United Nations
Educational, Scientific and
Cultural Organization

Natural Sciences Sector
Social and Human Sciences Sector

United Nations
Educational, Scientific and
Cultural Organization

From
the People
of Japan

UNESCO - Japan/MEXT

project on "Broadening the Application of the Sustainability Science Approach"

Case studies in Sustainability Science

Christine A. ISKANDAR, PhD
SC/PCB/CB

The international UNESCO project ***"Broadening the Application of the Sustainability Science Approach"*** initiated in October 2015 with the support of the Japanese Ministry of Education, Culture, Sports, Science and Technology Japan/MEXT) aims to identify good practices and develop policy guidelines to help Member States harness the potential of sustainability science in their sustainable development strategies.

This project also aims to help UNESCO Member States and other stakeholders introduce or reinforce a sustainability science approach into transdisciplinary research and education, to enable them to better respond to global challenges, through three symposia to foster dialogue and collaboration among experts and policy-makers.

Based on the joint efforts of UNESCO's Natural Sciences Sector, Social and Human Sciences Sector, Education Sector and Regional Science Bureau for Asia and the Pacific in Jakarta, the project benefits from the guidance of a multidisciplinary steering committee and a drafting sub-committee.

Project Steering Committee Members

- **Maik Adomssent,** Leuphana University of Lüneburg
- **Eduardo Brondizio,** Indiana University and Future Earth
- **Mathieu Denis,** International Social Science Council (ISSC)
- **Heide Hackmann,** International Council for Science (ICSU)
- **Yosuke Kobayashi,** Japan/MEXT
- **Joanne Kauffmann,** Integrated Research System for Sustainability Science, University of Tokyo
- **Luiz Oosterbeek,** International Council of Philosophy and Human Sciences (CIPSH)
- **Lutz Möller,** German National Commission for UNESCO
- **Jan Monteverde Haakonsen,** Research Council of Norway
- **Mohamed Saber,** National Research Centre (NRC), Egypt
- **Kazuhiko Takeuchi,** United Nations University (UNU) and University of Tokyo
- **UNESCO Assistant Director-Generals for Natural Sciences and for Social and Human Sciences (or their representatives)**

Project Drafting Sub-Committee Members

- **Maik Adomssent,** Leuphana University Luneburg
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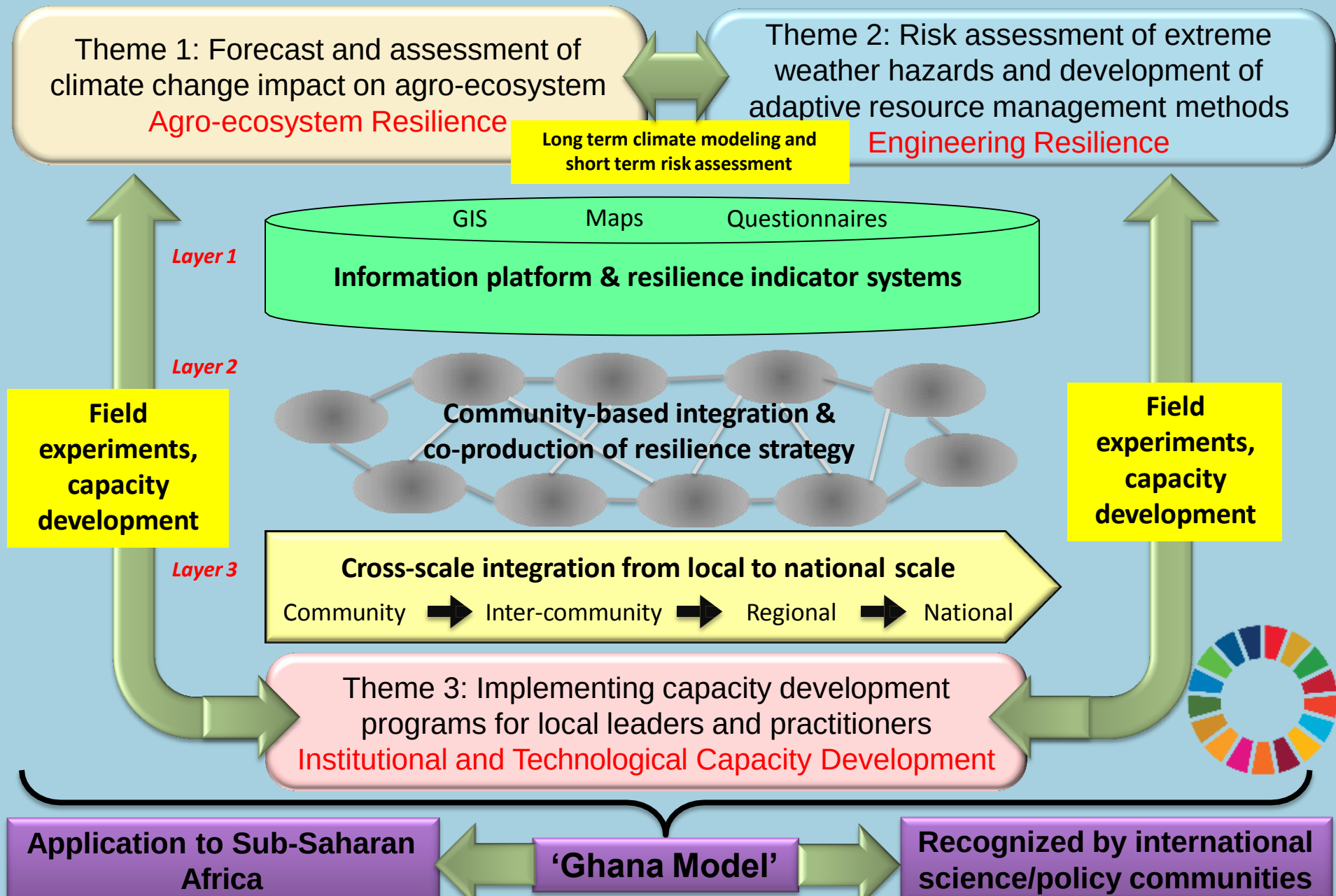
- **Joanne Kauffmann,** Integrated Research System for Sustainability Science, University of Tokyo
- **Lutz Möller,** German National Commission for UNESCO
- **Pedro Manuel Monreal-Gonzalez,** UNESCO
- **Mohamed Saber,** National Research Centre (NRC), Egypt
- **Kazuhiko Takeuchi,** United Nations University (UNU)

Africa

Thanks to:
David Mungai, Wangari Maathai Institute for Peace and Environmental Studies, Kenya
Osamu Saito, United Nations University (UNU)

Conceptual Framework of the 'Ghana Model'



Ghana Model: Disseminating Research Findings through Community Theatre

Disseminating and **validating** major scientific **research findings** and **intervention strategies** on climate and ecosystem changes through Community-based environmental theatre .

- Scientific findings and project intervention strategies are being translated into **drama, dance and music** pieces to reflect the most plausible past, present and future scenarios
- An opportunity to **encourage, stimulate and empower** local communities to understand research findings promote **self-action and ownership**.

SOME KEY MESSAGES IN THEATRE

PAST

PRESENT

- High unpredictability in weather patterns
- More floods and drought conditions
- Shortage of farmlands and infertile soils
- Increased water scarcity (dams dry up)

FUTURE

- Unpredictable and extreme weather
- Engage in multiple livelihood sources
- Agroforestry
- Collective management of resources
- Integrating knowledge systems
- Climate-smart agriculture
- Water harvesting technology

http://ias.unu.edu/en/news/news/disseminating-research-findings-through-community-theatre-in-ghana.html

Arab States

Thanks to:

Muhammad Saidam, Royal Scientific Society, Jordan and International Council for Science (ICSU)

Mohamed Saber, National Research Center, Egypt

National Case Studies

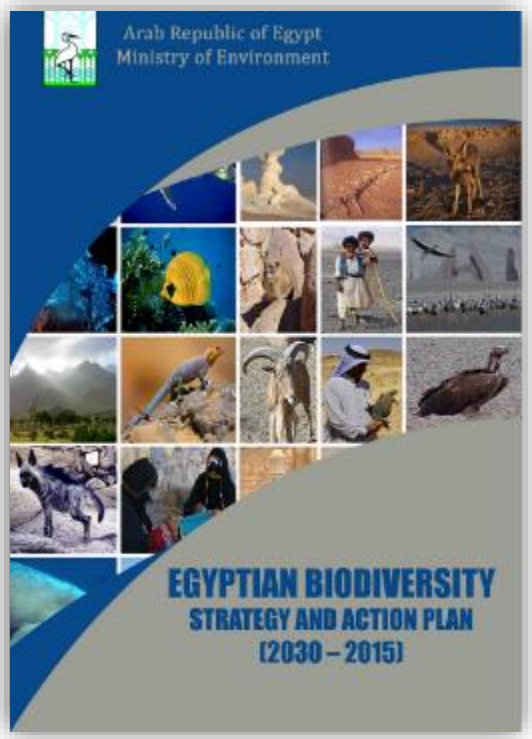
In recent years, Egypt, Qatar, Tunisia, Morocco, Lebanon, Jordan, Yemen, Syria, UAE, Jordan and Sudan had formulated new national development strategies, visions and plans based on their national circumstances and priorities addressing sustainable development objectives to varying degrees.

Algeria set a Five-Year Development Plan (2010-14) and an Environmental Action Plan for (2001-2011). The Development plan aims to diversify the country's economy in six major axes, human development, basic infrastructure, public service improvement, economic development, unemployment control, R&D and new communication technologies. With the assistance of the World Bank, Algeria finalized its national sustainable development strategy in 2001.

- Egypt has a Strategic Framework For Economic and Social Development 2012 – 2022 based on 10 challenges in three phases. Recent efforts are clearly links with annual plans and budget allocations; however, the vision has not been implemented.

- Jordan is currently in the process of developing a national vision to 2030.

- Qatar has two key strategic planning documents, National Vision 2030 (2009) and National Development Strategy 2011-16 (2011). The National Vision defines trends that reflect the aspirations, objectives and culture of the people of Qatar. Its main goal is to transform Qatar into an advanced country by 2030, capable of sustaining its own development and providing high standard of living for future generations. It addresses four main development pillars: human, social, economic and environmental.



- Syria outlined the elements of its comprehensive environmental strategy from 1992, including annual plans, a five -year development plan, and prospective twenty-year plans. Planning is done on a consultative basis.

- United Arab emirates has a vision 2021 in place.

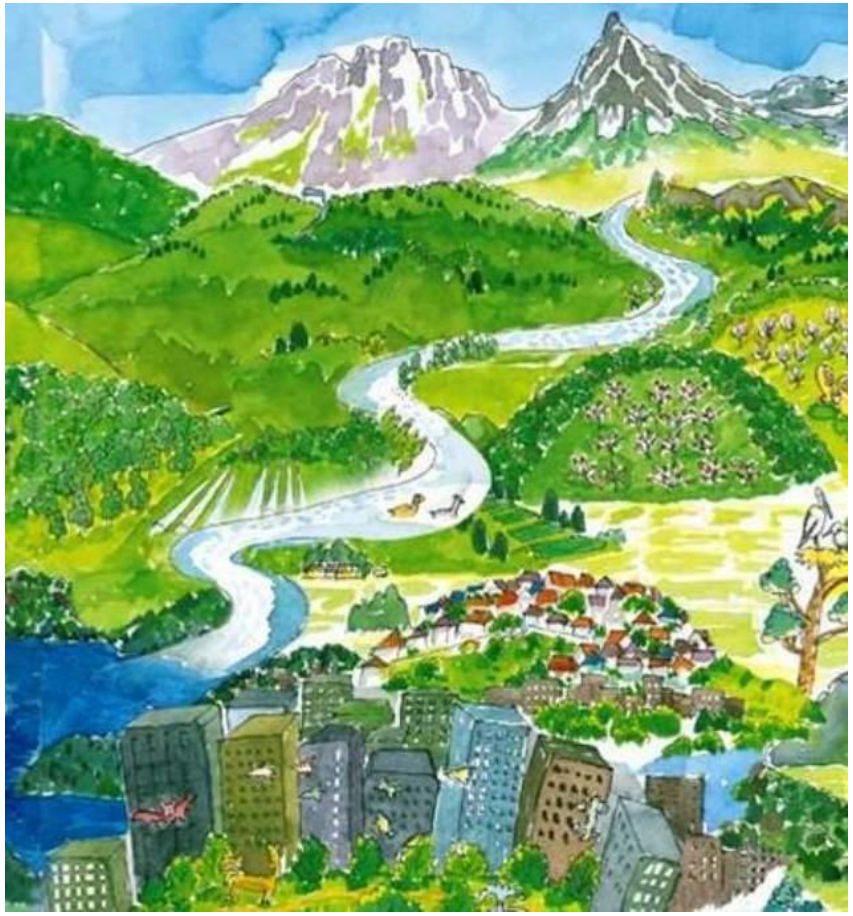
Asia and the Pacific

Thanks to:

Kazuhiko Takeuchi, University of Tokyo and United Nations University (UNU)
Nor Aieni Mokhtar, Universiti Malaysia Terengganu (UMT)
Suzyrman Sibly, Universiti Sains Malaysia (USM)
Mazlin Mokhtar, Universiti Kebangsaan Malaysia (UKM)
Ibrahim Komoo, Langkawi Research Center, Universiti Kebangsaan Malaysia (UKM)
Abdul Rashid Abdul Malik, Pulau Banding Foundation, Malaysia
Denison Jayasooria, Malaysia CSO Alliance on SDG
Raha Abdul Rahim, Ministry of Higher Education (MOHE), Malaysia
Anders Karlsson, ELSEVIER

Social-Ecological Restoration after the Great East Japan Earthquake

- Building social/ecological resilience will increase security and contribute to an enhanced quality of life.
- Building resilience in the affected area requires a transformation to sustainable agriculture, forestry and fisheries.
- Satoyama and satoumi landscapes can contribute to the revitalization of primary industries and strengthen the relationship between local residents and the landscape.
- Decision makers at local, regional and national levels need to take a holistic approach based on sustainability science to develop a robust rebuilding plan for the affected communities.
- Satoyama and satoumi linkages can be a model for building resilient rural and urban communities throughout the world.



Satoyama and Satoumi Linkages

Case Study of Kesennuma Oshima Island in the Sanriku Fukko National Park

- Kesennuma Oshima Island occupies a part of Sanriku Fukko National Park. Nature experience opportunities provided by the island, such as nature trailing, sea bathing, and fishing, used to attract many tourists before the GEJE.

- After the GEJE, it was decided after consultation with the local communities that, at Tanakahama beach, a seawall of 3.9m would be reconstructed on the beach near the shoreline as it was before the GEJE. The local administrative authority bought affected land behind the seawall to establish disaster prevention forests.

- MOEJ developed a centre for Tanakahama nature experience programs promotion near the beach and an emergency evacuation route to reduce tsunami risks.

Tanakahama Beach in Kesennuma Oshima Island

Emergency evacuation route at Tanakahama Beach

Promoting Ecosystem-Based Disaster Risk Reduction (Eco-DRR)

- People in disaster-affected areas in the Tohoku region are now thinking about a future vision for living in harmony with nature.
- Urban neighborhoods need to be relocated from tsunami-affected areas or subsided land.
- Utilizing vulnerable land for farming and restoring natural marshlands will strengthen regional resilience.
- Reconstruction of safer coastal forests, partly using recycled debris from the disaster.
- The Third World Conference on Disaster Risk Reduction was held in Sendai City in March 2015.
- The roles of ecosystems, including coastal wetlands and forests, in preventing and mitigating disaster risks in different parts of the world was discussed.
- Cooperation among various stakeholders, including government, private sector organizations, NPOs and citizens is important to realize societies in harmony with nature with strengthened resilience to respond to disasters.

Restoring natural marshlands

Planting trees for rehabilitation
(Photo by Mr. Takao Ogawara)

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Pulau Banding Foundation
www.pbf.org.my


PROCEEDINGS OF THE
2nd Temengor Scientific Expedition 2012
glimpses
Pey ba'a
PULAU BANDING FOUNDATION
RESEARCH BRIEFS
The FOUNDATION newsletter
Proceedings of the
4th ROYAL BELUM SCIENTIFIC EXPEDITION 2015
BRainS2016
BELUM RAINFOREST SUMMIT 2016
Programme and Book of Abstracts for the International Conference on Conservation & Sustainable Use of the Tropical Rainforests
17th - 22nd October 2016
BELUM RAINFOREST RESORT,
Pulau Banding, Gerik, Perak, Malaysia.

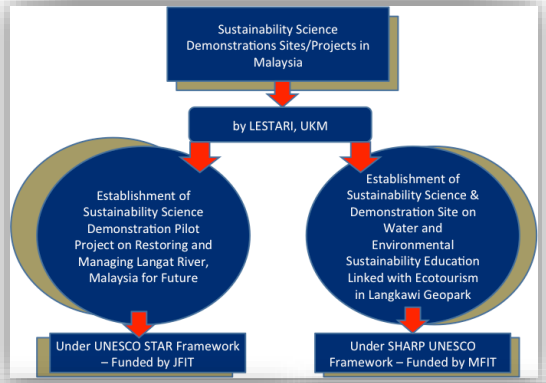
Demonstration Site
at Langat River Basin & Langkawi Geoparks, Malaysia

Langat River Basin, Malaysia

Langkawi Geopark, Malaysia

Key areas for Sustainability Science Demonstration

Knowledge of the interrelations between urban conditions and the state of waters as well as instruments and techniques for their management



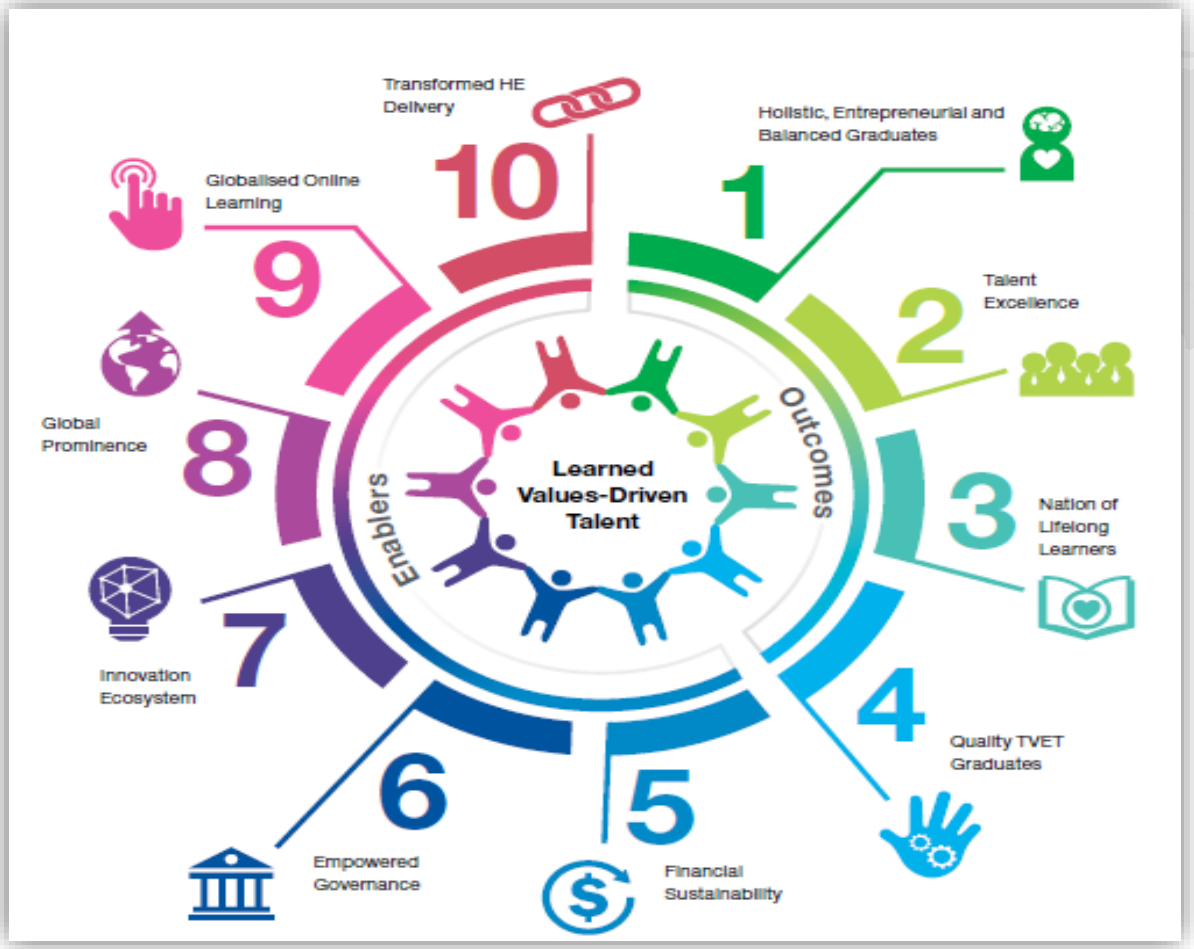
Key areas for Sustainability Science Demonstration

Integrated water and environmental management balanced with socio-economic development and cultural heritage conservation.

		WSI				
		Pressure	State	Response	Average	Score
Hyrology	Quantity	0.25	0.25	0.75	0.42	0.55
	Quality	1	0.5	0.5	0.67	
Environment	EPI	0.75	0.75	0.75	1.0	1.0
Life	HDI	1	0.75	0.5	0.75	0.75
Policy	EDI	0.75	0.75	0.5	0.67	0.67
Result						0.74

SOARING UPWARDS
MALAYSIAN HIGHER EDUCATION

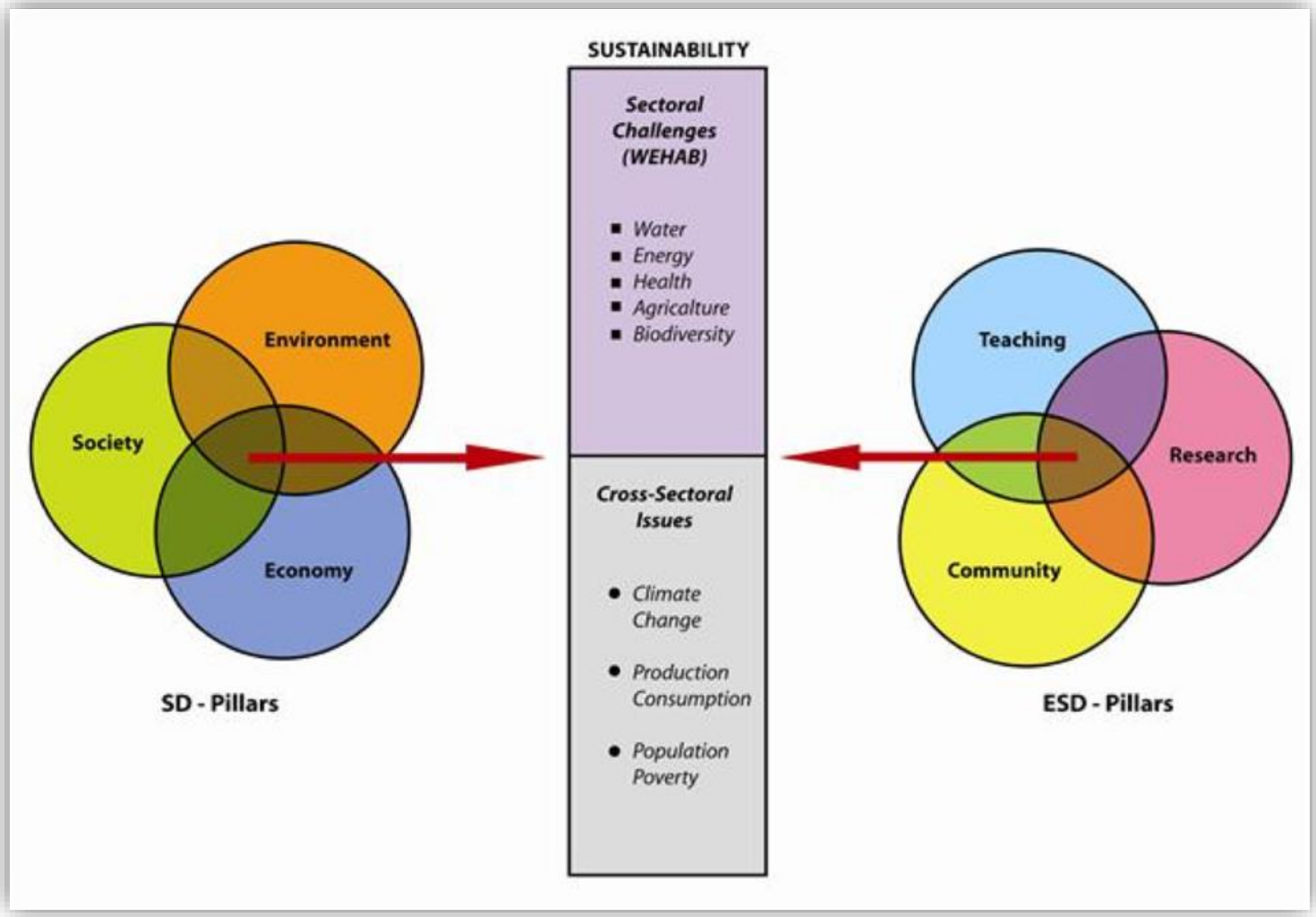
Malaysian Education Blueprint (Higher Education)



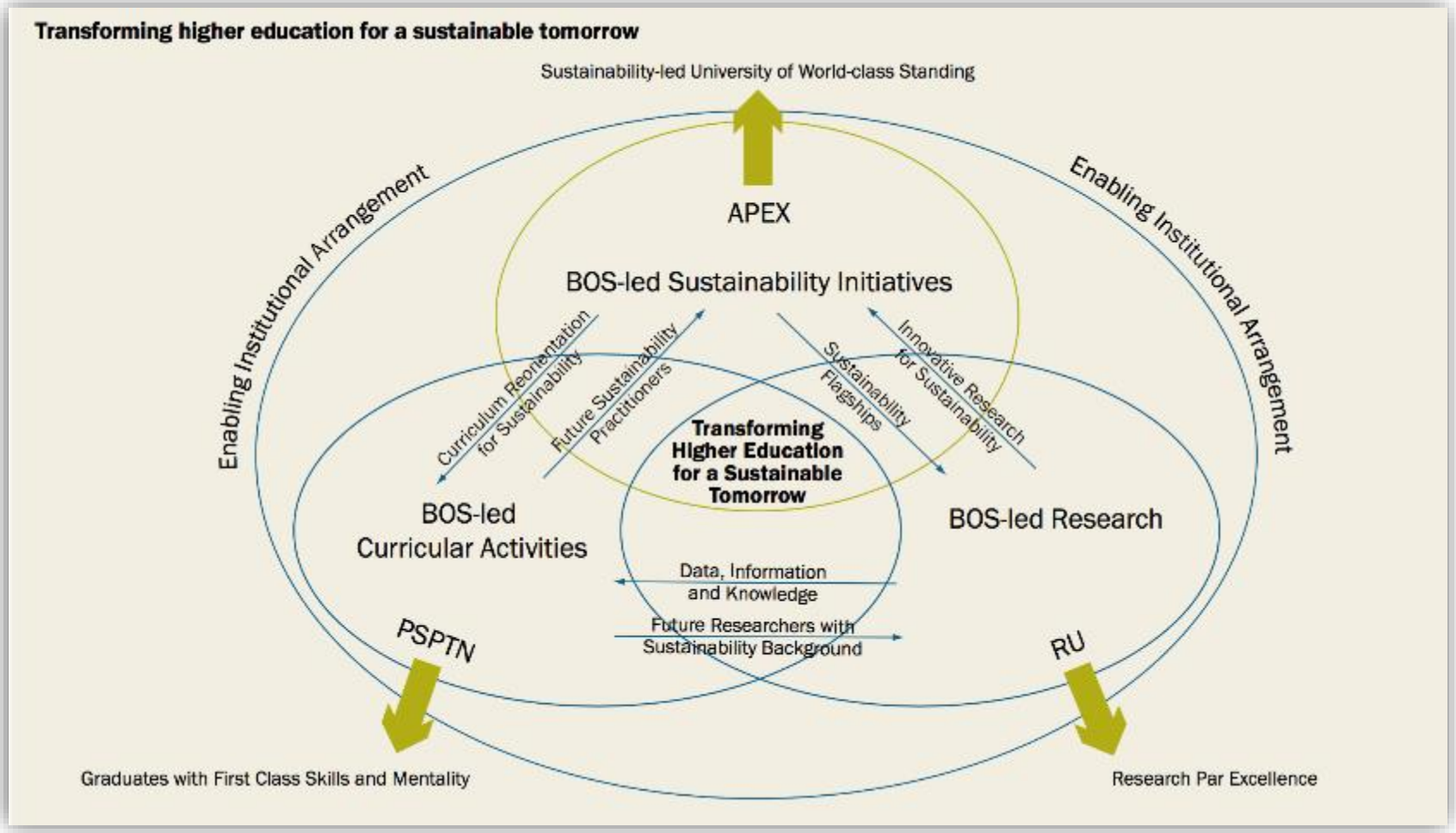
10 Shifts to support the attainment of System and Student aspiration; access, quality, equity, unity and efficiency

www.usm.my

Universiti Sains Malaysia (USM) Sustainability Model



Universiti Sains Malaysia (USM)
APEX in a nutshell




TSUNAMI

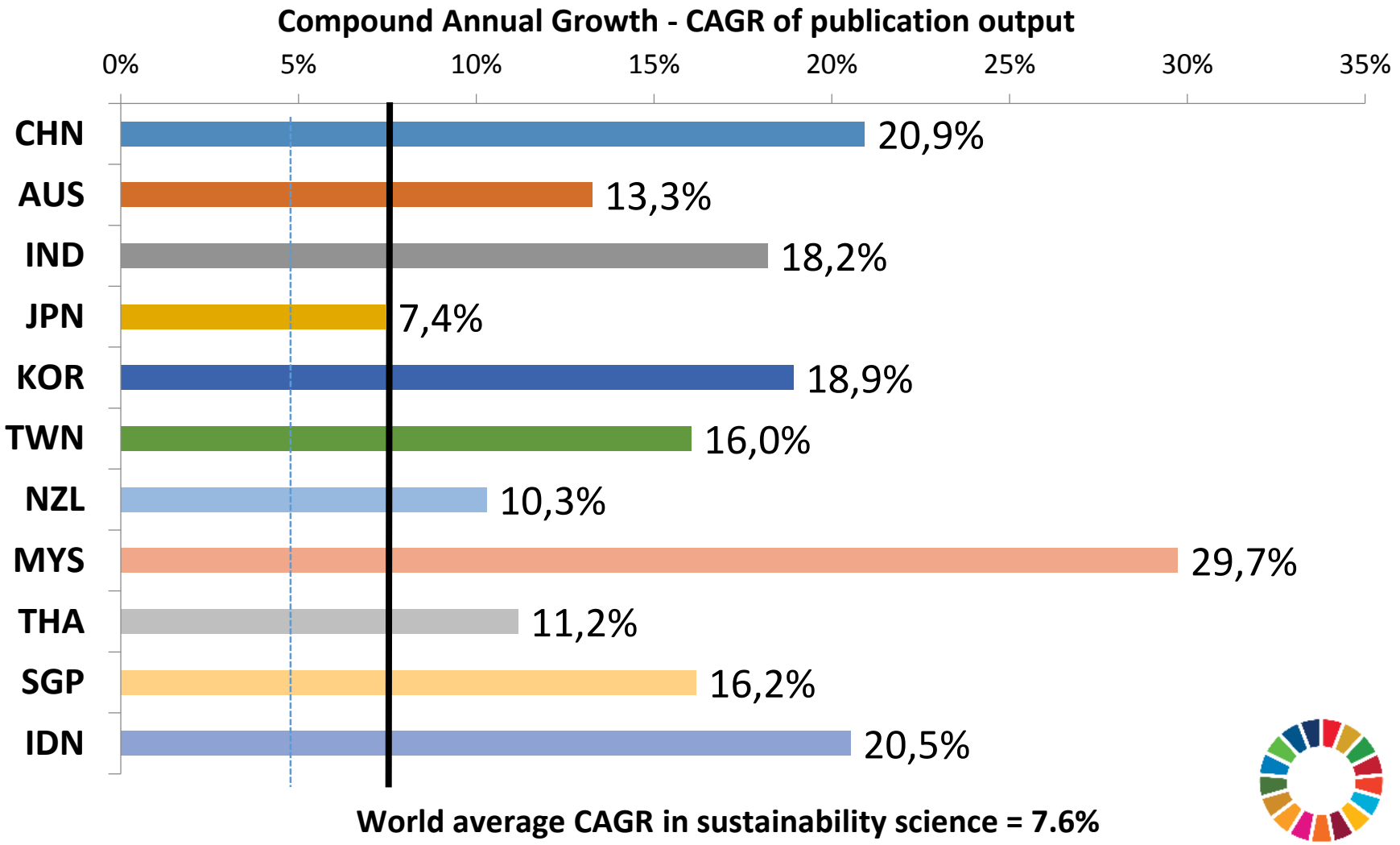

GREEN TECH

Sustainability Science in Asia

ELSEVIER

Empowering Knowledge

Sustainability Science grows fast in Asia



Source: Elsevier Scopus

Europe and North America

Thanks to:

Lutz Möller, German National Commission for UNESCO

Maik Adomssent, Leuphana University of Lüneburg , Germany

Luiz Oosterbeek, International Council of Philosophy and Human Sciences (CIPSH)

Steven Hartman, Mid Sweden University, Department of Tourism and Geography and the European Tourism Research Institute (ETOUR)

Tomasz Komorowski, Polish National Commission for UNESCO

Jan Monteverde Haakonsen, Research Council of Norway

Germany: FONA research funding programme

FONA research funding programme by BMBF since 2004

- Research funding of altogether close to 2 billion Euro
- Support for the German SD strategy
- Society/economy, energy, global change, resources, earth system
- Sup-programme SÖF on socio-ecological systems (~5%)
- FONA3 launched in September 2015

FONA Goals

- Networking of research and the industry, esp. SMEs
- International networking, including with dev. countries
- Expanding transdisciplinary research concepts

FONA
Forschung für nachhaltige Entwicklungen
BMBF

- Helmholtz Association
  - Promising transdisciplinary initiatives, e.g. involving consumers into energy scenarios,
- University of Lüneburg:
  - Sustainability department
  - All first-year university students have to take a course on sustainability / research accountability
  - MSc, Dozens of sustainability-focused courses
  - Sustainability report, EMAS; UNESCO Chair
- University of Sustainable Development Eberswalde
- Institute of Advanced Sustainability Studies
- EcorNET, incl. Wuppertal Institute, etc.
- ~150 sustainability courses + ~200 related courses

The Apheleia Approach

Apheleia
Ἀφέλεια
Erasmus+

Human, social and natural sciences

Fostering contradiction

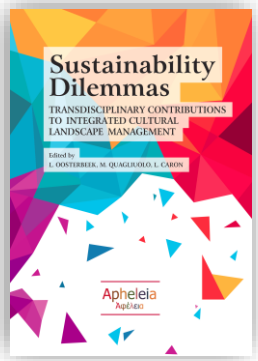
100 words of sustainability

Applied projects

Dilemmas

Sociocultural matrices

Education



www.apheleiaproject.org

INSTITUTO TERRA E MEMÓRIA

Germany: Leuphana University of Lüneburg

Underlying profile and academic focus:
A university for civil society in the 21st century

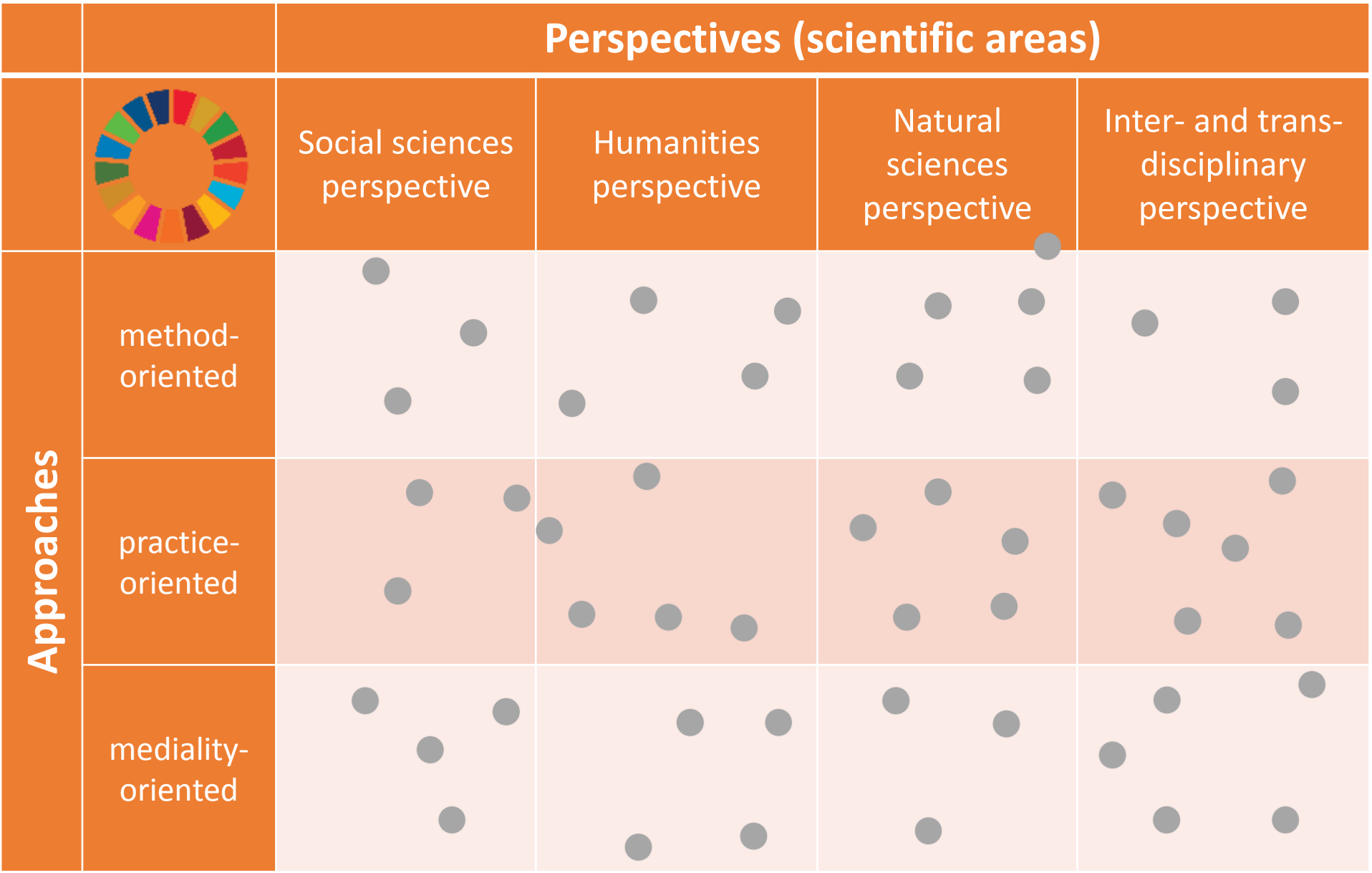
Sustainability is one of the key principles for Leuphana University

Leuphana University of Lüneburg

Humanistic university	Education through scholarship.
Sustainable university	Transformation competence for sustainable development.
Action-oriented university	Analysis, creativity and reflexivity with regard to practical problems.

http://www.leuphana.de/en/about-us/profile/mission-statement.html

Orientation towards classical scientific fields + one new perspective



CONSUS

CONNECTING SCIENCE-SOCIETY COLLABORATIONS FOR SUSTAINABILITY INNOVATIONS

CONSUS The aim of the project is to establish a regional science-society network for sustainability innovations in Albania and Kosovo in order to strengthen the connection and collaboration of institutions in the field of higher education, research and practice.

Accessible online: http://consus.allafine.com/en/modules

Learning material is the combination of a tool (text, book, picture, video, computer game, real game, experiment, experimental equipment, measurement device, computer program

University | Author | Search resources...

Teaching Tools & Methods | Time required | Group Size | Social Setting

131 learning materials found

A Series of Lectures on the Basic Concepts of Sustainability, Regional challenges and Solu...

Acting local, thinking global: An Albanian perspective

Active learning in Macroeconomics: Growth forecasting and growth models.


nies
Nordic Network for Interdisciplinary Environmental Studies

IHOPE

Integrated History and future Of People on Earth

IEM is a sub-project of IHOPE (The Integrated History and future of People on Earth). IHOPE asserts that humans are a part of the Earth system and are now agents in planetary change.

To offer viable paths for humanity's future, our models, scenarios, and other visions must incorporate the full range of human experience and creativity by drawing on experiments in the laboratory of the past.

IHOPE is unique in its focus on how the human past can offer important knowledge on which to build an equitable future for our species and in its integration of perspectives, theories, tools, and knowledge from the social and biophysical sciences, the humanities, and various communities of practice.

Bifrost

A Research-Media-Arts Public Engagement Project

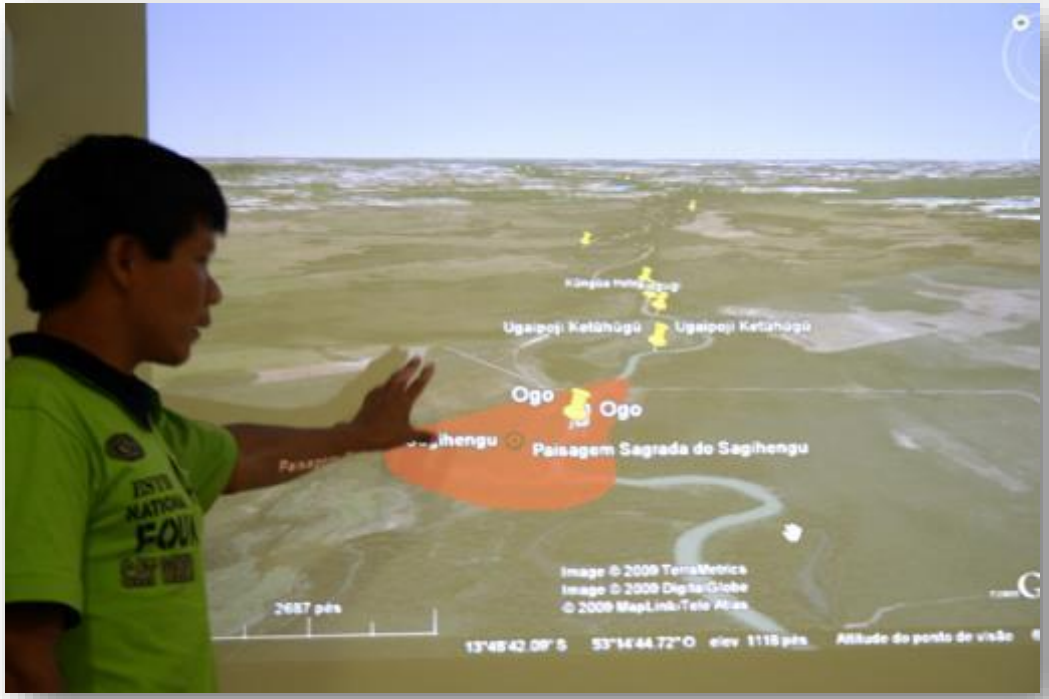
The project is a collaboration among working media artists and environmental researchers to promote public awareness of environmental issues – their causes, risks and consequences.

Bifrost seeks to communicate powerfully the human stakes involved in Climate Change through a coordinated multimodal approach, using parallel communicative channels, immersive art platforms, educational interventions & other creative forms of public engagement in the agora.

Latin America and the Caribbean

Thanks to:
Leonard Nurse, Faculty of Science and Technology, University of the West Indies, Barbados
Erika Robrahn-Gonzalez, State University of Campinas, Brazil
Inguelore Scheunemann, CYTED Programme

RECOGNITION AND PROTECTION OF SACRED PLACES: XINGU INDIGENOUS GROUPS

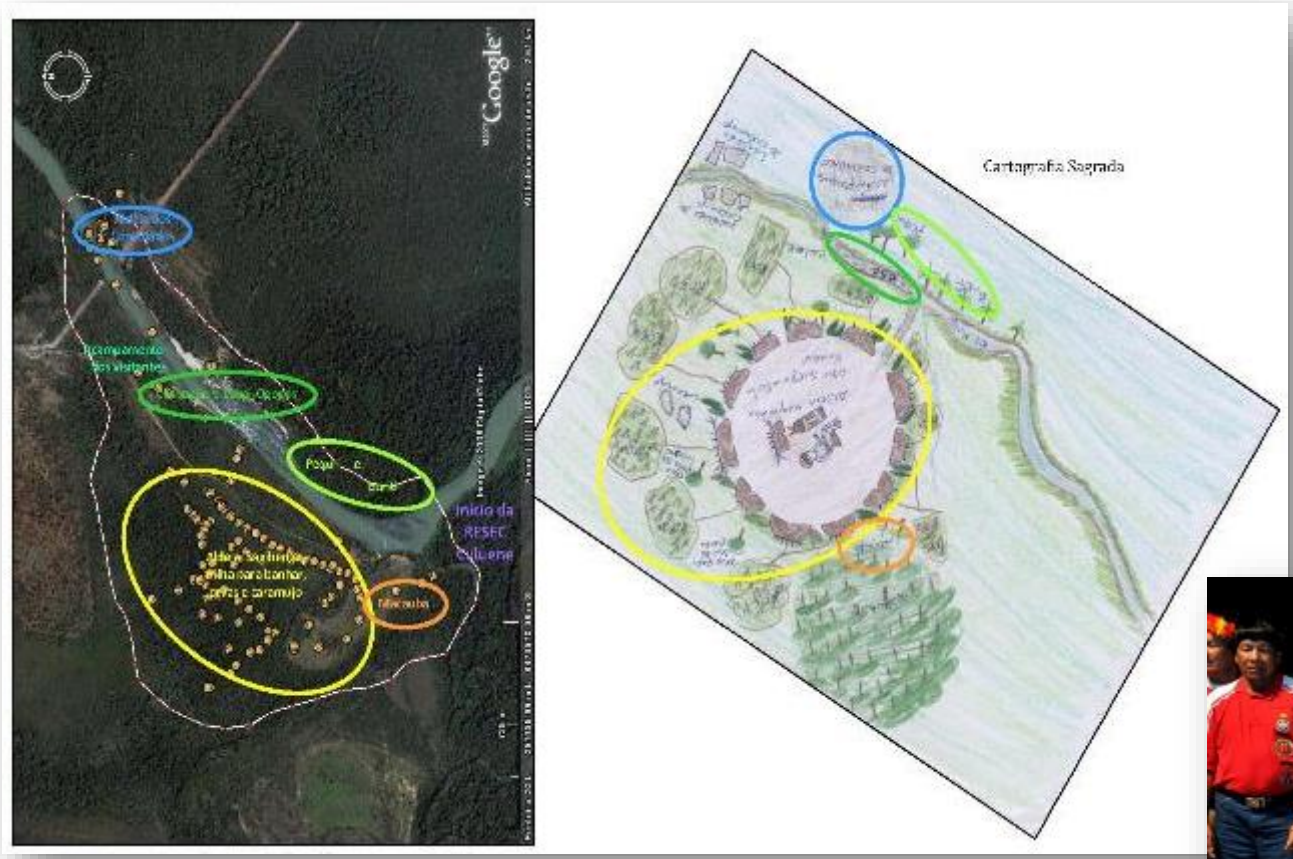


www.oficinaxingu.ning.com

RECOGNITION AND PROTECTION OF SACRED PLACES: XINGU INDIGENOUS GROUPS

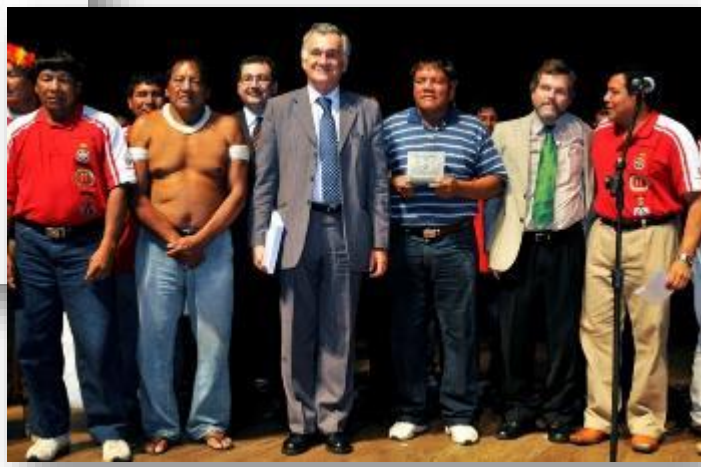
Archeological cartography

Sacred cartography



Sangitsegu

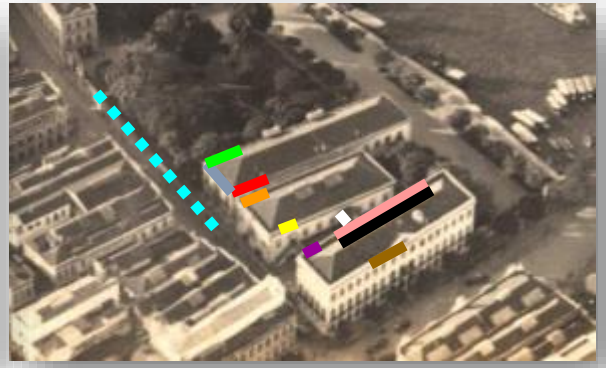
Sangitsegu inha Taugi ísi, sangitsegu apungu, ülepe ihanügüha suü inha kuãtüngü inha. Egitsa kitakoha ihatigi tütelüko heke, tuetüingini kugiheki, ülehinhe sogoko kilü ugetiha utetani. Suü etu ataniha nhatasate, sogoko etimbelü ete agiponga, takikotsi itsu, uã uã ogopijü leha.
Akuakenügü ebege ihekeni

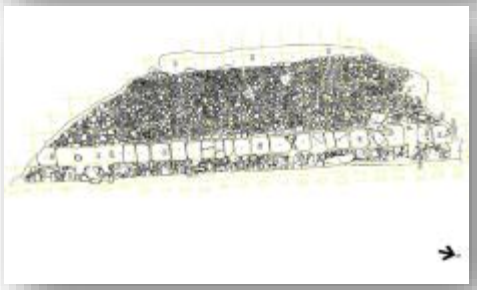


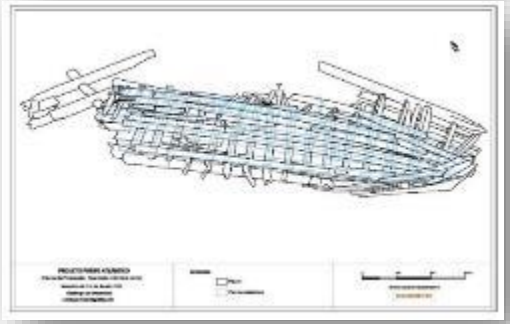
FIRST DECLARATION OF INDIGENOUS SACRED PLACES AS BRAZILIAN UNION HERITAGE

URBAN ARCHEOLOGY IN THE CONTEXT OF SMART CITIES

Scientific researches focused on the history of slavery, with ample participation of representatives from the afro-descendant communities







Examples of predictive models of underground archeological heritage. Example of archeological excavation and reproductive structures. The use of 3D modeling in the reconstitution of structures and evolutionary scenarios for the formation of the cultural landscape.

URBAN ARCHEOLOGY IN THE CONTEXT OF SMART CITIES

Use of technology, information, and science to understand **complex systems and establish predictive models** in the planning and managing of smart cities.

Reconstitution of cultural landscapes using Predictive Modeling and Augmented Reality Technology

URBAN ARCHEOLOGY IN THE CONTEXT OF SMART CITIES

"The most intriguing location of any small island is its coastal zone. This transitional strip of land contains some of the most productive and valuable habitats of the biosphere. It has multiple resources, resource users, varying levels of development and in essence is fundamental to the very existence of a small island. Barbados is no exception in this regard, especially with its highly varied coastline of unique geological formation"

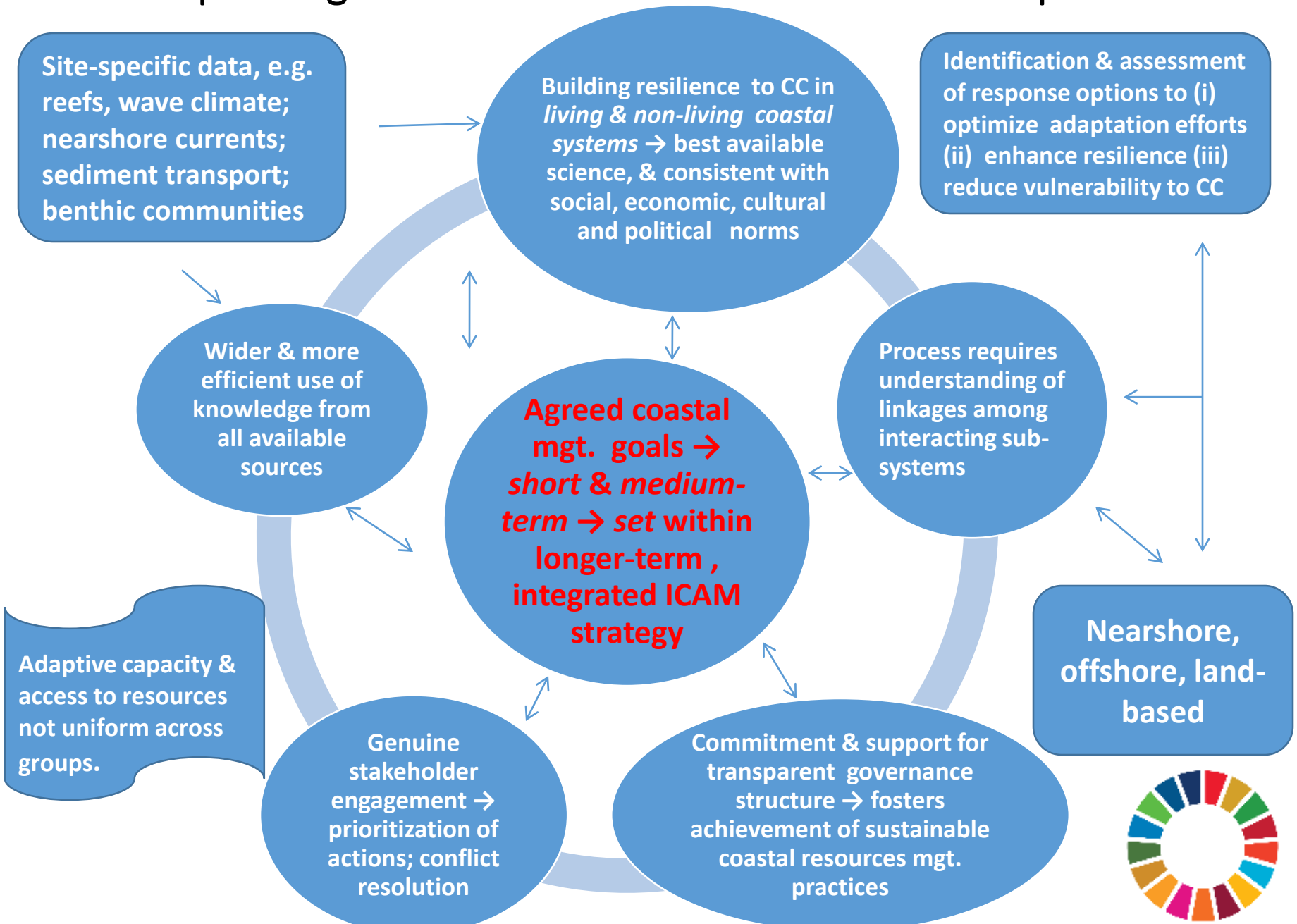
THE COASTAL ZONE MANAGEMENT UNIT (CZMU), BARBADOS

Caribbean Climate Change Risk Atlas (CCCRA)

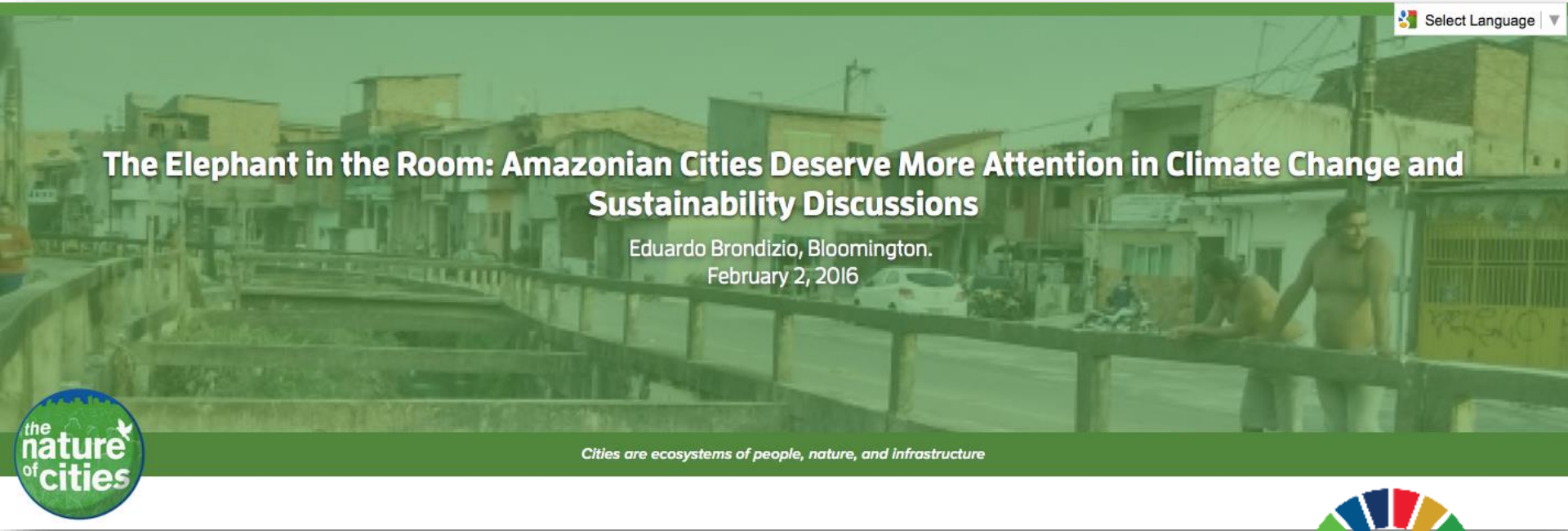
The Climate Change Risk Atlas is where the best climate science and thinking from communities come together to enable a region prepare for the future. It is a comprehensive guide to the threats climate change poses to **15 Caribbean countries** and what they can do about them

During three years, some of the **world's leading researchers in climate, physical and social sciences** plotted the path of coming change and assessed the vulnerability of the region's people, environment and infrastructure. The team worked with **regional experts and institutions**, particularly the **University of the West Indies and the Caribbean Community Climate Change Centre (CCCCC)** and applied various state-of-the-art, high-resolution climate models to estimate the most likely changes across the region. The project also used advanced mapping and survey techniques to identify where storm surges would hit or what infrastructure would be submerged by the projected rise in sea level.

Transdisciplinarity can also support achievement of sustainable development goals at the sectoral level in SIDS: Example ICAM.



Reaction to COP21
Amazonian Cities deserve more attention in climate change and sustainability discussions



Blog post Feb. 2, 2016. The Nature of Cities

http://www.thenatureofcities.com/2016/02/02/the-elephant-in-the-room-amazonian-cities-deserve-more-attention-in-climate-change-and-sustainability-discussions/

Learning about & solving real problems
Sandwatch

Volunteer network of children, youth and adults, in 30 countries worldwide, especially small island developing states, working together to monitor and analyse changes in their beach environment.

Uses a standardized scientific approach with simple equipment, share their findings with the wider community and then take action to (a) address beach issues, (b) enhance their beach environment and build resilience to climate change.

Sandwatch methodology: M.A.S.T.

Monitoring the environment

Analyzing the results

Sharing the findings

Taking action

Global

Thanks to:

Benno Werlen, International Year of Global Understanding

Luiz Oosterbeek, International Council of Philosophy and Human Sciences (CIPSH)

Kazuhiko Takeuchi, University of Tokyo and United Nations University (UNU)

Cities as catalysts for sustainability

- Cities are considered key actors
- International networks: C40, 100RC, ICLEI (Local Governments for Sustainability), UCLG (United Cities and Local Governments), CityNet.

Technology and the Cities

- CitiScore – Boston
- Copenhagen moves towards being the first capital carbon emission neutral in the world, an objective to be achieved by 2025 - includes urban reorganization and reuse of degraded areas for the emergence of planned neighbourhoods.
- Cristal City (Siemens) IT and automation are expanding the potential of infrastructure across the world. Solutions for sustainable power distribution, efficient traffic systems and efficient, intelligent buildings are becoming more flexible and adaptable to new conditions.

C40 Network Program

- Shinagawa Ward - a small region in Tokyo, that aims to meet a 'climate positive' emissions target of net-negative operational GHGs emissions.
- Hammarby Sjöstad, in Stockholm, with urban redesign and innovation, and has opened the door for a redevelopment with the concept of "circular urban metabolism", which involves the reuse of waste, water, energy and used materials, as well as a strong involvement of the residents and neighbours.

C40 CITIES
CLIMATE LEADERSHIP GROUP

World Humanities Conference

STRUCTURING THEMES

- Humans and Environment
- Cultural identities, cultural diversity and intercultural relations
- Cultural Heritage
- Borders and Migrations
- History, Memory and Politics
- Humanities in a World in Transition

LIEGE 2017 WORLD HUMANITIES CONFERENCE

Transversal themes

- Landscape management and Humanities in technology
- Re-visiting sustainability
- Translation of Concepts and the Humanities of Sciences
- Fundamental competences to develop in pre-university education
- International research priorities

CIPSH

UNESCO
Organisation des Nations Unies pour l'éducation, la science et la culture

En partenariat avec
MOST
Programme pour la gestion des transformations sociales

centro de geo ciências

ipt Instituto Politécnico de Tomar

INSTITUTO TERRA E MEMÓRIA

Some Examples of North-South Collaboration

International Research Initiative on Adaptation to Climate Change (IRIACC), Canada	**Partnerships for Enhanced Engagement in Research (PEER) Science, US**	**The Climate Adaptation Flagship, CSIRO AusAID Alliance, Australia**	**Science and Technology Research Partnership for Sustainable Development (SATREPS), Japan**
Started in 2010 Duration: 5 years Total budget: CA$12.5 million	Started in 2010 1-3 years. Up to $50,000/project/year Larger awards possible with $100,000/year.	Established in 2008 and Phase 2 began in 2010.	Started in 2008 3–5 years Approx. $1 million /project/year
IDRC issued and administered the grant agreements of the funded full research programs, on behalf of all the granting agencies. Three research councils are contributing half this amount to support participation of team members in Canada. IDRC is contributing the other half to support team members in low and middle income countries.	**USAID** funds researchers of developing countries who have a U.S. partner with an active award funded by the **NSF**. **NAS** (National Academy of Science) coordinate the whole programme.	**CSIRO** covers research activities by CSIRO researchers and **AusAID** covers activities by partnering researchers in developing countries.	**JST** uses research contracts to support research costs incurred in Japan (and in other locations outside the developing country involved in the project), and **JICA** provides support through its technical co-operation project framework to cover costs in the developing country. Overall R&D management of the international joint research is handled jointly by JST and JICA.

For further information on Sustainability Science, please visit:
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Thank you for your attention

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