



NATURAL RESOURCES AND ECOSYSTEM SERVICES

IGES

Strategy and Activities

policy research and partnership-building for vibrant,
equitable and resilient societies



Who we are

Institute for Global Environmental Strategies

The Institute for Global Environmental Strategies (IGES) was established in 1998 under an initiative of the Government of Japan as an independent policy research institute to formulate innovative policy instruments and environmental strategies for the Asia-Pacific region. IGES works through partnerships and networks involving governments, the private sector, non-governmental organisations, research institutes, and other organisations working in the fields of environment and sustainable development.

IGES Natural Resources and Ecosystem Services

The IGES Natural Resources and Ecosystem Services Area (NRE) consists of teams of researchers who are working on fundamental natural resource management issues in the Asia-Pacific region. NRE is undertaking solution-oriented and synthesis research, networking, capacity building and outreach on forest conservation, water resource management, climate change adaptation, biodiversity and ecosystems services, and integrated approaches to natural resource management. The aim of NRE is:

to provide and promote analytically-based policy recommendations, guidance and tools through multi-disciplinary policy research that spans actor types, sectors and scales, as well as contribute to partnerships, networks and capacity building, for the integrated management of natural resources, with a view to building vibrant, equitable and resilient societies

How we work

- Apply a broad analytical perspective that captures cross-sectoral interests
- Apply multiple methodologies to provide a strong analytical basis from which policy recommendations and instruments can be derived
- Analyse future scenarios and identify sustainable development pathways
- Support multistakeholder forms of natural resource governance and build capacities through trainings and workshops
- Develop tools and approaches that secure community participation in and benefits from natural resource management
- Develop guidance and tools for responsible corporate behaviour and the reform of markets towards sustainability
- Manage and utilise networks to share experiences and lessons, with a view to identifying and promoting best practices

Website and publications

For more information on our work, please visit our website:

<http://www.iges.or.jp/en/natural-resource/index.html>

Our publications can be downloaded from:

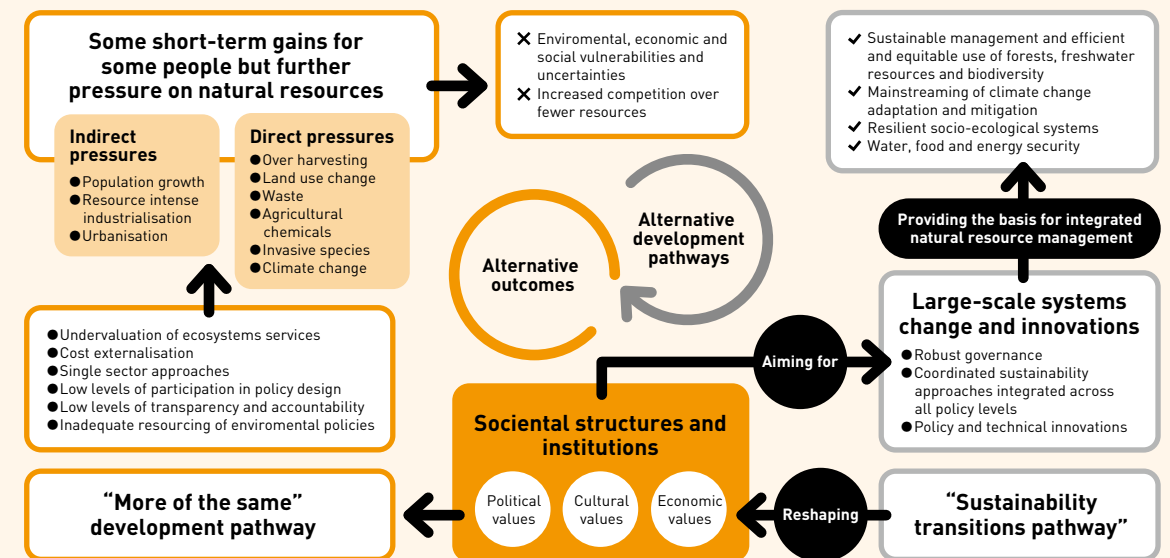
<http://pub.iges.or.jp/modules/envirolib/doclist.php?field=area&id=3>

Conceptual approach

Sustainability transitions as the foundation for integrated natural resource management

Countries in the Asia-Pacific region have made tremendous progress over recent decades in growing their economies. This growth is believed to have lifted more than half a billion people out of poverty, but has not been fully inclusive. In addition, urbanisation, rapid population growth, resource-intensive industrialisation, chemical intensive agriculture, and the consumption preferences of a rapidly expanding middle class have accelerated the degradation of natural capital and the generation of waste and emissions. The region has entered a development context that is increasingly influenced by resource constraints and growing risks.

NRE activities are all framed by an understanding that sustainable and equitable management of natural resources requires robust governance structures, enhanced accountability and coordinated sustainability approaches to be integrated across all policy levels. This calls for *transitions to sustainability* through structural transformations to resolve deep and persistent problems that are embedded in existing social, economic and governance systems. Actions will need to be framed within a long-term perspective that aims towards significant shifts in political, economic and cultural values, changes in institutional structures and individual behaviours, and large-scale systems changes and technological innovations that reduce the rate, scale and magnitude of global environmental change and its consequences. Transitions to sustainability are a necessary foundation for integrated natural resource management, which aims to combine resource conservation and human development in ways that support national objectives for food, water and energy security, biodiversity protection, and climate change adaptation and mitigation.



More of the same, or sustainability transitions for integrated natural resource management

Project portfolio



Forest conservation

Problem snapshot: Southeast Asia holds only 5 per cent of the world's forest yet experienced 25 per cent of global forest loss between 2000 and 2010 (Blaser, 2010).

- Our focuses:**
- REDD+
 - Community-based natural resource management
 - Timber legality and sustainability, and forest products trade

Community-based REDD+ approaches

The IGES study on community-based REDD+ approaches is funded by the Ministry of Environment of Japan (MOEJ) and the Asia-Pacific Network for Global Change Research (APN). The Forest Conservation Team is working with local partners to test and develop approaches to engage local communities in assessing and monitoring carbon stocks and other values in their forests. Strategies to support community-based REDD+ approaches are also being studied.

Research problem / issue	Approach	Aim	Long term goal through systems transformation
Local communities cannot take full advantage of new forest management opportunities & deal with new forest threats.	Action research to develop & test approaches for communities to manage their forests for REDD+.	Strategies to support community-based REDD+ approaches.	Strong community institutions & well-being built. Sustainable management of forests through REDD+.



Training communities on forest monitoring PNG

REDD+ at project, national and international levels

IGES manages an online REDD+ database that provides profiles of REDD+ project designs and the results of IGES research on national REDD+ strategies and the international REDD+ negotiations.

Drivers of deforestation

This project is researching drivers of deforestation in Thailand and Indonesia, focusing on the cultivation of biofuel feedstocks. The research aims to develop methodologies to support land use planning, with a view to achieving the multiple goals of forest conservation and water, food and energy security.

Research problem / issue	Approach	Aim	Long term goal through systems transformation
Cultivation of biofuel feedstocks threatens food security, environmental values & well-being.	Develop comprehensive methodology for lifecycle assessment of biofuels. Use remote sensing, GIS, modelling & empirical analysis to study competition over land & resources.	Analytical methodologies to guide sustainable biofuel production.	Integrated management of natural resources for forest conservation, & food, water & energy security.

Legality / sustainability verification and corporate social responsibility

IGES is part of the Responsible Asia Forestry and Trade (RAFT) partnership, which aims to make responsible forestry and trade the norm across the Asia Pacific region. The Team has contributed analytical studies to support the development and uptake of forest sector legality and sustainability standards, and is studying how Japanese companies can ensure they only purchase legal and sustainable wood-based products.

Research problem / issue	Approach	Aim	Long term goal through systems transformation
Trade in wood-based products can drive deforestation & conflict.	Support forest managers to acquire certification. Develop procurement guidance for timber buyers.	Increased proportion of sustainable wood in timber trade.	Timber trade supporting sustainable forest management.

Selected outputs / links



•Community Carbon Accounting Action Research Project
http://www.iges.or.jp/en/natural-resource/forest/activity_cca.html



•Responsible Asia Forestry and Trade (RAFT)
<http://www.responsibleasia.org/>



•COMMUNITY BASED FOREST BIOMASS MONITORING - Training of Trainers Manual
http://pub.iges.or.jp/modules/envirolib/upload/4999/attach/IGES_CBFBM_Manual_-_reduced_.pdf



•IGES Policy Report 2013-01: Managing Forests as a Renewable Asset for Present and Future Generations: Verifying Legal Compliance in Forestry in Papua New Guinea
<http://pub.iges.or.jp/modules/envirolib/view.php?docid=4809>



<http://redd-database.iges.or.jp/redd/>

•IGES REDD+ Online Database Research Project





Illegally harvested timber, Cambodia



Water resource management

Problem snapshot: Water withdrawals exceed recharge rates in many areas and this imbalance will become worse with agriculture, which accounts for 79% of annual average water withdrawals, and demand for food and animal feed crops predicted to grow by 70 to 100% over the next 50 years.

- Our focuses:**
- Nexus (water-energy-food-climate) approach
 - Multistakeholder involvement in water/wastewater management

Water governance to address the water – land linkage and sustainable groundwater management

Under the project Enhancing the Resilience and Productivity of Rainfed Dominated Systems in Lao PDR through Sustainable Groundwater Use, conducted by IGES and the International Water Management Institute (IWMI), the Water Resource Management Team is researching land and energy issue linkages in groundwater management at country and transboundary levels in the Mekong River Basin.

The Comparative Research of Groundwater Management in the Coastal Areas in Southeast Asia project, which the Team is implementing together with the UNESCO-IHE Institute for Water Education and the Asian Development Bank (ADB), encourages local stakeholders in coastal cities to participate in the development and application of a groundwater governance index.

Research problem / issue	Approach	Aim	Long term goal through systems transformation
Increasing water scarcity in Asia. Inadequate coordination among water users.	Quantitative assessment of inter-linkages among water users through modelling. Development of user friendly tools to guide decision making.	Guidance to optimise water use for multiple purposes. Raised awareness on nexus approach.	Greater water security through governance strengthening.

Sustainable wastewater management with a view to resource efficiency

This study reviews current policy coordination and governance within departments at national level and local/community practices with the aim of harmonising water quality, resource use efficiency and climate change mitigation policies. Wastewater treatment options will be inventoried and selection guidelines will be developed for different socio-economic settings. Decentralised treatment will be analysed through case studies.

Research problem / issue	Approach	Aim	Long term goal through systems transformation
Lack of knowledge & capacity on wastewater treatment technology, operation & management.	Create & share practical knowledge & good practices. Develop tools to estimate GHGs, & resource recovery & reuse potential.	Improved awareness on water pollution & quality issues. Increased information on policy, management & technical solutions.	Good governance of the water sector, especially in WEPA countries.
Poor water supply & sanitation.	Provide good practices & lessons learnt on domestic wastewater management. Develop & replicate "success stories" through pilot projects.	Strategies on water supply & sanitation adopted. Best practices shared & replicated.	Target 7B (MDGs): Halve by 2015, proportion of population without sustainable access to safe drinking water & basic sanitation.

Competition over water

Assessment of Climate-Induced Long-term Water Availability in Ganges Basin and Impacts on Energy Security in South Asia is a 2-year APN project that aims to project climate-induced, long-term water availability in the Ganges River Basin and assess the impacts on water and energy security in South Asia. The research includes i) projection of water supply under different climate change scenarios based on hydrological modelling using satellite as well as survey data at the river basin level, ii) estimation of water use intensity of available power generation technologies based on firm-level survey data in three countries, and iii) assessment of long-term energy supply scenarios under projected water supply constraints at river-basin level using bottom-up energy optimisation modelling.



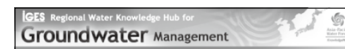
Community resource planning meeting, Viet Nam.

Knowledge sharing and networking

The Water Resources Management Team is the secretariat for both the Asia-Pacific Water Forum Knowledge Hub on Groundwater Management and the Water Environmental Partnership in Asia (WEPA). Regular communication is maintained with network participants including through E-mail-based news dissemination, knowledge dissemination through each network website and network publications, and holding of network meetings.

Research problem / issue	Approach	Aim	Long term goal through systems transformation
Increasing water stresses in Ganges river basin.	Model water supply under climate change scenarios, estimate water use intensity of power generation technologies, & assess long-term energy supply scenarios.	Inputs into formulation of national & regional integrated water-energy policies.	Increased water use efficiency in power generation & strategic inter-sectoral water allocation.

Selected outputs / links



● The Knowledge Hub for Groundwater Management (GW-KHub)
<http://www.iges.or.jp/en/natural-resource/groundwater/index.html>



● Water Environment Partnership in Asia (WEPA)
<http://www.wepa-db.net/>



Adaptation to climate change

Problem snapshot: By 2100, due to climate change and development patterns and without adaptation, hundreds of millions of people will be affected by coastal flooding and displaced due to land loss. The majority affected will be in East, Southeast, and South Asia. . . Climate change will cause declines in agricultural productivity in many subregions of Asia (IPCC WGII AR5, 2014).

- Our focuses:**
- Assessing climate change adaptation (CCA) effectiveness for monitoring and evaluation of adaptation interventions
 - Climate-smart development in rural and urban areas
 - Community-based approaches for fairness and equity in adaptation
 - Financial mechanisms such as risk insurance and microfinance
 - Training needs assessment and developing training modules
 - Public awareness activities and networking

Adaptation effectiveness indicators and vulnerability assessments

This project is funded by MOEJ through the Environment Research and Technology Development Fund and aims to develop a set of local adaptation effectiveness indicators for the

Gangetic basin. The study has identified adaptation effectiveness indicators through both top-down and bottom-up approaches and has employed multi-criteria analysis tools to map adaptation decisions by communities. The objective now is to operationalise the adaptation metrics. With funding from ADAPT-Asia, the Adaptation Team will also assist NABARD in developing a vulnerability assessment methodology for Adaptation Fund projects in India.



Research problem / issue	Approach	Aim	Long term goal through systems transformation
Lack of decision making frameworks for, and implementation barriers to, supporting community level adaptation.	Through consultative processes, develop adaptation effectiveness indicators.	Develop local adaptation index from indicators.	Effective adaptation support through prioritisation (ex-ante) and evaluation (ex-post) of adaptation actions.

Community risk insurance initiatives

The Adaptation Team is assessing community risk insurance initiatives and identifying enabling policy and institutional factors for maximising CCA and disaster risk reduction (DRR) benefits of risk insurance. The project works with national partners on community risk insurance initiatives in India, Japan, Malaysia, Philippines and Australia.

Research problem / issue	Approach	Aim	Long term goal through systems transformation
Communities unfamiliar with formal insurance. Costs too high to deliver insurance to most vulnerable groups.	Identify/quantify benefits of insurance for CCA, DRR & sustainable development. Through case studies, identify cost-effective approaches.	Affordable agricultural insurance products available to vulnerable groups.	Increased resilience of vulnerable groups to climate impacts on agriculture.

Microfinance, resilience and adaptive capacity

IGES and the Institute of Microfinance, Bangladesh are conducting the research project Building Resilience and Adaptive Capacity to Climate Change through Microfinance in Bangladesh. This research projects analyses how microfinance providers can ensure their products and services are contributing to household adaptive capacity, while maintaining their own financial sustainability.

Research problem / issue	Approach	Aim	Long term goal through systems transformation
Lack of integration of microfinance and CCA policies.	Empirical study to identify relationship between microfinance and adaptive capacity.	Best practice guidance for microfinance services to support CCA.	Households have necessary adaptive capacity to cope with climate extremes & slow onset events.



Household cattle fattening supported through microfinance, Savar Upazila, Bangladesh

Non-economic losses and damages associated with climate change

The IGES APN-funded project on non-economic losses and damages assesses case studies of recent extreme climate events in Bangladesh, India, Japan and the Philippines to consider how non-economic losses and damages can be incorporated into future planning.

Research problem / issue	Approach	Aim	Long term goal through systems transformation
Disaster impact assessment & planning inadequate, as non-economic damages ignored.	Develop rapid assessment methodology on non-economic damages.	Case studies demonstrating ways to measure non-economic damages and lessons for decision making.	Non-economic damages integrated into CCA & DRR planning & assessments.

DDR-CCA linkages

The linkage between DRR and CCA was a subject of intensive debate at the World Conference on Disaster Reduction (WCDR). The Asia Pacific Adaptation Network (APAN) is providing funding for IGES to research DRR-CCA linkages in existing policy and planning processes and ways to strengthen them.

Research problem / issue	Approach	Aim	Long term goal through systems transformation
Lack of shared understanding on synergies between DRR & CCA & ways/means to identify & strengthen them.	Cases studies of policy, planning & technology interventions.	Case studies showcasing synergies between DRR & CCA.	Enhanced DRR & CCA through improved understanding of synergies & how to strengthen them.

Capacity building

The aim of this project is to develop training modules on CCA for existing induction and in-service training programmes for agriculture and allied sectors. The project was initiated under APAN and has received further funding from the APN. Over four years, the project was able to conduct training needs assessment for various government functionaries in Bangladesh, Cambodia, Lao PDR, Mongolia and Nepal; convert these needs into structured training modules for induction and in-service training programmes; and conduct pilot training programmes for revising selected modules in all project countries.

Research problem / issue	Approach	Aim	Long term goal through systems transformation
Limited integration of CCA knowledge & skills in existing in-service & induction training programmes.	Conduct training needs assessments and develop structured training modules.	Training modules for agriculture departments of project countries.	Improved knowledge & skill levels of government officers on CCA.

Local government climate planning

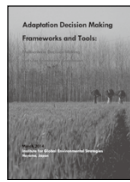
The Low-Carbon, Climate-Resilient Society project funded by the MoEJ aims to assist local governments in developing countries climate proof their land-use plans. Under the project, IGES is employing Geographic Information Systems, adaptation metrics, and economic analysis in collaboration with local governments and the University of the Philippines in the Silang-Santa Rosa River basin in the Philippines to contribute to strengthening local government land-use plans.

Research problem / issue	Approach	Aim	Long term goal through systems transformation
Ineffective use of resources due to lack of integration between CC mitigation & adaptation.	Modelling to improve knowledge on nexus issues. Development of local adaptation effectiveness indicators. Macro & micro economic analysis.	Support local governments at research site in the Philippines to develop CC plans.	Effective local government management of DRR and CCA.

Networks and public outreach

IGES serves as the Secretariat for the Asia Pacific Adaptation Network (APAN) (<http://www.apan-gan.net/>), and the Adaptation Team is facilitating collaboration between APAN and the Low Carbon Societies initiative (<http://lcs-rnet.org/>). The Team has also been commissioned to organise symposiums and side events in conjunction with relevant COP and IPCC meetings. These events target the general public and the media and aim to raise awareness and encourage discussion on adaptation issues by providing the latest information on climate science and policy.





● IGES Research Report No.2013-02: Adaptation Decision Making Frameworks And Tools: Multi-Criteria Decision Making Tools For Prioritizing Adaptation Actions At Community Level
<http://pub.iges.or.jp/modules/envirolib/view.php?docid=4969>



● Scaling Up Risk Financing In Asia And The Pacific Region: Bottom-Up Lessons From Agriculture Insurance In Malaysia, Philippines And Vietnam
<http://pub.iges.or.jp/modules/envirolib/view.php?docid=4553>



● Loss and Damage Associated with Climate Change Impacts and Adaptation: Stakeholder Perceptions for Shaping the Future Agenda of Asia Pacific Adaptation Network
<http://pub.iges.or.jp/modules/envirolib/view.php?docid=4949>



<http://www.apan-gan.net>

● Asia Pacific Adaptation Network (APAN)



Biodiversity and ecosystem services

Problem snapshot: The Asia-Pacific region has a greater number of species threatened with extinction than any other region, and for the period 2002-2009 almost 2,500 species in the region were recorded in the IUCN Red List as critically endangered, endangered or vulnerable.

Our focuses:

- Community resilience in production landscapes/seascapes
- Quantification of ecosystem services
- Mainstreaming biodiversity concerns in development projects and business strategies
- Governance of ecosystems use

Enhancing the resilience of socio-ecological landscapes

In many parts of the world, local communities have developed systems to utilise and manage their surrounding natural environment in ways to sustain and improve their daily lives. In hilly areas of Japan, these systems are collectively known as 'Satoyama'. In many countries, Satoyama-like systems are facing threats associated with rapid socio-economic changes. In support of the Satoyama Initiative, the Biodiversity and Ecosystems Services Team is conducting case study analysis to provide guidance on best practices, contributing to the development of a resilience indicators toolkit, managing the Satoyama Development Mechanism, which funds the development and replication of good practices, and organising international forums.

Research problem / issue	Approach	Aim	Long term goal through systems transformation
Rural communities unable to cope with sudden external drivers of social & economic change.	Develop & provide guidance on indicators to assess resilience of communities in landscapes/seascapes.	Indicators used effectively.	More resilient rural communities.



Community consultations, Nepal

Valuation of ecosystem services and natural capital

The Biodiversity and Ecosystem Services Team are participating in a project financed by the Mitsui Bussan Environment Fund that aims to develop and promote a Land Health Index (LHI). This index captures the importance, value, and state of biodiversity, and identifies actions that promote conservation.

Research problem / issue	Approach	Aim	Long term goal through systems transformation
Externalities drive the unsustainable use of ecosystems.	Quantify externalities.	Tested methodologies & values.	True values & costs incorporated in commodity prices & decision-making.

Forest sector governance standards

To guide and assess REDD+ readiness processes and projects, the Team, together with researchers from Griffith University and the University of Southern Queensland, is developing REDD+ quality-of-governance standards in Nepal and Papua New Guinea.

Research problem / issue	Approach	Aim	Long term goal through systems transformation
Poor governance undermining management of ecosystems.	Test methodology to develop governance standards for management & use of ecosystems.	National governance standard for forest ecosystems & REDD+ in Nepal.	Inclusive, transparent & consensus-based management of ecosystems & natural resources.



Business, development projects and biodiversity protection

The Team is consulting industry groups in Japan to develop guidance on setting and implementing clear business goals for biodiversity and ecosystem conservation. The Team is also conducting a review of approaches to biodiversity offsetting policy design and implementation in various countries.

Research problem / issue	Approach	Aim	Long term goal through systems transformation
Lack of clear measures & good practice examples on biodiversity & ecosystems conservation for business groups.	Review international best practices & develop guidance for business groups.	Major business groups in Japan set up clear goals for biodiversity & ecosystem conservation.	Japanese businesses are global leaders on environmental conservation.
Development is driving loss of habitats.	Develop guidance for offsetting habitat impacts through best practice.	Effective offset policy in Japan.	Both development & habitat conservation achieved.

Selected outputs / links



● IGES Discussion Paper No. FC-2012-02: Quality-of-Governance Standards for Carbon Emissions Trading. Developing REDD+ Governance through a Multi-Stage, Multi-Level and Multi-Stakeholder Approach
<http://pub.iges.or.jp/modules/envirolib/view.php?docid=4658>



● The International Partnership for the Satoyama Initiative (IPSI)
<http://satoyama-initiative.org/about/>



Synthesis study on integration of sectoral interests in natural resource management

This study involves review and analysis of policy, planning and administrative processes in selected countries to identify, categorise and assess the effectiveness of existing strategies to integrate sectoral interest in natural resource management and development. Landscape approaches, integrated natural resource management (INRM), integrated water resource management (IWRN), river basin management, transboundary management approaches, and integrated and participatory land use planning are being reviewed.

Research problem / issue	Approach	Aim	Long term goal through systems transformation
Narrow focus on sectoral interests leading to degradation of natural resources.	Assessment of existing approaches and new concepts for integrating sectoral interests.	Guidance on effective means to integrate sectoral interests.	Integrated management of natural resources in support of food, water and energy security.

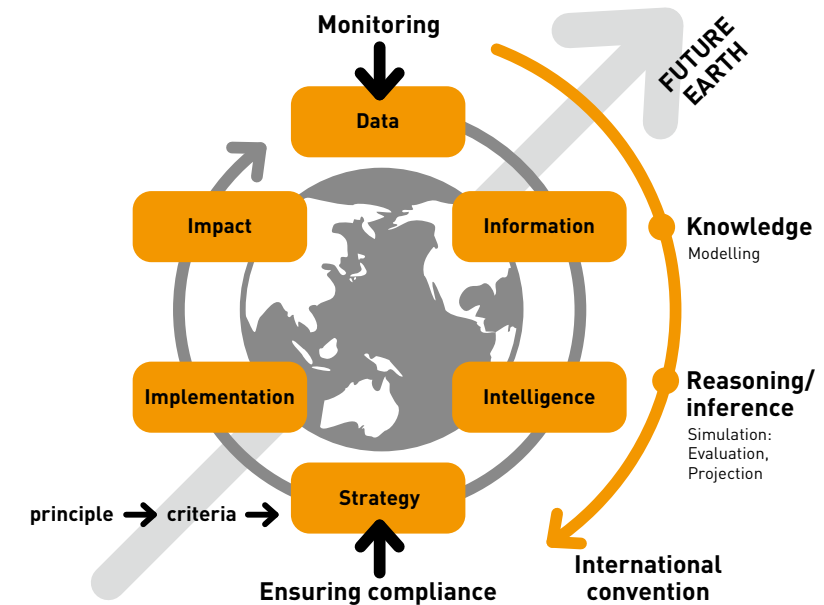
Integrating policy needs into space missions

This 3-year project is funded through the Japan Science and Technology Agency, and is being implemented by a research consortium including IGES, Tokyo Institute of Technology, Japan

Aerospace Exploration Agency (JAXA), Keio University, and National Institute of Informatics. The project aims to promote the development of a 'policy and Earth observation innovation cycle' to ensure policy needs are fully considered in the design of space missions.

Research problem / issue	Approach	Aim	Long term goal through systems transformation
Space missions indifferent to policy needs.	Develop & apply methodologies to assess contribution of Earth observation to environmental policy.	Guidance to incorporate monitoring of environmental contribution of Earth observation policy in Earth observation programmes.	Achieve global environmental objectives agreed in international conventions, e.g. on reducing air pollution

Policy and Earth Observation for Innovation Cycle





Design: weekend design laboratory

IGES Natural Resources and Ecosystem Services: Strategy and Activities-Ver.1.0 2014

The purpose of this booklet is to share information on the aims and activities of the Institute for Global Environmental Strategies (IGES) Natural Resources and Ecosystem Services Area. For further information:

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