



## **Global Systems Dynamics and Policy**

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## Publishable summary

The overall purpose of the GSDP project is to design a research program for developing ICT methods, techniques and resources to study global systems in an open dialogue with policy makers and relevant practitioners. While in the first year the work was focused on producing an overview of the state of the art in global systems research, the primary task in the second year was to identify **key challenges and questions** which concern ‘**Global Systems Science**’ (GSS) and to carry out an intense activity of community building around this new emerging transdisciplinary field. In particular the work of the second year has helped to consolidate the actual concept of Global Science and to strengthen a community of learning around this concept.

GSS should not simply be considered a research activity in the more traditional scientific sense, but a growing body of ICT-centred knowledge with a science-policy interface in which multiple methodologies, research and technological approaches as well as policy concerns can be brought together. The overall goal is to improve our scientific understanding and coping capacities to deal with some of the most pressing global challenges of today.

The world of computation is growing into new dimensions, not only technically, but also socially. In the future, it will be essential to integrate the push for “more machines” – big data, super-computing, etc. – and for “social networking” – facebook, twitter, and beyond – through a better understanding of the global systems of which the emerging global ICT-infrastructure is a paradigmatic example (Figure 1).

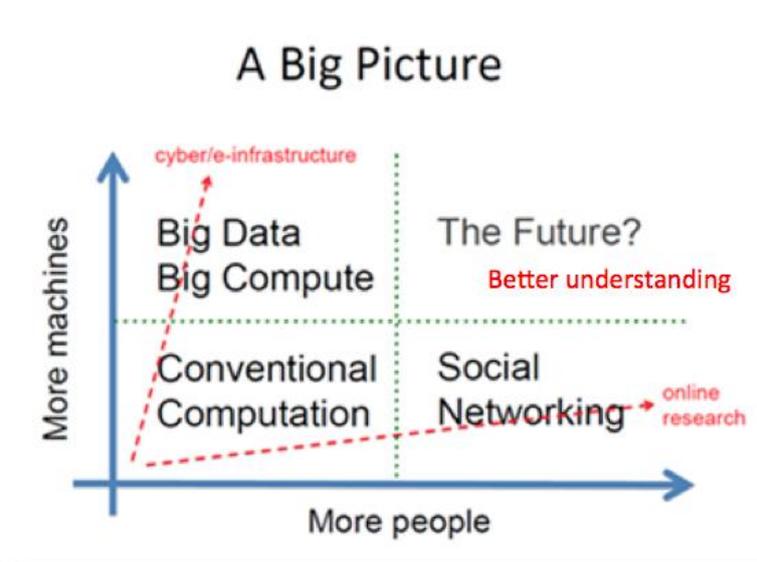


Figure 1. ‘A big picture’. From David de Roure (2012). ‘Knowledge Infrastructure for Global Systems Science’. First Open Global Systems Science Conference.:

[http://www.gsdp.eu/uploads/tx\\_conturttnews/David\\_de\\_Roure\\_-\\_Knowledge\\_Infrastructure\\_for\\_Global\\_Systems\\_Science.pdf](http://www.gsdp.eu/uploads/tx_conturttnews/David_de_Roure_-_Knowledge_Infrastructure_for_Global_Systems_Science.pdf)



However, better understanding cannot be achieved simply by combining more machines and more people, it requires an inquiry based on new insights, methods, questions, and practical initiatives – a research program for Global Systems Science. The second project year of GSDP has allowed to assemble elements of such a program and to nurture a community – much larger than the GSDP consortium – capable of fleshing out the program and develop vibrant research in that spirit.

Three distinctive features of the research program of Global System Science (GSS) shall be highlighted at the outset:

- GSS will develop as an ICT-based conversation among researchers and society. Society here means decision-makers, but also people in a variety of roles: members of political communities from counties to nations to supra-national bodies, members of professional fields that cross-cut political boundaries, members of cultural groups and networks adding further dimensions of personal and social identity.
- GSS will develop new ICT techniques, devices and methods to gather data on problems that are hard to deal with at the present state of knowledge, not only taking advantage of the rapid developments in ICT, but actively shaping them through the development of suitable algorithms, data structures, type systems, and high-level concepts. This will happen in a continuous interaction with the relevant industry.
- GSS will develop an understanding of global systems building on the achievements of algorithmic game theory and mechanism design. This shall enable societies to perceive global systems and focus attention on new options for addressing some of the biggest problems of our time. Coordination here is not only a matter of interaction between nations, but implies the ability to overcome barriers implied by received patterns of organizational specialization while enhancing, not weakening, the know-how made available by specialists.

During the second year, GSDP has directly organized or contributed to a rich array of Conferences and Workshops of relevance for GSS as follows:

- New Thinking about Global Challenges (Oct. 2011, Berlin)
- Expert Roundtable "New Economic Thinking" (Nov. 2011, Berlin),
- Planet under Pressure Conference (March 2012, London),
- Global Systems as Networks of Networks (May 2012, Florence)
- Financial Risks, Green Growth and Jobs (May 2012, Barcelona)
- Global Risk Forum (Aug. 2012 Davos).



- ICT & ART – Connect – Engaging dialogues in Art and Information Technologies (April 2002, Belgium)
- Modelling Carbon Prices – MOCAP (October 2012, Potsdam)
- Global Systems Science (Nov. 2012, Brussels)

Further information and presentations of these workshops are readily available at our project website: [www.gsdp.eu](http://www.gsdp.eu) and at the blog [www.global-systems-science.eu](http://www.global-systems-science.eu).

**For each GSDP work package, a set of key questions and challenges has already been identified** and these are available in our Second Year compendium of deliverables. **These elements have been integrated into a first outline of the global systems science research program**, again available in the Second Year compendium.

The research program will be finalised in the third project year. Against the background of all the work carried out and the new contacts established so far, therefore, GSDP will focus its activity in the third project year on producing a strategic document on Global Systems Science and further carrying out several workshops and support the preparation of new research proposals in this field.