

UNU/ Zero Emission Research Initiative Aims at the Realization of Sustainable Society with maximum utilization efficiency of resources and energy

United Nations University
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WSSD Plan of Implementation in Johannesburg 2002

- Poverty eradication
- Changing unsustainable patterns of consumption and production
- Protection and managing the natural resource base of economic and social development
- Sustainable development in a globalizing world
- Health and sustainable development



Changing unsustainable patterns of consumption and production

- All countries should promote **sustainable consumption and production** patterns, with the developed countries taking the lead.....
- Encourage and promote the development of a 10 -year framework of programmes.....
- Develop production and consumption policies to improve the products and services provided, while reducing environmental and health impacts, using, where appropriate, science-based approaches, such as life-cycle analysis.....



Changing unsustainable patterns of consumption and production

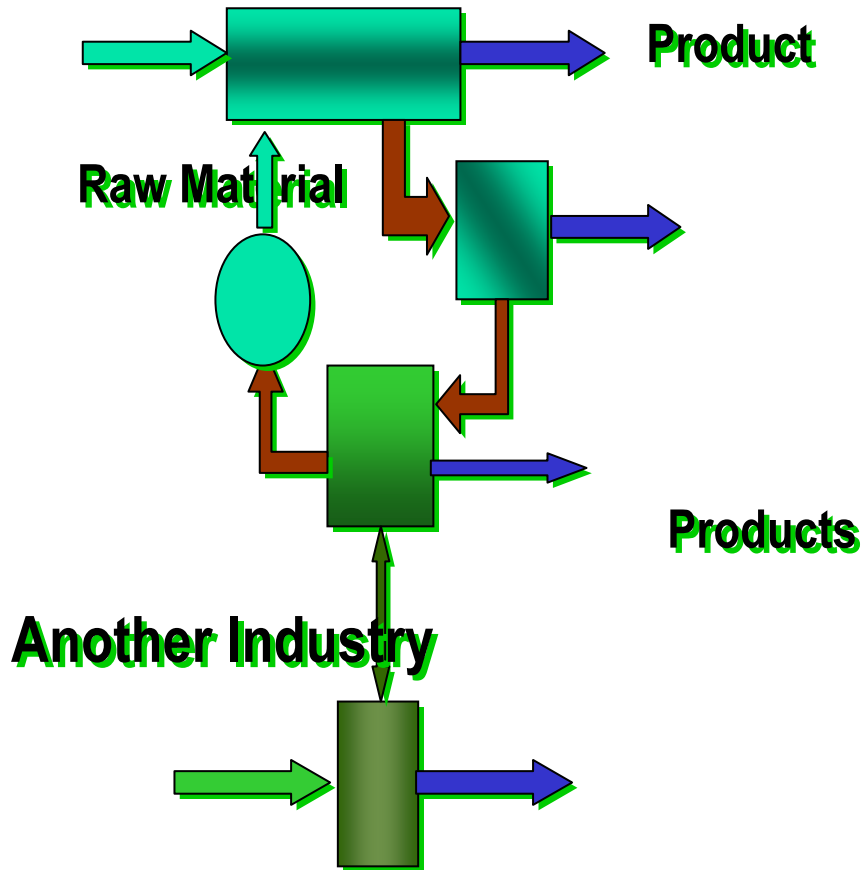
- Enhance corporate environmental and social responsibility and accountability.....
- **Prevent and minimize waste and maximize reuse, recycling** and use of environmentally friendly alternative materials.....
- Promote an integrated approach to policy -making at the national, regional and local levels for transport services and systems.....
- Sound management of chemicals throughout their life cycle and of hazardous wastes.....



Zero Emissions

Prof. M.Suzuki

≠ No Waste Disposal



- * Human activities should be managed as an integrated/holistic system.
- * Optimization should be considered as an integrated network system of processes.

Zero Emission System Experiment in Fiji Island



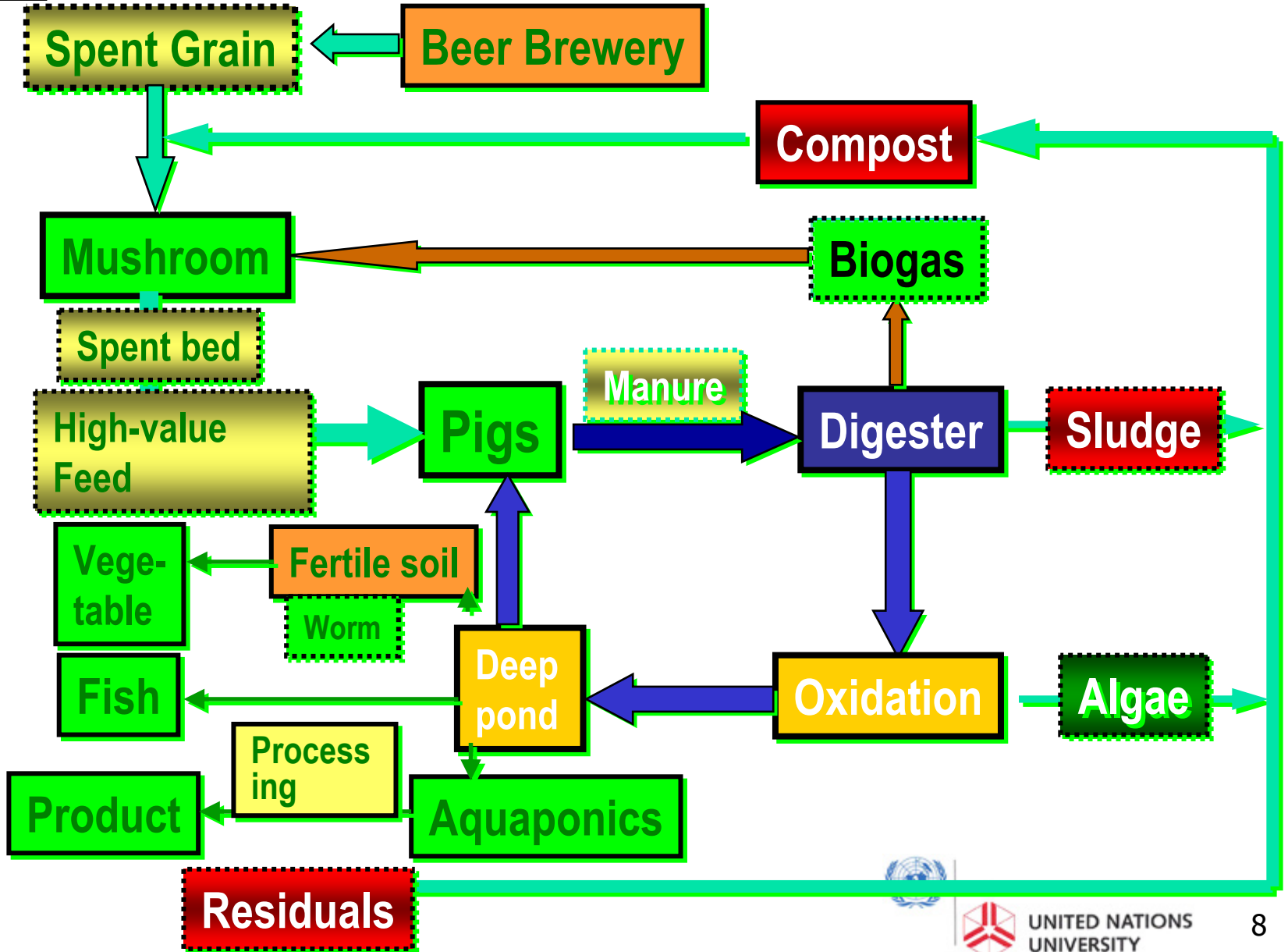
An Example of Integrated Biomass System (IBS, Zero Emission system based on agriculture) -- Experiment in Fiji

- **Experiment supported by United Nations University**
- **Designed by Dr George Chan**
- **Initiated from 1998**
- **Operation and monitoring by Montfort Boys Town (Job training school run by Catholic Fathers)**
- **Water quality measurement by Institute of Industrial Science, Univ. of Tokyo**



Zero Emission System in Fiji Island Agriculture-based Example (IBS)

Ylab
CREST



Experimental Plant at Montfort Boys Town (1)

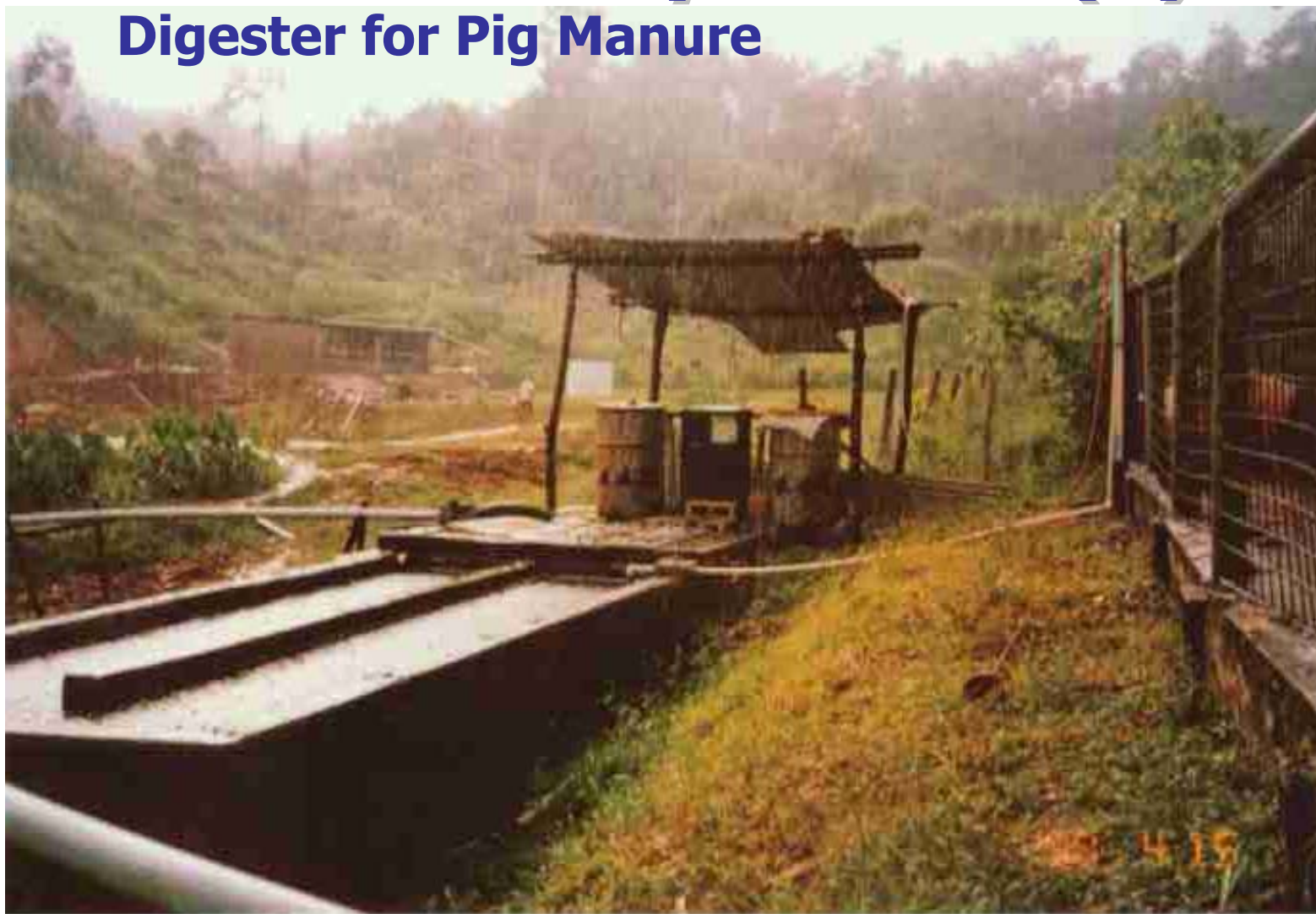


Experiment Station in Montfort Boys Town (2)



Experiment Station at Montfort Boys Town (3)

Digester for Pig Manure

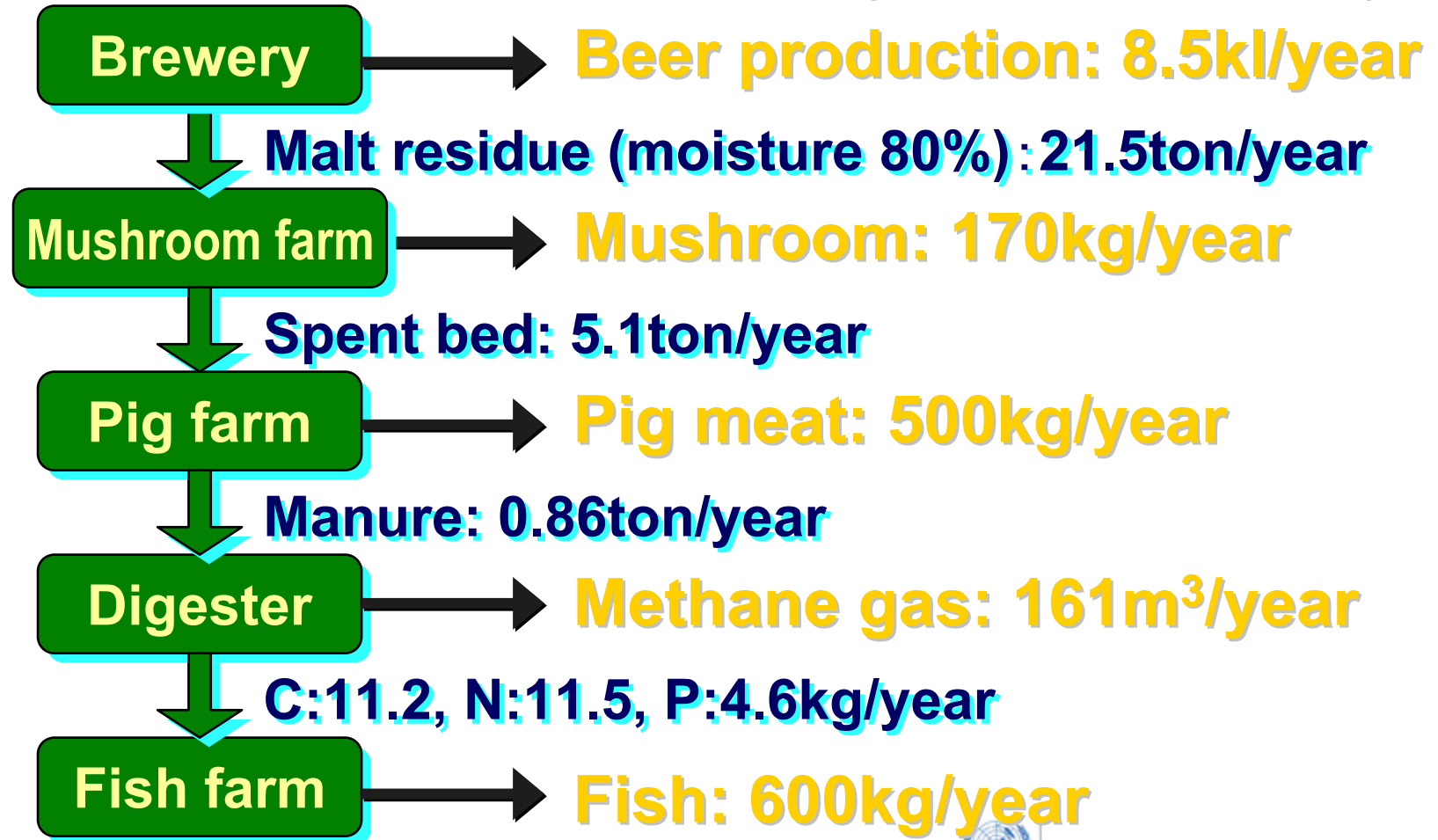


Grass Carps in the Pond



Material balance based on results obtained at Fiji plant

Process Design for Shinano Brewery

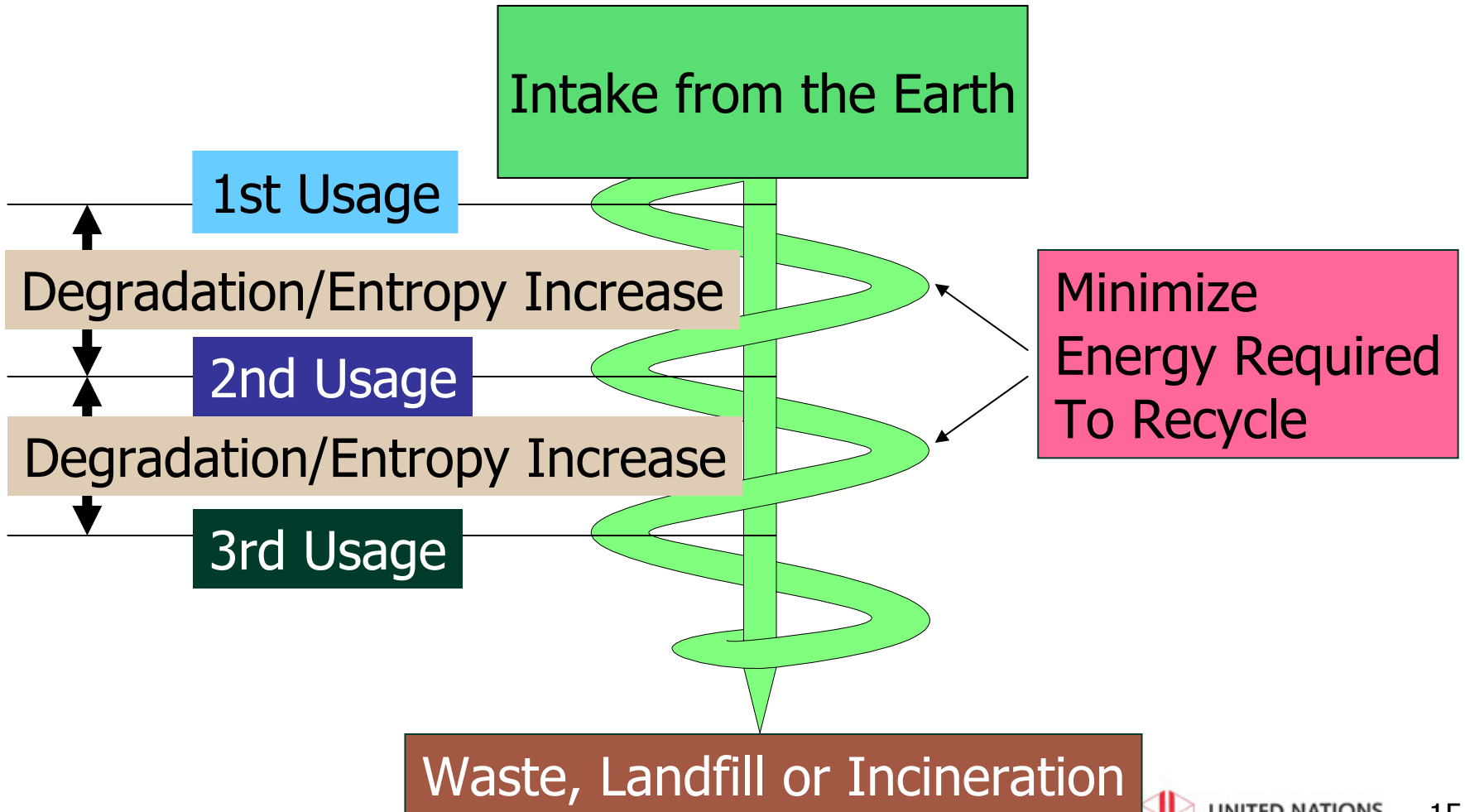


Material Use and Sustainability

- Intake of natural resources:
 - within the renewable limit / **max resource efficiency**
- Final emission to environment:
 - within the ecosystem's assimilable limit
/ **minimize final disposal**
- Material cycles in the human activities should be managed as an integrated/holistic system.
- Optimization should be considered as an integrated network system of processes.
- **Residence times of Materials/resources in the anthropogenic sphere should be maximized.**



How to Minimize Degradation due to Recycling

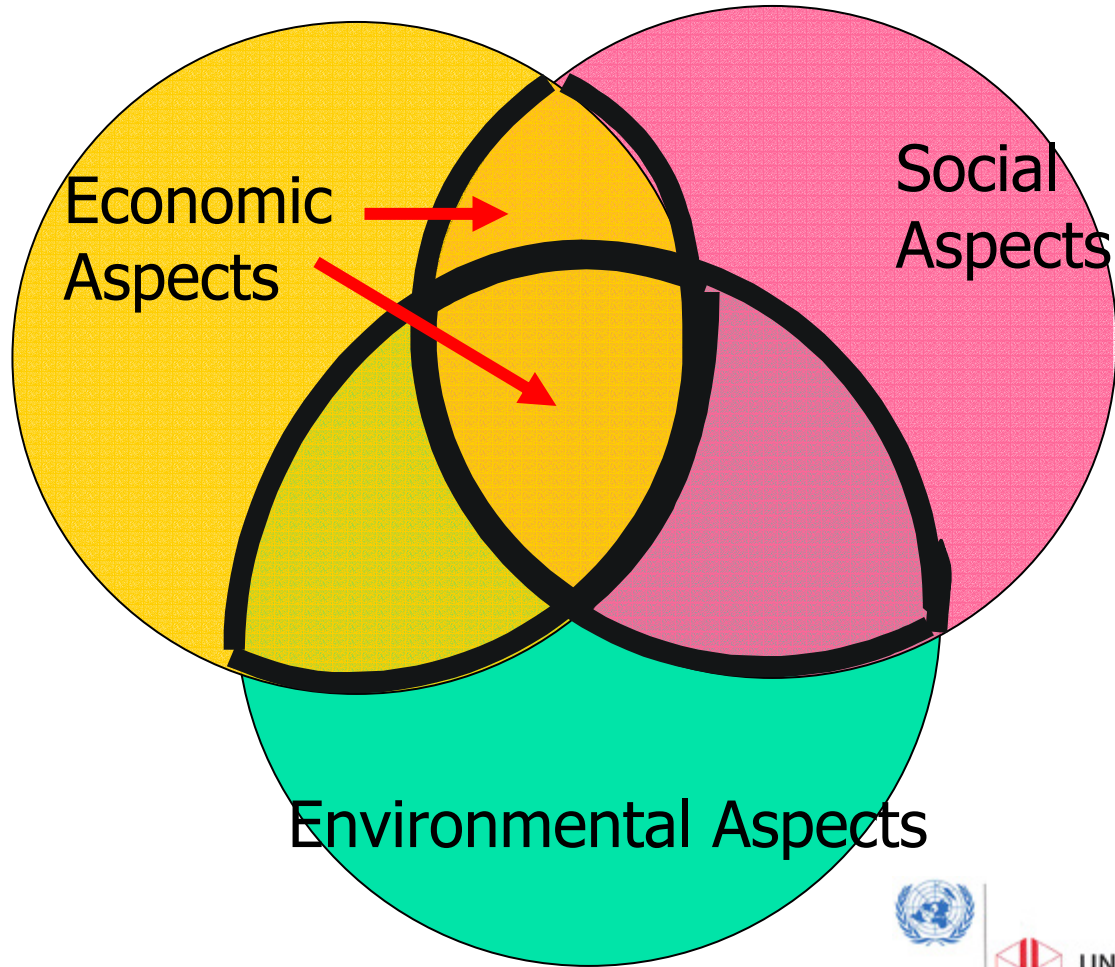


Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

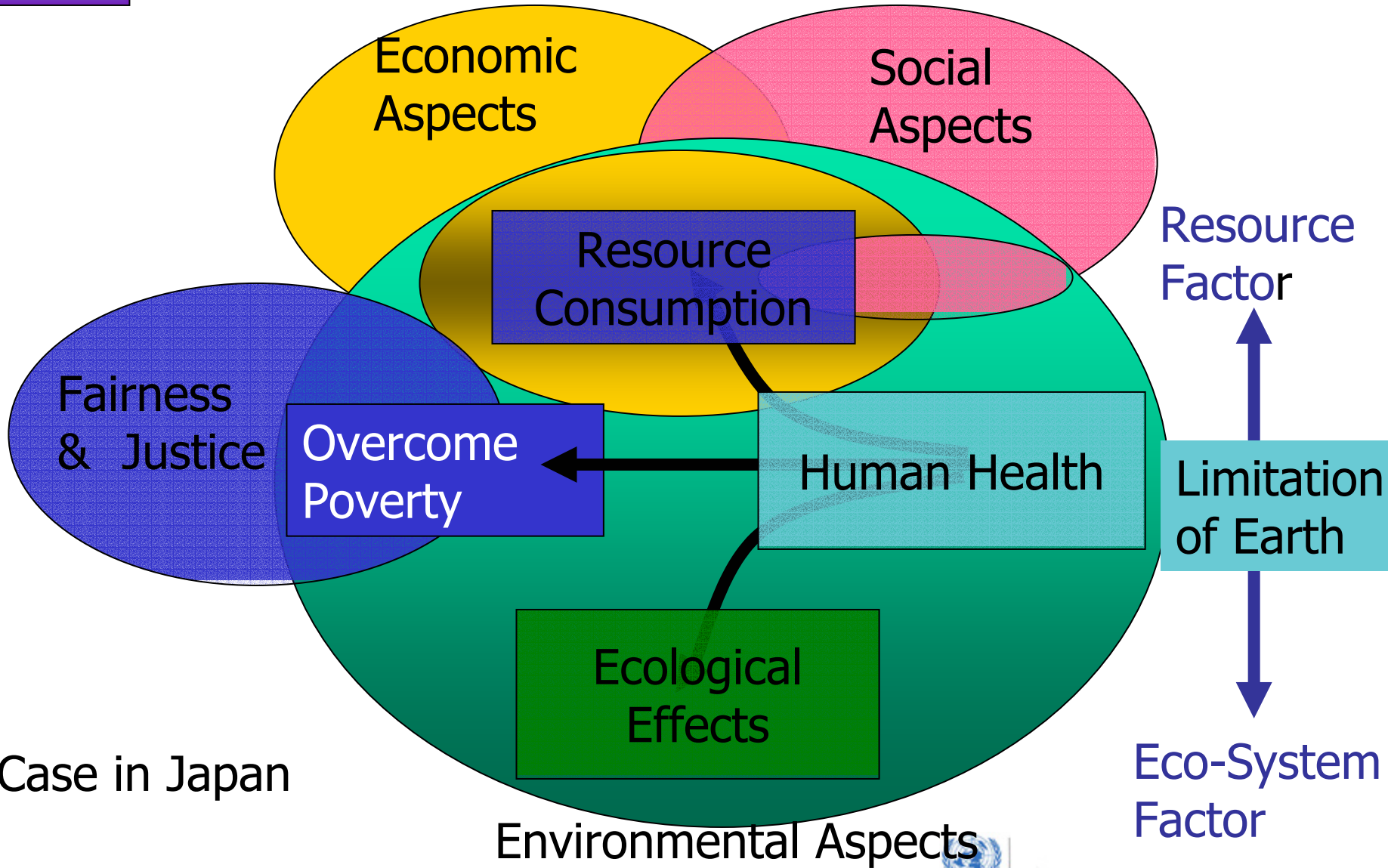
Defined by
Brundtland Commission which Published
“Our Common Future” in 1987



Sustainability Triple Bottom Line



Green & Sustainability; Different Views



Case in Japan

Environmental Aspects

