Implementation of Education for Sustainable Development in NTUU ‘KPI’ (2007-2014)

Speaker:

DZHYGYREY Iryna

Discipline

«*Analysis of sustainable development in society*»

Description

- for the masters of the university
- 2 credits
- 4 issues

Issues of the discipline

1

Common items on sustainable development

2

Sustainable development assessment

3

Sustainable development in economic-technological measure

4

Sustainable resource management

Issue 1
Common items on sustainable development

Themes

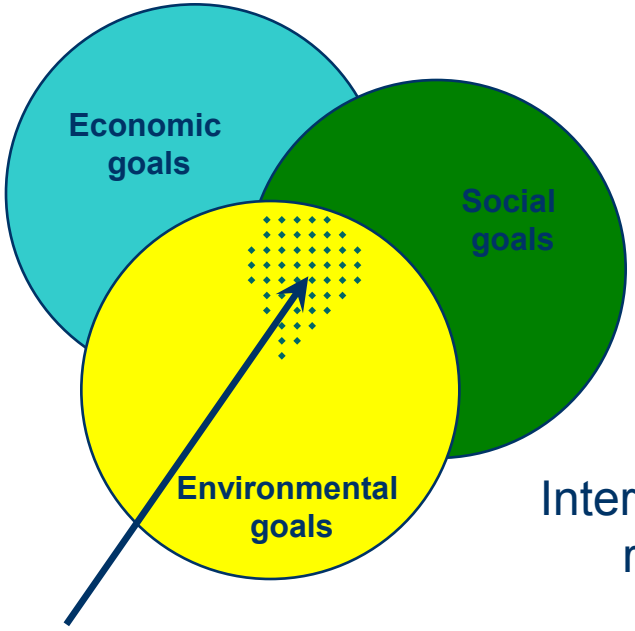
- Prehistory and main sustainable development concepts
- Globalization and sustainable development problems
- World community's main documents for sustainable development
- Sustainable development problems in Ukraine

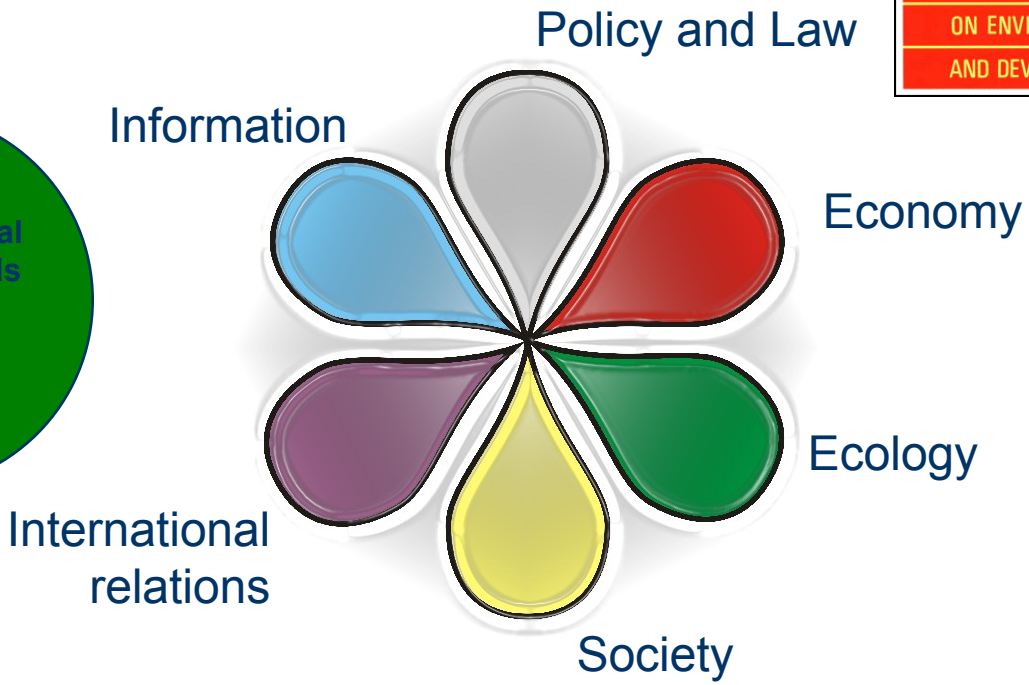
Theme 1
Prehistory and main sustainable development concepts

Definition

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs

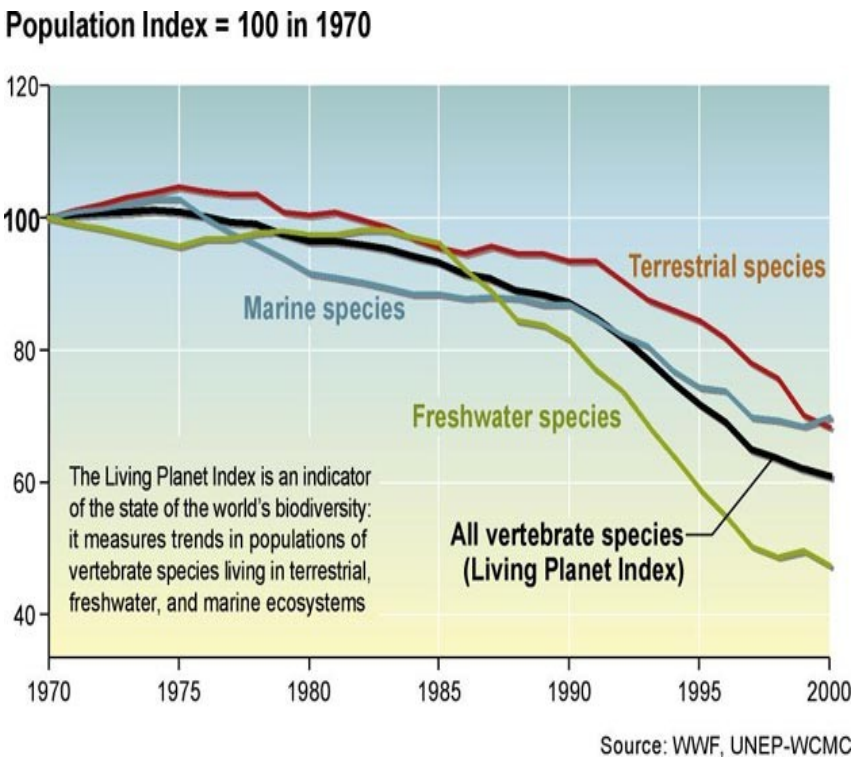
OUR COMMON FUTURE
THE WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT





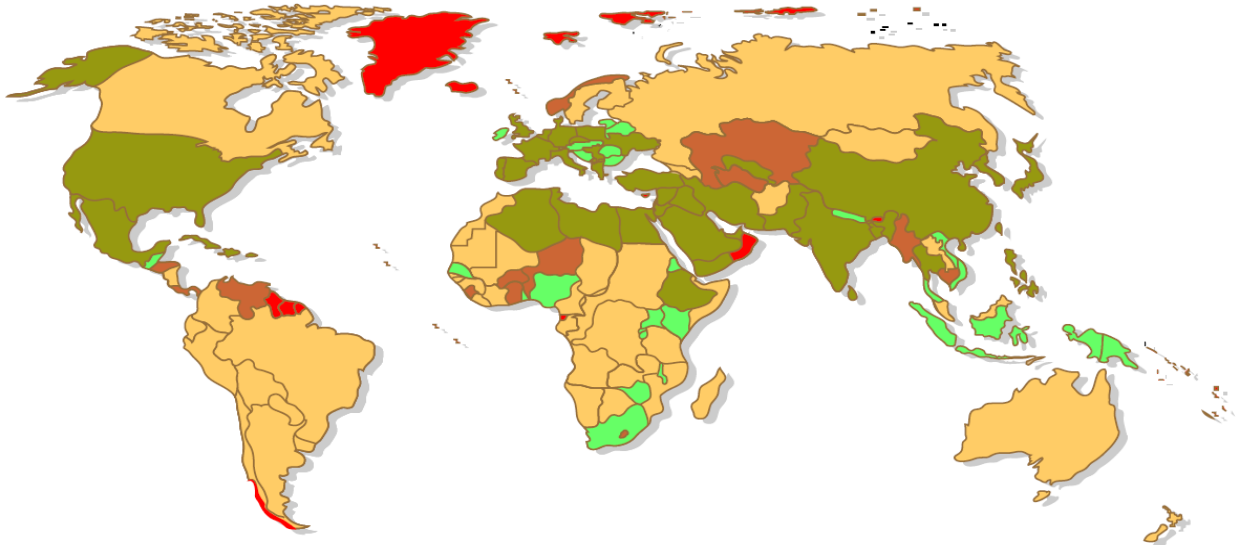
Prehistory and main sustainable development concepts

Environmental, economical and social preconditions



Prehistory and main sustainable development concepts

Biocapacity and Ecological Footprint

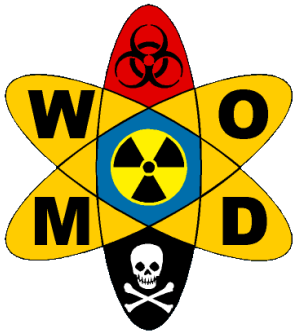


Ecological Footprint

Globalization and sustainable development problems

Global problems

Global risks [WEF]

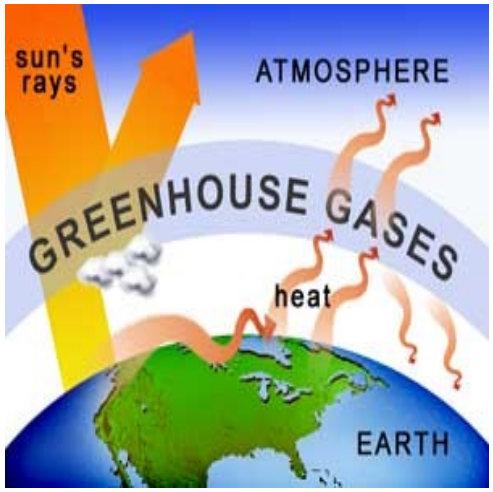


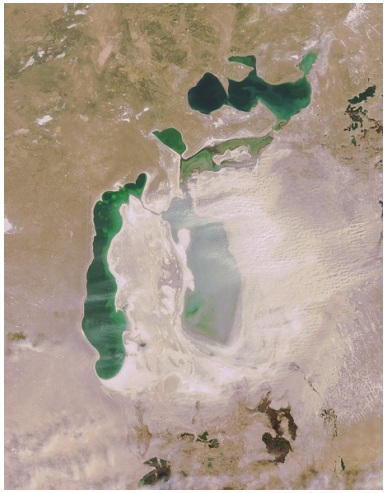
Existential Risks

Globalization and sustainable development problems

Problems of Global Life Support Systems

Biosphere
Hydrosphere
Atmosphere
Lithosphere





World community's main documents for sustainable development

Ramsar

Convention on Migratory Species

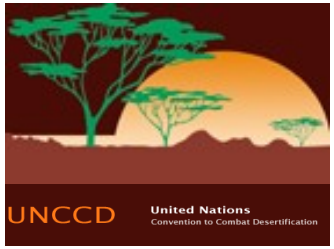
CMS

MONTREAL PROTOCOL

BASEL CONVENTION

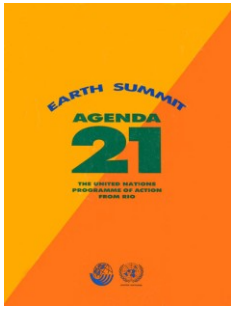
CBD

Stockholm Convention on persistent organic pollutants (POPs)



UNFCCC

World community's main documents for sustainable development

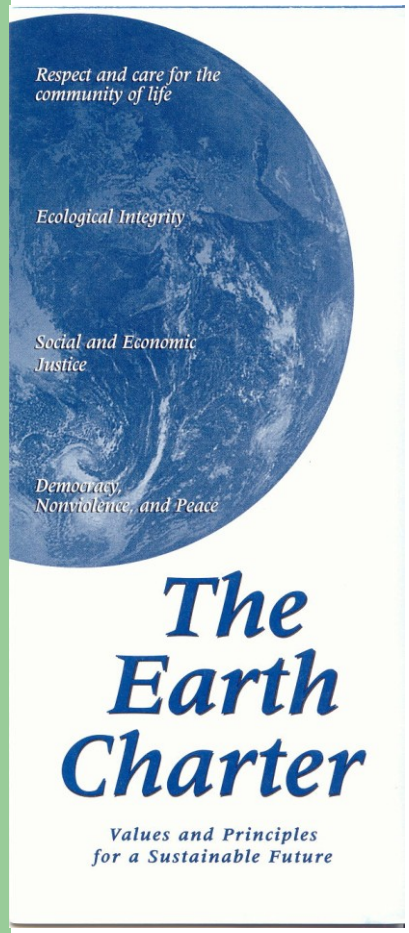


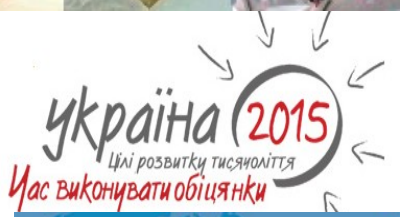
United Nations Educational, Scientific and Cultural Organization

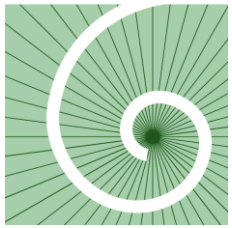
Education for Sustainable Development

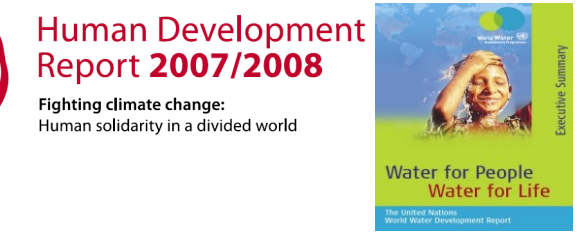
United Nations Decade (2005-2014)

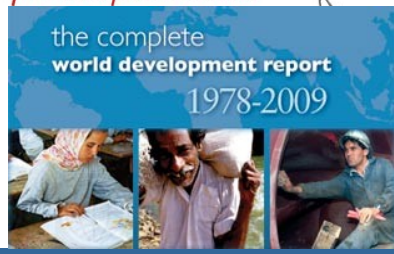
World community's main documents for sustainable development











Sustainable development problems in Ukraine

International Agreements
National Programs
National Reports
…

Ecosystem state
Health system crisis
…

Natural Resources Potential

Millennium Development Goals

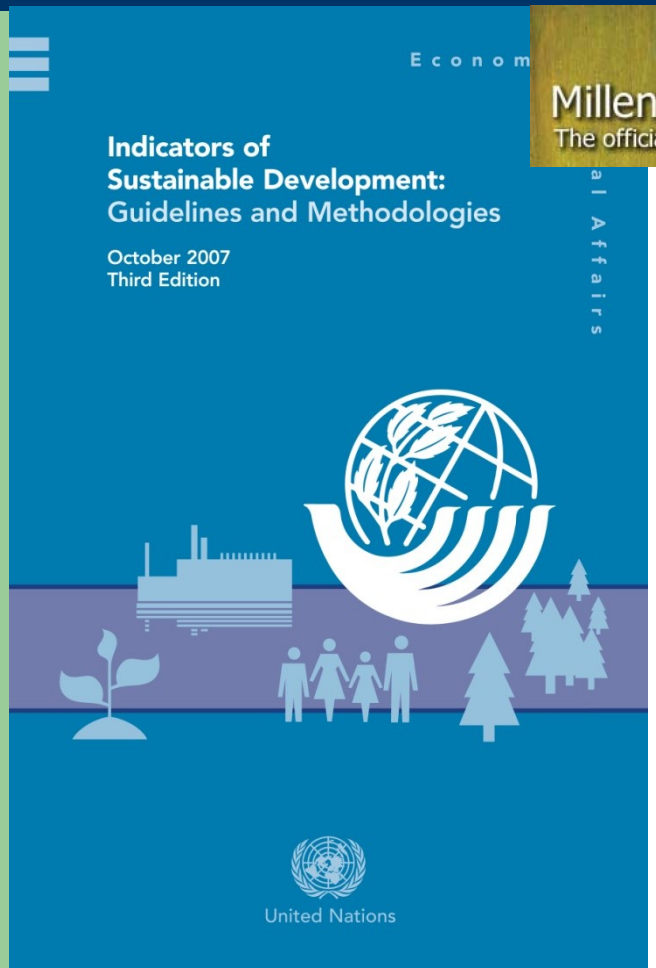
Issue 2
Sustainable development assessment (indicators and indices)

Themes

- Sustainable development indicators and indices
- Analysis of sustainable development processes
- Environmental monitoring

European Environment Agency

Sustainable development indicators and indices



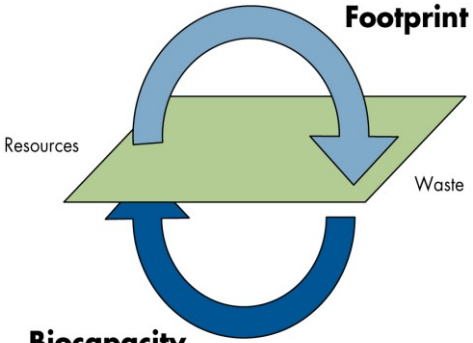
Environmentally adjusted net domestic product

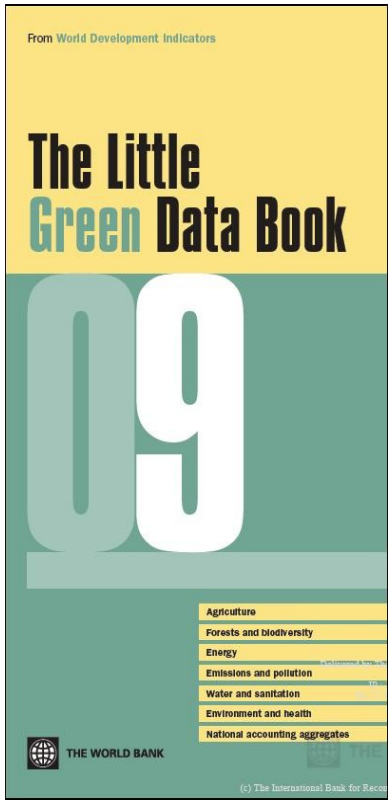
Genuine Saving

OECD indicators

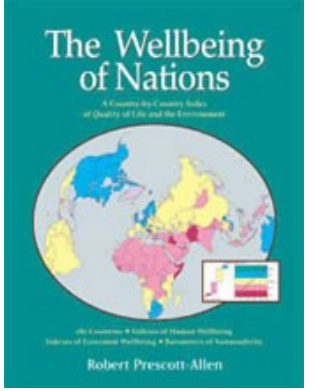
IAEA
International Atomic Energy Agency

plan bleu



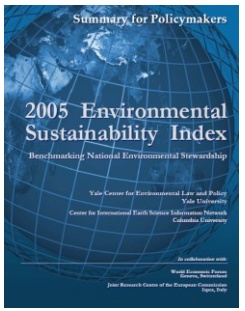


Sustainable development indicators and indices



- Index of Sustainable Economic Welfare [ISEW]
- Human Development Index [HDI-2009]
- Well-being Index [WI-2001]
- Environmental Sustainability Index [ESI-2005]
- Environmental Performance Index [EPI-2008]
- Environmental Vulnerability Index [EVI-2005]
- Happy Planet Index [HPI-2009]
- Living Planet Index [LPI-2003] …

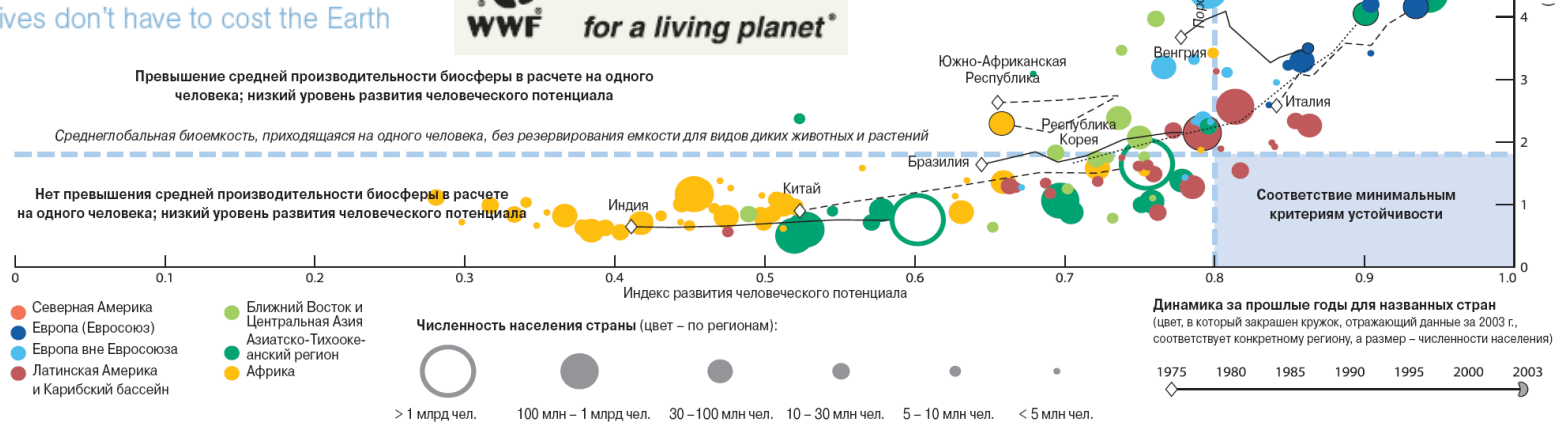
Friends of the Earth



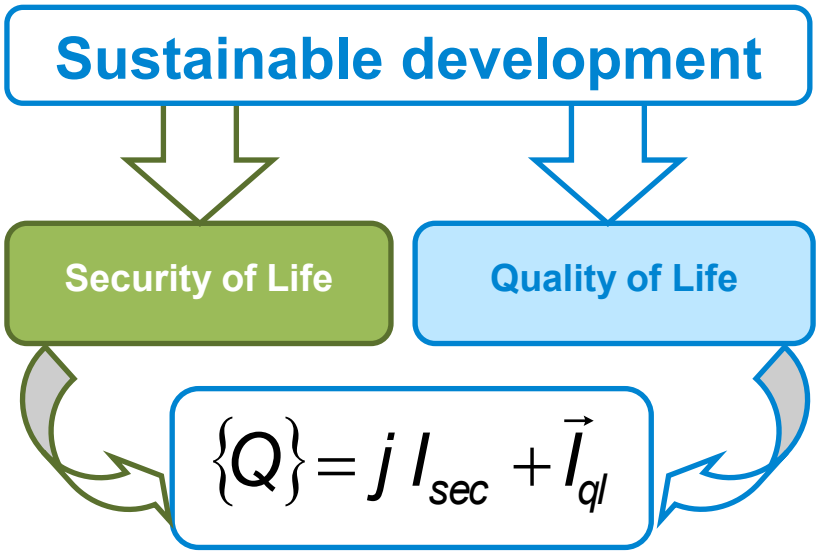
THE UN HAPPY PLANET INDEX 2.0

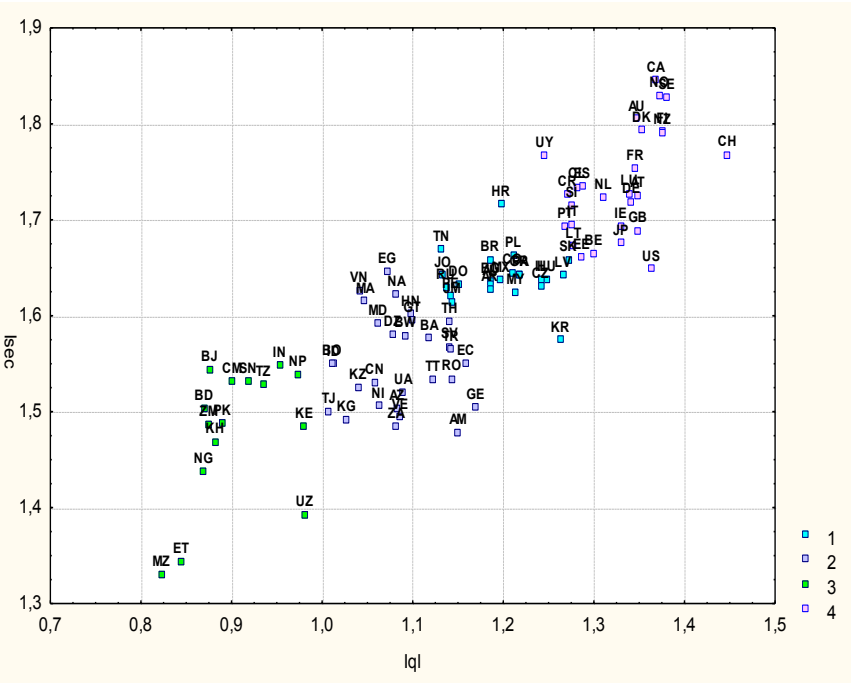
Why good lives don't have to cost the Earth

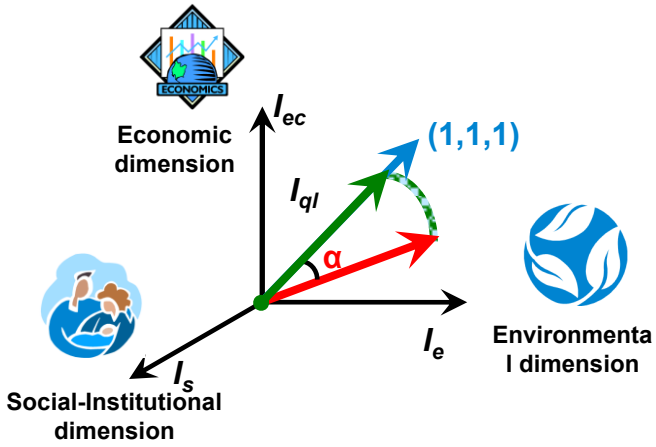
WWF for a living planet®



Analysis of sustainable development processes







SDGM **SWOT analysis** **scenarios**

Analysis of sustainable development processes

Western-North American	Western-European	Confucian	Japanese	Muslim-Arabic	Muslim-Turkic	Muslim-Malayan	Hindu	Slavic-East Orthodox	Slavic-West Catholic	Latin American	African	
	3	1	2	1	1	1	1	2	3	2	1	Western-North American
3		1	2	1	1	1	1	2	3	2	1	Western-European
1	1		3	2	2	2	2	2	1	2	2	Confucian
2	2	3		2	2	2	2	2	2	2	1	Japanese
1	1	2	2		3	3	2	1	1	2	2	Muslim-Arabic
1	1	2	2	3		3	2	1	1	2	2	Muslim-Turkic
1	1	2	2	3	3		3	1	1	2	2	Muslim-Malayan
1	1	2	2	2	2	3		1	1	2	2	Hindu
2	2	2	2	1	1	1	1		3	2	1	Slavic-East Orthodox
3	3	1	2	1	1	1	1	3		2	1	Slavic-West Catholic
2	2	2	2	2	2	2	2	2	2		2	Latin American
1	1	2	1	2	2	2	2	1	1	2		African

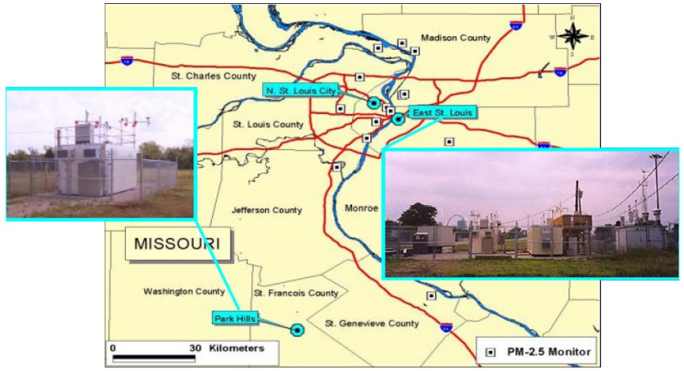
Matrix of the general breaks between civilizations

Predisposition of civilization to association

Predisposition of civilization to opposition

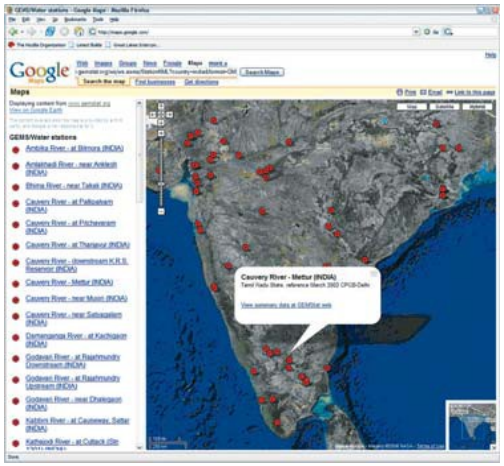
Environmental monitoring

Monitoring System
- Functions
- Forms, Types and Levels



GEMS Water

United Nations Global Environment Monitoring System Water Programme



Global Environment Outlook

GEO4

environment for development

United Nations Environment Programme

GLOBAL CHANGE

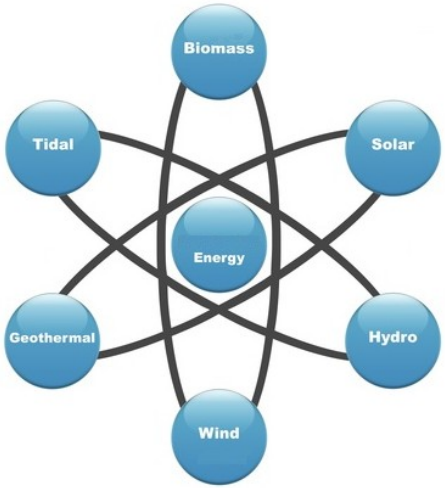
IGBP

International Geosphere-Biosphere Programme

Issue 3
Sustainable development in economic-technological measure

Themes

- Sustainable development, technology and engineering
- Sustainable technologies and “Cleaner Production” concept
- Sustainable development, technology and standards
- Safety



- Regulation
- Reducing
- Reusing
- Recycling
- Recovering
- Rethinking
- Renovation

Sustainable development, technology and engineering

Renewable Resources [2-R]
Renewable Energy
Minimization of Resource Usage
Source Reduction

Recycling Reuse Repair
Regeneration Recovery
Remanufacturing
Mutualism
Environmental Accounting
Eco-efficiency Factor X
Ethical Investments
Polluter Pays Principle
Social responsibility
Reporting to the stakeholders
Health and Safety

Cleaner Production
Eco-design
Green Chemistry
Waste Minimization
Zero Waste
Supply chain management
Environmental Legalization
Voluntary Environmental Agreements

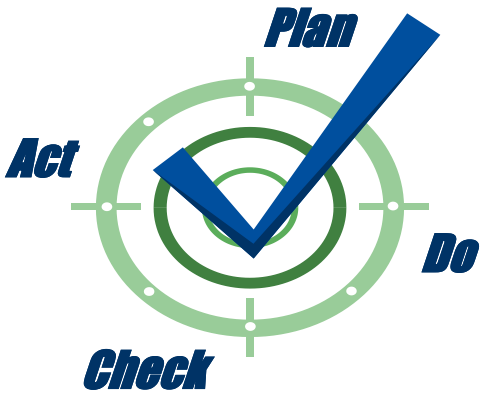
Environmental Engineering
Environmental Technology
Integrated Pollution Prevention and Pollution Control
Industrial Ecology
Industrial Ecosystem
Cradle to Cradle
Pollution Prevention
Environmental Management Strategy

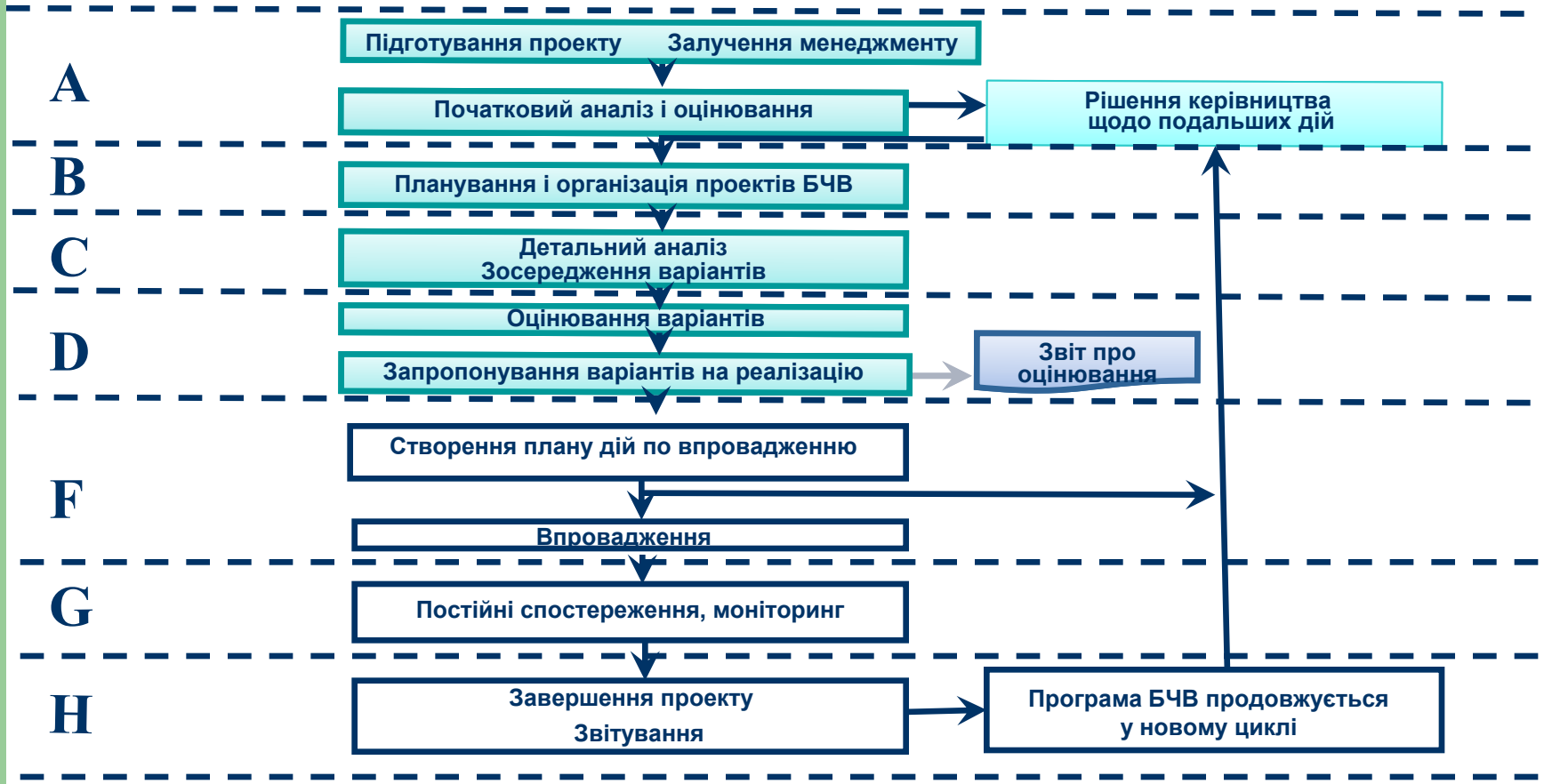
Responsible Care
Sustainable Production
Sustainable Consumption

Sustainability Policy

Factor T

Cleaner Production





ISO International Organization for Standardization

Sustainable development, technology and standards

Environmental standards

ISO 14000
and
Environmental Management Systems

Environmental labels and declarations

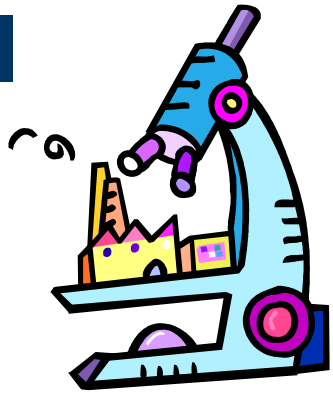
Environmental assessment of sites and organizations

EMS: PDCA

БЕЗ ГМО

GLOBAL ECOLABELLING NETWORK

Global Ecolabelling Network

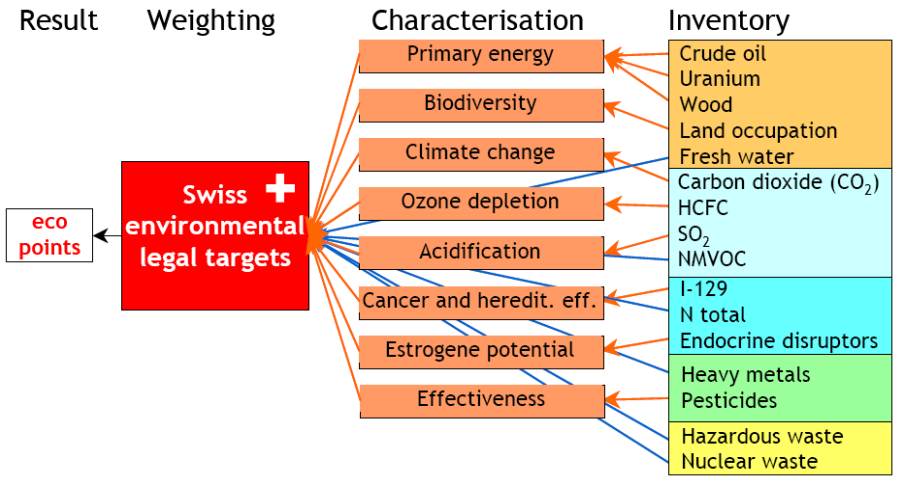


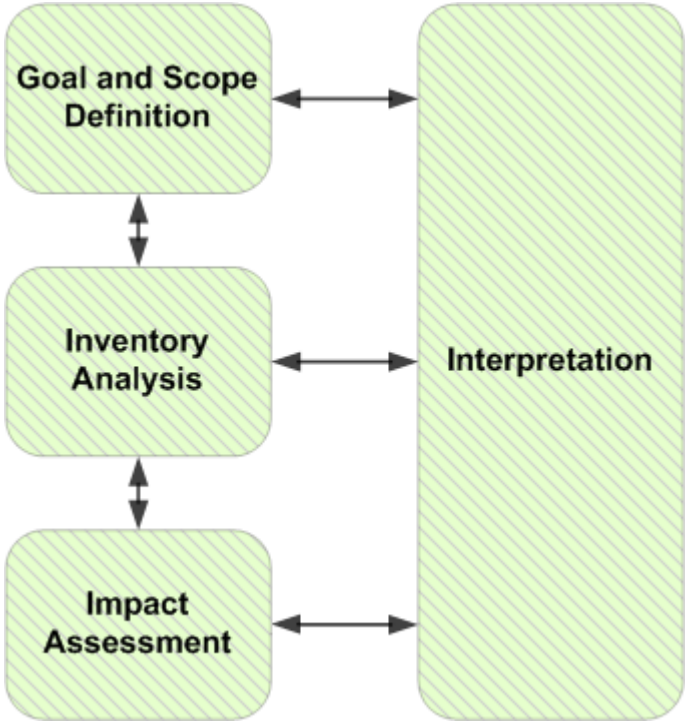
ЕКОЛОГІЧНО ЧИСТО ТА БЕЗПЕЧНО

Sustainable development, technology and standards

Environmental standards

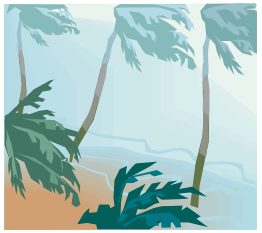
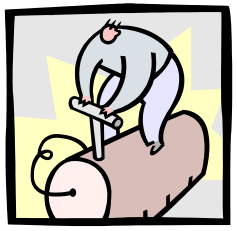
ISO 14000
and
14040 series
Life Cycle Assessment



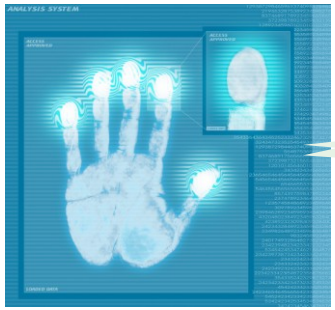


SimaPro 7
GaBi lite
OpenLCA
Modular Open Source Software for Sustainability Assessment

Safety

Externalities
Risk assessment
Environmental burden of disease
Emergencies
…



Identification | Response = *f* (dose) | Impact Assessment | Risk characterization

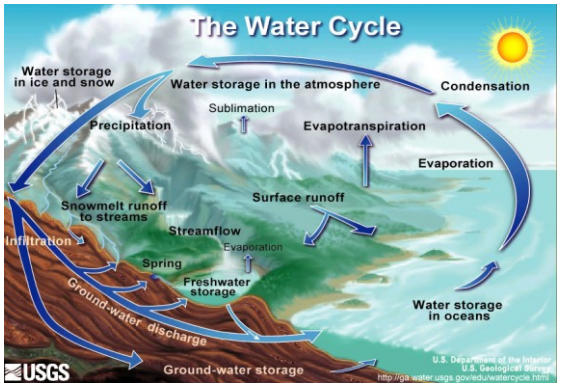
Issue 3
Sustainable resource management

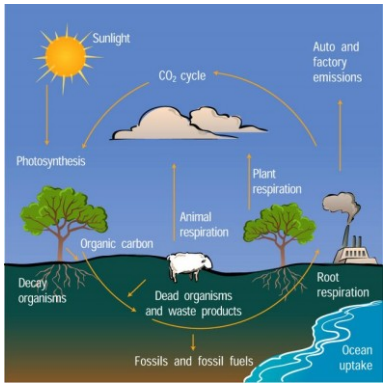
Themes

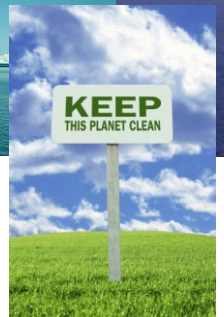
- Natural capitalism
- Basics of the natural resource management theory
- Modeling systems

Natural capitalism

Natural Resources
Ecosystem Functions
Environmental Goods and Services
Environmental Donors
Debt for Nature Swaps
Environmental Rent
…



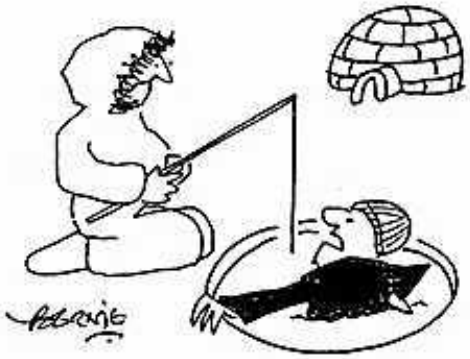




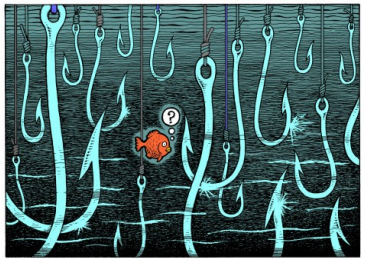
Natural resource management

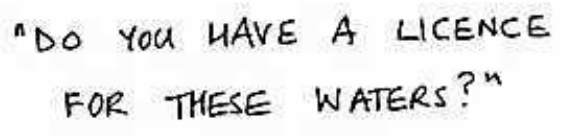
Sustainable Development Economics

Non-renewable resources
- The Gray Model
- The Hotelling Rule and Model
- Hartwick's Rule
- El-Serafi Approach



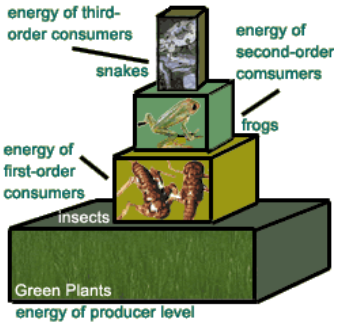
Bioeconomics
- Basic Bioeconomic Model
- Maximum Sustainable Yield
- Bioeconomic Theorems
- BioBalance Instruments

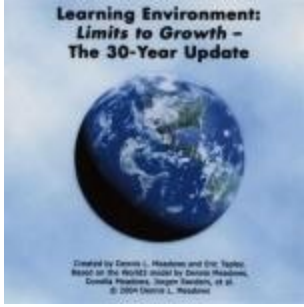




SRM Sustainable Resource Management

Barry Commoner's Four Laws of Ecology
Daniel Chiras Environmental Laws
Lindeman Generalized Energy Pyramid
…

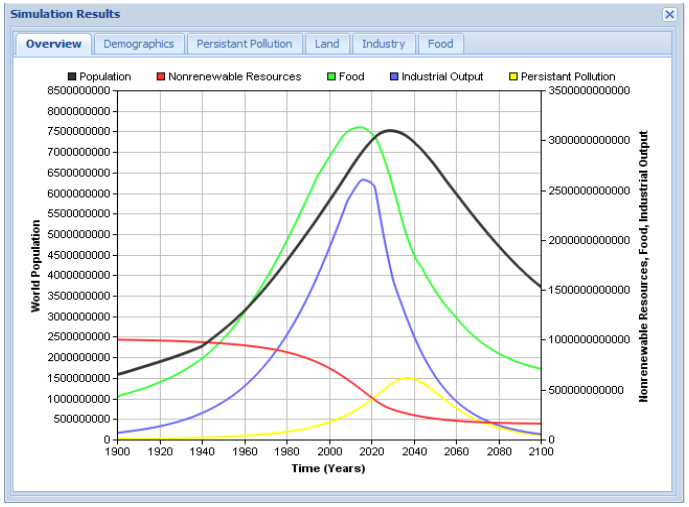




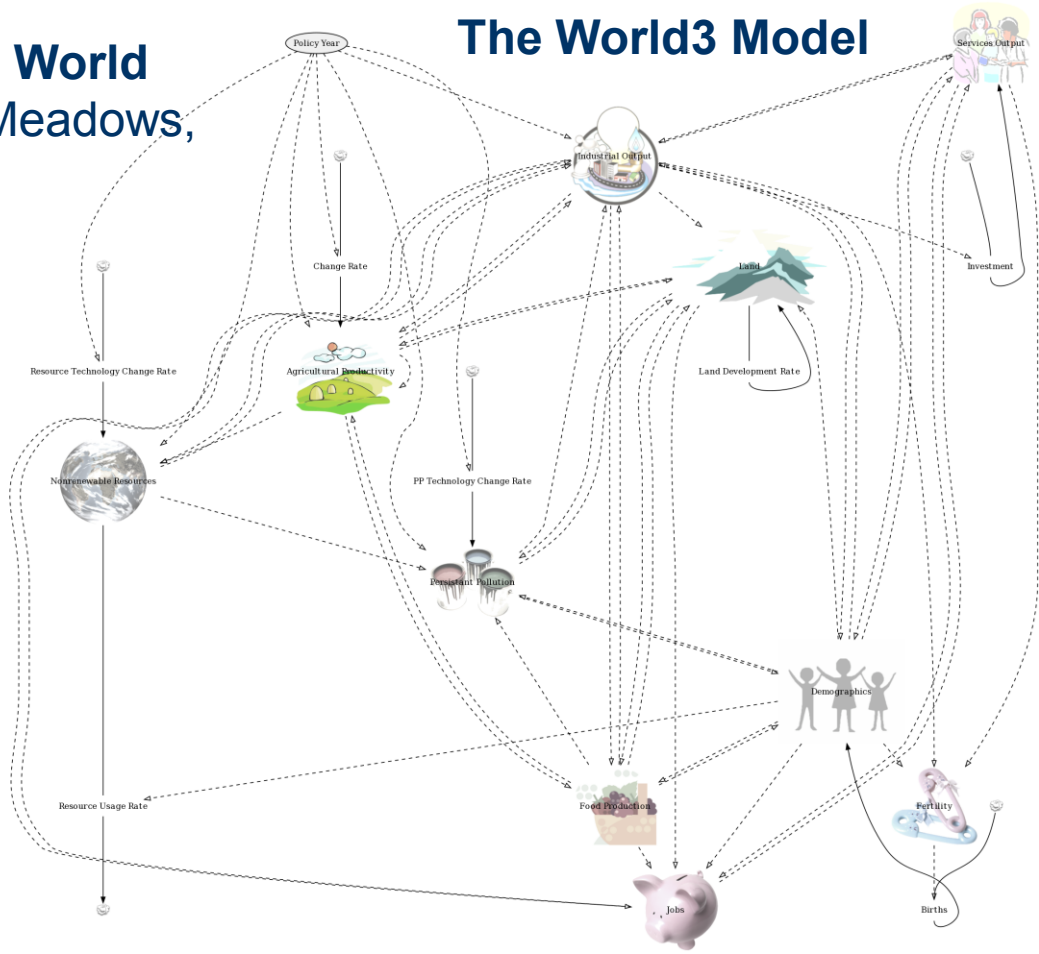
Modeling systems

Dynamics of Growth in a Finite World
D. Meadows, W. Behrens III, D. Meadows, R. Naill, J. Randers, and E. Zahn

World Dynamics
J. Forrester



The World3 Model



Analysis of sustainable development in society

Thank you for your attention