cost, transportation cost, storage expenses, dealing cost and operation risk, and enhance production efficiency. The rural infrastructures provide crucial support for the sustainable development of rural regions. The country road construction could reduce the expenditure of agricultural production. The potential of agricultural production can be growth through rural infrastructure investment. The rise in agricultural productivity, which reduces food prices, benefits both urban and rural inhabitants who are net food buyers. Thus, aside from its growth benefits, agricultural productivity has significant poverty reduction effects. Good infrastructure has other ancillary and equally important effects.

Agriculture is relatively with large share in GDP and employment of a country. The public investments in agricultural research and development, such as irrigation, rural education, and infrastructure including roads and electricity have positive marginal impacts on agricultural productivity growth and opportunities of employment. Increase in public infrastructure investment is reduced that the total cost of livestock and crop production. Government spending on productivity-enhancing investments such as agricultural R&D, irrigation, and rural infrastructure in rural India contributed to reductions in rural poverty and contributed to growth in agricultural productivity. The largest impacts on poverty reduction cultural productivity are brought about by government expenditures on roads and R&D. Irrigation investment only has a modest impact on growth in agricultural productivity and poverty reduction.

2.3.3 Impact on Society

Infrastructure development is mainly related of road, bridge, building, hydroelectric power generation, telecommunication network, transportation facilities and safe drinking water facilities etc. It has also included the building facilities such as public house, school, universities, hospitals, industry or shopping complex. It has also used the communication facilities such as mobiles, phone, Radio, Newspapers, Televisions and computers facilities. It can be generally defined as the set of interconnected structure elements that provide supporting frameworks an entire structure of development. It is important key for checking a country, District, place and regions development. The term refers to the structure that supports a society

development, such as transportations, household, electricity, micro-industry, drinking water supplier's project and communication. It also refers the physical components of interrelated systems that provide commodities and services access to enable, sustains or reachable to the social living conditions.

Infrastructure development has been related with the society and nature. It exploits the environmental situation giving great benefit for society actives. If the lack of ability to develop sufficient required infrastructure together with skill manpower, lack of investment and policy that cannot be for sufficient energy drinking water, irrigation. As a result most of the population both in rural and urban area suffers from power shortage, water borne diseases, inadequate sanitation. Despite of this, government has set objectives to increase the access of water supply and sanitation services, and to continue raising the quality of drinking water with investment for maintenance, repair and construction of new projects. Tourism sector related with infrastructure because infrastructure is main baseline people to people, people to place and core to periphery relation developed. It is interconnected with infrastructure development. Tourism sector also has a strong role play in economic, given the significant positive relationship between tourism and infrastructure.

Infrastructure development mainly aim are providing basic needs for local people and investment the minimum by the local people and society. It is indirectly leads to poverty eradication by providing a better working, better living, stander environment create, physical healthily and human capital formation for the poor. Infrastructure development is to make the people self-reliant and capable of meeting their basic needs out of their own resources. It is extension market; the transport and communication has profound effect in establishing links between cores to periphery. It has been found that in spite of the existence of physical and social infrastructure in certain disadvantages groups like poor children and woman. Government body and local people are discussing the gap between roadway development and utilization the local level resources for infrastructure development. It is encourage and facilitate financial intermediaries and provide security for investment the finance to infrastructure projects. It is need to special skills manpower for infrastructure development accepts. Hence, financing is main challenge for collection because investor always investment in the non-production sector so, it is hard work for agree to invest in the new infrastructure projects. Infrastructure projects are across various

sub-sectors from non-government sources. It would be a major challenge and would require a significant level of push and sustained support through investor-friendly.

2.4 Review on Previous Study

John Bryden (2011) studied that Rural Development Indicators and Diversity in the European Union. The aim of this this survey is to examine social well-being, economic structure and performance, and population and migration in EU countries. The main question in this survey is light of recent changes about rural policies, new social and economic indicators in EU Member States which might feasibly be applied at EU level. This survey paper seek Dynamics of Rural Areas (DORA) in the EU are identifying the main factors responsible for differences in economic performance over the medium term (10-20 years) among rural areas in similar geographical and policy contexts.

Incham Manggat, Rajwani Zain and Zakiyah Jamaluddin (2018) studied that The Impact of Infrastructural Development on Rural Communities in Malaysia. The aim of this paper is to seek the impact of infrastructural development on rural communities. The survey is carried out in view of the relationship between social wellbeing and provision of complete infrastructure facilities. They hoped that this paper could contribute ideas on issues related to the impact of infrastructural development on Malaysian rural communities.

Madhusudan Ghosh (2017) studied that Infrastructure and Development in Rural India. The aim of this study was examined the impacts on income and non-income dimension of rural development. Despite several public initiatives for infrastructure development in rural India. The objective of this study is to estimate individual indicators of rural infrastructure reveal that improved physical and social infrastructure, livelihood opportunities enhance agricultural productivity inputs, improved literacy and life expectancy, and reduce poverty and infant mortality. This results showed that the relative important of various infrastructures and suggested that the government should priorities additional investment in electricity, roads, irrigation, housing and telecommunication to enhance overall well-being.

Stanislav Zekic, Zana Kleut and Bpojan Matkovski (2017) studied An Analysis of Key Indicators of Rural Development in Serbia; A Comparison with EU Countries. Their object is to analyze the rural development level of Serbia in comparison to European Union countries and to determine the indicators of rural

development. This paper used multivariate statistical analysis. Factor analysis and cluster analysis were applied to extract three factors of rural development; the relative economic significant of rural areas, the general level of economic and agricultural development and rural development. This result showed that Serbia has a lower level of rural development than EU countries.

Yoon Nadi Hlaing (2017) studied that A Study of Rural Transportation and Rural Development in Ingapu Township. This study was analyzed the rural transportation improvement conditions and examined the effectiveness of better transport on rural people within Ingapu Township from2005 to 2015.The research methodology used .in this study by using convenient sampling method, data collected Primary Information on the socio-economic conditions of people from 12 villages before and after building of bridges and roads in Ingapu Township. The survey shows that they can directly contact their product to the market and they can receive more updated information about prices and other related market information. Roads are a means for people to reach social services and basic rural infrastructure.

Cho Cho Mar Kyaw (2012) studied that A Study on Urbanization and Infrastructure Development of Naypyitaw. This study examined the relationship between urbanization and infrastructure development conditions in Naypyitaw from 2006 to 2011.This study was used descriptive method and secondary data. It was founded that with the development of this capital city, in spatial structure, in economic and social condition and especially transport and communication infrastructure in the surrounding areas have been observed. It is also found that together with the development of a city, the state has been putting effort to implement the necessary facilities and public services that are required to fulfill the needs of the public in this city.

CHAPTER III
OVERVIEW OF INFRASTRUCTURE AND RURAL DEVELOPMENT IN MYANMAR

3.1 History of Infrastructure Development in Myanmar

In most developing countries of the world including Myanmar, inadequate infrastructure such as roads, bridges, canals, railways, ports and communication facilities, delay economic growth. Myanmar's long coastline is many excellent natural harbors such as Pathein, Bhamo (Banmaw), Mandalay, Yangon, and Dawei. The government has taken steps to develop new ports and maintain the existing ones, although all the ports are not used to their maximum capacity. A main geographic feature of Myanmar is its many rivers, especially the Irrawaddy River. The country's waterways remain the most important traditional mode of transportation to many remote areas of the country.

Since the economic liberalization in 1989, the government started many public works programs. Early in the 1990s the government used forced rural labor to work on these projects. However, due to international criticism, the government began to engage the armed forces on these construction projects starting in mid-1990s. These projects did not bring about major improvement in the infrastructure needs of the country. The result has been that economic expansion was made difficult because in the absence of adequate transportation facilities, distribution of goods and services has been extremely difficult and costly. In 1996, Myanmar had a total of 28,200 kilometers (17,523 miles) of roads, of which only 3,440 kilometers (2,138 miles) were paved. Although the government attempted to improve many major roadways during the final years of the 20th century, most remain in poor repair and are not passable during the monsoon season. A major effort was to reconstruct the Old Myanmar Road from Mandalay to the borders of China. As of late 2000, the work on the project was still incomplete.

Rail services remain poor despite attempts in the 1990s to renovate the existing lines, add new ones, and upgrade railway services on the main routes. The

recent efforts include upgrading Yangon-Mandalay rail line and beginning a new 162-kilometer Ye-Dawei Rail track project. In the 1995-96, Myanmar has 80 airports and 1 heliport. Only 10 airports have paved runways. Both the private sector and the state sector are active in air transportation. The Department of Civil Aviation is responsible for the airports and the state-run airline. Air Mandalay, Myanmar Airways, and Myanmar Airways International are the chief airlines of the country. Myanmar's chief airports at Yangon, Mandalay, and Bago were upgraded in the late. Light transportation such as buses and cars are a private sector activity in Myanmar. Industrial production and expansion are limited due to inadequate production and intermittent supply of electric power. Electricity production of 4.38 billion kilowatt-hours (kWh) in 1998 was far below demand. Around 38 percent of the electricity is generated by hydroelectric projects while the remaining 62 percent comes from fossil fuels. Moreover, very often they have to depend on their own diesel-run power generators to meet their electrical needs.

Myanmar’s telecommunications sector is significantly underserved, with exceptionally low penetration rates given the size and potential of the market. Although the mobile subscriber base has grown fivefold in the last four years, official statistics report that there are 5.4 million subscribers as at December 2012, or a penetration rate of just 9% of population. Fixed-line subscriber numbers have been growing erratically, with an overall penetration of around 1% of the population or 0.6 million subscribers. Internet user penetration is even lower, at less than 1% of the population or 0.5 million subscribers. Yangon and Mandalay account for majority of the mobile and fixed-line subscribers.

As of 1995, there were 158,000 main telephone lines. In 1997, there were 500 exchanges with a capacity to reach 320 of the 324 townships in the nation. The number of mobile cellular phones was only 2,007 in 1995. Although the telephone system is capable of providing basic services, it is inefficient and outdated. Attempts in the 1990s to upgrade the system yielded only minimal results. Cellular and wireless phones function more efficiently than the traditional lines. The switching system is incapable of meeting current demands, and people have to wait for a long time for a telephone connection to their homes and factories. International service powered by a satellite earth station is relatively good. The 2 television stations in Myanmar service 260,000 (1997) television sets. TV Myanmar is able to transmit 82 percent of its broadcasts to 267 of the 324 townships in the country with the help of 120 TV relay

stations. In 1997 the country had a total of 4.2 million radio sets. Radio and television stations are state-owned and operated. In 1996, there were 5 newspapers with an estimated circulation of 449,000.

3.1.1 Dam

There are almost 200 large dam in Myanmar. Myanmar has a large hydroelectric power potential of 39000 megawatts, although the economical exploitable potential is about 37000 megawatts. Between 1990 and 2002, the country tripled its installed capacity of hydro plants, increasing from 253 megawatts to745 megawatts. Total installed capacity in 2010 is at least 2499 megawatts, 6 % of potential. Several large dams are planned to increase future hydro utilization. Dam are used also when a river flows at a lower elevation than the land to be irrigated. Dams are usually constructed to store water in a reservoir, which is then used for a variety of applications such as irrigation and municipal water supplies. Reservoir water can also be directed to flow through hydraulic turbines, producing electric power for use in home and industries.

The primary function of many dams is to provide water for farming. Some dams divert rivers into canals or pipelines to irrigate land many miles away. Dams and waterways store and provide water for irrigation so farmers can use the water for growing crops. In areas where water and rain are not abundant or summer season for farmers, irrigation canals from rivers or dams are used to carry water. For only irrigation, which are not produce electricity namely Gyobyu, Manchaung, Natmouk, Taungnawin, Sundaung, Kintat, Tabuhla, Alaingni, Mobye, Yezin, Kinda, Ngalaik, Sasawgi, Ngamoeeyeik, Thaphanseik, Chaungmagyi and Kataik. There were at least 10 major irrigation dams completed during the period between 1962 and 1988.

3.1.2 Transportation Sector

Myanmar's transportation sector consists of 6 subsector, roads, railways, inland waterways, ports, civil aviation. Myanmar is a large country, with a land area of 676,577 square kilometers (km2). Its geographic location, when combined with strategic investments in transport infrastructure, provides Myanmar with the potential to become a land bridge between South and Southeast Asia, and linking the People's Republic of China (PRC) to these markets. Myanmar shares borders with Bangladesh, the PRC, India, the Lao People's Democratic Republic (Lao PDR), and Thailand. The

country has a 2,800 kilometer (km) coastline along the eastern side of the Bay of Bengal. Myanmar's population is approximately 60 million, with more than 70% living in rural areas. Gross domestic product per capita was estimated to be $380 in 2009 and Myanmar is ranked among the poorest (161 out of 180 countries) by the International Monetary Fund. The economy is predominantly based on agriculture, with rice being the main crop and staple food. The country has abundant natural resources; development of Myanmar's oil and gas reserves since the early 1990s has resulted in rapidly increasing petroleum exports, reducing agriculture's share of total exports.

Myanmar's long period of isolation, since the 1980s, and the intense economic sanctions that accompanied it, seriously hampered the country's development. The sanctions are only now being eased. During nearly 3 decades, Myanmar lost most access to international investment and assistance, including from ADB and the World Bank. Consequently, Myanmar's transport sector has suffered from a lack of international expertise, experience, and investment; and a loss of capacity in the agencies that are tasked with managing and operating the sector. This applies broadly to all of the transport subsectors: roads, railways, ports, inland waterways, and civil aviation. Compared with other member countries of the Association of Southeast Asian Nations
(ASEAN), Myanmar's transport sector is considerably underdeveloped (Asia development bank, 2012).

(a) Road

Road transport is the dominant transport mode in Myanmar. However, for a country covering an area of 676,577 km2, with a population of about 60 million, the country has a relatively low road density, both in terms of total road length and the extent of higher-standard roads. Myanmar has about 130,000 km of roads of all types, equivalent to about 2 km of road per 1,000 people. As noted earlier, road density for ASEAN as a whole is more than five times higher. The comparison is even less favorable in terms of total road length paved to all-weather standards, which is only 20% in Myanmar's case. About 48% of the core network of about 34,000 km is paved with an all-weather surface.

In contrast, only 8% of the noncore secondary and local road network, such as it is, has some form of all-weather surfacing; much of this is in very poor condition. The implications of this low level of access for economic and social activity are grim.

Many studies have shown that poverty reduction is more likely to be effective when communities have ready access throughout the year and in all-weather to essential services and to markets. A recent study in Bangladesh confirms the strong link between access and poverty reduction. In 2010, Myanmar's number of vehicles per 1,000 people, inclusive of motorcycles, was about 38; Thailand's ratio was 10 times this. Viet Nam and even the Lao PDR also had much higher ratios. While Myanmar's number of vehicles has been growing rapidly, increasing from around 175,000 in 1990 to 2,300,000 in 2010, almost all of the increase is attributable to motorcycles; they now account for 82% of the total number of vehicles. Vehicles with four or more wheels have increased much more slowly, by about 5% per annum to some 400,000.

The Road Transport Administration Department is responsible for driver licensing, vehicle registration, aspects of road safety, and other related regulatory activities. The Transport Planning Department is responsible for scrutinizing and coordinating plans, budget, and financial matters prepared by the ministry and its agencies; issuing licenses to commercial vehicle operators for carrying passengers and freight; managing passenger and freight logistics to ensure sufficient supply to meet demand; and functioning as the focal point for international relations related to land transport. The Road Transport Agency provides freight and transport services, including buses in Yangon and trucks operating in

competition with private transport companies. The Central Institute of Transport and Communications manages the human resource requirements for the overall transport sector. Table (3.1) show the construction of roads in Myanmar.

Table (3.1) Construction of Roads in Myanmar

Year	Total Road (km)	Paved Road (km)	% paved
2009	29,497	14,126	47.9
2010	29,825	14,356	48.1
2011	30,433	14,956	49.1
2012	30,711	15,213	49.5
2013	30,902	15,387	49.8
2014	32,070	15,583	48.6
2015	34,178	16,550	48.4
2016	37,784	17,260	45.6

Source; Myanmar Ministry of Construction

(b) Port

Myanmar's favorable geographic location makes it an attractive location to develop port facilities. The country's 2,800km coastline runs along the eastern side of the Bay of Bengal and has the potential to become an alternative international trade route to Asia, bypassing the longer route through the Straits of Malacca. The development of its ports can see Myanmar becoming a regional trade and transport hub. The Bay of Bengal is already home to some of the biggest ports in the world.

The Myanmar Port Authority (MPA) is a government agency vested with the responsibility to regulate and administer the coastal ports of Myanmar. It is a department of the Ministry of Transport. The MPA was founded in 1989 and is located in Yangon. The modern era of the Port of Yangon began in 1880 with the Commissioners for the Port of Rangoon. In 1954, the Board of Management for the Port of Rangoon was established, and then in 1972 the Burma Ports Corporation. The MPA was founded in 1989 to replace the Burma Ports Corporation. In March 2011, MPA began collaborating with a Chinese firm, CCCC TDC Tianjin Dredging, to begin dredging the Port of Yangon, to increase the size of vessels that can dock at the port (to 35,000 tons deadweight, up from the current capacity of 15,000).

MPA has been involved in contracts to develop Myanmar's Special Economic Zones, including a USD $8.6 billion deal to develop a deep sea port at Dawei. There have been reports that ports run by the MPA will be privatized. The country's largest port, Thilawa Port, is currently operated by a Hong Kong-based firm, while another in Ahlone Township is run by Asia World. On 17 March 2012, Japanese firm MOL, began a twice-weekly container service between the Port of Yangon and Singapore. 8 new Yangon area ports complete jun1st 2019. The coast of Myanmar fronts on the Indian Ocean's Bay of Bengal and Andaman Sea. Major port facilities administered by the MPA include:

(i) Myanmar Port Authority, Yangon
(ii) Asia World Port Terminal, located in Ahlone Township of Yangon
(iii) Myanmar Industrial Port, Yangon
(iv) Myanmar International Terminal Thilawa, (MITT) 25 km from Yangon
(v) Myanmar Integrated Port Limited (MIPL), Yangon

Generally, Myanmar has 9 ports along the western and southeastern coast of the country, which are Yangon, Sittwe, Kyaukphyu, Thandwe, Pathein, Mawlamyine,

Dawei, Myeik, and Kawthaung. In addition, Myanmar International Terminals Thilawa (MITT) is a private multi-purpose container terminal owned and operated by Hutchinson Port Holdings. However, with the exception of the country's principal port in Yangon, the rest are reportedly small coastal ports with limited port handling capabilities. According to official statistics from the Myanmar Port Authority, Myanmar's ports handled 24 million tons of import and export freight in 2011, with the Port of Yangon handling 90% of the cargo throughput. Myanmar's Container Port Throughput was reported 1,026,216 TEU in Dec 2016-2017 and 1,070,343 TEU in Dec 2017-2018. CPT are increase from 163,692 TEU in 2009-2010 to 1,070,343 TEU in 2017-2018 which are shown in table (3.2).

Table (3.2) Container Port Throughput (2009-2018)

Budget Year	CPT (TUE)
2009-2010	163192
2010-2011	335346
2011-2012	380675
2012-2013	474300
2013-2014	567156
2014-2015	716926
2015-2016	827249
2016-2017	1026216
2017-2018	1070343

Source; Myanmar Port Authority

(b) Railways

Myanmar has four modes of transportation; railway, waterway road and airway. The railway sector in Myanmar is currently a monopoly operated by state-owned Myanmar Railways. The rail network has expanded considerably over the last twenty years, expanding by almost 78% between 1988 and 2010, although the focus had been on providing transport services and connectivity to remote areas of the country. According to ADB's initial assessment of the railway sector, the rail network is in poor condition and investment in basic infrastructure, such as track renewal, replacement of sleepers, and upgrading of signaling and communications systems, has been inadequate. Twenty years ago, MR commanded a 44% share of the passenger market and 14% share of the freight market. As of 2015, its market share is only 10% for passengers and 1.5% for commercial freight.

Myanmar railway operated 443 trains per day in fiscal year 2018, which is consistent with its operations since fiscal year 2009. The quantity of Myanmar railway's impressive, given that these trains are operated with outdated train control systems, signaling equipment, and rolling stock in table (3.3).

Table (3.3) Myanmar Railways Daily Train Runs

Train Type	Number of Trains per day
Intercity Passenger	198
Express	42
Mail and others	66
Mixed	62
Rail bus	28
Yangon Circular (Sub Urban)	215
Freight	30
Total	443

Source: Ministry of Transport and Communications

In table (3.4), this table shows the construction of railway lines in Myanmar. Some of these railway lines are still construction.

Table (3.4) Construction of Railway Lines in Myanmar

Lines	Distance (miles)	Start Date	Open Date
Sinkhan-Bamaw	57.81	16.5.2007	2018-2019
Katha-Moethagyi	16.68	16.5.2007	20.5.2010
Moethagyi-Kyaukkyi	20.38	16.5.2007	7.2.2014
Natmouk-Kanpyar	94.71	10.11.2008	2019-2020
Magwe-Kanbya	7.68	10.11.2008	19.12.2009
Pyawbwe-Ywadaw	22.12	10.11.2008	16.1.2010
Ywadaw-Natmauk	35.42	10.11.2008	16.3.2013
Yechanbyin-Kwantaung-Kyaukhtu	257	15.2.2009	2021-2022
Sittwe-Yechanbyin	11.46	15.2.2009	19.5.2009
Kwantaung-Ponnagyun-Yotayouk	22.72	15.2.2009	15.5.2010
Yotayouk-Kyaukhtu	19.28	16.5.2010	11.4.2011
Einme-Nyaundong	96.51	1.12.2009	2019-2020
Pathein-Einme	20.75	1.12.2009	20.3.2011

Source: Ministry of Transport and Communications

Myanmar Railways (MR) has 6,106 route km in 2014 (3,795 route miles), of which 705 km (438 miles) are double-tracked between Yangon and Mandalay. About 50% of the routes were constructed during 1988–2010, and another 116 route miles were added since 2011. The total length of tracks (including yards and stations) is 7,937 km (4,933 miles). MR has been progressively upgrading its rail from 60 pounds to 75 pounds and replacing wooden sleepers with concrete sleepers produced in plants constructed under build-operate-transfer (BOT) arrangements with MR. As of 2014, about 50% of sleepers are concrete. MR spent about $1,650 per track kilometer on maintenance in 2014. This is very low by international comparison, which reflects the low standards used by MR. The track maintenance requirements are a function of the extent of mechanization, traffic volume, train speed, and geographic conditions.

(c) Airports

Myanmar currently has a total of 69 airports, of which only 32 are operational. There are 4 international airports that are in Yangon, Mandalay, Bago and Nay Pyi Taw, 45 domestic airports and 5 military airports, 19 international airlines and 4 domestic airlines operating regular flight services between Myanmar and 17 regional destinations. The Union of Myanmar has 25 operating airports with commercial flights. The country is bordered by China to the north, Laos to the east, Thailand to the southeast, Bangladesh to the west, India to the northwest. In 2011, there were 1.5 million international passengers and 1.4 million domestic passengers. The Myanmar Department of Civil Aviation (DCA) wishes to double the capacity at Yangon International Airport from 2.7 million passengers a year to 5.5 million. The government also has plans to transform some of the existing domestic airports into international airports to serve the growing number of foreign investors and tourists. The DCA has already announced plans to re-develop airports in Yangon and Mandalay and to also build a new airport at Hanthawaddy, about 80km from Yangon. According to the table (3.5), this shows the (15) biggest airports in Myanmar.

Table (3.5) The (15) Biggest Airports in Myanmar

No.	IATA	Name	City	Airlines	Destinations
1	RGN	Yangon International Airport	Yangon	27	28
2	MDL	Mandalay International Airport	Mandalay	8	8
3	NYU	Bagan Airport	NyaungU	3	3
4	HEH	Heho Airport	Heho	3	3
5	THL	Tachileik Airport	Tachileik	3	4
6	NYT	Naypyitaw Airport	Pyinmana	2	2
7	MYT	Myitkyina Airport	Myitkyina	2	3
8	AKY	Sittwe Airport	Sittwe	2	2
9	TVY	Dawei Airport	Dawei	1	2
10	KET	Kengtung Airport	Kengtung	1	1
11	KYB	Kyaukpyu Airport	Kyaukpyu	1	1
12	KAW	Kawthoung Airport	Kawthoung	1	1
13	MGZ	Myeik Airport	Myeik	1	2
14	PBU	Putao Airport	Patuo	1	1
15	SNW	Thandwe Airport	Thandwe	1	2

Source: Ministry of Transport and Communications

3.1.3 Energy and Power

Myanmar has abundant energy resources, including renewable alternatives such as hydro, biomass, wind and solar. The country's primary energy supply includes coal, oil, gas, hydropower and biomass. Hydropower is the main source of fuel in the country and electricity from hydropower plants contribute nearly 70% of the total electricity generated in the country, followed by 22% produced from natural gas and 8% from coal. Over the last 10 years, electricity consumption in Myanmar has almost doubled from 3,303 GWh in 2000 to 8,093 GWh in 2017. However, Myanmar's per capita electricity consumption still remains the lowest among the ASEAN-10 countries, at 100 KWh in 2010, compared to a consumption of around 600 KWh in Indonesia and over 2,000 KWh in Thailand. It is estimated that only a quarter of Myanmar's population currently have access to a regular supply of electricity and even Yangon is plagued by frequent outages, limiting economic growth and development. The low national average per capita electricity consumption is due to the low electrification rate, low industrial development and lack of investment.

Myanmar's average electrification grew from 16% in 2006 to 26% in 2011. Big cities are relatively well electrified: 67% for Yangon, 54% for Nay Pyi Taw and 31% for Mandalay while rural areas remain poorly electrified with an electrification ratio of about 16%. Out of 62,218 villages, 2765 villages are electrified by the System and 14,195 villages via a "self-help basis" such as Biomass, Solar, Wind, Diesel, Mini Hydro, and Biogas. According to the 5 year plan by Ministry of Electric Power (MOEP), the government aims to achieve the following electrification rates for the villages.

Seven ministries in Myanmar are responsible for energy matters, with the Ministry of Energy (MOE) as the focal point for overall energy policy and coordination. Myanmar's Energy Policy framework has four main goals:

(i) Maintaining energy independence;

(ii) Promoting the wider use of new and renewable sources of energy;

(iii) Promoting energy efficiency and conservation; and

(iv) Promoting household use of alternative fuels.

The Myanmar government has also indicated under the Framework for Economic and Social Reform that the sector will be further liberalized through the deregulation of prices, the adoption of appropriate taxes and elimination of across-the-board subsidies in the energy sector. Myanmar is also developing a master plan for the electricity sector that will project future electricity consumption, develop a plan to meet those consumption requirements and identify necessary regulatory reforms. In table (3.6), this shows energy sector from Myanmar according the World Bank data. In this table which includes Electricity production from oil sources, natural gas sources, hydroelectric sources, coal sources, electric power transmission and distribution losses, access to electricity for rural and urban in Myanmar. According to this data, energy sector of Myanmar was well developed.

Table (3.6) Myanmar Energy Sector

Name / Year	Electricity production from natural gas sources (% of total)	Electric power transmission and distribution losses (% of output)	Electricity production from hydroelectric sources (% of total)	Electricity production from oil, gas and coal sources (% of total)	Access to electricity (% of population)	Access to electricity, urban (% of urban population)	Access to electricity, rural (% of rural population)
2009	17.30327	28.3027	75.47387	24.52613	51.57104	86.93047	37.3148
2010	22.9882	16.61143	67.67864	24.52613	48.80000	89.0000	39.47184
2011	16.09242	20.227	76.18565	24.52613	53.81276	88.37972	41.64238
2012	19.97764	25.2609	72.36303	24.52613	55.00157	89.03849	43.91888
2013	22.81375	21.51547	72.04213	24.52613	56.22527	89.32339	45.40433
2014	35.15575	20.49163	62.36491	24.52613	52.00000	90.00000	47.88095
2015	39.01691	29.00936	58.8541	24.52613	55.50000	90.80000	49.60192
2016	39.82713	30.62979	53.94225	38.5231	60.60000	91.78560	53.80994
2017	49.26012	29.24783	56.55571	43.44429	63.81484	92.30000	57.91913
2018	41.65351	30.2906	61.4769	46.05775	69.64981	92.55452	60.37849

Source: World Bank Data

3.2 Rural Development in Myanmar

The Republic of the Union of Myanmar is the second largest country in the mainland of Southeast Asia with an area of 676,577 square kilometers bordered by Bangladesh, India, China, Lao PDR and Thailand. Myanmar has an ethnically population of approximately 51.5 million, and 70% of the population lives in rural areas. According to the 2014 World Bank report, Myanmar is a lower-middle income country with a Gross Domestic Product (GDP) per capita of USD 1,203. As stated in the Observatory of Economic Complexity (OEC) measurement, Myanmar is the 84th largest export economy in the world. Myanmar is rich in natural resources, agricultural land, water resources and a suitable climate for Cultivation. As it is located at the intersection of China and India, which are two of the world's most powerful economies, Myanmar could be a regional commercial hub.

The country may be divided roughly into five major topographic and climatic zones: the mountainous region, the Shan Plateau, the central dry zone, the delta region, and the coastal region. Agriculture accounts for 60%–70% of employment, and 25%–30% of exports. Myanmar is undergoing rapid transformations, which are political, social, economic and institutional sectors towards democratic governance. The total GDP of Myanmar is approximately USD 64.33 billion and population estimates range from 51.4 million 3 to 53.44 million people. The economy grew at 8.5 percent in the 2014/15 fiscal year, but the World Bank expects this to moderate to 6.5 percent this year by reason of natural disasters and slowing investments. The government has implemented policies to develop more "people-centered" and "bottom-up" access to planning and budgeting.

Indeed, local development funds (LDFs) are necessary for reforming the management and implementation of rural development and decentralization in Myanmar. In order to achieve the development in rural areas, the Department of Rural Development (DRD) is organized under the Ministry of Agriculture, Livestock and Irrigation (MALI). The DRD has implemented the construction of rural roads, bridges, housing and electricity that are necessary to develop the agricultural sector. The DRD has implemented the National Community-Driven Development Project (NCDD project), which is an important project financed by LDFs. This project gives grants for infrastructure and services such as the construction of roads, bridges, hospitals, schools, health clinics, drinking water and rehabilitation of community livelihoods in rural areas.

Over the last 25 years, the NCDD project was first supported by the World Bank with a budget of USD 80 million (80 billion kyats). According to the mid-2015 approved fund, the total amount of funding needed by the NCDD project is approximately USD 544 million (544 billion kyats) and this initiative is supported by the Myanmar Government, the World Bank, the Government of Italy, and the Japanese Social Development Fund (JSDF) with the following amounts:

(i) Myanmar government : USD 30 million (30 billion kyats)
(ii) World Bank (IDA grant): USD 80 million (80 billion kyats)
(iii) World Bank (IDA loan) : USD 400 million (400 billion kyats)
(iv) Government of Italy (loan): USD 22.5 million (22billion kyats)
(v) Japanese Social Development Fund (JSDF): USD 11.5 million (11billion kyats)

In addition, the government spent about USD 90 million (90 billion kyats) in the 2015-2016 fiscal year for another project called the Mya Sein Yaung rural project that will be allocated to 3,000 villages. This project is managed by the Myanmar Economic Bank (MEB). Due to sufficient infrastructure in rural area, like as roads, the low cost of production, no restrictions on finance, surplus of labor productivity and growth of innovation in research and development, sustainable economic development within the country, improve the level of living standard of rural people and higher literacy rate for them who live in rural areas, it can be rural development.

Under the Ministry of Agriculture, Livestock and Irrigation (MOALI), the Department of Rural Development (DRD) is the government body which takes responsible for formulation and implementation of rural development works across the country. Investment in roads can be provided a short-term boost to demand, enhancing long-term productivity and improving connectivity.

3.3 Rural Policies and Guidelines

National and subnational development planning and investment programming is the responsibility of the Ministry of Planning and Finance (MOPF). Department of Planning (DOP) of the MOPF is specifically responsible for issuing policies and procedures for national and subnational development planning, while the Ministry's Finance Department sets out policy guidance and procedures for government budgeting both capital and current expenditure budgeting, and revenue estimation. The DOP is also responsible for coordinating and managing the preparation of

national and subnational development plans. Township and state/region development planning is considered as subnational dimension of national development. Township development planning is therefore situated in the context of subnational development effort.

While the DOP is responsible for formulating township development plan and budget under coordination of the General Administration Department (GAD) of the Ministry of Home Affairs, the Department of Rural Development (DRD) of the Ministry of Agriculture, Livestock and Irrigation (MOALI) has the responsibility for village development planning. DRD together with DOP are responsible for contributing to the process of integrating village development plans and investment programs with their respective township development plan and budget.

The Guidelines offer complementary input to the overall guidelines for township development planning and budgeting. It is foreseen that the content of this document will be integrated and subsumed with the overall "consolidated" guidelines and manual for township development planning and budgeting when such an exercise is undertaken by the DOP in the future. DRD expects to use this document as a management and technical tool for mobilizing participation of government departments and all stakeholders at the township level for planning and investment programming for rural development. This task will be facilitated through the institutional mechanism of the Township Planning and Implementation Committee (TPIC) or the Township Management Committee (TMC), as appropriate.

The content of the Guidelines covers the following elements:

1. Principles, approaches, institutional mechanism and organizational arrangements, process tools and instruments for forging stakeholder participation at the township level for formulation of rural development strategy and indicative programme of township development plan;
2. Technology and knowhow for consolidating and integrating village development plans and annual village investment programme with their respective township development plan and budget;
3. Structured presentation of socioeconomic planning tables covering 30 – 35% of the villages at a township, with sample frames constructed to represent the entire rural area of a township;

4. Analytical perspective of rural development situation, issues and challenges, development potential and strategy;
5. Medium term (five-year) indicative programme outline;
6. Annual rural investment programme (ARIP) for each township.

Policy and programmatic action

1. Government policy adoption on bottom-up planning and budgeting
2. Policy directive on institutions that will be responsible for coordinating and managing the planning process
3. Integration of the VDP process with subnational and national planning process
4. Bottom-up planning - an integral part of government programme with resource provision

3.4 Infrastructure and Rural Development

Rural infrastructure are need to improve for rural people's living standards and their well-beings because 70% of Myanmar people are live in rural areas. Myanmar's agricultural development potential is considerable and offers the most significant opportunity for inclusive economic growth. The country has 18.2 million hectares (ha) of arable land, of which only 13.3 million ha (73%) are cultivated at present. Of cultivated land, only 2.1 million ha (16%) are irrigated, in the main monsoon season, while 11.2 million ha (84%) are rain fed. Grain is the main crop; other crops cultivated include pulses, oilseeds, maize, cotton, rubber, sugarcane, tropical fruits, and vegetables. Myanmar has abundant water resources including (4) longest rivers such as Mekong, Salween, Irrawaddy and Chindwin river. The agriculture sector is one of the most important sectors for the country's economy; agricultural goods are Myanmar's second largest export commodity. The agriculture sector contributes 38% of GDP, accounts for 20 to 30% of total export earnings and employs more than 70% of the workforce. 12.8 million hectares out of 67.6 million hectares of land in Myanmar are cultivated land. Rice is the country's primary agricultural product, which accounts for nearly 43% of the total agricultural production value.

Agriculture sector will development due to the water supply from dams and improvement of transportation sector that can effects on costs and times of farmers who live in rural areas. Therefore, the development of rural areas is very important

because it affects 70 percent of the population. Thus, if agriculture sector growth, increasing farmer's incomes, improving their life and so on. So, agricultural development is an important role for rural development. While Myanmar's economic growth is projected to sustain in next future, there is huge need for large scale investment in infrastructure.

In particular, infrastructure projects covering road, bridge and railway construction, housing, connectivity, electricity and water supply, health care, education and tourism are immediate need for Myanmar to sustain its economic growth. Myanmar needs to close its infrastructure gap, to further integrate with the world economy, and to collaborate with neighboring countries, in order to maximize its economic growth from ASEAN Economic Community (ACE) and China's One-Belt-One-Road Initiative. The Asian Development Bank (ADB) stated that Myanmar's infrastructure gap from now to 2030is worth US$ 120 billion. Thus, the government is accelerating its implementation of infrastructure projects, particularly on roads, bridges, railways, ports, airports, energy and power, industrial parks and economic zones. The government invite the investors to invest in infrastructure improvement projects under the Build-Operate-Transfer (BOT system or other Public Private Partnership (PPP) agreements.

3.5 Overview of Yangon Region

Yangon is an administrative region of Myanmar and located in the heart of lower Myanmar, the region is bordered by Bago Region to the north and east, the Gulf of Martaban to the south and Ayeyarwady Region to the west. Yangon is located in Lower Myanmar at the convergence of the Yangon and Bago Rivers about 30 km(19 mi) away from the Gulf of Martaban at 16°48' North, 96°09' East. Yangon Region is dominated by its capital city of Yangon, the former national capital and the largest city in the country. Other important cities are Thanlyin and Twantay. The region is the most developed region of the country and the main international gateway. The region measures 10,170 km^2 (3,930 sq mi). Yangon region consists of 4 districts and 44 townships. From of this 44 townships, the city of the Yangon now encompasses 33 townships. Downtown Yangon's road layout follows a grid pattern, based on four types of roads:

(i) Broad 49-m wide roads running west to east

(ii) Broad 30-m wide roads running south to north

(iii) Two narrow 9.1-m wide streets running south to north

(iv) Mid-size 15-m wide streets running south to north

Yangon served as the administrative capital of Myanmar until 2006, when the military government relocated the administrative functions to the purpose built city of Naypyitaw in central Myanmar. With over 7 million people, Yangon is Myanmar's largest city and it is the most important commercial center. Yangon boasts the largest number of colonial-era buildings in Southeast Asia, and has a unique colonial-era urban core that is remarkably intact. The colonial-era commercial core is centered around the Sule Pagoda, which is reputed to be over 2,000 years old. Shwedagon Pagoda is the Myanmar's most sacred Buddhist pagoda. Yangon suffers from deeply inadequate infrastructure, especially compared to other major cities in Southeast Asia. Though many historic residential and commercial buildings have been renovated throughout central Yangon, most satellite towns that ring the city continue to be profoundly impoverished and lack basic infrastructure. Yangon is administered by the Yangon City Development Committee (YCDC).

Yangon has a tropical monsoon climate. The city features a lengthy wet season from May through October where a substantial amount of rainfall is received; and a dry season from November through April, where little rainfall is seen. It is primarily due to the heavy rainfall received during the rainy season that Yangon falls under the tropical monsoon climate category. During the course of the year 1961 to 1990s, average temperatures show little variance, with average highs ranging from 29 to 36 °C (84 to 97 °F) and average lows ranging from 18 to 25 °C (64 to 77 °F).

The city of Yangon covers a surface area of 598.75km2 (231.18 sq. mi). The population density comes to approximately 12308 individuals living per square kilometer in the urban area of Yangon. Yangon has the largest population in all of Myanmar, and its population is very diverse. It is so diverse that ethnic groups have created their own communities for networking. It is the most ethnically diverse city in the country. Some of the largest ethnic groups include Indians, South Asia Burmese, and Chinese Burmese. The primarily religions practiced in Yangon are Buddhism, Islam, Christianity and Hinduism. Yangon is the most ethnically diverse city in the country. Burmese is the principal language of the city.

Yangon's 2019 population is now estimated at 5243989. In 1950, the population of Yangon was 1302462. Yangon gas growth by 392624 since 2015 that represents a 1.96% annual change. Yangon's population of 4477638 according to

1014 MPHC data, 8.3 % of the Union of Myanmar, 67% of the population live in urban areas, the remaining 33% live in rural. Yangon is the highest percentage of the population living in the urban area or region. Thilawa Special Economic Zone is located in that region.

Many of the roads are in poor condition and not wide enough to accommodate an increasing number of cars. The vast majority of Yangon residents cannot afford a car and rely on an extensive network of buses to get around. Over 300 public and private bus lines operate about 6,300 crowded buses around the city, carrying over 4.4 million passengers a day. All buses and 80% of the taxis in Yangon run on compressed natural gas (CNG). Highway buses to other cities depart from Dagon Ayeyar Highway Bus Terminal for Irrawaddy delta region and Aung Mingala Highway Bus Terminal for other parts of the country. On 16 January 2017, city bus network system Yangon Bus Service (YBS) was created.

Yangon is Myanmar's main domestic and international hub for air, rail, and ground transportation. Yangon International Airport, located 12 miles (19 km) from the centre, is the country's main gateway for domestic and international air travel. The airport has three terminals, known as T1, T2 and T3 which is also known as Domestic. It has direct flights to regional cities in Asia, mainly: Doha, Dubai, Dhaka, Kolkata, Hanoi, Ho Chi Minh City, Hong Kong, Tokyo, Beijing, Phnom Penh, Seoul, Guangzhou, Taipei, Bangkok, Kuala Lumpur, Kunming and Singapore. Although domestic airlines offer service to about twenty domestic locations, most flights are to tourist destinations such as Bagan, Mandalay, Heho and Ngapali, and to the capital Naypyidaw.

Yangon Central Railway Station is the main terminus of Myanmar Railways' 5,403-kilometre (3,357 mi) rail network whose reach covers Upper Myanmar (Naypyidaw, Mandalay, Shwebo), upcountry (Myitkyina), Shan hills (Taunggyi, Lashio) and the Taninthayi coast (Mawlamyine, Dawei). Yangon Circular Railway operates a 45.9-kilometre (28.5 mi) 39-station commuter rail network that connects Yangon's satellite towns. The system is heavily used by the local populace, selling about 150,000 tickets daily. The popularity of the commuter line has jumped since the government reduced petrol subsidies in August 2007.

CHAPTER IV
ANALYSIS ON THE DEVELOPMENT OF TAIKKYI TOWNSHIP

4.1 Geographical Situation of Taikkyi Township

Taikkyi Township is located in the North of Yangon Region. It is included in North District of Yangon and it is the Northernmost Township of Yangon Region. Taikkyi Township is one of the 44 townships in Yangon Region. The population of Taikkyi is 277268 according to 1014 HMIS data, which is 6.2 % of the Yangon Region. Yangon Region is composed of 4 Districts, East Yangon Districts, West Yangon Districts, South Yangon Districts, and North Yangon Districts. As an administrative record, Taikkyi is under the authority of North District and it is composed of 3 big towns namely Taikkyi, Oakum and Ahpyauk. Road is the main connection of transportation to these three towns.

Table (4.1) Population of Taikkyi Township

Sex	Population	Percentage (%)
Male	129333	49
Female	137934	51

Source: Taikkyi Township General Administrative Office

Taikkyi Township is situated in North Yangon District in Yangon Region. It extends from the in North Latitude 17°10' to 17°48' and East Longitude 95°40' and 96°8'. Taikkyi Township is bordered by Tharyarwaddy Township from Bago Region in North, Hmawbi Township and Htantabin Township in South, Helgu Township in East and Danuphyu Township and Zalun Township in West. It has an area of 1832.5 km^2 (708.14square miles) and stretches for 29 miles from East to West and 35 miles from North to South. Location of Taikkyi Township is the north of Hmawbi and it is the north of Yangon Re. There is a Tabuhla Dam in the east of Taikkyi to provide sufficient water for farmers in Taikkyi Township who farm in the summer season. People in Taikkyi have diversified livelihood. Most people have a lot of farms and

they use to be farmers. Some are working as merchants, timbers and owners of small scale home based businesses. Some earn by providing motorbike transportation service and there are also casual labors.

4.2 Climate and Physical Features of Taikkyi Township

Taikkyi Township is situated the average of 100` above the sea level, the highest mountain is Hmanpya mountain and it is located 1500` above the sea level, the lowerst place is 40`. The Pago Yoma Mountain in Taikkyi Township is situated 255` above the sea level. The climate is hot and wet and the highest temperature is 34°C and the lowest temperature is 24°C. The annual rainfall of Taikkyi is about between 90 inches and 120 inches. Taikkyi Township is composed of 20 wards and 25 village tracts. In 2018, there were altogether 61706 households and total population of Taikkyi is 267267 (129333 males and 137934 females).

Table (4.2) Population of Ethnic in Taikkyi Township

No	Ethnic	Population	Township's Population	%
1	Kachin	220	267267	0.08
2	Kayar	-	267267	-
3	Kayin	26618	267267	9.96
4	Chin	488	267267	0.18
5	Mon	50	267267	0.02
6	Burma	223536	267267	83.64
7	Rakhine	196	267267	0.07
8	Shan	4474	267267	1.67
	Total	255582	267267	95.62

Source; Taikkyi Township General Administration Office

According to the General Administration Department, total male population of under 18 years are 44175 and that of over 18 years are 85158. Total female population of under 18 years are 44422 and that of over 18 years are 93512. The population ratio of Taikkyi Township is 1:1.06. Difference ethnics of Myanmar live in Taikkyi Township and which is shown in table (4.2), and among them Burma is the highest in percentage with 83.64% and the second is Kayin with 9.96% and the third is Shan

with 1.67%. The total population percentage of Myanmar people is 95.62% and others are 4.38%. There are Buddhists, Christian, Hindus and Islam. The population of Buddhist is the largest, Christian is the second largest and the Islam is the third largest.

Table (4.3) Foreigner in Taikkyi Township

No	Foreigner	Population	Township's Population	%
1	China	1163	267267	0.44
2	India	4527	267267	1.69
3	Pakistan	4429	267267	1.66
4	Bangladesh	958	267267	0.36
5	other	608	267267	0.23
Total		11685	267267	4.38

Source; Taikkyi Township General Administration Office

The occupations of population in Taikkyi are shown in Table (4.4). Most of the people in Taikkyi Township are casual workers such as motor transport services,, mason workers and rebar workers, the second largest workforce is farmers who cultivate grains, groundnut, and sesame, some types of beans, cotton, rhinoceros and corn and suns flower. Some of the perennial crops are seep, rubber, coconut and mangoes.

Table (4.4) Occupations of Population in Taikkyi Township

No	Types of Work	Population Amount	%
1	Government Staff	5236	3
2	Agriculture	26381	15
3	Livestock	8703	5
4	Trade	33071	18
5	Factory	297	0.17
6	Casual	98211	56
7	Other	3210	1.9
	Total	**175109**	**99.07**

Source: Taikkyi Township General Administration Office

4.3 Infrastructure Development and Socio Economic Situation

The infrastructure development can promote to growth or develop for the rural a areas. These infrastructures such as dam, road and bridge, health and education building, electrifying in rural areas can effects on the living standard of rural people and their income distributions and communications. Rural areas are often isolated for a number of reasons, including a lack of basics, such as portable water, electricity, alternative power sources, suitable transportation or even adequate roads. The role of infrastructure is important because basic infrastructure such as education, health, services for cultivation, transportation and electrification and availability of drinking water are basic needs for everybody. In this section, infrastructures include as education sector, health sector, energy sector and transportation sector.

4.3.1 Tabuhla Dam and Production Crops

The famous dam in Taikkyi Township is Tabuhla Dam which is located in Oaken which has two canals such as left and right. The left canal is 23 miles long and right canal is 2 miles long. This dam was constructed since 1933-1994 and finished in 1995-1996. This storage area of water is 194600 cubic feet, sufficient for useable water is 30344 acre and area of dam is 200 feet, the high of the dam is 29 foots and the length of the dam is 170 feet. This dam supports water for summer grain by the unit of 1950 Ks per acre and 900 Ks for other crops per acre. The distribution of water from dam passes through by 29 of water gates. The cost of maintenance for Tabuhla dam is about (400-1000) million Ks per year.

There are other river pumping projects from Hlaing River. There are 5 river pumping projects and they are Eigalong project (5000 acre), Tapaytan project (960 acre), Tawlatee Project (100 Acre), Alaboat project (140 acre) and South- Zeekone (1000 acre), therefore the total amount of available water. For drinking water, there are 2 purified water factories and they are Quick and PinKwin, Quick factory can produce 4000 gallons per day whereas PinKwin factory can produce 4300 gallons per day. There are 452816 acres in Taikkyi Township, 191174 acres are net agricultural land, 13649 acres are undone area, and 9445 acres are grazing land, 172 acres of industrial land, 1526 acres of city land and 10208 acres of village land, 58663 acres are not planting land.

Table (4.5) Annual Grain Production in Taikkyi Township (2010-2011 to 2017-2018)

Year	Grain							
	Rain				Summer			
	Acres Planted	Harvested Acres	Production per Acers	Total Production (Baskets)	Acres Planted	Harvested Acres	Production per Acers	Total Production (Baskets)
2009-2010	125703	125703	70.13	8815342	48296	48296	79.48	3138602
2010-2011	125703	125703	70.11	8813341	56007	56007	78.45	4393749
2011-2012	126187	126187	69.36	8752330	44292	44292	78.47	3475593
2012-2013	126207	125772	69.63	8757588	44424	44424	80.09	3557918
2013-2014	127188	127188	71.36	9075730	44586	44586	81.74	3644420
2014-2015	127545	127145	72.82	9287966	44929	44929	82.24	3695153
2015-2016	127545	115364	73.34	8460762	49045	48975	83.86	4097046
2016-2017	128195	105614	71.79	7646345	50119	50119	83.80	4199879
2017-2018	128117	126830	70.40	8929062	53620	53620	86.40	4632554

Source: Ministry of Agriculture, Livestock and Irrigation

Annual crop production in Taikkyi Township are shown in table (4.5) and table (4.6). According to this table, the main five crops production are grain, corn, groundnut, sesame and sunflower. Tabuhla dam supports water for summer grain. The total production of grain in summer are increase 3838602 baskets in 2009-2010 to 4832554 baskets in 2017-2018 and the percentage of production per acre are also increase from 79.48 to 86.40, planted acres of corn are also increase from 536 acres to 803 acres, betel leaf are also cultivated in Taikkyi Township. Agricultural outputs are

also increase in Taikkyi Township as water supporting from Tabuhla Dam in the summer, especially grain and corn cultivation were improved within study period. This dam is the main source of irrigation water for agriculture in Taikkyi Township.

Table (4.6) Annual Groundnut and Sesame Production in Taikkyi Township (2010-2011 to 2017-2018)

Year	Groundnut				Sesame			
	Acres Planted	Harvested Acres	Production per Acers	Total Production (Baskets)	Acres Planted	Harvested Acres	Production per Acers	Total Production (Baskets)
2009-2010	2924	2924	78.00	45086	4819	4819	10.18	49047
2010-2011	3012	3012	49.35	148634	4708	4708	10.26	48307
2011-2012	2688	2688	51.46	138321	4326	4326	10.28	44487
2012-2013	2828	2828	50.05	142046	4194	4194	10.31	43257
2013-2014	2857	2857	51.70	147707	4393	4393	10.98	48221
2014-2015	2529	2529	51.09	129228	4456	4456	10.03	49133
2015-2016	1820	1820	50.64	92173	4355	4355	13.13	48482
2016-2017	1820	1820	50.64	92173	3922	3922	11.06	43376
2017-2018	2010	2010	50.76	102022	3932	3932	11.03	43351

Source: Ministry of Agriculture, Livestock and Irrigation

Taikkyi Township has 3 Bazaar which are Taikkyi Myoma Bazaar, Oaken Bazaar and Aphauk bazaar. Taikkyi Myoma Bazaar has total number of 967 shops, Oaken Bazaar has 691 shops and Aphauk Bazaar has 653 shops**,** the total number shops in Taikkyi Township is 2311. Rural development is directly related to GDP of this region, Taikkyi Township's annual GDP are shown in Table (4.7). 35680

unemployment of 210789 labor force have unemployment rate is 16.93% in 2017-2018. According to table (4.7), Taikkyi Township's annual GDP increased within 2009-2010 to 2017-2018.

Table (4.7) Annual GDP for Taikkyi Township (2010-2011 to 2017-2018)

Year	GDP (Million Ks)
2009-2010	115683.9
2010-2011	125256.4
2011-2012	164471.5
2012-2013	167215.3
2013-2014	171079.9
2014-2015	173239.3
2015-2016	185936.6
2016-2017	188531.3
2017-2018	199577.4

Source: Taikkyi Township's Project Office

4.3.2 Transportation Sector

As the smooth transportation is very important for regional development, the government spent a considerably large amount of expenditure for construction of roads and bridges all over the country. These roads and bridges not only linked the districts, cities and towns but also linked with the villages. Infrastructure growth and services can play a critical role in economic growth and rural development. As far as infrastructure has developed in a region, this can impact regional economic activities. The development of transportation, an economic infrastructure, in other words, connectivity infrastructure would result in increase in investment. From such new investments, new economic opportunities, job opportunities and income generation can be created.

The construction of infrastructure facilities will open up more job opportunities for people. From this, income will rise, and it can reduce poverty to some extent. Development of irrigation would result an increase in agricultural productivity which will impact upon the low income classes. Development of transportation can ensure health facility for rural people; consequently, mortality rate

will decrease. If there is easy access due to enhance means of transportation, school enrollment rate will increase as well and rural goods can reach to the market at the right time with the support of good transportation. Since economic, income, education and health are indicators of rural development, so there is a relationship between infrastructure development and rural development.

(a) Roads and Ways

Improvement of transportation in a region can improve and support the living standards of the residents in the region. The main transportation of Taikkyi is road. Together with the development of transportation, bus transportation systems have increased, it became the base for government offices and economic and social activities have been growing. There are two main roads which are Taikkyi-Outo-Chaung 3Kwa-Aphauk Roads and Taikkyi-Faunggyi-Bago Roads in Taikkyi Township. Taikkyi-Outo-Chaung3Kwa-Aphauk Roads passes through Outo, Ywartar, Inlan, Chaung 3kwa and Aphauk town along this road and this length is 15 miles and 5 furlongs that connects to Zalon town from Ayeyarwaddy Region. Taikkyi-Faunggyi-Bago Roads passes through Hninsi Myaing, Malaysia Wine, Myittar Aye, Onealpin, Lagekyi, Poattinnyo and Taunf Htat Ywar along this road and this lenth is 12 miles and 3 furlongs that also connects with Bago town from Bago Region.

Table (4.8) Neighbour Township Roads from Taikkyi Township

No.	Name	Within Township		Miles
		From	To	
1	Yangon-Pyay-Mandalay Road	42/5	70/6	28miles1furlong
2	Taikkyil-Outo-Chaung3kwa-Aphauk Road	0/0	15/5	15miles5 furlongs
3	Taikkyi-Faunggyi-Bago Road	1/0	13/2	13moles2furlongs

Source: Taikkyi Township General Administration Office

Development of transportation can create jobs and other positive effects for residential people. Table (4.8) shows roads connected to three neighborhood townships, Yangon-Pyay Road, Taikkyi-Outo-Chaung3Kwa-Aphauk Road and Taikkyi- Faunggyi- Bago Road. MAX constriction was constructed 4 lanes ways from

Yangon to Magway by build operate transfer (BOT) system since 2017, length of Yangon to Taikkyi is 50 miles that was finished by concrete structure.

Table (4.9) Car Terminals from Taikkyi Township

No	Gate Name	Way of Trip	Type of Car	No. of Car
1	YBS(90)	Oaken-Taikkyi-Thirimingalar Bazaar	City Bus	51
2	YBS(90)	Aphauk-Taikkyi-Insein BOC	City Bus	52
3	YBS(91)	Taikkyi-Kayaepin Lankwal	City Bus	8
	Total			111

Source: Taikkyi Township General Administration Office\

Table (4.9) described the car terminals from Taikkyi Township because the main transportation of this region is the road. Taikkyi Township also has streets, water ways and rail ways but no air ways. The rural roads in Taikkyi, are types of Macadam, Earthen, and Concrete road. Yangon Bus Service (YBS) 90 and YBS 91 are commuting passengers from Yangon to Taikkyi and vice versa. Taikkyi is 50 miles away from Yangon, which is nearly 3 hours drive from city center and city bus, minibus and light trucks are the common vehicles for transportation. \

Table (4.10) Water Way of Taikkyi Township

No.	Name	Distance		Miles	No. of Ports
		From	To		
1	Taikkyi	APhyauk	Zalon	20	1
2	Taikkyi	Tayatchaung	Kalotthawt	15	1
3	Taikkyi	APhyauk	Danuphyu	20	1
	Total			55	3

Source: Taikkyi Township's General Administration Office

In table (4.10), it shows the transportation bywater way, three water ways are located in Taikkyi Township that are transport from Zalon and Danuphyu ports in Ayeyarwady Region to Aphauk, Tayachaung port in Taikkyi Township. In Taikkyi Township, it has only one station which is Taikkyi-Oaken rail way and the distance is 18 miles.

In Taikkyi Township, there are roads with length of within Taikkyi Municipal area. The committee had undertaken projects to smooth out the transportation and to raise the improvement of rural areas. The construction of roads in rural area within the year 2009-2010 to 2017-2018 is presented in table (4.11). In Taikkyi, there are 501 total roads within the township and some are earth roads, asphalt Roads or macadam roads or concrete roads. Most of the types of roads are macadam roads (336Roads). Roads were upgraded from asphalt road to concrete road, thus transportation of this township well improved.

Table (4.11) Construction of Roads in Taikkyi Township (2011-2012 to 2017-2018)

Fiscal Year	New Construction Road				Upgraded Road			
	Asphalt Road	Macadam Road	Concrete Road	Total	Asphalt Road	Macadam Road	Concrete Road	Total
2009-2010	-	-	-	-	2	-	-	7
2010-2011	-	-	-	-	1	-	-	4
2011-2012	-	-	-	-	-	-	1	1/2
2012-2013	-	-	-	-	3	3	-	6/5
2013-2014	1	-	-	1	-	-	-	-
2014-2015	1	-	-	4/3	-	2	-	4
2015-2016	1	-	-	1/6	-	2	-	4
2016-2017	-	5	1	3/5	1	1	-	20/4
2017-2018	1	2	2	6/5	1	3		6

Source: The report of Taikkyi Township Development Committee

(b) Bridges

There are total 68 bridges in Taikkyi Township and they are 56 Concrete bridges and 12 wooden bridges. This bridges can be divided into three types according to Department of rural Development in Taikkyi Township such as under 50 foots, under 180 foots and over 180 foots. There are 66 bridges in number under 50 feet, 10 bridges under 180 feet and 4 bridges over 180 feet in Taikkyi Township. 4 bridges over 180' and total number of 58 bridges were built within study period. The construction of bridges in rural areas within the year 2009-2010 to 2017-2018 is presented in table (4.12).

Table (4.12) Construction of Bridges in Taikkyi Township (2009-2018)

Budget Year	Under 50`	Length (foot)	Under 180`	Length (foot)	Over 180`	Length (foot)
2009-2010	20	429	4	255	-	-
2010-2011	-	-	-	-	-	-
2011-2012	7	109			1	260
2012-2013	12	284	-	-	-	-
2013-2014	-	-	-	-	-	-
2014-2015	-	-	-	-	-	-
2015-2016	2	30	-	-	2	1020
2016-2017	5	110	1	120	1	240
2017-2018	3	80	-	-	-	-
Total	49	1042	5	375	4	1520

Source: The Report of Taikkyi Township Development Committee

4.4 Energy and Electrical Power

Electricity is important for improve the living condition because it can achieve social and economic development in a region as a necessary infrastructure, and it can enhance the production and income within region. There is a state owned petroleum well and Aphauk natural gas land, petroleum well is namely Aphauk Petroleum well and it can produced 7955 barrels per year. Taikkyi Township has 3 natural gas pipelines that are Aphauk-Outo-Ngar phyu lay natural gas pipeline which 12 miles in length from Aphauk Natural gas land to Outo village, Shwe Pyi Tar- Inn Ywar natural

gas pipeline which 12 miles in length from Yoekalay to Innlan and Aphauk-Outo natural gas pipeline which is long 14.5 miles in length from Innlan to Tanutchaung. Aphauk natural gas land can produced natural gas 3089.508 cubic feet.

There are 3 electric power substations (33/11 KV 10 MVA) and these were owned by state and distributed the total amount of 8500 KW in Taikkyi. In addition, there were also 3 types of power transformer namely 33/11 KV transformer, 33/0.4 KV transformer and 11/0.4 KV transformer and the total number of distribution transformers is 185 that distributed the total amount of 18500 KW and has 6 electrical feeder. There are 6 feeders in Taikkyi and 2 feeders in Oakken. In the electrical manager office of Taikkyi, there are60 to 65 number of staff.

Table (4.13) shows the electrifying villages undertaking of the Taikkyi Township's Electrical Manager Office within the study period. In this period, only 29 villages were electrifying but some villages were also electrifying by self-help generators. In Taikkyi Township, 231 villages out of 476 villages have accessed to electricity in Taikkyi Township.

Table (4.13) No. of Electrifying Villages in Taikkyi Township (2009-2018)

Year	No. of Electrifying Villages
2009	4
2010	4
2011	3
2012	3
2013	3
2014	2
2015	2
2016	2
2017	3
2018	3
Total	29

Source: Taikkyi Township's Electrical Manager Office

4.5 Health Sector

Health is an important indicator when the measure development of a region or city. Thus, the number of hospitals, clinics and doctors, maternal rate, infant mortality rate are focused tostudy Taikkyi health sector. Under Taikkyi Township, there was one Township 50 Bedded Hospital which is Taikkyi Township Hospital, and it also has four 16 Bedded Station Hospitals, they are Tawlatti Hospital, Eigalong Hospital, Aphayk Hospital and Oakken Hospital. In Taikkyi Township, there are 34 private clinics namely General clinic and X-ray clinic, Dental clinic and eye clinic and Maternity clinic, and public 8 RHC which is attached with respective Station Hospitals and altogether 36 Sub-RHC in the respective villages. There are 2 INGO for health services in Taikkyi Township, PSI and JICA, They were responsible for treatment of TB and Malaria.

There are 20 kinds of health delivering projects under Taikkyi Township Health Services, namely Primary Health Care and Referral project, Family Health care projects, Nutrition project, Immunization project, mental health projects, Cardio vascular disease prevention project, Malaria prevention project. National TB project, HIV/AIDS project, child disease prevention project, trachoma prevention project, environmental sanitation project, school health project, prevention of communicable disease from animals project, birth and death project, and reproductive health projects and others.

The most prevalent diseases in Taikkyi Townships are Diarrhea, ARI, Dysentery and TB. The scope of reproductive health care is so broad and the activities under the reproductive health projects are:

(i) Giving monthly reproductive health education sessions to different age levels by basic health staff of health institution under townships

(ii) Teaching with practical demonstration on reproductive health care for respective age groups

(iii) Giving counseling services

(iv) Giving health education session on prevention of HIV/AIDS11

(v) Giving health education on birth spacing to married women

Table (4.14) Health Indicators of Taikkyi Township (2011-2018)

Name	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
CBR	16	16.3	16.5	16.7	16.8	17.0	17.0	18.4	18.9
CDR	5.4	5.1	4.9	5	5.8	5.9	5.1	5.5	5.2
IMR	8.8	8.7	7.2	8.7	7.9	9.1	6.5	6.5	6.4
U5MR	11.5	11.8	9.7	10.7	8.8	10.7	7.9	11.0	8.7
MMR	1	1.09	0.6	1	2	1.6	1.1	1.1	0.89
Abortion	3.5	3.4	3.4	3.1	3.1	2.9	2.8	2.5	2.2

Source: Taikkyi Township Hospital

In table (4.14), the annual health indicators for Taikkyi Township are descripted such as crude birth rare (CBR), crude death rate (CDR), infant mortality rate (IMR), under 5 mortality rate (U5MR), mother mortality rate (MMR) and abortion rate that health indicators are better in 2018 than 2009. These indicators are decrease because RHC and volunteer health organization were trained and treated twice per year in rural areas. According to this table, health indicators in Taikkyi Township are well improve.

Table (4.15) is represent the hospital services and administrative indicators of health sector in Taikkyi Township. According to the table, the number of deliveries are obviously increased from 796 (2009) to 3096 (2018) and the rate of bed occupancy based on sanction bed has also increased from 75 (2009) to 118 (2018). The average duration stay days are almost constant. Health conditions of rural people are also improved because people can achieve for emergency case about with health from newly open clinics and rural health centers in rural areas than initial state. In health sector of Taikkyi Township, it was separated into health and treatment since 2016. Therefore, rural people in this township can get the more services for health than initial state by improving the health buildings in rural areas. In Taikkyi Township, heath indicators are also improve as a result of health sector development in the township.

Table (4.15) Hospital Service and Administrative Indicator in Taikkyi (2011-2018)

No.	Name	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
1	Out Patient (number)	11365	12015	10064	15191	23047	25564	21781	19134	22554
2	In Patient (number)	7958	8327	7258	8738	11979	13555	14812	17543	1419
3	Deliveries (number)	796	807	1276	1513	1941	2298	2691	3084	3096
4	Deaths (number)	73	75	65	78	149	165	113	111	119
5	In-patient per day (number)	86.2	88.7	84.1	85.7	136.04	104.3	151.9	165.37	168
6	Avg. duration of stay Days	4	5	4	4	4	3.7	4.1	4	4
7	Bed Occupancy Rate Based on Sanction Bed (%)	75	77	73	75.43	119.2	91.4	133	121	118

Source: Taikkyi Township Hospital

4.6 Education Sector

The Expansion of education opportunities at all levels has contributed to aggregate economic growth by creating a more productive labor force with increased knowledge and skills. The education sector is an important factor for growth or development because the people can get skills and managements for work and society from education. When people are more educated, they can get medium or high wages based on to their qualification, and they can get good jobs if they have the skills or knowledge which starts from the basic education. In Taikkyi Township, there is good

result of increasing teacher-student ratio from 1:27 to 1:22. Therefore, the education of Taikkyi Township is improving and there is positive effect for this township. The enrollment rate for primary school was 99.87% by 7678 children under five out of 7688 and the literacy rate was 99.7% in 2018.

Table (4.16) No. of School in Taikkyi Township (2013-2018)

No	School	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	1017-2018
1	Basic Education High School	5	5	6	6	9	9	9	9	9
2	Sub-Basic Education High School	3	3	3	3	3	5	9	10	10
3	Basic Education Middle School	4	5	5	5	5	5	5	6	6
4	Sub-Basic Education Middle School	9	9	9	9	15	15	20	20	20
5	Basic Education Post-Primary School	25	26	26	26	44	46	54	58	58
6	Basic Education Primary School	198	200	215	220	223	223	224	224	224
	Total	244	249	264	269	299	303	316	327	327

Source: Department of Education in Taikkyi Township

Table (4.16) shows that the number of school in Taikkyi and the total number of primary-school is 282,and 26 middle schools, 19 high schools,7 KGs, 4 monastic schools which has 31 teachers and 466 students. The number of schools increased from 244 to 327 within 2009-2010 and 2017-2018.

Table (4.17) No. of Student and Teacher in Taikkyi Township (2013-2018)

Year	Type	Male	Female	Total	Teacher-Student Ratio
2009-2010	Teacher	208	1250	1453	1:27
	Student	20208	19807	40015	
2010-2011	Teacher	220	1380	1600	1:26
	Student	21548	20637	42185	
2011-2012	Teacher	235	1475	1710	1:26
	Student	22654	21588	44242	
2012-2013	Teacher	238	1500	1738	1:27
	Students	23956	22882	46838	
2013-2014	Teacher	251	1511	1762	1:28
	Students	24747	23932	48679	
2014-2015	Teacher	544	1934	2478	1:19
	Students	8383	8405	46788	
2015-2016	Teacher	372	1886	2258	1:20
	Students	22638	21614	44297	
2016-2017	Teacher	351	1938	2334	1:22
	Students	26436	25215	51651	
2017-2018	Teacher	429	1900	2329	1:22
	Students	26599	25082	51681	

Source: Department of Education in Taikkyi Township

According to the table (4.17), the total number of students has increased from 40015in (2009) to 51681 in (2018) and the total number of teachers has also increased from 1453 in (2009) to 2329 in (2018). The teacher-student ratio is almost constant.

Table (4.18) Percentage of Matriculation Success (2014-2015 to 2017-2018)

Year	Parade	Answer	Success	%
2009-2010	1547	802	245	30.54
2010-2011	1816	856	207	24.18
2011-2012	2061	1208	387	32.04
2012-2013	1956	1281	405	31.62
1013-2014	2065	1347	456	33.85
2014-2015	2211	1366	506	37.04
2015-2016	2331	2276	647	28.43
2016-2017	4134	3861	1366	35.38
2017-2018	2787	2690	783	29.11

Source: Department of Education in Taikkyi Township

According to the table (4.18), the percentage of matriculation success rate is higher than 2014-2015. In Taikkyi Township**,** the primary enrollment rate, literacy rate and the number of teachers and students are quite good in basic education level but there is decrease in the number of student in high level of education. It can be concluded that the children's education is directly impact on their family income and the livelihood. Their children might have been qualified in primary and secondary level. Only 17 to 35 percent of high school students reached university in each year.

4.7 Results of the Key Informal Interview

Key informal interview had been conducted with 5 people of the respondents in Taikkyi Town, who are from government official staff, private official trader, and causal worker. They have long over 5 years in their jobs and they say that rural are more developed especially in transportation sector, electricity sector, health and education sector within township. They satisfy their living standards about with rural infrastructure development within township.

According to their opinions, there is a very difference between current and past (10) years, rural development and rural infrastructures were improved than past years such as health and education buildings, roads and bridges, market shops and more electrifying, money transfer services and banks that can achieve low cost of transportation and others. In health sector, health buildings, clinics, health staffs and health services were increased. Health conditions of rural people are also improved

because people can achieve for emergency case about with health from newly open clinics and rural health centers in rural areas than initial state. In health sector of Taikkyi Township, it was separated into health and treatment since 2016. Therefore, rural people in this township can get the more services for health than initial state by improving the health buildings in rural areas. In Taikkyi Township, heath indicators are also improve as a result of health sector development in the township.

In education sector, schools, teachers and education staffs are increase and school enrollments are also increase due to the number of schools are increasing. Before 2010, students who live in rural areas were tried to attend school in other town, villages or tracts. The respondents said that education is the main escape from the poor. As well as in transportation sector, number of roads and bridges were increased and roads were also upgraded from asphalt road to concrete roads which can effect on health, education, transportation, marketing and communication or information. Within 2009 and 2019, banks and money transfer systems were also improved, it also works well. About electricity sector, rural are more lighting and more build transformers or feeders than initial that can also impact on health services, living standards, working fields and others.

So, above these sector development, they can more consumption and production due to the rural infrastructures development. All of their opinions about with development within township are approve that there is rural infrastructure and rural development than past (10) years in Taikkyi Township. Especially, transportation development is more achieve benefits because that can reduced costs and times, and can quick deliver their outputs to markets and that can impact on all of these sectors. When there is a good transportation such roads, ways and bridges to travel within region or other, traveling time and costs can be reduced and people can gain benefits from this. If the good road is accessible, it is easy to travel to reach to the hospital or clinic for emergency purposes, there is a gain from good transportation. And, from more construction of roads and bridges, the people or unemployment can access to jobs. Thus, good transportation can create job opportunities for people. In construction sector, 30 percentage of the budget for construction is to hire the labors required for construction. Therefore, construction sector is a main source for rural development because this can create the job opportunities and brings other positive impacts.

There are 4 commercial banks in Taikkyi Township which are KBZ bank, AYA bank, CB bank and Myawaddy Bank and others can transfer by wave money, true money and Ooredoo money for transfer money to others. Electricity sector are also important for rural development because this can support to improve the living standards such as access to television, media, cooking, health care and others. In addition, Taikkyi Township has 2 purified drinking water factories and 2 textile machineries that can create job opportunities for unemployment people about 2000 labors and also there are 2 wooden machines in this township.

CHAPTER V
CONCLUSION

5.1 Findings

The infrastructure development and rural development in Taikkyi Township was described under each infrastructure sector. Taikkyi Township has 191174 acre of net cultivation lands and cultivate various types of crops. The main cultivated crop is grain and the second is groundnut, the perennial crops are also cultivated such as seep, rubber, coconut and mangoes. Many more health infrastructures are allowed to be constructed within next 2 years. The construction or maintenance and preparing budgets for each sector are also improving.

As a transportation of Taikkyi Township, most of the inhabitants use to commute with only light trucks and mini-bus before the year 2000, however, by now YBS and the new roads and bridge were constructed by government and earthen roads are built by community themselves from each village. So, transportation sector of this township has improved and the trade for goods and services has become excellent without delay in transporting to markets or consumers. The population of male in Taikkyi is lower than the population of female. The poor transportation can cause negative effects in the field of health, education, and communication and trade markets and so on. MAX constriction was constructed 4 lanes ways from Yangon to Magway by build operate transfer (BOT) system since 2017, length of Yangon to Taikkyi is 50 miles that was finished by concrete structure.

During the construction of bridges and roads, the nature of projects require a large number of unskilled labor and significant amount of skilled labor according to 30 % of the budgets for construction which amount is directly represented by Military of Construction of Myanmar. Therefore, new job opportunities can be created both for skilled and unskilled labor during the construction process. The construction of bridges and roads between the villages can achieve the benefits such as lower travel time and cost, better communication and information, etc. Access to roads reduces prices under conditions of competitive transport services provision, increases mobility

and reduces labor market imperfections, enables them to find well paid jobs, allows production of high value cash crops and supplies of cheaper agricultural inputs ,and then better transportation can also be supportive to emergency cases related to health care. Transportation infrastructures have a stronger impact on rural area. Agriculture sector are also increase in Taikkyi Township as water supporting from Tabuhla Dam in the summer, especially grain and corn cultivation were improved within study period. This dam is the main source of irrigation water for agriculture in Taikkyi Township.

In addition, the female population is higher than the male population in Taikkyi Township. 327 basic education schools including primary, middle and high schools were constructed in this township. The total number of students in primary is more than the total number of students in high school. The total number of schools has also increased than the initial number. The total number of teacher and students have also increased and that can be seen as growth or development of this region. In health sector, the number of clinics, RHC or Sub-RHC, doctors, nurses and health services have also increased and average death rate has also fallen. 231 villages 476 villages have accessed to electricity and some villages have accessed to electricity by self-help generators.

Electricity supports to improve the living standards and access to information from television or social network about the information of education, health, economic and society. Electricity is main requirement for rural development. Most of the electricity pillars were constructed in some villages which are needed only to connect with feeders. Taikkyi Township's project office has future plans for developments with Department of rural Development in Taikkyi which is undertaken for construction of new infrastructures and maintenance or renovation of old infrastructure. Taikkyi Township has 2 purified drinking water factories and 2 textile machineries that can create job opportunities for unemployment people about 2000 labors and also there are 2 wooden machines in this township.

5.2 Suggestions

This study found that a large number of rural bridges and roads have been constructed in Taikkyi Township over a period of 10 years. With an improvement of rural bridges and roads construction within this township, the interaction between rural infrastructures is observed. The effects arises when the government investments

in rural infrastructure such as education and health of rural people that can promote greater employment and income earning opportunities for the vulnerable community who live in rural areas and cheap food. The effects of government expenditures on rural areas are also important because this can have direct impacts on health, education, physical infrastructure and living standard of rural people.

It is observed that due to the improvement of roads, there are a number of benefits such as travel times, cost and distance. Roads reduced travel time and provided better access to basic education and health services. Electricity promoted living standard and education, health services and technological communication and information. Government expenditure effects on the agriculture productivity and it also connect with wages of farm labor, non-agricultural employment, Landless and prices of the agricultural products. Investment in infrastructures has provided access to growth for rural areas. Besides contributing to growth, this investments have directly helped reduce poverty by increasing access to services and economic opportunities.

Therefore, more infrastructure investments are needed in rural areas and the regions underdevelopment. Investment in transportation sector has provided access to markets, facilitates domestic market integration, lowers cost of production and transportation, it also helps to access better services and opportunities. Most of the people are living in rural and to promote the well-being of rural population is essential. Therefore, more supports for basic needs should be provided in order to reduce the development gap between rural and urban area in this township. In the Taikkyi Township, hospital beds are not sufficient with the patient population and some villages are not electrifying, government should invest in such places which have poorer infrastructure.

Therefore, according to above cases, infrastructure development is a source of rural development. People need to meet basic infrastructure to produce, to distribute and to consume to gain their wants. To nation development, rural development is a fundamental need. But some rural infrastructures are needed to be well maintain. The government should be more build rural infrastructure assets in rural areas of this township, especially need to build cannels of dam to achieve water within the whole township area and invite BOT systems and PPP firms for development.

REFERENCES

Ayesha.J. (2013). Infrastructure: Meaning and Importance; Economic Growth.

Bryden, J. (2011). Rural Development Indicators and Diversity in the European Union.

Chappelow, J. (2019, June 25). *Infrastructure.* Retrieved from Investopedia.

Cho Mar Mar Kyaw. (2012). *A Study on Urbanization and Infrastructure Development of Naypyitaw.*

Development, D. o. (2018). *Rural Development in Taikkyi.* Taikkyi.

Edwards, C. (2015). Adam Smith on Infrastructure . *CATO Institute*, The Wealth of Nations on The Infrastructure.

Forum, W. E. (2014). *Global Enabling Trade.*

Gu, Q. (2017). Integrating soft and hard infrastructures for inclusive. *Journal of Infrastructure, Policy and Development (JIPD)*, 1-3.

Incham manggat, Rajwani Zain and Zakiyah Jamaluddin. (2017). The Impact of Infrastructure Development on Rural Communities. *International Journal of Academic Research In Business and Social Science*.

Luta, H. (n.d.). *Civil Society Comments on Infrastructure Strategic Sector.*

Merriam-Webster. (n.d.). Defination of Infrastructure.

Ohn Nyunt. (2006). *A Study on The Development of Maubin Township, Ayeyarwady Division.* Yangon Institute of Economics.

Qingyang.Gu. (2017). Integrating soft and hard infrastructures for inclusive. *Journal of Infrastructure, Policy and Development (JIPD)*, 1-3.

Reddy, N. (2018). Meaning of Infrastructure.

Samil, A. (2009). *Infrastructuring " The Key to Achieving Econimic Growth, Productivity, and Quality of Life.*

Shah. (1992). *Public Infrastructure and Industrial Productivity, Review of Economics and Statistics* (Vol. 74).

Sheffrin (2003). *Economics Principle in action.*

Sie Sie Htun. (2018). *Asean Busibness Guide . KPMG*.

Smith, A. (1970). *Wealth of Nations.* London: Pelican Books; p.153

Smith, Lawrence D. (n.d.). *Decentrakization abd Rural Development ; The role of the public and private sector in the provision of services.*

Spacey, J. (2017). *Hard Infrastructure vs Soft Infrastructure*. Retrieved from Simplicable.

Stephan. (2001). *Regional Infrastructure Policy and Its Impact on Productivity: A Comparison of Germany and France.* Berlin: Discussion Paper.

Sugolov. (2003). *Infrastructure Policies and Economic Development in East European Transition Countries.* Public Sector Management and Regulation Working Papers.

Yoon Nadi Hlaing. (2017). *A study of Rural Transportation and Rural Development in Ingapu Township.*

Township, D. o. (2018). *Development of Taikkyi Township*

www.drd.gov.mm

www.ilo.org

www.moali.org

www.wikipedia.org

www.ycdc.gov.mm

Taikkyi Township Hospital

Taikkyi Township General Administration Office

Taikkyi Township Development Committee

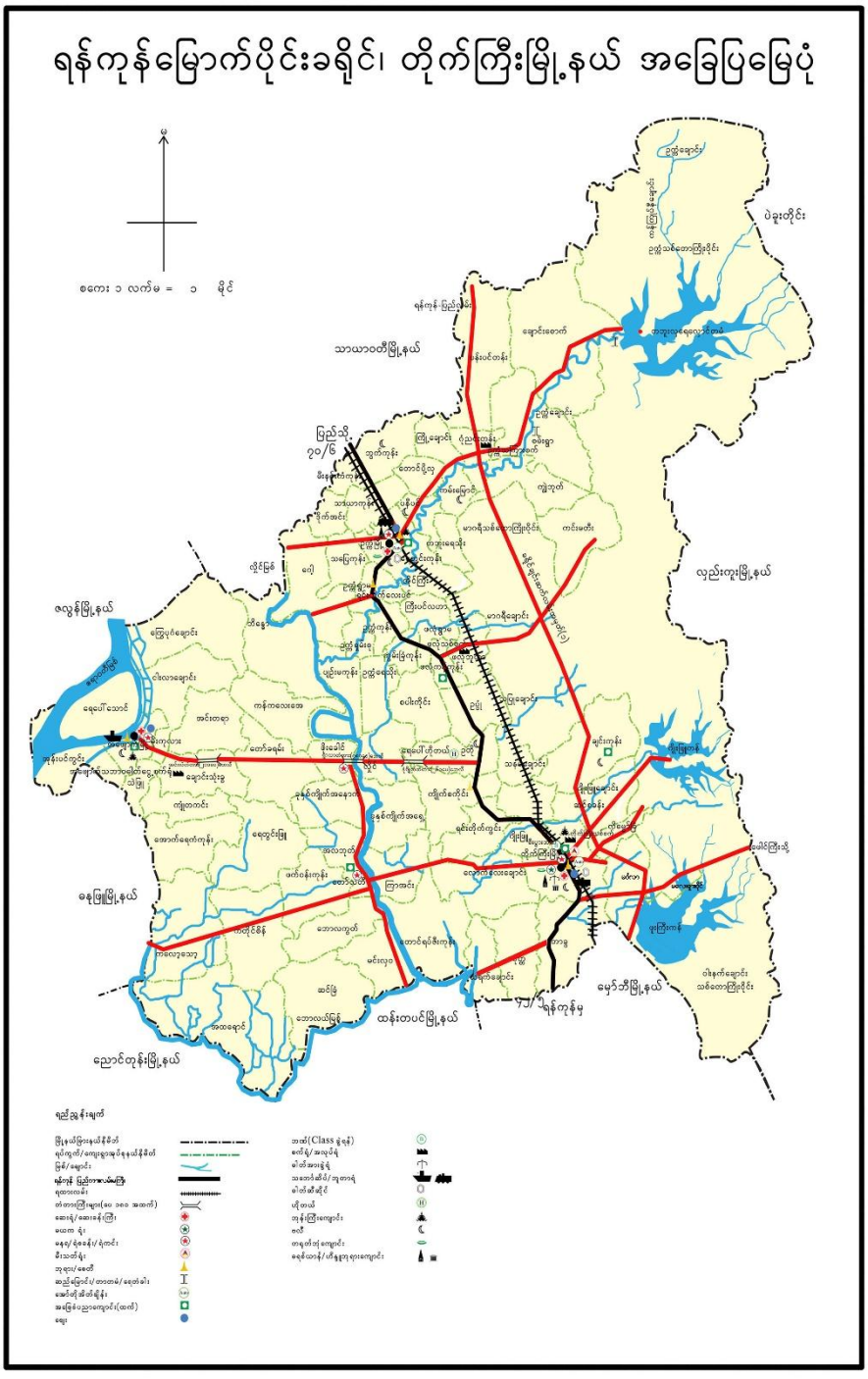
Department of Education in Taikkyi Township

Taikkyi Township's Project Office

တိုက်ကြီးမြို့နယ် ဒေသဆိုင်ရာအချက်အလက်များ ၂၀၁၈ ခုနှစ်

Appeindix I

Yangon North District, Taikkyi Township Map



Appendix II

Taikkyi Township Map