Aligning Environmental Education and Training Goals in Meeting Industry Needs

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Presentation Outline

- Introduction
- Ecosystem of Academic Culture and Outcomes
- Green Technology Management and Environmental Education – The Imperial College London - UK Experience
- Developing Competent Green Workforce for Sustainable Environment in Promoting Quality of Life – Malaysian Experience
- Conclusion

“Having the right human capital is critical to the success of the initiatives within CCI (communication content and infrastructure), and the positive outcome of this NKEA will be given greatly by the level of qualification and skills that the sector attracts and develops”
(PEMANDU, 2010)

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The five most important questions we need to ask about our education system

Self-Assessment:

1. What is our mission?
2. Who is our customer?
3. What does customer value?
4. What are our results?
5. What is our plan?

Drucker et at., (2008)

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Conception, birth and maturity of selected examples of green institutions in Malaysia 1901 – 2004: under the Ministry of Natural Resource and the Environment (Hezri, 2016)

- **Water resource management** (Hydraulic Branch Public Work Dept, DID 1932, Flood Mitigation and Hydrology added to DID in 1972, Current DID: Coastal zone, Water Resource Management and Hydrology, Special Projects, Flood Mgmnt, Eco-friendly Drainage)

- **Pollution control** (Minister with Special Functions, Nuclear Research and Env. Matters, August 1973, Minister of Local Government and Environment,16 Dec 1974, DG of DOE Appointed Dec. 1974, Division of Environment Officially established 15 Sept 1975, Environmental Quality Council appointed, 12 April 1977)

- **Forest Management** (Small Forest Department established under Straits Settlements Director of Gardens 1883, Forestry Dept established in 1901 and Chief Forest Officer appointed, National Forestry Council established in 1971, National Forestry Act 1984 and revised in 1993)

- **Wildlife Management** (First wildlife formulated in 1880, Chlor Wildlife Reserve Perak Gazetted in 1902, Appointment of Chief of Wildlife Commission of Malaya 1930, Wild animals and Wild Bird Protection Ordinance 1955, Game Dept Federalised under the Protection of Wildlife Act in 1972 and known as Dept of Wildlife and National Park

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Current landscape of (environmental) sustainable development issues in Malaysia and their institutions: Multiple Ministries, Councils and agencies (Hezri, 2016)

- **Habitat** (Local Authorities, Town and Country Planning Department)
- **Waste management** (Dept. of Solid waste Mgmt, Alam Flora & other concessionaires)
- **Energy** (Energy Commission, TNB, Sabah Energy Cooperation, Sarawak Energy, Sustainable Energy Development Authority SEDA and PETRONAS)
- **Green Technology** (Malaysian Green Technology Cooperation MGTC, Malaysian Green Building Configuration MGBC)
- **Climate change** (Ministry of Agric and Agrobased Industry, Nat. Hydrolic Res. Inst.)
- **Minerals** (Mineral and Geoscience Department, Land and Mines Office)
- **Transportation** (Ministry of Transport, Land Public Transport Commission SPAD)
- **Biodiversity** (Dept of Wildlife and Nat Park, Dept of Forestry, ASM, Nat Oceanography Directorate, State Park Authority)
- **Air quality** (Dept of Environment, Road Transport Dept, Inst. of Medical Research
- **Water quality and availability** (Nat Water Service Com., Dept of Environment, Drainage and Irrigation Dept. NAHRIM, Selangor Water Mgmt Agency)

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PHILOSOPHY & OBJECTIVE OF EDUCATION

National Education Philosophy

(Falasafah Pendidikan Negara)

Translating

- Certification, matching and translation of human resource allocation (H&V)
- Transmission of cultural values/ethics and belief – intergenerational
- Development of human potential to actualize their talent & ambition
- "Maieutic" function– birthing ground knowledge discovery and vision

Envisioning the Future in Environ. Sciences Teaching and Learning

- Transformation phases - MOHE Model
- Ecosystems of academic culture
- Graduate attributes and employability
- Learning outcomes (LOs) and key performance index (KPIs)
- Quality assurance & teaching and learning cycle
- Curriculum design & implementation

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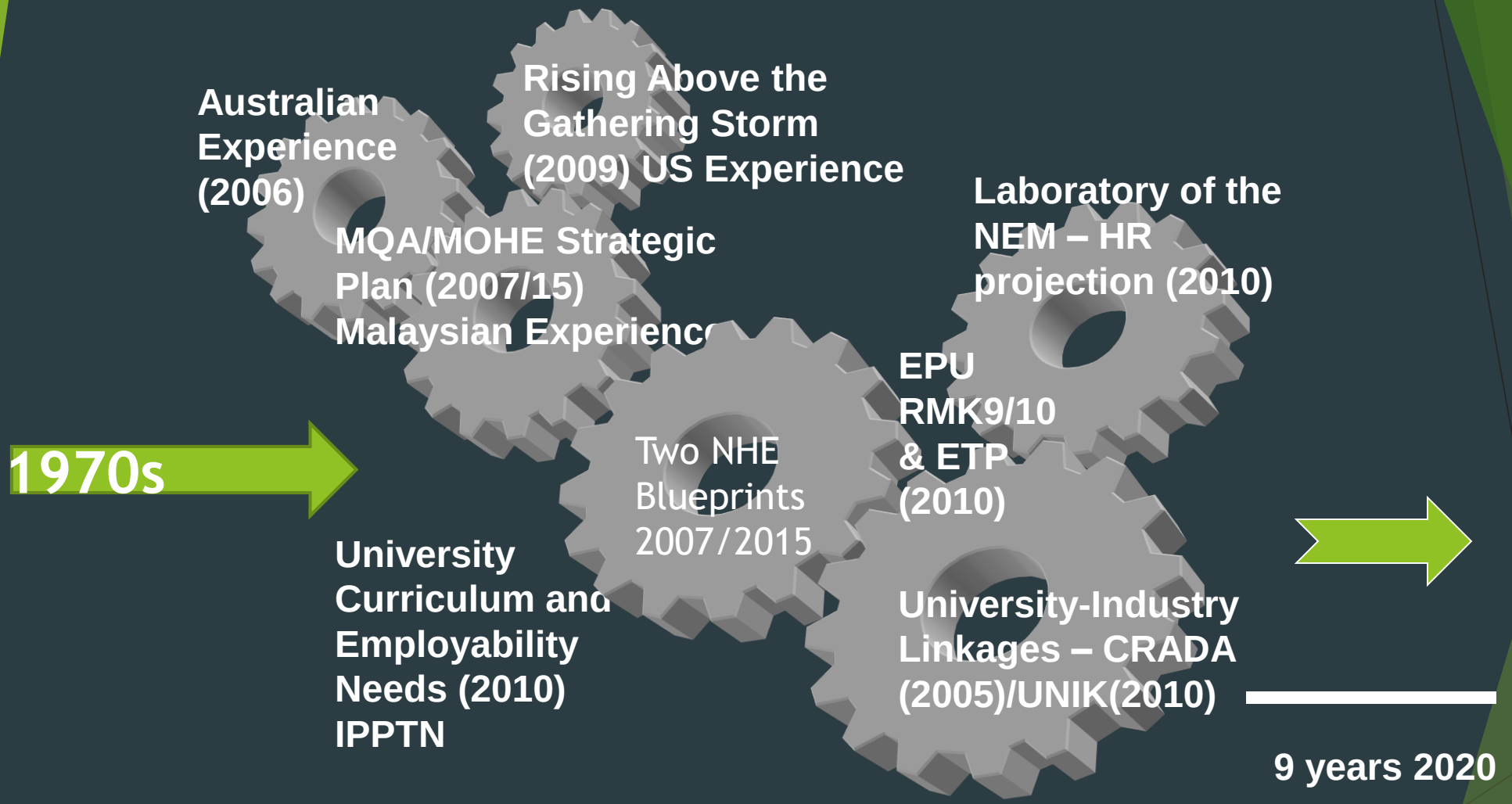

Benchmarking and Quality Assurance

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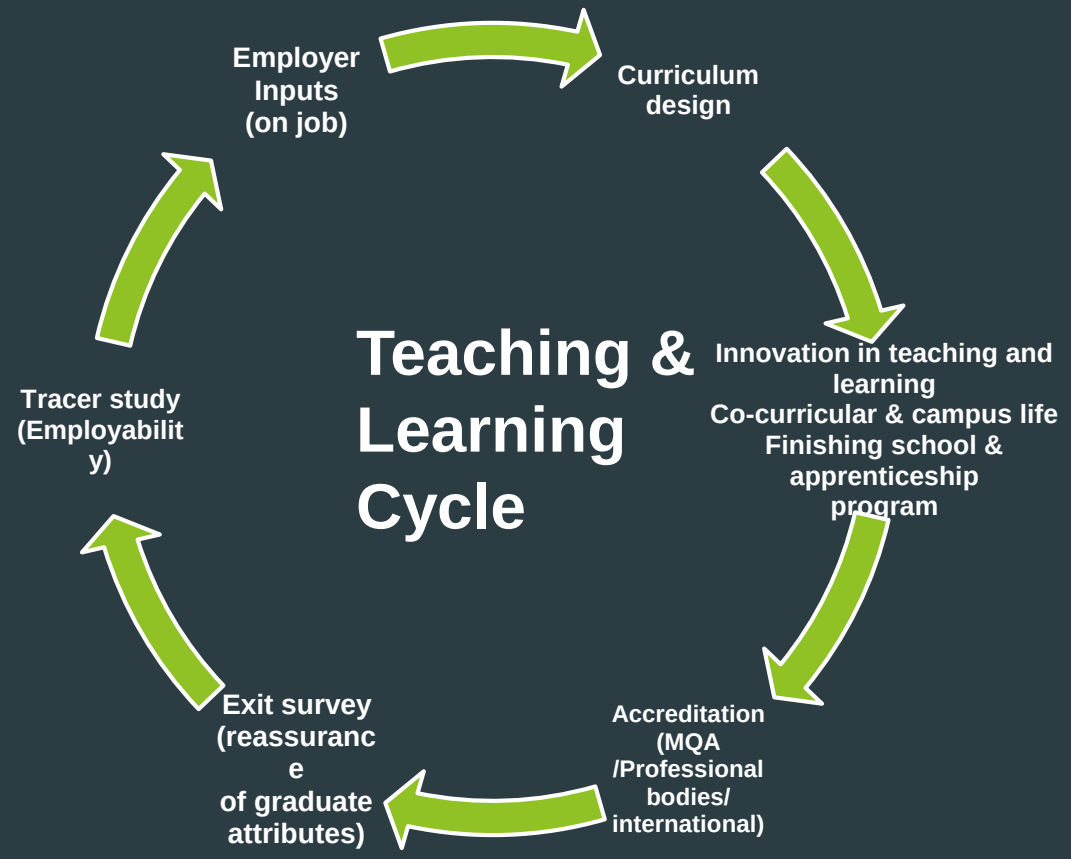
QUALITY ASSURANCE SYSTEM



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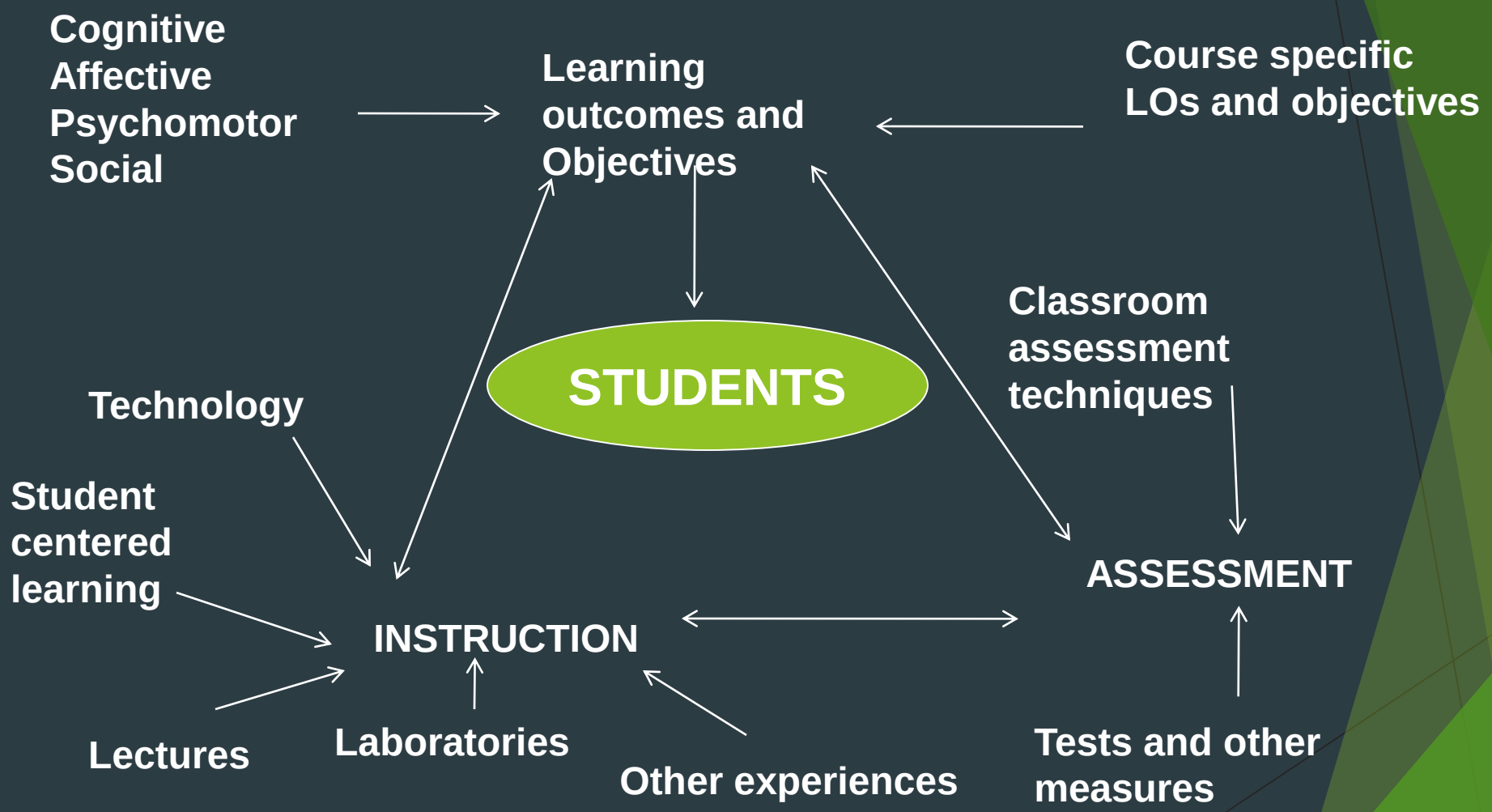
Effective Course Design



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What is LO?

Outcome based education (OBE)

1. **Education philosophy specifically designed to produce knowledgeable, skills and right attitude students**
2. **Well designed curriculum with pedagogical and delivery techniques, assessment tailored for LOs**
3. **Clearly shown students' expectation could be achieved accordingly**
4. **Could be measured and observed – knowledge, skills, efficiency, behavior, achievement, attitude and social skills**

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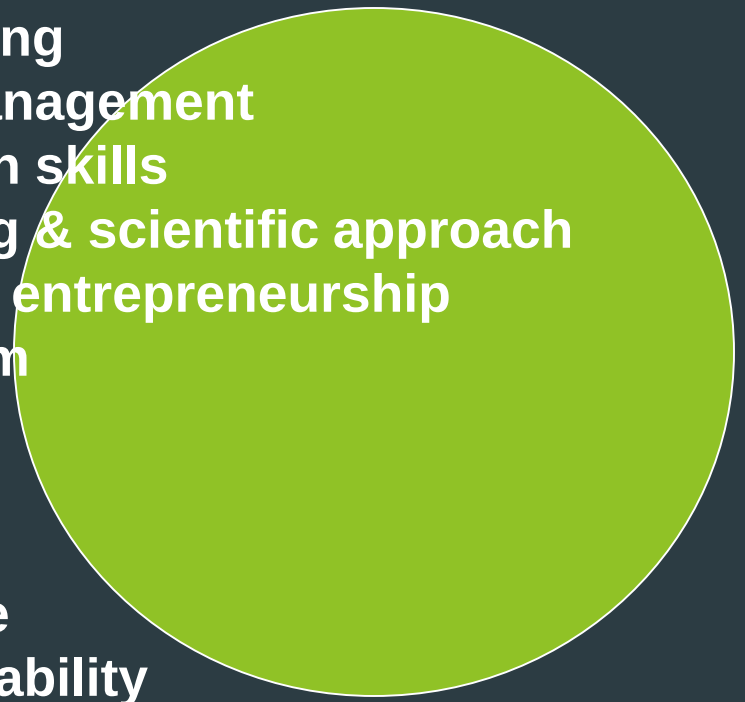
SKILLS Required from LOs:

Psychomotor
Life-long learning
Information management
Communication skills
Critical thinking & scientific approach
Management & entrepreneurship
Professionalism
Values
Attitude
Ethics
Knowledgeable
Social accountability



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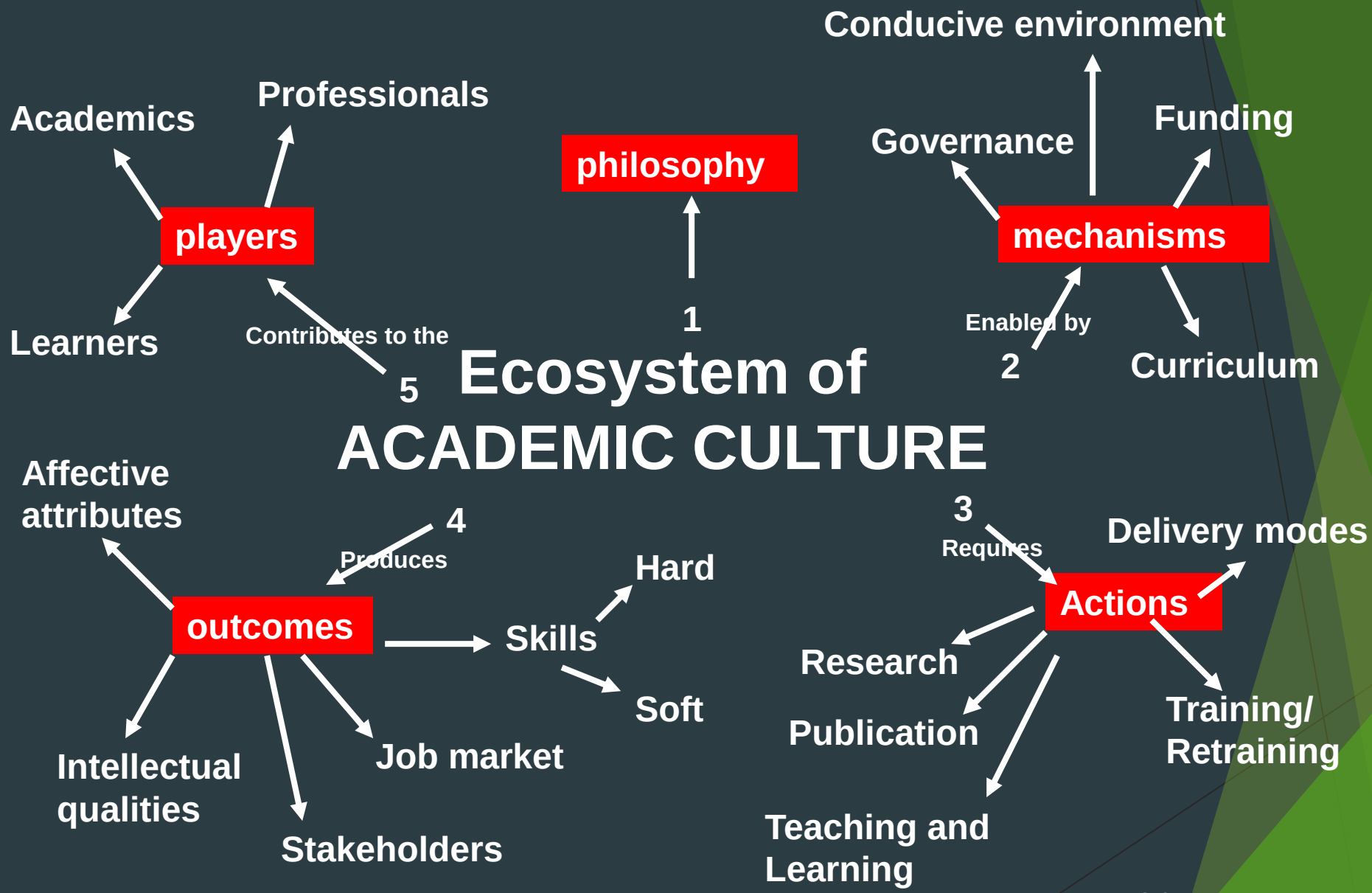
Conducive environment
Academics
Professionals
philosophy
Governance
Funding
players
mechanisms
1
Learners
Contributes to the
5
Enabled by
2
Curriculum
Ecosystem of
ACADEMIC CULTURE
Affective attributes
4
Produces
3
Requires
Delivery modes
Hard
outcomes
Skills
Actions
Research
Soft
Publication
Training/ Retraining
Intellectual qualities
Job market
Stakeholders
Teaching and Learning

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Integrity
Values
Team players
Ethics
Positive outlook in life
Affective attributes
Players
Outcomes
Knowledge
Multi-intelligences
Analytical
Critical thinking
Creative thinking
Innovative
Intellectual Qualities
Skill
Soft
Management
Leadership
Multi-lingual
Report writing
Communication
Socio-cultural
Entrepreneurship
Hard
Technical
Professional

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Curriculum Design and Implementation of Embedded Model

- Learning outcomes (LOs)
- Learning Taxonomy - Key Indicators (KIs)
- LO & KI based curriculum
- Varied teaching methods
- Varied evaluation methods

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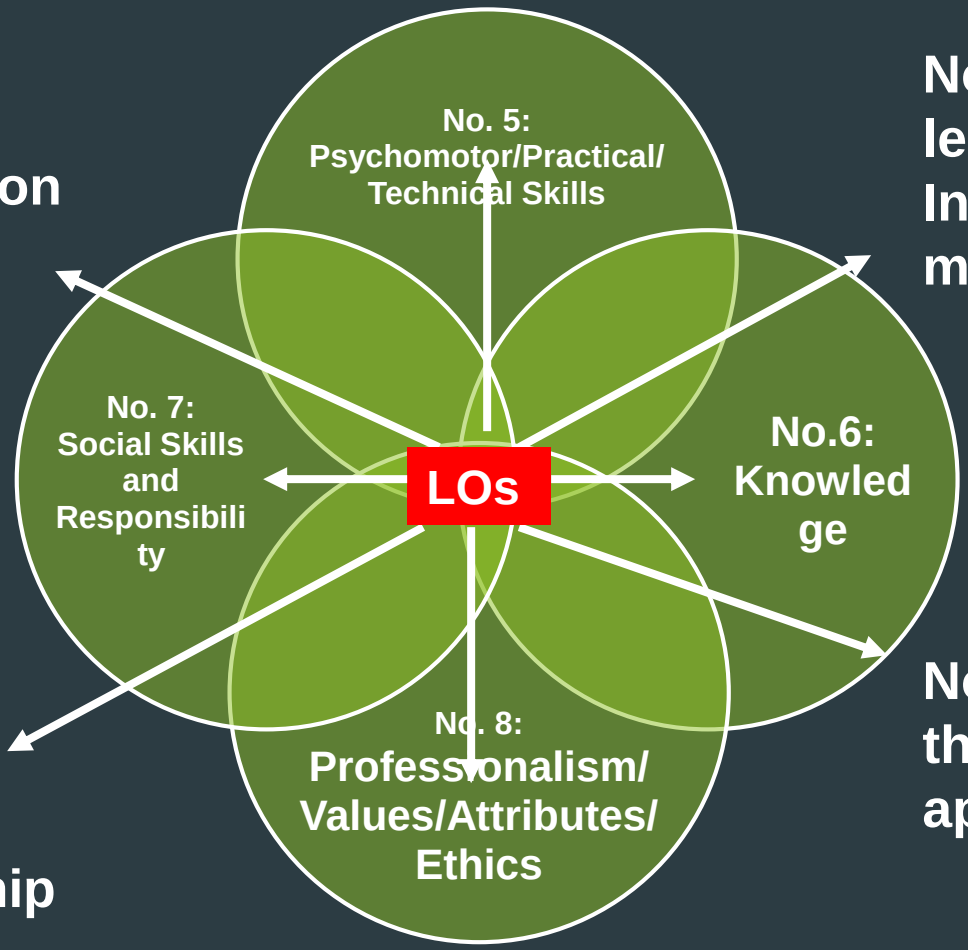
LEARNING OUTCOMES – Breadth & Depth

No. 2: Communication skills

No. 1: Lifelong learning & Information management



No. 4: Management & Entrepreneurship

No. 3: Critical thinking/ Scientific approach

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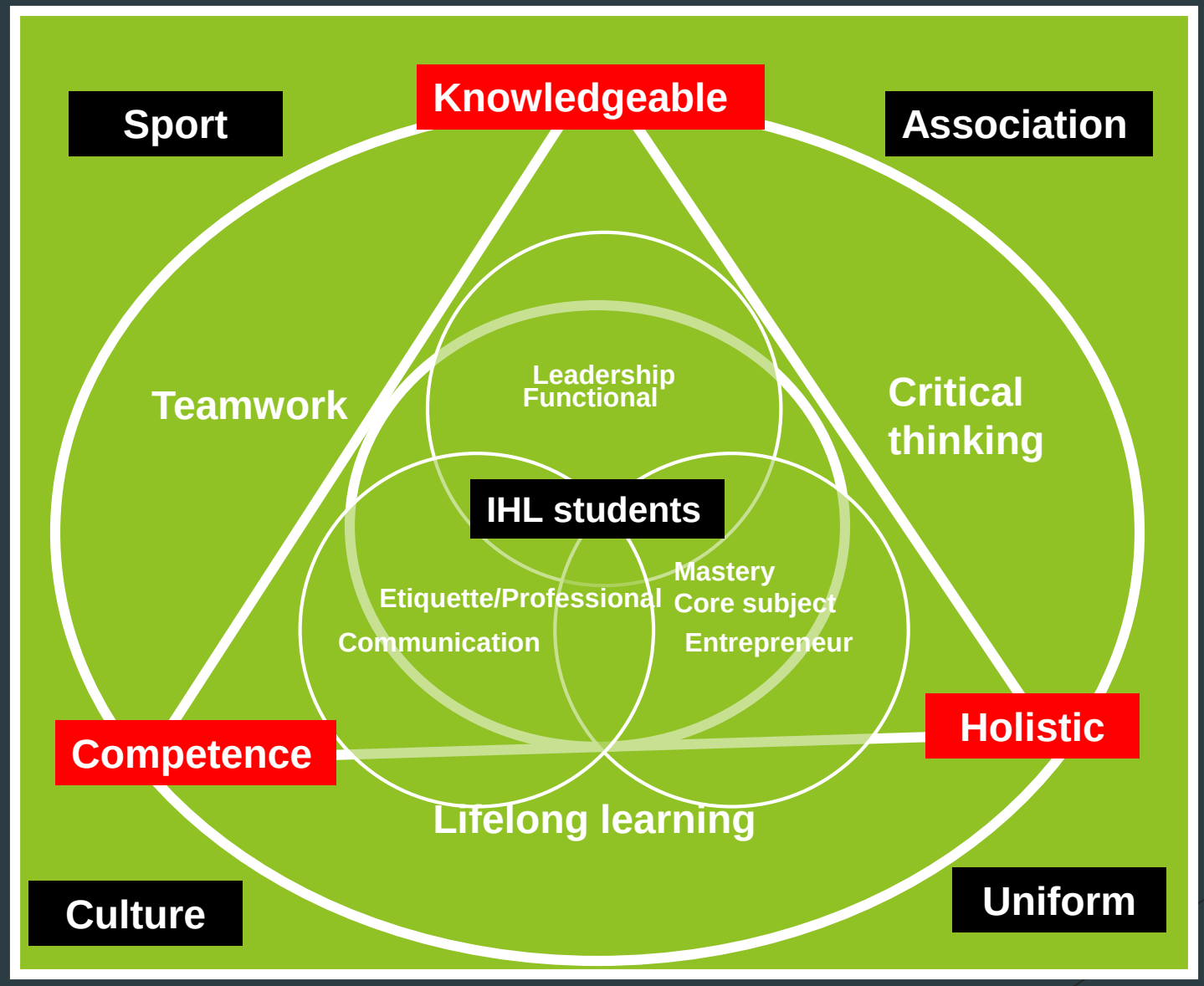

SOFT SKILLS CONCEPTUAL MODEL Awang2017

The top 3 key selection criteria used for recruiting graduates: graduate's interpersonal

- communication skills (57.5 per cent respondents),
- academic qualifications (35.4 per cent), and
- work experience (27.6 per cent).

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Green Technology Management and Environmental Education - The Imperial College London Experience

J. Nigel B. Bell

Professor of Environmental Pollution, Imperial College London. Director, M.Sc. In Environmental Technology, 1980-2008; currently Director of Careers and Alumni

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1st Degree Courses in UK Universities

- Environment (1349 courses in 128 universities/colleges)
- Environmental Analysis
- Environmental Biology
- Environmental Conservation
- Environmental Law
- Environmental Management
- Environmental Planning
- Environmental Science
- Environmental Studies
- Renewable Resources Planning

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Postgraduate Environmental Degrees in the UK

Title	No. of Courses	No. of Universities/ Colleges	Title	No. of Courses	No. of Universities/ Colleges
Environmental Analysis	18	8	Environmental Planning	61	18
Air Pollution	5	2	Environmental Policy	28	10
Control of Specific Pollutants	3	2	Environmental Pollution	21	7
Energy Management	126	33	Environmental Pollution Control	3	2
Environmental Assessment	18	6	Environmental Protection	1158	113
Environmental Biology	34	13	Environmental Regulation & Planning	77	18
Environmental Chemistry	14	6	Environmental Science	233	49
Environmental Design (Architecture)	80	21	Global Warming	3	2
Environmental Engineering	112	21	Pollution Control	38	14
Environmental Health/Safety	219	51	Renewable Resources Planning	80	26
Environmental Management	254	63	Soil Pollution	5	2
Environmental Monitoring	16	8	Water Pollution	4	2

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M.Sc. in Environmental Technology: the Imperial College, London history

- Strongly interdisciplinary, operating at interface of social and natural sciences
- Started in 1977 as the focus of the Centre for Environmental Technology (24 students); now 140-150
- c. 70% ‘mature’
- c. 2600+ graduates (alumnus network)

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Aim:

To produce Environmental Scientists and Managers who will become leaders in:

- Industry
- Commerce
- Consultancy
- Research
- Government
- NGOs

Objectives

- **A command of the range of subjects** necessary to understand and resolve environmental problems and the ability to apply the knowledge to practical issues
- **Specialisation** on certain areas in greater depth
- **Understanding** of the fundamental mechanisms operating in the environment and the principles underlying the tools for sustainable environmental management
- Development of **interpersonal and transferable skills**
- **Quantitative and qualitative skills**
- Development of the ability to conduct **independent rigorous research** into environmental problems with confidence.

Course structure

- 1st term: Core Course: Ecology; Environmental Pollution & Control; Environmental Policy & Management; Environmental Law; Environmental Economics; Research Methods; Risk Assessment; Small Group Seminars; Policy Seminars

- 2nd term: Specialist Options: Pollution Management; Water Management; Ecological Management; Energy Policy; Environmental Analysis & Assessment; Global Environmental Change & Policy; Business & the Environment; Environmental Economics and Policy

- April – September: Project period.

Ecology

- Introduction to Ecological interactions
- Community Ecology
- Ecosystem Structure – Energy and Materials, Pollution
- Discussion of Ecology: Practical
- Spreadsheet Exercise
- Atmospheric Science
- Landscape Ecology
- Global Climate Change
- Biodiversity and Conservation
- Human Demography
- The Ecology of Food Production

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Environmental Pollution and Control

- Introduction to Pollution
- Marine Pollution
- Atmospheric Pollution
- Air Pollution Impacts
- Soil Pollution
- Drinking Water
- Contaminated Land
- Groundwater Resource Management
- Surface Water Quality
- Pollution and Health
- Wastewater Treatment
- Biosolids Management
- Air Pollution Control
- Soil, Air and Water Pollution control

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Environmental Policy and Management

- Introduction to Environmental Policy and Management
- Environmental Policy I – History and Institutions
- Environmental Policy II Content and Outcomes
- Environmental Management I – Environmental Impact Assessment and Strategic Environmental Assessment
- Environmental Management II – Environmental Management and Business
- Environmental Management III – Tools, Techniques and Approaches

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Environmental Law

- Introduction to Environmental Law
- EC Environmental Law
- Remedies:
  - **Part I** – Private Law Applications and Liability
  - **Part II** – Enforcement of Environmental Law in the UK and EC
  - **Part III** – The Public Law Approach
- International Law and the Environment
- Implementing Environmental Law

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Environmental Economics

- Economic Foundations 1: Introduction and Consumption
- Economic Foundations 2: Production & Welfare Economics
- An Introduction to Environmental Economics and Policy 1 – Environmental Resources, Economic Efficiency and Market Failure
- An Introduction to Environmental Economics and Policy 2 – Environmental Policy Targets and Policy Instruments
- Cost Benefit Analysis
- Environmental Valuation

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Research Methods and Statistics

- Lectures and Practicals
  - Introduction to Research Methods
  - Introduction to Statistics
  - T-Test, Chi Square test
  - Correlation and regression, ANOVA
  - Transforming data & non-parametric tests
  - Reading, writing and illustrating statistics
  - Statistics Assessment (online) (10%)
  - Social sciences research techniques – questionnaire design, structured interviews, focus groups, analysis of qualitative data etc. (start of project period)

Risk Assessment (half module)

- Introduction to Risk Assessment
- Law, Science and Risk
- Probabilities for Risk Assessment: What do they mean and how are they applied?
- Environmental Risk Management
- Public Understanding of Risk
- Statistical Risk Assessment
- Risk Assessment Modelling – online assessment

Teaching

- Teaching as telling or transmission
- Teaching as organising student activity
- Teaching as making learning possible

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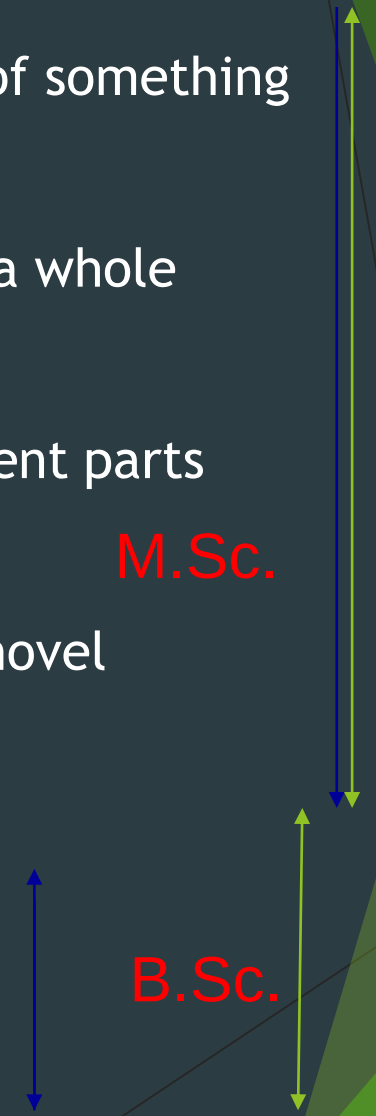
The Learning Experience

- Lectures
- Seminars
- Tutorials (academic and pastoral)
- Workshops
- Laboratory sessions
- Policy seminars
- Remedial support network
- Independent study groups
- Independent study
- Independent project work
- Online WebCT (Blackboard) resources

- Evaluation
  - Ability to make a judgement of the worth of something
- Synthesis
  - Ability to combine separate elements into a whole
- Analysis
  - Ability to break a problem into its constituent parts
- Application
  - Ability to apply rephrased knowledge in a novel situation
- Comprehension
  - Ability to rephrase knowledge
- Knowledge
  - That which can be recalled



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Bloom's hierarchy of the cognitive domain (1956)

Developing Competent Green Workforce for Sustainable Environment in Promoting Quality of Life - Malaysian Experience

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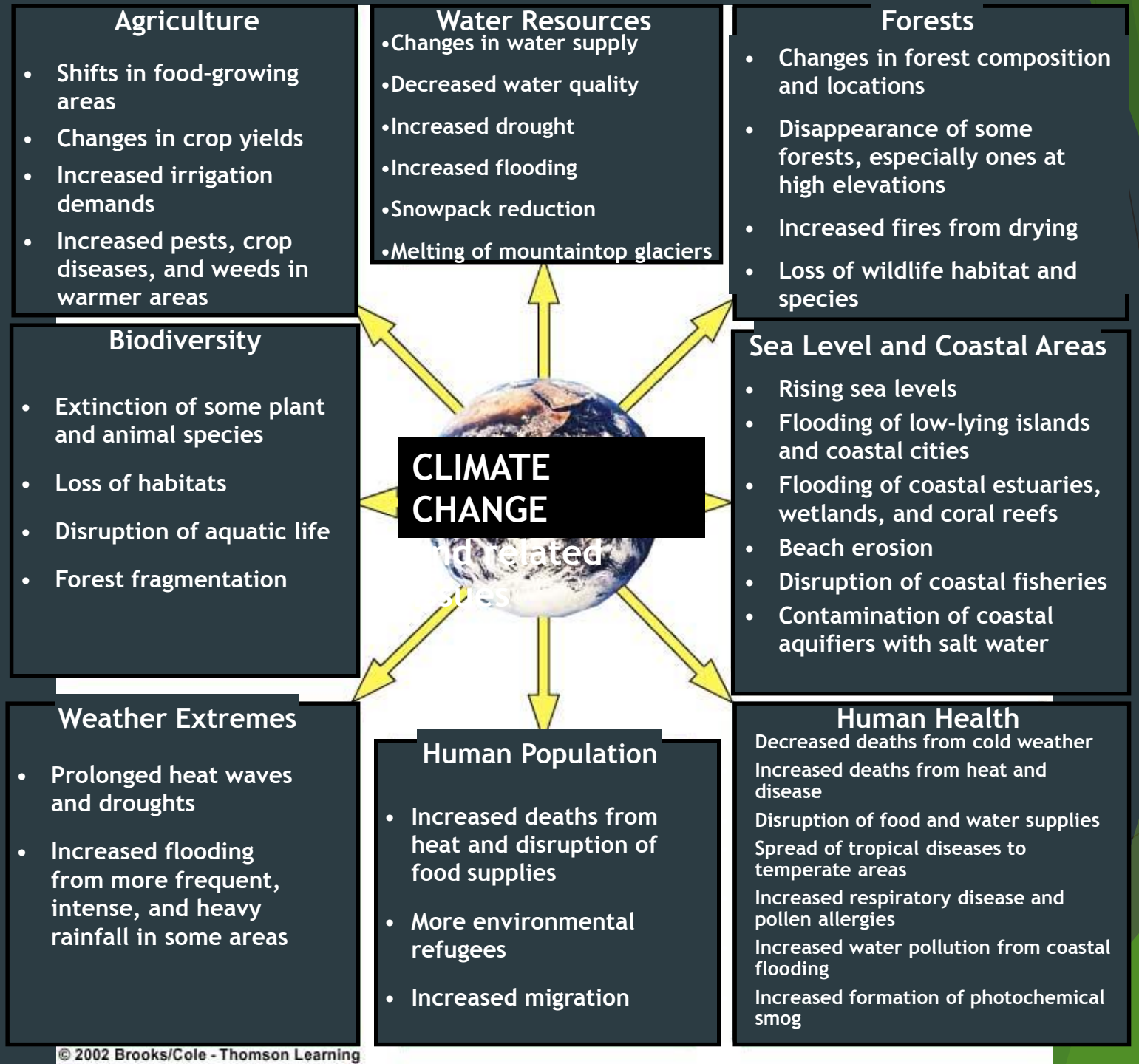
- Curriculum development – Bachelor of Environmental Science & Technology (BEST)
- Nature of the programme
- Approach and justification
- Master in Environmental Management Technology (MEMT)
- Centre of Excellence


Agriculture
Shifts in food-growing areas
Changes in crop yields
Increased irrigation demands
Increased pests, crop diseases, and weeds in warmer areas
Water Resources
Changes in water supply
Decreased water quality
Increased drought
Increased flooding
Snowpack reduction
Melting of mountaintop glaciers
Forests
Changes in forest composition and locations
Disappearance of some forests, especially ones at high elevations
Increased fires from drying
Loss of wildlife habitat and species
Biodiversity
Extinction of some plant and animal species
Loss of habitats
Disruption of aquatic life
Forest fragmentation
CLIMATE CHANGE
Sea Level and Coastal Areas
Rising sea levels
Flooding of low-lying islands and coastal cities
Flooding of coastal estuaries, wetlands, and coral reefs
Beach erosion
Disruption of coastal fisheries
Contamination of coastal aquifers with salt water
Weather Extremes
Prolonged heat waves and droughts
Increased flooding from more frequent, intense, and heavy rainfall in some areas
Human Population
Increased deaths from heat and disruption of food supplies
More environmental refugees
Increased migration
Human Health
Decreased deaths from cold weather
Increased deaths from heat and disease
Disruption of food and water supplies
Spread of tropical diseases to temperate areas
Increased respiratory disease and pollen allergies
Increased water pollution from coastal flooding
Increased formation of photochemical smog
© 2002 Brooks/Cole - Thomson Learning

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Why do we need green workforce?

Highly complex in terms of structure and function of our ecosystem

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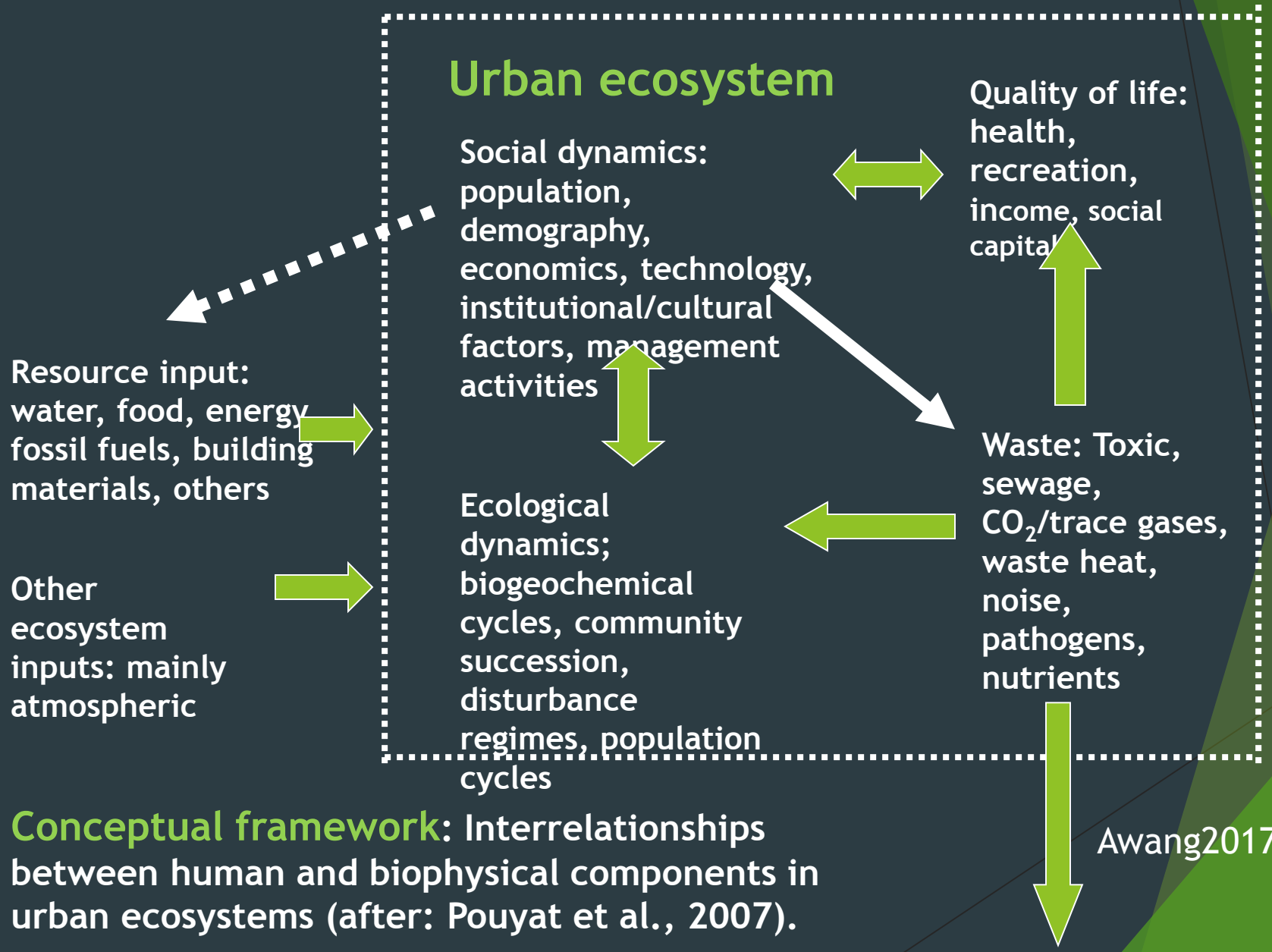
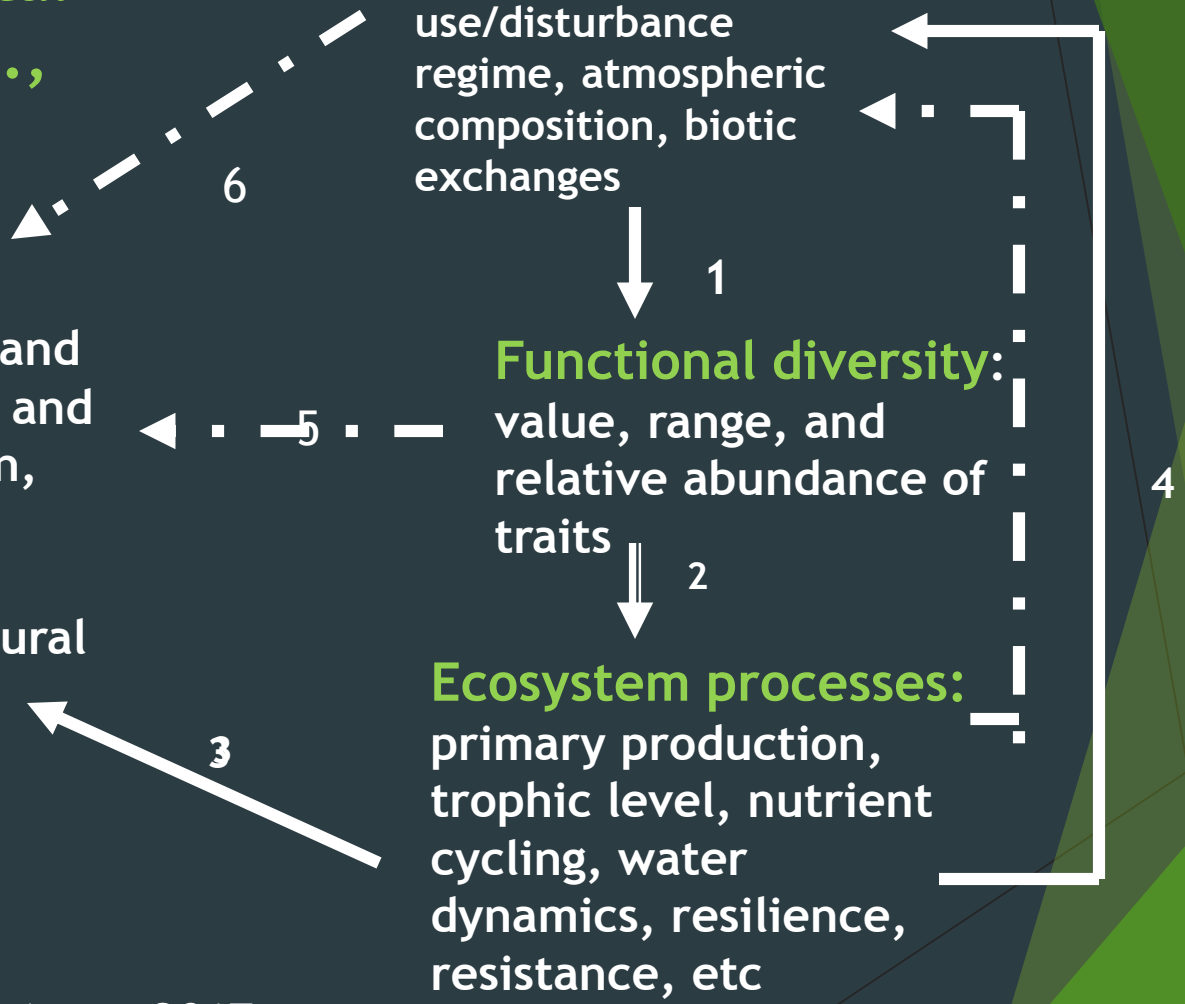


Conceptual framework: Interrelationships between human and biophysical components in urban ecosystems (after: Pouyat et al., 2007).

Functional Diversity – Ecosystem Functioning and environmental filter (Diaz, et al., 2007)



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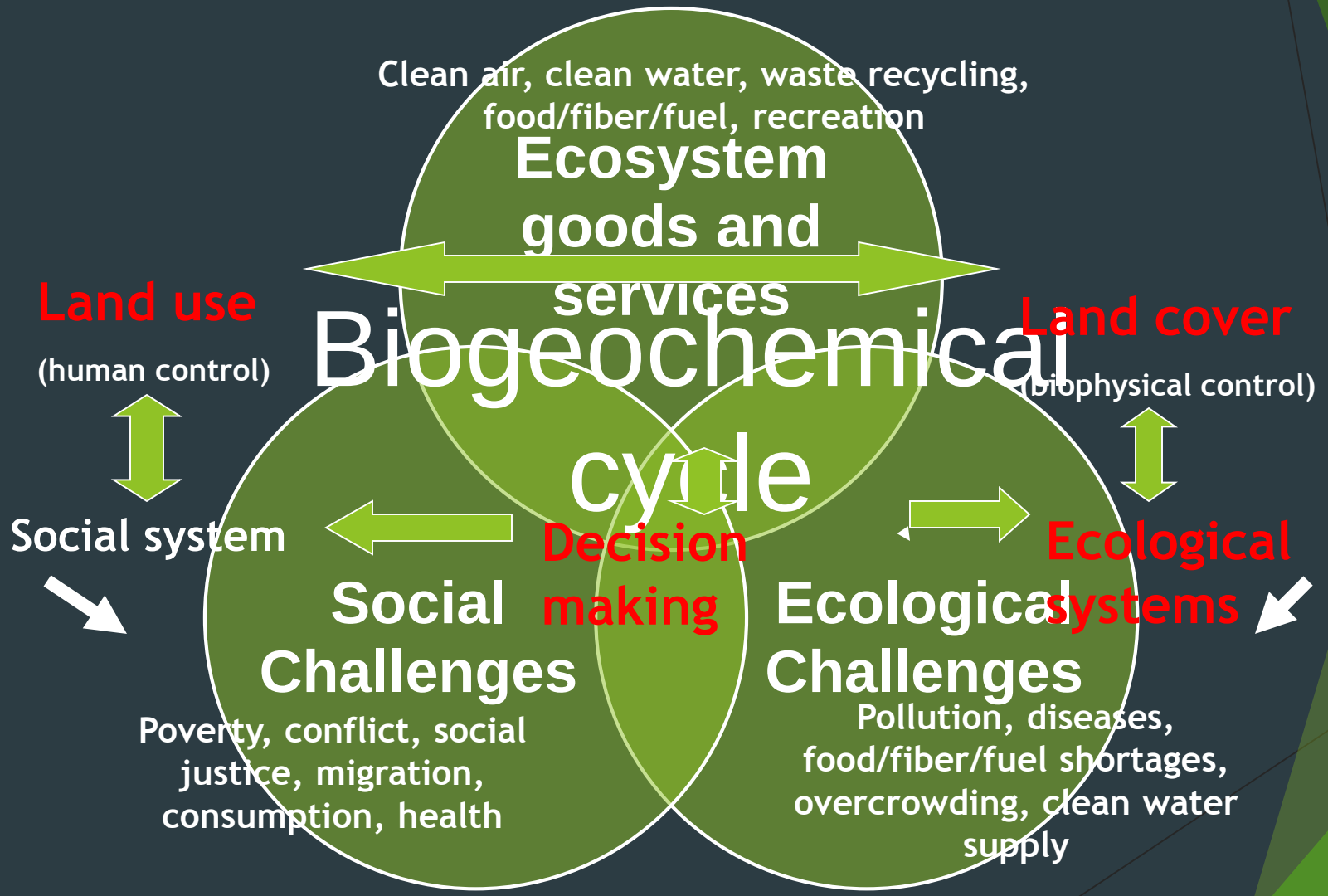
Global Changes: Dynamic Land Transition



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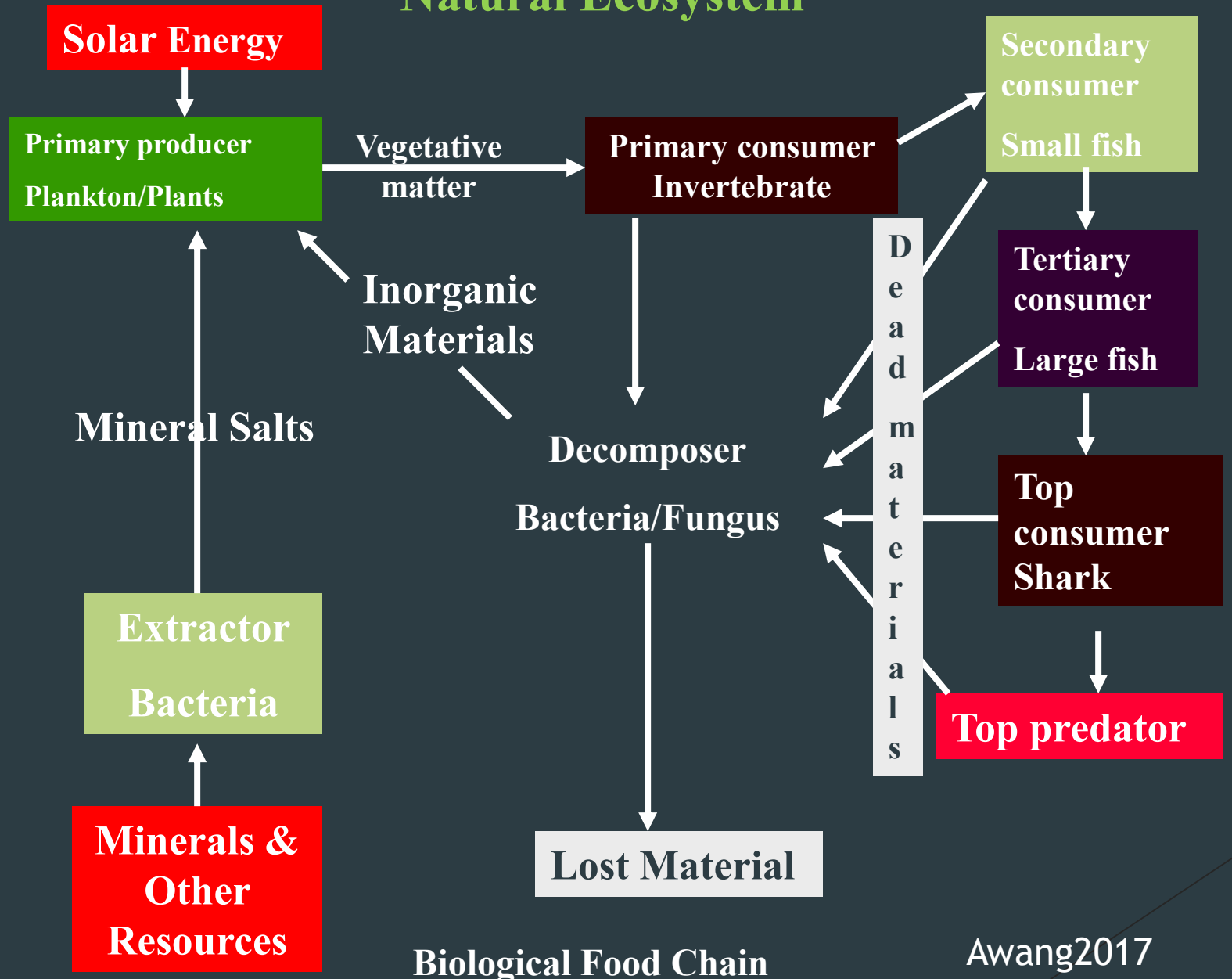
Natural Ecosystem



Biological Food Chain

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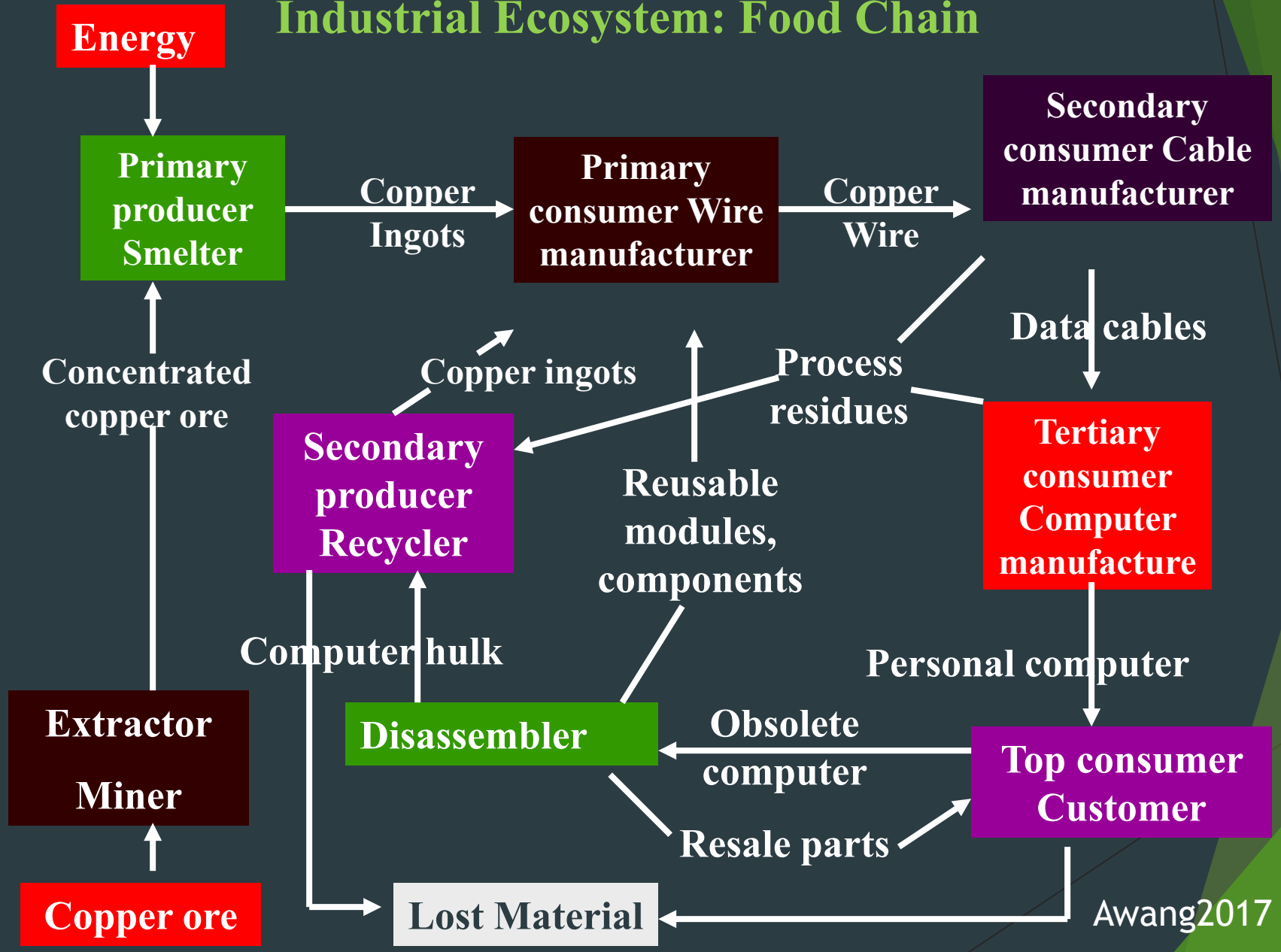
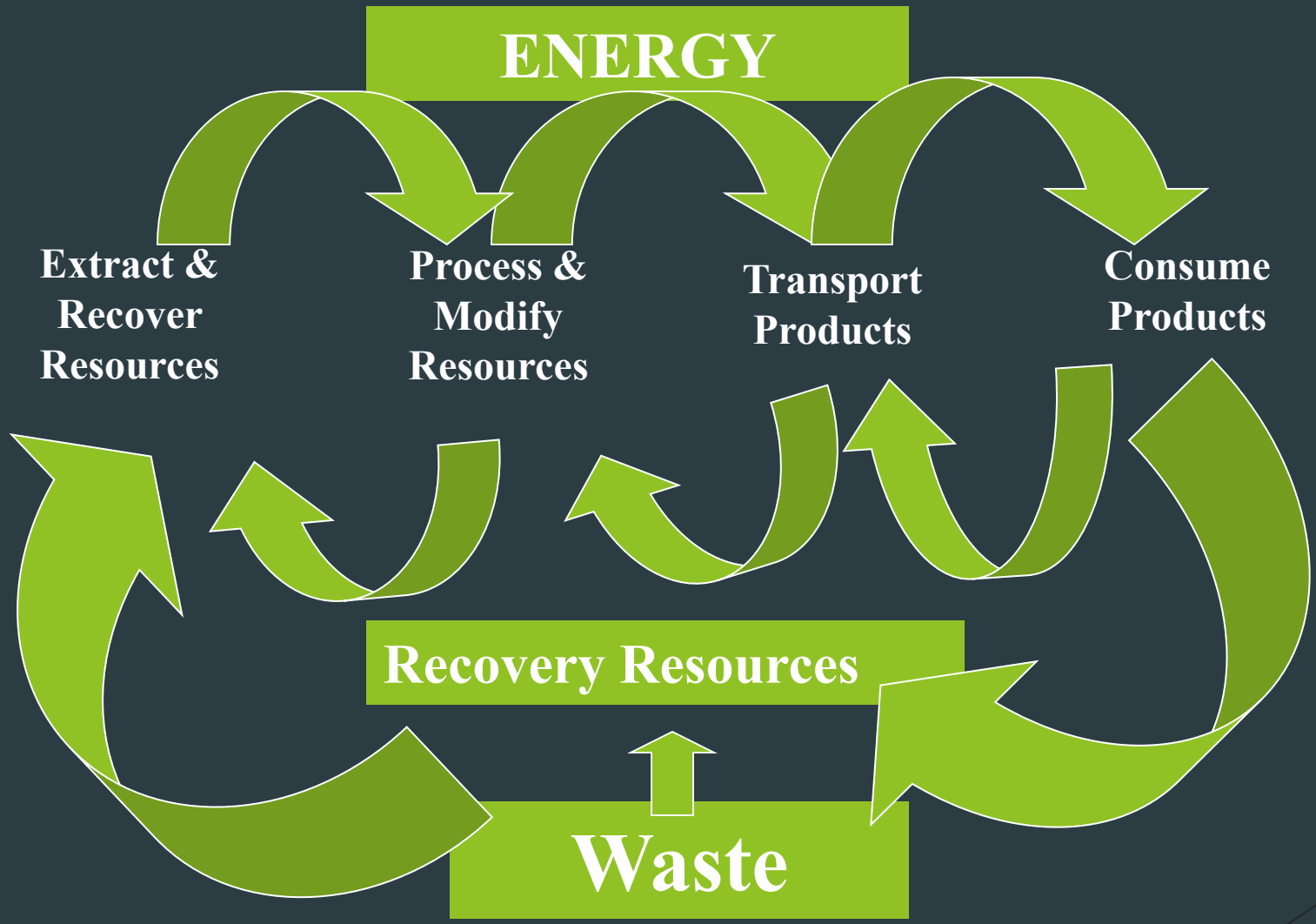
Industrial Ecosystem: Food Chain





Concept of Industrial Ecology

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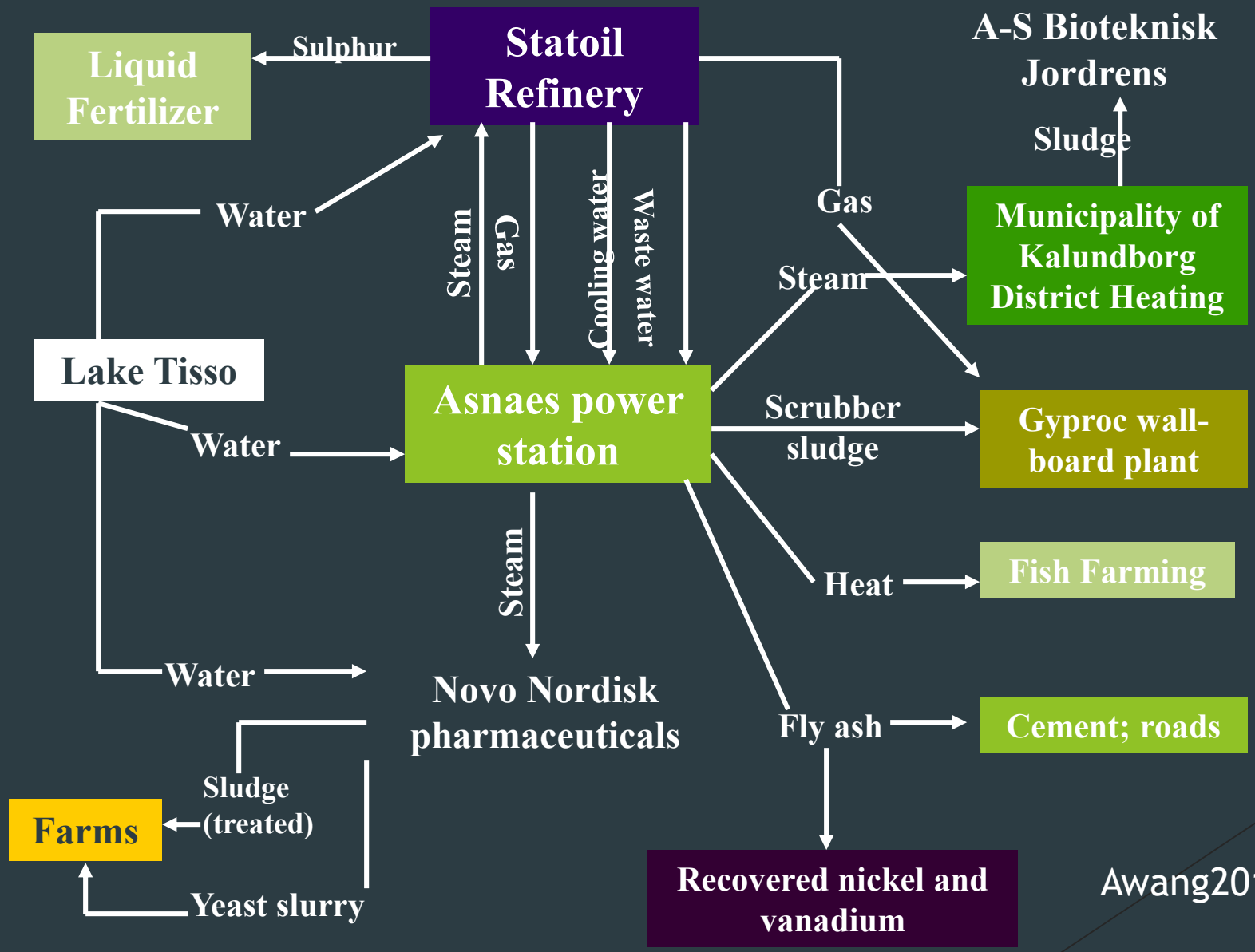
Flow of Resources in the eco-industrial system at Kalundborg, Denmark



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Ideal ECOSPHERE?

Miller (2005)

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What we have done and What's next?

Redefine the "environment and urban geography" (Mayer and Kohn, 1952)

"….a system which includes all living things and the air, water and soil which is their habitat…."

"….a system being something made up of interrelated parts in dynamic interaction with each other, and capable, for certain purposes, of co-operating in a common behavioral program…." Ecologist (1972)

Education System - developing curricula on Environmental Education

- 1974: EQA introduced and promulgated
- Establishment of Dept of Environmental Studies in UPM and Bac of Environmental Sciences was introduced, subsequently other related programmes introduced by other IHLs

- 1982: Alam dan Manusia (Man and Environment) at the primary level and scraped after 10 years and replaced with Kajian Tempatan (Local Social Studies)

- 1996: Environmental Education was reintroduced in both primary and secondary curricula through integrated approach

- Establishment of Centre of Excellence 1990 - present:

1. Sustainability Science Research Cluster – UM
2. Institute for Environment and Development – UKM
3. Centre for Global Sustainability – USM
4. Jeffrey Sacsh Centre for Sustainable Development – SU
5. UMS, UNIMAS and others

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Curriculum Development

Strong in fundamental sciences with understanding of the natural ecosystem concept/modern technology, through the integration of human dimension, will produce high quality “green workforce” to meet the national and international need.

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Objectives: Bachelor of Environmental Science & Technology (BEST) Awang2017

- **To produce human capital** in dealing with environmental issues through allocation - certification, sorting and matching of the individuals by their ability and interest to meet the need of the society (horizontally and vertically)
- **To transmit environmental and cultural values and beliefs** at the local and societal levels
- **To develop of human potential**, helping individuals to actualize their talents and interests in dealing with environmental welfare
- **To provide as Maieutic platform/function** – birthing ground of new ideas and vision on future environment technology and management

Approach

- The Faculties of Engineering and Built Environment, Health Sciences, Business Administration and Accountancy, and Law are jointly developed to offer the BEST
- A three/four-year undergraduate program specifically focusing on environmental issues through the integration of basic sciences, technologies, and humanities.

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Nature of the Programme

Drawing upon the **traditional and core disciplines;**

- environmental geology, geochemistry, hydrology,
- ecology and natural resources, oceanography
- physical, biological and chemical processes which control natural environments
- atmospheric and water sciences, and fundamental of environmental engineering and technology

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Nature of the Programme (cont.)

- The application of environmental engineering solutions in minimizing the environmental problems with special emphasis on management approach
- The program also integrates with social science and humanities components in enhancing the importance of human dimension such as industrial psychology, law, and ethics.

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Approach

Due to the interdisciplinary nature of the programme: environmental science, technology, and humanities, undergraduates majoring in BEST should satisfy the following requirements:

Completion of a) a set of courses from tradition discipline

and b) the core environmental sciences, including introductory courses in environmental engineering and technology, and social sciences.

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Interdisciplinary (traditional + core)

Traditional discipline

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Core Discipline

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Approach: a) Understanding on Biogeophysicochemical Processes in Relation to Hydrologic cycle is critical

- Pollutant pathway
- Industrial metabolism
- Ecosystem response to changes

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Approach and justification (cont.)

b) **Connectivity**: **Biogeophysical and chemical processes and environmental systems** include biochemical pathways of pollutants and industrial metabolism.

c) **Response of ecosystems to change** such as microbial degradation of pollutants, biogeochemical cycling of greenhouse gasses, hill-slopes erosion, rivers, and coastline; sediment production, transport and fate; groundwater movement of contaminant plumes

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Approach and justification (cont.)

d) **Connectivity:** oceanography, atmospheric physics and chemistry, aerosol formation; global warming; environmental fate of pollutants, water and waste-water treatment, geochemistry, atmospheric chemistry, ozone depletion and acid rain

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Approach and justification (cont.)

e) **Environmental modeling**, risk assessment, environmental system design, pollution control strategies.

f) **Application of the engineering solutions through management perspective** in the context of the public decision-making process including economics, social and administrative factors that requires knowledge of both engineering processes and engineering design **to alleviate environmental problems.**

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Approach and justification (cont.)

g) **Analysis of interrelationships of engineering and administrative decisions** on cultural, institutional, and environmental sectors of the society, especially in the urban, rural and industrial environment.

This requires case study development and research papers analyses, analyzing environmental or natural resource issues, **technology and its political impact, and industrial implications.**

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Approach and justification (cont.)

h) **Application of techniques** to help students to think in a future **perspective in dealing with the most challenging problems of sustainable development** i.e. developing resilient and adaptive decision-making tools that can cope with risk and uncertainties.

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Approach and justification (cont.)

3) **Linking research with teaching and internship** through work experience,

a) **project and assignment** work carried out in conjunction with **staff research programs**

b) **opportunity to develop a range of research and transferable skills.**

Approach and justification (cont.)

3.1) **Linking research and teaching through external projects** (e-Science, consultancy and contract research) include:

- provision for students **to develop research skills** within “live” projects
- opportunity for student **to demonstrate their ability to apply theory to practice**
- **integration of fieldwork**, experimental and theoretical investigations

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Approach and justification (cont.)

3.2). Opportunity for students to;

- **gain contacts in their chosen field of interest**
- meet the aims of the work experience placement
- **meet the intended learning outcomes** of the independent research project

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Expected output from Project

1. **Ability to formulate research problems**, translate to research design and to implement the research program
2. **Ability to select and plan** the execution of appropriate research methods
3. **Understand the effective integration** of the discrete skills and techniques of various programs in a research program of their choice

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Expected output from Project (cont.)

4. **Develop and demonstrate their ability to work independently** and with initiative within a research context
5. Ability to **evaluate data**
6. Develop and demonstrate their ability **to produce an extensive written report of their research** with some originality of perspective to standard expected in a professional context relevant to their BET degree

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4) Industrial placement: to complement the academic experience

Aims to provide:

- wider experience in the academic and professional discipline
- an experience of working relationships, employment, hours and practical constraints of the working environment
- knowledge on an area of employment within which they seek employment
- an experience of contributing to the design and/or implementation of a specific project within an organization.

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Master in Environmental Technology Management (MEMT)

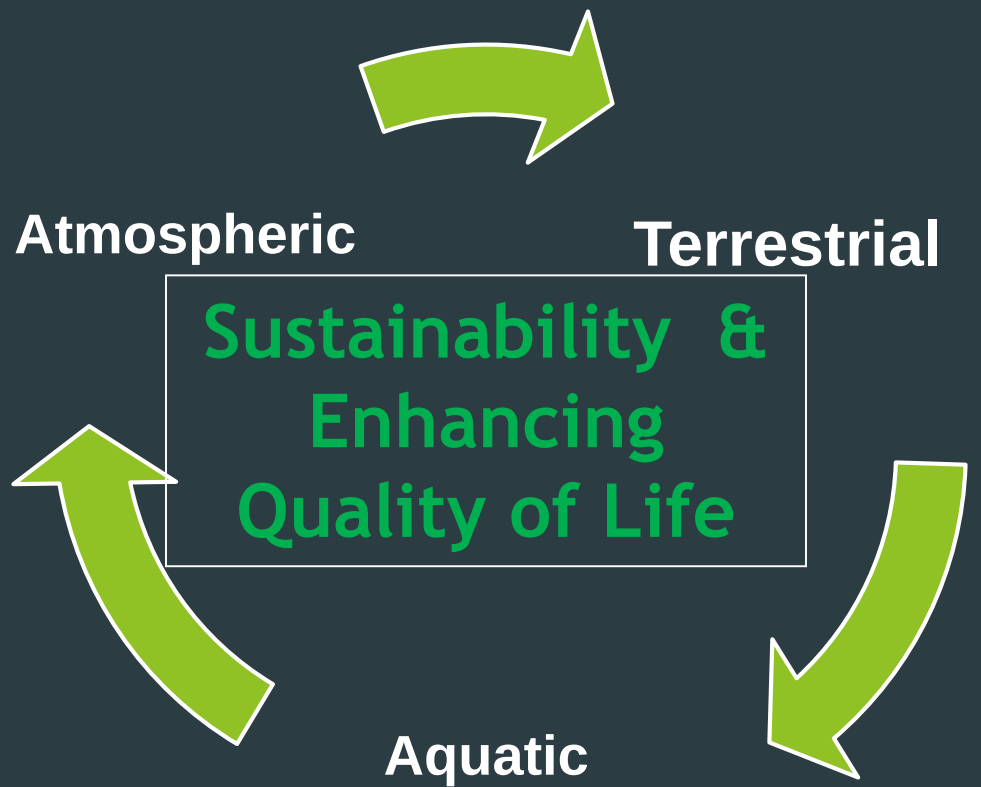
General objective

To produce human capital focuses on growing demand for specialized and effective environmental scientists to tackle significant environmental issues utilizing available environmental technology, policy, planning and management

Philosophy of the Curriculum

- Environmental education is a business that is important for job opportunity and economic of sustainable development of the nation
- learning (*deep and broad*) - about research, teaching, budget and taxes, ethics and discipline, religion and values, and political correctness and connections

Curriculum focus: issues pertaining to the sustainability of biogeochemical cycle and learning with cases:



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Factors Contributing to Wealth Creation and Sustainability of the Nation

Curriculum approach:

integrates the following components modularly; 11 modules and dissertation (42 credits)

Part 2:
Nature of Research process and design/case studies

Science
Technology
Humanities

Part 1:

Management, governance and law, and technology

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Nature of research/case studies

embedded in the curriculum and approach based on the following tools:

- Environmental resource management
- Environmental impact assessment
- Landscape ecology
- Soil erosion and risk assessment (USLE)
- Agricultural practices and management/precision agriculture
- Forest fire and risk assessment
- Management of ecosystems
- Regional and rural development

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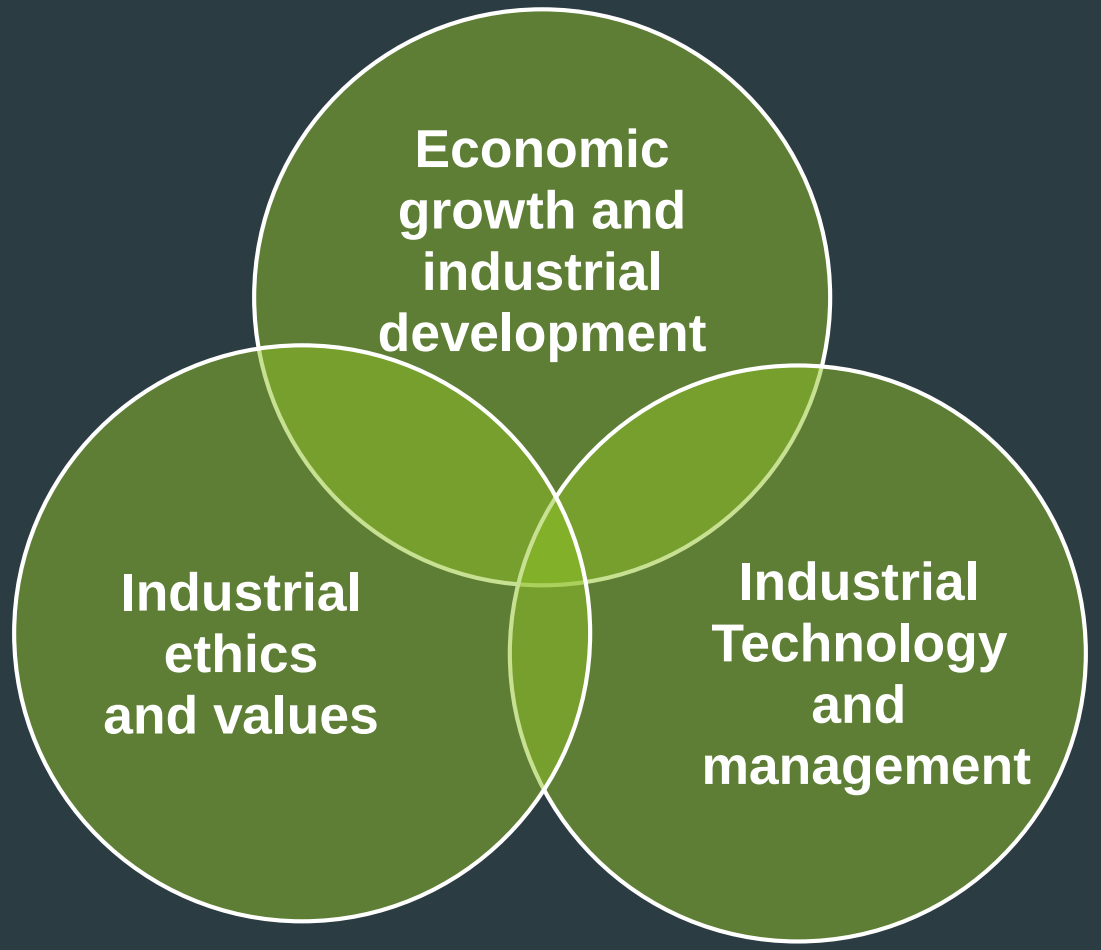
Core components



Approach: past achievements by the nation (national, regional and global), issues, way forward

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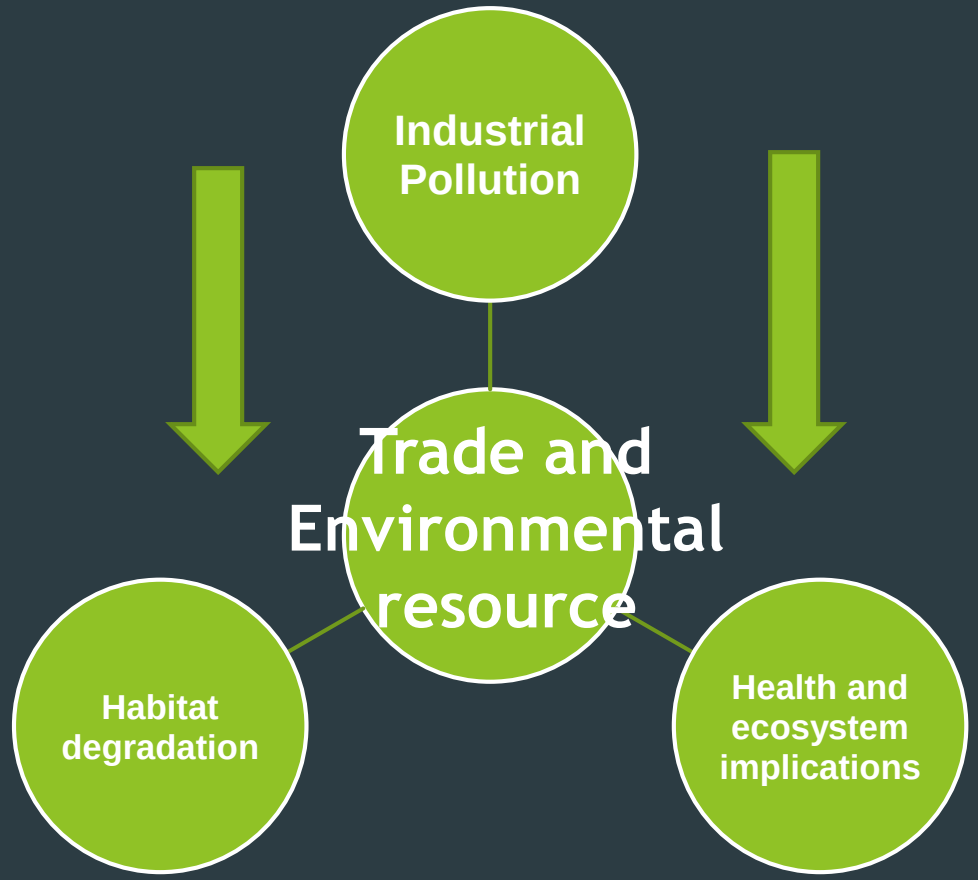
Core related subjects/modules



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1. First component: Habitat degradation and forest fragmentation covers the following topics: Case Study:

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2. Second component of the core module: Industrial Technology Management - aspects of pollution prevention covers:

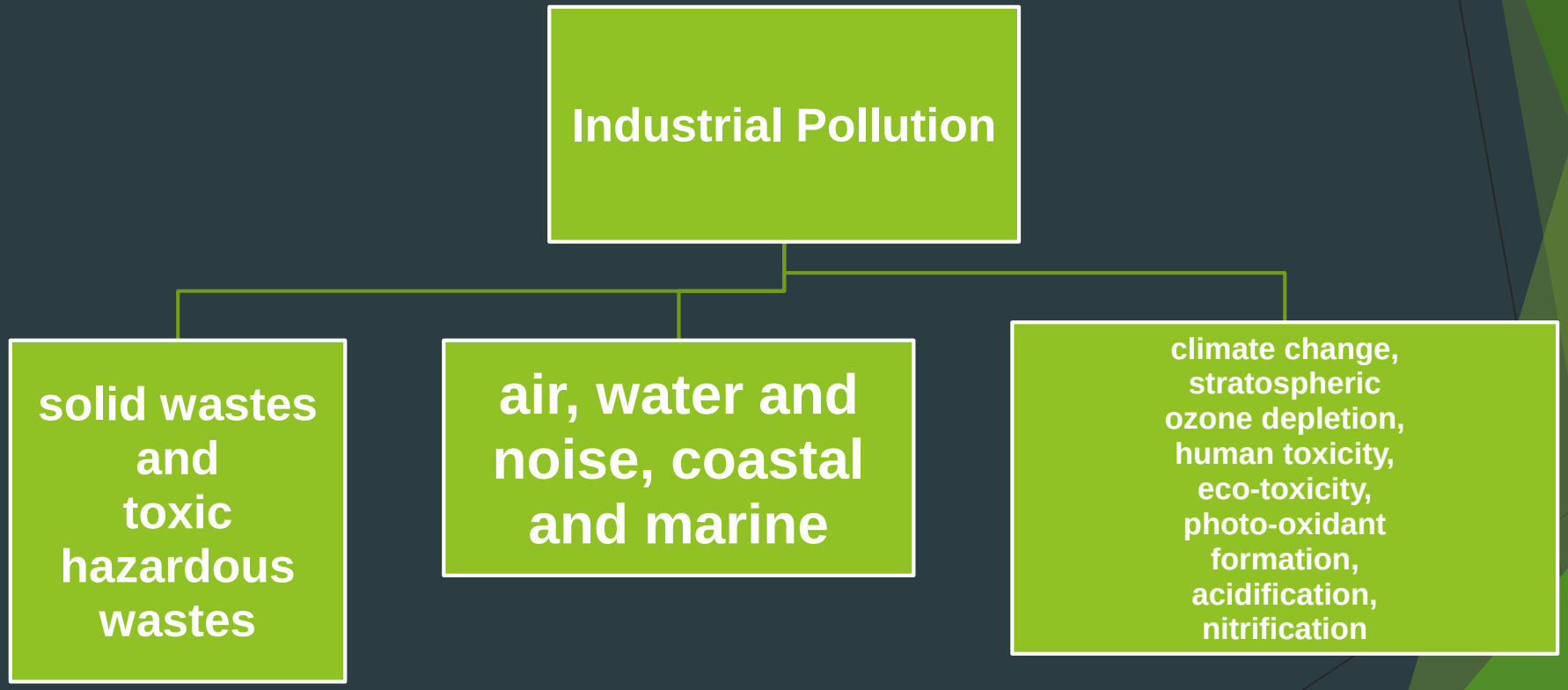
a) properties and fate of environmental contaminants, industrial activities and the environment, manufacturing operations, technology of pollution prevention for air and water pollution, hazardous and solid wastes pollution technology and management, pollution prevention planning, residual technology management, municipal pollution prevention program

2. Second component of the core module: (cont.)

b) Coastal zone and marine pollution prevention, technology and management including restoration ecology and conservation, optimization of the resources and physical development

c) Agro-environment pollution prevention, technology and management with special reference to agro-based industries and their related activities

3. Third component: Industrial Pollution and Health :



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4. Fourth component: trade and environmental resources: industrial ecology and metabolism, and way forward: for the survival of the industry with special reference to small, medium enterprise:

- Issues on global trade barrier and compliance to environmental standards
- Economics of industrial ecology
- Tools and methodology – covers environmental impact assessment (EIA), environmental management systems, life cycle assessment, ecobalance and ecoaudit, and ecolabeling

4. The fourth component of the core module covers environmental health and industrial ethics (cont.):

a) the economics of health and health care due to environmental negligence in the industrial operations and disaster

b) Industrial ethics, governance, values and attitudes

Why Do we need Green Technology?

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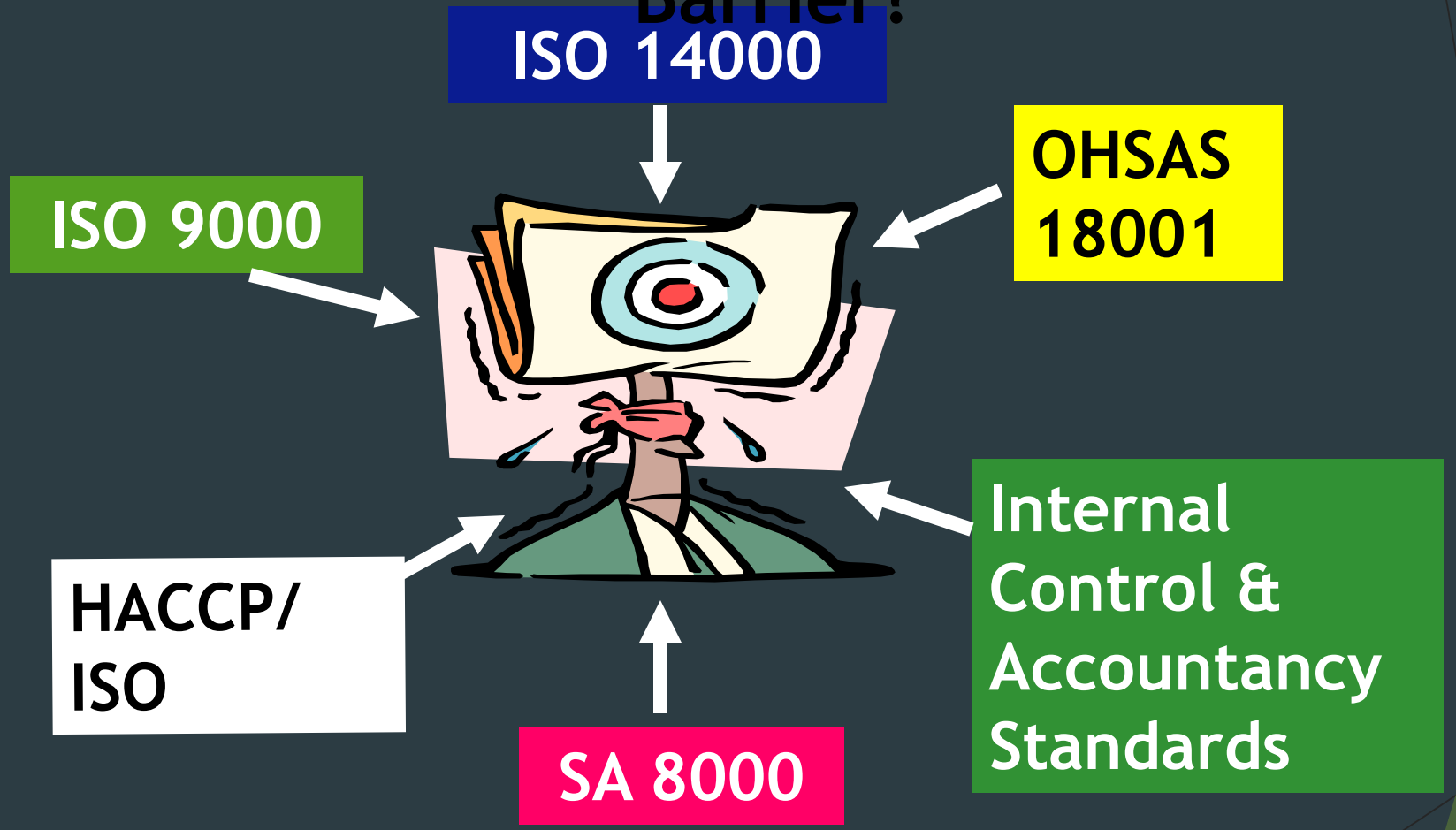
Human Health? Biodiversity? Or Trade Barrier?



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Environmental Psychology

Business Executive, Scientists, Bureaucrats, Technologists, Government Officials

Emotional communication has replaced reasons; Activism has overtaken scientific investigation; Exaggeration often overwhelms precision; Grass-roots manipulations is the new realism

Critical Communication Concepts through Auditing Processes

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Journey Towards "Natural Capitalism"

- Increase the Productivity of Natural Resources
- Adopt Close-loop Production System (no waste or toxic)
- Change of Business Model (one selling - one delivering)
- Reinvesting in Natural Capital (to restore, conserve, sustain & expand the planet's ecosystem)

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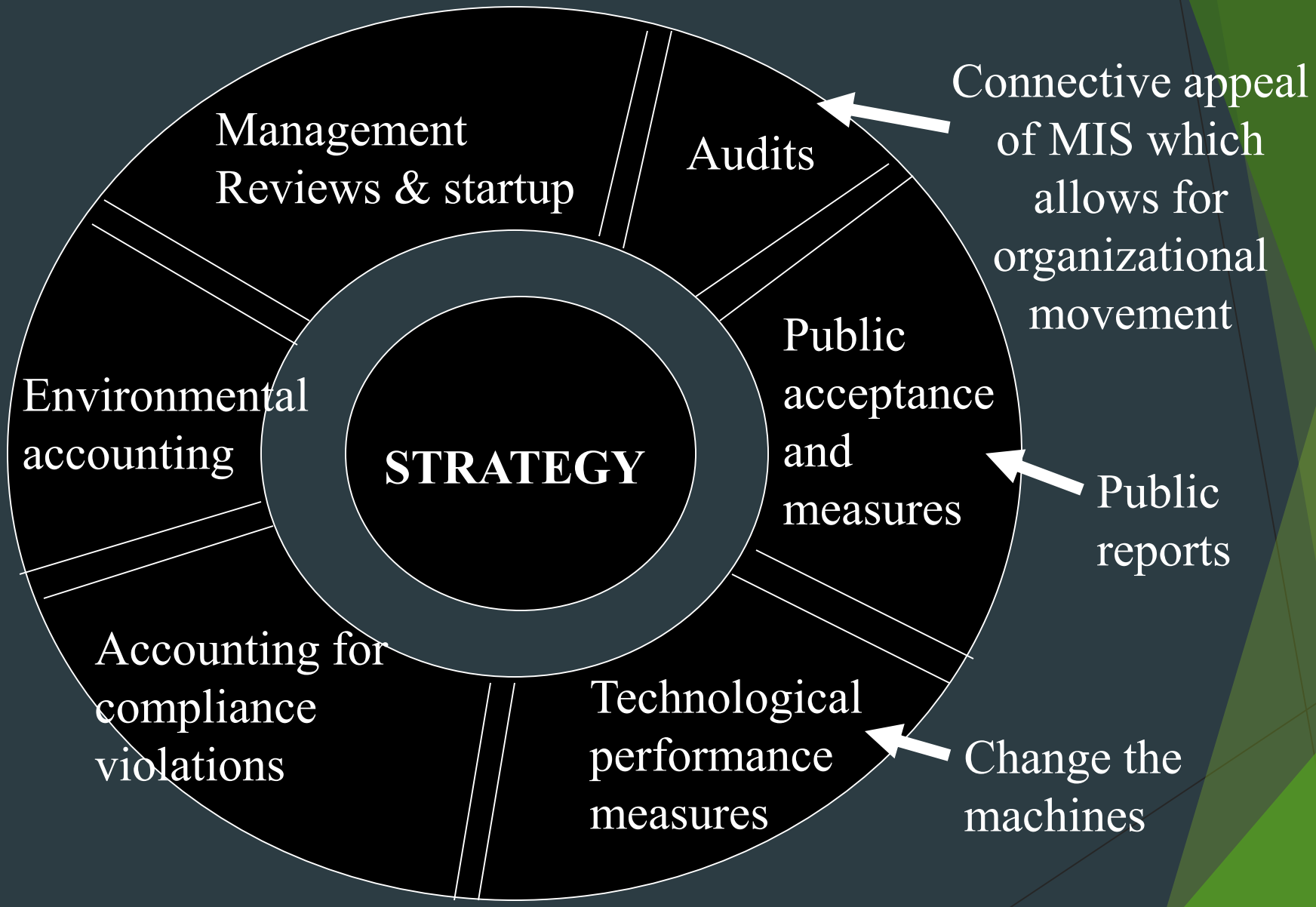

Connective appeal of MIS which allows for organizational movement

Public reports

Change the machines

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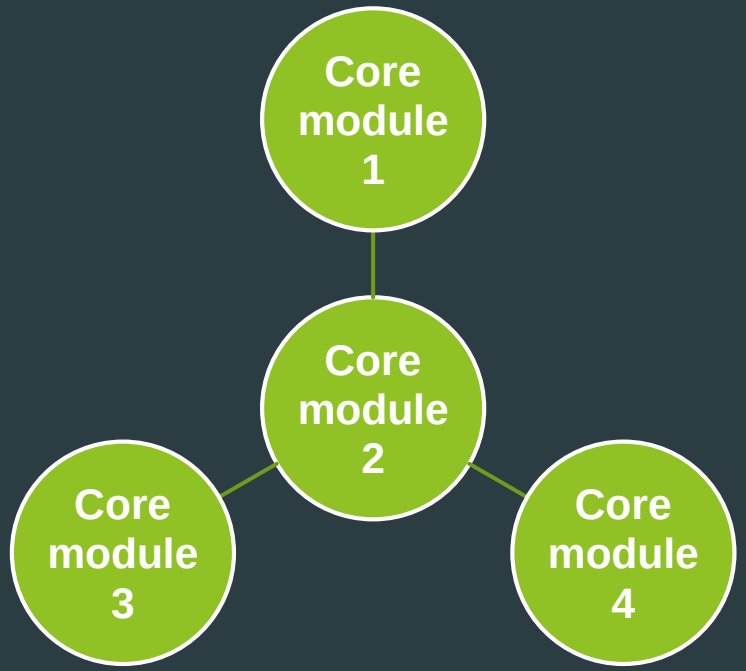
Conclusion

Program structure: each module has its own theme contributed by couples of specialists according to their specialization. Thematic in nature and yet holistic!



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Each core module will carry 6 to 8 credits, while the extra credits will be utilized for small project specifically tailored for a “real case study”.

Take home Message

- **Our civilization:** challenged by the environmental issues due to:

  a) Failure of our/global society to understand the natural ecosystem concept as indefinite life support systems – ecosystem services.

  b) Failure in understanding the concept of **"caliph"** entrusted by the God in managing **"our ecosystem"**

  c) Failure in managing **the greed on how much is enough** for the improvement of quality of life.

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Thank you for your kind attention

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