Sustainability Science

Integrated Research System for Sustainability Science
of the University of Tokyo (IR3S)
and the United Nations University (UNU)

Special Feature - African Regional Perspectives

SUBMIT ORIGINAL MANUSCRIPTS BY JUNE 15th 2010

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G8 University Summit
Sapporo Sustainability Declaration (SSD)

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Sapporo Sustainability Declaration (SSD)

- Recognising the expanding role of scientists and universities, the Presidents, Rectors, Chancellors, Vice-Chancellors and representatives (hereinafter referred to as “Presidents”) of 27 of the leading educational and research institutions in the G8 member nations held a G8 University Summit from June 29 to July 1, 2008 in Sapporo, Hokkaido, Japan, prior to the G8 Hokkaido Toyako Summit. The United Nations University and seven universities from six major non-G8 member nations were invited to participate. The subject of discussion was the responsibility of universities to contribute toward the attainment of sustainability, and the specific actions they must undertake to fulfil that responsibility.
- The Presidents of the attending universities at the G8 University Summit hope that universities all over the world will endorse this declaration and take actions appropriate to their respective countries and regions.

G8 University Summit 2008: Sapporo Sustainability Declaration

From Point 3: **The role of universities**

> "All universities have an important role in problem-solving to bequeath a sustainable world to future generations."

From Point 4: **The need to restructure scientific knowledge**

> "(..) the development of a truly comprehensive vision of a sustainable society will require new scientific knowledge, restructured to reverse past tendencies toward stratification and fragmentation in research, and to foster an integrated approach to solving problems by accelerating inter-disciplinary research activities."

From Point 5: **The need for a Network of Networks**

> "Essential to such a framework is the creation of a "network of networks" (NNs) that links the various discipline-specific research networks already in place, thereby utilizing and augmenting their respective strengths and knowledge bases."

From Point 7: **The role of higher education for sustainability**

> "Universities have a critical role to play in educating future generations, disseminating information about sustainability, and particularly by training leaders with the skills to solve regional and local problems from a global and interdisciplinary perspective. "

International Conference on Sustainability Science, Tokyo 2009

DRAFT

Su.Sci. ICSS 2009
TOKYO University

	Track 1	Track 2	Track 3	Track 4
	Climate Change and Energy	Food, water and Land Use	Long-Term Scenario for Sustainable Society	Role of University and Industry for Sustainability
	Session 1 Climate Change (Tyndall)	Session 3 Food and Water (IR3S)	Session 5 Resilience for Sustainable Ecosystem Management (SRC)	Session 7 Development of Doctoral Program on S. S.
Session Leader	Mimura (IR3S)	Chongrak (AIT) Will.Steffen (ANU)	Takeuchi (IR3S/UNU)	Yarime (IR3S)
Co-Leader	U of East Anglia	Oki (IR3S) Herath (UNU)	Carl Folke (SRC)	N. Dickson (Harvard U)
IR3S Coordinator	Hiramatsu (IR3S)	Fukushi (IR3S)	Y. Hara (IR3S)	Sugiyama (IR3S)
Coordinating assistant		Honda (IR3S)		
	Session 2 Energy Sustainability (CIRPS)	Session 4 Resource Circulation and Land Use (GLP)	Session 6 Integrative Scenario for Sustainable Society (IR3S)	Session 8 Education of S.S (IR3S)
Session Leader	Vincenzo Naso (CIRPS)	Osaki (IR3S)	Hanaki (IR3S)	Brad Allenby (Arizona Sta.U)
Co-Leader	Kushiya/ Yokoyama (IR3S)	Zhejiang Univ	Masui (NIES)	Mino (IR3S)
IR3S Coordinator	Kitamura (IR3S)	K. Hara (IR3S)	Arai (IR3S)	Onuki (IR3S)
Coordinating assistant	Matsuda (IR3S)		Inoue (IR3S)	Hoshikoshi (IR3S)

PLENARY

Day 1 Keynote Speech

Braden Allenby

Day2 Keynote Speech

Hiroyuki Yoshikawa

Day2 Panel discussion

Panel discussion 1 “Role of alliance for SS”
Representatives from IR3S, Tyndall, SRC, GLP, AAAS, and CIRPS

Panel discussion 2
“Sustainability for Industry”
(details not decided)

Day 3 Session report and discussion (Chair: Hanaki)

Session report and discussion: Session leaders

Invitation for ICSS2009 by CIRPS

Overall Coordinator

(IR3S)
K. Takeuchi
K. Fukushi, R. Honda
A. Tezuka,A. Ono
S. Nomura

NNs Action Plan

K. Takeuchi
S. Arai

Parallel: Speakers list (candidates)

Climate change mitigation	Land use, food, water, Resource circulation	Long-term vision to sustainable society	Role of university for sustainability
A. Sumi	**S. Ohgaki**	**K. Takeuchi**	**B. Clark**
Low carbon society	**Land use, Food and water,**	**Resilience**	**Concept of S.S**
Trevor Davis (Tyndall/UEA) T.D.Davies@uea.ac.uk N. Mimura (IR3S/Ibaraki) Jürgen Kropp (Potsdam) kropp@pik-potsdam.de	Chongrak (AIT) Will Steffen/ Rob Dybal (IARU/ANU) Will.Steffen@anu.edu.au Rob.Dyball@anu.edu.au	Carl Folke (SRC) calle@ecology.su.se carl.folke@beijer.kva.se Annette Reenburg (GLP/ UOC) Ar@geogr.ku.dk A.H. Zakri (UNU) Hiroyuki Matsuda (Yokohama National)	Bill Clark (AAAS/Havard) Nancy Dickson (ditto) M. Yarime (IR3S/UT)
Energy sustainability	**Resource circulation**	**Integrative scenario**	**Education of S.S**
Vincenzo Naso (CIRPS) Shinya Yokoyama (Todai)	M. Osaki (IR3S/Hokkaido) T. Morioka (IR3S/Osaka)	K. Hanaki (IR3S/UT) T. Masui (IR3S/NIES)	Braden Allenby (AAAS/Arizona State) Braden.Allenby@asu.edu T. Mino (IR3S/UT)

International Conference on Sustainability Science, Tokyo 2009

Statement of Participants in the ICSS2009[1] on the need for a Network of Networks

Representatives of major universities and research organizations worldwide met at the University of Tokyo February 5 – 7, 2009 to foster a deeper understanding of diverse academic approaches to sustainability science and to discuss how to design a framework for integrating, structuring and deploying knowledge generated on and through the practice of sustainability science. Participants met in plenary sessions and in parallel workshops to review and discuss the current status of ongoing activities to address the sustainability crisis, and to identify means to enhance the effectiveness of existing research networks. At the conclusion of the conference, participants issued the following statement and requested that it be submitted to the 2nd G8 University Summit to be held in Torino Italy in May 2009 and that it be disseminated to university research institutions worldwide inviting them to join the endeavor to create a network of networks for sustainability science.

CENTRO INTERUNIVERSITARIO
DI RICERCA PER LO SVILUPPO
SOSTENIBILE CIRPS

SAPIENZA
UNIVERSITÀ DI ROMA

IR3S

ICSS-2010

International Conference on Sustainability Science 2010

Rome - June, 23-25

Faculty of Engineering - Sapienza University of Rome, Italy

(ICSS2010, www.icss2010.net)

ICSS2010
Piazza S. Pietro in Vincoli Roma
tel 328 9048259
Secretariat: scientific@icss2010.net
www.icss2010.net

Venue: Sapienza University of Rome

Organized by Sapienza *University of Rome - Interuniversity Research Centre on Sustainable Development (CIRPS), University of Tokyo- Integrated Research System for Sustainability Science (IR3S), Arizona State University School of Sustainability and United Nations University Institute for Sustainability* and *Peace (UNU- ISP).*

OBJECTIVES:

The Conference has six primary objectives:

1. Strengthen the framework of sustainability science and identify the epistemological pillars of sustainability science, as well as discuss the methodology aspects;

2. Present case studies of transdisciplinary research practices to address the complexity of human-nature interaction;

3. Review and discuss the current status of high education in sustainability science with regard to diverse visions, approaches, and methodologies used ;

4. Discuss the possibilities and challenges of an effective collaboration civil society, industry, policy makers - academia for a transition towards sustainability;

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2° INTERNATIONAL CONFERENCE ON SUSTAINABILITY SCIENCE

Venue: Sapienza University of Rome

Organized by Sapienza *University of Rome - Interuniversity Research Centre on Sustainable Development (CIRPS), University of Tokyo- Integrated Research System for Sustainability Science (IR3S), Arizona State University School of Sustainability and United Nations University Institute for Sustainability* and *Peace (UNU- ISP).*

5. Examine the central issues and challenges of global sustainability giving equal attention to the perspectives of the South;

6. Identify specific and concrete activities and instruments to consolidate the collaboration among research institutions and Networks.

(ICSS2010, www.icss2010.net)

IT'S TIME TO CHANGE

What is happening with Sustainability Science is unique.The birth and development of this new Science is based on the international and trans-disciplinary interaction of leaders, forward thinkers, researchers from leading universities, industry, society and institutions.

The mission and the challenges that ustainability Science faces and the opportunities it opens might not be there in the future. The possibility of achieving global sustainability is entirely dependent upon the respect of the delicate boundaries of nature.
The consequences of what may be irreversible damages that the present generations are incurring on nature cannot possibly be paid by the future ones.

The local and global environmental deterioration, the extreme poverty and hunger afflictingmore than one billion people, and the recent financial crisis are unequivocal symptoms of the urgency for change.
The role of science and technology, related research and development, and knowledge networking are fundamental. Training and education institutions represent an important driver of change and have to collaborate with the different stakeholders, which include the government, the private and public sectors and the civil society.

However the limits of traditional disciplinary approaches to the complex problems that threaten global sustainability are strong. Sustainability science has the ambitious aim of overcoming these limits and link the scientific understanding of human - nature systems with action to achieve sustainability.

ICSS2010 gathersand links world scientific leaders in Sustainability Science and representatives from industry and civil society. ICSS2010 is not only an academic event, the interaction of the different stakeholders and the organization of the global network plays a central role in the conference.

CIRPS Sapienza University of Rome feels a great responsibility and is honoured to co-organize this important event and I am delighted that the conference will be held in Rome, from the 23st to the 25th of June 2010.

Vincenzo Naso
Chairman, ICSS 2010
Director, CIRPS

Organizing Institutions

CENTRO INTERUNIVERSITARIO DI RICERCA PER LO SVILUPPO SOSTENIBILE - CIRPS

SAPIENZA UNIVERSITÀ DI ROMA

Interuniversity Research Centre for Sustainable Development (CIRPS) - SAPIENZA UNIVERSITY OF ROME:
The Interuniversity Research Centre for Sustainable Development was founded in April 1988 and located within Sapienza University of Rome. As an advanced University Institution, CIRPS incorporates eleven Italian Universities, takes part and coordinates national and international networks, and a number of interdisciplinary activities with private and public partners in several areas of the world. CIRPS main objectives are to promote and develop research and educational activities, to provide scientific and technological knowledge and services and to cooperate with national and international organizations and companies in the field of sustainable development. The settlement and growth of the new Sustainabilty Science is seen by the Centre as a strategic initiative to pursue sustainability.

UNITED NATIONS UNIVERSITY

United Nations University Institute for Sustainability and Peace (UNU-ISP) - UNITED NATIONS UNIVERSITY (UNU):
The UNU-ISP's main thematic section are Global Change and Sustainability; Peace and Security; and International Cooperation and Development. It takes innovative, integrated, and transdisciplinary approach for Sustainability and bridges cross-cutting issues through research, educational, and collaborative initiatives with the aim of solving current problems and anticipating future challenges. It works in collaboration with other UNU Research and Training Centres and Programmes as well as in co-operative relationships with the global academic and policy-making communities. It provides opportunities for postgraduate students and professionals to obtain a wider understanding of relevant issues.

THE UNIVERSITY OF TOKYO

Integrated Research System for Sustainability Science (IR3S) – UNIVERSITY OF TOKYO:
IR3S is a research network founded to serve as a global research and educational platform for sustainability scientists. Administered by The University of Tokyo and composed of eleven participating or cooperating institutions in Japan, IR3S is actively engaged in collaborative research with universities and institutes around the world. There are two main challenges facing the IR3S going forward, first is the development of a worldwide sustainability science network and the second challenge is education. By incorporating a new networking style and new types of education and research, the IR3S hopes to provide society with sound guidelines for the future of humankind.guidelines for the future of humankind.

ASU ARIZONA STATE UNIVERSITY

Arizona State University:
Arizona State University is a New American University, a public institution promoting excellence in research and teaching, increasing access to educational resources, and working with communities to positively impact social and economic development. At ASU, sustainability is a fundamental precept underlying teaching, learning, research, and business missions. ASU's Global Institute of Sustainability (GIOS) is the hub of ASU's sustainability initiatives. The Institute advances sustainability research, education, and business practices for an urbanizing world. ASU's School of Sustainability, being part of GIOS, brings together academic leaders to train a new generation of scholars and practitioners, building their capacity to develop practical solutions to the most pressing sustainability challenges our societies face.

Keynote Speakers

Dr. Hiroshi Komiyama

Dr. Hiroshi Komiyama became the Chairman of the Institute of Mitsubishi Research Institute, Inc. and President Emeritus at the University of Tokyo (Todai) in April 2009, after completing four-year presidency at Todai. In addition, he serves as a member of the Special Committee for the Council for Science and Technology Policy. Dr. Komiyama received his Bachelor's (1967), Master's (1969), and Doctoral degrees (1972) in chemical engineering from Todai. After serving as Dean of the School of Engineering, Executive Vice-President, Dr. Komiyama was appointed the 28th president of the University of Tokyo in April 2005. Dr. Komiyama Specialized in chemical engineering, global environmental engineering and advanced material engineering. His research work and papers have received awards three times from the Society of Chemical Engineers of Japan.

Elinor Ostrom

Elinor Olstrom is Distinguished Professor, Arthur F. Bentley Professor of Political Science, and Senior Research Director of the Workshop in Political Theory and Policy Analysis, Indiana University, Bloomington; and Founding Director, Center for the Study of Institutional Diversity, Arizona State University.
She is a member of the American Academy of Arts and Sciences, the National Academy of Sciences, and a recipient of the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2009, and the Reimar Lüst Award for International Scholarly and Cultural Exchange. Her books include Governing the Commons; Rules, Games, and Common-Pool Resources (with Roy Gardner and James Walker); Local Commons and Global Interdependence (with Robert Keohane); The Commons in the New Millennium (with Nives Dolšak); Understanding Institutional Diversity; and Working Together: Collective Action, the Commons, and Multiple Methods in Practice (with Amy Poteete and Marco Janssen).

Jill Jaeger

Jill Jäger is a member of the European Sustainability Science Group (www.essg.eu) and a well-known author on sustainability and policy. She has worked as a consultant on energy, environment, and climate for national and international organizations.
She is also a senior researcher at SERI in Vienna, Austria. She has served as the Executive Director of the International Human Dimensions Programme on Global Environmental Change, and as Deputy Director of the International Institute for Applied Systems Analysis.
Her main field of interest is in the linkages between science and policy in the development of responses to global environmental issues.

Parviz Koohafkan

Dr. Parviz Koohafkan is presently the Director of Land and Water Division of FAO and has a PhD. degree in Ecology from University of Sciences and Techniques of Montpellier, France, and an engineering degree in Agronomy and Natural Resources Management from university of Teheran, Iran. Specialized in integrated natural resources management and sustainable development, Dr. Koohafkan is the author of several books and publications on biodiversity, agro-ecology, climate change and sustainable development. Dr. Koohafkan is the pioneer and coordinator of the UN Partnership Initiative on "Conservation and Adaptive Management of Globally Important Agricultural Heritage Systems (GIAHS)" presently implemented in more than 20 countries.

Corrado Clini

Dr. Corrado Clini is Director General of the Ministry for the Environment, Land and Sea of Italy since 1990.
He is Chairman of the inter-ministerial task force of the Italian Government for the implementation of the Kyoto Protocol. Chairman of the G8 - Global Bioenergy Partnership since 2006 and Chairman of the European Environment and Health Committee since 2007. He is Member of the Clinton Global Initiative. He is Visiting professor at the Department for Environmental Sciences and Engineering – Tshingua University – Beijing and Visiting Professor at Harvard Kennedy School of Government.

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THE UNIVERSITY OF TOKYO

"A Roadmap for Industry-Academia collaboration towards sustainability"

SUSTAINABILITY SCIENCE WORKSHOP

Conference Room 6 - North Lawn Building
United Nations Headquarters - New York
October 5th 2010

NY - 5th October 2010

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SUSTAINABILITY SCIENCE WORKSHOP

United Nations Headquarters - New York - October 5th 2010

Industry – Academia Working Group

"A Roadmap for Industry-Academia collaboration towards sustainability"

Conference Room 6 - North Lawn Building

United Nations Headquarters - New York, NY

October 5th 2010

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THE CONCEPT BEHIND

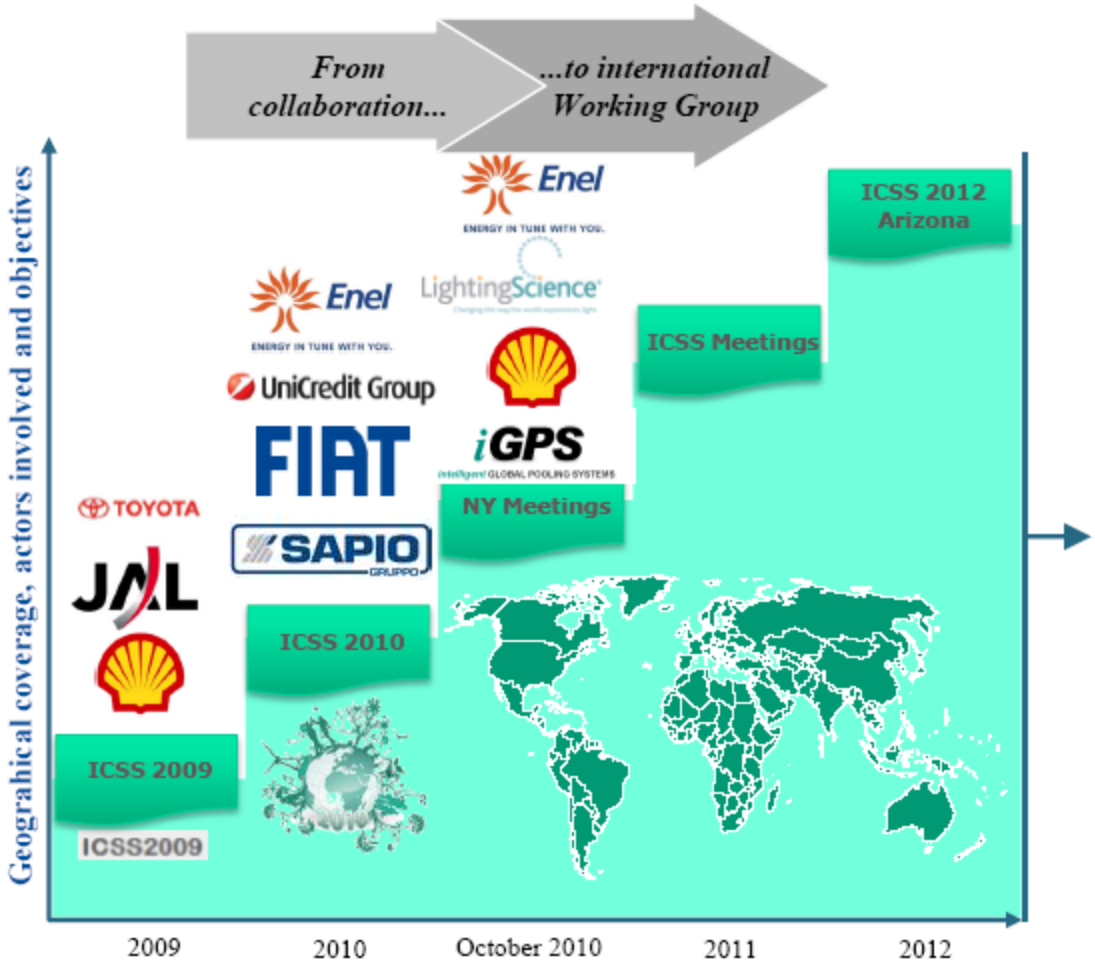
A new Science in the 21st Century

cannot be developed without a collaboration

between "business" and academia

We have to get the knowledge "where it is"

THE EVOLUTION OF I&A COLLABORATION



ICSS 2012 - Arizona

- I&A collaboration state of the art
  - ✓ Results
  - ✓ Challenges
  - ✓ Next steps

ICSS Metings

Future meetings focused on specific issues/topics decided in NY (*i.e energy sustainability, indicators, etc.*)

NY Meetings

- Sustainability Science International Society Kick-off
- Geographical coverage expansion
- Roadmap with key issues to be addressed
- Paper of Wills signature

- Enhancement of I&A collaboration
- Paper of Wills
- Roadmap

ICSS 2009

- ICSS Kick –off
- I&A collaboration Kick-off

ICSS 2010 Panel 1 "Industry and Academia for a transition towards Sustainability"

Working Points

Industry

- **How to enhance Industry-Academia collaboration**
- **Industry Strategy for Sustainable Business**
- **How to measure sustainability and sustainable business:** *beyond conventional economic indicators*
- **Deployment of new technologies:** *effective policies to promote sustainable business*
- **Industry and Sustainability:** *reaching a shared definition of Sustainability Science*

Academia

- **How to enhance Industry-Academia collaboration**
- **Industry Strategy for Sustainable Business**
- **How to measure sustainability and sustainable business:** *beyond conventional economic indicators*
- **Deployment of new technologies:** *effective policies to promote sustainable business*
- **Industry and Sustainability:** *reaching a shared definition of Sustainability Science*

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PAPER OF WILLS

- Declares intentions of the cooperating parties
- Indicates guiding principles of the collaboration
- Identifies main areas of cooperation
- Establishes the modus operandi
- Paves the way forward to key actions

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ROADMAP FOR THE I&A COLLABORATION

"To do" list:

* Increase the support of key industries from different continents
* Select key topics for future workshops before ICSS 2012
* Set-up of Working Groups activity
* Development of Topic Briefs

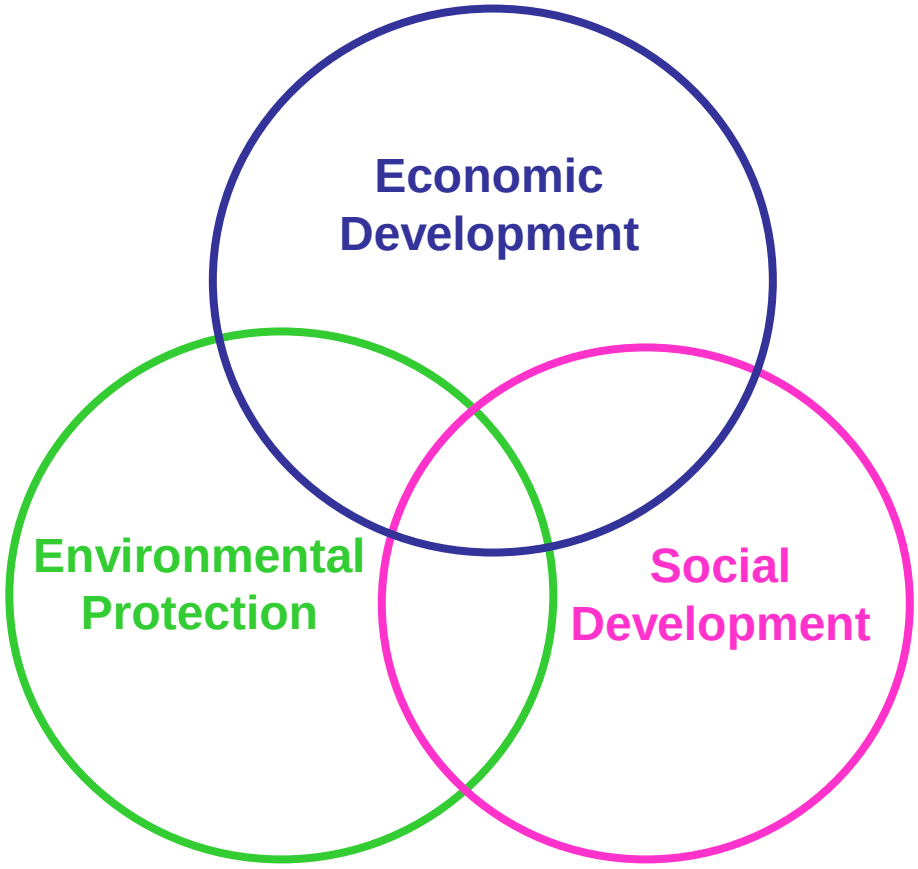
Sustainability Science in North America: towards ICSS 2012

”Knowledge to Action for Sustainability”

James Buizer
Science Policy Advisor to the President,
Arizona State University

The Role of Science in Sustainable Development

Sustainability Science **focuses on the dynamic interactions between nature and society, with equal attention to how social change shapes the environment and how environmental change shapes society.**



What Do Businesses and Governments think of University Scientists?

Current Perspective	Desired Perspective
Slow	Fast
Cautious	Bold
Ivory tower	Practical
Poor listeners	Responsive
Compartmentalized	Transdisciplinary

Mission of Sustainability at ASU

Dedicate ourselves to:

- The creation of new knowledge and technologies
- Research-based solution options to the most salient of sustainability challenges in the region
- Teach the next generation of business, government and university leaders, and
- Reduce the environmental footprint of our university campus operations.

Critical components of sustainable urban systems

Biophysical

- Clean air
- Adequate water & sanitation
- Stable climate
- Renewable energy supplies
- Non-polluting mobility
- Energy-efficient urban design
- Healthy ecosystems

Socioeconomic

- High-paying jobs
- Good educational system
- Affordable housing
- Low crime rates
- First-class public health
- Recreational options
- Innovation & creativity
- Cultural diversity

Overarching questions

- How can sustainability of individual urban regions be achieved in the face of increasingly rapid external drivers like climate change?
- What are the relative roles of individual behavior, corporate practice and government policy in making cities sustainable?
- What new tools, technologies and policies can help promote more sustainable cities?
- What are the complex dynamic feedbacks among components of an urban system?
- What can university research contribute to sustainability?

Specific questions

- How will urban water supplies be affected by the combined impacts of climate change, population growth and new re-use technologies?
- How to model generation, transport, deposition and health effects of air pollution in complex urban terrains under climate change?
- How to minimize health consequences of urban heat island effect? How can regulatory and economic changes promote the growth of distributed renewable energy systems within urban regions?
- How can integrated information technology, energy generation and storage and transportation networks reduce fuel consumption?

Priority for Moving Forward

- **Mobilize the required "knowledge network(s)" to:**
  - Create a cadre of "boundary organizations" as part of the decision support system, eg. Extension
  - Engage scientists, decision-makers, consultants, trusted information brokers, educational partners
  - Partner with professional/industry associations
  - Develop demonstration projects with early adopters
  - Train new skills; Enhance communications skills

Institutional Challenges

- Traditional Faculty Culture
- Engaging with the Community
- The Cost of Transdisciplinary Research
- Boundary Spanning

ICSS 2012

Arizona State University
Tempe, Arizona

February 22-24, 2012


Thank You Very Much