Capacity Development for Low Carbon Economies - AIT's Perspectives

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Outline 概要

- Sustainable Development in the Context of Climate Change
- New Paradigm
- Green Jobs
- Capacity Building / Technology Transfer: AIT Perspective
- Conclusions
- References
Sustainable Development in the Context of Climate Change

気候変動の文脈における持続可能な開発

Sustainable Development is Holistic Development
持続可能な開発とは包括的な開発
Education for Sustainable Development (ESD)
持続可能な開発のための教育

ESD goes far beyond environmental education
環境教育を超えるESD

ESD is the educational process of achieving human development
ESDは人間開発を達成する教育プロセス
Sustainable Development is Broad-Based Development

- Geographic
  - all regions
- Sectoral
  - all groups
- Temporal
  - all generations

Sustainable Development is Integrative Development

- multi-dimensional
  - addresses six dimensions
- multi-stakeholder
  - gov't, civil society, business
- multi-level
  - global, national, local
Climate Change Effects
気候変動の影響

- Threatens development and progress towards UN MDGs
- Both a technical (scientific) and a developmental policy & strategy concern
- Hinders human development and environmental conservation
- A major threat to human security at the global, national and grassroots level

Most frequently identified challenges for human and social development. Source: Lobera et al. (2008)
人間と社会開発に関してよく取り上げられる高い課題 出典：Lobera et al. (2008)

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty reduction</td>
<td>60%</td>
</tr>
<tr>
<td>Sustainable development</td>
<td>58%</td>
</tr>
<tr>
<td>Ethical values into globalization</td>
<td>50%</td>
</tr>
<tr>
<td>Democracy</td>
<td>44%</td>
</tr>
<tr>
<td>Access to education</td>
<td>38%</td>
</tr>
<tr>
<td>Qualified human resources</td>
<td>35%</td>
</tr>
<tr>
<td>Access to Knowledge Society</td>
<td>28%</td>
</tr>
<tr>
<td>Multicultural understanding</td>
<td>25%</td>
</tr>
<tr>
<td>Human Rights</td>
<td>12%</td>
</tr>
<tr>
<td>Competitiveness of companies</td>
<td>10%</td>
</tr>
</tbody>
</table>
Millennium Development Goals (MDGs)

Ranking of ADB Countries by % of MDG Indicators Off Track

- Afghanistan
- Papua New Guinea
- Uzbekistan
- Vanuatu
- Lao PDR
- Marshall Islands
- Micronesia, FSM
- Azerbaijan
- Fiji
- Tuvalu
- Bangladesh
- Georgia
- Armenia
- Nepal
- Tajikistan
- Solomon Islands
- Tonga
- Indonesia
- Lao PDR
- Marshall Islands
- Micronesia, FSM
- Azerbaijan
- Fiji
- Tuvalu
- Bangladesh
- Georgia
- Armenia
- Nepal
- Tajikistan
- Solomon Islands
- Tonga
- Indonesia
- Lao PDR
- Marshall Islands
- Micronesia, FSM
- Azerbaijan
- Fiji
- Tuvalu
- Bangladesh
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- Marshall Islands
- Micronesia, FSM
- Azerbaijan
- Fiji
- Tuvalu
- Bangladesh
- Georgia
- Armenia
- Nepal
- Tajikistan
- Solomon Islands
- Tonga
- Indonesia

Source: ESCAP; PovcalNetOnlineData. To be updated pending release of 2009 data

Ranking of MDG Indicators by Performance (% Off Track) - ADB Countries

- Women with HIV
- Adults with HIV
- Land area covered by forest
- Access to improved sanitation facilities, rural
- Access to improved drinking water sources, urban
- Access to improved drinking water sources, rural
- CO2 emissions
- Access to improved sanitation facilities, urban
- Infant mortality rate
- Population below 1.25 per day, %
- Primary Completion Rate
- Children under 5 mortality rate
- Pupils who reach last grade of primary
- Gender Parity in Primary Level Enrolment
- Gender Parity in Tertiary Level Enrolment
- Children under 5 in secondary
- Net enrolment in primary education
- Women in wage employment in the non-agricultural sector
- Consumption of all Ozone-Depleting Substances
- Tuberculosis death rate
- Gender Parity in Secondary Level Enrolment
- Tuberculosis prevalence rate
- Protected area to total surface area

- Indicators where more than 50% countries are off track:
  - Poverty
  - Education quality (Primary completion)
  - Water and sanitation
  - HIV
  - Child and infant mortality
  - Forest cover
  - CO2 emissions

Source: ESCAP; PovcalNetOnlineData. To be updated pending release of 2009 data
New Paradigm
新しいパラダイム

Implications in the global context
グローバルな観点が意味すること

Multiple crises:

- **Financial** - 18 to 51 million unemployed over 2007 levels and the number of extremely poor has increased by at least 100 million people worldwide;
- **Fuel** - rising prices cost developing economies USD 400 billion in higher energy bills in 2007;
- **Food** - rising prices cost developing countries USD 324 billion in 2007;
- **Ecosystem** - EUR 50 billion worth of biodiversity is being lost each year; and
- **Climate** - current global GHG emissions at 42 Gt per annum - 5 times higher than the threshold.
'“For decades, we have known the days of cheap and easily accessible oil were numbered. ... And for decades, we have failed to act with the sense of urgency that this challenge requires. .....We cannot consign our children to this future. ..the transition to clean energy has the potential to grow our economy and create millions of good, middle-class jobs -- but only if we accelerate that transition. Only if we seize the moment. ......Now, there are costs associated with this transition. And some believe we can't afford those costs right now. I say we can't afford not to change how we produce and use energy -- because the long-term costs to our economy, our national security, and our environment are far greater”.

President Obama Speech on Oil Spill, 16 June 2010

Implications of a business as usual approach ...

By 2030...

• Global energy demand up by 45%
• Oil price up to USD 180 per barrel (IEA)
• GHG emissions up 45%
• Global average temperature trajectory +6 °C
• Economic losses equivalent to 5-10% of global GDP as compared to the 3% of GDP loss from the current financial crisis;
• Poor countries will suffer costs in excess of 10% of their GDP (Stern)
What is a Green Economy?

• Increase in **green investment**
• Increase in quantity & quality of jobs in **green sectors**
• Increase in share of **green sectors** in GDP
• Decrease in Energy/resource use per unit of production
• Decrease in CO2 and pollution level/GDP
• Decrease in wasteful consumption

Some Green economy concepts

• **A low carbon economy**: part of a GE measured by the carbon level of economic activities
• Green growth: GDP growth subject to green conditions as well as focusing on green sectors as new growth engines - growth in a GE is green growth
• **Green jobs**: jobs in green sectors, also known as green collar jobs
• **Circular economy**: an economy in which the waste from one production/consumption process is circulated as a new input into the same or a different process - one of the approaches to a GE
• **Ecological economy**: an economy subject to ecological principles (e.g. biodiversity & carry capacity) as well as utilizing ecological functions to contribute to both the economy and ecosystems (e.g. organic farming) - one of the approaches to a GE
Further evidence of green economies

• 2.3 million jobs in renewable energy now to grow to 20 million by 2030
• USD 253 bn market for water supply, sanitation, & water efficiency now to grow to USD 658 bn by 2020
• EU & US: green buildings to create 2-3.5 million jobs
• Organic agriculture provides more than 30% more jobs/hectare
• China: 10 million jobs in recycling; and renewable energy output at USD 17 bn/year employing 1 million
Two defining challenges of the 21st Century

1. Averting dangerous and potentially unmanageable climate change and protecting the natural environment which supports life on earth.
2. Providing decent work and thus the prospect of well-being and dignity for all in the face of rapid population growth worldwide and the current exclusion of over a billion people from economic and social development.

The above challenges are closely linked and cannot therefore be addressed separately. Green jobs are the key to meeting both simultaneously.

Green Jobs: Towards decent work in a sustainable, low-carbon world
Worldwatch Institute

World Job Market transition

- Job Market will be affected in at least 4 ways:
  - Additional jobs will be created
  - Certain jobs may be eliminated
  - Some employment will be substituted
  - Many jobs will be redefined

- 100 million: Number unemployed in Asia and the Pacific (2009)

- World Working population: 4.5 (2010) to 5.2 billion in 2025 (300 million additional in A and P)

- Projected green jobs in next two decades:
  - 20 million additional jobs in RE sector (UNEP)
### Future Job Opportunities

<table>
<thead>
<tr>
<th>Sector</th>
<th>Business</th>
<th>Greening potential</th>
<th>Green job progress to-date</th>
<th>Long-term green job potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>Renewable energy</td>
<td>Excellent</td>
<td>Good</td>
<td>Excellent</td>
</tr>
<tr>
<td></td>
<td>Carbon capture and sequestration</td>
<td>Fair</td>
<td>None</td>
<td>Unknown</td>
</tr>
<tr>
<td>Industry</td>
<td>Steel</td>
<td>Good</td>
<td>Fair</td>
<td>Fair</td>
</tr>
<tr>
<td></td>
<td>Recycling</td>
<td>Excellent</td>
<td>Good</td>
<td>Excellent</td>
</tr>
<tr>
<td>Transportation</td>
<td>Fuel-efficient cars</td>
<td>Fair to Good</td>
<td>Limited</td>
<td>Good</td>
</tr>
<tr>
<td></td>
<td>Public transport</td>
<td>Excellent</td>
<td>Limited</td>
<td>Excellent</td>
</tr>
<tr>
<td>Buildings</td>
<td>Green buildings</td>
<td>Excellent</td>
<td>Limited</td>
<td>Excellent</td>
</tr>
<tr>
<td></td>
<td>Retrofitting</td>
<td>Excellent</td>
<td>Limited</td>
<td>Excellent</td>
</tr>
<tr>
<td>Agriculture</td>
<td>Organic farming</td>
<td>Excellent</td>
<td>Limited</td>
<td>Good to Excellent</td>
</tr>
<tr>
<td></td>
<td>Small sustainable farming</td>
<td>Excellent</td>
<td>Negative</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

Source: UNEP, 2008

### Job Opportunities in Renewable Energy Sector

Bioenergy has a particularly high potential to create employment and accounts for half the reported jobs.

Under favourable conditions, bioenergy can contribute substantially to reducing greenhouse-gas emissions from transportation.

The quality of jobs in the biofuels industry also varies significantly.

Source: Green Jobs - Towards Decent Work in a Sustainable, Low-Carbon World, UNEP/ILO/IOE/ITUC, September 2008
Capacity Building / Technology Transfer: AIT Perspective

Some Examples of ESD @ AIT

- Research Focus on “Sustainable Development in the Context of Climate Change”
- AIT-UNEP Regional Resource Center for Asia-Pacific
- 3R-Knowledge Hub
- Yunus Center at AIT
- CSR Asia Center at AIT
- ASEAN MDG Regional Center of Excellence
- Poverty Reduction and Agricultural Management (PRAM)
- Wetland Alliance Program (WAP)
- Promotion of Sustainability in Postgraduate Education and Research (ProSPER.Net)
- Regional University Consortium (RUC)
“AIT is positioning itself under an Institute-wide thematic research area of “Sustainable Development in the Context of Climate Change”, focusing on adaptation and mitigation strategies that will drive poverty reduction, reduce risk and resource consumption, and create opportunities for job creation and building sustainable livelihoods. The Centre will serve as an umbrella for specific nodal centres created in the sub-themes”.

An example of how AIT deploys mobile wireless networks on an ad-hoc basis for Emergency conditions, such as after a natural disaster when a fixed network infrastructure is not available or had been destroyed.

Centre of Excellence on “Sustainable Development in the context of Climate Change”.

Researchers whose work will focus under AIT’s endeavor will be supported by a critical mass of thematic knowledge sub-areas, namely: Vulnerability and Disaster Risk Reduction, Water Resources and Coastal Adaptation, Urban and Rural Sustainability, Low Carbon Society and Renewable Technology, and Cleaner Production and Waste Refinery.
Celebrated AIT’s 50th and AIT-UNEP.RRC.AP’s 20th year anniversary celebrations respectively in 2009.

AIT-UNEP.RRC.AP started as GRID Bangkok in the early 90’s and from its initial focus on providing GIS and Remote Sensing data within Southeast Asia, has grown significantly over the years.

In response to the changing demands for information on environment and development the Center has expanded to become the Regional Resource Centre in Asia and Pacific (RRC.AP) in its present form. The three pillars of the AIT-UNEP collaboration have been: education, research and outreach.

Support and strengthen Asia-Pacific’s regional capacity in generating innovative development concepts and technologies relevant to ADB and its developing member countries (DMC), and to promote networking among the regional institutes for knowledge dissemination.

Mainstream new concepts in innovation, science, technology, management development, and related fields for the region.

Promote information exchange and sharing of knowledge and information.
A "Yunus Center at AIT", in partnership with Professor Muhammad Yunus, recipient of the 2006 Nobel Peace Prize, has been established this year to address issues of food security, social business in agriculture, applications of ICT in agriculture, and to act as a watchdog to encourage research that will have a positive impact on the lives of poor people.

The mission of the CSR Asia Center at AIT is to:

- Advance the development and implementation of effective and innovative sustainability solutions and CSR strategies for and by business
- Facilitate the development of the supportive framework conditions for corporate social responsibility (CSR) and sustainable development in the Asia-Pacific region
Regional Centre of Excellence on MDGs (MDG促進のための地域センター)

AIT serves as the site of the world’s first Regional Centre of Excellence on the Millennium Development Goals (MDGs), dedicated to the promotion and achievement of the MDGs in Southeast Asia through education and training, which has been endorsed by the UN.

A “Joint Declaration on the Attainment of the Millennium Development Goals in ASEAN” signed and adopted by the ASEAN leaders at the 14th ASEAN Summit officially acknowledging the Center as an important avenue and platform for the ASEAN in meeting its MDG targets.

Poverty Reduction and Agricultural Management (PRAM) 貧困撲滅と農業管理

Professional degree for Poverty Reduction and Agricultural Management (PRAM) Lao district and provincial staff (in-service professional development) - linked to official Ministry systems of staff promotion. Laos Government will “purchase” educational services from Thailand as scholarships. Degree would be issued by AIT and its partners: courses delivered by Thai provincial educational institutions in Northeast Thailand.
Wetland Alliance Program (WAP)

Building Local Capacity for Sustainable Wetlands Management

brings together strengths of four institutions in:

- education
- training
- conservation
- development
- research

focusing on wetlands in and around the Mekong region

**Bottom up approach**

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Promotion of Sustainability in Postgraduate Education and Research (Prosper. Net)

Network of several leading higher education institutions in Asia and the Pacific that have committed to work together to integrate Sustainable Development (SD) into postgraduate courses and curricula.

Member institutions involved have strong education and research programmes in sustainable development and related fields.
Regional University Consortium (RUC)

UNEP Asia-Pacific University Consortium on Environment for Sustainable Development

Established on Sep. 17th, 2003

Members:
- Asian Institute of Technology
- Tongji University
- Griffith University
- University of New South Wales
- Nanyang Technological University
- United Nations University
- Wollongong University
- Yale University

Capacity building programs

- Masters and PhD in CC and SD (climate science, climate mitigation, climate adaptation and vulnerability - launch in 2011)
- Energy Business management (cross-disciplinary professional program, targeting energy companies - launch 2011)
- E-learning course on renewable energy and energy policy - already offered
- GMS development studies - in progress, Training courses (in CDM)
- A double degree program on Urban Water Engineering and Management, collaborative effort with UNESCO Institute for Water Education (IHE) - launched in 2009

Research and sponsored activities

- Low carbon cities (ADEME), Low carbon technologies in industrial sector (UNIDO)
- Biomass gasification - with Energy Environment Partnership (EEP) in the Mekong with Finnish Ministry of Foreign Affairs
- Bio-fuel policy studies - with the Global network on Energy for Sustainable Development (GNESD)
- Credit-facility to support ecosystems friendly accommodations in Thailand’s coastal areas
- Renewing Assessment Approaches to Environmental Externalities of Rice Production Systems in a context of Climate Change
Some of the Planned Research Activities
実施予定の研究活動

- Assessment of GHG emissions - Energy consumption and green house gas emissions – sector wise, country wise and region wise
- Promotion of renewable energy technologies
- Renewable energy technology development and promotion coupled with income generation and related issues
- Sustainable Cities: urban greenery, buildings, urban transport and urban planning
- Energy access and energy security (urban and peri urban areas, national and household sector)
- Land use options for increasing landscape-level carbon stock/density
- Identifying land use options and management practices for reducing C emission and increasing C sink
- Development of carbon market and conservation financing mechanisms for multifunctional landscape bio-corridors

Research in Nanotechnology @ AIT
APIにおけるナノテクノロジー研究

- Nanoparticles: Gold, Silver, Platinum, Silica, Zinc oxide, Zinc sulphide
- Nanowires: Zinc Oxide
- Coating Techniques: layer by layer organization, Ink-Jet Printing, Spin Coating

ENVIRONMENT
- Photocatalysis
- Heavy metal Ion Sensors
- Bacteria Sensing
- Self Cleaning windows

AGRICULTURE & FOOD
- e-coli Sensors
- e-nose
- Smart pesticide
- Gas sensors

ALTERNATE ENERGY HARVESTING
- Nanobio Solar cells
- Nano-energy generators
Some points to think about.....

- Brain war: growing competition in research, new industrialized powers with advanced engineering skills like China, India
- Implement a new system for research direction & research performance
- Scientific knowledge is considered to be the highest level of knowledge and is valued far more than the praxis-based knowledge
- Structure the hidden knowledge
- Integration of tacit knowledge: strong integration of experience-based/praxis-based and scientific knowledge and also involving a close and strong partnership between academia and industry / public sector
- Building the capacity: research (region) & university: major development challenge of the university leader
- Linking universities and other research institutes
- Implementation of new technologies to enhance the quality of life and strengthen the economic development of the region
Universities and Science

OLD: Universities speak to society

Science as the accumulation of new knowledge as a goal in itself

• Researchers with their own agenda: unrestricted freedom of research; unconditional funding

• Research: unpredictable and unmanageable?

NEW: Society talks back

• Societal perspective on science

• To produce new knowledge for practical application with high relevance, utility and economic impacts

• Research is intentional, purposive and manageable

• Responsive to requirements of market

• Funding tied to needs of sponsors
Reason for change in Education
教育における変化の理由

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参考文献

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• UN Millennium Campaign, Montreal, April 2009
• The Green Economy and International Environmental Governance, John Scanlon, Principal Adviser to the Executive Director United Nations Environment Programme
Thank You!
ご清聴ありがとうございました。