



GRADE 11

ECONOMICS

UNIT MODULE 2

GROWING THE ECONOMY

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| <p>TOPIC 1: FACTORS OF PRODUCTION</p> <p>TOPIC 2: CHAIN OF PRODUCTION</p> <p>TOPIC 3: SPECIALISATION OF PRODUCTIVE RESOURCES</p> |
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DIANA TEIT AKIS

PRINCIPAL



Flexible Open and Distance Education
Papua New Guinea

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SECRETARY'S MESSAGE

Achieving a better future by individual students and their families, communities or the nation as a whole, depends on the kind of curriculum and the way it is delivered.

This course is a part of the new Flexible, Open and Distance Education curriculum. The learning outcomes are student-centred and allows for them to be demonstrated and assessed.

It maintains the rationale, goals, aims and principles of the national curriculum and identifies the knowledge, skills, attitudes and values that students should achieve.

This is a provision by Flexible, Open and Distance Education as an alternative pathway of formal education.

The course promotes Papua New Guinea values and beliefs which are found in our Constitution, Government Policies and Reports. It is developed in line with the National Education Plan (2005 -2014) and addresses an increase in the number of school leavers affected by the lack of access into secondary and higher educational institutions.

Flexible, Open and Distance Education curriculum is guided by the Department of Education's Mission which is fivefold:

- To facilitate and promote the integral development of every individual
- To develop and encourage an education system satisfies the requirements of Papua New Guinea and its people
- To establish, preserve and improve standards of education throughout Papua New Guinea
- To make the benefits of such education available as widely as possible to all of the people
- To make the education accessible to the poor and physically, mentally and socially handicapped as well as to those who are educationally disadvantaged.

The college is enhanced to provide alternative and comparable pathways for students and adults to complete their education through a one system, many pathways and same outcomes.

It is our vision that Papua New Guineans' harness all appropriate and affordable technologies to pursue this program.

I commend all those teachers, curriculum writers, university lecturers and many others who have contributed in developing this course.

DR.UKE KOMBRA,
Secretary for Education



11.2: GROWING THE ECONOMY

UNIT INTRODUCTION

Growing the economy, covers how best limited resources can be used to produce goods and services to satisfy Papua New Guineans' needs and wants. Moreover, it discusses economic growth, improve quality and increase quantity of the factors of production which leads to increased efficiency, innovation, investment and the creation of wealth. In this unit, you will use and apply various skills to examine the issues surrounding production and the growth of the economy.



Broad Learning Outcomes

At the end of this unit module, you will be able to:

- describe the meaning of measurement and trends of economic growth in Papua New Guinea
- evaluate the costs and benefits of pursuing economic growth in Papua New Guinea
- demonstrate an understanding and application of concepts, principles, models, skills and terminology used in the study of Economics.



Time Frame

This unit should be completed within 10 weeks.

If you set an average of 3 hours per day, you should be able to complete the unit comfortably by the end of the assigned week.

Try to do all the learning activities and compare your answers with the ones provided at the end of the unit. If you do not get a particular exercise right in the first attempt, you should not get discouraged but instead, go back and attempt it again. If you still do not get it right after several attempts then you should seek help from your friend or even your tutor. Do not pass any question without solving it first.



TOPIC 1: FACTORS OF PRODUCTION

Basically, the aim of this topic is to give a clear understanding of the factors of production and how best these factors can be used to produce goods and services that are vital to Papua New Guinea's economy. Improvements in the quality and quantity of production will lead to economic growth, increased efficiency, innovation, investment and the creation of wealth.



Specific Learning Outcomes

At the end of this topic, you will be able to;

- identify and define the four factors of production.
- explain the types of resources and their factor rewards.
- explain land resources in Papua New Guinea.
- explain capital and appropriate capital.

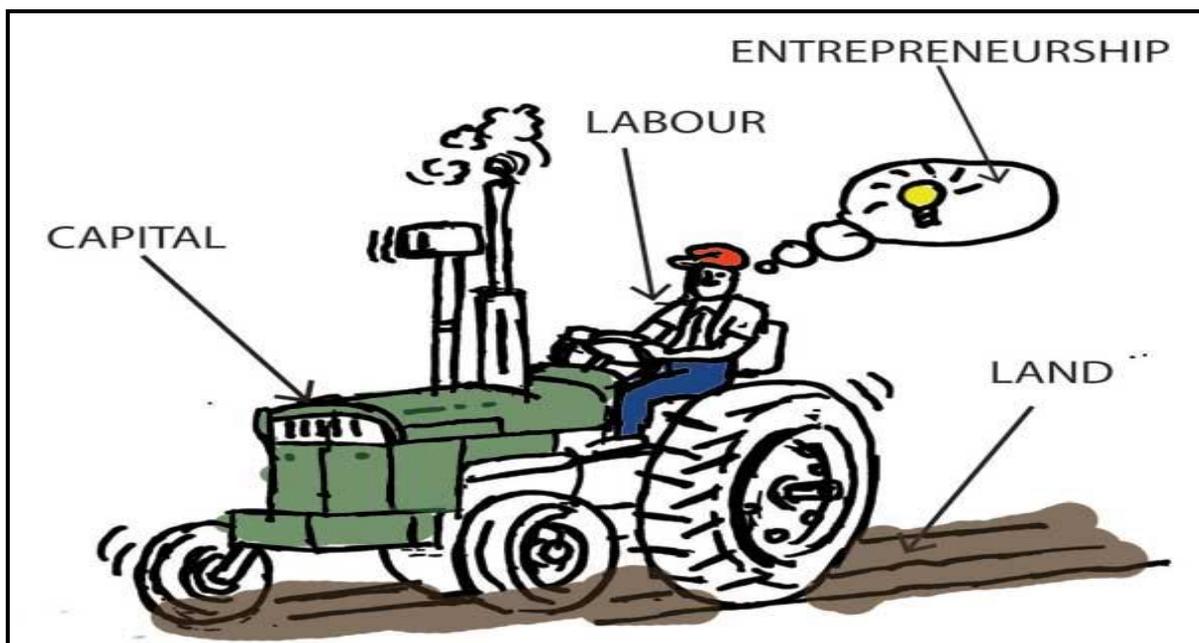
11.2.1.1: Economic Resources (Factors of Production)

Production of goods and services take place anyway in the world. In Papua New Guinea, our ancestors produced goods and services using the available resources to satisfy needs and wants. The surplus produced was exchanged for what they did not have.

A factor of production is an economic term to describe the inputs that are used in the production of goods or services in the attempt to make an economic profit. These goods and services are used to satisfy human needs and wants and to trade. Factors of production are also called Economic Resources. They are classified into four groups;

1. Land
2. Labour
3. Capital and
4. Entrepreneurship

FACTORS OF PRODUCTION



Source: www.romeconomics.com

Land

This refers to all the natural resources, gifts of nature needed for production. For example, air, water, oil, sea, fish and the natural forests.

Labour

This refers to any productive human effort contributed towards changing raw materials to finished products. For example, a hairdresser, a block layer and a driver.



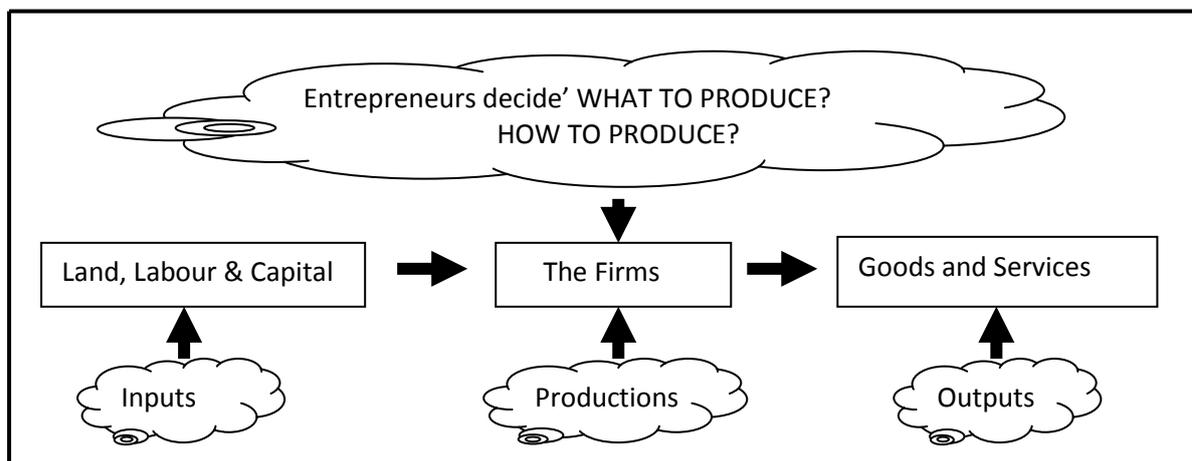
Capital

Human created wealth or man-made items which help in further production such as roads, factories, computers, machines and trucks.

Enterprise/Entrepreneurship

Taking the risk to make a profit is called entrepreneurship. People see an opportunity to make a profit and investing in it with the combination of other factors. For example, self-employed people, shareholders, shop owners, farmers and managers. They organise the raw materials, capital and labour in the production process. All factors are essential to produce a good because production is not a job of a single factor. Production refers to the making of these goods and services. Firms or businesses are producers. Firms use the land, labour and capital called inputs to make goods and services known as outputs.

THE PRODUCTION PROCESS



The aim of production is to satisfy the needs and wants of people, therefore, the process is not complete until the goods and services actually reach the people who need and want them.

Factor Payments

These are payments made to economic resources, or the factors of production (labour, capital, land, and entrepreneurship), in return for productive services. Factor payments are categorised according to the services of the productive resource being rewarded.

1. **Wages** are paid for the services of labour
2. **Interest** is the payment for the services of capital
3. **Rent** is the payment for service on land
4. **Profit** is the factor payment to entrepreneurship



11.2.1.2: Labour

What is labour?

Labour is the human effort, which can be physical or mental, put into the production of goods and services. It is the work done by human beings to produce something. Construction and plantation workers provide physical labour, whereas engineers, managers and accountants provide mental or conceptual labour. Both groups are equally important to the production process and the economic growth of a country.

The Labour Force in Papua New Guinea refers to the total number of people who are capable of working. Therefore, the actual workforce in Papua New Guinea and other developing nations is more difficult to count because many children are economically active from an early age. Workforce refers to those who are actively working or participating in the production of goods and services. They are actually employed and contributing towards the economy.

Generally, the labour force includes;

- the armed forces
- the unemployed and
- first-time job-seekers

In Papua New Guinea, people are engaged in different types of activities to earn money for their living. These activities are divided into two main sectors.

1. Formal Sector Labour Force

The part of the economy comprising of firms (businesses) which hire productive resources in order to produce goods and services. The formal sector provides a narrow employment base, which consists of workers engaged in the mining and manufacturing industries. It also includes the public sector employees (police, teachers, doctors) and service industries such as finance, construction (building roads and bridges), transportation and utilities.

Formal wage employment in Papua New Guinea is relatively insignificant when compared to other economic activities. Please read the report by the Asian Development Bank on employment in the formal sector of Papua New Guinea on the next page.



Formal Sector Job Growth, a Key Challenge for Papua New Guinea - ADB Report

PORT MORESBY, PAPUA NEW GUINEA (3 July 2014) – While its economy enjoys robust economic growth, Papua New Guinea (PNG) will face challenges in continuing to generate formal job opportunities for a rapidly growing work force, according to the Asian Development Bank's (ADB) new issue of the Pacific Economic Monitor, launched today.

“Papua New Guinea has made some significant progress in creating more formal job opportunities for its young, rapidly growing workforce, but more needs to be done,” said ADB Country Economist, Aaron Batten. “Recent estimates show that the number of formal sector jobs doubled over the last decade. However, the majority of PNG's population remains excluded from formal job markets.”

The Monitor says a defining feature of PNG's formal job growth between 2002 and 2013 has been the diversity of employment-generating sectors. Estimates show that agriculture accounted for the largest share of net job creation, followed by manufacturing, then building and construction.

The Pacific Economic Monitor says that underpinning this job growth is improved investor confidence created by fiscal prudence, macroeconomic stability and important policy reforms that reduced government involvement in the financial services and telecommunications sectors.

Papua New Guinea's GDP growth is forecast at 6.0% in 2014, picking up to a record 21.0% next year, as liquefied natural gas exports start their first full year of production.

The report recommends that policies aimed at reducing inequality and improving the inclusiveness of economic growth should be targeted at expanding access to social services and protection to informal sector workers.

Even with sustained growth in formal sector job creation, it will take decades to move a majority of the population out of the informal sector, the Monitor says. Raising the living standards of those in the informal sector will require assistance that can provide essential infrastructure and social services necessary to expand their access to markets and their ability to participate in PNG's growing economy.

The Pacific Economic Monitor is a bi-annual review of economic developments in ADB's 14 developing member countries in the Pacific region.



2. Informal Sector Labour Force

The informal sector refers to those workers who are self-employed, or who work for those who are self-employed. People who earn a living through self-employment in most cases are not on payrolls thus, are not taxed. Many informal workers do their businesses in unprotected and unsecured places. The active labour force in the informal sector is difficult to know. The majority of the population who are dependent upon self-employment and subsistence activities will continue to increase.

Labour is a marketable factor of production meaning, labour can be sold. Entrepreneurs pay *wages* for the use of labour in production activities. Wage rates are determined by the labour market based on demand and supply. There are many industries in PNG, ranging from fishing, building and construction, mining, agriculture, finance and transport have risen and fallen in their employment levels. This depends on how strong each industry is performing in the market.

Factors affecting the Supply of Labour

Labour supply in an economy is concerned with the number of hours that workers are willing to work at a given wage rate at a given time. This supply of labour available to an economy for use in production is determined by the following factors;

- The size of the population

This factor is obviously of prime importance. A country with a large population has a large pool of potential workers who can be employed into the labour force.

- Age composition

In this category people who are too young or too old are unable or unwilling to actively participate in the labour force. These people entirely depend on others for their basic needs. Such people are known as dependents. A country that has a greater number of old people may probably have a low supply of labour for production. This is because these people do not increase productivity but they place a heavy burden on the nation and thus the supply in the labour force falls.

- The school leaving age

This affects both the supply and the quality of labour. When more children stay at schools and tertiary institutions, there is a smaller number entering the workforce. The better education received by these students make them potentially more productive when they join the workforce.

- Number of working age people
- Number of hours or days legally allowed to work per week

The number of hours worked by the members of the labour force will have a significant attitude on the labour supply available to assist in production.

- Wage rate and other benefits.
- Migration increases the size of the population so it will inevitably increase the labour force.
- Number of women

The social attitude towards women going out to work has a great impact on the labour supply.



When the number of unemployed people is deducted from the number of people with jobs we can work out the proportion of the population that is engaged in economic production. The labour force comprises of the number of people employed and looking for employment in a country.

As recorded in *Australian Aid 2009*, Papua New Guinea has 85% of the workforce employed in semi-subsistence agriculture. A large proportion of the population lives in small, rural communities regulating their lives according to traditional village values.

Generally, Papua New Guinea, like all developing countries, has a big problem of unemployment.

Unemployment refers to those who are willing and able to use their human effort in return for wage or salary but, are not engaged in this activity. These are the people who want to work for pay in the production process but, are not actually working.

Wage is the total amount of money someone receives based on a predetermined wage rate (usually agreed between an employee and the employer) and number of hours worked.

Wage rate is the minimum amount of money an employee is entitled or obliged to receive in one hour.

The current minimum wage rate for PNG, as endorsed by the government through the Minimum Wages Board, is K3.20. This rate is gazetted (endorsed by government) to be changed in two years' time to K3.50. This is the legal (by law) minimum amount of money all employers in the country must pay per hour to their employees. Any employer who pays below the current wage rate of K3.20 per hour is deemed to break the law.

Salary is a fixed amount of money that an employee earns every fortnight. Wage rate and number of hours worked do not determine how much salary you earn. It is fixed and received by the employee every fortnight (two weeks).

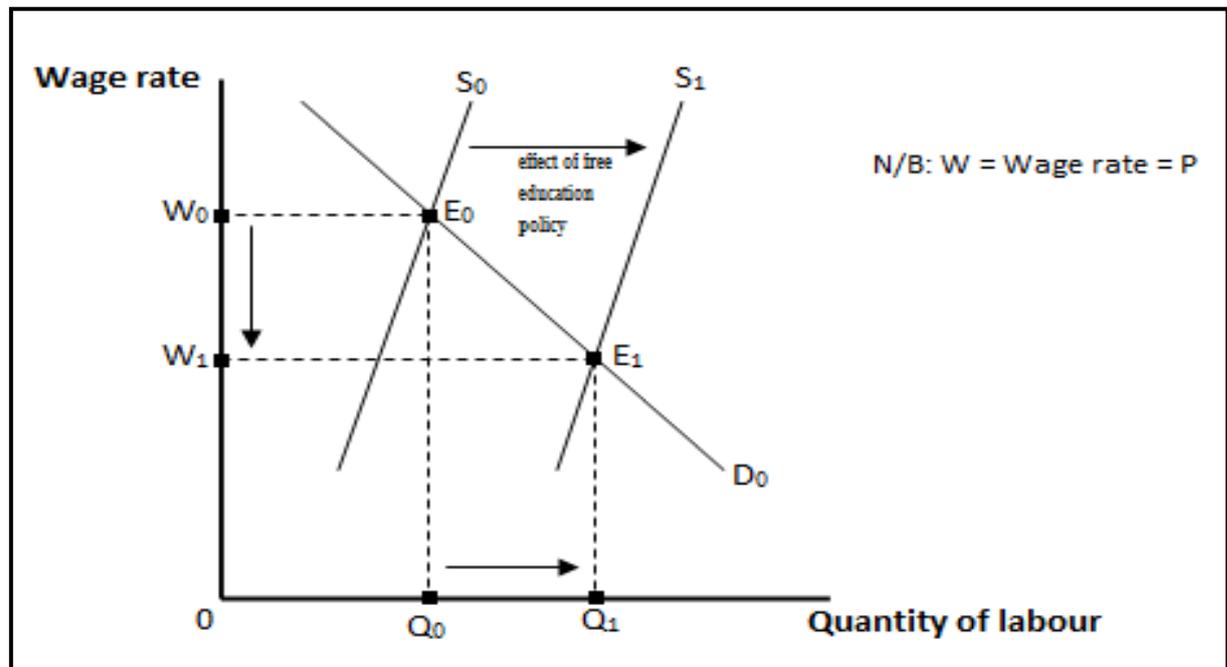
Big unemployment problem means there is large number of people unemployed in the country. Despite high unemployment level, the government is currently coming up with policies to further increase the size of employment level.

One such policy is the free education and free health services.



Let us use the supply and demand model to see what happens with the introduction of such policies and analyse the effect of free education policy on labour.

EFFECT OF FREE EDUCATION POLICY ON LABOUR



We assume that;

- Before the free education policy, the initial market demand and supply is S_0 and D_0 , which intersects at E_0 . The wage rate paid initially is W_0 .
- When the government implemented free education policy, there will be more people passing out from schools, further adding to unemployment level. This increase is shown as Q_1 and S_1 (intersecting at E_1).
- What then will happen to the wage rate? Graphically, it has indicated that there is a drop from the initial wage rate W_0 to new wage rate W_1 . Does this analysis relate to common sense? Of course it does. When you have too many products to sell in the market, the price will drop. Employers or companies will of course have the advantage of paying lower wages (in most cases not below the minimum wage rate) because there are too many of us (increases size of unemployment) looking for jobs.

The quality of skills that people in the labour force have is an important factor that contributes to the efficiency of production and economic growth. Education, training, health and experiences all help to raise the **productive** capacity of the labour force.



Characteristics of Labour

- It comprises of individuals
- It is a human factor
- It cannot be stored; if labourers are idle they are unproductive
- Mobility
- Labourers sell their labour

Productivity is a measure of the number of goods produced per person during a given period of time.

There are certain factors which contribute to the low levels of productivity. They are;

- poor diet, hygiene, health and sanitation
- absenteeism, underemployment and an ability of many people to stand the pressure of work
- absence or severe shortage of inputs such as capital and educational facilities
- attitudes of workers and management
- attitudes towards work, discipline and authority, flexibility of workers, alertness and job satisfaction may all need to be considered during efforts to increase productivity.

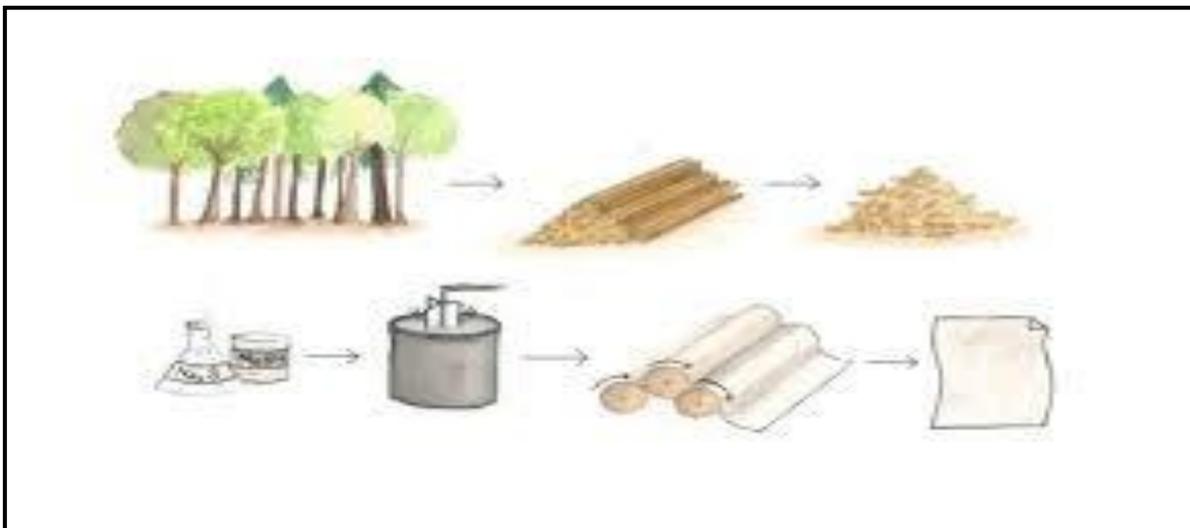


11.2.1.3: Land Resources in Papua New Guinea

This category of resources comprises all the natural resources that the natural environment provides. Land is a valuable resource used in production, which includes not only the site of production but natural resources above or beneath the surface of the earth. These resources include rainforest, mineral deposits, wild life, seas and oceans, river systems and soil and landform.

Land provides natural resources that cannot be consumed in their original form. These resources are altered or changed using other factors of production to get an output (finished good). For instance, trees are harvested and go through the process of manufacturing to make paper.

MAKING PAPER



Source: worldscrap.wordpress.com.

Natural Resources of Papua New Guinea

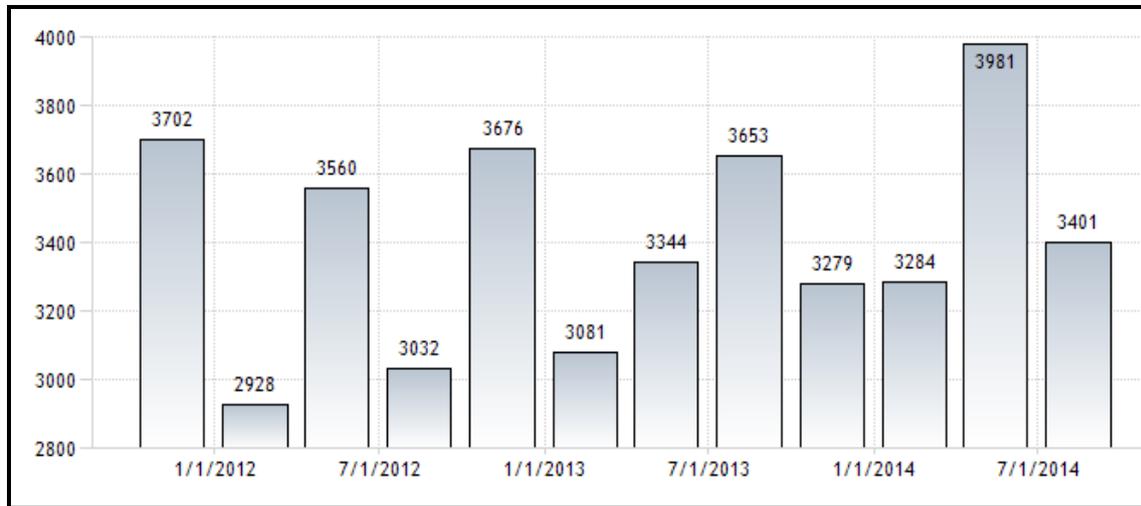
Papua New Guinea is one of a resource rich nation in the world. It has a resource dependent economy in which resource extraction contributes more to its export earnings and the government revenues.

Below is a list of natural resources in Papua New Guinea

- Mineral resources like gold, copper, zinc and nickel.
- The forest industry in PNG is also a major exporter of forest products.
- The fishing industry
- The gas and oil industry
- The Cash crop industry
- The fruits and vegetables market



PAPUA NEW GUINEA'S EXPORTS

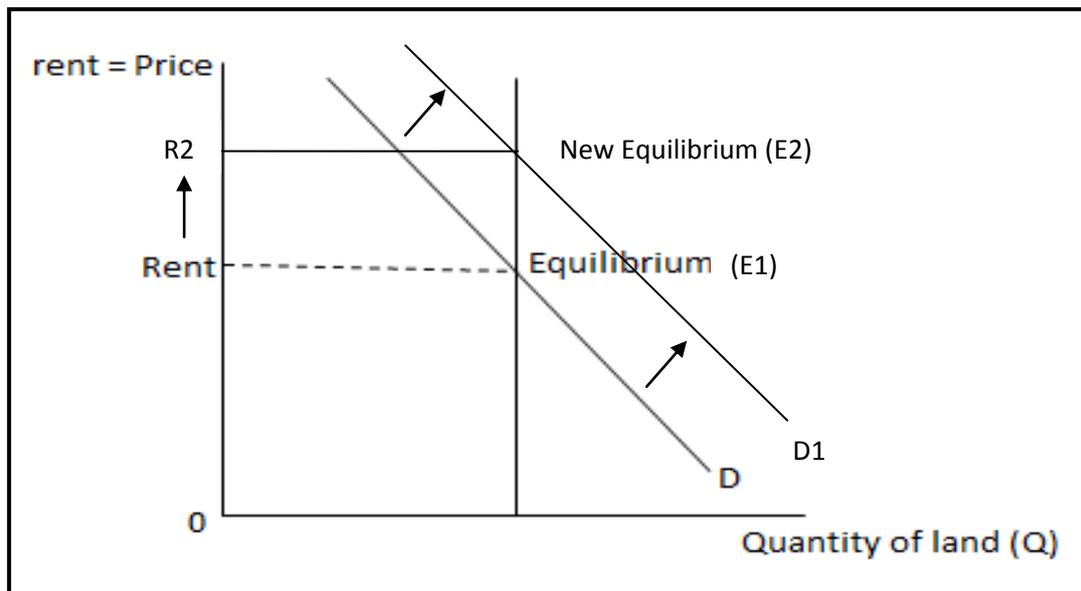


Source: www.tradingeconomics.com.

The significance (importance) here is the wise use of such resources for their sustainability. Resources are scarce compared to wants at any time; the quantity of land cannot be increased over time. It becomes relatively even scarcer than the other factors of production. This scarcity is reflected now a days, in the way prices for blocks of land especially in commercial areas have risen drastically over the years.

Land is a marketable resource which can be bought or sold. Entrepreneurs need the land resource for creation of goods and services. They also decide the quantities to be supplied according to prices available in a market. The landowners receive returns (prices) in the form of rent for allowing land to be used in the production process. The more productive the land, more rent that will be offered. So we simply say that rent is determined by the market forces of supply and demand.

THE DEMAND FOR LAND IN PAPUA NEW GUINEA



The graph above shows;

- A perfect competitive land market in which rent is determined by the intersection of supply and demand curves. Fixed supply of land means that the rent will change if the demand changes. The supply will remain the same.
- When the demand for land increases to D_1 , it forces the price (rent) for land to increase to R_2 .

Land as a factor of production is a gift from nature and has a fixed supply but its availability is limited. Land which is not productive is not a resource. Land has yields that depend on the efficiency of other factors. A higher output can be achieved if capital and labour are used more efficiently. People believe that supply of resource is essentially unlimited because they see and enjoy the abundant wealth the earth provides.

Some of these resources can be renewed but in the long run the supply of all land resources is limited. With this fact, natural resources used in production should be utilised economically because non-renewable resources like gold, oil and others will become scarce due to overuse. Additional expenses will be required for replacement (e.g. replacing and recycling of renewable resources).

Therefore, the following should be considered when using natural resources.

- Avoid over use: over- hunting, over-fishing, clear-felling type of logging and open-pit mining.
- Pollution: polluting river system destroys all natural resources and cause extinction to wildlife



Land Use in Papua New Guinea

This entry contains the percentage shares of total land area for three different types of land uses in Papua New Guinea in 2011.

1. Agricultural Land (arable land) is about 0.65%

Land cultivated for crops like sweet potatoes, ramu sugar, and rice that are replanted after each harvest.

2. Permanent Crops make up 1.51%

Land cultivated for crops like citrus, coffee, rubber, oil palm, tea and cocoa which are not replanted after each harvest. However, they occupy the land for a long period of time. This may include land under flowering shrubs, fruit trees, nut trees, and vines, but excludes land under trees grown for wood or timber.

3. Others make up about 97.84% (2011)

Any land not arable or under permanent crops; includes permanent meadows and pastures, forests and woodlands, built-on areas, roads and barren land.

(www.indexmundi.com & www.tradingeconomics.com)

Major environmental issues about land include;

- inappropriate land use practices due to intensified farming systems that accelerate land degradation (eg. soil erosion, siltation, and loss of soil fertility)'.
- unsustainable logging practices that result in adverse environmental impacts (eg. soil erosion, hydrology and water quality impacts, and loss of habitat and biodiversity.
- destructive fishing practices and coastal pollution due to run-off from land-based activities and oil spills that cause impacts on coastal and marine resources.
- environmental impacts of large-scale mining operations (eg. discharge of heavy metals, cyanide, and acids into rivers) that cause adverse impacts on forests and water quality.
- increase of extreme weather events due to climate change (eg. El Nino, extreme droughts / floods) that increase vulnerability to impacts of natural disasters.

To conclude, PNG has been described as "a mountain of gold floating on a sea of oil". It reflects the importance that PNG's extensive natural resources play in the country's development. It is also appropriate, from the agricultural point of view, to describe PNG as a Garden of Eden. Fertile soil and a conducive (favourable) climate allows most agricultural products to be harvested.

PNG is rich in natural resources. There are extensive reserves of natural gas and oil. The first oil production began at the Kutubu field in mid-1992. Estimates of recoverable reserves have been put at around 270 million barrels. The main mineral deposits are copper and gold but there are also recoverable deposits of other minerals. The Ok Tedi mine is now producing more copper than that produced by the huge Bougainville mine before its closure in the late 80s.



11.2.1.4: Land Ownership

Papua New Guinea is located on the eastern half of the island of New Guinea and is 160 kilometres north of Australia. PNG comprises of both the mainland and some 600 offshore islands. It has a total land area of 470,000 square kilometres.

PNG's population is about 7.321 million people. Around 15 percent of the population live in the ten major urban areas. The major city and capital of the country is Port Moresby with a population of just over 220,000. Other important towns and cities include Lae, (population around 90,000), Madang (30,000), Mt Hagen (45,000), Wewak (23,000) and Goroka (25,000)

MAP OF PAPUA NEW GUINEA



Source: hausples.com.pg

Land is useful to the majority of our people because they depend entirely on it for their livelihood. Unlike many other countries, in Papua New Guinea 97% of land is communally owned or customary.

Land Ownership in Papua New Guinea

1. Customary or Tribal Land (97%)

It is land held under customary title by the traditional landowners. These lands are not registered and members of a tribe or clan own the land. It is owned by Indigenous communities and administered in accordance with their customs. Common ownership is one form of customary land ownership.



2. Alienated Land (3%)

Alienated lands are controlled by the Government and are in two groups.

(a) State Land

The government leases these lands for development purposes to developers. The developers can use leased land for commercial purposes, including the construction of buildings. Most state lands are found in the urban centres and small towns. The alienation of land from customary owners is a legacy of the early German and Australian colonial administration that negotiated and acquired land for towns, ports and other purposes.

(b) Private Freehold Lands

These lands are owned by individuals or companies. They are registered under the owner's name which means they hold the title.

Land Tenure in Papua New Guinea

Land resource management in Papua New Guinea (PNG) has been experiencing a lot of pressure over the years in response to economic and social development and change. Customary tenure is the dominant form of tenure yet it has received very little attention as a resource which underpins (strengthen) such development.

Papua New Guinea's customary land ownership is legally recognised by the Constitution. It is generally estimated that around 97% of the land in PNG is under customary ownership. Some people find this an impediment (barrier) to progress.



The table below shows a comparison of some characteristics of alienated and customary land tenure systems in PNG.

	Alienated Land Tenure (3%)	Customary Land Tenure (97%)
Origins	Based on traditional practice in Europe; unfamiliar and formal in the PNG context.	Local practice; appropriate for traditional needs; established and well understood by users.
Responsiveness to change	Extensive and on-going modifications to internal and external pressures; formalised through courts and legislation. Control of system and ownership of land are separate.	Responsive to internal pressure; less responsive to external impacts; flexible as verbal. Control by landowners.
Political Aspects	'Ownership' is limited to interests in land under the State. Activities are documented and recorded. Penalties for infringement. (breaking the laws) Conformity (fit into) at the level of society.	Outright ownership by the clan; individual members have rights to use and occupy land. Based on verbal agreement. Penalties for infringement. Conformity at the level of the clan.
Social Aspects	Planning and zoning system provides for areas of sporting, recreational/and entertainment uses.	The clan sets aside land for meetings, singsings, feasts, rituals and sports.
Economic Aspects	Economic specialisation generates surplus production, freeing much land and labour from direct production of basic needs.	Role of land is to ensure survival of the clan, traditionally through a high level of self-sufficiency.

Source: www.indiana.edu.pg



Land related problems are and have been for many years, and is a major concern in Papua New Guinea. Land issue is one problem that hinders economic growth here in Papua New Guinea.

Below is report from the Institute of National Affairs (INA) titled *Land Policy and Economic Development in Papua New Guinea (Knetsch and Trebilcock, 1981)*, which highlights some of the land related problems facing Papua New Guinea today.

Land policy is correctly perceived (seen) as a major issue in PNG. Land is central to the welfare of most people in the country; it is the source of much of the present wealth, and with little doubt offers for the foreseeable future the greatest potential for improving the economic well-being of most people. Further, and rightly, current policies are widely thought to be seriously deficient- procedures are unduly burdensome, for example, and do not adequately protect the interest of those they were designed to aid; worthwhile changes have been discouraged or prevented; and land matters continuous to be the source for civil conflict and disruption, taking excessive amounts of the time and energies of the government and private parties alike. (pp. 30)

Uncertainty over land ownership has frequently discouraged new investment in Papua New Guinea. Administrative procedures for registering land claims are very complex and time consuming. It is believed that many of the problems facing the systems of land registration and settling land disputes have occurred because these systems are excessively ambitious; Policies and procedures need to be organised so that they can be efficiently administered.



11.2.1.5: Land and Economic Development

Economic development needs economic growth. Economic development is the improvement in a country's standard of living (for example: the building of schools and hospitals close to all villages and towns) and economic growth (for example: growth in production activities) is the result of an increase in the production of goods and services.

Land plays a vital role in setting up factories and office buildings, establishing plantations, and developing infrastructure such as communication towers, air and sea ports, and roads.

With the current land tenure system, it is hard to acquire land. This has been seen as an obstacle to economic development in PNG, where land is not a traded commodity like in other development countries. There are cultural values attached to land in many traditional societies. Owners believe that customary lands are given to them by ancestors to be used wisely. If they sell their lands, it is seen as an act against their ancestors wish. Therefore, people have a responsibility to protect their lands, which are not just, property like in the developed countries.

Economic Development in Papua New Guinea

Papua New Guinea's economy is described as dualistic. That is, we have;

- i. a large scale export sector based on natural resources (minerals, petroleum, timber, plantation tree crops and fish).
- ii. on the other hand a subsistence or semi-subsistence rural economy supports over 80 % of the population. The trend is slowly changing as smallholders now increase their participation in commercial agriculture.

Papua New Guinea's Gross Domestic Product (GDP) is dominated by minerals, petroleum, logs, tree crops and fish. The manufacturing sector is small and supplies mostly the domestic market while it relies heavily on imports of manufactured goods.

Tourism is largely hindered by law and order problems including under developed, expensive and inconvenient transport services. This is, despite the fact that Papua New Guinea has extremely diverse natural and cultural attractions. From 2003 to 2005, GDP growth has been steady at 3% and was forecast to continue at this rate beyond 2006.

Factors that hinder Economic Growth

The Asian Development Bank (ADB) reported that; there are three broad development challenges that face Papua New Guinea.

1. To convert natural resources revenues into sustainable development outcomes.
2. To broaden the base of the economy and the basis for economic growth and job creation.
3. To tackle very poor health and education standards.

Quality of governance and public sector capacity limits are binding constraints and addressing them underpins efforts to meet each of these challenges. Strengthening public financial management is a key step to achieve the problems mentioned above.



According to the surveys conducted by the Government and the ADB,

- i. creation of jobs and income earning opportunities and
- ii. re-building service delivery into rural areas

are two critical issues which stand out clearly.

The World Bank also stated that, the deteriorating transport infrastructure and law and order problems, the workings of the provincial and district administrations and the inability of the Government to allocate finance to these services cause delays. Therefore, improvements in the Government's governance as well as public sector and the public finance management urgently needed to overcome these constraints. (www.abd.org/Documents)

The business houses in Papua New Guinea also acknowledge the deteriorating conditions of transport and communication infrastructure, law and order problems, corruption and administrative inefficiency will take years of sustained effort to overcome.

Papua New Guinea has a dual system of Land Tenure.

1. The adopted tenure system is based on the written legislation and the management and administration of the 3% alienated land on which most economic activities take place.
2. Customary land Tenure is dominant about 97% of Papua New Guinea's land comprising over 46 million hectares.

Customary tenure operates on unwritten laws, customs and practices which are accepted by people themselves. Although land ownership rights vary in different places, kinship groups recognise and strengthen customary land rights thus providing security.

Almost 85% of Papua New Guineans depend on customary land for food, water and shelter for survival. Any changes proposed to this system can cause serious problems indicating the people's strong ties to their land.



www.pngblogs.com.



www.aidwatch.org.au



The pictures below show different types of economic developments.



RH Ramu Logging in 2009,
Source: news.mongabay.com



Mt. Fubilan, Tabubil, OK Tedi
Source: en.wikipedia.org



Oil Palm seedlings in WNB.
Source: www.tourismwestnewbritian.org.pg



Fish Processing
Source: www.businessadvantage.png.com

Land management and administration in Papua New Guinea is highly problematic. Effective management and administration of land cannot be achieved without land information such as the location, size, value, use, improvements, owners, occupiers, rights, responsibilities and restrictions relating to land.

Government has experienced difficulties in purchasing land from customary owners because people now see land as a valuable and important commodity.

Today they demand extremely high monetary compensation for the acquisition of their land and rightly so! Land is viewed as an asset. There cannot be a fixed value for land but depending on the period in time when land becomes an issue as well as what land is used for. For example 50 years ago people gave land away to the state and churches for settlement purposes in exchange for tobacco and steel axes. This was at a period in time when the cash economy played a lesser role in the lives of the people.



11.2.1.6: Capital and Appropriate Capital

Capital is a productive resource or durable good that is used for the production of other goods and services. It consists of any productive resources which have been obtained as a result of previous productive effort. Included in capital are machinery, transport equipment and factories. Capital significantly increases the productivity or efficiency of production.

For example, new machinery that improves working conditions is an **appropriate capital**, whereas out-dated and worn machinery which reduces productivity due to break downs is inappropriate capital. When such break downs occur, workers cannot perform their part in the production process. This reduces the productivity of labour and also increases wastage and production costs. Therefore, it is important that the appropriate capital base is used in production processes. Should more sophisticated capital equipment be found on the market, the use of this equipment is appropriate, as long as it is suitable and affordable.

Suitability-capital is said to be appropriate when it meets the objectives of its purchase. If you buy a machine that is capable of producing 6000 units a day when you really need a machine that produces 10 000 items a day, then its purchase has not been appropriate.

**Use of capital goods need to reduce the cost of production to satisfy market demand.
In other words, capital needs increase productivity.**

Affordability-capital resources are affordable when a business is able to generate revenue that covers its operating, maintenance and loan financing costs. Over-spending or cost blow-outs in production will affect profitability, so it is important to prevent this happening. The appropriate use of capital needs to reduce the costs of production and to satisfy market demand. In other words, it means capital needs to enhance productivity.



11.2.1.7: Entrepreneurial Skills

The final economic resource that is necessary for efficient production is entrepreneurial skill. Entrepreneurs are concerned with taking risks and making management decisions.

Entrepreneurship is the ability to combine the other factors of production, being innovative and to face up to all business risks. This is a skill that takes years of hard work for those who wish to dedicate themselves to running an enterprise. Lack of adequate entrepreneurship may limit the size of a business and the ability of a nation to achieve its economic goals.

Collectively, entrepreneurs are people who have changed the world through their innovative products. Two examples include Steve Jobs (Apple) and Bill Gates (Microsoft). Often these entrepreneurs who have adapted other people's inventions to manufacture new goods that appeal (attractive) to consumers.

In return for this contribution, the entrepreneur receives *profit*. It is the reward for having the initiative to go into business, to implement a new idea, to take the risk of producing a good which had not yet proved successful or to use a different production method. For instance, in PNG we have farmers or village gardeners who grow their own food and sell a proportion of this produce at local markets; or we have others who risk their time and money investing in buying goods and re-selling them, or buying machines to produce goods which they then hope to sell. is an example of risk. Profit is what remains after deducting costs of production such as rent, and interest, from sales revenue. When a consumer buys a coffee table for K200, the amount does not all go to the shop owner. The K200 is divided up according to the factors of production:

1. Land-part of money goes to pay timber owner.
2. Labour-saw mill operators and carpenters needs to be paid
3. Capital-interest for the use of capital
4. Entrepreneurship-this part of the money is the furniture manufactures reward, or profit.

Characteristics of Good Entrepreneurs

- No production activity can occur without the intervention (involvement) of entrepreneurs. Therefore, it is the fundamental factor of production.
- Entrepreneurs are the decision – makers and good organisers who allocate resources.
- Entrepreneurs generate innovations and have good knowledge to compete with other businesses.
- Entrepreneurs are willing to bear and take reasonable risks. In world of uncertainty they produce products to sell in unknown future markets. There are times when political, economic, social or technological factors adversely affect profitability .Example include rascal gangs in Port Moresby, or in natural disasters such as the volcanic eruptions in 1994 which destroyed the town of Rabaul.
- Entrepreneurs operate their businesses as sole proprietorships, partnerships or companies.
- Reliable, honest, flexible and respect of employees.



11.2.1.8: Case Studies of Successful Businesses in Papua New Guinea

To conclude this topic, you have learnt about the factors of production and their significance in the production process. Now I believe that you would also be interested to read stories of successful business people who make use of these economic resources in today's competitive business world. Read the case studies below.

Case Study One: Story told by the owner, Berry MAIP

Here is an exciting story of a successful businessman by the name of Berry Maip who is the Managing Director of Whisky Fresh Ltd. Berry comes from Baisu, a village few kilometres away from Mt. Hagen in Western Highlands Province.

Whisky Fresh Ltd is 100% Papua New Guinea owned and is specialised in supplying and distributing fresh vegetables to big supermarkets and shops in major cities like Port Moresby and Mount Hagen and catering for institutions like the University of Papua New Guinea.

Berry was a correctional service officer. He used to save K50.00 from his salary every fortnight. After two years, he withdrew his savings and had a dream to invest that money by doing something productive. This all started with an amount of K1400 to buy few vegetables from Mt. Hagen market and sent to Port Moresby and sold them at the famous Gordon market. With great determination and commitment by Berry and his hard working wife, the business grew quickly.

They began to cultivate any land that was available to grow their own vegetables apart from buying at Mt. Hagen market. The production increased and more vegetables were sent to Port Moresby to be sold. Berry realised that he needed people to help him so he employed villagers to work on the land.

In 2002, Berry engaged his younger sibling to manage his business as he was caught up with his job. However, things did not work out right as his brother misused the money and had nothing in the account.

Anyway, Berry took this as a challenge and made the toughest decision to retire from his job. He got his retired savings and started all over. He learned from his mistake and managed the business on his own with the help of his wife. Berry was very confident and successfully signed contracts with big companies like Stop and Shop, RH Group of Companies and Super Value Stores to supply vegetables. Whisky Fresh Ltd is now the main supplier of vegetables to supermarkets in Port Moresby.

With positive thinking and proper management, Berry is also engaged in other business activities such as, hire cars and a building construction company with employees.

To conclude, Berry spoke of the challenges involved in business and how to overcome. He said, 'making business is actually taking a risk, but it all depends on, self-determination, confidence, commitment and positive thinking'. Berry thanks and appreciates his wife for her endless support. They have a very big family mansion worth half a million in their village and send their children to the best schools in Papua New Guinea.

After their hard work, Berry and His wife are happy together.

**Case Study Two: The National, Tuesday, January 27, 2015.**

Firm Owner Tells Success Story

A milestone has been achieved in the construction industry for a locally-owned company to be awarded a major road construction project worth K29.1 million.

The Evelyn and Jerelyn (EJ) Sisters Company, owned by PNG women, is one of four companies to win a contract for a 12.38 km road construction project from Pangia to Laiagam, in Enga.

Everlyn Kepa is an account by profession so the motivation to run a family company was the greatest achievement for her. She is the first born of a family of three and said she learnt a lot from her parents and she and her younger sister Jerelyn were encouraged on how to start managing small capitals.

Venturing into business with the construction company was their father Thomas' dream achieved after fifteen solid years of commitment as a simple operator at the Pogera Mine Work Station.

"I believe the key to success is how cooperative the parents Nelly and Thomas had put their best effort", she added.

From a humble beginning, Thomas and Nelly had better plans with selling second-hand clothes and then ventured into Public Motor Vehicles (PMV) buses.

The company was registered with the Investment Promotion Authority (IPA) in 1995. With more than ninety plant operating machines, the owners of EJ Sisters Company are building on the achievements of their parents.

"Nothing comes free but anyone can start somewhere, depending on the self-determination to do something in order to be successful or achieve your goal". Kepa said.

She said preserving one-tenth offering (tithe) for GOD is the essential part of their success. They said they could not thank their parents enough for their commitment and being faithful in what they wanted to do.

They have signed the K21.9 million Pangu and Liagam road rehabilitation contract with the state in Port Moresby recently.



Factors which influence the success of businesses

- Self-determination

Successful business people have a high degree of personal energy and drive. They possess energy to work for long hours for the good of their business.

- Self-confidence

Business people believe strongly in themselves and their ability to achieve the goals they set. They set clear goals, which are usually challenging but also realistic so that they are not put off by difficult situations.

- Commitment

Successful business people set up firms and make them grow. They commit themselves to building and expanding their business. These people do not simply get in and out in a hurry once they have made a certain amount of money. Successful business people stick to what they planned to do initially to achieve the goals set.

- Ability to take risks

Successful people like the challenge of a situation in which a certain amount of risk is involved. They are able to operate under conditions of uncertainty.

- Accountability

Most importantly, the finances of the businesses are managed well so the firm keeps on operating.

- Innovative and creative

Successful business people are always smart and creative. They think of new and exciting ways to attract customers where there is competition.

Factors which cause a down fall in businesses

Many businesses are unsuccessful in their first or second year of operation because of poor management. The owners are poorly prepared for operating the of firms. They may leave the running of their business to their relatives or others and not properly supervise them as in case study one, where Berry Maip gave the responsibility to his brother who used the finance and shut down the business and he had to start all over again. Anyway, the main cause of failure is due to mismanagement. Below are factors which contribute to failure in business.

- Lack of initial planning

Lack of proper planning at the start is one of the main reasons why businesses fail in their early years. Some people are really excited about establishing a business as quickly as possible that they fail to do planning in the beginning. As a result, they may have no real idea of the likely success of the business until the money and assets are already committed. What often happens in such a situation is that the financial needs of the business are much greater than expected and the firm soon finds itself with a serious cash shortage.

- Lack of proper records

Some business people sometimes do not see the need for or recognise the importance of keeping accounting records of their operations. As a result of not keeping proper records, it may not be possible to know if a business is operating profitably. Owners of loss making



firms may not be aware of their losses until the losses become so great that the future of the business is in serious danger.

- Owners not running their own business

In Papua New Guinea, it is very common for owners not to personally manage their own business. Instead they may get relatives to run the business for them. These relatives may not be closely supervised because they are not living in the same town or area. In this situation, the persons running the business may not always act in the best interests of the owners. For example, they may sell goods on credit to their wantoks which is a major cause of failure.

- Unsuitable location

Choosing a suitable location is very important in doing business. Many businesses fail because they choose the wrong location, which means, there are not many customers and the demand is low, high criminal activities or there is competition in that area.

Recommendations for emerging small businesses in Papua New Guinea

As mentioned already, the main reason why businesses fail is lack of proper planning before they are set up. Unfortunately many business people do not even prepare a business plan. A person may have a very sound business idea, but the business may be unsuccessful in practice unless detailed research and planning has been carried out in advance. Once a business person fails, his or her reputation is damaged which makes it difficult to obtain capital in the future in order to start up again. Therefore, below are some things business people need to consider before establishing a business. When developing a business plan, you must;

- consider your skills, assets and weaknesses.
- research the market in order to discover costumers' needs. For example, through questionnaires.
- find the best location to set up a particular kind of business
- being creative and find ways of selling the product or service you have decided upon
- decide on the number of people to be employed
- identify the equipment to be used
- decide on the organisational structure of the business
- identify your suppliers, choose the cheapest but quality and bargain.
- do a cash flow plan. Estimate the costs.

The careful preparation of a business plan presents a great opportunity to consider all aspects of operating a business. Planning provides a person with the chance to examine the likely results of different marketing, production and financing policies. This helps to decide how much money, labour and other resources are needed to expand a business.

NOW READ THE SUMMARY OF 11.2.1 ON THE NEXT PAGE.



11.2.1: SUMMARY

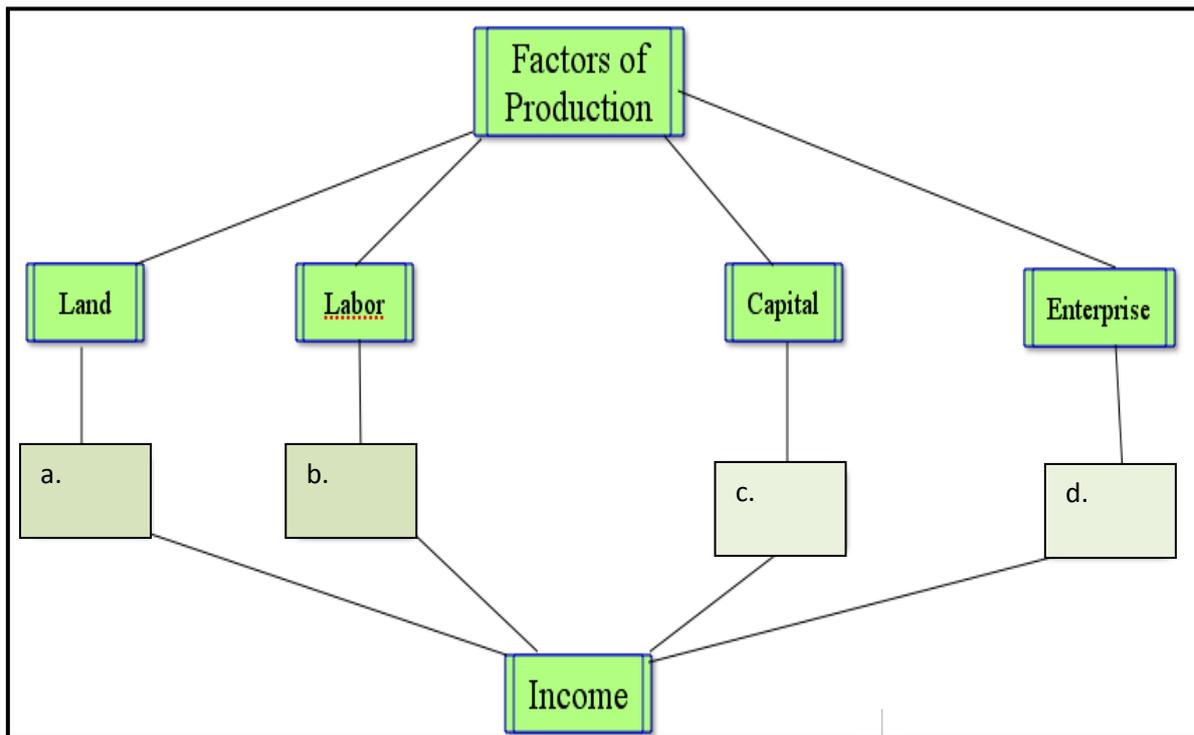
- Factors of production refer to the economic resources used in the production of goods and services to make an economic profit.
- Factors of production include;
 - a. Land
 - b. Labour
 - c. Capital
 - d. Entrepreneurial skills
- Land consists of all the natural resources used in the production process to produce goods and services to satisfy people's needs and wants.
- Land resources are significant in the development of Papua New Guinea as it brings in money which increases the money supply.
- Land is a marketable resource which can be bought or sold. There is increasing demand for land which increases the price.
- There are two types of land ownership in Papua New Guinea;
 - a. Customary land which comprises of 97 %
 - b. Alienated land of 3 %
- Types of land use in Papua New Guinea;
 - a. Agricultural (arable) land which is about 0.65 %
 - b. Permanent crops make up 1.51 %
 - c. Others consisting of 97.84 %.
- Capital is a productive resource used to produce other goods and services.
- Entrepreneurial skills refer to the ability to combine the other factors of production to produce goods and services.
- Rewards for the factors of production are;
 - a. Land – rent
 - b. Labour – wage
 - c. Capital – interest
 - d. Entrepreneurial skill - profit
- Characteristics of successful business people;
 - a. Self-determination
 - b. self-confidence
 - c. commitment
 - d. Ability to take risks
 - d. accountability
 - e. innovative & creative
- Characteristics of unsuccessful businesses;
 - a. Lack of initial planning
 - b. No proper records of business transactions
 - c. Owners not running their own businesses
 - d. Unsuitable location

NOW DO STUDENT LEARNING ACTIVITY 11.2.1 ON THE NEXT PAGE.



TOPIC: 1. Student Learning Activity

1. Given below is a basic overview of the factors of production. For each factor given write the factor payment in the box below each one of them.



2. In your own words, explain how the diagram above works. That is, explaining the factors of production and their factor payments.

a. Land

b. Labour



c. Capital

d. Entrepreneurial Skills

3. In a paragraph, describe and differentiate between the types of land ownership in Papua New Guinea.

4. In your own words, explain what this statement means “PNG is a mountain of gold floating on a sea of gold”.

5. Explain the relationship between land and economic development in Papua New Guinea?

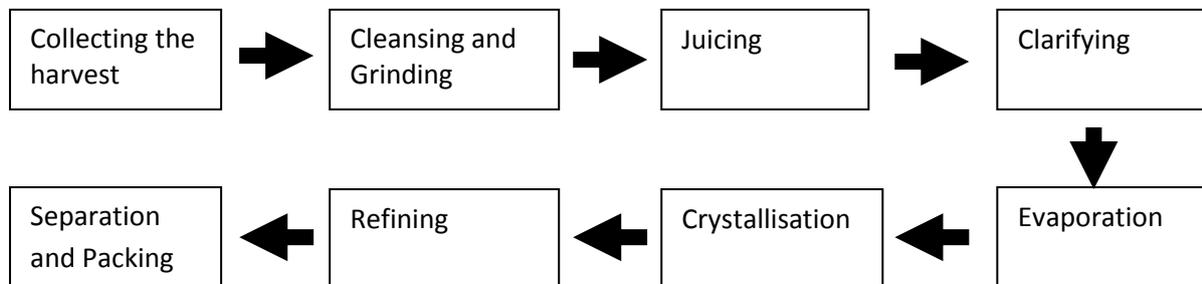


TOPIC: 2 CHAIN OF PRODUCTION

Have you ever heard of a production chain before? In your grade 9 and 10 Business Studies Course you may have already come across these words. It is also known as the production process. Now, if you can recall the meaning of the word production that you learnt earlier, production is the making of goods and services.

A process refers to steps or a series of actions taken in order to achieve a particular end. Therefore, a production chain or process refers to the steps followed in order to change raw materials into finished goods which are used by consumers like you and me. Take a look at the process of making sugar given below.

THE PROCESS OF MAKING SUGAR



This is the process used to produce sugar. As you can see, there are complicated steps involved before reaching the final product. Now, from this you can make a list of the things needed to produce sugar. They have used things like, sugar cane, tractor to harvest, machines for grinding, water, packets for packing and even a factory building where these processes took place. Can you guess what name is given to these things used in the production process? They are known as **inputs** in the production process. The finished product which is the sugar is called the **output** of the production process. This has brought us to our first topic of discussion 'The Chain of Production'.



Specific Learning Outcomes

At the end of this topic, you will be able to;

- define chain of production
- identify the inputs and outputs in the production process
- interpret production possibility curves
- list and explain the types of production
- differentiate between economies of scale and diseconomies of scale
- explain the concept of diminishing returns
- identify the costs of production
- interpret graphs showing the different costs of production



11.2.2.1: Inputs in the Production Process

Inputs in the production process refer to things or resources a firm uses in order to produce a final good. As you learnt earlier, the factors of production (land, labour, capital and entrepreneurial skills) are inputs which make it possible for production to occur.

Inputs are of two types;

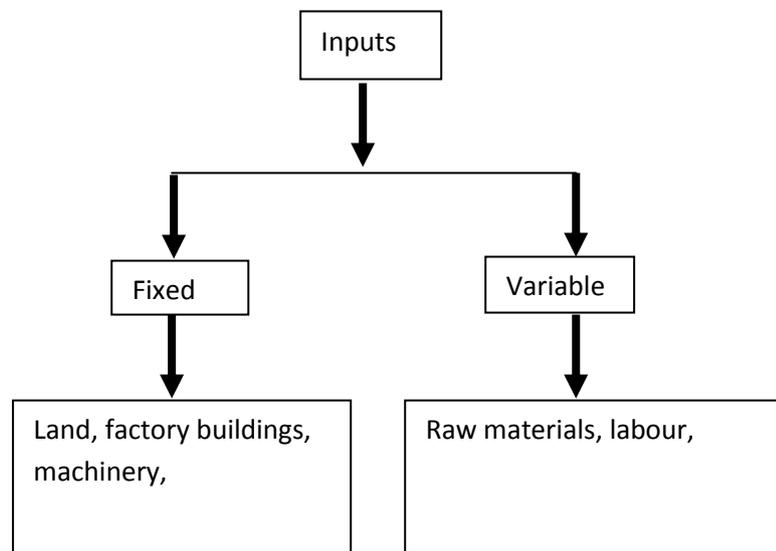
(a) Fixed Inputs (factors)

Inputs that cannot change during a certain time period are those that are held constant over a range of output. For example, a factory building is used many years regardless of the number of items produced. The factory building will not run out after a certain amount is being produced unless it is destroyed by fire, fights, earthquakes and other problems. Otherwise, it will still be used for many years until there is a need be renovated or rebuilt.

(b) Variable Inputs (factors)

An input whose quantity can be changed in the time period given. Variable inputs change in accordance with the volume (quantity) of production. This means, no production means no variable input; more production means more variable inputs. The most common example of a variable factor of production is labour. A variable factor of production provides the extra inputs that a firm needs to expand short-run production.

TYPES OF INPUTS IN THE PRODUCTION PROCESS



Both the land and factory building are examples of fixed factors or inputs. The output of fixed factors can sometimes be increased by using more of the variable factors such as the number of workers employed. This implies that the fixed factors were not being fully used before, there was **excess capacity**.

Excess capacity refers to a situation where a firm is producing at a lower scale of output than it has been designed for.



It may arise because as demand increases, firms have to invest and expand capacity in lumpy or indivisible portions.

Short Run and Long Run

There are time periods in the production of goods and services. If a firm wishes to increase the amount of goods and services produced, it must employ more resources. If it wishes to do this very quickly, it can usually do so by hiring more labour to work for it or by asking its existing workforce to work overtime. Obtaining more natural resources like land or capital goods such as a new factory building takes a long time

There are time periods in the production of goods and services.

The **momentary run** is the period of time during which a firm will not be able to increase production. This may be no more than a day.

The **short run** is the period of time during which a firm can increase production only by employing more labour because no more land or capital is available. In the short run, labour is a variable factor of production while land and capital are fixed in supply. It is the time period in which production is varied by changing the variable factors only. The output can only be increased with an increase in variable inputs

The **long run**, however, is when a firm employs more of all the factors of production. In the long run it is possible to vary all fixed and variable inputs. In the long run, for example, a firm can build new factory buildings; carry out research and development programs to devise new processes and products. They may also recruit and train managers and skilled workers. However, in the short –run these things are impossible.



11.2.2.2: Outputs in the Production Process

Output is the quantity of goods or services produced in a given time period, by a firm, industry, or country. These goods and services are either consumed or used for further production. Consumption of goods and services is assumed to provide utility (satisfaction) to the consumer.

Goods are items that can be seen and touched, such as books, pens, salt, shoes, hats, and folders.

Services are provided by other people, such as doctors, lawn care workers, dentists, barbers and waiters.

Outputs are of two types;

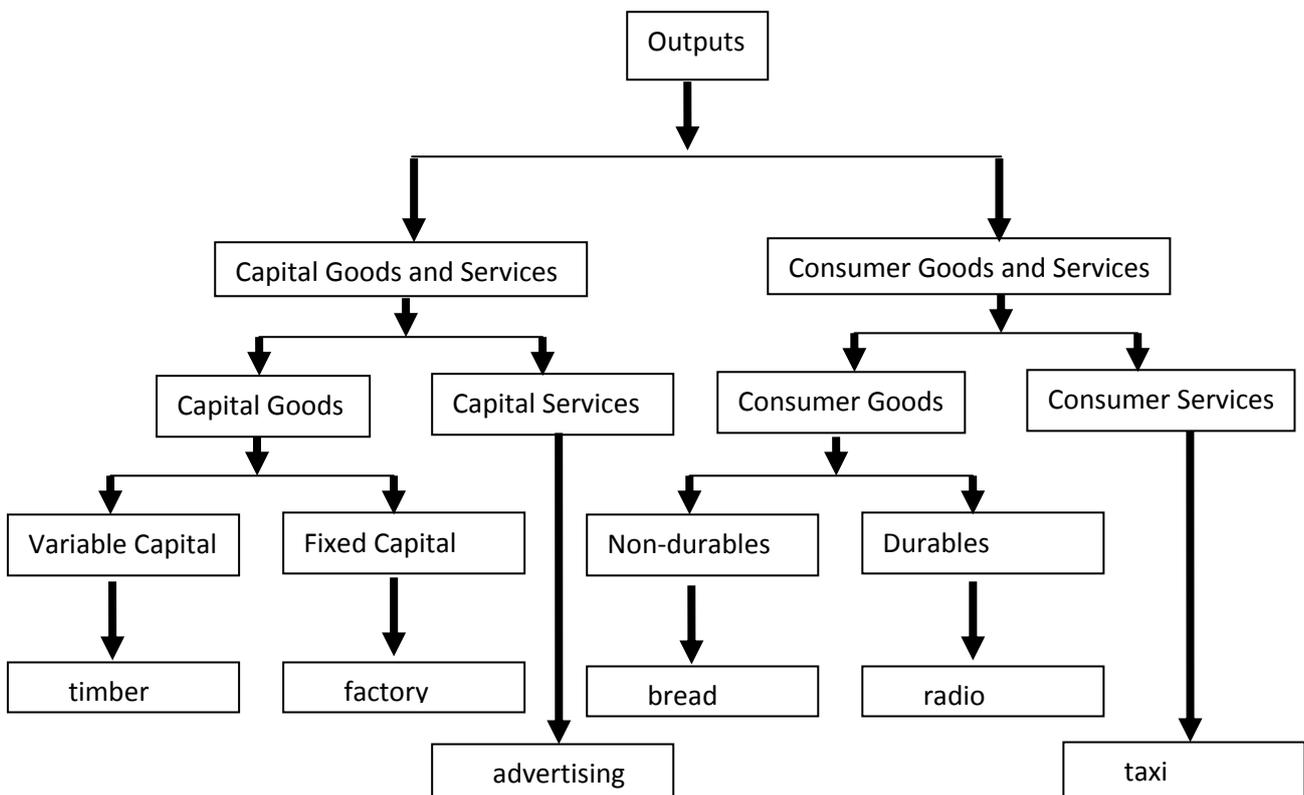
(a) Capital Goods and Services

These are goods and services used for production of other goods. They are also known as producer goods and services. For example, machines may be an output for a production process that has already occurred but an input for another process because it is a capital good which will be used to produce other goods.

(b) Consumer Goods and Services

Goods, such as food and clothing that satisfy human wants through their consumption or use. They are produced for final consumption. That is, when you buy it, you consume or use it and it will not be used again. Look at the diagram below.

TYPES OF OUTPUTS IN THE PRODUCTION PROCESS





Now, look at the diagram carefully, bread is a non- durable consumer good and a factory building is a fixed capital good. The difference is, bread is a consumer good because will be consumed and that is the end of it. However, a factory building is capital because it will be used to produce other goods. We also have services provided, like the taxi. It is the producer's choice to engage in the activity which gives the most satisfaction and depending on certain factors.

Factors which determine the types and amount of goods produced.

1. Types and amount of resources available
2. Climate
3. Size and skill of the labour force
4. Willingness of the entrepreneurs to take the risk
5. Access to and type of capital available
6. Availability of land

When most of these factors are in order, firms are successful in their production thus, make profits. Otherwise, production is low and firms may make a loss. Therefore, entrepreneurs make judgements and decide what to produce and where to produce. It all goes back to carefully studying the 'Basic Economic Questions' and finding answers which bring maximum satisfaction. With the resources available, firms can produce one good or service and skip another because it is not possible to produce everything at the same time.



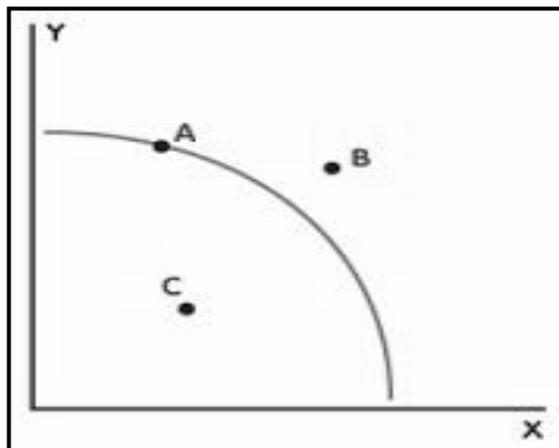
11.2.2.3: Production Possibilities

This is a revision of what you have already studied in Module 1. The different mixes or ranges of goods that could be produced if an economy exploited all available workers, technologies, and other resources to the full is known as production possibility.

One of the main principles of economics is that everyone faces tradeoffs because resources are limited. These tradeoffs are present both in individual choice and in the production decisions of entire economies.

Trade-off is a situation where you give up one thing in order to get something else that you also desire.

The **production possibilities frontier** (PPF, sometimes called a production possibilities curve) is a simple way to show production tradeoffs graphically. It is a graph representing production tradeoffs of an economy given fixed resources. Below is a sketch of a production possibilities curve.



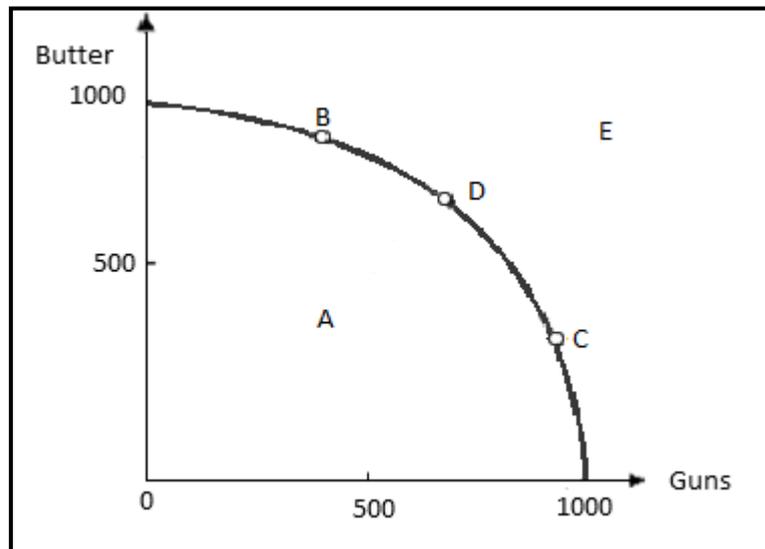
Since graphs are two-dimensional, economists make the simplifying assumption that the economy can only produce two different goods.

For example, we choose guns and butter when describing an economy's production options. Since guns represent a general category of capital goods and butter represents a general category of consumer goods, the tradeoff in production can then be framed as a choice between capital and consumer goods.



Therefore, we use guns and butter as the axes for our production possibilities frontier.

PRODUCTION POSSIBILITIES CURVE FOR GUN AND BUTTER



The PPC shows left to right downward position. A PPF (production possibility frontier) or PPC typically takes the form of a curve.

An economy that is operating **on the PPF**;

- that is, points **B**, **C** and **D** is said to be efficient. An **efficient point** is one that lies on the production possibilities curve. At any such point, more of one good can be produced only by producing less of the other. The resources are fixed, meaning the available quantities of factors of production do not change over time and technological progress does not occur.

For example, the economy is operating on the PPF production of guns would need to be sacrificed in order to produce more butter. If production is efficient, the economy can choose between combinations (i.e., points) on the PPF: **B** if guns are of interest, **C** if more butter is needed and **D** if an equal mix of butter and guns is required. Therefore, any point that lies either on the production possibilities curve or to the left of it is said to be an **attainable point**, meaning that it can be produced with currently available resources.

- **In the PPF**,

all points *on* the curve are points of maximum productive efficiency i.e., no more output of any good can be achieved from the given inputs without sacrificing output of some good.

However, if the economy is operating below the curve that is, point **A**, then, it is operating **inefficiently**. A point inside the frontier can be produced but is productively inefficient. It could reallocate resources in order to produce more of both goods. The available resources are not being fully utilised to produce more.

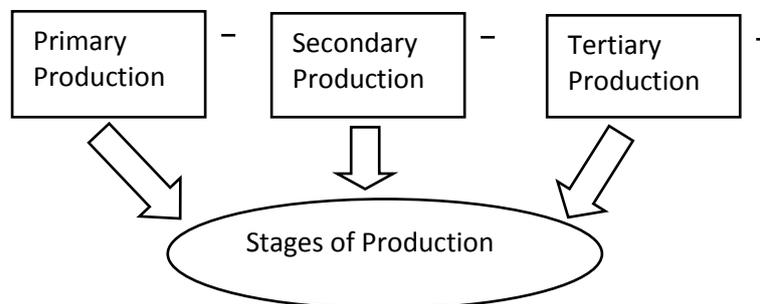
- Points that lie to the right of the production possibilities curve are said to be **unattainable** because they cannot be produced using currently available resources. For example, point **E** cannot be produced with the given, existing resources. Refer to Unit 1 for more information.



11.2.2.4: Types (stages) of Production

You have studied the types of resources in Grade 9 and 10 Business Studies. This is only revision and we will discuss where Papua New Guinea' strength is, in production.

Papua New Guinea is rich with natural resources, but it has become difficult to extract them because of the rugged terrain and the high cost of developing infrastructure. Agriculture provides a subsistence livelihood for the bulk of the population. In Papua New Guinea, extracting of natural resources is the main type of production. Not many businesses are involved in the secondary and tertiary production of resources due to lack of skills and capital.



1. Primary Production is the extraction of raw materials provided by nature, either above or below the earth surface. The extractive industries are: Farming, fishing, logging and mining. Without these, production would not take place.
2. Secondary Production refers to industries that take raw materials obtained by the extracted industries and change them into products such as fishing goods and office supplies. This involves the transformation of raw materials into goods e.g. manufacturing steel into cars.
3. Tertiary Production is when these finished products must be transported, stored, insured advertised and sold by traders. Tertiary production involves the provision of services to consumers and businesses, such as cinema and banking. A shopkeeper and an accountant would be workers in the tertiary sector.



Rimbunan Hijau in PNG



PNG Tuna Processing in Madang



Transporting Oil



The relative importance and size of each sector is closely measured by economists using a measure of GDP which adds together the value of output produced by each sector in the economy using the concept of value added. Value added is the increase in the value of a product at each stage of the production process.

Let us look at the stages of production and the economic value of Trukai rice.

Trukai has been Papua New Guinea's favourite rice since 1970. With its unique flavour and consistency, Trukai rice appeals to all consumers and as a result continues to maintain its position as one of the strongest and most recognisable brands in Papua New Guinea.

However, Trukai is much more than rice. It is about people, community, agriculture and knowledge. The company employs more than 1,000 Papua New Guineans, and supports tens of thousands more through family networks and indirect employment across the rice industry supply chain.

Most importantly, Trukai has a strong track record of supporting the local community, both socially and economically, and making extensive investments in agriculture. Through this, Trukai continues to produce nutritious food and maintain its standing as Papua New Guinea's leading supplier of quality rice.

Primary Production



Harvesting rice using a rice harvester.

Secondary Production



Rice Production

Tertiary Production



2013 Trukai Fun Run in Port Moresby.

In general, Papua New Guinea economy is highly dependent on imports for manufactured goods. Its industrial sector excluding mining is only 9% of GDP and contributes little to exports. Small-scale industries produce beer, soap, concrete products, clothing, paper products, matches, ice cream, canned meat, fruit juices, furniture, plywood, and paint. The small domestic market, relatively high wages, and high transport costs are constraints to industrial development.



11.2.2.5: Costs and Benefits of Production

The costs and benefits of economic activity were explained in unit 1. In this section we will study costs and benefits in relation to production. If you recall the meaning of production, it is the making of goods and services using resources. The resources used in the production process are the inputs.

The costs incurred in the production are divided into two groups.

1. Private Costs

The costs of money spent on the factors of production used in the production process are called the private costs. This includes wages for workers, raw materials, transportation and depreciation.

2. External Costs

The negative effects as a result of production to the surrounding community are called the external costs. Noise, traffic congestion, air and water pollution and stress are examples of external costs.

The difference between private and external costs is, private costs can be measured but external costs cannot be measured. In reality, external costs are not recorded in the firm's accounting records.

The Social Cost of Production

This refers to costs mentioned above. That is, **Social Costs = Private Costs + External Costs.**

The Benefits of Production

1. Private Benefits

Profit is the major private benefit of the firm.

2. External Benefits

These are benefits gained by people other than the firm or the producer. For example, a mining company built a road to the mine site to be used for transportation during the mining period. However, it is now used by the surrounding community. Another benefit is the employment of the local people by the mining company.

The Social Benefits of Production = Private Benefits + External Benefits

Social Benefit is the sum of all beneficiaries regardless of who generates the production.

Externalities

Production does not affect only the producers of goods. It has negative and positive effects on others who do not take part in production. These negative (harmful) and positive (beneficial) effects are called externalities. They are borne by those who are not party to the production.

Such third parties who receive benefits do not make any payments. They enjoy the benefits.



For instance, local people collecting off-cut timber for firewood, building houses or other uses from a logging company without any payment. However, there are third parties who suffer from externalities such as the noise from the mill and the dust deposited over their vegetable gardens.



11.2.2.6: Production Variables

Just as consumers make decisions about what goods and services to buy, entrepreneurs make decisions about what goods and services to produce and how to do this. Whatever method of organising production an entrepreneur uses, the aim is to reduce costs to their lowest possible level so that they can make as much profit as possible.

Below is a case study of a firm which produces toy bears. Read and find out various costs accumulated in the production process.

The Bear Company

Sue Brown used to make toys when she was a young girl at school. Her friends and relatives thought that they were so good that they asked her to make some for them to give as presents to others. She gave Sue an idea for the future.

When she left school she went to work in a local furniture-making factory for two years where she gained experience of using cloth to make seat covers. She saved some money and asked her bank to lend her some more so that she could start up her own business.

She rented a small factory unit on a new industrial estate. The cost of the building, including fittings is K100 per week. She also hired some machinery at a cost of K45 per week. Sue employed her two brothers to help her make toy bears. Sue pays herself and her brothers K1.00 for each toy bear they complete.

Since she started, her toy bears became very popular and she had many orders for them. The average price she charged for her toy bears was K10.00 each.

The costs of the Bear Company

In running her toy making business, Sue has a number of things she has to pay for. These are her **costs**. Some things have to be paid for each and every week, no matter how many toys Sue makes and sells. These are her **fixed costs** which do not vary with the numbers of bears she produces. On the other hand, **variable costs** change with the number of bears produced. The more Sue produces, the more materials and foam she needs. Wages to herself and her brothers also rise.

Fixed Costs are costs of production which remain constant (do not change) in the short run regardless of the level of output. This includes, rent, salaries of management and loan interest.

Variable Costs are those that change depending on the level of output. They include payment for raw materials, labour, power and transport.



Fixed Costs per week		Variable Costs per bear	
Rent & Rates of Factory	K100.00	Materials	K6.00
Hire & machines	K45.00	Foam	K1.00
Heating & Lighting	K5.00	Wages	K1.00
Repayment of Bank Loan	K50.00		
Total	K200.00		K8.00

The Total Cost (TC) of producing bears is found by adding together the fixed costs (FC) and the variable cost (VC).

$$\text{Total Costs (TC)} = \text{Fixed Cost (FC)} + \text{Variable Cost (VC)}$$

Sue keeps any profit that is left after she has taken away her costs from the money or revenue she earns from selling bears.

Let us assume that Sue produced 100 toy bears in a week, what is her total cost;

$$\begin{aligned} \text{FC} &= \text{K200 per week} \\ \text{VC} &= \text{K8.00 per bear so } \text{K8} \times 100 \text{ bears} = \text{K800.00} \\ \text{TC} &= \text{FC} + \text{VC} \\ \text{TC} &= \text{K200.00} + \text{K800} \\ \text{TC} &= \text{K1000.00} \end{aligned}$$

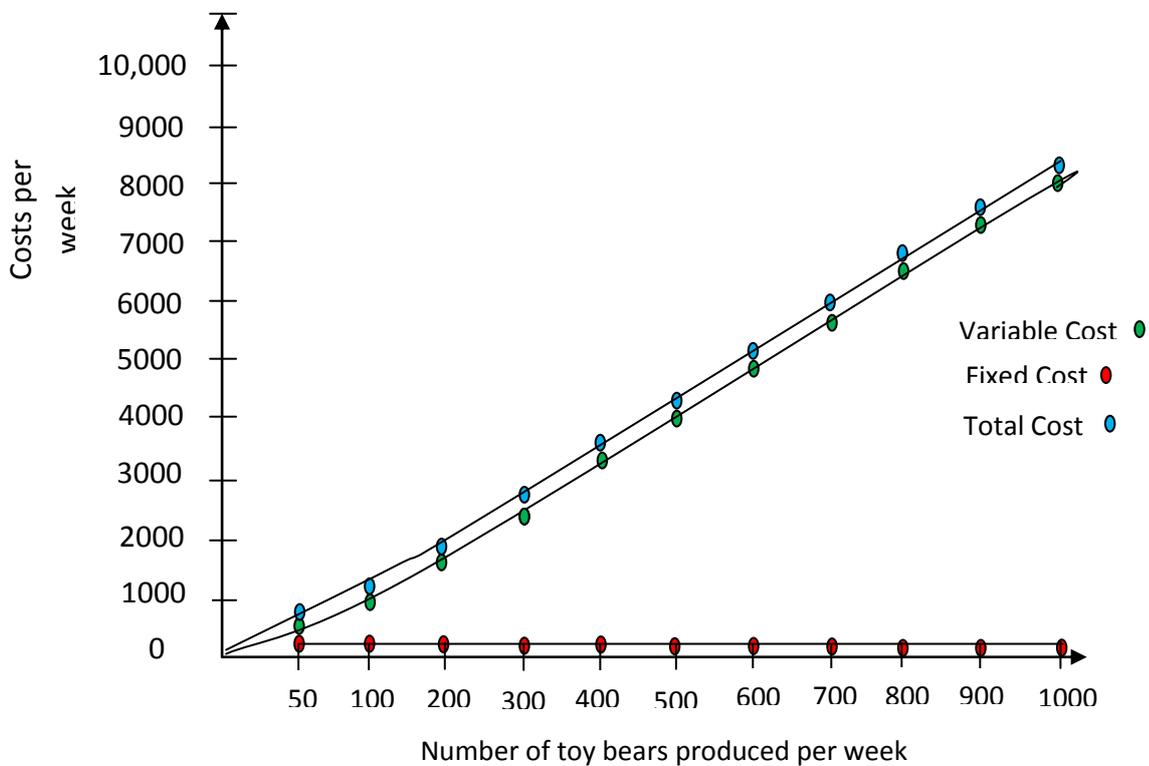
On the next page is a table showing the costs of producing certain number of bears in a week. Following the above example and the formula given calculate the total cost.



Bears produced in a week	Fixed Costs	Variable Costs	Total Costs
0	-	-	-
50	K200	K400	K600
100	K200	K800	K1000
200	K200	K1600	K1800
300	K200	K2400	K2600
400	K200	K3200	K3400
500	K200	K4000	K4200
600	K200	K4800	K5000
700	K200	K5600	K5800
800	K200	K6400	K6600
900	K200	K7200	K7400
1000	K200	K8000	K8200

We will now use the above information to draw a graph which shows how costs change with the number of bears produced.

SUE'S TOY BEAR PRODUCTION





So far we have discussed three costs of production;

a. Fixed Costs

These costs do not vary with the level of output or production. Fixed costs remain constant regardless of quantity produced. Examples include; rent for factory, loan interest, salaries for full time staff, equipment and machinery.

b. Variable Costs

They vary with output. As production increases, variable costs also increase. These include water bills, electricity, raw materials and labour.

c. Total Costs

This is the sum of fixed and variable costs.

As output changes the only cost that varies is the variable cost. The more you use, the more you pay. Therefore, at zero output, total cost consists of fixed cost only. The only factor that determines the change in total cost is the variable cost. This means that by managing the variable costs, a firm can reduce its total cost.

Let us look at Sue's Toy Bear Production again. We will calculate how much it costs on average to make one bear. This is known as the average **cost** or **unit cost** of production. It is the fourth cost of production.

d. Average Cost

From the example, when Sue produced 400 bears per week, her total costs were K3400. Therefore, if 400 bears cost K3400 to make then, one bear cost K8.50 to make ($K3400 \div 400$).

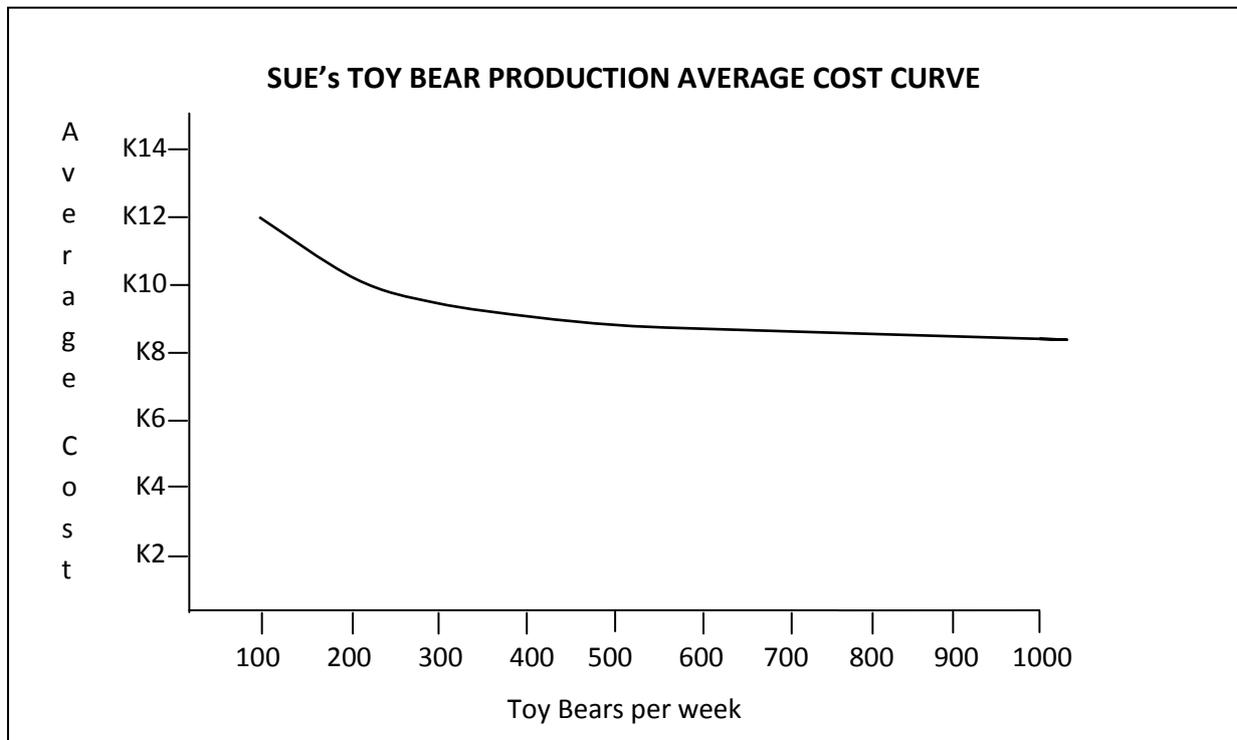
$$\text{Average Cost (AC)} = \frac{\text{Total Cost}}{\text{Number of bears produced}}$$

Thus, we will calculate the average cost for Sue's Toy Bear production.

Bears produced in a week	Fixed Costs	Variable Costs	Total Costs	Average Cost
0	0	0	0	0
50	K200	K400	K600	12
100	K200	K800	K1000	10
200	K200	K1600	K1800	9
300	K200	K2400	K2600	8.7
400	K200	K3200	K3400	8.5
500	K200	K4000	K4200	8.4
600	K200	K4800	K5000	8.3
700	K200	K5600	K5800	8.3
800	K200	K6400	K6600	8.3
900	K200	K7200	K7400	8.2
1000	K200	K8000	K8200	8.2



Now that, we have the average cost of producing one toy bear, we are able to draw the average cost curve.



When output is low, average costs are high because fixed costs still have to be paid. As output rises, average costs fall because the fixed costs remain the same but their burden is spread over a much larger output.

The optimum point of production or best level will therefore be where the average cost of producing each good is at the lowest level possible. At this point, the entrepreneur has managed to organise and combine the factors of production in the most cost effective or efficient way.

Therefore, the optimum point of production in the above example is where AC is K8.20.

e. Marginal Cost

Sue would now like to know how much it would cost to produce one extra bear. The cost of producing an additional item is known as the marginal cost of production. It is the change in total cost as output increases by one unit.

Return to your table and calculate the marginal cost of production.

For instance, when 50 bears are produced, the total cost is K600. The following week number of bears produced increased to 100 and total cost also increased to K1000. In this case, the marginal cost is the difference between K600 and K1000. Thus the marginal cost for the initial increase is K400. Do the same for the other levels of output.



Bears produced in a week(Output)	Fixed Costs	Variable Costs	Total Costs	Average Cost	Marginal Cost
0	0	0	0	0	0
50	K200	K400	K600	12	400
100	K200	K800	K1000	10	800
200	K200	K1600	K1800	9	800
300	K200	K2400	K2600	8.7	800
400	K200	K3200	K3400	8.5	800
500	K200	K4000	K4200	8.4	800
600	K200	K4800	K5000	8.3	800
700	K200	K5600	K5800	8.3	800
800	K200	K6400	K6600	8.3	800
900	K200	K7200	K7400	8.2	800
1000	K200	K8000	K8200	8.2	800

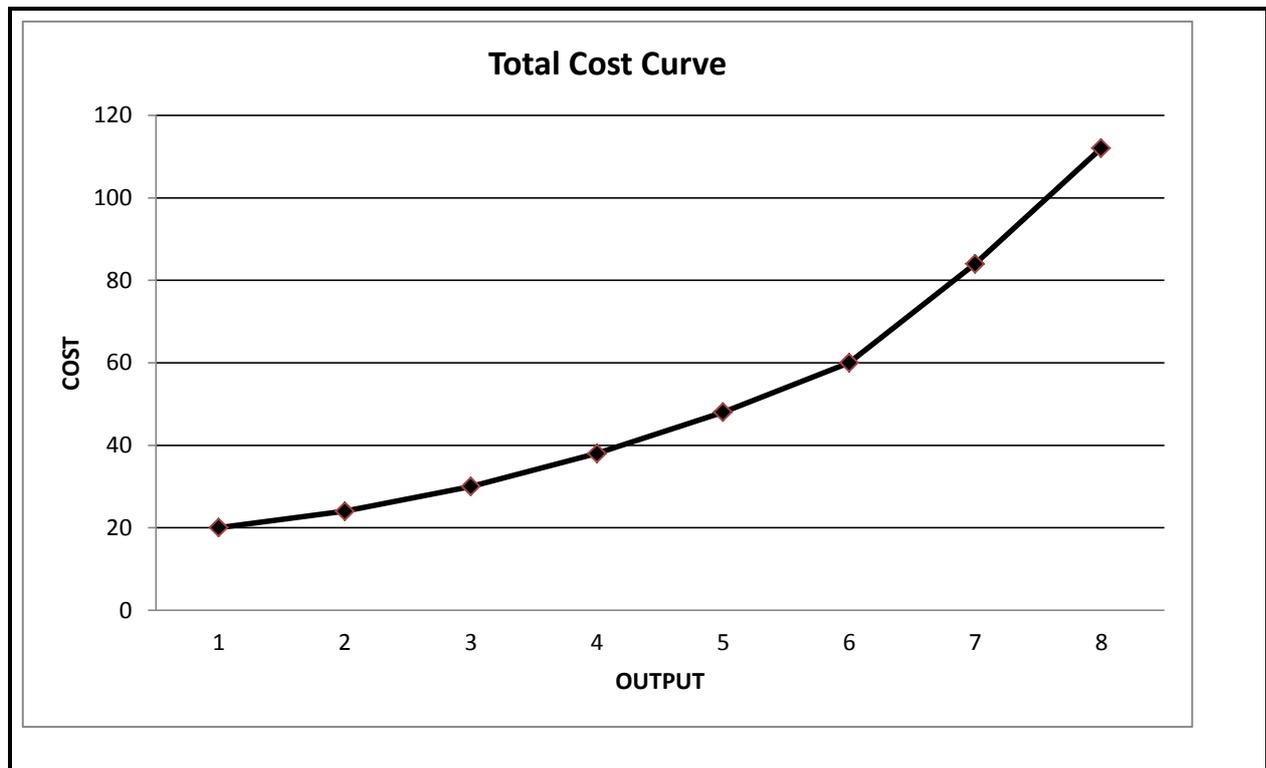
After drawing cost curves in the examples above, you are now able to construct a marginal cost curve. You may use the space below to sketch a marginal cost curve.



To conclude, below is a table showing all the production costs of a product. We will construct cost curves for each of them.

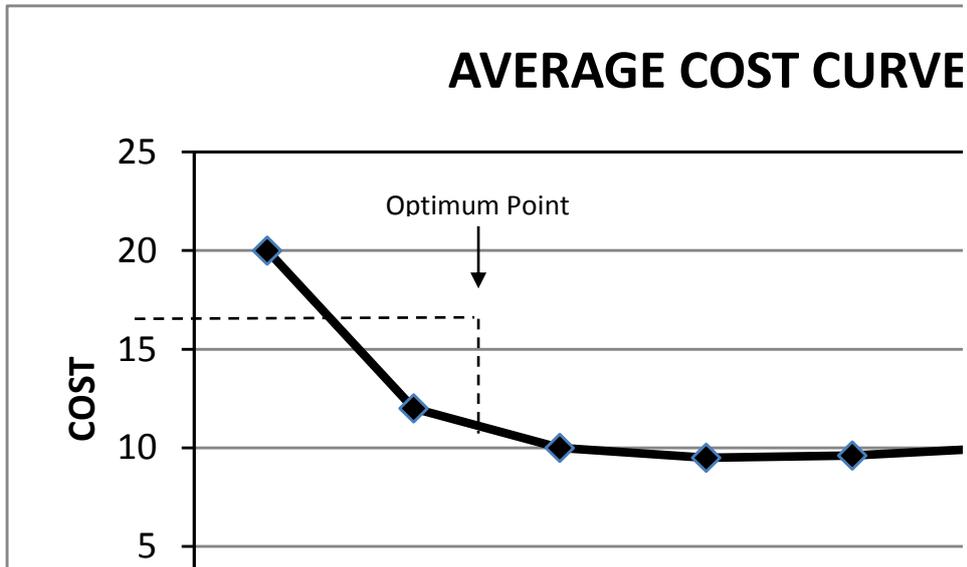
Units of Output	Total Cost (K)	Average Cost	Marginal Cost
1	20	20	-
2	24	12	4
3	30	10	6
4	38	9.5	8
5	48	9.6	10
6	60	10	12
7	84	12	24
8	112	14	28

i. TOTAL COST CURVE

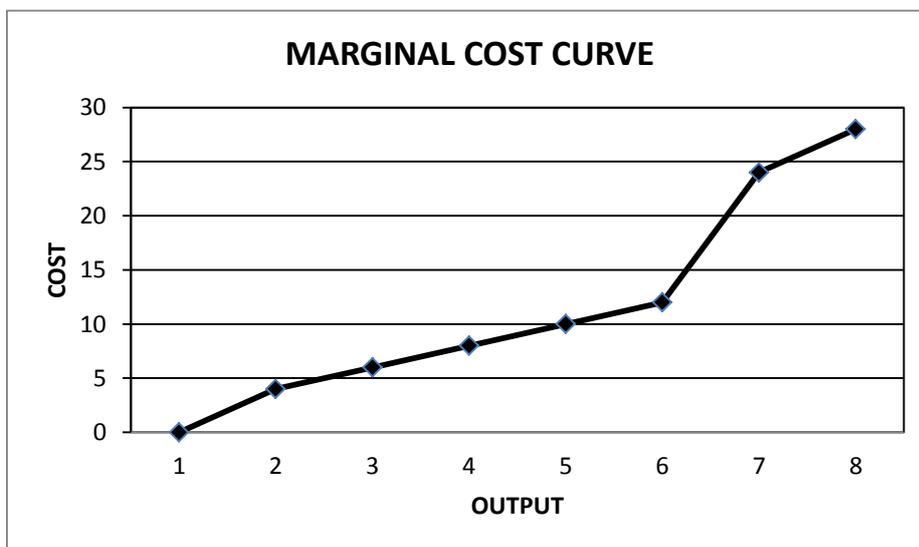




ii. AVERAGE COST CURVE



iii. MARGINAL COST CURVE



It is possible to insert all the three cost curves on the same graph. You can do this as a practice and see how they look.



Total Revenue

The total revenue of a firm is the price received for each unit multiplied by the quantity sold at each price. Total revenue is given by this simple equation.

$$\text{Total Revenue} = \text{Price} \times \text{Quantity Sold}$$
$$(\text{TR} = \text{P} \times \text{Q})$$

Average Revenue

This is the revenue per item sold. Average Revenue is equal to the price of the item.

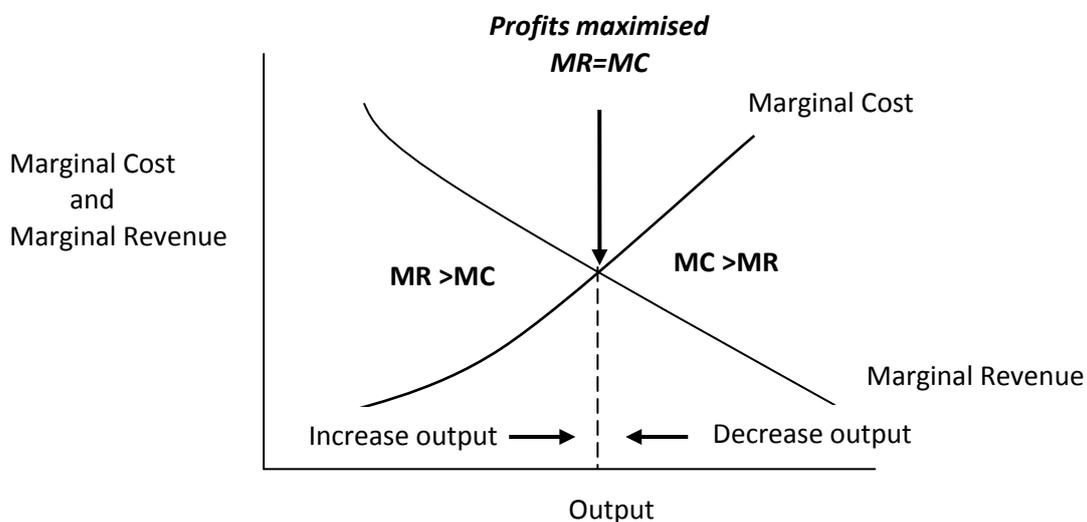
$$\text{Average Revenue} = \text{Total Revenue} \div \text{Quantity Sold}$$
$$(\text{AR} = \text{TR} \div \text{QTY})$$

Marginal Revenue

Marginal revenue is the extra income or revenue earned from the additional unit of good produced. It is total revenue at a given level of output (Q) minus total revenue at the preceding level of output.

Usually a firm will keep producing more of its product while the marginal revenue is enough to cover the cost of producing that extra product (marginal cost). Once the marginal cost becomes higher than marginal revenue, it will no longer be profitable to increase production.

Thus, firms will usually try to increase production up to the point at which marginal revenue equals marginal cost. This is the point at which **profits are maximized**. The graph below illustrates this concept.





Profit

The profit of a business is the income of the entrepreneur.

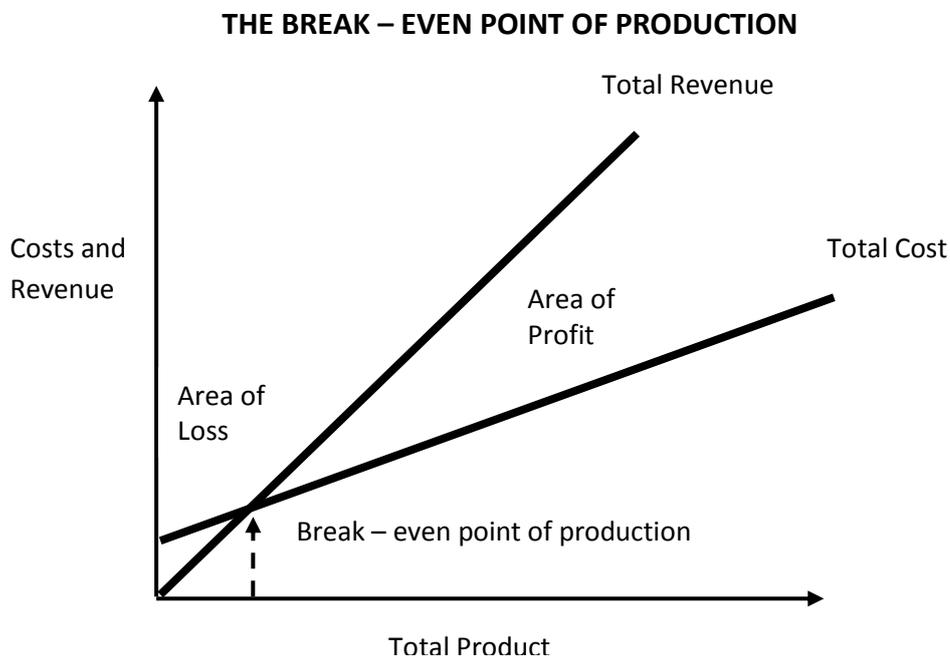
To find the profit or loss made from producing and selling, use the equation below.

$$\text{Profit} = \text{Total Revenue} - \text{Total Cost}$$
$$(P = TR - TC)$$

If Total Costs are greater than total revenue, then the firm makes a loss. However, if the total revenue is greater than total cost, the firm makes a profit. Many firms price their products to make a desirable level of profit. However, entrepreneurs must be careful not to price above other competitors as they will lose customers.

As a firm sells more of its goods and services, the total revenue from their sales rises and appears on a graph as an upward sloping line. With total cost plotted on the same graph, we can mark those outputs that result in a loss or a profit and find the **break-even point of production**.

Have a look at the graph below.



Output below the break-even level means losses and output above the break-even level means profit.



11.2.2.7: Law of Diminishing Returns

Any business owner or entrepreneur will try to combine the factors of production to obtain the best possible results from their use. There is an important relationship between the inputs of production and the output they produce. This relation can be shown by law of diminishing returns.

Diminishing Returns is the decrease in the marginal (additional) output of a production process as the amount of a single factor of production is increased, while the amounts of all other factors of production stay constant. It is when inputs increase and outputs increase less than proportionately.

The law of diminishing returns states that in all productive processes, adding more of one factor of production, while holding all others constant ("*ceteris paribus*"), will at some point yield lower incremental per-unit returns.

For example, the law of diminishing returns states that in a production process, adding more workers might initially increase output and eventually create the optimal output per worker. After that optimal point, however, the efficiency of each worker decreases because other factors such as the production technique or the available resources remain the same.

Let us read a case study to clearly understand how diminishing returns occur in a firm.

Farmer Scale's Apple Orchard

Farmer Scale has a very large apple orchard full of apple trees. At the end of the summer, the trees were heavy with ripe fruits ready for picking.

The farmer employed a young apple-picker named Sam who could pick 50 kilograms of apples each day in his basket. To enable him to do this, Farmer Scale had a ladder, which Sam would prop against the apple tree so that he could reach the fruits on the high branches.

But Farmer Scale was worried that, not all the apples would be picked before the cold weather arrived. He decided to higher some more units of labour. Angus was the first new employee. He and Sam would climb the ladder together. Sam picked fruits from the highest branches while Angus picked from the lowest branches. Together they could pick 80 kilograms of apples each day. That is, on average, they picked 40 kilograms of apples each. This was their average output or **average product**. Because the ladder had become a little unsteady with both Sam and Angus climbing it so their picking of apples was slowed down.

On his own, Sam could pick 50 kilograms of apples each day. With Angus the total weight of apples picked increased to 80 kilograms. Thus, the employment of Angus raised total output or total product by 30 kilograms per day. This extra 30 kilograms is known as Angus's marginal output or **marginal product**.



Lisa was the second employee who joined the farm two weeks later. Sam, Angus and Lisa climbed the same the ladder together. All three could pick 84 kilograms of apples in a day, which is an average product of 28 kilograms each. This is because the ladder began to wobble quite a lot which made picking difficult.

Together, Sam and Angus could pick 80 kilograms of apples each day, but the employment of Lisa, increased the total product of apples to 84 kilograms per day. Thus, Lisa's marginal product was only 4 kilograms of apples.

A fourth unit of labour is added. Bob, Lisa, Angus and Sam climbed the ladder together but they could only pick 45 kilograms each day. By now the ladder became over-crowded, it was unsafe and difficult for everyone. Clearly, the employment of Bob resulted in total product falling from 84 to 45 kilograms of apples per day. Bob's employment reduced total product by 39 kilograms per day. His marginal product is a minus or negative number. (Moyhahan & Titley, 2000)

The total, average and marginal products of Farmer Scale's workers are presented in the table below.

Units of Labour	Kilograms of Apples Per Day		
	Total Product	Average Product	Marginal Product
0	0	0	0
1 (Sam)	50	50	50
2 (Angus)	80	40	30
3 (Lisa)	84	28	4
4 (Bob)	45	15	-39

Source: (Moyhahan & Titley, 2000)

This example illustrates the law of diminishing returns. It states that if one factor of production is fixed in supply (land/capital) in the short run and extra units of another factor (labour) are added to it, then the extra output or returns gained from the employment of each extra unit of this factor must after a time go down or diminish.

Farmer Scale discovered this when he added extra units of labour to his fixed unit of capital (ladder). The ladder was shared among too many workers and picking apples became more and more difficult. That is, he experienced diminishing returns to labour.



Calculating the Average and Marginal Product of Labour

If 100 workers produce a total output or total product of 4000 shoes in one week, then clearly on average each worker has produced 40 shoes. We use the following equation to calculate the average product of labour.

$$\text{Average Product (AP)} = \frac{\text{Total Product (TP)}}{\text{Number of Workers}}$$

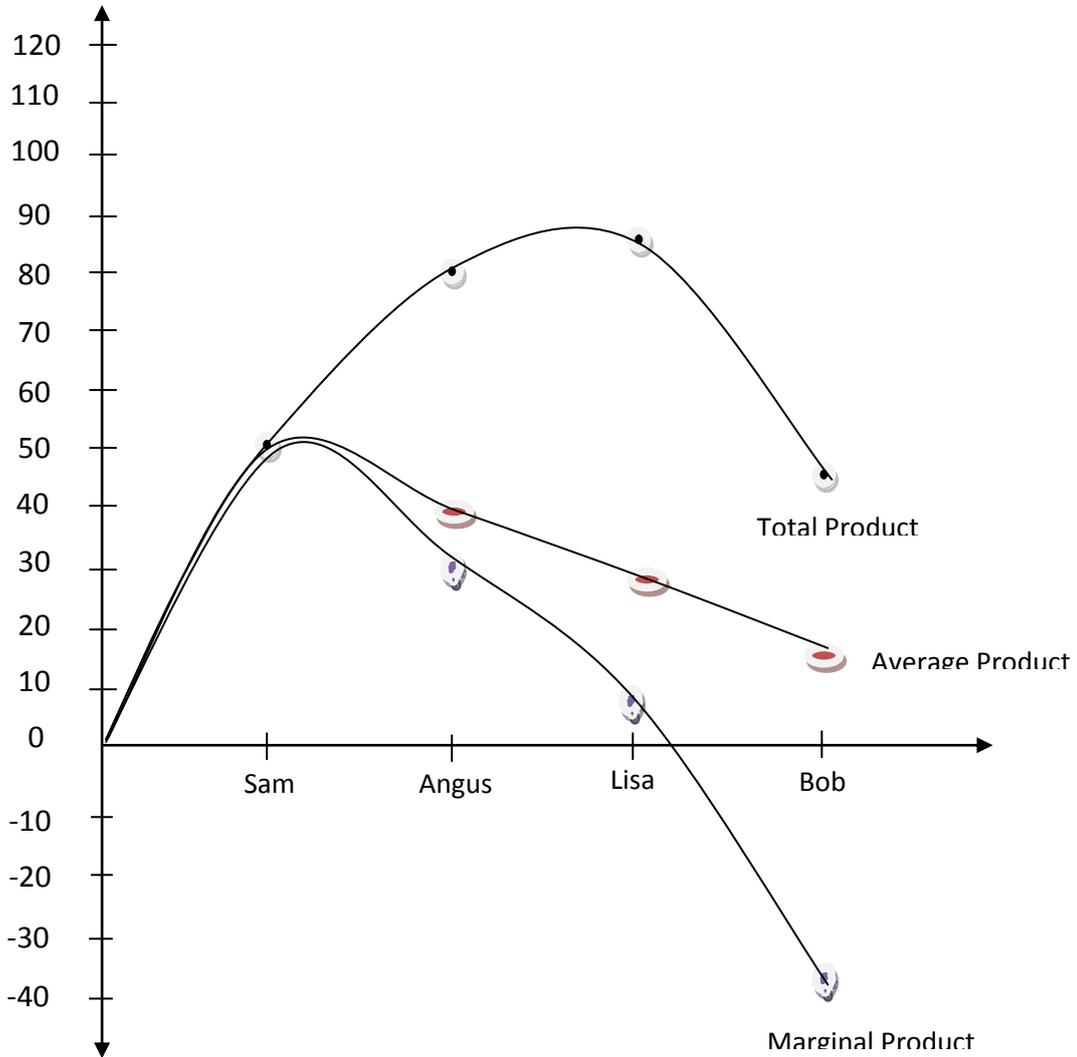
If one more worker is employed and Total Product rises to 4030 shoes then, the employment of the extra unit of labour has added 30 shoes to total product. That is the marginal product of the worker. We therefore, use the following equation to calculate the marginal product of labour.

$$\text{Marginal Product (MP)} = \frac{\text{Change in Total Product}}{\text{Change in number of Workers}}$$

Let us use Farmer Scale's example to draw a graph illustrating average and marginal products.



FARMER SCALE'S APPLE PRODUCTION



The graph shows how each new employee or unit of labour produced less than the employee before them until eventually the fourth employee caused the total amount of apples picked to fall.



11.2.2.8: Economies and Diseconomies of Scale

In order for you to understand the concepts of economies and diseconomies of scale, we will have a look at a case study. The case study is based on three (3) chocolate manufacturing firms. These firms have expanded their production in two years. All three firms have doubled their inputs or the factors of production they used. But what happened to their output of chocolate boxes?

The ACE Company	The BOOM Company	The CRIKEY Company
Year 1 Labour = 50 Number of Machines = 10 Number of Factories = 1 Total Product = 10 000	Year 1 Labour = 40 Number of Machines = 15 Number of Factories = 1 Total Product =12 000	Year 1 Labour= 60 Number of Machines= 5 Number of Factories =1 Total Product =9 000
Year 2 Labour =100 Number of Machines =20 Number of Factories= 2 Total Product =25 000	Year 2 Labour =80 Number of Machines =30 Number of Factories =2 Total Product =20 000	Year 2 Labour =120 Number of Machines =10 Number of Factories =2 Total Product =18 000
=increasing return to scale	= diminishing return to scale	= constant return to scale

- A firm that doubles all its inputs and more than doubles its output of goods or services as a result is said to be experiencing **increasing returns to scale**. This is what happened to the ACE Chocolate Company.
- The BOOM Company however, doubled its input but did not manage to double its output of chocolate boxes. Firms like this are said to be experiencing **decreasing or diminishing returns to scale**.
- On the other hand, the CRIKEY Chocolate Company **experienced constant returns to scale** because as it doubled its inputs, it also doubled its outputs.

Increasing Returns to Scale is when firms increase the factors of production (inputs) to produce a larger amount of output.

Decreasing Returns to Scale is increasing the factors of production (inputs) but produces a lesser amount than the doubled input.

Constant returns to Scale are doubling the factors of production (inputs) which doubles the output.



The three chocolate companies have doubled all their inputs and have therefore doubled their costs. One firm managed to more than doubled its output, one doubled its output while the other did not do this at all. Now, calculate what happened to the average cost of producing boxes of chocolates in each company as they moved from year 1 to year 2.

$$\text{Average Cost (AC)} = \frac{\text{Total Cost (TC)}}{\text{Total Product (TP)}}$$

The ACE Company	The BOOM Company	The CRIKEY Company
Year 1 Total Cost of all inputs = K10,000 Total Product = 10,000 Average Cost = K1.00	Year 1 Total Cost of all inputs = K12,000 Total Product = 12,000 Average Cost = K1.00	Year 1 Total Cost of all inputs = K9,000 Total Product = 9,000 Average Cost = K1.00
Year 2 Total Cost of all inputs = K20,000 Total Product = 25 000 Average Cost = K0.80	Year 2 Total Cost of all inputs = K24,000 Total Product = 20 000 Average Cost = K1.20	Year 1 Total Cost of all inputs = K18,000 Total Product = 18 000 Average Cost = K1.00

- The ACE Company experienced falling average costs.
- The BOOM Company experienced increasing average costs.
- The CRIKEY Company had no change (constant) in average cost.

Falling Average Cost (AC) is a very important benefit to the firm. In this situation we say that the firm experiences economies of scale. That is, **average costs fall as output increases up to a certain level**. It makes costs savings from increasing the scale of production by raising the output. This was certainly the case for the ACE Chocolate Company whose average cost per box of chocolate fell from K1.00 to K0.80 as it doubled all its inputs and total costs. In other words, it experienced increasing returns to and more than doubled the output.

However, if the average cost of production rises as more is produced then the firm is experiencing diseconomies of scale. It arises when a firm produces beyond the minimum point which causes the average cost of each successive unit of output to increase. The firm is producing too much and has become inefficient. This happened to the BOOM Chocolate Company where it doubled its inputs but failed to double its outputs. Diminishing returns to



scale here meant that the firm's average costs increased from K1.00 to K1.20 per box. The BOOM Company, like any firm in this situation would regret taking the decision to expand its scale of production.

Deciding how large a firm should be, is not easy for entrepreneurs. If the firm expands its scale of production it may be lucky and experiencing falling average costs or economies of scale.

If the firm expands too much and watches its average costs rise, like the BOOM Company, it experiences diseconomies of scale.

Clearly, then the best or optimum size for a firm is where it can reduce average cost to its lowest point in the long run. Here it can benefit fully from economies of scale, with low average costs and higher profits. The firm could use these profits to improve their factory and products and may even lower prices to attract customers away from competing firms.

Internal and External Economies of Scale

When a firm expands the scale of production, it has a chance to become more efficient and lower its average costs. This is because it gives the management or owners a chance to re-organise the way the firm is run and financed. Such decisions are taken within the firm and so the advantages they bring are known as **internal economies of scale**. These are the cost savings that result from a firm being large. We shall now look at this in detail.

- **Division of Labour and Specialisation**

As the firm expands, workers become better at what they do, for example if they are producing refrigerators, they improve their knowledge of parts and assembling techniques. This may reduce waste of time or materials. In other words, an expansion sees an increase in productivity through improved specialisation thus reducing costs.

- **Technical Economies**

An expansion in the size of the business means that it can invest in more complicated and specialised plant and machinery. For instance, a small scale electrical goods producing company may use simple and few machinery while a large electrical goods producing company may automate the entire production process to make goods for an entire region at lower cost.

- **Managerial Economies**

When firms expand many people are needed to look after sections, therefore, they employ managers to take care of different departments which increases operational efficiency. Small scale firms have managerial problems when one manager tries to oversee the entire business.

- **Marketing Economies**

Bigger firms have the advantage in advertising, bulk buying and distribution. A single advertisement may cover an entire population which increases the demand for its products. They have the power to attract customers.



- **Research and Development**

As the firms increase in size, they need to know the market of their products. Huge amounts of money are invested into doing more research on selling their products. They spend more money on producing variety using the same inputs so the firm does not concentrate on one product. This will generate additional revenue for the firm.

- **Financial Economies**

An advantage of being big is that the firm is popular and is easy to obtain financial assistance from financial institutions at low interest rates. This reduces the financing costs. They have track records of profits and solid sales and revenues which will guarantee them the loans for further improvements in the expansion of the business.

Eternal Economies of Scale

This refers to economies of scale which occurs outside a firm but within an industry. When a whole industry expands, because the number of firms within it is growing or the existing firms are getting bigger, the firms in the industry may find they can enjoy certain benefits. External economies of scale are those advantages in the form of lower average costs which a firm gets from the growth of the industry. They are especially important when all the firms in the industry locate together in one particular place.

- **Skilled Labour**

When firms involve in the same types of activities located near each other, they all employ and train local people in the work skills they need. A large skilled labour force emerges, this can benefit other firms who move into the area.

- **Ancillary Firms**

In areas where similar firms locate, other firms may join them to cater for some of their needs. For example, smaller car parts producing firms may set up near large car factories.

- **Co-operation**

When firms locate together to produce one particular good or service they tend to help each other, even though they are competing.

A general expansion of industries in a particular area may lead to setting up of banks and supermarkets which all facilitate in the purchasing and sale of goods which reduce the cost of production. Localisation or concentration of firms within a similar industry in the same geographic location allows other support industries to enter the same area to provide services such as transport, maintenance, cleaning, computer software, development, catering and training.

The government may also assist by providing power, road construction, and communication networks encouraging firms to further expand. This will all lead to a reduction in the firms average costs.



Diseconomies of Scale

It seems very beneficial for a firm to go to a large size so that it may enjoy economies of scale. However, some firms become too large which can cause inefficiency, that is, production slows down and costs rise. This is caused by diseconomies of scale. In other words, as a firm continues to expand, it reaches a point where economies of scale are no longer possible, which means it reached the minimum average cost. At this point, cost of production will rise but the product output will fall which leads to a reduction in the firm's profits. For example, if the inputs of a firm increase by 10% and output increases by only 8%, then diseconomies of scale exist. Please read the examples of the three chocolate producing companies and find out which company experienced diseconomies of scale.

Factors which contribute to the existence of diseconomies of scale

- **Management Diseconomies**

Large firms have to be divided up to many specialist departments. For instance, there may be a planning department, personnel, accounts, production, design and sales. Each department will have a manager responsible for running it. For the firm to run successfully all the departments must work together, but with many department managers, decisions will take a long time and there may be disagreements. On the other hand, if there is only one or few managers, they are unable to coordinate all the operations of the business.

- **Labour Diseconomies**

Production inefficiencies are the other factors that contribute to diseconomies of scale. With growing demand a firm is unable to plan and schedule production because the capacity of the fixed factors is not sufficient to produce large quantities. However, if the firm decides to increase more inputs to production then, diminishing returns to scale occur. This is when production decreases and average costs increase.

Sometimes large firms use specialised mass production techniques where there is division of labour which leads to boredom because of repetitive job. The work force may then become less cooperative or less attentive to their work leading to poor production.



Now read this example,

'Big is not always Better'

Diseconomies of scale exist in schools. One teacher may be able to teach a class of twenty (20) students, really well, having time to deal with students on a one – to - one basis where necessary. But if the same teacher is to have a class of fifty (50) students, their productivity in terms of student learning may fall as the same amount of personal attention cannot be given. This is why educators try to reduce class sizes in order to improve educational outcomes. (*Panditha Bandara, 2013*)

Now, after reading the above example, think about the education system of Papua New Guinea?

NOW READ THE SUMMARY OF 11.2.2 ON THE NEXT PAGE.



11.2.2: SUMMARY

- Production process refers to the steps followed in order to change raw materials into finished goods to satisfy needs and wants.
 - Inputs are resources or raw materials used to produce a final good.
 - a. Fixed inputs
 - b. Variable inputs
 - Outputs are the final goods and services produced or the outcome of the production process.
 - a. Capital goods and services
 - b. consumer goods and services
 - Production possibility refers to the alternative combinations of the amounts of two goods or services that an economy can produce with a given amount of resources.
 - A production possibility curve is a representation of the amount of two different goods that can be obtained by shifting resources from the production of one good to the production of the other. It is used to describe a society's choice between two different goods.
 - The three stages of production are;
 - a. Primary is the extraction of natural resources or raw materials
 - b. Secondary is the making and changing of raw materials to finished goods
 - c. Tertiary production is the provision of services to the consumers
 - Cost of production refers to all the cost paid for in producing a good or providing a service.
 - a. Fixed costs do not vary with the numbers of goods produced. They are constant over a period of time.
 - b. Variable costs vary with the number of output. The more a company produces, more materials are needed which automatically increases the variable cost and vice versa.
 - c. Total cost is the sum of fixed and variable costs.
 - d. Average cost is the cost of producing one unit or a single good or product.
 - e. Marginal cost is the additional cost of producing one extra unit of a product or good.
 - Revenue is the money received from the sales of the products produced.
 - a. Average revenue is the income received from each item sold.
 - b. Marginal revenue is the extra income earned from the extra unit of output.
 - c. Total revenue is the sum of average and marginal revenues.
 - Profit of the business is the difference between the total cost and the total revenue.
 - The optimum point of production in a business is where the average cost of producing a good is at the lowest possible level.
-



- The profit of a business is maximised when the Marginal Cost is equal to the Marginal Revenue ($MC=MR$).
 - The break –even point of production is when the expenses of the business are equal to the revenues ($\text{Expenses} = \text{Revenue}$).
 - Law of diminishing returns is when one factor of production (number of workers, for example) is increased while other factors (machines and workspace, for example) are held constant, the output per unit of the variable factor will increase but at a certain point it will eventually diminish or decrease.
 - Increasing returns to scale occurs when a firm increases its inputs, and its output increases more than proportionately. If, for example, inputs double and outputs more than double, we experience increasing returns to scale
 - Constant returns to scale is when inputs increase and outputs increase by the same percentage
 - Increasing returns to scale is associated with economies of scale.
 - Decreasing returns to scale is associated with diseconomies to scale.
 - An economy of scale is the situation experienced by a firm when the Average Cost per unit is decreasing. Economies of scale explains the relationship between the long run average cost of producing a unit of good with increasing level of output.
 - A diseconomy of scale is an economic concept referring to a situation in which economies of scale no longer function for a firm. Rather than experiencing continued decreasing costs per increase in output, firms see an increase in marginal cost when output is increased.
-

NOW DO STUDENT LEARNING ACTIVITY 11.2.2 ON THE NEXT PAGE.



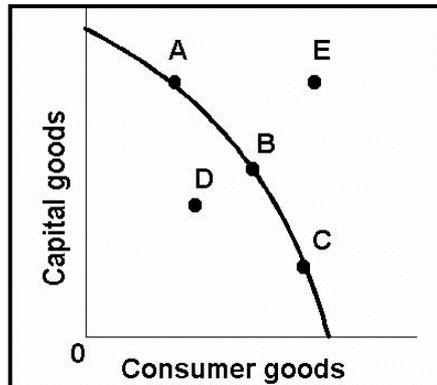
Learning Activity 11.2.2

Read the questions carefully and write the answers on the spaces provided.

1. Choose a product that is processed in Papua New Guinea or one that you can make.
 - a. Describe the processes or steps in making that product with diagrams.
 - b. List the inputs used in this production process.
 - c. List the outputs of the production process.



Refer to the diagram below to answer question 2.



2. Describe the production possibilities of capital and consumer goods on the following points.

a. B _____

b. D _____

c. E _____

3. Complete the table by making a list of firms under each stage of production.

Primary	Secondary	Tertiary
RH Ramu Logging	Global Construction	Digicel Communication Company

**Refer to the information below on OK Tedi Mine to answer question 4.**

The Ok Tedi Mine is an open-pit copper and gold mine in Papua New Guinea located near the headwaters of the Ok Tedi River, in the Star Mountains Rural LLG of the North Fly District of the Western Province of Papua New Guinea. Discharges from the mine have caused widespread and diverse harm, both environmentally and socially, to the 50,000 people who live in the 120 villages downstream of the mine.

The mine is operated by Ok Tedi Mining Limited (OTML) which is majority owned by the PNG Sustainable Development Program Limited (PNGSDPL). Prior to 2002, it was majority owned by BHP Billiton—the largest mining company in the world since a merger in 2001.

Located in a remote area of PNG, above 2,000 m (6,600 ft) on Mount Fubilan, in a region of high rainfall and frequent earthquakes, mine development posed serious challenges.^[1] The town of Tabubil was built to serve the mining operation. (From www.wikipedia.com)

4. List the external benefits and external costs of OK Tedi Mine on the surrounding community.

External Benefits	External Costs

5. Complete the following table on production costs of a firm.

Total Product (Output)	Total Cost (TC) (K)	Average Cost (AV)	Marginal Cost (MC)
0	10		
1	20		
2	28		
3	34		
4	46		
5	62		
6	84		
7	112		



6. Use the information in the table (Q5) to construct cost curves (total cost, average cost and marginal cost). Please note, all the three curves must be plotted on the same graph.

7. Differentiate between diminishing returns and economies of scale. **Sketch** a graph to show the difference.

CHECK YOUR ANSWERS AT THE END OF THE UNIT.



TOPIC: 3: SPECIALISATION OF PRODUCTIVE RESOURCES

Most people earn the money they need to exchange for the goods and services they want by doing one particular occupation, such as plumbing, engineering, accountancy, printing or making containers,. People do this to take full advantage of their natural talents or the abilities they have acquired from their education or training.

This is a very different situation from that faced by our primitive ancestors who tried to be self-sufficient, that is each person or community produced all the things they needed and wanted for themselves. For example, growing and hunting their own food, making their own clothes and shelter.

However, people were not always very good at doing everything for themselves and so people slowly started to specialise in doing the tasks they were best able to do. Some people specialised in making spear heads, while others made the spear rods. Others would hunt, while others built shelters and made cooking pots.



Specific Learning Outcomes

At the end of this topic, students will be able to;

- differentiate between specialisation and division of labour
- state the importance of specialisation and division of labour
- identify the characteristics of specialisation and division of labour
- identify and describe forms of specialisation
- define productivity
- describe the relationship between specialisation and productivity
- list and discuss factors which increase productivity
- discuss productivity and economic growth in Papua New Guinea



11.2.3.1: Specialisation and Division of Labour

Specialisation was the first step towards a wealthier society. A community which practised specialisation was able to produce more than enough food, clothes, pots and other things.

Specialisation is concentrating on producing particular types of goods and services, and relying on others to provide what one does not produce.

Early Specialisation

Specialisation began in early times within a family or tribe of people in a village where the fruits of their labour were shared among the whole family or tribe. In subsistence economies people produced goods mainly for their own consumption or family use. Each person's share depended on his or her contribution to production, then the total output of the whole group. Although there was division of labour, particularly between the sexes, there was limited specialisation. The table below shows division of labour between men and women in subsistence economies.

Women	Men
Collecting vegetable foods	Hunting and fishing
Cooking	Making tools
Making baskets and pots	Making weapons
Care of children	Carving and painting
Educating children	Administering laws
Collecting water and firewood	Care of sacred objects
Care of animals and gardens	Organising ceremonies
Care of the house	Building houses

However, as we move into medieval times, people began to specialise in trades. Labour was divided up according to what good or service they produced and **medieval guilds** developed. These were groups of skilled trades people trained to be bakers, engineers, butchers and carpenters.

Since then, the production process has been broken down into series of separate operations, each one performed by a separate person or a group of people.

For instance, in the early days of the motor - car industry, one person would put together the entire engine. However, the leading car manufacturer, Henry Ford decided to separate the work into eighty-four (84) varied operations. Eighty-four people were needed to build a whole engine instead of just one person. This meant more engines could be built each day.



Specialisation and the division of labour means that if people concentrate on doing those tasks, they are best able to do, much more can be produced and more wealth created. This means, peoples' standard of living would improve and they would have greater choice.

With specialisation people need to exchange or trade. If people specialise in producing one particular good or service, then they exchange the surplus for other goods and services to have a variety to satisfy their needs and wants. In modern economies, it is difficult for one person to produce a good alone.



11.2.3.2: Forms of Specialisation

Specialisation of labour takes three (3) forms;

1. Specialisation takes place between industries

Different industries specialising in producing different goods and services. For example, the coffee, clothing and baking industries.

2. Specialisation in the types of work done

People are specialised in the type of work they do. Teachers are specialised in teaching while doctors are specialised in treating sick people. Geologists study rocks while a chef prepares delicious food.

3. Specialisation within the different stages in the production process

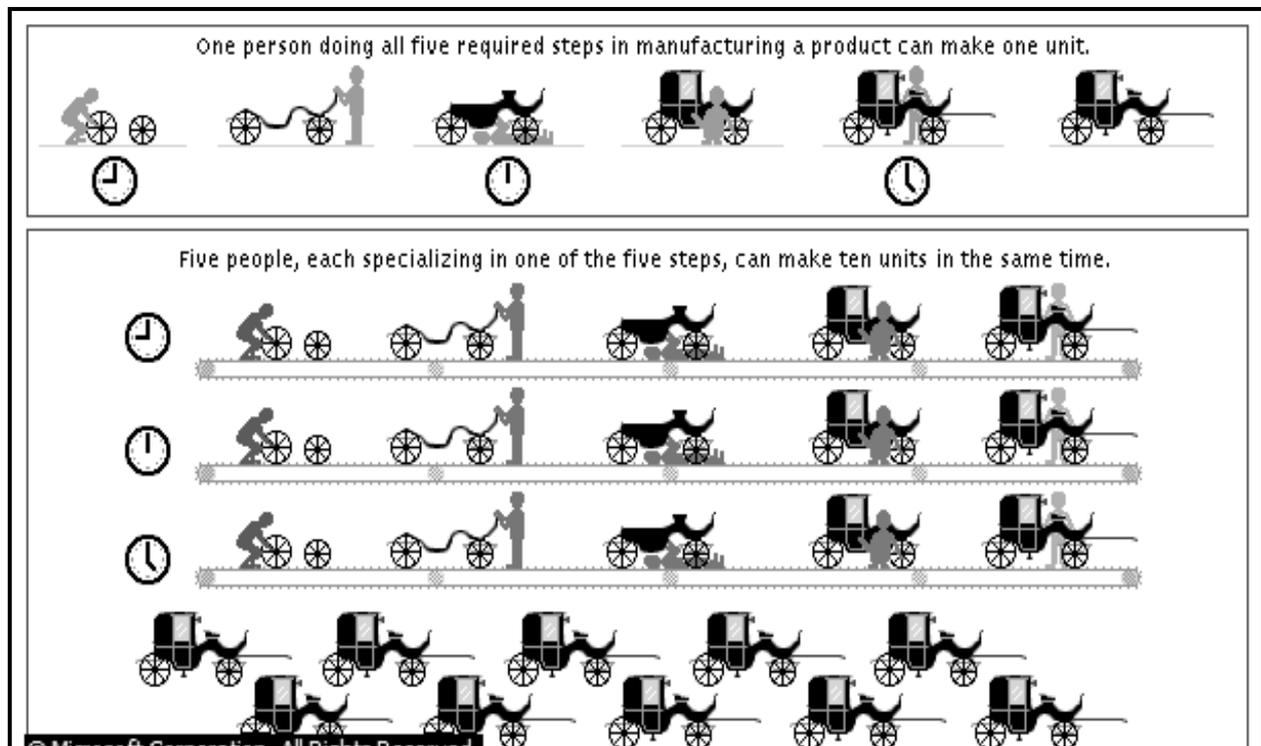
This is the more highly developed form of specialisation which occurs within the different stages or steps in the production process. For instance, Henry Ford's idea mentioned. When producing biscuits, a worker may be there only for packing or sealing the packet. This is actually where the division of labour occurs.

The increased production achieved by specialisation is the result of the division of labour.

Division of Labour is the breaking down of the production process into a number of steps/stages and the specialisation of workers in particular tasks.

Look at the diagram on the next page and see how division of labour works in industries.

DIVISION OF LABOR IN INDUSTRY



Source: Microsoft® Encarta® 2008. © 1993-2007 Microsoft Corporation.

Division of labor is a basic tenet of industrialisation. In division of labor, each worker is assigned to a different task, or step, in the manufacturing process, and as a result, total production increases. As this illustration shows, one person performing all five steps in the manufacture of a product can make one unit in a day. Five workers, each specialising in one of the five steps, can make 10 units in the same amount of time.

The organisation of labour into a number of divided and specialist tasks have brought a number of advantages to firms and to the economy.

Advantages of Specialisation (Division of Labour)

1. More goods and services are produced

When workers become specialists in the jobs they do, repetition of the same operation increases the skill and speed of the worker and as a result more is produced. In other words, it increases productivity.

2. Full use is made of everyone's abilities

With the division of labour, there is greater chance that people will be able to do those things at which they are best and which interest them the most.

3. Time is saved



If a person had to do many different tasks or operations, then much time would be wasted, switching from one task to another.

4. It allows the use of machinery

As labour is divided up into specialist tasks, it becomes worthwhile to use machinery, which allows a further saving in time and effort. However, many people complained that their jobs are taken over by machines and they have been unemployed.

Disadvantages of Specialisation (Division of Labour)

1. Work becomes boring

A worker who performs the same operation each and every day becomes bored.

2. Workers feel alienated

Workers feel unimportant because they can no longer see the final result of their efforts. Think of the chance of achievement and pride you would have if you could build a complete car by yourself instead of just tightening the wheels.

3. People become too dependent upon each other

Specialisation and division of labour means that people come to rely on others for the provision of goods and services. For example, people who do not produce food rely on those who do, while the people who produce food rely on others for the provision of other things such as machinery and fertilizer. This illustrates how workers in one industry depend on other industries.

4. Products are all the same

The goods produced under a system of specialisation turn out in big numbers and share the same design. They are said to be standardised.



11.2.3.3: Productivity in Papua New Guinea

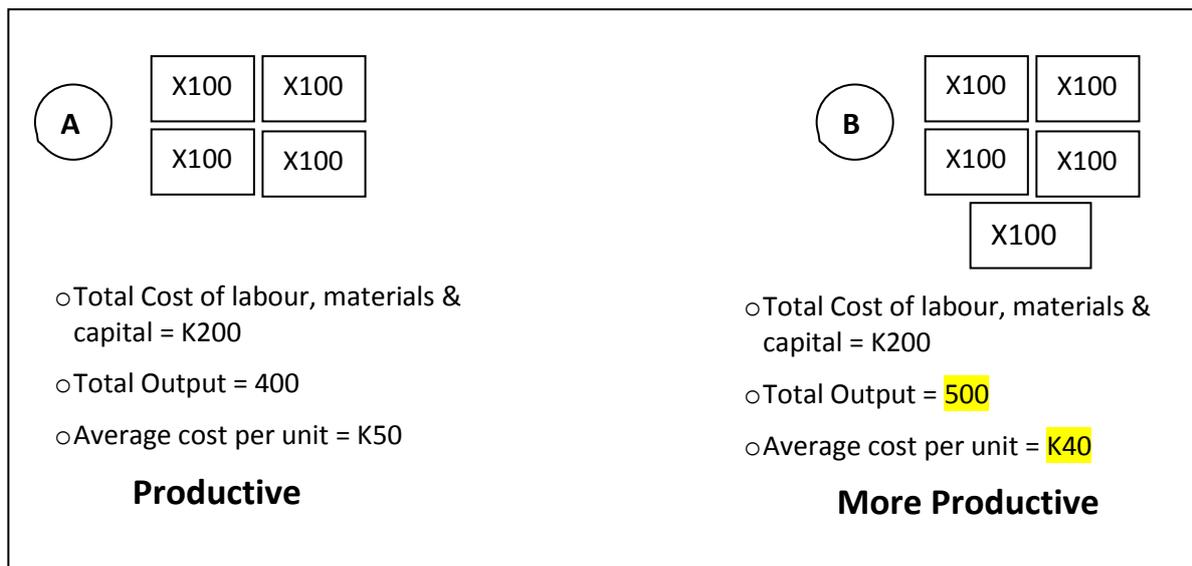
According to the Oxford Dictionary of economics, *productivity is the amount of output that can be produced from a given input of resources by a firm, an industry or by a country.*

For example, a firm that uses 10 units of labour, land and capital to produce 40 units of output is twice as productive as a firm that uses 10 units of resources to produce 20 units of output.

The aim of any business is to combine its resources in the most efficient way. That is, it will attempt to maximise the productivity of its resources in order to produce as much as it can at the lowest cost possible.

For instance, a construction firm that employs 10 carpenters and yet supplies only 1 hammer, drill and chisel between them has clearly not combined labour and capital in the most efficient way. By increasing the input of capital, that is more hammers and chisel, the firm will increase productivity.

In general, productivity in a firm will increase if more output can be produced with the same input of resources, or if fewer resources can be used to produce the same amount of output.



From this you can see that the amount of resources used is the same. However, the output varies which means that firm 'B' is more productive than firm 'A'. Productivity is used for comparison purposes. It is used to compare the output or production levels of similar firms in an industry. It is a key factor which determines cost per unit and competitiveness by using less input to produce a given level of output.



Factors which increase Productivity

1. The nature of the product

Products in high demand, in domestic and international markets will tend to be mass produced using a large input of automated machinery

2. The relative prices of labour and capital

If wages are high, a firm may decide to use more capital instead of labour.

3. The size of the firm

As a firm grows in size, it tends to employ more capital relative to labour.

Labour Productivity

Labour productivity which indicates output per labour is an important indicator that measures labour efficiency. It is calculated by dividing total output in a given period of time by the number of workers employed.

$$\text{Average product of labour} = \frac{\text{Total Output}}{\text{Number of employees}}$$

The average product of a labour is a useful measure of how efficient workers are.

For example, if a company employs 10 workers to produce 200 DVD players per day, then the average product per labour is;

$$\begin{aligned} \text{APL} &= \text{T O} \div \# \text{ of employees} \\ \text{APL} &= 200 \div 10 \\ \text{APL} &= 20 \text{ DVD players} \end{aligned}$$

If output rises to 220 DVD players per day without the company employing any more workers, then productivity will have increased to 22 DVDs per worker per day. When output increases, it can be seen as a productivity improvement.

How can firms increase the productivity of Labour?

A firm can attempt to raise the productivity of its workers through a combination of the following:

1. Train workers to improve their existing skills.
2. Rewarding increased productivity with performance –related pay and bonus payments
3. Encouraging employees to buy shares to in their organisations.
4. Improving job satisfaction (improving the working environment and team working.)



5. Replacing old plant and machinery with new ones.
6. Introducing new production processes and working practices designed to reduce waste, improve quality and increase output

Why increasing Productivity?

1. Increased profits
2. Lower costs of production
3. Improve market competitiveness

Productivity in Papua New Guinea

Papua New Guinea's economy is dominated by a large – labour intensive agricultural sector and a capital intensive minerals sector. The formal sector consists of extractive industries, cash crop production and a small manufacturing sector. The informal sector is largely subsistence agriculture. Over the years Papua New Guinea's uneven growth rates have been accompanied by structural transformation.

Unlike the trend observed in other developing countries, the share in Gross Domestic Product (GDP) of the primary sector has increased steadily since 1975 while those of the secondary and tertiary sectors have declined.

The main agricultural sector including the cash and subsistence crops is dominated by small farmers and has been hurt by the deteriorating physical infrastructure and of weak law and order.

The mining sector's share of GDP has increased. This sector is mostly foreign –owned, though the government holds equity in some projects.

The manufacturing sector has been declining. This sector includes food, soft drinks, beer, tobacco processing, furniture making, small scale-engineering and metal processing, clothing and other lighting industries. This sector is dominated by firms geared to the domestic market. Its expansion has been delayed by shortage of entrepreneurial, managerial and skilled labour, complicated regulations, high utility and transportation overheads and the high cost of labour relative to productivity. Its contribution to GDP has varied over the years.

The output of the construction sector is characterised by year to year variations reflecting the impact of large individual projects.

The service sector includes economic activities such as transportation, banking, communication and advertising. This sector has deteriorated overtime as well as community and personal services which are sensitive to weaknesses in law and order and governance.



Papua New Guinea's economic growth reductions are mostly accounted for by a significant slowdown in capital inputs and lower total factor productivity growth. On average, no productivity improvements in labour have been recorded since independence. Significantly higher productivity growth and investment will be needed to sustain higher GDP growth rates. The historical performance also indicates that, in the absence of structural reforms and stronger institutions, higher rates of productivity growth will be hard to achieve.

Below is a speech from the Prime Minister Peter O'Neill.

We are now looking to secure the development of new LNG plants, and wider gas sector development, as well as empowering sectors that will last beyond the LNG sector. These are sectors like agriculture, fisheries and tourism."

Prime Minister Hon. Peter O'Neill said to build these sectors would require hard work from everyone.

"This approach is also going to require us to do something else. This is something that I have spoken about on a number of occasions.

We must lift our productivity and improve the infrastructure which is so vital to the growth of our economy. "Productivity remains a real challenge for us. We cannot afford to be a high-cost producer both in the resources sector, and sectors like agriculture.

"We have to be able to compete not just regionally but internationally. "The PNG LNG story is a wonderful success story as a low cost project, but we need to build on that success – with the development of at least two more substantial projects in the years ahead," Prime Minister Hon. Peter O'Neill said.

He said the mining sector also continues to be impacted by low world mineral prices but it also brings challenges as well and that is to be addressed through better productivity and a competitive environment.

Factors that hinder development and greater productivity.

- Cost of Finance

It is quite difficult for locally based investors to have access to finance. The available financial instruments may not match the needs of investors due to a mismatch between the loan period and the investment requirements.

- Social Returns to Investment

Low levels of economic growth and investment can be caused by low social returns to economic activities, which in turn can be due to inadequate human capital, infrastructure and other public goods that compliment private investment. Formal employment opportunities are low in PNG and a majority of the labour force is involved in farming. Skilled human capital is scarce in most of the formal sectors of the economy.

- Infrastructure

Inadequate infrastructure adds to the cost of doing business, thus, reducing economic returns to investment. PNG's infrastructure remains less developed. Deficiencies in telecommunications, transport and electricity are the most critical constraints to development. PNG's road network is inadequate and poorly maintained.



- Law and Order

Papua New Guinea performs poorly in enforcing law and order compared to other developing countries. Port Moresby has some of the best infrastructure in the country; however, the high crime rate may be hampering its ability to attract investors and slows down economic growth.

- Control of Corruption

Corruption is an impediment to investment in which PNG is weak and unable to control.

- Political Stability

Political and policy stability has been improving with the introduction of the Organic Law.

Engaging employees for greater productivity

Create a sense of belonging and company advocates. An engaged workforce can have a significant impact on an organisation's performance. Employees, who have a greater sense of belonging, believe in the goals of the organisation, and share a common understanding of the behaviour needed to carry-out key tasks are far more productive.

With the cost of disengagement for business significant benefits can be gained through employee engagement including:

- higher operating incomes
- net income growth and earnings per share
- higher retention rates

NOW READ THE SUMMARY OF 11.2.3 ON THE NEXT PAGE.



11.2.3: SUMMARY

- Specialisation is concentrating on producing particular types of goods and services.
 - Division of Labour is the breaking down of the production process into a number of steps and the specialisation of workers in particular tasks.
 - Specialisation and division of labour increase productivity.
 - Forms of specialisation;
 - a. Specialisation between industries
 - b. Specialisation in the types of work done
 - c. Specialisation within the different stages in the production process.
 - Advantages of specialisation;
 - a. Production increases
 - b. Full use of everyone's ability
 - c. Saves time
 - d. Allows the use of machinery
 - Advantages of specialisation;
 - a. Work becomes boring
 - b. Workers feel alienated
 - c. People become too dependent upon each other
 - d. Products are all the same
 - Productivity is the volume of output produced using a given amount of resources.
 - Factors that increase productivity;
 - a. The nature of the product
 - b. The prices of labour and capital
 - c. The size of the firm
 - Labour productivity indicates output per labour.
 - Reason for increasing productivity;
 - a. Increased profit
 - b. Lower cost of production
 - c. Improve market competitiveness
 - Papua New Guinea's economic growth reductions are mostly accounted for by a significant slowdown in capital inputs and lower total factor productivity growth.
 - Productivity remains a real challenge for Papua New Guineans. We cannot afford to be a high-cost producer both in the resources and agriculture sectors.
-

NOW DO STUDENT LEARNING ACTIVITY 11.2.3 ON THE NEXT PAGE.

**Learning Activity 11.2.3**

1. In your own words, explain early specialisation and division of labour.

2. Differentiate between specialisation and division of labour.

3. Describe the relationship between specialisation and productivity.

4. Complete the table below by listing some examples of the forms of specialization.

Specialisation between industries	Specialisation in the types of work done	Specialisation within the different stages in the production process
Clothing industry	Electrician	Packing

YOU HAVE COME TO THE END OF UNIT 2. THE ANSWERS TO STUDENT LEARNING ACTIVITIES 11.2.1 TO 11.2.3 ARE ON THE NEXT PAGE.

**ANSWERS TO STUDENT LEARNING ACTIVITIES TOPIC 1 – TOPIC 3**

TOPIC: 1

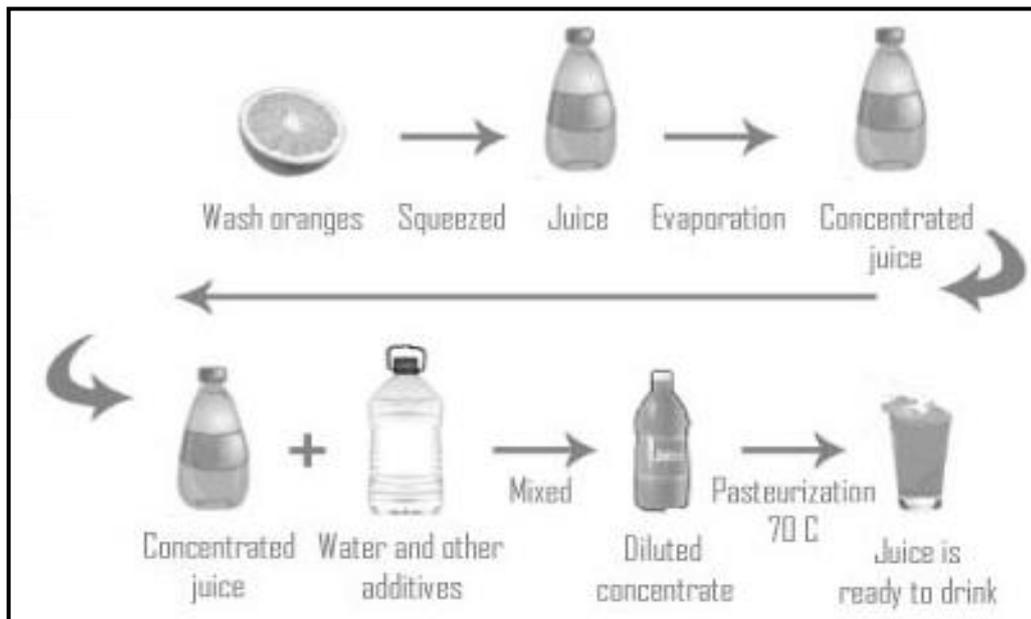
1. a. rent b. wage c. interest d. capital
2. a. Land is an economic resource because it contains all other resources. When land is used by an individual or a firm they pay rent to the person who owns the land.
b. When human physical effort is used to produce a good or a service, wages are paid to compensate for the labour.
c. Owners of capital goods are paid interest for the use of machinery for production.
d. The organisers of the factors of production in the production process receive profits. They take the risk in order to make a profit.
3. In Papua New Guinea there are two types of land ownership;
 - a. Customary land which consist of 97% owned by the indigenous people of Papua New Guinea.
 - b. The remaining 3% is called alienated land which is state land and controlled by the government. The government leases these lands to individuals and groups for development purposes.
4. Papua New Guinea is a resourceful nation. Its existence depends on the natural resources.
5. When more land is released to be used more development takes place. However, when land is not given away then it hinders economic development. When the price or rent for land increases, development will slow down but when price or rent for land decrease more development takes place.
6. Answers will vary.



TOPIC 2

1. Production Process

a. The Production of Juice



b. Inputs: Oranges, Plastic containers, water, mixer, labour, factory building etc.

c. Output: Vita Juice

2.

a. It is an efficient point of production meaning the resources are well used to produce consumer and capital goods.

b. Point D is an inefficient point meaning the country is operating or producing below the expected quantity. The resources allocated to produce consumer and capital goods are not fully utilized. Wasting of resources for production.

c. This point is unattainable because it cannot be reached with the resources available.



3.

Primary	Secondary	Tertiary
RH Ramu Logging	Global Construction	Digicel Communication Company
RD Tuna Canning	RD Tuna Canning	Bank of South Pacific
Ramu Sugar	Ramu Sugar	Mapai Transport
Barric Ramu Nico	Niugini Pot	EMTV for Advertising
Exton Mobil	Paradise Beversges (Assorted Drinks)	

4. OK Tedi Mining

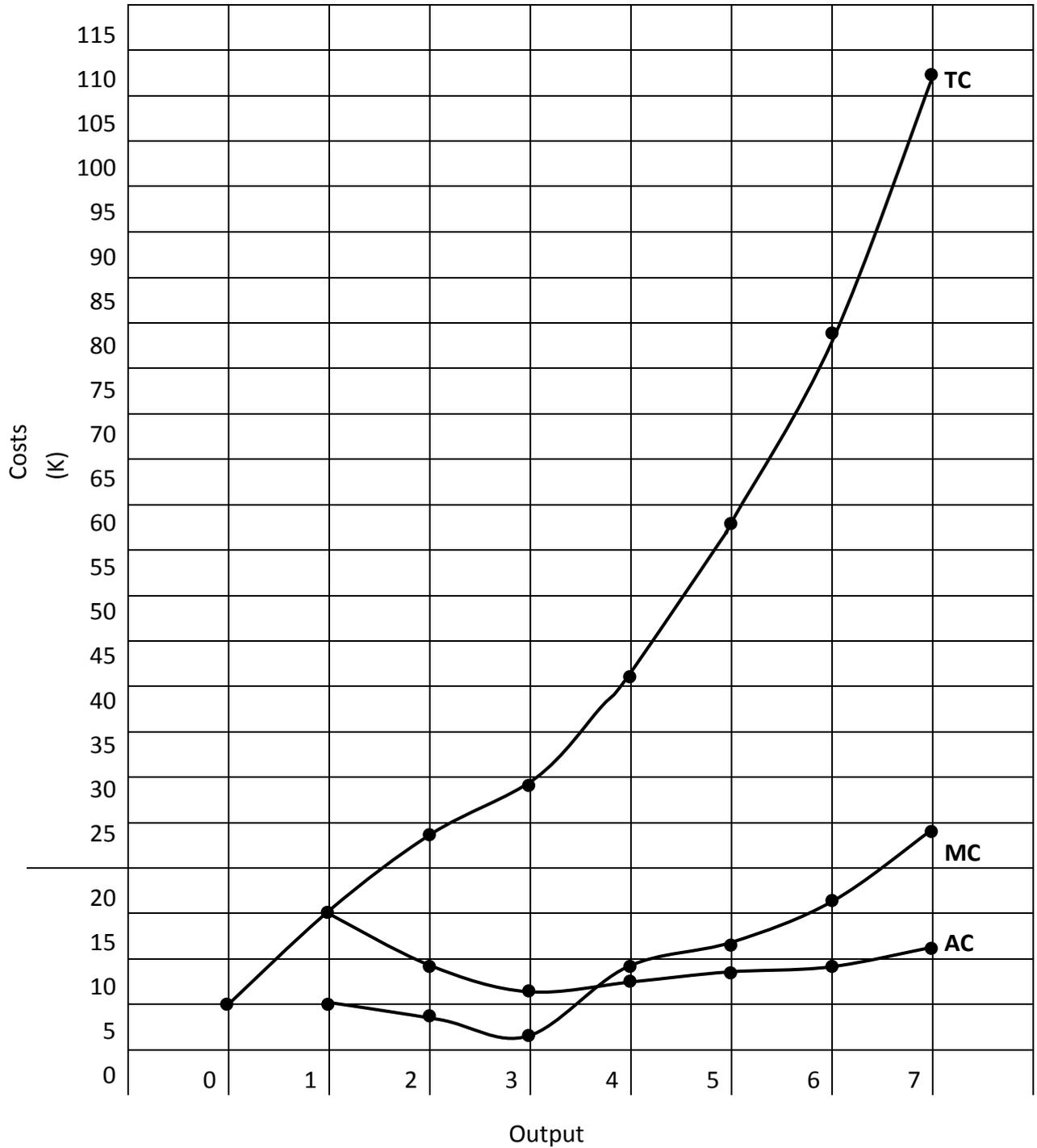
External Benefits	External Cost
<ul style="list-style-type: none"> Local people having excess to the road built by the company Start spin-off businesses such as a trade store Employment for local people Royalties for landowners Acquire skills from expatriates 	<ul style="list-style-type: none"> Pollution of the river Destruction of the forest leading to the extinction of wildlife

5.

Total Product (Output)	Total Cost (TC) (K)	Average Cost (AV)	Marginal Cost (MC)
0	10		
1	20	20	10
2	28	14.00	8
3	34	11.33	6
4	46	11.50	12
5	62	12.40	16
6	84	14.00	22
7	112	16.00	28



6. Production Cost Curves



Please note: You should have a graph similar to the one shown above showing all the costs. If you have time you may also draw three different graphs showing TC, AC and MC.



7. Law of diminishing returns is when one factor of production (number of workers, for example) is increased while other factors (machines and workspace, for example) are held constant, the output per unit of the variable factor will increase but at a certain point it will eventually diminish or decrease.

Whereas, economies of scale is an economy of scale is the situation experienced by a firm when the average cost i.e., cost per unit is decreasing. Economies of scale explains the relationship between the long run average cost of producing a unit of good with increasing level of output.



TOPIC 3

1. In traditional subsistence and barter economies, there was limited specialisation. It began within the families and tribes. They produced goods for self-consumption. In producing food, the tasks were divided among the family members. Each one of them knew exactly what to do and the fruits of their effort were shared among themselves depending on their contribution.
2. Specialisation is when concentrating on doing one particular job and division of labour is breaking down the process of production into a number of steps.
3. Specialisation increases productivity.

4.

Specialisation between industries	Specialisation in the types of work done	Specialisation within the different stages in the production process
Clothing industry Automobile industry Food industry	Electrician Teacher An accountant Plumber Singer	Labeling Packing Advertising Distributing

NOW CHECK THE LIST OF BOOKS USED IN THIS MODULE ON THE NEXT PAGE.



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www.google.com.

YOU HAVE COME TO THE END OF UNIT 2. NOW DO ASSESSMENT TASKS IN ASSESSMENT BOOK 2.



PC NO	FODE PROVINCIAL CENTRE	ADDRESS	CUG PHONES (COORDINATORS)	WIRELESS PHONES	SENIOR CLERK	CUG PHONE
1	DARU	P. O. Box 68, Daru	72228146	77522841	Mr Kevin Sere	72229047
2	KEREMA	P. O. Box 86, Kerema	72228124	77522842	Mr David Saria	72229049
3	CENTRAL	C/- FODE HQ	72228110	77522843	Mr Aubi Elodo	72229050
4	ALOTAU	P. O. Box 822, Alotau	72228130	77522844	Mr Albi Bapera	72229051
5	POPONDETTA	P. O. Box 71, Popondetta	72228138	77522845	Mr Stansen Sevese	72229052
6	MENDI	P. O. Box 237, Mendi	72228142	77522846	Mr Wari Tange	72229053
7	GOROKA	P. O. Box 990, Goroka	72228116	77522847	Ms Ovin Tuki	72229054
8	KUNDIAWA	P. O. Box 95, Kundiawa	72228144	77522848	Mr Denge Gundu	72229056
9	MT HAGEN	P. O. Box 418, Mt. Hagen	72228148	77522849	Mr Robert Maki	72229057
10	VANIMO	P. O. Box 38, Vanimo	72228140	77522850	Mrs Isabella Danti	72229060
11	WEWAK	P. O. Box 583, Wewak	72228122	77522851	Mr David Wombui	72229062
12	MADANG	P. O. Box 2071, Madang	72228126	77522852	Mrs Applonia Bogg	72229063
13	LAE	P. O. Box 4969, Lae	72228132	77522853	Ms Cathrine Kila	72229064
14	KIMBE	P. O. Box 328, Kimbe	72228150	77522854	Mrs Bernadette Litom	72229065
15	RABAU	P. O. Box 83, Kokopo	72228118	77522855	Mrs Verlyn Vavai	72229067
16	KAVIENG	P. O. Box 284, Kavieng	72228136	77522856	Mr John Lasisi	72229069
17	BUKA	P. O. Box 154, Buka	72228108	77522857	Mr Marlyne Meiskamel	72229073
18	MANUS	P. O. Box 41, Lorengau	72228128	77522858	Ms Roslyn Keket	72229080
19	NCD	C/- FODE HQ	72228134	77522859	Mrs Marina Tomiyavau	72229081
20	WABAG	P. O. Box 259, Wabag	72228120	77522860	Mr Salas Kamberan	72229082
21	HELA	P. O. Box 63, Tari	72228141	77522861	Mr Ogai John	72229083
22	JIWAKA	c/- FODE Hagen	72228143	77522862	Joseph Walep	72229085

**SUBJECTS AND GRADE TO STUDY**

Grade Levels	Subjects
Grades 7 and 8	1. English Language
	2. Mathematics
	3. Science
	4. Social Science
	5. Making a Living
	6. Personal Development
Grades 9 and 10	1. English
	2. Mathematics
	3. Science – Biology/Chemistry/Physics
	4. Social Science
	5. Business Studies
	6. Personal Development
	7. Design and Technology- Computing
Grades 11 and 12	1. English - Applied English/Language and Literature
	2. Mathematics - Mathematics A/Mathematics B
	3. Science – Biology/Chemistry/Physics
	4. Social Science – History/Geography/Economics
	5. Business Studies
	6. Personal Development
	7. ICT

REMEMBER

- For **Grades 7 and 8**, you are required to do all six (6) courses.
- For **Grades 9 and 10**, you must study English, Mathematics, Science, Personal Development, Social Science and Commerce, Design and Technology-Computing is optional.
- For **Grades 11 and 12**, you are required to complete seven (7) out of thirteen (13) courses to be certified.
- For **Matriculation**, you must successfully complete 8 courses; 5 core and 3 optional courses.

Matriculation Certificate**CORE COURSES**

- Basic English
- English 1
- English 2
- Basic Maths
- Maths 1
- Maths 2
- History of Science & Technology

OPTIONAL COURSES

- Science Stream:
Biology, Chemistry and Physics
- Social Science Stream:
Geography, Introduction to Economics,
and Asia and the Modern World