Tutorial 2

PRT 3006

Economy growth element
5 capitals assets for agricultural systems

1. Natural capital
2. Social capital
3. Human capital
4. Physical capital
5. Financial capital

5 capitals assets for agricultural systems

1. Natural capital – produces environmental goods and services and is the source of food, wood and fibre; water supply and regulation; treatment, assimilation and decomposition of wastes; nutrient cycling and fixation; soil formation; biological control of pests, climate regulation; wildlife habitats; storm protection and flood control; C sequestration; pollination; and recreation and leisure
2. **Social capital** – yields a flow mutually beneficial collective action, contributing to the cohesiveness of people in their societies.

- Include norms, values and attitudes that predispose people to cooperate; relations of trust, reciprocity and obligations; and common rules and sanctions mutually agreed or handed down.
3. **Human capital** – total capability residing in individuals, based on their stock of knowledge skills, health and nutrition.
   - It is enhanced by access to service such as schools, medical services and adult training
   - People’s productivity is increased by their capacity to interact with productive technologies and other people
   - Leadership and organizational skills are important in making other resources more valuable

4. **Physical capital** is the store of human-made material resources and comprises buildings, such as housing and factories, market infrastructure, irrigation works, roads and bridges, tools and tractors, communications and energy and transportation systems, which make labour more productive.
5. **Financial capital** is more of an accounting concept, as it serves as a facilitating role rather than as a source of productivity in and of itself. It represents accumulated claims on goods and services, built up through financial systems that gather savings and issue credit such as pensions, remittances, welfare payments, grants and subsidies.

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**Externality - Definition**

1. Is something that, while it **does not monetarily affect the producer of a goods**, does influence the standard of living of society as a whole.

2. In economics, an externality (or transaction spillover) is a **cost or benefit**, not transmitted through prices, incurred by a party who did not agree to the action causing the **COST or BENEFIT**.
3. As third party (or spill-over) effects arising from the production and/or consumption of goods and services for which **no appropriate compensation** is paid.

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**Economics studies two forms of externalities.**

i. **+ve externality / external benefit**: something benefits society, but in such a way that the producer cannot fully profit from the gains made.

  e.g. A cleaner environment certainly benefits society, but does not increase profits for the company responsible for it.
  
  e.g. A beekeeper keeps the bees for their honey. A side effect or externality associated with his activity is the pollination of surrounding crops by the bees. The value generated by the pollination may be more important than the value of the harvested honey.
ii. **-ve externality / external cost:** something costs the producer nothing, but is costly to society in general.

A negative externality is an action of a product on consumers that imposes a negative side effect on a third party; it is "social cost". e.g. pollution. A company that pollutes loses no money in doing so, but society must pay heavily to take care of the problem pollution caused.

The study of externalities by economists has become extensive in recent years - not least because of concerns about the link between the economy and the environment.
Supply and demand diagram

The demand curve is the amount that will be bought at a given price.

The supply curve is the quantity that producers are willing to make at a given price.

An extra supply curve is added, as in the diagrams below.
An extra demand curve is added, as in the diagrams below.

Private costs for a producer of a good, service, or activity include the costs the firm pays to purchase capital equipment, hire labor, and buy materials or other inputs.

Social costs include both the private costs and any other external costs to society arising from the production or consumption of a good or service.
Â SOCIAL COST = PRIVATE COST + EXTERNALITY COST

Â External costs, on the other hand, are not reflected on firms' income statements or in consumers' decisions.

Â However, external costs remain costs to society, regardless of who pays for them.

Â Consider a firm that attempts to save money by not installing water pollution control equipment.

Â Because of the firm's actions, cities located down river will have to pay to clean the water before it is fit for drinking, the public may find that recreational use of the river is restricted, and the fishing industry may be harmed.

Â When external costs like these exist, they must be added to private costs to determine social costs and to ensure that a socially efficient rate of output is generated.

Using Social Costs (Private + External Costs) Results in Higher Prices and Lower Output and Better Resource Use

Lower output typically would also reduce the amount of pollution generated by the activity.
e.g.: a chemical factory emits wastage as a by-product into nearby rivers and into the atmosphere. This creates negative externalities which impose higher social costs on other firms and consumers. e.g. clean up costs and health costs.

Society is better off when production and consumption decisions are based on social costs that include external costs, because external costs really do matter in the real world.

Policy makers look for ways to make firms and consumers internalize or take into account the external costs they create when they make production and consumption decisions.
Externalities

- Can cause market failure (kegagalan pasaran) if the price mechanism does not take into account the full social costs and social benefits of production and consumption.

- The quantity of a product demanded by consumers does not equate to the quantity supplied by suppliers (Keseimbangan tak tercapai).

MARKET FAILURE AND EXTERNALITIES

- Negative production externalities: marginal social cost > private marginal cost.

The marginal cost of an additional unit of output is the cost of the additional inputs needed to produce that output.
Why do externalities lead to market failure?

If we assume that the producer is interested in maximising profits - then they will only take into account the private costs and private benefits arising from their supply of the product.

We can see from the diagram below that the profit-maximising level of output is at Q1. However the socially efficient level of production would consider the external costs too. The social optimum output level is lower at Q2.

Marginal revenue is the revenue obtained from the last unit sold.
Â This leads to the **private optimum output being greater than the social optimum** level of production.

Â The producer creating the externality *does not* take the effects of externalities into their own calculations.

Â In the diagram above, the private optimum output is when **private marginal benefit = private marginal cost**, giving an output of Q1.

Â For society as a whole though the social optimum is where **social marginal benefit = social marginal cost** at output Q2.

Â The failure to take into account the negative externality effects is an example of **market failure**.
NEGATIVE CONSUMPTION EXTERNALITIES

Consumers can create externalities when they purchase and consume goods and services

- Pollution from cars and motorbikes
- Litter on streets and in public places
- Noise pollution from using car stereos or ghetto-blasters
- Negative externalities created by smoking and alcohol abuse
- Externalities created through the mis-treatment of animals
- Vandalism of public property
- Negative externalities arising from crime

Externalities in the agricultural sector have at least 4 features:

i. Their costs are often neglected
ii. They often occur with a time lag
iii. They often damage groups whose interests are not well represented in political / decision-making processes
iv. The identity of the source of the externality is not always known
Public Goods

*Public Goods*

• Goods or services that can be consumed by several individuals simultaneously without diminishing the value of consumption to any one of the individuals

• Is a special case of externalities and are goods for which consumption cannot be confined to a particular consumer / group of consumers

• Having characteristics of non-excludability and non-rivalry in consumption
Non-rivalry (bukan persaingan): multiple individuals can consume the same good without diminishing its value

Non-excludability (merangkumi): an individual cannot be prevented from consuming the good whether or not the individual pays for it. eg fresh air, public park, beautiful view, national defense

Basic characteristics of public goods

1. All members of the society enjoy the goods
2. It is impossible, or only at a prohibitive cost, to exclude anyone from enjoying the good
3. All members of the society enjoy the good equally
4. No property rights (will be explained later) associated with the good
Public goods are another type of market failure, in which the market price does not capture the social benefits of its provision.

For example, protection from the risks of climate change is a public good since its provision is both non-rival and non-excludable.

Non-rival means climate protection provided to one country does not reduce the level of protection to another country.

Non-excludable means it is too costly to exclude any one from receiving climate protection.

A country's incentive to invest in carbon abatement is reduced because it can "free ride" off the efforts of other countries.
Rationale for Study of PG

- Traditional public policy formulation on SA frequently fails to account for the value of PG derived from ecosystem services
- Without explicit effort to estimate value of PG, there may be risk of inappropriate public policy (e.g. subsidization, loss of ecological resources, etc)
- Valuation of PG is also needed for a proper accounting of our national income, since a trade-off between development and environment may exist

What are public goods from a sustainable agriculture?

1. Sufficient food and feed
2. Renewable resources and bioenergy
3. Production of oxygen
4. Groundwater regeneration as a source for drinking water
5. Biodiversity and landscaping
6. Recreational value of the countryside
7. Jobs and employment in rural areas
It needs clear and tough regulations and controls, but at the same time it needs the freedom and flexibility to take the optimal or most appropriate in any given situation (on the farm).

That is the difference to other businesses: agriculture is an open production system depending on weather, water, soil and sun.

The great complexity of SA is difficult to communicate to the public.

What is the major challenge when providing these public goods?

The answer: Resource efficiency

1. In the production processes on farm, machinery, energy use, input of fertilisers/pesticides, feed and feed-additives, genetic potential, innovation, production know-how and experience.

part mainly of the farmer himself
2. In terms of ecological development:

- **Soil and water protection** - soil fertility, humus content, soil structure and soil organisms
- **Erosion**
- **Emissions**: fertilisers, industry, housing
- **Enhancing of biodiversity** (contradiction between productivity on arable/grassland and enhancement of biodiversity on the same site. Solution: contracted nature protection and minimal input farming, nature protection areas, structure forming elements in the rural landscape. The highest biodiversity is only feasible by minimal input agriculture on marginal land.)

→ part of the farmer and experts and legislative/political bodies

3. In terms of the social dimension of sustainable development

- **Farm income** - the possibility to make a living, earn enough to be able to invest enough in education, training, advisory services and innovative technology
- **Social livelihood** - jobs, infrastructures, schools, hospitals, social contacts etc.
- **Building** understanding and trust in agriculture in the public at large
- **Renewable resources and bioenergy** offer new and great chances especially in the field of the social development in rural areas

→ part mainly of policy and legislative/administrative bodies
Integrated Farming Framework

Is a most practical solution for mainstream agriculture as a provider of public goods

1. Organisation, Management and Planning
2. Human and Social Capital
3. Energy Efficiency
4. Water Use and Protection
5. Emissions to Air
6. Soil Management
7. Crop Nutrition
8. Crop Protection
10. Landscape, Wildlife and Biodiversity
11. Waste Management, Product Storage and Waste Disposal
Property rights and economic growth

A property right is the exclusive authority to determine how a resource is used, whether that resource is owned by government or by individuals.

Society approves the uses selected by the holder of the property right with governmental administered force and with social ostracism.

If the resource is owned by the government, the agent who determines its use has to operate under a set of rules determined
What happens when property rights don't exist?

- The Tragedy of the Commons
- The fenced area was private property, subdivided into five portions.
- Each year the owners moved their animals to a new section.
- Fallow periods of four years gave the pastures time to recover from the grazing.
- The owners did this because they had an incentive to take care of their land.
- But no one owned the land outside the ranch. It was open to nomads and their herds....

Forms of Intellectual Property Rights

1. Patents: provide the right to prevent for 20 years the unauthorized making, selling, importing, or using of a product or technology that is recognized in the patent claim and that must demonstrate novelty and industrial utility.

   - Related devices are utility models, or petty patents, which provide exclusive rights for a shorter period for incremental inventions, and industrial designs.
In most countries patent applications are made public after a prescribed time period.

A similar type of industrial property is *plant breeders’ rights*, which have fixed terms, novelty requirements, and disclosure rules.

2. *Trademarks* protect rights to market goods and services under identified names and symbols.

Trademarks and brand names must be sufficiently unique to avoid confusing consumers, thereby playing the important role of reducing consumer search costs.
✓ These rights encourage firms to invest in name recognition and product quality.
✓ They also induce licensees to protect the value of assets by selling goods of guaranteed quality levels.

3. Trade secrets, or undisclosed information.
✓ Trade secrets are protected by legal rules against learning by rivals through dishonest means
✓ Such protection lapses if the technologies are discovered by fair means, such as independent invention or reverse engineering
✓ Rules protecting trade secrets thus promote adaptive innovation and encourage learning through legal means
4. **Copyrights:** protect literary and artistic creations and computer software, which provide exclusive rights for some period to copy and sell particular expressions of ideas after they are fixed in some medium

- Related IPRS include *neighboring rights* of performers and broadcasters, *moral rights* of original artists, and copyrights for derivative products
- Like patents, copyrights are limited in scope for various purposes of public policy. The most significant limitation is the fair-use doctrine, under which it is lawful to make **limited numbers** of copies for research and educational purposes

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**The Purposes and Mechanisms of Intellectual Property Rights**
Two central economic objectives of intellectual property protection

1. To promote investments in knowledge creation and business innovation by establishing exclusive rights to use and sell newly developed technologies, goods, and services

Absent such rights, economically valuable information could be appropriated without compensation by competitive rivals

Firms would be less willing to incur the costs of investing in research and commercialization activities

In economic terms, weak IPRS create a negative dynamic externality

They fail to overcome the problems of uncertainty in R&D and risks in competitive appropriation that are inherent in private markets for information
2. To promote widespread dissemination of new knowledge by encouraging (or requiring) rights holders to place their inventions and ideas on the market

Â Information is a form of public good in that it is inherently non-rival and, moreover, developers may find it difficult to exclude others from using it.

Â In economic terms it is socially efficient to provide wide access to new technologies and products, once they are developed, at marginal production costs.

Â Such costs could be quite low for they may entail simply copying a blueprint or making another copy of a compact disk or video.

Â The final market failure has to do with situations where no property rights (and hence no market) exist for certain goods (whether resources, services, or products used by producers or consumers).

Â These are generally referred to as open-access resources or public goods which are usable by all without payment.

Â Since such resources are difficult to value, they tend to be overexploited due to their negligible user charges.

Â eg haze
Intellectual Property Rights in Agriculture

History

• 1930: 1st patent in US on vegetatively propagated plants
• Protection of plant breeder’s right became widespread in the 2nd half of 20th century

• DOA - member of the International Union for Protection of New Varieties: protection of new varieties of plants by an intellectual property right
Plants and IP Protection

1. The US model of plant patents, which are distinct from normal patents
2. Through allowing normal patents on plants / part, such as cells
3. Through patenting plant var
4. Through applying a *sui generis* (different from all others) form of plant var protection, such as plant breeders' right
5. Through allowing patents on DNA sequences, and gene constructs including the gene, plants transformed with those constructs, the seed and progeny of those plants

Crop Royalty

- Is a royalty paid on every single unit of product on a varieties produced and sold by growers
- Resulting in lower costs to growers, and a more efficient flow of research and development funds
- Confers exclusive rights to the registered owners of a plant variety and allows them the control of production, distribution and sale of seed of that variety
A summary of the Crop Improvement Royalty System for AGWEST Varieties 2000 / 2001

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