Session T1

International TA Perspectives

Chairs: Constanze Scherz, Somidh Saha (Institute of Technology Assessment and Systems Analysis)

We consider a global interest in technology assessment (TA), a growing recognition that societies worldwide need to develop adequate methods to anticipate and manage profound impacts of science and technology on economic, social and environmental conditions. In this session, we discuss how TA and similar activities work in different regions of the world. What can we learn from others' perspectives on knowledge-based policy-making on science, technology, and innovation? How to involve policymakers and other stakeholders in this endeavor?

With cases from India, South Korea, Mexico, Jamaica and Germany, we present and discuss different international TA perspectives such as:

- How to realize citizens' involvement adequately? How to integrate stakeholders and citizens in technology-related decisions?
- Maximum efficiency through modern technologies? Alternatively, degrowth and focus on local actors and their interests?
- Is there a "right" direction of technological development?
- How do the results of TA studies get into S&T policy?

To sum up: In talks of 15 minutes, the following presentations are planned:

- Innovation in policy discourses: India and the EU (Anwesha Chakraborty, Gothenburg)
- Reasons to do TA in South Korea (Moonjung Choi, Korea)
- Forestry sector and the discussion of maximizing efficiency through technology (Somidh Saha and Constanze Scherz, Germany)
- Urban decentralized water, sanitation and hygiene interventions: The influence of specific cultural settings in Jamaica and Mexico (Sarah Ward, Bristol)
- Citizens' participation in forest transformation (Iulia Almeida et al., Germany)

In a general discussion, the participants will work out what can be generalized from the research results and which aspects of technology assessment can be transformed into other countries and regions. Method: Clustering of arguments.

Science and technology for the people? On the framing of innovation in policy discourses in India and in EU

Author: Anwesha Chakraborty (Chalmers University of Technology)

In 2010 both India and Europe launched new strategies focused on innovation, for economic growth and for addressing societal challenges: the Decade of Innovation from the Indian Government and the Innovation Union from the European Union. This piqued our interest in investigating how these two political entities have envisioned the concept of innovation, particularly in studying and comparing how they have focused on people, both as final beneficiaries (and thus principal legitimizers) of policy actions, and as actors themselves in the innovation process. Per contra we found, in institutional documents, very different descriptions of how to adequately realize citizens' involvement, spanning from the abiding reference to people's inclusion in the Indian case to the varied discourses on public engagement in EU, down to the passive role accorded to citizens in some

Expert Groups reports. The comparison between the understandings of innovation (and innovators) in the two contexts can enlarge and refine the argumentative and metaphoric repertoire of science communicators. Further, it can form the basis of a mature and shared debate on the role that knowledge production and innovation policies can and should play in the public governance of science and technology.

TA Experiences in South Korea

Author: Moonjung Choi (Korea Institute of S&T Evaluation and Planning)

In Korea, technology assessment (TA) became mandatory due to the enactment of Framework Act on Science and Technology in 2001 and was performed from 2003. Since then, in total of 19 TAs were successfully completed on various topics such as big data, 3D printing, genome editing, blockchain and more. The purpose of Korea's TA is to find the right direction for technological development by evaluating newly developed S&T's impact on economy, society, ethics and environment and to apply its result to the related policy planning.

One of the important characteristics of Korea's TA is that TA is performed with the legal basis. The other characteristic is that the government, which is S&T Ministry, is responsible for the TA process. However, the Ministry does not influence the results of the TA. The role of Ministry in the TA process is to discuss the annual TA plan with KISTEP, which operates TA process, and gather opinions from the related government departments. And, the final TA results are reported to PACST (Presidential Advisory Council on Science & Technology) under the lead of the Ministry. This step is for the effective application of the TA results in policy and budget planning.

In terms of implementation process, experts and the general public participate in Korea's TA. It is a dual system that operates the TA Committee, composed of experts in the field of technology and experts in the social sciences, and the Citizens Forum composed of ordinary citizens. In addition, the online citizen participation bulletin board which does not have time and space restriction is operated at all times.

In this paper, the TA experiences and how the TA results are reflected to S&T policy in South Korea are explained.

Technology assessment in forestry sector under climate change

Authors: Constanze Scherz, Somidh Saha (Institute of Technology Assessment and Systems Analysis)

The forestry sector is going through a profound transformation in Germany and many other countries, which is leading to the development of new technologies. Technology assessment (TA) has an essential role in this context; however, the scope of this not yet thoroughly investigated. In the forestry sector, a wide range of technologies are used from the management of forest tree nurseries, site preparation and planting to production and use of timber. These technologies can be a combination of tools and machines (e.g., tree planting machine, timber harvester) as well as combinations of materials and production systems (e.g., genetically modified trees and monocultures). Use of modern technologies is chiefly designed for maximizing yield and profit from forest enterprises. However, they also create socio-ecological, socio-technological, and socio-economic problems. If not adequately assessed and mitigated, these problems can contribute in climate change (i.e., increasing greenhouse gas emissions), biodiversity loss, soil fertility decline,

social inequality (i.e., increase in poverty and income disparity), etc. The main aim of this paper is to develop a framework for global technology assessment to be used in the forestry sector. More specifically, we would like to address the following questions: 1) How we define "technology" in the forestry sector, and what are the most common technologies in this sector? 2) How can technology assessment be carried out in the forestry sector? 3) How transdisciplinary innovations to increase public dialogue and awareness can be used in technology assessments of forestry sector? We would like to achieve our aims by 1) doing a literature review on technology assessment in forestry sector, 2) assessing some relevant technologies (from tree planting to harvesting) and production systems (monoculture vs. polyculture) in current forestry sector, 3) providing examples on case studies from Germany, India, South Africa, Australia, Chile, and the USA. Our presentation and future article on this topic will be one of the first comprehensive academic works on global TA in the forestry sector. We are optimistic that our research paper will be useful for forestry practitioners and policy makers around the world.

Urban decentralized water, sanitation and hygiene interventions in technology assessment – When states and markets collide in the provision of alternative systems of provision

Author: Sarah Ward (University of the West of England)

Alternative and decentralized systems of provision focused on water, sanitation and hygiene, (WaSH) such as rainwater harvesting (RWH), greywater reuse, composting toilets or urine separation and reuse, require technology assessment (TA) to perform a dual role. Where such interventions are being considered, TA needs to be legislative advisor, to ensure the public good in relation to social needs, and market assessor, to determine how each privately developed intervention will perform and be received by people who will use them in their daily lives. This is no easy task where water laws, policies and guidelines, as well as world views, norms, values, beliefs, attitudes and behaviors relating to water-using practices are as diverse as the cities, streets and houses in which water finds itself. Cultural influences can be highlighted through policy documents, surveys and expert opinion, but these only go some way in developing an understanding of how social practices shape water use (and vice versa). Consequently, different configurations of alternative WaSH technologies and the form interactions with them may take requires careful representation in TA. These configurations and interactions can be particularly complex in urban and 'off-grid' contexts, such as in informal settlements on the urban periphery where there may be deep poverty. Here, conflicting informal and formal politics may impact decisions underpinning access to or distribution of water, creating issues of fairness and equity. Even where decentralized WaSH technology implementation is driven by policy, internal innovation systems may not be well-developed enough to respond to socio-technical challenges. Therefore interventions may come from across the global stage and may not consider the influence of specific cultural settings. These perspectives are explored in this presentation/paper through two contrasting narratives: (i) from Kingston, Jamaica, where corrupt garrison communities (unofficial leaders strongly connected to politicians) could impact the implementation of a new National Water Sector Policy and Implementation Plan (2019) that aims to provide 50 liters of water within 500m of every home, through a range of actions including encouraging RWH system implementation; and (ii) from Mexico City, Mexico, where RWH systems have been implemented in their thousands as a direct result of a Mayor-led scheme, but where harvested rainwater quality (as well as mains water quality) is so variable across the city that a 'once size fits all' treatment approach is completely inappropriate. In these contexts the norms and values of water-users, along with knowledge of their water-related social practices are becoming hidden and at risk of being forgotten as rainwater becomes commodified in multiple direct and indirect ways. The paper provides a

provocation for science & technology and TA scholars to consider how differing policy, value and innovation systems and issues of fairness, equity, inclusivity and gender will influence the continued development of a new transdisciplinary global TA and, in the context of urban water governance, how that relates to the achievement of sustainable develop goal (SDG) 6 (ensure access to/availability and sustainable management of water and sanitation for all).

Comparison of Ecosystem Services from Mixed and Monospecific Forests in Southwest Germany: A Survey on Public Perception

Authors: Iulia Almeida, Christine Rösch and Somidh Saha (Institute of Technology Assessment and Systems Analysis)

Scientific studies have shown that mixed forests of silver fir (Abies alba Mill.) and European beech (Fagus sylvatica L.) provide higher ecosystem services than monospecific forests. Mixed forests are known for their high resilience to climate change impacts and superior biodiversity compared to monospecific forests. Despite this superiority, the transformation from monospecific to mixed forests can meet socio-technical challenges that are manifested in dissent or even in conflicts. The integration of stakeholders and citizens plays a key role in analyzing their perceptions and views of forest transformation. Their knowledge is required to co-design and implement socially acceptable options and pathways to increase the share of mixed forests. Based on a survey in Southwest Germany, we analyzed stakeholders' and citizens' perceptions of ecosystem services of monospecific and mixed forests of silver fir and beech. The findings show that people believe that mixed forests provide better cultural, regulating, and supporting ecosystem services than monospecific forests. However, provisioning services were perceived as being equally or even better provided by monospecific forests. The assumed abundance of old trees and the feelings of pleasantness especially influenced the superior perception of ecosystem services provided by mixed forests. The results indicate that there is public support for the transformation of monospecific silver fir and beech forests into mixed forests in Southwest Germany.