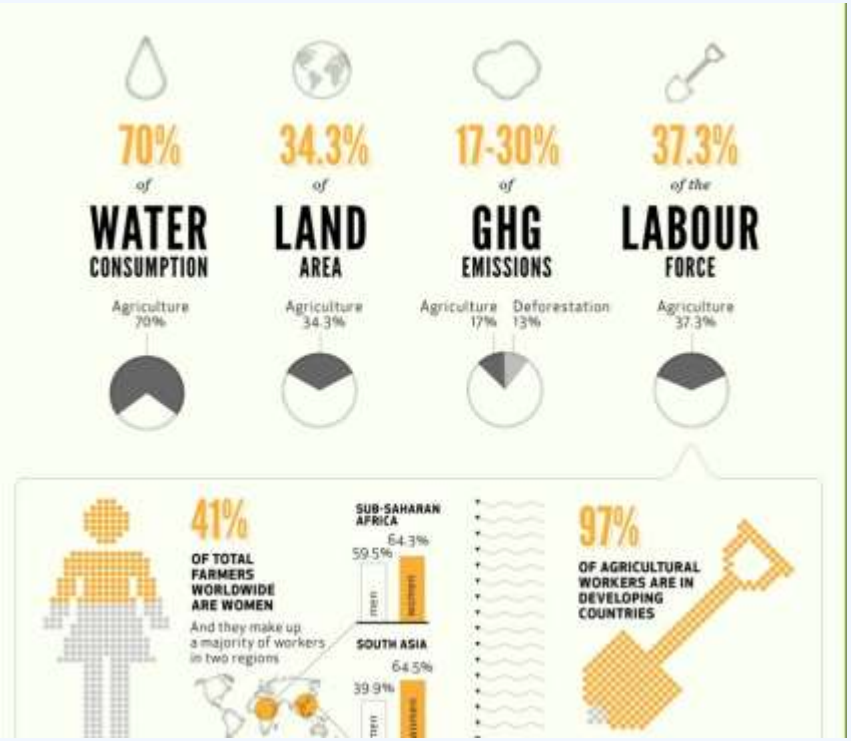
SUSTAINABILITY – FOOD SUPPLY AND PRODUCTION

Agriculture

-Food and agriculture are the world's **largest** industry.

-Growth in agriculture has a key role in reducing hunger, malnutrition and ultra poverty, although the impact of growth is slow. Agriculture underpins the economic and social development of people in developing countries in particular.



Food system

- “**Food systems surround all the people, institutions and processes by which agricultural products are produced, processed and brought to consumers**.

- The **industrial food system started with the factory system of fast food**, which changed how food was produced.

- **The food system is complex and involves many steps**.

- Sustainable: to able to be maintained at a certain rate or level.

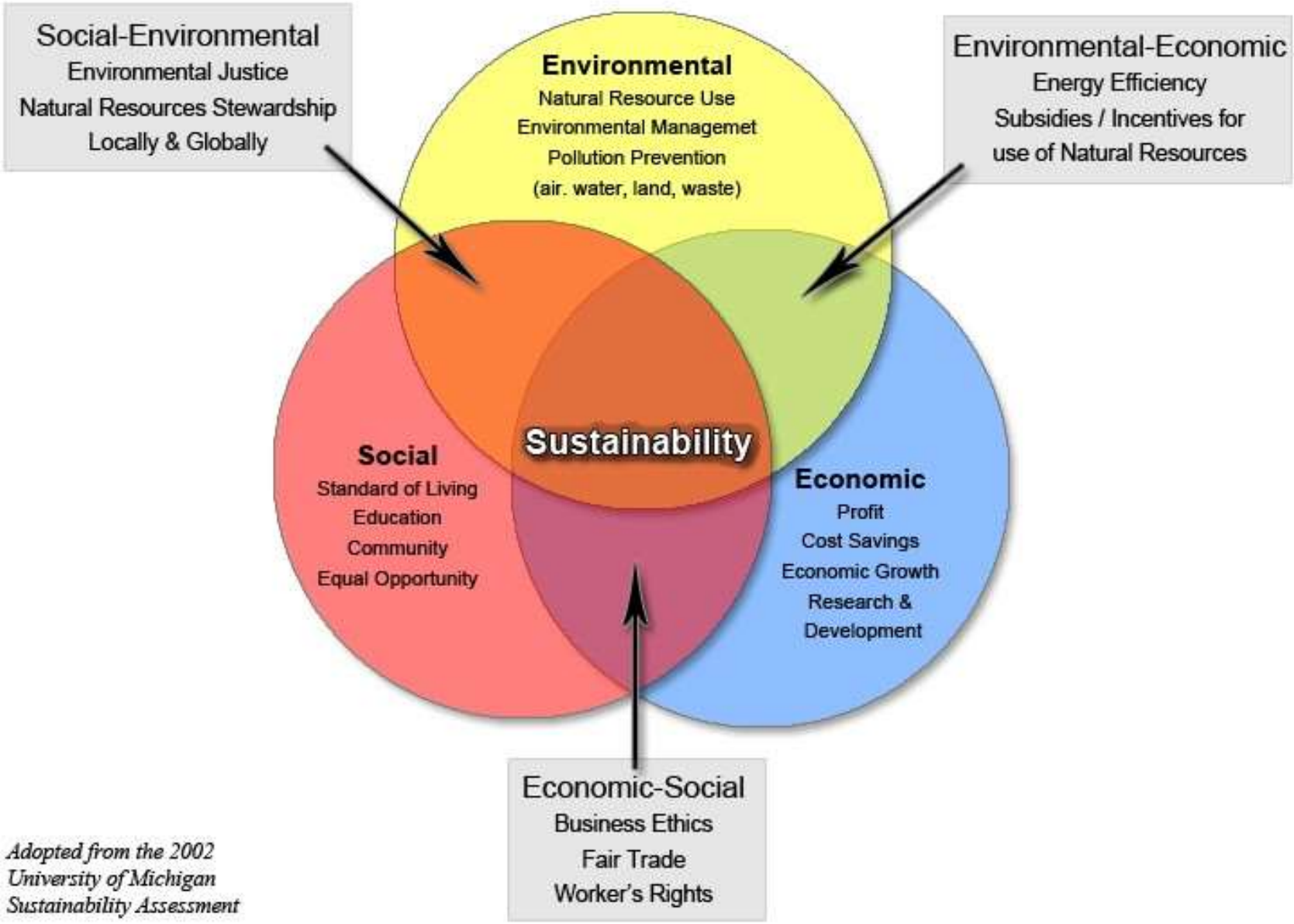
Food-secure livelihoods ultimately depend on sustainable production of food.

TASK: Watch the clip on agriculture and the green economy.
Discuss: What is the difference between food security for 'us' and sustainable food systems for all and note the key points of the discussion.

http://www.farmingfirst.org/green-economy/

What is green economy?

The Three Spheres of Sustainability



Adopted from the 2002 University of Michigan Sustainability Assessment

Sustainable system

A well-functioning system:

•Improves human health and social well-being

•Maintains environment and economy long-term

•Builds resilience at times of shocks from natural and man-made disasters. **Resilience** is the ability to withstand shock.

Food system Nutrition and sustainability

- The food system is currently **not** ensuring basic food and nutrition security and sustainability around the world.

- If we judge food security on the basis of production alone, it is already failing given hunger.

- While sustainable strategies are the ideal, there is also a need for non- sustainable strategies such as food aid in emergencies.

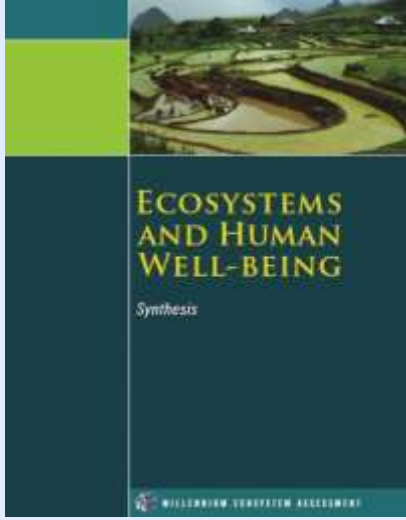
Agronomic practices

In agri-business there has been relatively little emphasis on how to grow food without as much fossil fuel (sustainable food production goes hand in hand with sustainable energy resources.)

More sustainable agricultural production systems that are proven to reduce the dependence on fossil fuels, entail combinations of:

- **Integrated pest management**
- **Strategic application of fertilisers and irrigation water**
- **Low-impact pesticides**
- **Precision-farming procedures**
- **No-till or Minimum tillage**
- **Crop diversification**
- **Crop rotation**

Unsustainable food production

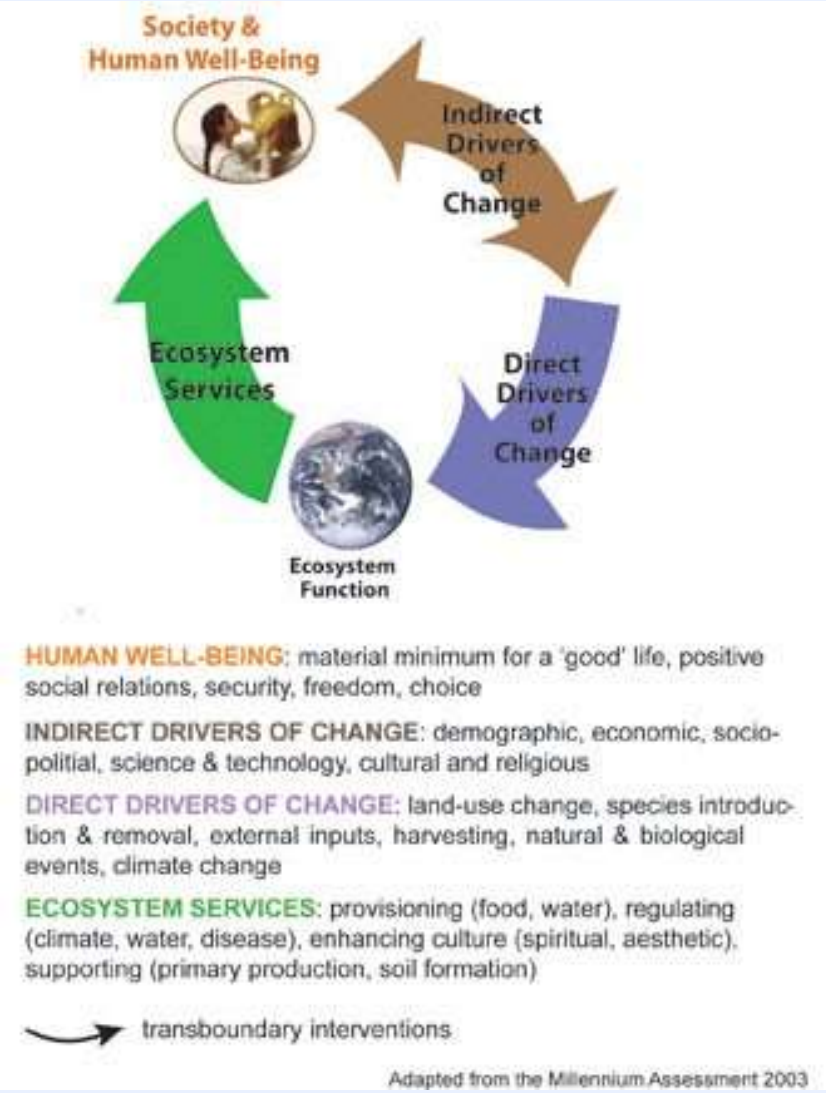


- The negative impacts of the **Green revolution** and then **GM (genetically modified)** crops and the global food system became more topical in the 1990s following food price hikes.

- International companies are recognizing more and more that it could be in their interest to shift to more sustainable practices.

- Like developed countries, developing countries adopting Green Revolution Technologies are facing resource constraints and similar changes to natural ecosystems and **loss of biodiversity** due to the scale and intensity of food production on land and in the oceans. “The existence of over 4,000 plant and animal species is threatened by agricultural intensification” (Fairfood)

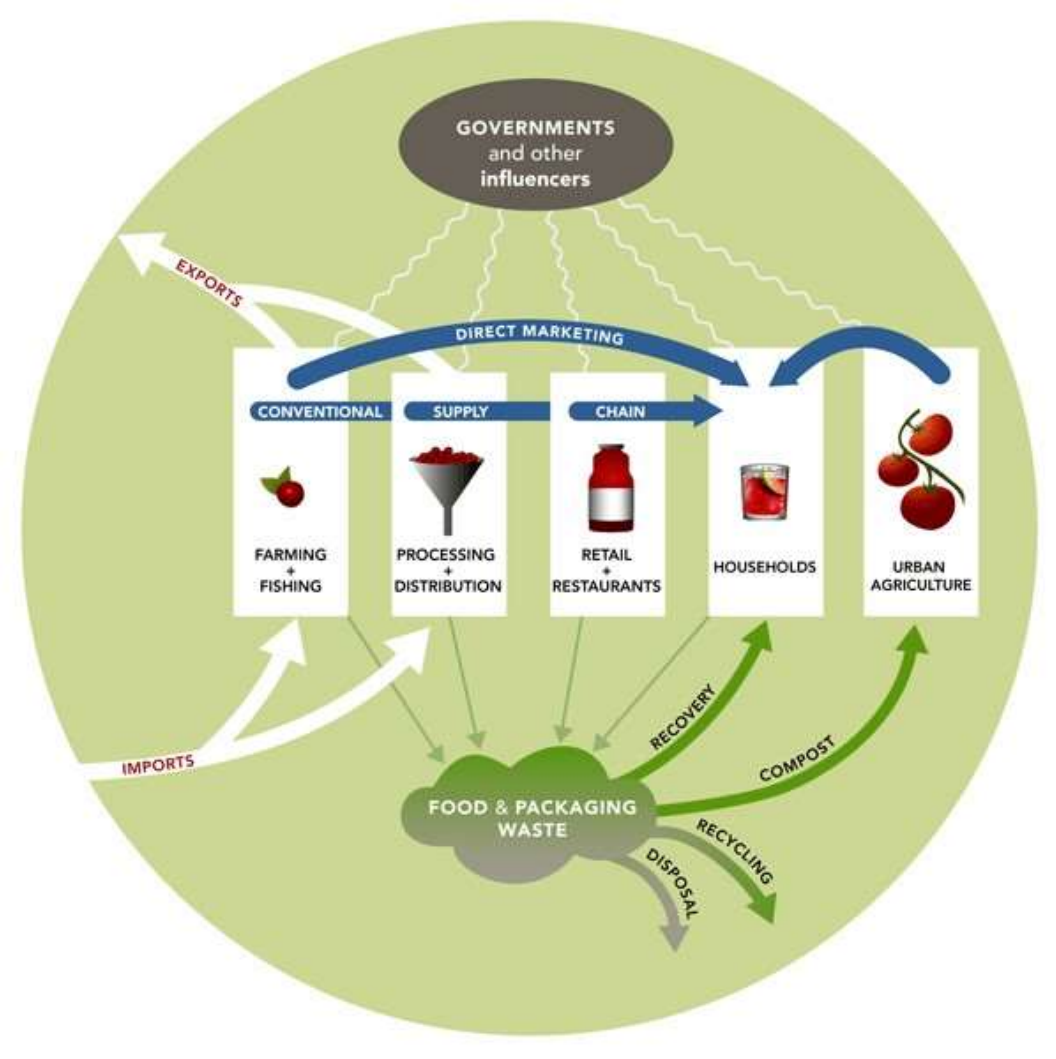
Ecosystem (1)



Agriculture needs to be thought of as part of a larger ecosystem linked to society and human well-being and ecosystem function. In order to preserve ecosystem service, the expansion of land area for agriculture needs to be restricted.

Image: http://www.micologica.com/wp-content/uploads/2013/01/Ecosystem.jpg; http://udallcenter.arizona.edu/lauralhlab/aboutecosystemservices.html

Food supply chain



Food supply defines what food is available.

Food availability is influenced by production and distribution of food – in a country and household.

Challenges: Powerful corporations

- **A small amount of corporations have increased their power and control over the entire food system**

- 300 to 500 giant corporations control the bulk – 70%.

- Throughout the world, **farmers are controlled by the debt** they need to take on to keep up with the technologies and systems imposed by **large transnational corporations (TNCs)**.

Agricultural terms

Commercial Farming - the growing of crops / rearing of livestock to make a profit. Common in most countries

Subsistence Farming - where there is just sufficient food produced to provide for the farmer's own family

Arable Farming - involves the growing of crops

Pastoral Farming - involves the rearing of livestock

Mixed Farming - involves a combination of arable and pastoral farming

Intensive Farming - where the farm size is small in comparison with the large amount of labour, and inputs of capital, fertilisers etc. which are required.

Extensive Farming - where the size of a farm is very large in comparison to the inputs of money, labour etc.. Needed

Industrial agriculture – entails intensifcation, concentration and specialisation.

The role of innovation, science and technology

- Technology can help overcome physical factors**,** e.g. temperature, water and nutrient deficiencies.

- Health innovations, more affordable transportation and communication in one part of the world can positively impact other parts.

- Technological advances can lead to greater food supply

Large-scale, high-intensity food production

Images: http://oneaction.ch/industrial-agriculture/; http://www.thinkgreenliveclean.com/2010/01/the-increased-impact-of-the-food-we-eat/

Negative impact of intensive farming

Many systems of food production are unsustainable with environmental issues brought on in large part by the high-impact modern food production started in the developed world after WWII. These lead to:

i) **Overuse of chemicals and technology** inherent in the **high use of fossil fuel-derived energy** for synthesis of nitrogen fertilisers and pesticides
ii) **Environmental pollution and human health issues**
iii) **Excess use of fertilizers** with their run-off of **nitrogen and phosphates damages water resources**
iv) **Substantial quantities of greenhouse gases** and other pollutants contributing to air contamination
v) **Soil degradation** of intensive farming eroding the overall base of agriculture
vi) **history of earth abuse and soil erosion.**
vii) **Depleted commercial fisheries**, endangered bird species and extinct insects that preyed on pests; and an increase in insect-resistant pest species.

Organic farming

- Relatively low impact on the environment, whereas industrial farming can exceed the biophysical limits of the soil.
- Usually less profitable than more technologically based types
- The majority of farmers in developing countries use subsistence and small scale production methods, often organic.
- Markets for organic food are expanding as more people consider it worthwhile to pay more for food about which they know more.

TASK: (10 marks)

Research about the food production methods in Canada and compare them to your country.

1.What do you think the future of agriculture and food production looks like? (Answer based on research)