The Stakeholder Involvement in Sustainability Science – The Potential of Localization the Sustainable Development Goals, SDGs in Harmonizing the UNESCO Multi Designated Sites

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Gate in front of the town of Xidi Village

Source - Wikipedia

“These sites are laboratories of harmonious interaction between people and nature, allowing for advances in the sciences and in traditional knowledge” — UNESCO chief Audrey Azoulay

Panoramic view of the Huangshan landscape

Gate in front of the town of Xidi Village

Source - Wikipedia

Hongcun Village or Water Village in southern Anhui Province.

The Chengkan Village
<table>
<thead>
<tr>
<th>UNESCO Multi Designated Sites of Huangshan</th>
<th>Main Characteristics</th>
<th>Assessment</th>
<th>The Way Forward</th>
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<tbody>
<tr>
<td>1. Mt Huangshan World Heritage Site 1990.</td>
<td>Natural Heritage – “Four Wonders” of Mt. Huangshan - Fantastic Pines, Grotesque Rocks, A Sea of Clouds, Hot Springs. Total area 18,080 ha. Buffer zone 49,000 ha. Cultural Heritage - Hongcun Village &amp; Xiù - 2000. Tangyue Memorial Archways preserved arches in Anhui Province.</td>
<td><strong>Criterion ii:</strong> cultural value of Mt Huangshan’s scenic landscape first entered the Chinese imagination in the Tang Dynasty. <strong>Criterion vii:</strong> magnificent natural scenery - massive granitic boulders and ancient pine tree, enhanced by cloud and mist effects. <strong>Criterion ix:</strong> provides the habitat for a number of locally or nationally endemic plant species, several of which are globally threatened.</td>
<td>‘The Special Plan for Huangshan Buffer Zone’ by <strong>Huangshan District government</strong> for coordinating the functional arrangements of resource protection, tourism service facilities, traffic and other aspects of the buffer zone aimed at avoiding conflicts and duplications of constructions. <strong>Huangshan Municipal Government</strong> - in charge of coordination of the property and the buffer zone, and ensure personnel for the coordination with the buffer zone. A special section of ‘<strong>The Master Plan of Huangshan National Park</strong>’ is dedicated to provide guidance for the operation and management coordination within the buffer zone. <strong>ICOMOS</strong> considers that there is insufficient information about the need for the enlarged buffer zone in relation to the cultural values.</td>
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<td>2. Huangshan UNESCO Global Geopark (GGP) 2004.</td>
<td>“Rock, cloud and sculpted pine combine to form a unique landscape that has shaped art and culture” 500-1,864m height 3 Wonders of Nature - spectacular rocks, peculiar pines, and heavy clouds. Mesozoic granite rising 1,000 m high. Over 1,450 kinds of plant are found within the park. The most spectacular tree is the unique Pinus huangshanensis. There are 470 species of animals, the most frequently seen are squirrels and small skinks.</td>
<td>3 Main Task GGP:  i. To protect world heritage site and the resources;  ii. To Educate the public;  iii. To Promote the development of the local community.</td>
<td>An ideal place to demonstrate the formation mechanism of granite geomorphology. Remarkable granite pillars take on amazing shapes – domes, cones, crests, columns and boxes – in the many valleys that radiate from the mountain.</td>
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<td>3. IUCN (International Union for Conservation of Nature) Huangshan 2014 – Green List</td>
<td>Green List status for geodiversity, biodiversity, cultural diversity and entire ecosystem / ecological services.</td>
<td>3 Pillars of the Green List of IUCN: i. to set planning targets – concept of equitable governance, ii. effective management, iii. Good outcomes to improve the work in WHS and GGP.</td>
<td>Improve the Education Cultural Protections – extend the cultural sites, enhance the monitoring and protection of the sites. Ecosystem – making plan for the use of the water, research on water resources and river in neighbouring province.</td>
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Common to all THREE designations is the focus on **nature conservation** (in addition to **promoting sustainable development** and **education**), and their relatively large geographical extent.

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| 4. Mt Huangshan Biosphere Reserves 2018 (42,558.48 hectares) | i. CORE area occupies 7,743.84 ha.  
ii. BUFFER zone covers 4,958.35 ha.  
iii. TRANSITION area 29,856.29 ha – a permanent population of 24,782 people. | High forest coverage rate 90.51%, the rich variety of the plant community and the complete vertical band spectrum, the area functions as an important germplasm gene bank and a hotspot for animal and plant species – scientific research. | Buffer zone suggest for ‘community based’ tea plantation due to the mountain topography and mountain climate or microclimate. Traditional tea cultivation and manufacturing technology reflects local residents’ understanding of the harmony between people and nature – sustaining the culture. |

Xin’An Jiang, the Changjiang, the Qing Yi and the Qipu river system – a key ‘beacon’ for migratory birds, from north and south China, an important ‘stepping stone’ linking the AsiaPacific West Bank islands with internal Eurasia and a hotspot of the West Pacific Rim biosphere stretching back to the Mesozoic era.
Benefits of Multiple Designated Sites

• **increase resilience of conservation areas** to external pressures as they underline the exceptional and diverse values of a site at the global level.

• Linking conservation with sustainable development by facilitate **engagement of local communities in the area’s conservation** – traditional/indigenous knowledge.

• **accentuates the scientific significance** of an area for research, education and public awareness and may be helpful in fostering transboundary collaboration, twinning of sites, global knowledge sharing and partnership programmes.

• provide a platform for strengthened **inter-institutional cooperation** at the national and international level. i.e. **help fundraising efforts** for the management of a site at the national level and contribute to securing financial resources from international donors.

• **to raising national visibility and global prestige**, which in turn may bolster the economic base of an area through **tourism**, related visitor spending and the marketing of **locally branded products and services**.
Why We Need Sustainability Science in MDSs?

• a considerable shift in approaches to environmental management, moving from ...

  management informed by reductionist ideas (e.g., the modeling of single species)

  to a post-normal science associated with the erosion of boundaries between different forms of knowledge and rationality;

• (beliefs about the nature of knowledge or how individuals come to know something) of researchers constrain or support the engagement of multiple interest groups within environmental planning and management
<table>
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<tr>
<th>Dimensions</th>
<th>Knowledge Type</th>
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<tbody>
<tr>
<td>Local vs Generalised</td>
<td>Local ← Generalised</td>
</tr>
<tr>
<td>Level of formal processes used to generate</td>
<td>Informal ← ← Formal</td>
</tr>
<tr>
<td>knowledge</td>
<td></td>
</tr>
<tr>
<td>Extent of expertise</td>
<td>Novice ← ← Expert</td>
</tr>
<tr>
<td>Extent to which knowledge is articulated or</td>
<td>Tacit ← Implicit ← Explicit</td>
</tr>
<tr>
<td>accessible to others</td>
<td>(cannot be articulated)</td>
</tr>
<tr>
<td></td>
<td>(not yet articulated)</td>
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<tr>
<td></td>
<td>(articulated)</td>
</tr>
<tr>
<td>Extent to which knowledge is embedded in</td>
<td>Traditional ← Local Ecological ←</td>
</tr>
<tr>
<td>and reflects traditional cultural rules and</td>
<td>Scientific</td>
</tr>
<tr>
<td>norms that are derived from many generations</td>
<td></td>
</tr>
<tr>
<td>of past human-environment</td>
<td></td>
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<tr>
<td>relationships</td>
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Fig. 1. Dimensions of knowledge types derived from the environmental literature. Some knowledge types may cross different dimensions and others include broader concepts that express multiple aspects (e.g., personal knowledge and lay knowledge might be tacit or implicit, expert or non-expert, but are usually considered to be informal). Note that the types on the left or right do not necessarily group together, so knowledge might be ‘expert’ and ‘tacit’ or ‘traditional’ and ‘local’.
Known as trans-disciplinary, organically a community based, interactive, or participatory research approach (Lang et al. 2012).
Stakeholder Involvement

- Johannesburg World Summit on Sustainable Development, the science and technology communities, along with other nonstate actors, were singled out as major partners in the quest for sustainability.
- Refashioning scientific expertise into a more transparent, accountable and democratic enterprise.
- Citizen Science - civil, participatory, citizen, stakeholder, democratic science and lay knowledge.
- Participatory, civil, citizen, civic, stakeholder or called as Non-State Actors, NSA
- DEMOCRATIC SCIENCE are catchwords that signify the ascendancy of participatory paradigm in science policy.
- Multiple International Designations Area (MIDA) enhance the Stewardship function, increase resilience of conservation areas to external pressures and open up more possibilities for collaborations in achieving common goals.
- How to harmonised various goals of MIDs with its management plan?
  - Hence, defining common the goals for the sites is crucial !!
  - An issue based approach of SUSTAINABILITY SCIENCE, SuS harmonised the objective of various sites management plan, i.e. world heritage sites, biosphere reserves and global geopark.
  - Complement to the science, imaging technology where the consensus among NSAs in SuS as a science policy drive approach customize the SDGs for the sites.
  - Stakeholder selection is important, matrix stakeholder analysis to mobilize the trans-disciplinary approach of Sus and support the inter-disciplinary approach such as various discipline of studies in analysing the Huangshan MIDA will produce more robust result.
The Potential Sustainability Science for UNESCO Multi Designated Sites

i. Using participatory approach with various stakeholder involve during co-realization & prioritization of issues - transdisciplinary;

ii. Attraction to scientist from various field – inter-disciplinary,

Natural scientists find excellent opportunities to study ecosystem structure, functioning and dynamics,

Social scientists, interested in researching the interactions of people with their natural environment, or focusing on governance mechanisms through the participation of local communities in site management,

Economists are keen to assess the economic importance of such sites in the local, regional and national economies.
Our exercise involves steps 1, 2 and 3.

In a workshop based of participatory approach involving series of FGDs with local people, multi-stakeholders in

i. co-realization of a common problem

ii. co-production of Knowledge, co-solution – involving various stakeholders, local people, practitioners, local government representatives.

iii. Co-production of action plans as part of co-envisioning futures.
Sustainability Science

• solutions oriented and problems/issues based;
• optimizing social and humanity potential (through learning process approach);
• maintaining continuation of benefits stream (from ecosystem);
• aim at well-being for all.
• multiple disciplines of the natural, social, medical and engineering sciences – INTERDISCIPLINARY
• Various professions and practical field experience in business, government and civil society - TRANSDICIPLINARY
• “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”. (UNESCOMAB, 2015)
4 Component of Sustainability Science

From the literature review, the components of Sustainability Sciences are:

i. **Focus on dynamic interactions between nature and society**, i.e. how is evolving process of dynamic interactions between man vs environment manifest in Huangshan cultural landscape as World Heritage Site.

ii. **Inter- & Trans-disciplinary approach**, i.e. how is the local and scientific knowledge develop and issues and problems identify by scientist and practitioner.

iii. **Normative function**, what lies behind the Subak system or social norms related with Huangshan/ Chinese society surrounds the area.

iv. **Transformational function**, How the local knowledge integrate with other type of knowledge as a co-production of knowledge/ solution to the existing issues/ problems at local level.
AHEPT Leadership & Sustainable Development Programme

Date:
8-13 October 2017

Location:
Bali, Indonesia

SD 104: SUSTAINABILITY LEADERSHIP ASEAN COMMUNITY IN HIGHER EDUCATION PROGRAMME

“ACTION RESEARCH, EXPERIENTIAL & TRANSFORMATIONAL LEARNING”

Co-Organised:
The Cultural Landscape of Bali Province, the Subak System as a Manifestation of the Tri Hita Karana Philosophy Indonesia World Heritage Site
What is Subak?

- An independent, democratic egalitarian organizations of traditional irrigation system,
- organising by a group of farmers or head of farmer *Pekaseh*,
- to sustainable agricultural system of rice fields,
- Conserving the watershed - getting water from a certain source, managing at least one subak-temple, and internally-externally autonomy.

**ROLE & FUNCTION:**

- Water distribution.
- Maintenance (canal, temple, etc).
- Mobilization of resources (contribution of rice/money, manpower, etc)
- Conflicts solution.
- Ritual activities.
- RULE IN USE/REGULATION (AWIG-AWIG)
Subak – Water Temple Network

Figure 2. Balinese Water Temple Network (Lansing & de Vet 2012)
Inter Disciplinary Approach Sustainability Science for Subak System

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**SOCIAL CAPITAL**

**TRUST** BRIDGING TRUST: Trust to Stranger people

**NETWORKING** : Subak’s Interrelation

**SOCIAL NORM** : Local wisdom

**BONDING TRUST** : Trust among Subak Member
Trans- disciplinary Process
FORUM SUBAK 2
Co-realization of the Issues

Among the Issues.....

• Increasing number of tourist to visit Jatiluwih rice terraces as one of main attraction in Bali WHS.

• Increasing number of tourist need to be facilitate to reduce his effect to the environment, while increase the socio-economic benefit of the local people.

• No Local Committee set up to oversea the Bali WHS

• No interest from the young people
Problem definition in sustainable research is directly linked to normative values, science alone is not competent enough and legitimised to realize research and draw on recommendation without consulting societal actors (Nolting et al. 2004, Schafer 2007).

SR characterized by taking up life-world problems in the intersection of society and nature which urgently call for political action and coping strategies even if the knowledge available about causal interrelations and the effects of interventions is highly uncertain (Bechmann 2000).

Stakeholder Involvement is the process by which an organisation involves people who may be affected by the decisions it makes, or can influence the implementation of its decisions.

An underlying principle of stakeholder engagement is that stakeholders have the chance to influence the decision-making process.

This differentiates stakeholder engagement from communications processes that seek to issue a message or influence groups to agree with a decision that is already made.
• Transformation into a ‘complex labyrinths of communication and engagement.’

• The interactions described as ‘spider webs’ of connectivity and exchange in which there are nodes and complex linkages with old actors disappearing and new ones entering (Kasperson, 2005).

• Replaces the traditional paradigm of linear knowledge transfer to practitioners.

• New paradigm: interface between science and practice as a complex terrain that it is best described as a multi-level system of governance and knowledge production among a range of actors engaged in understanding and managing environment–society interactions (e.g. Cash and Moser, 2000; Cash et al., 2002a, b; Cash et al., 2006).
SDG Goals and Target Tracking for Bali Province WHS

The result of SuS - issue based and trans- and interdisciplinary approach generate FIVE main Goals:

1. Goal 17: Partnerships for the Goals (5 targets),
2. Goal 15: Life on Land (4 targets),
3. Goal 12: Responsible Consumption and Production (3 targets),
4. Goal 4: Decent work and economic growth (2 targets) and;
5. Goal 16: Peace, Justice and Strong Institutions (1 target).

Goal 17, partnership to achieve the Goals (Social), Goal 15 represent Biosphere/ WHS (Environment), Goals 12 e (Economy), Goal 4 urgency to work in decent (Social) and Goal 16 the need for peace, justice and strong institution.
Multiple International Designations Area (MIDA) have the potential to increase resilience of conservation areas to external pressures as they underline the exceptional and diverse values of a site at the global level.
Multi Level & Sites Sustainability Governance

• Define as an action by local governmental authority in areas related to climate change in legal and institutional frameworks at higher scales (Corfee-Morlot et al. 2009).

• A two-way relationships; top - bottom approach between local and national action on climate change can provide interface for policy making which functions as an enabler each other;

• Policy actors and stakeholders operating across horizontal and vertical levels of social organization and jurisdictional authority around a particular issue (Selin & VanDeveer, 2009).

• Widely practices in urban climate governance in North America and several OECD countries e.g Finland, Sweden, Sao Paolo-Brazil, New York City and Barcelona, as a response to climate change challenges.

• Possible framework for any multilevel governance in sustainability realm.
Strengthening Culture & Education
Sustaining Subak – Software Approach

Learning Materials

1. Integration Subak in formal curriculum for Teacher Education.

Its to revive and sustain the Subak TEK as a pedagogy material to the students, young generations.

Source: Sang Putu Kaler Surata 2017
Sustaining Subak – Software Approach

1. Integration Subak in formal curriculum of Teacher’s education

Source: Sang Putu Kaler Surata 2017
Subak related course in Several Local Universities

ESD Education for Sustainable Development in Formal & Local Education System

Universitas Mahasaraswati, Denpasar Bali. Prof. Sang Putu Kaler Surata

• Undergraduate (Student teachers):
  1) General ecology that introduce various concepts and issues in Subak (such as ecosystem, community, population, habitat, biogeochemistry cycle; 2) Ecopedagogy that harness interlinked between science, environment, technology and society through in which from Subak we can learn about social-ecology; 3) Contextual biology teaching with using Subak as place-based learning;

• Postgraduate (master degree),
  1) Ecological Development Planning to enhance capacity of student to understanding that Subak system is model actual of sustainable development since the system sustain for more than a millenium;
  2) Tourism Area Planning to design or developing strategy to help Subak to be edutourims destinations
Socializing Tri Hita Karana, the Balinese Philosophy in current context

Tri Hita Karana (THK) Awards and Accreditation is an initiative base on local philosophy about harmony which implement at the promoting sustainability development become tools to prevent the impact of tourism development for nature and culture in Bali.

(1) the initial screening to attract prospective participants
(2) Basic training for all the participants to provide evidence for the assessor team.
(3) completed the list of statement on the manual book.
(4) Site inspection phase I and II for tabulation data and meeting for determination of grade.
(5) Announcement of the grade
(6) Conferment of the THK Awards & Accreditation jointly organised with the celebration of the Balinese Food Festivals.
Culture Based Tourism Activity
Sustaining Subak and the cultural landscape

ESD Dimension to Public

Cultural based tourism activity

i. Visit to holy water, Tirtha at Tampak Siring - Have a purification bath in a holy spring temple and visit a local priest compound.

ii. Visit the holy spring water the famous Tirta Empul holy spring and Gunung Kawi temples and several other historical temples.

iii. Tracking the Pakerisan River and its watershed as one of Bali’s UNESCO world heritage sites.

iv. is a spiritual journey to these important sites in this cultural walk.

v. Several activities are also included to show and teach you the local culture.

• There us a local school visit as part of a charity program.
UNESCO MasterClass on Sustainability Science – Subak
ESD Dimension to Wider Public

• http://connect-asia.org/unesco-masterclass-mab-wh/
MAB programme MISSION
to balance the seemingly conflicting goals of environmental conservation and socio–economic development as well as to maintain the noble values of nations’s culture,
In the NUTShell

1. Sustainability Science APPROACH Has Potential To CAPTURE Knowledge Production ‘MODE 2’

2. The Establishment of Biosphere Reserves & World Heritage Site Functions to Accelerate This Process And Important Sources of Knowledge For Policy Intervention – The Practical Implication.

3. Two Function as Biosphere Stewardship Where Long Term Engagement And Spider Web of Common Understanding of Issues, Co-envisioning The Future, Continuous Improvement is Needed in Transition Phase of Sustainable Society.
Cultural Based Tourism for Huangshan

谢谢
(Thank you)