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Science that matters: Perspective from young scientists

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By IIASA YSSP participants 2014: Edoardo Borgomeo, Mikko Dufva, Lukas Figge, Thomas Schinko and Fabian Schipfer



Photo Credit: Dan Suarez

A growing number of young researchers in various fields (for example the [International Student Initiative for Pluralism in Economics](#)) are realizing that responding to global challenges creates a need for more radical rethinking of some of the basic underlying assumptions of applied science, something that is not captured in most of the way research is done at the moment. Along that line, we argue that research is often not critical and self-reflexive enough and gets lost in the details without connecting to

the bigger questions for the future of humanity.

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In order to start a conversation on these topics, we organized a workshop as part of our participation in the 2014 IIASA [Young Scientists Summer Program](#) (YSSP). To prepare for the workshop we interviewed fellow YSSPers and asked each of them to identify one major controversial question for the future of humanity. This process resulted in five *Big Questions*, a list summarizing the five most controversial themes identified by the YSSP cohort. Our five *Big Questions* are:

1. **Adapting to changing environments:** Who will be affected how badly?
2. **Planetary boundaries and resource constraints:** How will we manage to live within planetary boundaries and resource constraints?
3. **(Re-)defining quality of life:** Can humanity prosper without economic growth?
4. **Dealing with conflict:** What will be the main reasons for conflict in the future and how to overcome them?
5. **The efficiency fetish of science and technology:** What are or should be the moral and ethical limitations to optimization?

At the workshop, we asked participants – which included YSSP participants and IIASA researchers from different cultural and scientific backgrounds – to discuss the five *Big Questions* and how applied systems sciences could evolve to address them. The workshop's outcome was not a list of answers to the five questions, but a list of guidelines that scientists should consider when doing research that seeks to address these questions.



Workshop participants from left to right: Margaret Garcia, Miho Kamei, Thomas Schinko, Farid Karimi Photo credit: Aleksandra Cofala.

1. Connect and relate to the bigger picture

We as a scientists know that when doing research, it is easy to get tangled up in the details and miss the bigger picture of why the specific research matters. From the discussions at the workshop we distilled three relevant aspects to avoid not seeing the forest for the trees when doing research. First, the

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participants considered it essential to reflect about the impact that our own research has on society. Second, and connected to the first aspect, the group of researchers affirmed that it is essential how researchers relate and engage with their audience. Third, the discussants concurred that communicating research results means taking part in broader societal discussions: every scientific question, especially in applied sciences, raises political and ethical challenges and we need to realize that these cannot be separated from our research activities.

2. Accept that controversy is a fact and that it matters

The second main takeaway message from the workshop is that there is controversy around important issues and that sometimes controversy is a desirable thing. We learned that as applied scientists we need to understand that there are different perceptions about a research topic, based on different (cultural) worldviews, politicized processes and from the framing of the issue. Furthermore these perceptions change over time. This means that researchers have to constantly reassess their own perceptions about the specific research topic. However, we argue that controversy drives research forward and, as climate scientist Mike Hulme puts it, disagreeing is a form of learning.

3. Be more reflective about normative assumptions and cultural biases underlying research

Another important aspect that was brought up by the workshop participants is that the framing of a research question reflects assumptions made about it, either explicitly or implicitly. We agree that making assumptions is of course needed in science, as it is an inherent part of dealing with real world complexity, incomplete knowledge, and uncertainty. But we argue that at the same time, it is important to be aware of and open about the assumptions made. We would like to reiterate three important questions a researcher should answer for herself when framing a research topic: who, where and when? Who do we assume are the stakeholders most affected by our research? Where do we concentrate our attention on? When, i.e. which time horizon, is our research focused on?

4. Foster inter- and transdisciplinary research

We are aware that for an individual scientist, it is not an easy task to take all of the three previous points into account. Therefore, to engage with the *Big Questions*, science needs to approach them from multiple angles and foster inter- and transdisciplinary research between natural sciences, social sciences, the humanities, and non-scientific stakeholders. We are certain that not being restricted to only one discipline paints a more detailed and comprehensive picture of a specific problem.

We have presented four guidelines that scientists should consider when doing research that seeks to matter, based on the results of the workshop on the five *Big Questions*. However, it is not our intention to give commandments about how to do science. What we and the other participants of the workshop learned

from the discussions is that interdisciplinary thinking and debating about the big picture and being exposed to conflicting viewpoints is not only imperative for doing research that is relevant for the future of humanity, but can also be a thoroughly enjoyable experience. And this is perhaps the key take-home message from the workshop: Have fun with your research and find meaning in it by connecting to other researchers and to the bigger questions for the future of humanity.



Photo Credit: Lukas Figge

Note: This post gives the views of the authors, and not the position of the [Nexus blog](#), nor of the International Institute for Applied Systems Analysis.

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