

# Capacity Development for Low Carbon Economies – AIT's Perspectives

## 低炭素経済に向けた能力開発 AITの視点

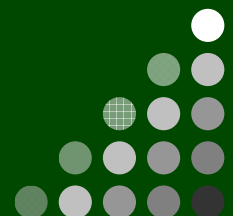


International Forum for Sustainable Asia and the Pacific (ISAP) 2010  
Yokohama, Japan (12-13 July 2010)

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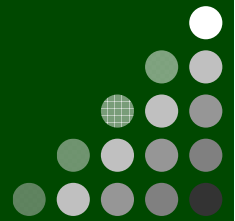
## Outline 概要

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

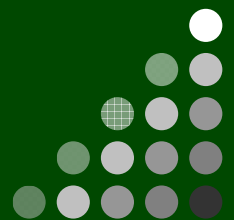
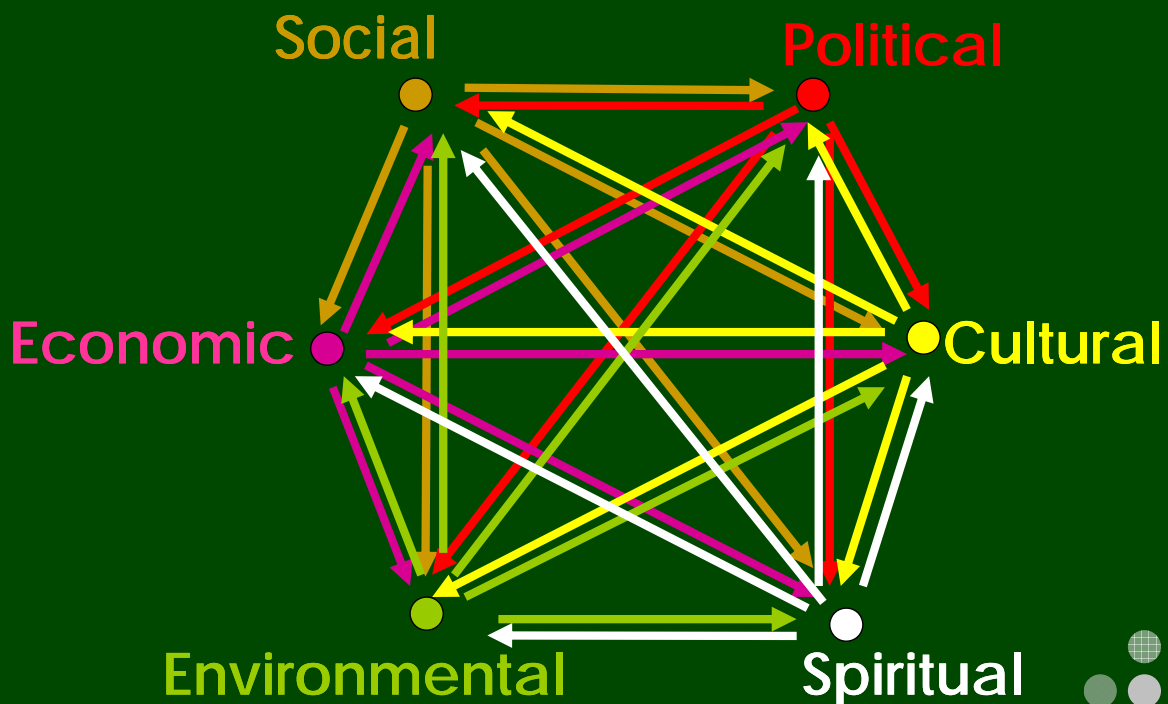


# Sustainable Development in the Context of Climate Change

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)

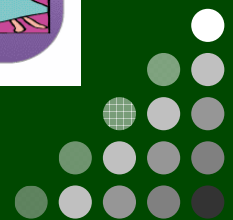
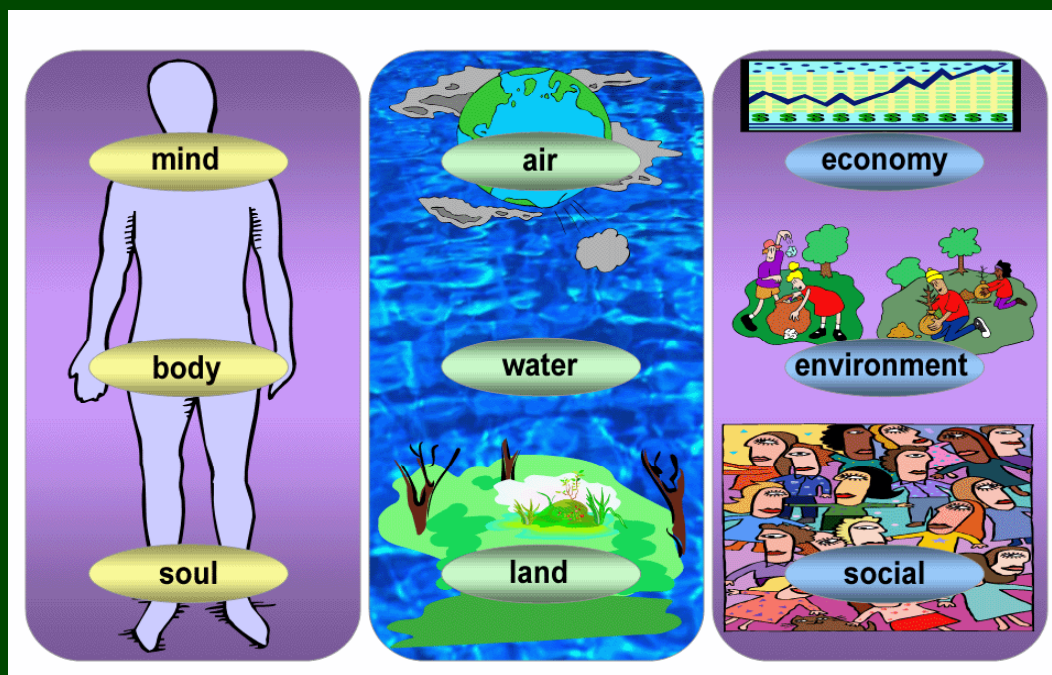
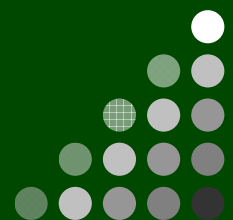
## 持続可能な開発のための教育

ESD goes far beyond environmental education

環境教育を超えるESD

ESD is the educational process of achieving human development

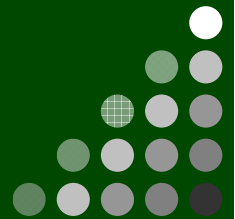
ESDは人間開発を達成する教育プロセス



## Sustainable Development is Broad-Based Development 持続可能な開発は広範な開発

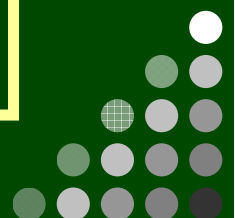
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- Geographic
  - *all regions*
- Sectoral
  - *all groups*
- Temporal
  - *all generations*



## Sustainable Development is Integrative Development 持続可能な開発は統合的な開発

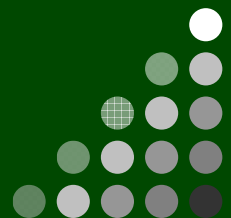
- **multi-dimensional**
  - addresses six dimensions
- **multi-stakeholder**
  - govt, civil society,  
business
- **multi-level**
  - global, national, local



# Climate Change Effects

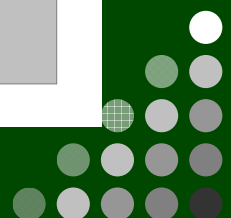
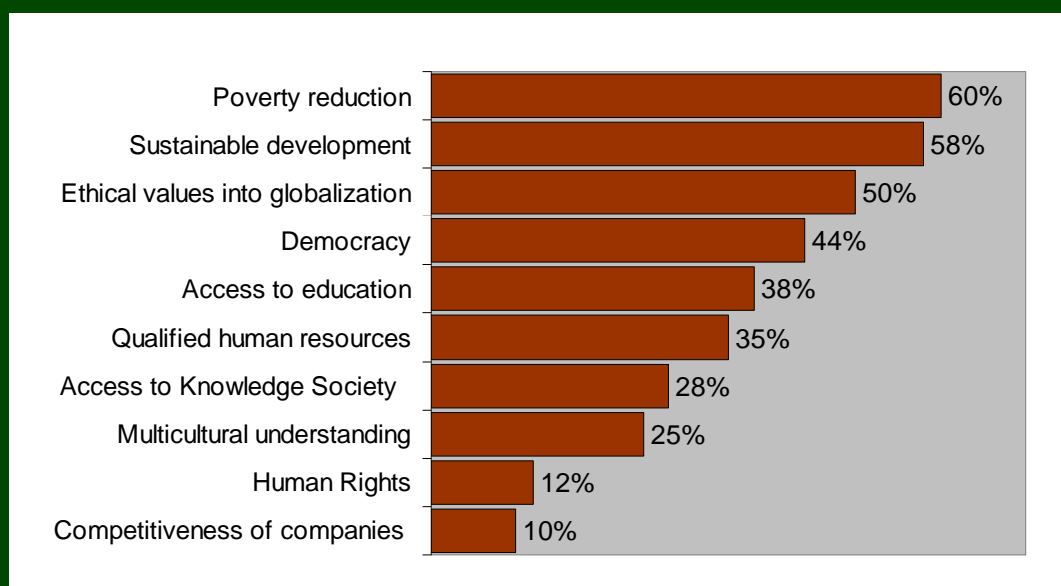
## 気候変動の影響

- 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



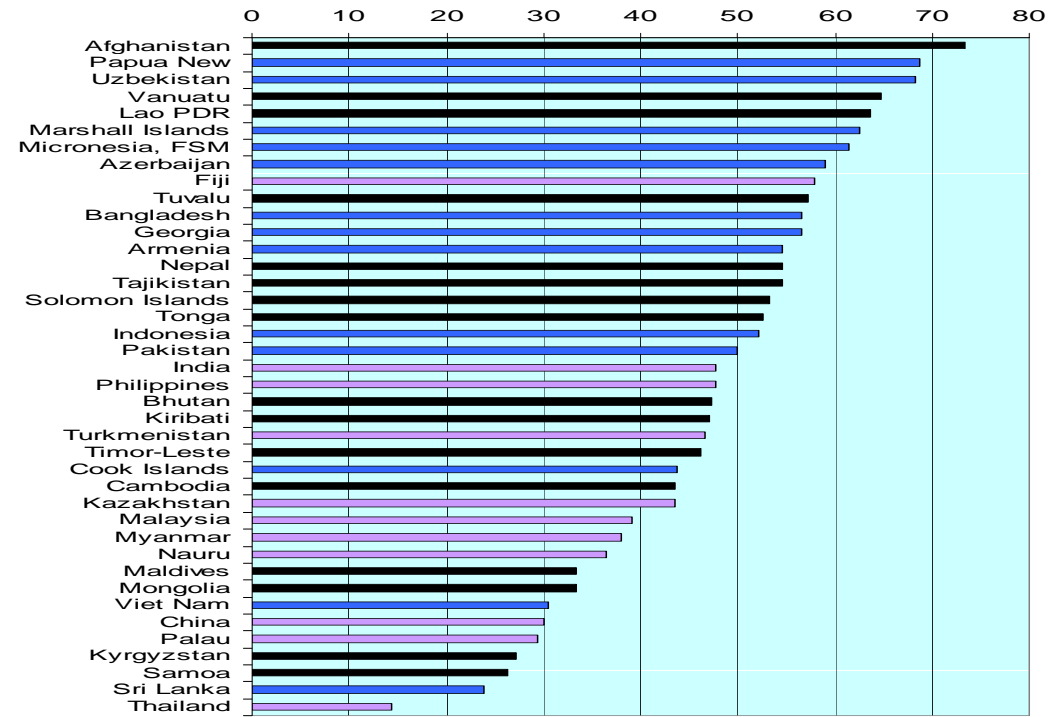
## Most frequently identified challenges for human and social development. Source: Lobera et al. (2008)

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)



# Millennium Development Goals (MDGs) ミレニアム開発目標

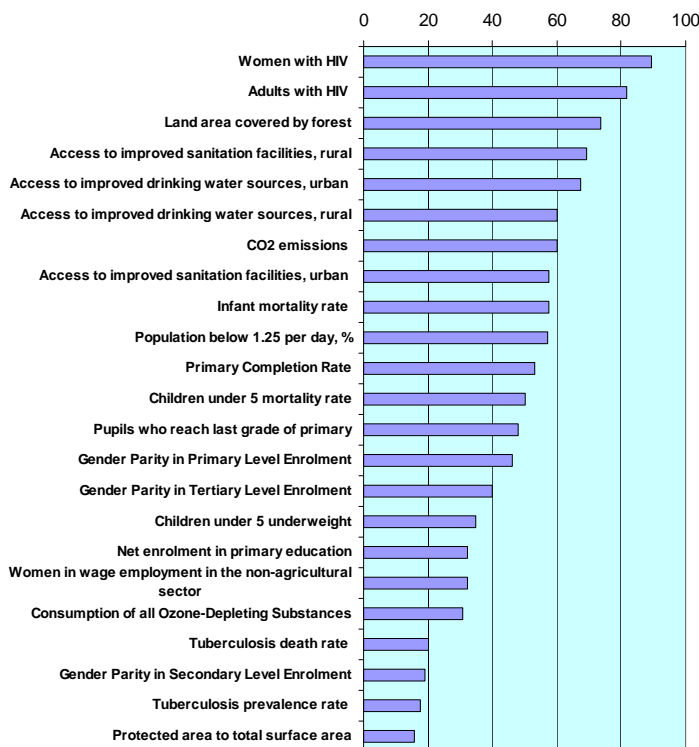
Ranking of ADB Countries by % of MDG Indicators Off Track



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

# Millennium Development Goals (MDGs) ミレニアム開発目標

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

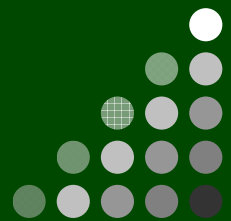


• Indicators where more than 50% countries are off track:

- Poverty
- Education quality (Primary completion)
- Water and sanitation
- HIV
- Child and infant mortality
- Forest cover
- CO<sub>2</sub> 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

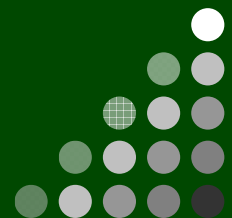
### Multiple crises:

- **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".*

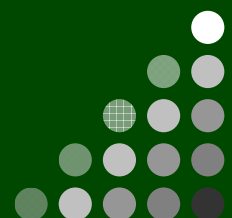
President Obama Speech on Oil Spill , 16 June 2010



## Implications of a business as usual approach ... BAUアプローチが意味すること

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)

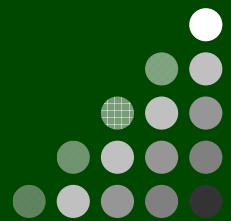




# What is a Green Economy?

## グリーン経済とは何か？

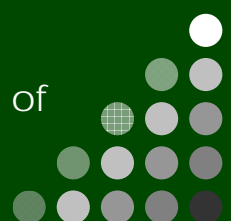
- Increase in **green investment**
- Increase in quantity & quality of jobs in **green sectors**
- Increase in share of **green sectors** in GDP
- Decrease in Energy/resource use per unit of production
- Decrease in CO2 and pollution level/GDP
- Decrease in wasteful consumption



# Some Green economy concepts

## グリーン経済の基本的なコンセプト

- **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

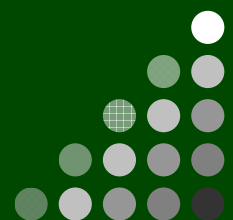


## Further evidence of green economies グリーン経済の証拠

- 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



Green Jobs  
グリーン雇用



## Green Jobs – More Sustainable Economy and Society グリーン雇用：より持続可能な経済・社会

Two defining challenges of the 21<sup>st</sup> 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 developed.

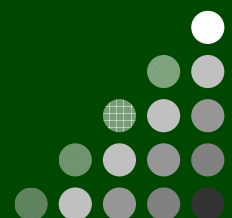
The above challenges are closely linked and cannot therefore be addressed separately. Green jobs are the key to meeting both simultaneously.

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



## World Job Market transition 世界の雇用市場の移行

- 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 将来の雇用機会

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

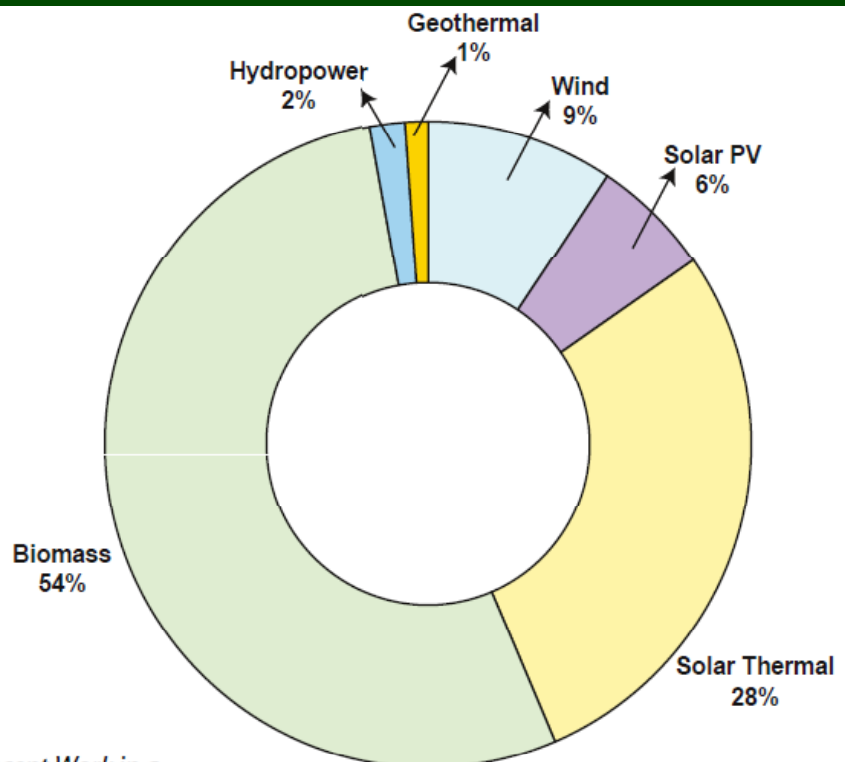
Source: UNEP, 2008

## Job Opportunities in Renewable Energy Sector 再生可能エネルギーにおける雇用機会

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

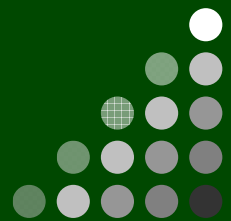
**Under favourable conditions, bio energy can contribute substantially to reducing greenhouse-gas emissions from transportation.**

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



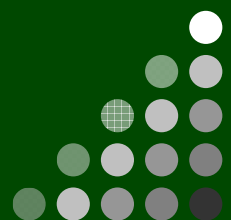
Source: *Green Jobs - Towards Decent Work in a Sustainable, Low-Carbon World*, UNEP/ILO/IOE/ITUC, September 2008

Capacity Building / Technology Transfer:  
AIT Perspective  
能力開発・技術移転  
AIT の視点



Some Examples of ESD @ AIT  
AITによるESDの事例

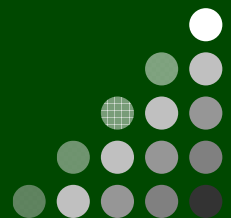
- Research Focus on "*Sustainable Development in the Context of Climate Change*"
- AIT-UNEP Regional Resource Center for Asia-Pacific
- 3R-Knowledge Hub
- Yunus Center at AIT
- CSR Asia Center at AIT
- ASEAN MDG Regional Center of Excellence
- Poverty Reduction and Agricultural Management (PRAM)
- Wetland 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".

「気候変動の文脈における持続可能な開発」に関するセンター・オブ・エクセレンス」

researchers whose work will focus under sAIT's endeavor will be supported by a critical mass of ix 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.





AIT-UNEP Regional Resource Centre for Asia and the Pacific (RRC.AP)



20 Years of Service

- Celebrated AIT's 50<sup>th</sup> and AIT-UNEP.RRC.AP's 20<sup>th</sup> 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.



Reduce, Reuse, Recycle  
**3R** KNOWLEDGE HUB



- 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.





# Yunus Center at AIT



(AITに設立された「ユヌスセンター」)



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  
(AITに設立されたCSR アジアセンターの使命)

- 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







# ARCMDG



## 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)

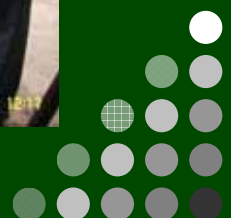
### 貧困撲滅と農業管理

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 partners: courses delivered by Thai provincial educational institutions in Northeast Thailand.



## Wetland Alliance Program (WAP)

### 湿地同盟プログラム

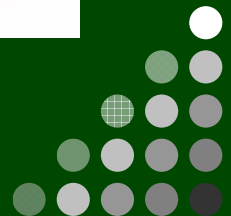
Building Local Capacity for Sustainable Wetlands Management

brings together strengths  
of four institutions in:

education  
training  
conservation  
development  
research

focusing on wetlands in  
and around the Mekong  
region

**Bottom up approach**

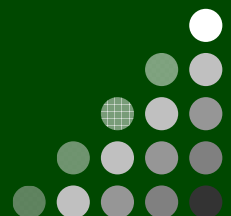


## Promotion of Sustainability in Postgraduate Education and Research (Prosper. Net)

### アジア環境大学院ネットワーク

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) アジア地域の大学コンソーシアム

- 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 能力開発プログラム

- 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 研究及び外部資金による活動

- 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

## AIT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

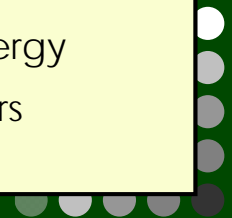
- Photocatalysis
- Heavy metal Ion Sensors
- Bacteria Sensing
- Self Cleaning windows

### AGRICULTURE & FOOD

- e-coli Sensors
- e-nose
- Smart pesticide
- Gas sensors

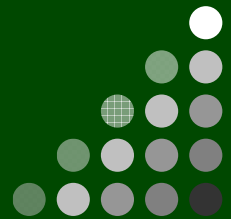
### ALTERNATE ENERGY HARVESTING

- Nanobio Solar cells
- Nano-energy generators



# Conclusions

## 結論



## Some points to think about.....

### 考慮すべきポイント

- 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



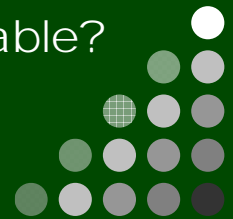
# Universities and Science

## 大学と科学

*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?

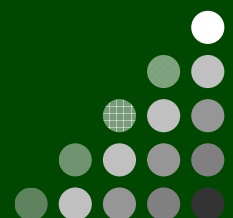


# Universities and Science

## 大学と科学

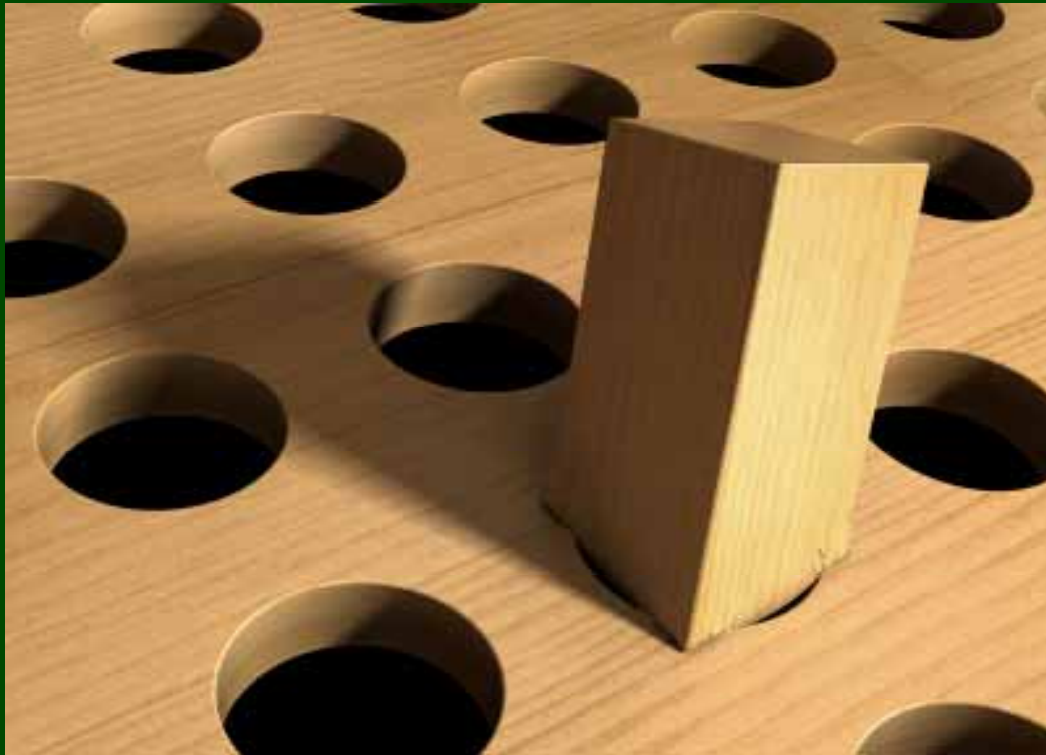
*NEW: Society talks back*

- 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



## References

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Thank You !  
ご清聴ありがとうございました。

