



**climate &  
energy**

**policy &  
institutions**

**atmospheric  
environment**

**future  
sustainability**

**water resources &  
sanitation**

**risk, livelihoods &  
vulnerability**

Annual Report

**2006**

# Stockholm Environment Institute Annual Report 2006

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*SEI's mission is to support decision-making and induce change towards sustainable development around the world by providing integrative knowledge that bridges science and policy in the field of environment and development.*

[www.sei.se](http://www.sei.se)

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# Report from the Director and Board Chairman

**Johan Rockström**

**Executive Director**



**Lars Anell**

**Chair SEI board**



*The 1987 Brundtland Commission report sparked not only an intense pursuit of sustainable development but also the establishment of the Stockholm Environment Institute. Now, twenty years on, we may be approaching a new era of sustainable development. 2006 may prove to have been the year when human responsibility for climate change was finally accepted.*

The “hockey-stick” pattern of green-house gas emissions, with its exponential branch taking off some 50 years ago, applies to virtually all environmental sustainability indicators - decline in biodiversity, fish catches, rate of deforestation, land and water degradation. With increased observational evidence, the negative social and environmental impacts of human induced climate change are more severe than were anticipated. There is growing concern that impacts are hitting earlier and with larger amplitude, manifested through accelerated glacial melting, heat waves, extreme inundations, and declining rainfall in dry regions. These research warnings, serious as they are, still do not capture the full complex social-ecological reality as they tend to focus on thematic or disciplinary lines – climate, ecosystems, water, air, etc. Human and ecological resilience and vulnerability do not respect sectoral or disciplinary divides. Instead, inter- and transdisciplinary systems analyses are required to fully appreciate the complex relations between environment and development, sustainability and livelihoods. For example, there is a concern that social vulnerability, related to ecosystem degradation at the local community scale, will amplify the impacts of climate change, further threatening the livelihoods of poor people and, as a consequence, undermine the ability to reach the Millennium Development Goals.

The year 2006 was a year that turned a page for SEI as an institution. SEI received new strategic institutional support from the Ministry of Foreign Affairs through Sida, the Swedish International Development Cooperation Agency. The purpose is to further raise SEI’s capacity to be an agenda setter and to advance new and policy relevant knowledge on critical issues related to environment and development. It is also an opportunity to strengthen SEI’s outreach capacity, particularly in bridging research to policy. This support also clarifies SEI’s institutional profile, empha-

sizing SEI’s role as an independent research institute with an institutional relationship to Sida and other government agencies in Sweden.

A second major institutional development is the initiative by SEI, the International Beijer Institute on Ecological Economics at the Swedish Royal Academy of Science, and Stockholm University, to establish a world-leading research centre on sustainable governance and the management of social-ecological systems at Stockholm University. This new centre - the Stockholm Resilience Centre – has been established through a major research grant from Mistra, the Foundation for Strategic Environmental Research in Sweden. To establish the new centre we will relocate SEI headquarters to Stockholm University, and create a new inter-disciplinary platform on sustainability research in Sweden, with some 100 researchers from the outset and planned to grow to some 150 researchers over the coming five years. This will strengthen SEI, raising our profile in Sweden and internationally.

2006 was a year of institutional transition for SEI, but was also a year characterised by profound achievements across SEI’s six research programmes by our 125 staff at six research centres around the world, as reflected in this Annual Report. It is also a year of strengthened human resource capacity, with, for example, our two new deputy directors, Dr Li Lailai and Professor Katarina Eckerberg, taking office during the second half of 2006.

The strengthening of SEI’s research and institutional capacity has occurred simultaneously with a sea-change in the attention given to environmental issues in the media and policy debates, driven by evidence of climate change. True, this may prove to be just a seasonal aberration, but it may also be a prelude to a social tipping-point, where societies across the world realise the massive environmental challenges facing humanity and the major changes in governance and management required for a true transition towards sustainability. Providing knowledge to support this transition is at the heart of SEI’s mandate.

# SEI History and Structure

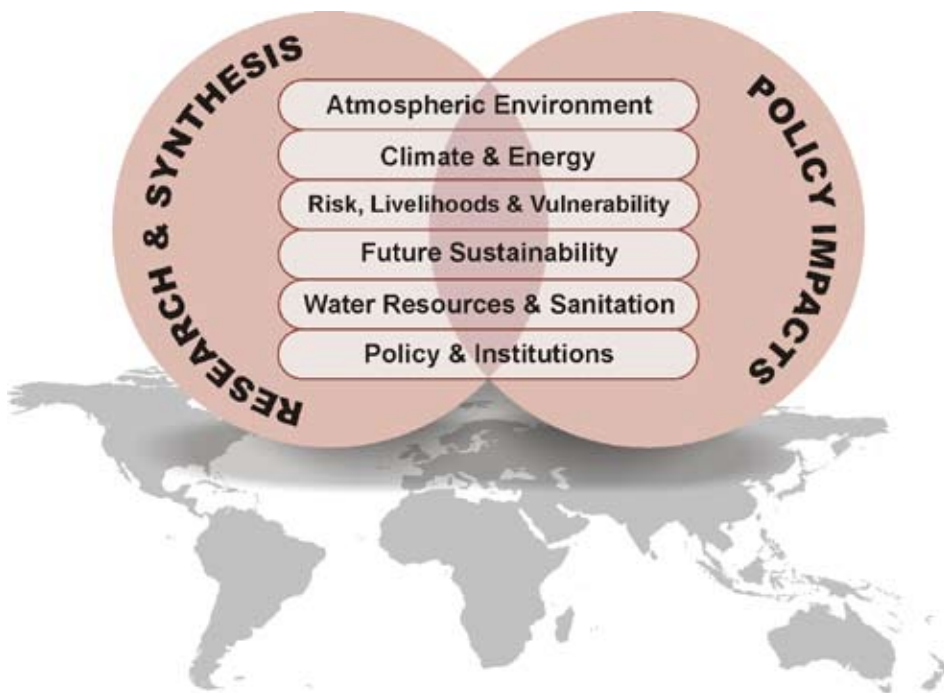
**The Stockholm Environment Institute (SEI)** was founded by the Swedish government in 1988 as a non-profit, independent and international research institute. SEI was established as a Swedish contribution to the advancement of policy relevant knowledge on transitions to sustainable development, following the Brundtland Commission report that lay the foundation for the UN Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992. SEI builds its legacy from the 1972 UN Stockholm Conference on Human Environment, from which it derives its name. SEI has been engaged since then in major environment and development issues, active at global, national and local levels to advance understanding on the role of the environment for development, and to clarify the requirements, strategies and policies needed for local, regional and global transitions to sustainability. It aims to bridge science and policy in the field of environment for development across the globe.

## SEI mission

Support decision-making and induce change towards sustainable development around the world by providing integrative knowledge that bridges science and policy in the field of environment and development. We achieve our mission by carrying out innovative, integrated and applied systems research, which forms the basis for policy advice, capacity building, decision support and policy implementation.

## A global research institute

SEI is a globally distributed institute with research centers and offices in Sweden, Estonia, Thailand, the United Kingdom and the United States, with an international board overseeing the strategic direction of the institute.



## A partnership Based Institute

SEI carries out its research and policy impact work in close partnership with stakeholders around the world. A key feature of SEI is its capacity to carry out participatory and demand driven applied research at community level linked to policy research from local to global scales.

## Research

**SEI seeks to be a leader** in advancing sustainability science aimed at understanding the development and policy implications of interactions between nature and society, and in providing policy relevant knowledge guiding transitions to more sustainable futures.

**Dedicated to Development** SEI research is focused on environment for development, linking ecosystem management with human wellbeing.

SEI has a strong commitment to development, with 60% of its research carried out in Africa, South and Southeast Asia and China.

**SEI is organized through the six research programmes** outlined in this report that are linked across our centres.

**SEI's approach to research** is to involve partners with local knowledge. SEI strives to develop alliances with knowledge institutions, civil society organizations and government institutions.

**SEI has attracted a world-class staff** of international environment and development professionals who work in multi-disciplinary teams tackling broad-based environment and development topics. This requires a mixture of broad and specialist knowledge.

### SEI Centres

- Stockholm (HQ), Sweden
- Bangkok, Thailand
- Oxford, UK
- Tallinn, Estonia
- Boston, US
- York, UK

### Capacity building

SEI's collaborative research approach is also aimed toward building **regional capacities** and strengthening partner institutions. Running through SEI programmes is an uncompromising commitment to high ethical standards for the conduct of research and the provision of policy advice.

**SEI capacity building** and training activities cover a wide array of topics. Some examples are:

- Training and application of LEAP (energy resources planning model) and WEAP (water resources

planning model) in over 100 countries around the world;

- Transfer of methodologies and analytical tools using GIS in various regions of the world;
- Training on Biodiversity and Sustainable Management of Forests;
- Training and seminars on Ecological Sanitation;
- Biotechnology and biosafety for researchers and decision makers in East Africa.

**SEI supports the academic community** through internships, masters and PhD supervision and international exchanges.

### Policy dialogues, policy support and communications

SEI bridges science to society through policy dialogues and policy support. SEI has an internationally recognized convening power, as a credible and independent platform to discuss complex and contentious environment and development challenges. SEI gives policy advice to governments and policy processes, e.g. to the UN Commission for Sustainable Development and the UNEP Global Environment Outlook process. Examples of policy processes where SEI is involved include:

- Environmental Sustainability and the Millennium Development Goals;
- Lead authors of the Intergovernmental Panel for Climate Change (IPCC);
- Sulphur and nitrogen protocols for Europe;
- Atmospheric pollution in South Asia and control of stratospheric ozone-depleting substances;
- Agro-biotechnology risk assessments feeding into the Convention on Biological Diversity;
- Renewable energy systems and rural electrification studies leading to regional development in sub-Saharan Africa.

*“...the communication of scientific knowledge and the use of different channels and methods for informing stakeholders is an integral part of SEI's mission...”*



While fossil fuels are still acting as an engine for today's economic growth, the threat of global climate disruption and the lack of basic energy services for billions of people in poverty calls for an energy transition to environmentally sustainable and equitably accessible energy services. We believe that policy and institutional innovations or changes can bring such services to the market. SEI Climate and Energy Programme (C&E) addresses these challenges in collaboration with global partners in Africa, Asia, Europe,

and Latin America at levels ranging from local village-scale activities, to regional initiatives, to national analyses, and up to global regimes.

### **Achievements in 2006**

2006 has been a very active year for the C&E Programme and there is only room to mention a selection of this year's activities. *Tiempo* (our global publication on climate change and developing country issues) enters its 10th year of publication, in our collaboration with IIED and University of East Anglia. *Tiempo's* southern perspective will be expanded to include regional publications in Francophone Africa, the Mekong region and the South Pacific. Under the umbrella programme entitled Information Dissemination on Energy and Environment in Developing Countries (IDE-EDC), the Renewable Energy

for Development newsletter concluded its 18th year of publication.

The programme of the Cane Resources Network for Southern Africa (CARENSA) ended in 2006, with the completion of a series of five reports on how this bioenergy resource can be harnessed in support of sustainable development in southern Africa. SEI was scientific coordinator for the four-year EC-funded thematic research network, which included 13 partners from 10 countries.

The EC funded ENABLE project is a testimony to the success of SEI's strong partnerships in Africa. A major outcome of the project is the elaboration and adoption of 14 policy recommendations by the East African Community Council of Ministers and Heads of State, relating to the design of a regional energy access work plan and investment programmes to support the achievement of the MDGs.



# Climate & Energy

SEI's work with CASES (Cost Assessment for Sustainable Energy Systems), aims to compile coherent and detailed estimates of both external and internal costs of energy production for different energy sources at the national level for the EU-25 Countries and some non-EU Countries under energy scenarios to 2030. We took part in the annual COP12 in Nairobi, where the publication of the Climate Atlas co-authored by Dr Thomas E. Downing, Director of SEI Oxford Centre was launched.

SEI continues developing, disseminating and supporting the world-wide application of LEAP, an energy planning tool for sustainable energy use ([www.energycommunity.org](http://www.energycommunity.org)). NAPAssess ([www.napassess.org](http://www.napassess.org)) is a new software tool, helping stakeholders to identify vulnerable populations and potential climate adaptation initiatives, and has been tested in the Yemen and Sudan. CRISTAL (Community-based

Risk Screening Tool - Adaptation & Livelihoods) is being developed in collaboration with IISD, IUCN and Intercooperation. As a climate risk screening tool, it provides a basis for improving community- and project-based decision-making in the face of climate change.

**LEAP** LEAP, the scenario-based energy-environment modeling tool developed by SEI is widely used in government agencies, research institutes and academia with over 2000 users in 146 countries to do long-range energy planning and climate mitigation assessment. The UN has recently announced that more than 85 countries have chosen to use LEAP to conduct their mitigation assessments as part of their commitment to report on climate change to the UNFCCC.

SEI is coordinating COMMEND (Community for ENergy environment & Development), the five year international collaborative effort with leading international institutions working on sustainable energy development.

SEI works with OLADE, the Latin American Energy Agency, to rebuild its capacity for energy planning and re-establish itself as an agency that can assist other institutions in the region with energy planning.

In Hydrogen in the Sahel, we studied the potential for countries in the Sahel, by virtue of their vast and underutilized solar and wind energy resources, to become a major global source of sustainably-produced hydrogen.

Through Carbon Financing and Expanding Energy Access for the Poor, SEI has been providing assistance to the Sustainable Energy Program of the UNDP to convene experts in rural development and carbon finance to examine the potential for carbon finance (such as the CDM) contributing to sustainable development by providing resources for expanding the access of poor communities to energy services.

*“...the threat of global climate disruption and the lack of basic energy services for billions of people in poverty calls for an energy transition to environmentally sustainable and equitably accessible energy services...”*



# Risk, Livelihoods & Vulnerability

SEI has been a pioneer in developing and applying risk analysis methods and approaches, from early studies of the sensitivity of ecosystems to acid precipitation, risk implications of alternative energy choices, hazards of regional air pollution, and the health and environmental risks associated with climate change. More significantly, SEI's risk work emphasizes the situation of highly vulnerable groups as well as ecosystems, bringing within its purview an understanding of the sources of vulnerability, especially poverty, institutional weaknesses, globalization, and marginality and discrimination.

The approach of the SEI Risk, Livelihood and Vulnerability Programme is consistent with the more general notion of sustainability science. Sustainability science seeks

to understand broadly, and in fundamental terms, the interactions between nature and society. This understanding encompasses the processes that link society and ecology in particular regions and places.

SEI seeks to be a leader in the development and applications of sustainability science to complex environmental and technological problems. Much of SEI's work is with scientists, policy makers, and the public in developing countries, aimed at sharing experience and collaborative analysis. The approach of the SEI Risk, Livelihood and Vulnerability Programme emphasises: sustainability science and the interactions between nature and society as embedded in dynamic, coupled socio-ecological systems; integration of different types of knowledge and the

development of collaborative projects involving scientists, practitioners, and civil society; the role of institutions and how people cope with uncertainties and competing values; transitions and the means to create more sustainable trajectories for regions and places; and place-based and field-oriented understanding of local vulnerabilities in the context of risk processes at regional to global scales.

## Achievements in 2006

Over the course of 2006, we identified four priorities within the Programme:

a. **Multiple stresses.** Scales and regional partnerships, addressing multiple stresses (rather than climate change on its own, for instance) based on enduring and productive partnerships at the regional to local



*"...SEI seeks to be a leader in the development and applications of sustainability science to complex environmental and technological problems..."*



scale. Examples are the work in South Africa and the High Risk Areas work in the Mekong Region. We encourage, and indeed rely on, groups who know the local area and issues, the contrasting perceptions of vulnerability and how these shape responses.

**b. Complexes and transitions.** The background to this includes syndromes and our contributions to the GEO assessment. We seek to characterise regions using a set of conditions and indicators to recognise patterns (what is locally specific, what is regional risk, etc.), document the transitions from one complex to another, and draw lessons that are transferable and thus help to identify the types of interventions that would be useful against the diverse conditions of vulnerability.

**c. Climate risk management.** This includes the establishment of the collabo-

rating programme with UNEP and technical assistance provided through UNDP, UNITAR, UNEP and other projects. We are developing an exciting platform for addressing adaptation as a process of social learning, including assessing roles and responsibilities in managing climate risk, exploring how risk changes over time and addressing complexity in policy formulation.

**d. Social learning.** Underpinning all of our work are concepts related to how information is shared, how learning occurs within the process of adaptation, who needs what information and in what form, the relationship between learning and change and how they can be facilitated, and the role of influence and power.

The suite of large projects include: Tsunami VCA; South Africa Multiple Stres-

### Participatory Video

*"I vote for PV!" said Dago Tshering, Field Coordinator for the Royal Society for the Protection of Nature in Bhutan. PV - Participatory Video - was developed by SEI-Oxford. The camera is handed over to a group or a community to make their own films, telling something they feel is important and would want to change.*

*Having participated in the PV training at the COP 12 meeting in Nairobi and filmed his impressions of the COP, Dago Tshering said, "I feel that PV is a great modern tool for spreading the message about climate change issues faced by the vulnerable communities to policy makers, government, donors and people all over the world since it is a picture telling you the true stories..."*

sors; High Risk Areas II in the Mekong; Coastal Hazards in SE Asia; Food Security in Southern Africa; UNEP Collaborating Centre/Programme; Global Environment Outlook GEO-4; and Vulnerability mapping and handbook of vulnerability assessment.





# Future Sustainability

The Future Sustainability Programme aims to explore the current state, future prospects and intervention strategies of socio-ecological systems at various spatial scales. With its emphasis on whole systems, integration and the future, it complements the thematic foci of SEI's other programmes and projects.

Since the mid-1990s, SEI has developed a series of global and regional scenarios that shed light on the scale of the sustainability challenge and helped assess various development pathways that could address this challenge. More recently, the Programme has been examining the issue of sustainable consumption and production, lifestyle and behavioural change.

## Global and regional scenarios

The global scenario research is seen as a valuable quantitative building block and a unifying theme for all of SEI's research programmes, including Climate and Energy, Atmospheric Environment, Water Resources and Sanitation, and Risks, Livelihoods and Vulnerability. The Programme developed the PoleStar software ([www.PoleStarProject.org](http://www.PoleStarProject.org)) and has undertaken a series of global sustainability assessments (Branch Points, Bending the Curve) and regional studies in the Baltic, West Africa, and Asia. The Programme has also provided the backdrop for the work of the Global Scenario Group ([www.gsg.org](http://www.gsg.org)) and the Great Transition Initiative ([www.GTInitiative.org](http://www.GTInitiative.org)). SEI, through the Global Scenarios Group, also provided the majority of the scenarios for UNEP's flagship publication, Global Environmental Outlook (GEO).

## Sustainable consumption and production

Sustainable consumption focuses on formulating equitable strategies that foster the highest quality of life, the efficient use of natural resources, and the effective satisfaction of human needs while simultaneously promoting equitable social development, economic competitiveness and technological innovation. An interdisciplinary approach has been taken to address the issue of sustainable consumption and production combining environmental and economic sciences. The scientific basis of this research has been environmental input-output analysis – including such hybrid techniques as economy-wide material flow analysis and ecological footprint analysis. The concepts and methodologies developed are applicable in different countries and at multiple scales, both for governmental policy makers and businesses.

## Lifestyle and behavioural change

Attitudinal and behavioural change is critical to achieving low carbon lifestyles and sustainable patterns of consumption. Day-to-day lifestyle choices have direct and indirect impacts on the environment. The greatest impact is due to the consumption associated with housing, food, energy and personal travel such as car use and aviation. Such activities result in the generation of waste and polluting emissions which are a major cause of environmental degradation and contribute to global climate change.

*“...SEI has developed a series of global and regional scenarios that shed light on the scale of the sustainability challenge...”*

SEI has undertaken research on communicating low carbon lifestyle choices aimed at fostering voluntary attitudinal and behavioural change. This has involved using participatory techniques to engage the public in discussion and debate and providing personalised information on the impact of their current lifestyle choices. We have been successfully collaborating with the media to communicate the issue to raise awareness and understanding of low carbon living.

### Future directions

The Programme will build upon the strong foundations laid by the earlier research on scenarios, sustainable consumption, lifestyle and behavioural change. It will further explore the link between modelling, attitudes and behavioural change. In terms of analytical approaches, the previous research has a strong basis in the input-output framework. However, the behavioural work is often rooted in a different framework, which emphasizes awareness, attitudes and behaviour. The Programme will address the issue of how to build a common vision and support a citizen's movement for sustainability and how to inform individuals and local communities who wish to act collectively.

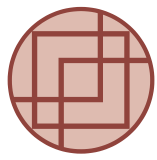
Future plans include the building of capability to apply sustainability modelling to time use analysis, supply chain analysis as well as hybrid life cycle and substance flow analysis. An ambitious goal is to develop a full multi-region input-output (MRIO) framework, which would allow for a robust, reliable and reproducible quantification and analysis of environmental, economic

and social impacts embedded in the international trade of goods and services. Finally, to complement the socio-economic analysis the Programme will in future examine ways of communicating lifestyle issues and supporting communities to achieve low carbon living.

### Achievements in 2006

- Training numerous policy decision makers to use REAP to assess the effectiveness of policy decisions. In 2006, over 100 policy makers were trained in the UK.
- Working closely with WWF, SEI published the "Counting Consumption" report. The report provides a much needed evidence base to better understand the important issues of Sustainable Consumption and Production. It provides a statistical and scientific basis for SCP strategies in the UK at national and regional levels. It shows the total global impact of UK consumption, not only by accounting for direct resource flows and emissions within the UK, but also by including the manufacture of imported products and materials.
- In 2006 SEI successfully gained funding from the UK government to undertake a communication project on climate change. The project is aimed at raising awareness of climate change issues, working in close collaboration with the BBC and Press to achieve sustained attitudinal and behavioural change.





# Policy & Institutions

**S**EI possesses a significant wealth of knowledge and experience in policy and institutional development across its programmes. The Policy & Institutions (P&I) Programme was set up in 2004 to deal systematically with the “policy end of the bridge” and how to develop institutional structures that enable policy decisions at various levels to move towards sustainable development both in the North and in the South.

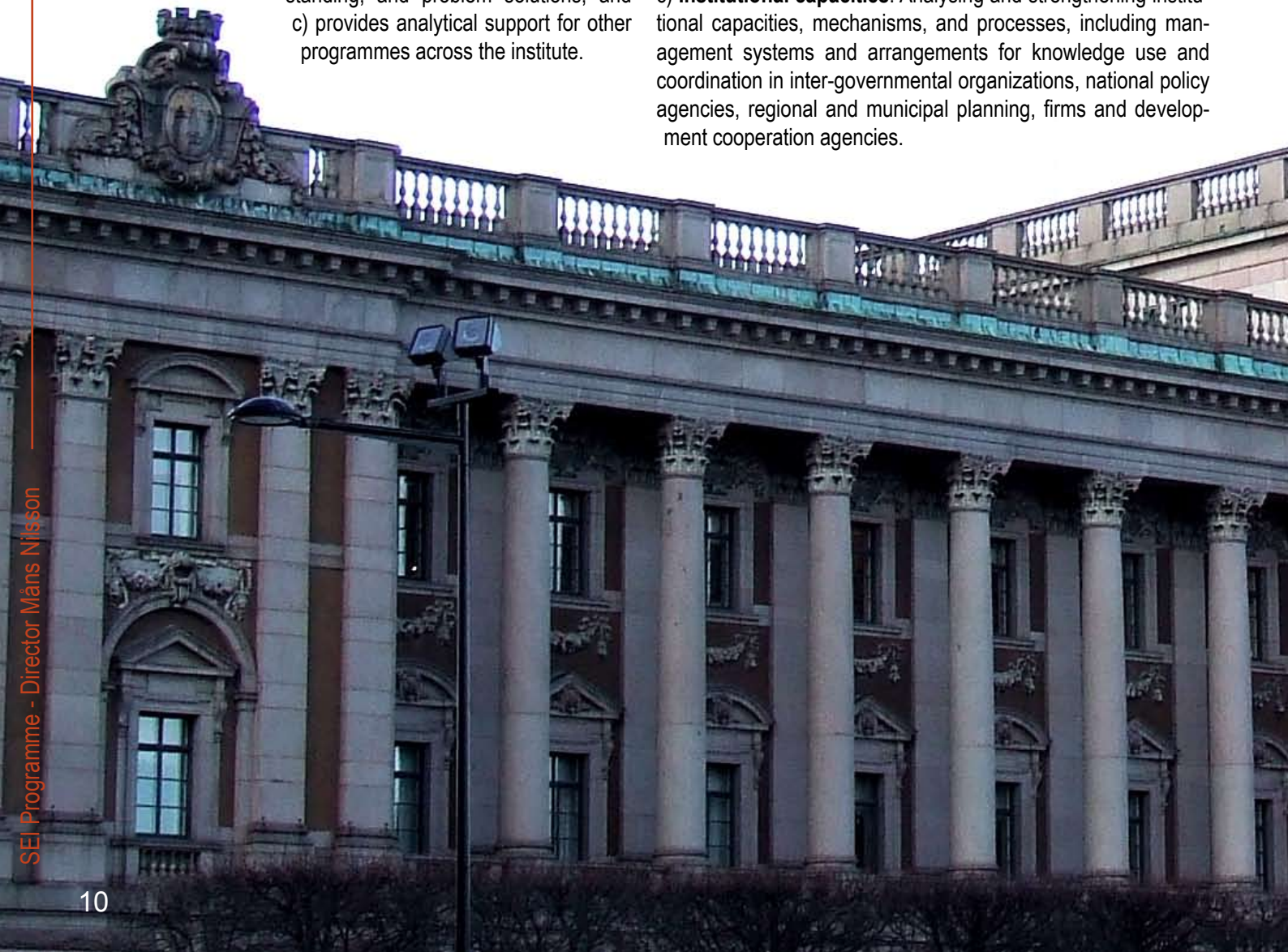
P&I’s mission is to contribute to institutions that enable effective integration of sustainability knowledge and values into mainstream decision-making processes. It is set up to be a learning node that: a) raises SEI’s profile as an international research partner on sustainability policy and institutions; b) works across SEI with synthesis as well as original research to establish generic analytical models, empirical understanding, and problem solutions; and c) provides analytical support for other programmes across the institute.

P&I research projects typically fall into one or several of the following three areas:

a) **Policy and planning.** Analysing how policy and planning decisions are made and how they may constrain or contribute to sustainability, e.g. studies of the process of policy instrument choice, regional planning processes, aid programme development and investment decisions.

b) **Integrated assessments.** Adapting analytical and deliberative methods and tools to facilitate integration of sustainable development in policy-making, such as scenario methodology, material flows and resource analysis, participatory methods, strategic assessments, and indicator systems.

c) **Institutional capacities.** Analysing and strengthening institutional capacities, mechanisms, and processes, including management systems and arrangements for knowledge use and coordination in inter-governmental organizations, national policy agencies, regional and municipal planning, firms and development cooperation agencies.



*“...P&I focuses on applied research that taps existing theories and associated methodologies and adapts them to real-world policy and institutional issues...”*

### **Achievements in 2006**

At the SEI Stockholm Centre, P&I finalized the work on Policy Integration for Sustainability, with a book released by Earthscan: “Environmental Policy Integration in Practice”. We also finalized the EC funded Sustainability ATEST project; reports and academic papers have been prepared, as well as a web-book for guidance on impact assessment tools. Work is continuing on integrated assessment together with partners around Europe through the MATISSE project. As an internal project, we have taken stock of experience gained during seven years of assisting developing countries in implementing the Montreal Protocol in the Swedish bilateral Ozone Layer Protection Programme. The lessons learned about implementation are summarized in a new

SEI report called “Multilateral environmental agreements on the ground”.

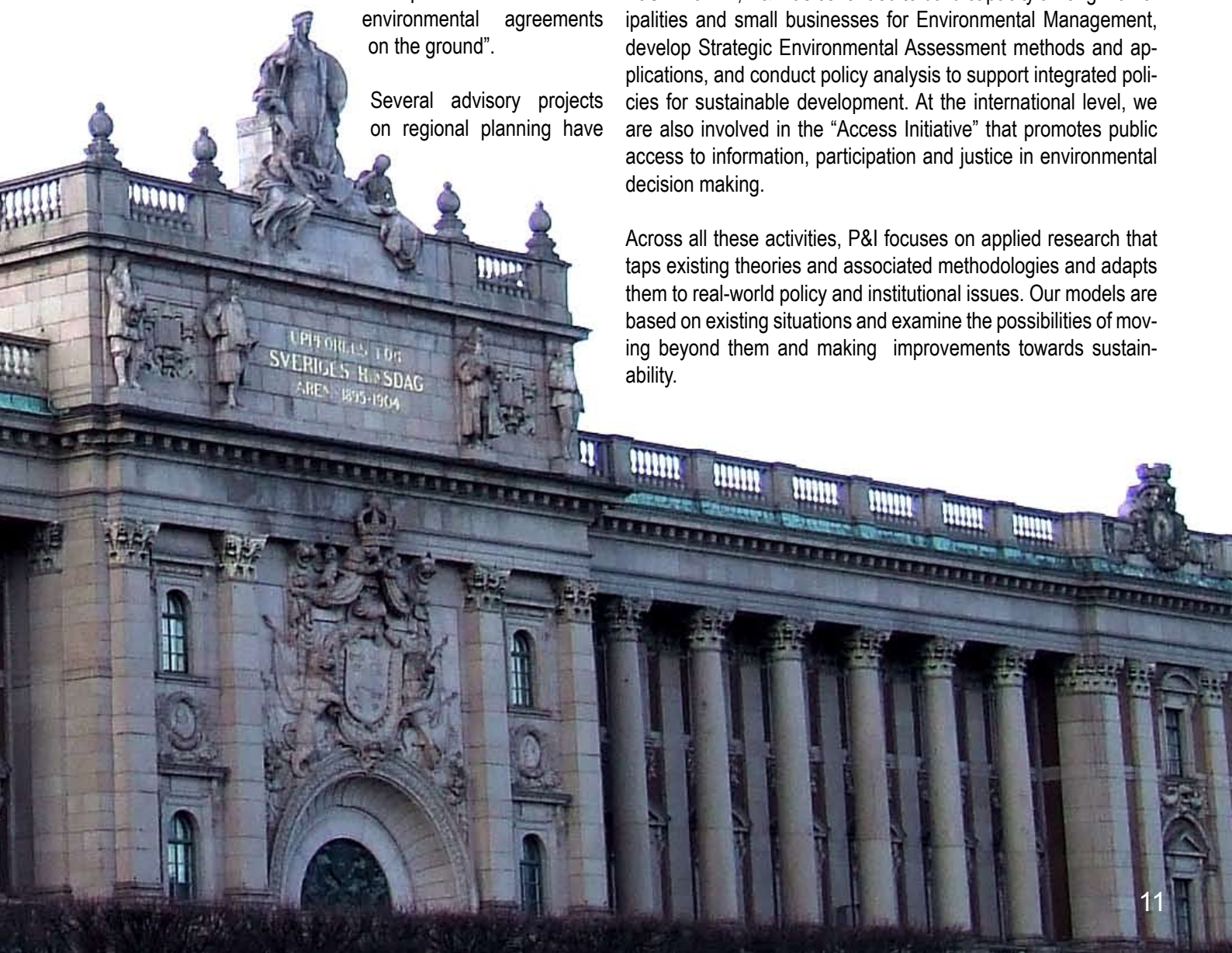
Several advisory projects on regional planning have

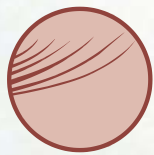
been concluded for the Stockholm Region Planning Agency. Out of the “Sustainable Transport Futures for Stockholm” project, in collaboration with KTH, a book has been prepared for publication during 2007.

At SEI’s York and Oxford offices, P&I has focussed on the interface between knowledge and policy and development of participatory approaches. We finished our contribution towards the new report “Stakeholder Engagement and the Work of SEI”. This report discusses the participation processes which form part of SEI’s mission across the world and places these in the context of wider participatory research.

At SEI-Tallinn, P&I has continued to build capacity among municipalities and small businesses for Environmental Management, develop Strategic Environmental Assessment methods and applications, and conduct policy analysis to support integrated policies for sustainable development. At the international level, we are also involved in the “Access Initiative” that promotes public access to information, participation and justice in environmental decision making.

Across all these activities, P&I focuses on applied research that taps existing theories and associated methodologies and adapts them to real-world policy and institutional issues. Our models are based on existing situations and examine the possibilities of moving beyond them and making improvements towards sustainability.





# Atmospheric Environment

The Atmospheric Environment Programme focuses on how atmospheric pollution in combination with other stresses, particularly climate change, affect people's lives in different parts of the world. A major goal is to contribute to effectively reducing air pollution impacts as part of a transition to sustainability. Programme activities focus on the developing countries of Asia and Africa, but there are also European-based projects and global approaches. Programme activities link scientific understanding to specific policy processes and range from assessing pollutant impacts on plants, through estimating the burden of air pollution on health, developing regional cooperation to solve air pollution and implementation of Multilateral Environmental Agreements. The work falls within the following inter-linked themes:

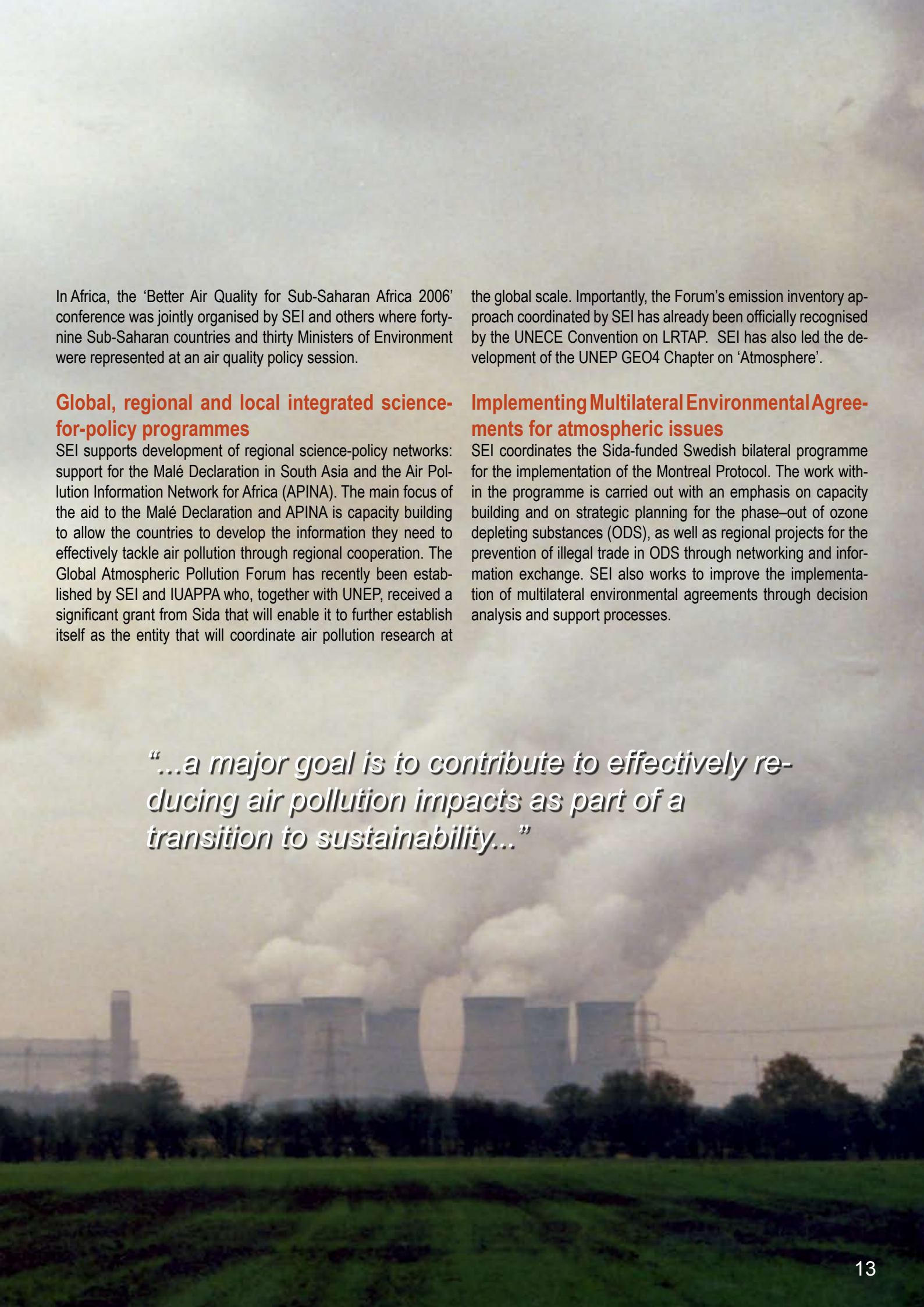
## Air pollution impacts on food production and ecosystem services

The programme assesses socio-economic impacts of elevated ground-level ozone on crop yield in Europe, Asia and Africa. SEI

models used in European assessments of crop yield loss scientifically underpin the UN ECE Convention on LRTAP. SEI is coordinating capacity building for biomonitoring and crop yield reduction risk assessments in South Asia and southern Africa. A global network on air pollution impacts on crops (APCEN) is being coordinated by SEI. There is also a focus on air pollutant impacts on regional-scale ecosystem biodiversity and function caused by acidification and nutrient enrichment. The combined impact of climate change and air pollution on these receptors is a current focus.

## Urban air quality and human health

This theme focuses on urban air quality management (AQM) in countries of Africa and Asia. This resulted in the publication of 'Urban Air Pollution in Asian Cities' in 2006 and the development of AQM training for the least developed Asian countries. CURB-AIR, which started in 2006, aims to improve air quality in Asian megacities while at the same time contributing to climate change mitigation, poverty alleviation and improving health conditions.



In Africa, the 'Better Air Quality for Sub-Saharan Africa 2006' conference was jointly organised by SEI and others where forty-nine Sub-Saharan countries and thirty Ministers of Environment were represented at an air quality policy session.

### **Global, regional and local integrated science-for-policy programmes**

SEI supports development of regional science-policy networks: support for the Malé Declaration in South Asia and the Air Pollution Information Network for Africa (APINA). The main focus of the aid to the Malé Declaration and APINA is capacity building to allow the countries to develop the information they need to effectively tackle air pollution through regional cooperation. The Global Atmospheric Pollution Forum has recently been established by SEI and IUAPPA who, together with UNEP, received a significant grant from Sida that will enable it to further establish itself as the entity that will coordinate air pollution research at

the global scale. Importantly, the Forum's emission inventory approach coordinated by SEI has already been officially recognised by the UNECE Convention on LRTAP. SEI has also led the development of the UNEP GEO4 Chapter on 'Atmosphere'.

### **Implementing Multilateral Environmental Agreements for atmospheric issues**

SEI coordinates the Sida-funded Swedish bilateral programme for the implementation of the Montreal Protocol. The work within the programme is carried out with an emphasis on capacity building and on strategic planning for the phase-out of ozone depleting substances (ODS), as well as regional projects for the prevention of illegal trade in ODS through networking and information exchange. SEI also works to improve the implementation of multilateral environmental agreements through decision analysis and support processes.

*"...a major goal is to contribute to effectively reducing air pollution impacts as part of a transition to sustainability..."*

**T**he Water Resources and Sanitation Programme focuses on sustainable solutions that will increase the contribution of water management to sustainable development, poverty reduction and economic growth. The programme is characterized by a high level of engagement in policy and governance processes and by collaborative and participatory approaches which seek to ensure local knowledge and values are mobilized and explicitly considered in regional and global policy processes. Our work falls within the following, inter-related, thematic areas:

### **Sustainable sanitation**

SEI has a long record of promoting alternative solutions to sanitation, including systems with or without water, to provide containment, treatment, and recycling of waste. We currently manage a programme on sustainable sanitation, with networking, capacity building and pilot projects in China, Africa, and Latin America.

### **The value of water**

One of SEI's newer areas of research is on the economics of water, including irrigation, water supply and sanitation, ecosystem, industrial and others. This research aims to more accurately value the returns on water sector investments, and to use the evidence as an advocacy tool to encourage increased investment in the sector.

### **Water and livelihoods**

Our work in this area focuses on understanding the role of water management in sustaining and diversifying livelihoods. The approach builds on livelihoods analysis to understand the role of water in all aspects of the lives and livelihoods of the poor, with a focus on rural areas.

### **Water and vulnerability**

The goal of this research is to reduce vulnerabilities and enhance the resilience of poor people and ecosystems impacted by water scarcity, floods, and other water-related shocks.

### **Balancing human and ecosystem needs**

SEI's research in this area focuses on the role of ecosystem goods and services with an emphasis on their potential in water and food security and in poverty reduction. It combines hydrological analysis, the assessment of resource management practices, policy and institutional analysis and the analysis of social and economic factors.

### **Urban water**

A new theme in the water programme is a focus on urban water and sanitation. The theme centres on community-level approaches, with a particular focus on low-income areas, urban water markets and peri-urban development.

The approach of SEI to all of these thematic areas is collaborative and cross-cutting. Hydrological analysis and modelling is combined with other areas of science such as environmental chemistry and with social science analysis into the economic, social, political and institutional processes that govern the management of water and sanitation. Across all areas, the underlying premise is that water and sanitation are not problems that limit sustainable development and poverty reduction: they are solutions to these challenges.





*“...the goal of this research is to reduce vulnerabilities and enhance the resilience of poor people...”*



## **Water Resources & Sanitation**

# The Sanitation Challenge

*Sanitation is really the last chapter in human development. Why is it that lack of access to private and public toilets has not become a larger political issue? Has the fact that at least 5000 children die each day due to diarrhoea caused by waterborne disease and that 1.3 billion people are parasitized due to exposure to contaminated food and water not yet created the political will?*

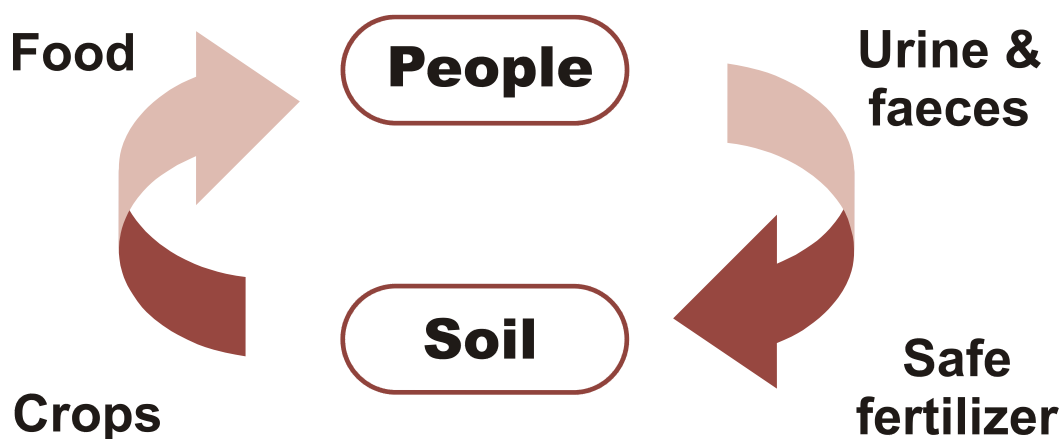
The Millennium Development Goal on sanitation is the largest of all MDGs and addresses the over 2.6 billion people in the world lacking basic sanitation services. The cost to meet the MDG on sanitation to 2015, according to the UNDP, is in the order of 10 billion USD per year or about 5 days of what the annual global military budget requires or about half what the rich countries spend on mineral water each year. So this challenge isn't really about money. It is a question of making this a public issue and it centers squarely on getting the taboo-ridden subject of human excreta "out of the closet" and into the legislatures. This question is one of children's rights, about access to clean, functional toilets in schools, and of providing people sanitation with some level of basic dignity.

## Situation today

The mindset most people have is centred on flush or hide (in pit latrines) and forget. And most humans know little about their own excreta, the quantities, content and what the health and environmental effects are if not properly managed. One person produces ca. 1.5 L urine per day that contains enough nutrients to produce a kilo of carbohydrate in the form of corn or wheat. One person produces only about 50 L of faeces per year. Most cities in developing countries cannot afford the costs of advanced waterborne sanitation systems. Yet little innovation has been seen to include more appropriate and affordable alternatives. The health and environmental costs of polluting surface and groundwater from leaky septic tanks, pit latrines and untreated sewage are also not well documented.

## Sustainable sanitation

New approaches to sanitation are needed to find more sustainable solutions that protect people's health and the environment, but that are also appealing and socially acceptable. This can involve decentralised systems with source separation of urine, faeces and greywater (from sinks, showers, laundry, etc.). It also can include the source separation of solid waste including kitchen organic wastes. The





latter are composted with faecal material to produce compost for soil improvement. The urine is added to growing plants and vegetables as a prime fertiliser source. The recent WHO guidelines from 2006 describe the methods prescribed to ensure proper handling and storage of faecal material.

### EcoSanRes programme

SEI has been involved in developing sustainable sanitation alternatives for urban and rural communities since 2001. The EcoSanRes Programme now in its second phase and funded by Sida is a long-term capacity-building and R&D programme that has initiated several projects in China, India, West Africa, East Africa, Southern Africa and Latin America. Training modules, research studies, guidelines on health and agricultural reuse, and full-scale pilot projects have been carried out. A network of regional nodes around the world is presently being developed in order to build capacity and provide opportunities for implementation.

**Further information:** [www.ecosanres.org](http://www.ecosanres.org)

*Closing the nutrient loop is a central approach to ecological sanitation. A range of different techniques can be used to achieve this goal (photos to the right):*

- Urine-diverting dry toilet used in the multi-story apartment buildings in Dongsheng, Inner Mongolia, China.
- Double vault urine diverting dry toilet (CREPA), Ouagadougou, Burkina Faso.
- Culturing of edible cactus using urine, Tepoztlan, Mexico (SARAR Transformacion SC).
- One day of urine from an adult provides enough fertiliser to grow a kilo of corn.
- Double vault urine diverting dry toilet in Guangxi Province, China.



# Building insights on the connection

*To deliver sustainability we depend on complex scientific as well as social-scientific knowledge being taken on board in policymaking processes. However, the impact that scientific knowledge has had on policy has been very mixed. Although there are success stories when it comes to global assessments, evidence of knowledge use in routine policymaking, at for instance EU and national levels, can be far less positive. What conditions provide for a more effective connection between knowledge and policy? What can really be expected in terms of science informing policy?*

**S**EI's Policy & Institutions Programme examines these questions in more detail at different levels in several research projects. In the European consortium MATISSE (Methods and Tools for Integrated Sustainability Assessment) we examine the real uses of policy appraisal in Europe to inform the advancement of assessment methodology from a user perspective. In the Swedish-based project PIntS (Policy Integration for Sustainability) we

study the role of knowledge for integrating environmental concerns into sectoral policymaking at the national level. In the UK-funded DISTILLATE (Design and Implementation Support Tools for Integrated Local Land use, Transport and the Environment) project we are looking at the way in which sustainable urban transport strategies are developed and delivered at the local level, focusing upon knowledge barriers to the delivery of sustainable strategies; and collaborations between agencies, organisations and individuals responsible for transport strategy development.

Our research shows that there is a strikingly large gap between how knowledge is intended to be used by its providers – as neutral and rational input to improve the overall decision basis – and the way it is actually used, which is often as “strategic ammunition”, to defend pre-established positions, to render suspicious your opponents or to claim legislative turf. Very rarely does the knowledge provided play an instrumental role that helps improve decisions from a sustainability point of view. As students of policy we must first recognise that different actors have many reasons for engaging with knowledge or ‘evidence’ to inform policymaking. The policy process is often messier and much more incremental than the official rational model of policymaking has us believe.



# ***between knowledge and policy***

There is a deeply engrained scepticism amongst policy officials towards formal knowledge: it is seen by many as being inferior to judgements based on expertise and experience - including their own. There is a widespread unfamiliarity with knowledge-generating tools and their uses and scepticism about their ability to handle value-based judgements. Adding to this, organisational cultures act as barriers. In spite of relatively far-reaching inter-departmental coordination procedures, there are also strong elements of "silo" cultures and overall there is a lot more incentive to take new initiatives than to carefully analyse and re-evaluate existing ones. Today, gathering evidence and coordinating with other agencies are often junior undertakings in the bureaucracy.

Although most countries in the world are supportive of sustainable development in a very broad sense, high level support for using assessment to deliver sustainability remains weak. The dominant policy paradigm is one of markets, jobs and competitiveness, and not sustainable development, and assessments are often set up to fit this agenda.

To introduce a more effective and creative relationship between knowledge and policy really requires a new culture of public administration and policymaking. Integrated

policy appraisals must be seen as a key strategic activity in public office, and one which is supported by senior officers. There need to be clear signals from top management, as well as incentive structures signalling that open and critical thinking about policy is actively encouraged and supported.

The term 'evidence-based policy' has come to mean using primarily hard evaluations of past policies to revise and revisit policy decisions. From SEI's horizon we will continue the exploration of methodologies for evidence-informed policymaking, using new social and natural sciences (including decision support tools such as participatory processes, models and scenarios) to provide knowledge to policymakers. The SEI-core funded STEP (Shift Towards Evidence-informed Policy) scoping study is examining the epistemological basis of this and investigating the prospects for underpinning decision making for sustainability with socially robust but also reliable knowledge.

**Read more:**

*MATISSE Work Package 2 at [www.matisse-project.net](http://www.matisse-project.net)*

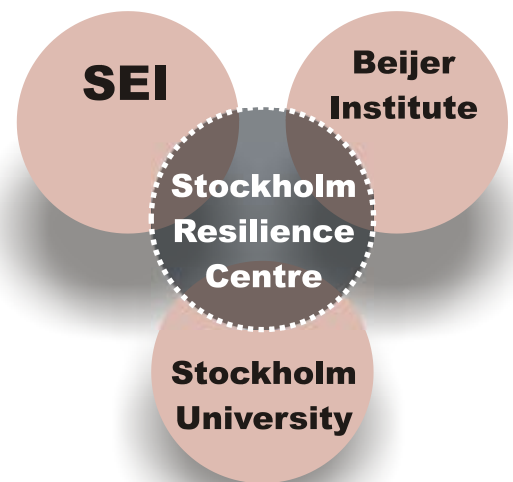
*Environmental Policy Integration in Practice at [www.earthscan.co.uk](http://www.earthscan.co.uk)*

*DISTILLATE Project D Reports at <http://www.distillate.ac.uk/reports/reports.php>*

*Contact: Måns Nilsson or John Forrester.*



# The Stockholm Resilience Centre



*SEI, together with Stockholm University and the Beijer International Institute of Ecological Economics have established, a new international research centre for governance of social-ecological systems. Funded from a major long-term research grant from Mistra, the Centre aims to become a world-leader in inter-disciplinary research and policy support with regard to sustainable governance and management of social-ecological systems.*

## The research challenge

*Humankind faces an unprecedented challenge to change the course of world development towards sustainable trajectories. Many terrestrial and marine systems have shifted into less productive states in their capacity to generate ecosystem services to society. At the same time human societies and globally interconnected economies rely on ecosystem services and support, while the institutional capacities to manage the earth's ecosystems are evolving more slowly than humanity's [over]use of the same systems. (Millennium Ecosystem Assessment, 2005).*

**W**e are at a cross-roads where drastic changes in governance and management are needed over the next generation. We need approaches to governance and management of ecosystem dynamics from local to global scales, and new principles for resource and environmental economics with far reaching implications for welfare theory.

***Increasingly, we realize that systems that in the past we thought behaved in a linear and predictable manner are, in fact, characterized by non-linearity, uncertainty, and are prone to sudden surprise and regime shifts, for example the Baltic, the Sahel region in West Africa and recently, New Orleans.***

The future challenges require that ***we truly integrate natural sciences, social sciences and humanities and expand the analyses into broad spatial (local to global) and temporal (historic trajectories to future scenarios) scales.***

## Establishing a joint research centre

In response to this challenge, together with Stockholm University and the International Beijer Institute for Ecological Economics at the Swedish Royal Academy of Science, SEI is establishing a new international research centre, the Stockholm Resilience Centre, on research for governance of social-ecological systems. The new Centre (starting from 1st January 2007) is supported by a major grant from the Swedish foundation for strategic environmental research, Mistra, and will be located at Stockholm University.

## The research agenda

The Centre will advance inter- and transdisciplinary research, integrating natural and social sciences with research on ecosystem services, social and ecological resilience, vulnerability and adaptive governance and management. Core features of the research will be to approach governance and management of relations between humans and nature, as:

- inter-linked social-ecological systems;
- complex systems characterised by non-linearities, abrupt change and uncertainties;
- systems interacting across scales, from local to global, and over time, from history, to present and future (scenarios);
- systems operating in a world in transition, where governance and management need capacity to deal with change and surprise.

The research will be problem-based with high policy relevance, include both place-based research and cross-scale links to the global scale, and cover both theoretical and applied research, including participatory action research.

### **SEI in new offices – a new strong environment for sustainability research**

SEI will co-locate its headquarters and Stockholm centre with the new Stockholm Resilience Centre. Together with the staff from the Centre for Trans-disciplinary Environmental Research (CTM) at Stockholm University and parts of the Beijer Institute, SEI will move into a new building at Stockholm University from the end of February 2007.

### **Organisation and leadership**

The Stockholm Resilience Centre will be a part of Stockholm University, formally placed directly under the Vice-chancellor as a cross-faculty

research centre. It will be jointly governed, with equal influence on strategic decisions between Stockholm University, SEI and the Royal Academy of Sciences. The centre will have an international board governing its strategic direction.

The Centre will have a joint leadership, shared between Johan Rockström (Director of the new Centre) and Carl Folke (Science Director). Johan Rockström will continue as Executive Director of SEI on 50 % time. From Stockholm University, two existing entities - CTM and the Baltic NEST Institute (BNI) - will be integrated with the Resilience Centre.

### **Research approach and communications**

The Resilience Centre will establish a dynamic research environment aimed at top-quality research where problem solving rather than academic discipline guides the thematic structure. Bridging science to policy will be a core objective of the centre where the strategy is to pool resources at SEI, the Beijer Institute and the CTM, to build a strong joint communications platform. It is thus a broad joint platform we are creating where the whole is more than the sum of the parts. This will enable SEI to contribute even further to substantially advancing the generation of new theories and methods in the forefront of interdisciplinary work for sustainability.

### **Vision and mission of the Stockholm Resilience Centre**

*A world where social-ecological systems are understood, governed and managed, to enhance human well-being and the capacity to deal with complexity and change, for the sustainable co-evolution of human civilizations with the biosphere.*

*High-quality research, science to policy bridging, and communications as the core strategies.*

*The understanding of complex social-ecological systems, and the generation of new and elaborated insights and means for the development of management and governance practices,*

- *through world leading inter- and transdisciplinary research that integrates social science, the humanities and natural sciences*
- *by fostering an international arena for science to policy dialogue, and*
- *through strategic communication for improved policy and decision support, which secures ecosystem services for human wellbeing and builds resilience for long-term sustainability.*

# Poverty Reduction and Water Management

The management of water resources is a key challenge in the global battle to reduce poverty. The potential role of water in poverty reduction is well recognised in some areas, such as improved water supply, but less known in others and we have only recently seen the emergence of an integrated approach to understanding the links between poverty reduction and water management. SEI has taken the lead in developing international approaches to the analysis of these links through the production of some key papers for leading international institutions. The latest of these, the PEP paper on Poverty Reduction and Water Management, provides a framework that looks at water's potential contribution to all of the MDGs, not just those that refer explicitly to water. The basic contention is that water management is a good investment: not only can it contribute to poverty reduction, but it can do so in ways that are affordable and, in many cases, generate wealth. This potential is often not understood: the political prominence of water issues is all too often not translated into investment priorities by governments, donors or the private sector.

The paper builds on the conceptual framework developed in earlier PEP papers through the analysis of the contribution of different aspects of water management to four key dimensions of poverty reduction:

**Enhanced livelihoods security:** the ability of poor people to use their assets and

capabilities to make a living in conditions of greater security and sustainability. Water is both a key input to many types of livelihood activity and a determinant of the health and productivity of ecosystems on which the poor depend.

**Reduced health risks:** the mitigation of environmental and social determinants that put the poor and most vulnerable (especially women and children) at risk from different diseases, disabilities, poor nutrition and premature death. Providing access to safe and sufficient water and improved sanitation is the most effective way to improve health, and also provides substantial economic benefits to both individuals and nations.

**Reduced vulnerability:** the reduction of threats from environmental, economic and political hazards, including sudden impact shocks and long-term trends. Water-related disasters such as droughts, floods and major storms undermine de-

velopment and destroy livelihoods, often throwing people into poverty. Actions to both reduce these risks and increase the resilience of the poor and of ecosystems should be an integral part of any poverty reduction strategy.

**Pro-poor economic growth:** enhanced economic growth is essential for poverty reduction in most parts of the world, but





*“...water management is a good investment: not only can it contribute to poverty reduction, but it can do so in ways that are affordable and, in many cases, generate wealth...”*

the quality of growth, and in particular the extent to which it creates new opportunities for the poor, also matter. Water management can be a catalyst for such growth, for both small local entrepreneurs who service local needs and large-scale infrastructure investments that, if done right, can transform the economies of whole regions.

on poverty (and, consequently, on health) and are beneficial in social, environmental and economic terms.

Investing in water (and sanitation) is an economically sound decision, whether in large-scale infrastructure or in small local developments. Investments can generate rapid returns that make them competitive with investments in other sectors and are

of structural and non-structural measures that includes social, environmental and health safeguards.

**Finding the finance:** innovations in financing the water sector are essential if the potential of water in poverty reduction is to be realised. This includes both increased financial flows from the international community and, more importantly, actions to enhance levels of internal capital generation in developing countries, including from the private sector and the poor themselves.

**Achieving the sanitation targets:** for many countries there is little prospect of reaching the sanitation MDG without major changes in their approach and allocation of resources. Innovations in technical choices, financial mechanisms, information and awareness raising and institutional responsibilities are needed if this challenge is to be met.

Water management needs to be linked to wider poverty reduction processes at national and local levels: this is the key approach to integrated water resources management, and part of a wider process of poverty reduction and sustainable development. Water management can impact on poverty reduction in a variety of ways, and increased resource flows to water management have positive impacts

beneficial in wider development terms, tackling fundamental causes of poverty. The potential of encouraging local entrepreneurs in particular needs to be explored.

**Getting infrastructure right:** substantial new investments in water control infrastructure are needed, including major water control structures to increase storage capacity and regulate water flows, but these need to be part of a package

Taken together, these areas of action have the potential to ensure that the potential of water as a key factor in poverty reduction becomes a reality. Ensuring that this happens needs good analysis and strong evidence to demonstrate to policy makers that investments in water are a good idea. It also needs an active engagement in the policy process, both internationally and in individual countries, so as to ensure that the evidence and analysis is understood by policy makers and that actions follow the analysis.



## Selected Publications

A small selection from the more than 150 books and papers published by SEI staff in 2006

**Ashmore, M.R., Toet, S., Emberson, L.D.,** *Ozone – a significant threat to future world food production?* *New Phytologist* 170, 201-204.

**Brody, J., Aschengrau, A., McKelvey, W., Swartz, C., Kennedy, T., and Rudel R.,** *Breast cancer risk and drinking water contaminated by wastewater: a case control study.* *Environmental Health*, 5(28).

**Dougherty, W., Bailie, A., Kartha, S., Lazarus, M., Rajan, C., and Runkle, B.,** *Hydrogen Transitions in a Greenhouse Gas Constrained World.* A study for the National Renewable Energy Laboratory, Volumes I, II, III, and IV.

**Dow, R.E. Kasperson, and Bohn, M.,** *Exploring the Social Justice Implications of Adaptation and Vulnerability.* pp. 79-96 in Adger, W.N. et al., eds. *Fairness in Adaptation to Climate Change.* Cambridge, MA: MIT Press.

**Forrester, J., Gerger Swartling, Å., Lonsdale, K., Forslund, H., Lindskog, E., Miller, F., Snell, C.,** *Stakeholder Engagement and the work of SEI.* SEI, Stockholm.

**Heinemeyer, A., Ineson, P., Ostle N., and Fitter A.H.,** *Respiration of the external mycelium in the arbuscular mycorrhizal symbiosis shows strong dependence on recent photosynthates and acclimation to temperature.* *New Phytologist* 171: 159-170.

**Johnson, F. X., and Matsika, E.,** *Bio-energy Trade and Regional Development: the case of bio-ethanol in southern Africa,* *Energy for Sustainable Development.* March, Vol. X, No. 1.

**Johnson, F. X.,- and Rosillo-Calle, F.,** *Biomass, Sustainable Livelihoods, and International Trade.* SEI Climate and Energy Report 2006-02, Stockholm Environment Institute: Stockholm, Sweden.

**Kartha S., Lazarus M., LeFranc, M.,** *Market Penetration Metrics: Tools for Additionality Assessment?* In: *Climate Policy*, 5(2), pp.147-165.

**Kartha, S.,** *Bioenergy and Agriculture: Promises and Challenges ?* *Environmental Effects of Bioenergy*, Focus 14, Brief 4, International Food Policy Research Institute.

**Klein, R.J.T., Alam, M., Burton, I., Dougherty, W., Ebi, K.L., Fernandes, M., Huber-Lee, A., Rahman, A.A., Swartz, C.,** *Applications of Environmentally Sound Technologies for Adaptation to Climate Change.* Technical Paper for the UNFCCC Secretariat.

**Marsden, G., Kelly, C., and Snell, C.,** *'Selecting indicators for strategic performance management'.* In *Transportation Research Record* Vol.156, pp21-29.

**Miller, F., Thomalla, F., and Chadwick M.,** *Approaches for Assessing Disaster Vulnerability and Building Sustainable Livelihoods: Insights from Sri Lanka one Year after the Tsunami.* *Proceedings of the International Conference on Adaptation to Climate Variability and Change*, India Habitat Centre, New Delhi, India, 5-7 January 2006.

**Miller, F., with contributions from Thomalla, F., Downing, T.E., and Chadwick, M.,** *Resilient Ecosystems, Healthy Communities: Human Health and Sustainable Ecosystems after the Tsunami.* *Oceanography*, 19, 2.

**Nilsson, M.,** *The role of assessments and institutions for policy learning: a study on Swedish climate and nuclear policy formation.* *Policy Sciences*, 38, 225-249.

**Persson, Å.,** *Characterizing the policy instrument mixes for municipal waste in Sweden and England.* *European Environment* 16(4): pp 213-231.

**Phoenix, G.K., Hicks, W.K., Cinderby, S., Kuylenstierna, J.C.I., Stock, W.D., Dentener, F.J., Giller, K.E., Austin, A.T., Lefroy, R.D.B., Gimeno, B.S., Ashmore, M.R., Ineson, P.,** *Atmospheric nitrogen deposition in world biodiversity hotspots: the need for a greater global perspective in assessing N deposition impacts.* *Global Change Biology* 12, 1-7.

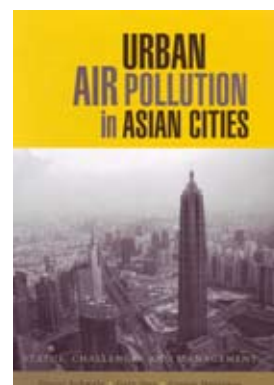
### Urban Air Pollution in Asian Cities: Status Challenge and Management

Schwela, D., Haq, G., Huizenga, C., Han, W., Fabian, H., and Ajero, M.

- Hundreds of millions of city dwellers breathe air so polluted with chemicals, smoke and particles that it dramatically exceeds World Health Organization limits with major impacts on health and the environment;
- The most authoritative assessment of air pollution and urban air quality management, practice and capability, covering 20 major Asian cities with easy-to-read city profiles, tables and graphs;
- Presents the latest strategies for managing and improving urban air quality in cities in Asia and across our rapidly urbanizing world.

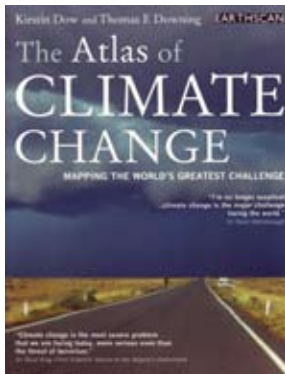
This volume is the most current and comprehensive assessment and comparison of the status and drivers of urban air pollution in 20 Asian cities and the Asian region, covering the effects on the environment, human health, agriculture and cultural heritage and the future implications for planning, transport and energy industries. National and local governments have begun to develop air quality management strategies to address the deterioration in urban air quality, however the scope and effectiveness of such strategies varies widely.

This book benchmarks these air quality management strategies, looks at successes and failures in these cities and presents strategies for improving air quality management in cities across Asia and the rest of our rapidly urbanizing world.



## The Atlas of Climate Change: Mapping the World's Greatest Challenge

Dow, K., and Downing, T.E.



Today's headlines and recent events reflect the seriousness of climate change. Heatwaves, droughts and flooding are driving people from their homes, destroying livelihoods and causing death among vulnerable populations. Rigorous in its science and insightful in its message, this atlas examines the possible impact of climate change on our ability to feed the world's people, avoid water shortages, conserve biodiversity, improve health, and preserve cities and cultural treasures. It also reviews historical contributions to greenhouse gas levels, progress in meeting Kyoto commitments and local efforts to meet the challenge of climate change. The atlas covers a wide range of topics, including warning signals, future scenarios, vulnerable populations, health impacts, renewable energy and emissions reduction. With more than 50 full colour maps and graphics, this is an essential resource for policy-makers, environmentalists, students and everyone concerned with this pressing subject.

**Soussan, J., and Chadwick, M.,** *Asia Waterwatch 2015 - Are Countries in Asia on Track to Meet Target 10 of the Millennium Development Goals? ADB/WHO/UNDP, Manila.*

**Thomalla, F., Downing, T., Spanger-Siegrfried, E., Han, G., Rockstrom, J.,** *Reducing hazard vulnerability: towards a common approach between disaster risk reduction and climate adaptation.* In: *Disasters*, Volume vol. 30, No. no. 1 pp 39-48.

**Todd, D., Soussan, J., and Risby, L.,** *Local Benefits in Global Environmental Programmes.* Global Environment Facility, Washington D.C.

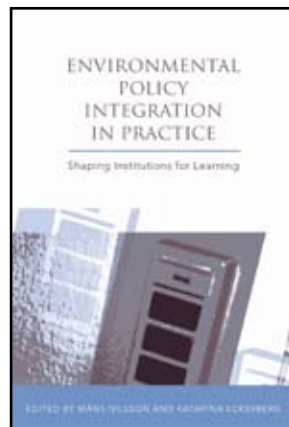
**Tol, R.J.S., Bohn, M., Downing, T.E., Guillerminet, M-L., Hizsnyik, E., Kaspersen, R., Lonsdale, K., Mays, C., Nicholls, R.J., Olsthoorn, A.A., Pfeife, G., Poumadere, M., Toth, F.L., Vafeidis, A.T., van der Werff P.E., and Yetkiner, I.H.,** *Adaptation to five metres of sea level rise.* *Journal of Risk Research*, Vol 9 No 467-482, July 2006.

**Vallack, H. W., and Rypdal, K.,** *The Global Atmospheric Pollution Forum Air Pollutant Emissions Inventory Manual.* Stockholm Environment Institute at York, University of York, York, UK.

**van Tienhoven, M., Zunckel, M., Emberson, L., Koosailee, A., Otter, L.,** *Preliminary assessment of risk of ozone impacts to maize (Zea mays) in southern Africa.* *Environmental Pollution* 140 (2), 220-230.

## Environmental Policy Integration in Practice: Shaping Institutions for Learning

Nilsson, M and Eckerberg, K. (Eds)



'Environmental policy integration (EPI) is a vital ingredient of the sustainability equation and an important policy principle in its own right, but there are precious few detailed analyses of the extent to which it has been translated into concrete change on the ground within member states of the European Union. This very timely and engagingly written book helps to plug a yawning gap in the existing literature by addressing the puzzle of why EPI has proved so difficult to implement even in a country like Sweden, which has traditionally championed very high environmental standards.' Dr Andrew Jordan, Philip Leverhume prize fellow, University of East Anglia, Norwich, UK.

'This excellent work provides detailed results from a leading-edge Swedish project on EPI. The study focuses on how environmental concerns are being integrated into the energy and agricultural sectors in Sweden, and offers insightful analyses of both theoretical and practical importance. This is strategic

policy research for sustainable development at its very Swedish best.' William M. Lafferty, Project Director of ProSus at the University of Oslo and Professor of Strategic Research for Sustainable Development at CSTM, University of Twente, the Netherlands.

Environmental values and concerns are meant to be reflected through environmental policy, which is then integrated into mainstream economic and social policy that serves to govern society and the economy in different sectors. Yet effective environmental policy integration has proven to be very difficult in actual practice and it remains largely an elusive aspiration.

This groundbreaking volume presents the first ever detailed examination of EPI at the national policy level, focusing on the key sectors of energy and agriculture within Sweden, a country that is widely recognized as a front runner in environmental management in Europe and world-wide. In doing so, the authors unpack EPI, look at what it means in policy formation and examine how environmental priorities are treated in relation to other political priorities. The final section of the book lays out the major findings and presents key lessons for international application including institutional recommendations on how to enhance the potential for EPI. Most fundamentally the book answers the questions of what works and why for EPI, and how it can be achieved in practice across sectors. The result is a rich and indispensable guide for all those involved in environmental and sustainable development policy issues.

# SEI Staff - 2006

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Forslund, Helena  
Forsman, Benita  
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Kjellén, Bo  
Kjellén, Marianne  
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Oja, Ahto  
Peterson, Kaja  
Poltimäe, Helen  
Smirnova, Olga  
Ulman, Kaire  
Urbel-Piirsalu, Evelin  
Uustal, Meelis  
Viss, Viire

## York

**Kuylenstierna, Johan (C.Dir/P.Dir)**  
**Cinderby, Steve (C.Dep. Dir)**  
Ashmore, Mike  
Barrett, John  
Barron, Jennie  
Büker, Patrick  
Cambridge, Howard  
Chadwick, Michael  
Clay, Richard  
Duckmanton, Jenny  
Emberson, Lisa  
Forrester, John  
Frey, Sibylle  
Haq, Gary  
Heinemeyer, Andreas  
Hicks, Kevin  
Ineson, Phil  
Matin, Neela  
Minx, Jan  
Morrissett, Tim  
Noel, Stacey  
Owen, Anne  
Paul, Alistair  
Regis, Adam  
Rosen, Paul  
Schwela, Dieter  
Snell, Carolyn  
Soussan, John (P.Dir)  
Subke, Jens-Arne  
Vallack, Harry  
Wang, Isabel  
Whitelegg, John  
Wiedmann, Thomas  
Willis, Erik

# List of Main Funders and Clients - 2006

## 1. Bilateral agencies

Deutsche Gesellschaft for Technische Zusammenarbeit (GTZ)  
Canadian International Development Agency (CIDA)  
Government of Switzerland (Swiss Development Agency)  
Danish International Development Agency (DANIDA)  
UK Department For International Development (DFID)  
Ministry of Foreign Affairs, The Netherlands (DGIS)  
Ministry for Foreign Affairs, Finland (FINNIDA)  
Swedish International Development Cooperation Agency (Sida)

## 2. Multilateral agencies

Challenge Program on Water and Food  
EU Commission  
Food and Agriculture Organization of the United Nations (FAO)  
Global Environment Facility (GEF)  
International Energy Agency (IEA)  
International Fund for Agricultural Development (IFAD)  
International Water Management Institute (IWMI)  
OLADE: The Latin America Energy Agency  
Organisation for Economic Co-operation and Development (OECD)  
UNECE ICP on Vegetation  
United Nations Development Programme (UNDP)  
United Nations Environment Programme (UNEP)  
United Nations Framework Convention on Climate Change (UNFCCC)  
United Nations Industrial Development Organization (UNIDO)  
United Nations National Communications Support Programme (NCSP)  
United Nations Institute for Training and Research (UNITAR)  
World Commission on Dams

## 3. Foundations

American Water Works Association Research Foundation  
BOC Foundation  
Energy Foundation  
ETC Foundation  
FORMAS (Forskningsrådet Miljö Arel)  
MacArthur Foundation  
MISTRA (The Swedish Foundation for Strategic Environmental Research)  
Rockefeller Foundation  
Sumitomo Foundation  
Tällberg Foundation

## 4. Governments

Bridgend Borough Council  
California Environmental Protection Agency (Climate Action Team)  
Estonian Government  
The French Energy Management Agency (ADEME:)  
Greater London Authority  
Government of South Korea  
Puget Sound Clean Air Agency  
Selby District Council  
Shetlands Isles Council  
Swedish Government [Kammarkollegiet]  
U.S. Agency for International Development (US-AID)  
UK Department for Environment, Food and Rural Affairs  
UK Foreign and Commonwealth Office  
Rhode Island Dept of Environmental Management  
Sustainable Development Commission UK  
Schools Carbon Footprint  
City of York Council

## 5. Research Institutes and NGOs

American Council for an Energy Efficient Economy (ACEEE)  
Asia Pacific Energy Research Center  
EKO Sihtkapital  
Estonian Association for Environmental Management

Friedrich Ebert Foundation  
International Institute for Education (IIE)  
International Water Management Institute  
International Institute for Environment and Development (IIED)  
International Union of Air Pollution Prevention and Environmental Protection Associations (IUAPPA)  
Lawrence Berkeley National Laboratory (LBNL, US-DOE)  
National Renewable Energy Laboratory (NREL, US-DOE)  
The Nature Conservancy  
Natural Environment Research Council (NERC)  
Silent Spring Institute  
Union of Concerned Scientists  
World Resource Institute  
World Wildlife Fund (WWF)  
EPSRC (Engineering and Physical Sciences Research Council)

## 6. Universities

University of East Anglia  
Erasmus Universiteit Rotterdam  
Massachusetts Institute of Technology  
Lund University  
Tallinn Technical University  
Türi Kollege  
Uppsala University

## 7. Private sector

ARUP  
Bureau Veritas  
Eesti Energia  
Steiger Inseneribüroo  
Viru Õlitööstus  
VKG Energia OÜ

## 8. Banks

World Bank Group  
Asian Development Bank  
European Investment Bank

# SEI Board Members - 2006

**Lars Anell**  
Sweden  
Senior vicepresident at AB Volvo, involved in policy and environment.



**Angela Cropper**  
Cofounder and President of The Cropper Foundation.



**Youba Sokona**  
Mali  
Executive secretary, Sahara and Sahel Observatory, OSS.



**AnnMari Jansson**  
Sweden  
Professor, Systems Ecology, Stockholm University.



**Eva Lindskog**  
Sweden, SEI staff representative. Research on social impact assessments.



**Carl Folke**  
Sweden  
Professor, Systems Ecology, Stockholm University



**Johan Rockström**  
Sweden  
Executive director, Stockholm Environment Institute.



**Jim Skea**  
UK  
Research director, UK Energy Research Centre.



**Elinor Ostrom**  
USA  
Professor, Political Science, Indiana University.



**Matthew Chadwick**  
UK, SEI staff representative. Research on water resources and livelihoods.



**Birgitta Dahl**  
Sweden  
Former Minister of Environment and Speaker of the Parliament, Sweden.



**Monthip Tabucanon**  
Thailand  
Inspector General, Ministry of Natural Resources and Environment, Thailand.



**John Schellhuber**  
Germany  
Tyndall Centre Headquarters, UK.



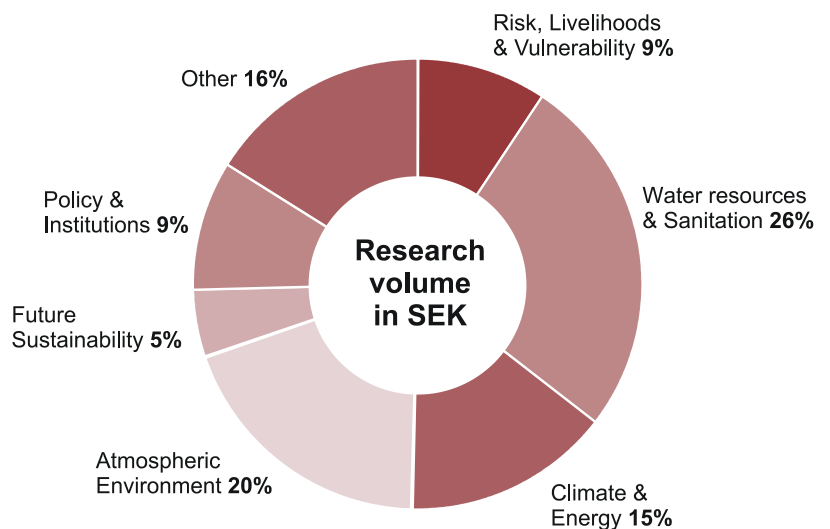
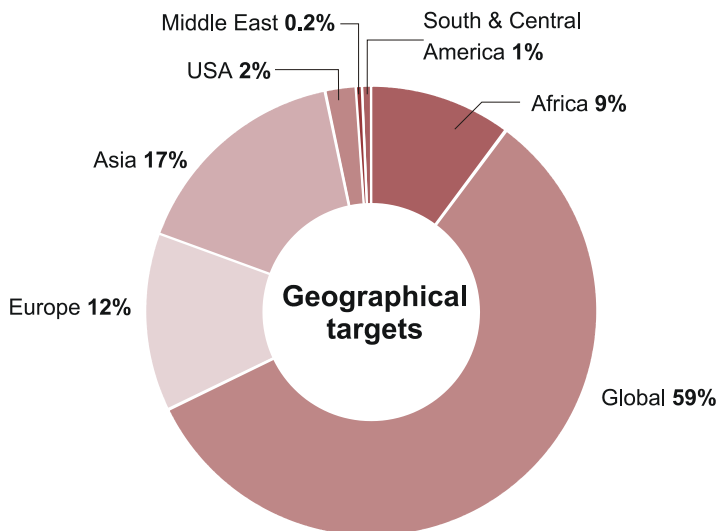
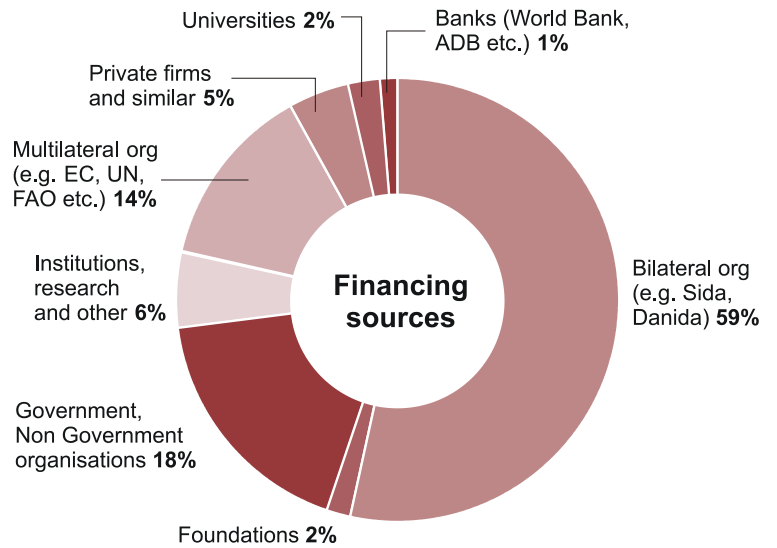
**Giuseppe Locati**  
Italy  
Vice president Corporate Health and Environment, Pirelli.



Professor AnnMari Jansson sadly died of cancer in January 2007. AnnMari - one of the founders of the field of ecological economics - was a genuine friend of SEI, serving with devotion on the SEI board.

# SEI Research Volume in 2006

The global SEI organization has generated research volume (measured in money terms), of about SEK 130 million during the year 2006. The proportions of sources of financing, and of targeted geographical and research areas, are shown on the diagrams.



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