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Synthesis Workshop of the project "Sustainability Transformation Across the Region (STAR)" and the project "Science Harnessed for ASEAN Regional Policy (SHARP)"

A Workshop on UNESCO Sustainability Science Demonstration Sites in Asia Pacific

2-4 November 2016

The Frangipani Langkawi Resort and Spa

Langkawi, Malaysia

Co-organised by:

UNESCO Jakarta
Regional Science Bureau for Asia and the Pacific

LESTARI
Universiti Kebangsaan Malaysia

Supported by:

United Nations Educational, Scientific and Cultural Organization — From the People of Japan

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Regional Sciences Bureau for Asia and the Pacific - UNESCO Office, Jakarta

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What is Sustainability Science?

"Sustainability science is an emerging field of problem-driven, interdisciplinary scholarship that seeks to facilitate interventions that foster shared prosperity and reduced poverty while protecting the environment.

The field is defined by the problems it addresses rather than the disciplines it employs.

It draws from multiple disciplines of the natural, social, medical and engineering sciences, from the professions, and from practical field experience in business, government, and civil society."

Harvard University's Sustainability Science Program

http://www.hks.harvard.edu/centers/mrcbg/programs/sustsci/about-us

(last visited on 1 June 2015)

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What is Sustainability Science?

- From the literature review, the components of Sustainability Sciences are:
  - Focus on dynamic interactions between nature and society
  - Transdisciplinary approach
  - Normative function
  - Transformational function.

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What is Sustainability Science?

UNESCO Man And Biosphere Program (MAB) definition:

"***Sustainability science*** is an integrated, problem-solving approach that draws on the full range of scientific, traditional and indigenous knowledge in a trans-disciplinary way to identify, understand and address present and future economic, environmental, ethical and societal challenges related to sustainable development." (UNESCO MAB, 2015)

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Background

- **2013 Sustainability Science in Kuala Lumpur, 4-5 April 2013.**

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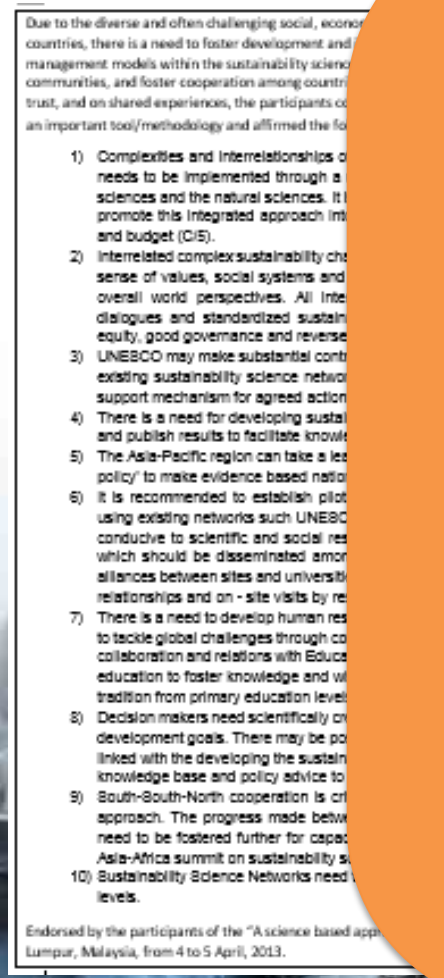
Background


Due to the diverse and often challenging social, econo
countries, there is a need to foster development and
management models within the sustainability scienc
communities, and foster cooperation among countri
trust, and on shared experiences, the participants c
an important tool/methodology and affirmed the fo

1) Complexities and interrelationships o
needs to be implemented through a
sciences and the natural sciences. It
promote this integrated approach int
and budget (CI5).
2) Interrelated complex sustainability ch
sense of values, social systems and
overall world perspectives. All inte
dialogues and standardized sustain
equity, good governance and reverse
3) UNESCO may make substantial cont
existing sustainability science netwo
support mechanism for agreed action
4) There is a need for developing susta
and publish results to facilitate knowl
5) The Asia-Pacific region can take a les
policy' to make evidence based natio
6) It is recommended to establish pilot
using existing networks such UNESC
conducive to scientific and social res
which should be disseminated amon
alliances between sites and universiti
relationships and on - site visits by re
7) There is a need to develop human res
to tackle global challenges through co
collaboration and relations with Educa
education to foster knowledge and w
tradition from primary education level
8) Decision makers need scientifically ov
development goals. There may be po
linked with the developing the sustain
knowledge base and policy advice to
9) South-South-North cooperation is cri
approach. The progress made betw
need to be fostered further for capac
Asia-Africa summit on sustainability s
10) Sustainability Science Networks need
levels.

Endorsed by the participants of the "A science based appr
Lumpur, Malaysia, from 4 to 5 April, 2013.

1) "Sustainability Science" needs to be implemented through a **unified integrated approach** between the social and human sciences and the natural sciences.

4) There is a need for **developing sustainability indicators** to monitor progress towards agreed goals and publish results to facilitate knowledge and technology transfer.

6) It is recommended to establish **pilot demonstration projects** for applying sustainability science using existing networks such UNESCO IHP, MAB and IOC.

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Background

- **2015 Sustainability Science in Kuala Lumpur, 3-5 March 2015.**

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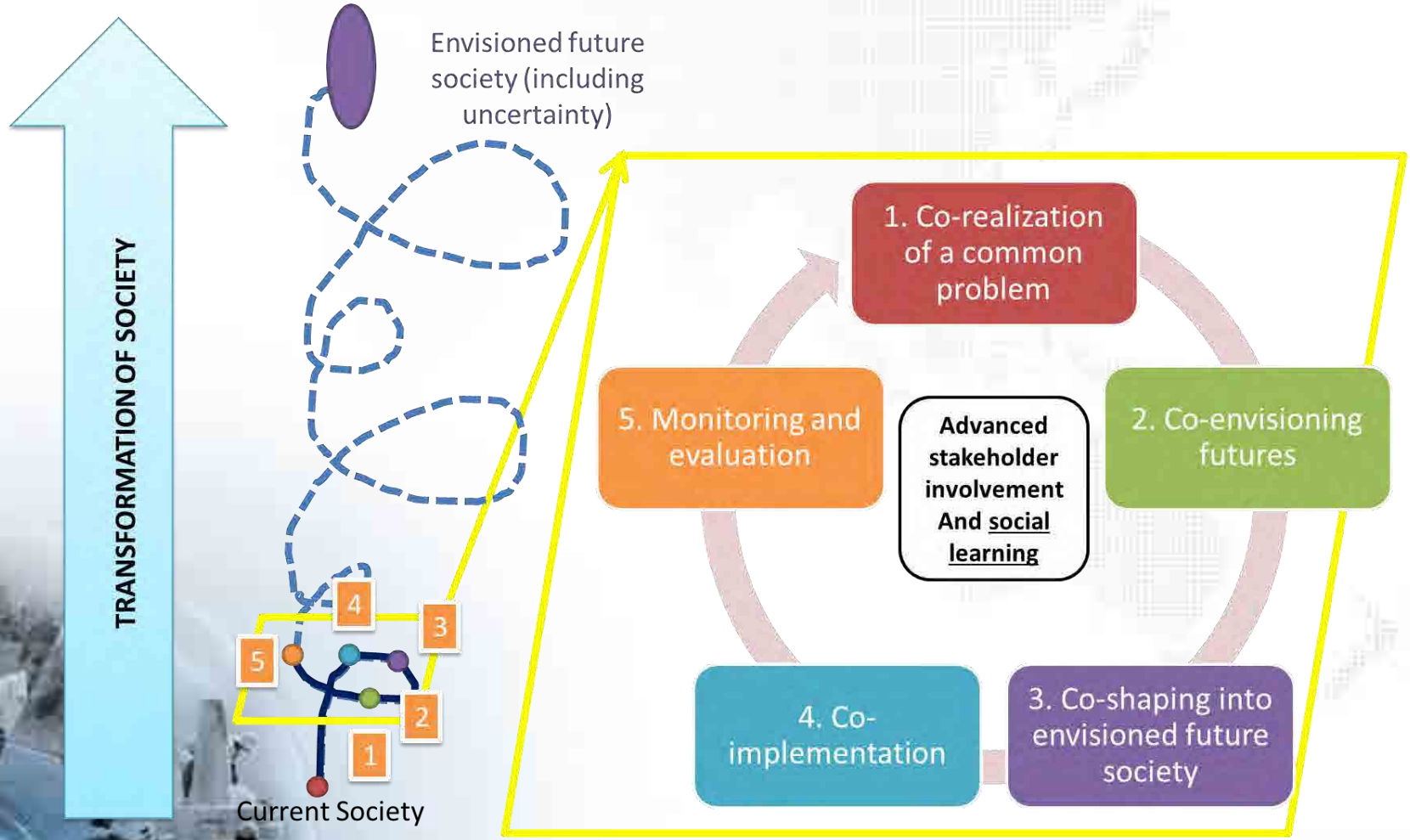
STAR Sustainability science implementation framework



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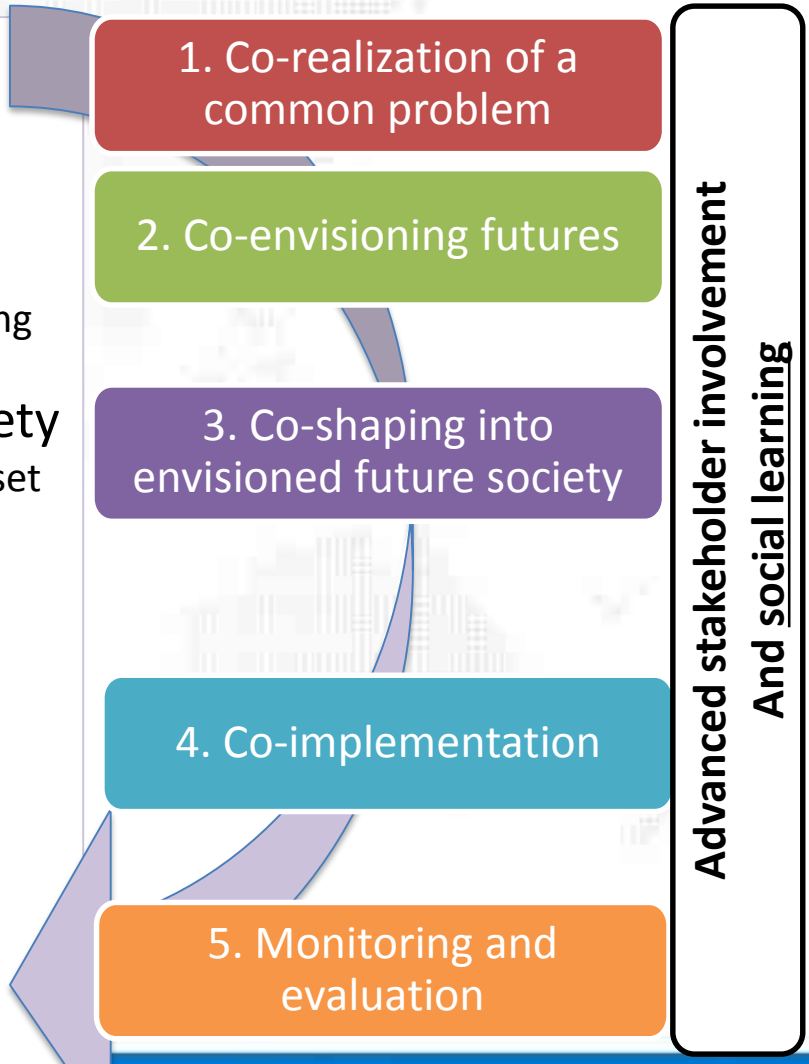
STAR Sustainability science implementation framework

1. Co-realisation of a common problem
   - Comprehensive problem analysis
2. Co- Envisioning of the future society
   - Identification of the set of indicators and/or their development
   - Translation of the envisioned future by benchmarking the selected indicators
3. Co-shaping into envisioned future society
   - Assessment of current society against the selected set of indicators
   - Analysis of Systems involved and how they interact including uncertainty and sensitivity analysis
   - Generation of Strategies/Scenarios
   - Agreement by selecting a strategy
4. Co-Implementation
   - Enabling the strategy
   - Development of Implementation Plan (Including resource mobilization and budget planning)
5. Monitoring and Evaluation



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Science Harnessed for ASEAN Regional Policy

Sustainability Science at Regional policy level:

- Reaching out to ASEAN environmental policies
- A regional knowledge platform

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Five case studies in the region for STAR and SHARP

- ***Restoring and Enhancing Angkor World Heritage Site and Water Management system at Siem Reap City and Tonle Sap Biosphere Reserve.***

→ *UNESCO World Heritage and Biosphere reserve*

- ***Restoring and Managing Langat River, Malaysia for Future***

→ *IHP Hydrology for the Environment, Life and Policy .*

- ***Maintenance of the Rice Terraces of the Philippines Cordilleras.***

→ *UNESCO World Heritage*

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Five case studies in the region for STAR and SHARP

- ***Langkawi Geopark, Malaysia: "Establishment of Sustainability Science Demonstration Site on Water and Environmental Sustainability Education Linked With Ecotourism in Langkawi Geopark".***

→ *UNESCO Global Geopark*

- ***Davao, Philippines: Demonstration site on "Enhancing Resilience to Disasters of Urban Water Systems of Mindanao".***

→ *IHP Hydrology for the Environment, Life and Policy .*

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UNESCO World Heritage Site

MaB World Heritage

- ***World Heritage Committee of the Outstanding Universal Value (OUV) of the site***
- *However, once listed the OUV has to be conserved and preserved. Therefore there is a monitoring system with the UNESCO World Heritage site described in comprehensive Resource Manuals on managing the sites (UNESCO, ICCROM, ICOMOS, & IUCN, Resource Manual Series: Managing Natural World Heritage., 2012) and (UNESCO, ICCROM, ICOMOS, & IUCN, Resource Manual Series: Managing Culture World Heritage, 2013).*

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UNESCO Biosphere Reserve

*There are no comparable management guidelines for **UNESCO Biosphere Reserve**. Statutory Framework for the World Network of BR (UNESCO MAB, 1995),*

"BR should strive to be sites of excellence to explore and demonstrate approaches to conservation and sustainable development on a regional scale. To do this, each biosphere reserve should combine three interconnected functions – conservation, development and logistic support – through appropriate zoning, comprising

1) *one or more legally-constituted core areas, devoted to long-term protection;*
2) *adjacent buffer zones;*
3) *an outer transition area where sustainable development is promoted and developed by public authorities, local communities and enterprises."*

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Hydrology for the Environment, Life and Policy

HELP is designed to change this by creating a new approach to integrated basins management. It is a problem- and demand-driven initiative that addresses five key policy issues:

- Water and climate
- Water and food
- Water quality and human health
- Water and the environment
- Water and conflict

Watershed Sustainability Index, WSI was developed by (Chaves & Alipaz, 2007) is a composite index defined as:

$$WSI = (H+E+L+P) / 4$$

Where each of the indicators are: H: function of hydrology, E; environment, L, life and PL water resources policy. It is based on a dynamic pressure-state-response model applied to the four indicators in a matrix scheme.

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Five case studies in the region

Table: Indicators and parameters of the WSI (Chaves & Alipaz, 2007)

	Pressure	*State*	*Response*
Indicators	*Parameters*		
Hydrology	- Variation in the basin's *per capita* water availability in the period; - Variation in the basin BOD5 in the period	- Basin *per capita* water availability (long term average) - Basin BOD5 (long term average)	- Improvement in water-use efficiency (last 5 yrs.); - Improvement in sewage treatment/ disposal (last 5 yrs.)
Environment	- Basin's EPI (Rural & urban) in the period	- % of basin area with natural vegetation	- Evolution in basin conservation (% of protected areas, BMPs) in the period
Life	- Variation in the basin per capita income in the period	- Basin HDI (weighed by county population)	- Evolution in the basin HDI in the period
Policy	- Variation in the basin HDI-Education in the period	- Basin institutional capacity in IWRM	- Evolution in the basin's IWRM expenditures in the period

Table: Indicators and parameters of the WSI (Chaves & Alipaz, 2007)

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UNESCO Geopark

- Geopark : territorial entity focusing on
  - Natural Resources
  - Geological Hazards
  - Climate Change
  - Education
  - Science
  - Culture
  - Women
  - Sustainable Development
  - Local and indigenous Knowledge
  - Geoconservation

UNESCO Global Geoparks

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Today

- Presentations from the five demonstration sites for Sustainability Science approach to solve water related issues in UNESCO sites.
- Presentations on current environmental sustainability programmes and effort in ASEAN member countries
- Presentations on environmental sustainability initiatives from UNESCO Regional Sciences Bureau for Asia and the Pacific wider network.
- Discussion and synthesis

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Thank you very much,

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