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The Society

The Integrated Assessment Society is a not-for-profit entity created to promote the community of inter-disciplinary and disciplinary scientists, analysts and practitioners who develop integrated assessment. The goals of the society are to nurture this community, to promote the development of IA and to encourage its wise application.

Integrated Assessment Defined

Integrated Assessment (IA) can be defined as the interdisciplinary process of integrating knowledge from various disciplines and stakeholder groups in order to evaluate a problem situation from a variety of perspectives and provide support for its solution. IA supports learning and decision processes and helps to identify desirable and possible options for addressing the problem. It therefore builds on two major methodological pillars: approaches to integrating knowledge about a problem domain, and understanding policy and decision making processes. IA has been developed to address issues of acid rain, climate change, land degradation, water and air quality management, forest and fisheries management and public health.

Feature

The Role of Integrated Assessments in the Twenty-first Century

by Rik Leemans, Professor in Environmental Systems Analysis, Wageningen University

The UNFCCC COP in Paris

Last December the twenty-first Conference of Parties (i.e. countries) of the UN Framework Convention on Climate Change (UNFCCC; http://unfccc.int/meetings/paris_nov_2015/meeting/8926.php) gathered in Paris to achieve a new climate agreement. COP21 was considered a great success after the failure of COP15 in Copenhagen, where only the target to limit climate change to a global mean warming of maximally 2°C was advocated. This target was reaffirmed in Paris. The final Paris Agreement even urges to limit the increase to 1.5°C. The major outcome of COP21, however, was to establish binding commitments by all parties to make 'nationally determined contributions' (NDCs) and to pursue domestic measures to achieve them. All countries must also report regularly on their progress in implementing and achieving their NDCs, and on their emissions. These reports should undergo international review. The countries seem committed to their national greenhouse gas emission reductions because they agreed to submit new, more progressive NDCs every five years. The NDCs of developed countries are binding, while voluntary contributions by developing countries are encouraged. This can be done by engaging parties in international emissions trading and the development of new mechanisms to enable emission reductions in one country to be counted toward another country's NDC (i.e. similar to the Clean Development Mechanism under the Kyoto Protocol). To support these mitigation and adaptation efforts, \$100 billion in public and private resources should be raised annually, increasing substantially after 2025. Additionally, 'loss and damages'

resulting from climate change should be addressed but this should not "involve or provide a basis for any liability or compensation". Finally, the Intergovernmental Panel on Climate Change (IPCC) is invited to produce a special report on the impacts of the 1.5°C target and related global greenhouse gas emission pathways.

Many studies have already addressed the outcome of the currently submitted NDCs and their consequent emission, concentration and climate pathways. Although this is not straightforward because countries used different baselines, starting years and pathways, the analyses show that the 2°C target is still exceeded by almost 2°C. More ambitious NDCs are thus needed. Pathways that comply with the 2°C target, require global emissions to peak in the next few years and are then reduced by circa 3% per year. If peaking is delayed, then emissions should be reduced faster afterwards, or even become negative (i.e. actively removing greenhouse gases from the atmosphere). IPCC shows that the 2°C target allows only 275 gigatonnes of carbon to be emitted in the future. How to distribute them across countries remains a major issue. These integrated assessments show that current IA approaches are easily capable of calculating the needs and consequences from the Paris meeting.

However, not only assessments are important, but also the analysis of observed trends. For example, a recent International Energy Agency (IEA) report shows that there are signs of decoupling the use of fossil fuels (and the related emissions) from economic growth. This current trend may provide grounds for some optimism. More (cheaper) renewable energy and increased energy efficiency are likely to have stabilized emissions over the last two years. The recent economic crisis in China could also explain (part of) this trend. Only longer term analyses will reveal the real trends and inform their causes.

The invitation to IPCC to produce a special report is also exciting. Better insights into the environmental (e.g. eco-

systems and agricultural, forest and water resources) and socio-economic consequences and possibilities to adapt to climate change are urgently needed.

As the current global temperature increase has just surpassed the 1°C mark, the special report must also take stock of the observed impacts and better attribute the underlying causes. This is challenging but helps to better develop and assess options to increase adaptability and resilience and reduce vulnerabilities. However, very few integrated assessment approaches focus on impacts, adaptation and vulnerabilities at such low levels of climate change. Additionally, such impacts are per definition influenced by local changes in weather and climate, and local socio-economic conditions. This complicates the assessments and probably requires new and more transdisciplinary research.

The UN Sustainable Development Goals

The Paris meeting was not the only summit for integrated assessments in 2015. In September the UN General Assembly formally accepted a new set of 17 measurable Sustainable Development Goals (SDGs; <https://sustainabledevelopment.un.org/sdgs>), ranging from ending poverty and hunger, achieving gender equality and water, food and energy security, and conserving biodiversity on land, along coasts and in the oceans by 2030. The Paris climate challenge is also included in these goals. The aspirational SDGs and their targets are integrated and indivisible, global in nature and universally applicable, but take into account different national realities, capacities and levels of development, and they respect national policies and priorities. The link between the SDGs and other relevant ongoing economic, social and environmental processes should be recognised and exploited. Although integrated assessment approaches (e.g. models) have been successfully used for single issues (e.g. climate change or ecosystem services), the SDGs require a different approach. As the SDGs are global in their scope but national (and local) in their implementation, and explicitly connect people to development, economics and livelihoods (including employment, production and consumption), health and environment, the integrated assessment should better combine not only all these different dimensions and scales, but also the various actors (e.g. natural resource managers, companies, governments, and other stakeholders). Many relevant issues are localized and depend on geographic patterns in weather and climate, soils, vegetation, rivers and lakes, coasts, and land and water use. Additionally, the actors do not act in isolation but interact and respond to local, regional, national and international incentives. Their behaviour is embedded in traditional habits that often define cultures. Finally, the SDG documents clearly state that each SDG should not be treated in isolation. Success can only be guaranteed if all the SDGs are combined and integrated.

This requires a much more comprehensive and cohesive approach to integrated assessment that amalgamates the different actors along their appropriate dimensions with their economic, social and environmental conditions. It thus requires a much stronger NEXUS approach by addressing simultaneous challenges (e.g. food, water and energy with biodiversity decline and climate change). Finally, the integrated-assessment scholars should recognize that they are part of the system they study and that their knowledge, insights and suggested solutions and outreach to decision makers and stakeholders will (eventually) alter the system. This requires a much more proactive and participatory approach by actively involving stakeholders. The new international research platform, Future Earth (www.futureearth.org), which is designed to provide the knowledge needed to support transformations towards a sustainable and equitable world, for example, strongly argues

that co-design and co-production of research is essential. Although such approaches are still resisted by disciplinary scholars participating in the platform, its governing structure is geared towards achieving effective transdisciplinary approaches.

Concluding remarks

Many of the above issues come together in Pope Francis' second encyclical "Laudato Si" with the subtitle "On Care For Our Common Home" (http://w2.vatican.va/content/francesco/en/encyclicals/documents/papafrancesco_20150524_encyclica-laudato-si.html). Here the Pope critiques consumerism and irresponsible development, laments environmental degradation, including climate change, and calls all people of the world to take "swift and unified global action". This encyclical includes an excellent chapter which highlights environmental degradation and its proximate causes with human ethics and the need for sustainability. This impressive chapter is solidly based on recent scientific insights. When I read it, I felt convinced of the urgent need to further develop the above next steps in integrated assessments: continue to support national and international conventions; more strongly focus on and involve actors and their needs; better assimilate the various dimensions and scales; and integrate not only natural and social sciences (mainly economics) but also humanities (e.g. history and ethics) and behavioural sciences. This will strengthen the urgently needed participatory NEXUS approaches to achieve both climate protection and the SDGs in 2030.

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IA News

New PBL study: 'Sustainable Development Goals in the Netherlands – building blocks for environmental policy for 2030'

In a recent study, PBL Netherlands Environmental Assessment Agency has analysed the implications of the 2030 Agenda for Sustainable Development for environmental policy in the Netherlands. In the study, PBL assessed to what extent environment-related SDG targets are covered by existing Dutch policy targets and whether current and planned policy efforts are sufficient for achieving these existing targets. The assessment includes policy targets agreed upon at national, European and UN levels.

Of the 169 SDG targets, 41 either directly address the quality of the physical environment (e.g. water, air, biodiversity) or indirectly affect its quality (e.g. via agriculture, industry, cities and sustainable consumption and production). For most of these SDG targets, the Netherlands already has policy targets in place, most of which have been agreed at EU or UN level. However, most existing policy targets are set for 2020, while the SDGs aim for 2030. Furthermore, current policy efforts are falling short of achieving the existing targets.

The study concludes that implementation of the SDGs in the Netherlands can build on existing policy targets, policy programmes and monitoring reports, but certain adjustments will be required. These adjustments ask for policy choices with respect to:

1. Ambition: The global SDGs have to be translated into a national ambition level, consisting of a clear, long-term

supported by new and updated national policy targets for 2030.

2. Coherence: National implementation requires close coordination of policy efforts and responsibilities between various ministries and provincial and local authorities, while a shifting of the environmental burden to other countries should be avoided.

3. Monitoring: A periodic national monitoring report is needed to track progress and – depending on the political ambition – to promote accountability by explaining underlying developments or even to evaluate policy performance.

A summary by Paul Lucas. For more information & the report: <http://www.pbl.nl/en/news/newsitems/2016/un-sustainable-development-goals-also-require-policy-effort-in-the-netherlands>

UNEP-MCC collaborative research initiative: The future of global environmental assessment-making (FOGEAM)

The ongoing research under the FOGEAM initiative is learning from past global environmental assessments (GEAs) in order to inform the design and implementation of future GEAs. Led by UNEP and the Mercator Research Institute on Global Commons and Climate Change (MCC), FOGEAM works toward establishing a deeper understanding of the evolution of GEAs and how their policy orientations have shifted in recent years. It analyzes the relationships between the objectives, procedures and methodologies and resources of GEAs with policy discourses and investigates major obstacles and tradeoffs that have arisen in these complex and large-scale social learning processes. In view of the increasing demand for solution-orientated assessments that can support the attainment of the multiple environmental goals that have been established at the international and domestic levels in recent decades, FOGEAM puts a special focus on strengthening the procedural and methodological options for carrying out and integrating solution-oriented public policy assessments.

More information is available from the MCC site:

<http://www.mcc-berlin.net/en/research/cooperation/unep.html>

44th session of the UNFCCC Subsidiary Body on Scientific and Technological Advice (SBSTA)

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) has published two working papers and two associated information notes synthesizing the latest knowledge on agriculture and adaptation. The papers and notes are designed to help countries to prepare submissions to the 44th session of the UNFCCC Subsidiary Body on Scientific and Technological Advice (SBSTA), and will be discussed during in-session workshops on agriculture. The SBSTA and in-session workshops will convene in Bonn, Germany from May 16th to 26th, 2016.

The first paper, entitled 'Adaptation Measures in Agricultural Systems,' explores actions and institutions that can improve climate resilience in smallholder farming, drawing on examples and results from CGIAR's diverse portfolio. The second paper, entitled 'Agricultural practices and technologies to enhance food security, resilience and productivity in a sustainable manner,' summarizes practices and technologies across the rural landscape, covering soils, crops, livestock, water, forests, fisheries, energy and services. More information:

<http://nr.iisd.org/news/ccafs-details-latest-knowledge-on-agriculture-and-adaptation>

TIAS News

Strategy Meeting

On February 26th, the members of the executive board had a face-to-face strategy in Osnabrück. The meeting was launched with a reflection on the history, goals, membership of TIAS and a review of the services and activities offered to our membership. The group then discussed more recent developments in research, training and environmental policy landscapes, and the challenges and themes that were highlighted by various TIAS members. Means of strengthening collaboration with organizations and individuals inside and outside TIAS were discussed together with ways of increasing our visibility, membership and capacity.

An important conclusion is that TIAS should increasingly be recognised as a bridging organization and a community of practice that provides access to knowledge about high-quality and effective Integrated Assessments and the individuals and organisations that are behind these. Various possibilities for increasing our financial resources and membership identified, together with means for strengthening the connections between and among members. We look forward to discussing the key outcomes of this meeting in an online meeting with the TIAS advisory board in June and the next Annual General Meeting (dates to be announced). We are grateful to members who took the time to share their suggestions and ideas and for the continued support of all members to our society.

Upcoming webinars

Integrated Modeling for implementing the SDGs

TIAS in collaboration with the International Institute for Sustainable Development (IISD) has announced the second of its two-part webinar, "Beyond Sustainable Development Goal (SDG) indicators". On the 2nd of February, the first part "Exploring the role of Integrated Assessment in implementing the SDGs" took place. The audio-visual recording can be viewed online and the presentations of the webinar can be downloaded from the TIAS website. The second part of the webinar "Integrated models supporting implementation, strategy development and transition planning" is planned for the 12th of April, 3-5 pm GMT. More information:

<http://www.tias-web.info/tias-activities/webinars/>

Co-production of Knowledge

The subsequent webinar focusing on the co-production of knowledge will take place **June 6th, 2016 at 16-18.00 GMT**. The webinar will be led by advisory board member, Marcela Brugnach. Registration for this event will take place in May and TIAS members will receive the announcement.



TIAS Workshop on Models in Scenario Analysis

Advisory board members, Anthony Jakeman and Dale S. Rothman, together with Kasper Kok are organizing a workshop on "Bridging Qualitative Approaches and Quantitative Models in Scenario Analysis for Decision Making: Recent Advances and Remaining Issues" at the 8th International Congress on Environmental Modelling and Software in Toulouse, France, on July 10-14, 2016. More information on the EMSs Congress: <http://www.iemss.org/sites/iemss2016/index.php>

New publication on “Deep uncertainty”

TIAS members, Jeroen van der Sluijs and Arjen Wardekker, and their Dutch colleagues have recently published an article **“Dealing with uncertainties in fresh water supply: Experiences in the Netherlands.”** Developing freshwater supply strategies for the long term requires that a highly uncertain future be taken into consideration. The extent of future climate change and the extent and nature of its impacts are unknown. Furthermore, socio-economic conditions as well as social preferences may change in unpredictable ways. Often it is not possible to find solid ground for estimating the probabilities for the range of imaginable possible future developments. Yet some of these may have profound impacts and consequences for society which could be reduced by timely and proactive adaptation. In response to these and similar challenges, various approaches, methods and techniques have been proposed and are being developed to specifically address long-term strategy development under so-called *deep uncertainty*.

This paper initially offers a brief overview of developments in the field of planning under (deep) uncertainty. Next the application of three different approaches to freshwater provision planning under uncertainty are illustrated with case studies in the Netherlands: a resilience approach, oriented to (re) designing freshwater systems in such a way that they will be less vulnerable, and at the same time, able to recover easily from future disturbances; a robustness approach oriented to quantitative assessment of system performance for various system configurations (adaptation options) under a range of external disturbances; and an exploratory modeling approach developed to explore policy effectiveness and system operation under a very wide set of assumptions about future conditions. **“Dealing with uncertainties in fresh water supply: Experiences in the Netherlands”** by Thissen, W., J. Kwakkel, M. Mens, J. van der Sluijs, S. Stemberger, A. Wardekker, D. Wildschut is available from: <http://dx.doi.org/10.1007/s11269-015-1198-1>

New TIAS Members

TIAS warmly welcomes one new institutional member and three individual members to our community.

The **Center for Environmental Systems Research** is an interdisciplinary research unit of the **University of Kassel** in Germany. The center is led by Prof. Joseph Alcamo (executive director) and Prof. Andreas Ernst (deputy executive director). The Center focuses on environmental problems, particularly in the context of climate change and resource consumption, from a systems science perspective. The center employs scientists with diverse backgrounds and expertise in natural and social sciences including hydrology, civil engineering, geo-ecology, informatics as well as psychology, philosophy, and political sciences. Research topics include climate impact, sustainable land- and water management, life cycle analyses, and changes in consumer behavior.

Weila Gong is a PhD candidate with the Environmental Policy Research Centre (FFU) at the Freie Universität Berlin. Her research focuses on climate governance and low-carbon transition in China. She is particularly interested in how policy entrepreneurs and resource mobilization influence the implementation of low-carbon policies at the local level. Weila is looking forward to actively engaging in TIAS interdisciplinary study activities.

Dr. Barbara Schröter is a postdoctoral researcher at Leibniz Centre for Agricultural Landscape Research (ZALF) in Müncheberg, Germany. Her interest is transdisciplinary research for resilient landscape development, in particular governance models and institutional analysis for managing natural resources, civil society engagement and participation. In a future project she will focus on nature-based solutions for resilient development of metropolitan regions, addressing water-borne challenges. Barbara was one of the IUSF-TIAS Autumn School 2015 participants.

Courses

27 June - 1 July, 2016, Summer School - Concepts and tools to engage in knowledge co-production and public participation, in Montpellier, France

This summer school is aimed at individuals interested in developing and improving skills and knowledge of participatory methods for the purpose of engaging in knowledge co-production and public participation processes. The event will take place at Agropolis International (www.agropolis.fr). The fee is €1200 for professionals and €720 for students and PhD candidates. Participants are responsible for their own travel, lodging and meal expenses. The course will be taught in English. **Application deadline: 15 April.** More information: <http://www.alter-net.info/events/summer-school-montpellier-2016>

One-Year Master's in Water Security and International Development at The School of International Development at University of East Anglia, United Kingdom

This degree program seeks to prepare graduates to engage with and contribute to societal responses to critical global water policy issues. The School takes an interdisciplinary and rigorous approach to teaching within a wider pedagogic framework of development and environmental studies. More information: <https://www.uea.ac.uk/study/postgraduate/taught-degree/detail/m-sc-water-security-and-international-development>



Photo: C. van Bers ©

Job Openings

Seven PhD student positions open in the Vienna Doctoral Programme on Water Resource Systems, Vienna University of Technology

The Centre for Water Resource Systems will host up to 70 doctoral students over a period of 12 years with the support of a dedicated programme of the Austrian Science Fund (FWF) that promotes doctoral research and education of the highest standards and provides excellent opportunities for cross-disciplinary research. International networking is facilitated by a mobility programme with a spectrum of attractive international partner institutions and a comprehensive guest scientist programme. Application deadline is April 30, 2016. More info: <http://www.waterresources.at/index.php?id=20>

Events

10-13 May 2016, International Conference Adaptation Futures 2016, in Rotterdam, Netherlands

Adaptation Futures 2016 is the fourth PROVIA worldwide adaptation conference. The conference aims to move climate change adaptation forward by promoting solutions across sectors, borders and communities. It is for scholars, practitioners, policymakers and business people from all around the world. Adaptation Futures 2016 offers a platform to exchange new and practical ideas, experiences and insights for climate change adaptation. Online registration until **3 May 2016**. More information: <http://www.adaptationfutures2016.org/conference/programme>

10-14 July 2016, 8th International Congress on Environmental Modelling and Software, in Toulouse, France

The International Environmental Modelling & Software Society (iEMSS) biennial meeting and congress is being convened by Dr. Sabine Sauvage and Dr. José-Miguel Sánchez-Pérez of the University of Toulouse. The purpose is to foster discussion and the interchange of challenges, solutions, ideas, and new methods and techniques in environmental modeling and software. The theme this year is on supporting a sustainable future. The deadline for the submission of abstracts is **March 31st, 2016**. More information: <http://www.iemss.org/sites/iemss2016/index.php>

4-9 September 2016, Quadrennial Ozone Symposium, in Edinburgh, UK

The symposium brings together researchers and stakeholders interested in a wide range of aspects related to stratospheric and tropospheric ozone. The 2016 symposium is organised by the Centre for Ecology & Hydrology and the University of Edinburgh on behalf of the International Ozone Commission (IO3C), and will incorporate scientific sessions on the following topics: stratospheric ozone, tropospheric ozone, ozone chemistry-climate interactions, global ozone observations and measurement technique ozone on climate, human health, ecosystems and food production. The abstract submission deadline has been extended to **31 March 2016**. More information: <http://www.ozone-symposium-2016.org/>



Photo:U. Meissner ©

17-19 May 2017, Sustainability and Social Science Research Symposium, in Michigan, USA

The symposium to be held at the University of Michigan, has the following aims: (1) to provide social science researchers focusing on sustainability an opportunity to present and discuss their work (e.g. empirical work, case studies, teaching and learning innovations, applied projects, etc.); (2) to foster the exchange of information, ideas and experiences acquired in the execution of research projects, especially initiatives which have influenced behavior, decision-making, or policy; (3) to discuss methodological approaches and projects which aim to offer a better understanding of sustainability across society and economic sectors; and (4) to network the participants and provide a platform so they can explore possibilities for further cooperation.

The Call for Abstracts is now open with a **May 30th, 2016 deadline**. Further details can be found at:

<https://www.haw-hamburg.de/en/ftz-als/events/michigan2017.html>



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