



2018 CONFERENCE REPORT

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INTRODUCTION:

The 2018 conference of the Transformative Innovation Policy Consortium took place on 3-4 October at the University of Sussex, hosted by the Science Policy Research Unit, and was attended by over 100 delegates from across the world. This report is a detailed compilation of the discussions and presentations of all parallel sessions that took place at the conference. This report has been compiled from session notes of scribes, and has been loosely edited in order to retain the rich nature of debate in each session. For a shorter, broader overview of the conference, please see our executive conference report.

The sessions were varied in content and structure, but the focal point for all was the emerging opportunities, contestations, challenges and directions of Transformative Innovation Policy (TIP) theory and practice in the arena of science, technology and innovation policy. The conference saw lively discussion around key programmatic elements of TIPC such as capacity building for TIP initiatives and developing evaluative frameworks for TIP. Pioneering case-studies of Transformative Innovation Policy experimentation were also explored, including examples from Colombia, Mexico, China, and Sweden as well as broader analysis of regional trends across Africa, Latin America and Europe. Other parallel sessions explored thematic concepts crucial for TIP, such as place-based policy making and experimental cultures.

The conference provided an opportunity to reflect and debate upon the way forward for Transformative Innovation Policy with a diverse range of actors from within the Consortium, those closely related to and interested to its work, and those that were relatively new to the ideas and goals of TIPC. The 2018 conference was both enriching and productive, and this report reflects the large range of topic, themes and debates that were discussed over the two days.

TIPC would like to thank the SPRU PhDs and Masters students - Vusa Ncube; Arthur Moreira; Maria Ruiz Sierra; Paloma Bernal Hernandez; Melina Alejandra Galdos Frisancho and Bipashyee Ghosh - for their invaluable work in scribing and reporting on the conference sessions.

PARALLEL SESSION 1A: Transformative Innovation Policy in China

Panellists:

- Adrian Ely, (Chair), Senior Lecturer, SPRU
- Guangxi He, Deputy Director & senior researcher at the Institute of Science & Technology and Society at CASTED (Chinese Academy of Science and Technology for Development)
- Dongmei Liu, Vice President of CASTED (Chinese Academy of Science and Technology for Development)
- Kejia Yang, PHD student, SPRU
- Jialing Lu, Visiting Research Fellow, SPRU

The session began with a historical overview by Guangxi He of China's STI policy, displaying primarily a frame 1 and 2 approach. Traditionally, STI policies have focused on promoting R&D investment and technology transfer as a means to foster economic growth and favour China's catching-up process. Recently, however, STI policies are taking a new turn towards a broader understanding of development beyond economic growth, incorporating a green, innovation-driven, and beneficial-to-all focus aligned with the Sustainable Development Goals agenda. Within this context, is where the transformative innovation policy framework becomes key in order to promote transformative change through experimentation and active societal participation.

Practical examples of policy implementation and initiatives such as the Science and Technology commissions for poverty alleviation, the renewable energy industrial development policy or the emerging sharing-economy services, were analysed from different perspectives, according to their approach: top-down/ government driven or bottom-up/ society driven as well as to their aims: economic or social development.

Moving to specific transformative innovation learning experiences, Kejia Yang, PhD student of SPRU, described how China's government had envisioned renewable energy as instrumental in order to tackle environmental challenges like air pollution. She drew upon the fast-growing development of the solar and wind power sector to carry out policy analysis. As a result, she highlighted the importance of understanding the different capabilities and needs of the multiple regions of China, and how this can have a direct impact on the outcomes. Furthermore, she reflected upon the different policy alternatives for this purpose: policies that promote large-scale environmental sustainability through industrial transitions (e.g. wind power policies) and those that encourage people's empowerment as small-scale producers (e.g. solar power policies).

Dongmei Lui, vice-president CASTED, described an opportunity to stimulate transformative innovation referring to the government's approval to create demonstration zones in three cities to experiment with alternatives around environment, energy and agriculture. The spirit of these zones includes the participation of multiple societal actors and an approach well beyond Science and Technology.

On the other hand, Jialing Lu, visiting Research Fellow at SPRU, emphasised the importance of the implementation stage of transformative innovation policies, arguing that it continues to be unclear how to do it, especially given the vast differences between rural and urban areas. She reinforced the relevance of local government to enhance regional understandings by data gathering and tailor-made implementation processes.

Going through all the interventions, four main conclusions become apparent:

- Transformative innovation policies have reached China's public agenda, and there is a growing commitment to open spaces for policy experimentation to address the most pressing societal challenges. Even if frame 1 and 2 remain important in the long run, frame 3 principles are increasingly being incorporated into policy processes, yet the design of sound strategies for governance and social inclusiveness is needed.
- Civil society empowerment and local engagement in development processes remains a challenge to move successfully towards transformative approaches in policy making.
- With a highly centralised government, there is an increasing need to balance coordination and control among administrative departments with a higher autonomy of local government for experimentation according to the understanding of particular contexts and needs.

PARALLEL SESSION 1B: Experimental Cultures

Panellists:

- Paula Kivimaa, (Chair), Senior Research Fellow, SPRU
- Lucy Kimbell, Professor of Contemporary Design Practices and Director of Innovation Insights Hub, University of the Arts, London
- Annuka Berg, Senior Researcher at the Finnish Environment Institute
- Adrian Smith, Professor of Technology & Society, SPRU

That experimentation constitutes an important means to pursue transformations towards sustainability is now well established. Around the globe, countries and cities are doing their best to establish an 'experimental culture', 'prototyping culture', 'experimental governance' and so forth. These terms, often painted in broad strokes, convey the idea that to induce transformations it is paramount that the practices, attitudes and means of governing should become experimental. They affirm that embedding particular innovations generated through ad hoc experimentation does not

suffice. This session fostered a nuanced discussion about the diverse experimental cultures which are emerging in different contexts. The approaches most suitable for Transformative Innovation Policy, and the political dimensions of such efforts, were explored by global practitioners and scholars involved in concrete attempts to embed such cultures in both governmental and grassroots settings, in Latin America, Finland and the UK. Further notes shortly available on web version.

PARALLEL SESSION 1C. Towards a STI public policy agenda as a transformational agent in Mexico: The case of sustainable fishery in the Southeast Region

Panellists:

- Teresa de León Zamora, (Chair), Director of Technology Commercialisation in CONACYT, the National Science and Technology Council in Mexico
- Julio Alcántar, Planning Director at CIDETEQ, and R&D Public Center; and part time postgraduate lecturer at Queretaro University in the PhD Technology Management and Innovation Program
- Emilio Martínez de Velasco Aguirre, Regional Director, National Council for Science and Technology, Mexico (CONACYT)
- Carmen Bueno, Professor and Researcher at the Graduate Program on Social Anthropology, Iberoamericana University, México City. Consultant to the National Forum of Science

This session focused on understanding the potential opportunities and challenges for the National Council for Science and Technology (CONACYT) acting as a transformative agent in the Mexican context. Transformative innovation was aligned with the objectives of CONACYT and the case study chosen by the team was located in Merida in Yucatan, south-eastern Mexico, where a possible niche was identified. This region has high levels of gender inequality and poverty: 30% of women were earning less income than the minimum wage salary in the last year; 40% of the population is living under poor conditions; and 60% of the child population have obesity problems. The key productive sectors of this region are production of pork and seafood, particularly octopus. This region is characterised by the application of a STI policy under frame 1 in which there is intensive investment from universities, research centres and laboratories, and an important focus on IT formation. CONACYT and TIPC identified that the fisheries of Octopus Maya as a potential niche. Maya octopus is an important natural resource, and the population living on the coastal area depend on its sustainability. About 12.000 fishermen work directly with the production of octopus and women are an important part of this socio-technical systems. Fishermen usually sell the octopus to freezing companies and wholesalers who in turn sell this product to final buyers. The octopus is finally exported to markets in the U.S.A, Asia and Europe, where there is demand for frozen octopus. Since there is not much transformation of the exported product and there is high demand, it is said that the freezing companies and wholesalers are in a 'comfortable position'.

Due to the low limitations for entering in the fishing business and the growing demand for octopus, there has been an increasing pressure over natural resources. This has resulted in higher competition amongst actors and lower quality of the product putting pressure on the dominant regime. As a result, there has been a reduction in the octopus population, increase of illegal and bad practices (e.g. increase of the use of Clorox and explosives) and more importantly, social confrontations and loss of trust within the fishing community and between fishermen and government actors. In addition, natural disasters such as hurricanes in the Yucatan peninsula worsen the situation for the sector.

The team of CONACYT identified a possible niche: fishermen's wives. In this case, the team identified a very particular niche in which several researchers work with a group of women in order to develop aquaculture and produce octopus outside the sea. It was seen that these women were willing to get involved in cultivation of octopus. This niche can help to fight against the regime of bad practices for

fishing octopus Maya and the massive exploitation of natural resources. Fishermen's wives were working with research institutions to cultivate octopus in laboratories in order to improve the taste and other characteristics of this product and to participate in discussions with these organisations. Although in an initial stage, this could be a potential solution for problems in this sector. Working with the women's cooperatives, it could be possible to think of an experiment and a niche that can potentially generate positive impacts on the SDGS such as: provision of decent works for women, reduction of poverty, inclusion of this population in economic growth, improvement of gender equality etc. Due to these impacts, the team of the TIPC want to co-create solutions with these cooperatives, help improving the environmental and economic sustainability of these communities, increase the awareness of these communities regarding better environmental conditions, and evaluate the results.

In order to reorient the current policy that has been focused on increasing productivity and growth, the team propose to create new spaces of learning and co-creation in which STI agencies and fishing communities learn from each other. The resources needed are infrastructure, financial support, training resources and proposed activities for development are inter-institutional collaboration, multidisciplinary training and mentoring, co-learning and evaluation. CONACYT expect that outcomes may include scalable aquacultures cooperatives, empowering women, and a parallel solution to massive fishing. Academic and research centres in the area of the case study are aware about local problems and the need to train women in terms of technical knowledge and entrepreneurship.

Questions and comments:

Q: Based on the evidence from other countries in Latin-American, governmental agencies often have a distance from activities occurring in rural areas and their communities in terms of backgrounds, knowledge, perceptions of problems, degrees of liability, trust, etc. To what degree have you thought about this problem and how do you make sure there is going to be trustable collaboration and equal exchange between the local governments and communities?

A: One of the different directorships of CONACYT is called Regional Development which is in charge of working closely with regional populations and recognising their specific challenges. Based on this work, CONACYT designs instruments of public policy in order to satisfy local demands and close the distance between communities and governmental actors. Since CONACYT usually funds companies, universities, entrepreneurs, and in few cases, cooperatives, there is still an important need to identify actors within the niches of this case study and to find the way in which they can be supported. In addition, CONACYT works has implemented "The mix fund programmes" in which both CONACYT and state governments fund local governments according to their particular STI needs and projects and involve other actors from local communities through these projects.

Comment: The team of CONACYT need to explore how farmer cooperatives can govern themselves in a way that more activities become more sustainable in highly problematic contexts such as in this case and how they can establish trustful relationships with national institutions. It is important to point out that communities not only need resources, but also leading actors who also have a vision and foster local development that improve production processes in order to be more sustainable. In these cases, the team need to identify who are these entrepreneurs and what type of capacities do they have to develop in order to organise their peers as well as communicate with regional institutions, for example CONACYT, in a reliable way.

The process from innovation to sustainable innovation can take around 10 years as in the case of farmers in the Netherlands. Farmers needed to be provided with economic resources and technical knowledge as well as knowledge of the socio-economic environment of the region.

The team of CONACYT understands the need of following a bottom-up directionality and to strengthen the sustainability of these communities in a way that they do not depend on public funding through strengthening of their capacities.

PARALLEL SESSION 1D: Research design and method for Transformative Innovation – Global South Focus

Panellists:

- Ed Steinmueller, (Chair), Professor of Information & Communication Technology Policy, SPRU
- Erika Kraemer Mbula, Associate Professor in Economics, at the University of Johannesburg
- Bipashyee Ghosh, PhD student, SPRU
- Rob Bryne, Lecturer, SPRU

One of the key components of TIPC is the intention to change research processes in order to alter public and policymaker discourse. Discourse can be changed in a variety of ways such as through academic publication and what is taught at universities. These two are influenced by how experience is translated through the lenses of research into academic publishing. The aim of the session is to talk about the problem of communicating experience working with TIP in established platforms for academic communication. The panellists should try to address the issues around transformative innovation research in their academic experience, such as recognition among peers taken that the field is, by definition, interdisciplinary. This approach is likely to sometimes even generate hostile reaction from other researchers in the department. Another common issue is regarding research methods and the obstacles brought by the necessity to publish and to follow certain practices, for instance, the established literature, methodology and evidence within a specific area.

Panellist Rob Bryne spoke about the interdisciplinary nature of SPRU which allows him to practice this without any issues. His current work is focussed on using climate action projects to help to build and strength innovation systems around climate technology in African contexts related to mitigation and adaptation. They run workshops in Kenya with policy-makers and in July they held a 2-week training to develop project proposals. The proposal is to then try to channel resources for climate action in their areas and to contribute to innovation system building.

One of the training sessions was an intensive one-to-one class to convey ideas of innovation systems (how to do it, to build it) with people from different backgrounds than STI studies. The follow-up will be virtual activities for the lack of resources. He hopes that the outcome for the near future would be better established proposals that will succeed in bringing resources to be applied in the area. This type of work represented a 2-year commitment, with little budget and no research. But how to turn that kind of experience, that hopefully has a meaning, a purpose and a contribution, into something that one can get published, bearing in mind that the researcher should not be exploitive and at the same time is under constant pressure for publication? The kinds of experiences that could be translatable into academic publication are the ones related to anthropology or ethnography, but that is not his background and he is struggling with finding what is available for him to be used academically.

Having just submitted her thesis at SPRU, Bipashyee Gosh shared some insights from her research. She focused on what she understands for transformative innovation in a Global South context and how to understand whether innovation is transformative or not. Her PhD "Transformation beyond experimentation" studied urban mobility transition in Calcutta, in India. She aimed at developing theoretical understandings of transformation within the transitions literature domain. She adopts the use of the term "Global South" even though it brings some criticism regarding geographical specificities, but it seems to apply well for her case because it indeed reflects the context.

Back to the question of what transformation is, there are two answers: 1) Transformation begins with experimentation. In addition, experimentation requires a look beyond the "niche actors" perspective, reaching also agents from outside those niches, which are present in certain regimes: policy actors, firms, governance organisations and users are equally important in the process since they innovate and experiment. She called it "regime transformation", a changing process that initiates within the regime settings and pushes its boundaries by changing rules. Important for

research on transformation is to locate what is the change in expectation of these actors regarding the future. Using cases from public transportation system change in Calcutta show that transformation in regimes happened because there were new beliefs and expectations about technologies, policies and social-cultural meaning.

A key aspect of transformation is that it is not just about mitigation of challenges, but shapes future through anticipation. The irony is that the idea of shared and collective expectations are highly problematic in the Global South since needs and routines are extremely heterogeneous due to the fact that diverse groups are in constant competition for space. This diversity arrives from differences in income inequality, education level etc. The key element for transformative innovation in this unequal context derives from the question "Who does transformative change benefit? And who is it for?"

In her study case of the proposal of a smart city in India, she tried to answer the question "What does it mean to be transformative in a democratic context?" The proposal for the smart city was supposed to be inclusive and sustainable but she investigated whom it actually included and whom it excluded. Through discourse analysis, she could conclude that a democratic transformative change does not simply derive from inviting marginalised actors to take part in discussions such as public forums. Their voices were heard but in fact not included in the projects. Policy-makers tend to adopt practices copied from the Global North and therefore exclude local voices. Therefore, researchers from the Global South should make use of theories from the North, but also keep in mind the issues with application in a different context.

An important aspect of researching in the Global South context is to engage with stakeholders and practitioners. Engaging with local academics, for example, helps to understand how they view particular issues. Emerging in coordination and interaction with heterogeneous actors can help to raise issues that come from local context.

The matters of translation and adaptation to local experience are currently not suitable for academic publication. The fact is that perhaps academic publication should be changed so it makes room for this type of research.

Erika Kraemer-Mbula spoke about her experience working in an interdisciplinary study and the challenges it brings: how to enforce integration in departments, how to locate oneself in an institution that has a disciplinary focus. It seems that currently, researchers are successfully engaging in multidisciplinary research. Teams of researchers with different backgrounds are brought together and each of them uses their own methodologies to explore the research. However, they are not succeeding in working in Trans and interdisciplinary research, such as having a common objective, using a common methodology, interpreting the data together.

Being an economist with an interdisciplinary approach and focused on innovation studies brings several challenges, especially related to capacity building, that is, trying to bring more people into the system. For example, bringing new PhDs in that group/system is tricky, also because there are insufficient assessment capabilities to evaluate a type of research that differs from the other students within economics. Multidisciplinary and interdisciplinary are usually welcomed by funders in South Africa, but the problems arrive when reviewers for proposals are needed. In some cases, this problem is solved by using international evaluation.

Another related issue is that the success of projects is still very much focused on academic publications. However, transformative innovation policy is often focused on interactions with policy-makers, which can require other types of outputs. Workshops, reports and other documentation can be of much validity and have great impact but they do not necessarily fit into the sets of academic publication.

Questions and comments:

The themes highlighted by the audience were: a) the absence of the approach of sustainability science in the local scientific community of African countries; b) the case of import substitution industrialisation in Latin America as an example of a type of technology transfer; c) absence of

discussion on “cognitive justice” when dealing with multidisciplinary and transdisciplinary research; c) the absence in discussing the role of governance.

Regarding the issue of trying to have a local influence when collecting data for research, Erika illustrated a case of a project in innovation in the informal economy. A workshop was organised with different stakeholders, including representatives of the informal economy sector. In that case, the informal economy stakeholders were invited to directly participate for the first time and not just to listen. The lesson is that when inviting stakeholders for participation, there is a need to not only having them there but also to hear from them. Trying to be inclusive is a moving target. Regarding cognitive justice, ethics in research is essential for interaction with indigenous knowledge, but this is not always the case, especially when collaboration is drawn from different structures of power. First, the danger of being policy focused is that we only look at things that are influenced by policy, letting aside matters that go under the radar. Second, by looking at transformation as a consequence of innovation leaders, we fail to look at macro-economy and political economy aspects that also influence the process. Third, we are exhausting the current system of mass-production. The new system is expected to bring consumption and production closer. If in one hand there is a need for large regulatory change and in the other for decentralisation. How to combine those two? The fact that there has been decentralisation of production does not mean that there was decentralisation of ownership nor decentralisation of the appropriation of the benefits of innovation. Bringing production close to consumption. The drive is to localise production systems. The political challenge is that we might have decentralised innovation occurring around the world but the appropriation of benefits is not happening. Inevitably, wherever we begin we come to: what is the vision transformative innovation is seeking? Where is it going? Who will participate in the process? What is the relevance of academic publishing and discussion of this?

PARALLEL SESSION 2A: New directions for Innovation Policy in Latin America and emerging opportunities for transformative change

Panellists:

- Sandro Giachi, (Chair), Research Fellow, SPRU
- Alejandro Olaya Davila, Former Director of COLCIENCIAS – National Agency of Science, Technology and Innovation of Colombia. Currently, Chris Freeman visiting fellow at SPRU
- Ana Lúcia Stival, Senior Analyst of science and technology, Brazilian Ministry of Science, Technology, Innovation and Communication (MCTIC), Visiting Researcher SPRU
- Carlos Aguirre Bastos, is specialist in science, technology and innovation and higher education policy in developing countries, Senior Policy Adviser at the National Secretariat for Science of Panama
- Teresa de León Zamora, Director of Technology Commercialisation in CONACYT, the National Science and Technology Council in Mexico

This session was formed by four policymakers from Latin America and focussed on some of the trends for transformative policy in the region:

- 1) The centrality of Sustainable Development Goals in the political agenda;
- 2) The increasing relevance of social innovation and inclusive development;
- 3) The connections with social movements and indigenous communities;
- 4) The role for regions in STI policy?
- 5) The dilemma between economic competitiveness and addressing social and environmental policies.

But the fundamental question for this debate is: which changes, trends and opportunities for transformative change do you see in your countries?

Alejandro presented some of the steps in process of constructing The Green Book 2030, the Colombian national policy guidelines for STI policy. Four trends were present in the construction of the Green Book. The first trend was the increasing interest of Colombian politicians in the SDG agenda, which may have started in RIO +20 in 2011. Another trend was the increasing interest of some leader's opinions on the STI System in Colombia. It moves from a more linear approach of the role of knowledge to a problem-solving approach that pays attention to need for applicability. Bibliometric evidence a broader interest in the Colombia scientific community on SDG Research: 30% annual growth of publications in SDG; 20% citation impact over the worldwide citation average; 15% of the Colombian SDG output are the most cited worldwide. This trend shows that there is space for research in the country beyond traditional areas. Finally, it was noted that there is a need to move on from the classic metrics to alternative ones.

Ana Stival spoke about the context of the STI policy in Brazil. In the period 2000-2015 there has been an increasing expending in STI amounting nowadays the sum of 25 billion US dollars (from both public and private sectors, each contributing with half of the figures). There is also an increasing number of people with post-graduation, of research groups and researchers, and of scientific articles indexed by Scopus (which represent 2% of world production). However, the picture is not as positive when looking at innovation. The amount of patents filed is steady, not increasing. The amount of companies investing in R&D has not changed. In comparison with other countries Brazil is in a similar situation to the BRICS regarding the percentage of GDP invested in STI (1.2%) and the number of researchers, but again, when it comes to patents, Brazil is in a lower position. The Brazilian National Innovation System is established and structured. It operates at federal and state level, but the society participation in the political operators is mainly formed by academics and company associations. It doesn't include groups from the Brazilian society that don't belong from these two groups. Therefore NGOs and other civil actors do not seem to be currently relevant to the System. Programs implemented by the Federal Government regarding transformative approaches tried in the last 15 years to tackle social issues. However, they are very narrow, allocated in specific areas and departments, receive small budgets and are developed in a top-down dynamic, not opening up for societal participation. Regarding the strategy present at the STI policy in Brazil that is set for the following years until 2022, the main challenges that can be identified, together with catching up, are the promotion of innovation, sustainable development and social and productive inclusion. However, the instruments used to reinforce policy for the challenges are very much focused on the promotion of research and entrepreneurship. It exemplifies the disconnection between the challenges and the instruments.

The STI policy presents 12 strategic themes that are related to 12 areas (aero-spacial and defence, water, food, digital economy, energy, climate etc.) Those are areas that could be related to SDGs and would be opportunities for a different approach. Even though current STI policy prioritises sustainable development and social inclusion as goals and the National Strategy is potentially related to sociotechnical transitions in areas such as energy, bioeconomic, food, digital economy, the instruments are still focused on Frames 1 and 2. Brazil is facing significant cuts in public spending in STI, which on one hand is posing a threat to the continuity of business as usual, but on the other, it is an opportunity for discussing the type of policy in use.

Insights from Carlos Bastos on Panama demonstrate that in 2015 a new approach for policy was taken that focus on three grand challenges: sustainable development, inclusive development and economic development. This change in the approach is related to the focus on SDG, but it brings a lot of problems: there are 17 SDG and only 13 years to accomplish it, but there is no money. Some countries claim that they are going to achieve the goals, without money and in such a short time. But how feasible is this scenario for Latin American countries?

From those 3 grand challenges Panama is addressing, a focus on inclusive development is needed. The economic challenges are related to the traditional ones, such as competitiveness. However, the inclusive part is the more complex one. It requires dealing with unknown social groups, who are not acknowledged by innovation policy studies. The approach taken was to understand how indigenous

knowledge has been developed in the past and what it actually means: an attempt to understand how indigenous people view knowledge. The secretary then has made a formal call for projects having in mind what they learned from their study of indigenous knowledge. But the fact is that the call received proposals in a very traditional way. It exemplifies the grand challenge of making the scientific community aware of the traditional community and inclusive development. After choosing the projects in the standard way, the traditional community, aware of the process, did not agree with the allocation of funding. The transformative approach needs to redirect its effort to a future perspective, but at the moment the focus continues to be rooted in the present, in the current ways to do research.

Teresa de Leon focussed on STI in Mexico. Mexico has half of the population in poverty, has severe security problems and is number 58 in the global innovation index. Contributing to that is the ranking of institutional aspects such as lack of governance and transparency and a systemic corruption. The budget for STI is rather small, US 1.7 billion per year.

The challenging aspects within which the Science and Technology Council is trying to address are related to developing capabilities in STI and not, for instance, security problems. The Council cannot tackle everything at once. But it can contribute with some skills regarding four challenges:

- STI policy in Mexico is Frame 1-focused: 75% of the budget is allocated here, which, as TIPC makes clear, might not be the most relevant for society.
- The auditing is not working well. Are calls the best way to choose projects? The selection criteria have not been aligned with societal needs.
- The policy has not been good with working locally and has taken a centralised and top-down approach.
- There is a lack of coordination and consistency among the ministries. The different actors are all working apart from each other.

The current scenario also presents some opportunities and trends. Social innovation has been growing strong, with civil society and universities. CONACYT then wants to identify trends and niches in this movement and use it for designing STI policies.

The new government has adopted the SDG approach deeply. CONACYT has in the last years tried to identify and contribute to national problems, moving focus out of Frame 1. Regarding Frame 2, there has growing attention to build social innovation networks, developing clusters and nodes. Strong Frames 1 and 2 should now contribute with and be utilised to address transformative innovation, moving now towards Frame 3.

Regarding international support in Mexico, some Asian countries, the British Council and the TIP Consortium are important contributors. Teresa clarified that TIPC really makes sense to what Mexico wants to accomplish in the area. It was noted that there was a common trend in the need to address societal challenges, framed as SDGs or missions. There is also a recognition that most of the tools that are being used are quite traditional and that concepts such as entrepreneurship or research and development can be used to address those challenges.

So to what extent are the innovation policy efforts addressing the SDGs in Latin America? In Brazil, there is a lot of work being done regarding SDGs and there is potential for more because in that sense Colombia and Mexico seem to be ahead in the process. But a big issue that should be considered here is how to translate knowledge into reality-changing actions. We complain that there's no budget to STI policy, but many times society cannot see an impact being made, which makes it more difficult to support this type of investment.

There is a need to develop a narrative to reach politicians when discussing innovation. To talk to them about the relevance of STI is complicated because they are not really interested in the theory. The language of SDG brings that opportunity because it is easier and facilitates the interaction with policymakers because what they are interested to do is solving specific problems. The issue with small budgets is also present in Colombia, but perhaps with a different narrative, we could convince a regular flow of resources in this direction.

In Panama, the society does not feel that STI policy is contributing to their demands for changes. Enterprises believe that knowledge is available anywhere so they do not need to develop it. And politicians are short-sighted. In the end, the agents don't believe in what STI studies propose and on the top of that there is no money. So, the question is, basically, what can we do? He agrees that a new narrative for transformative innovation should be constructed and modified for the specific audiences they are addressed for.

An interesting fact that was brought to the discussion was a research study on how society value science recently done in Brazil. It showed that more than 70% people believe that science can help to solve problems and that research can one day, for instance, help with main issues such as a solution for cancer. On the other hand, in the Brazilian case, the interviewed people did not believe local science would be able to do so.

Questions and comments:

Comment: We shouldn't over-estimate what policy alone can do. Policy has to work with and learn from civil society. Over the past 25 years, public policy systems have been constructed on ideologies from the Washington Consensus. Bringing the society is a way to avoid top-down policies that could be distant from what must be addressed. We need to open up the process for a bottom-up demand for the type of STI policy we engage in.

Q: There are opportunities now, but the window the opportunity might not be there in a few years. What seems to be more stable and present is the presence (via advising and funding) of international agents such as the OECD or the Inter-American Development Bank. And this might be especially true for smaller countries with smaller budgets. How do those agencies contribute to the STI systems in Latin America?

A: Regarding the complicated narrative for transformative policy in Colombia, one particular issue is that the terminology around "changes" and "transformations" is likely to be refused due to the fact that the country is very conservative. The new language to approach politicians would have to keep that in mind.

Q: Is there enough room for manoeuvre to push the issue of "unlearning" previous patterns? What would be a good strategy to do so?

A: Regarding the best strategy to push changes in the policy approach from governmental STI institutions, one way to start would be working with Universities and their relation with civil society, in a very active way and opening space for experimentations. Indeed, we need to open up the process, as suggested. Regarding international organisations: please forget about them! Panama has to develop its own approach to see what it works there and does not simply apply what is suggested by foreign organisations. There are many experiences of, for instance, local inclusion and processes that need to be analysed by, utilised for, and diffused by our policy initiative.

Regarding international organisations in Colombia, the interaction with the World Bank has been problematic. They only give the loan their own line of policies are implemented. In respect to bringing together traditional knowledge and formal academic knowledge, the efforts are still being developed. Good news is that the last prize in science in Colombia was given to a project that brought together these two types of knowledge.

In Brazil, the system is not including civil society groups (NGOs etc.) They are not relevant actors in the formulation of policies or in the process of allocating funds. There is a resistance from the scientific community in the matters of the outcomes of a scientific research. They refuse to acknowledge the merit of research that doesn't follow the regular approach of science. There are specific solutions for specific things and, for instance, patents are not the only way to approach challenges.

PARALLEL SESSION 2B: Transformative Innovation Policy in Africa: aspirations, progress, and challenges

Panellists:

- Chux Daniels, (Chair), Research Fellow in Science, Technology and Innovation at SPRU
- Matthew Wallace, Senior Program Officer at International Development Research Centre (IDRC), in Ottawa
- Imraan Patel, Deputy Director-General Department of Science and Technology, South Africa
- Ann Kingiri, Senior research fellow in STI with a focus on inclusive and sustainable development at African Centre for Technology Studies (ACTS)
- Mafini Dosso, Economist and Policy Analyst at the European Commission's Joint Research Centre (JRC) in Seville, Spain

Dr Chux Daniels introduced the panel and gave a brief background highlighting Africa's aspirational agenda; the African Union Agenda 2063 and the importance of background policy frameworks such as the Continental Educational Strategy for Africa (CESA 16-25) and the ten-year Science, Technology and Innovation Strategy for Africa 2024 (STISA-2024). He highlighted the transformative potential of deploying the core concepts of frame 3 thinking; 'core-creation, 'directionality' and 'experimentation' as a viable alternative path for addressing the challenges commonly encountered during implementation, evaluation and governance of existing Science Technology and Innovation (STI) policies in Africa.

Dr Matthew Williams from the International Development Research Centre (IDRC) in Ottawa reflected on what the partnership with the Transformative Innovation Policy Consortium (TIPC) might look like for the STI landscape in Africa. He emphasised the importance of African countries to be engaged in enacting science policies that further national priorities and societal needs.

The innovation community to reflect deeply on how the TIPC model can be operationalised.

Exploring the possible roles of intermediaries, in Engineering ecosystems for example, and how IDRC's programming could aid the establishment of strong connections between countries and the fostering of networking building at regional and sub-regional levels.

Recognition that transformative agendas cannot be enacted in a dispersed manner.

Exploring ways of spiralling out and socialising the thinking from TIPC with other networks on the continent.

In conclusion, Matthew envisioned TIPC as a 2-way street and highlighted that in the next 18 months IDRC would explore ways to learn based on the findings from the Science Granting Councils Initiative (SGCI) and TIPC to support the development of a transformative collaboration in STI policy with Ghana, Kenya and Senegal.

Dr Ann Kingiri drew on her experience in the capacity building work being done in STI by AFRICALICS. She emphasised the need for:

Targeted capacity building and gave an example of how AFRICALICS has worked in tandem with Universities to operationalise this delivery.

A more precise definition of the scope for STI policy.

Focus to be directed at analysis of innovation activities on the continent.

An exploration of how to undertake innovation policy analysis using information technology tools.

TIPC should simplify the language and that the current terminology could be viewed as elitist.

Progressively introducing new avenues of thinking as TIPC is developed.

Recognising that there were already initiatives and innovation platforms on the continent which TIPC could draw upon.

TIPC to consider mapping the existing initiatives and exploring the possibility of establishing collaborative links with these.

Finally, Ann felt that the methods articulated in frame 3 could be better unpacked and highlighted that experimentation offered an opportunity for engagement with other policy actors and decision-makers and with methods and approaches already in use in sectors such as Agriculture.

Dr Mafini Dosso from the JRC described her background in industrial development and her current research interest in place-based innovation, with a focus on Francophone Africa. As a starting point, Mafini reflected on the need to incorporate baseline mapping into STI policy thinking. She cited a study of cocoa production in Ivory Coast and observed an inherent policy failure in that developmental objectives were based on firms that were not well-embedded in their local contexts. She emphasised the increasingly important role of emerging ecosystems and alluded to the fact that up to 40 % of cotton production in Ivory Coast is constrained by the lack of access to electrical power. She argued that this lack of access to electrical power reflected the centrality of energy production for the 'cotton' ecosystem and added that this situation was in fact a microcosm of broader structural issues in industrial development across diverse sectors in Africa.

Mafini articulated the need for policy actors to profoundly reflect on:

How value-chains in cotton production, for example, can be harnessed for industrial development taking into account key contextual factors.

Recognising the need to explore alternatives to existing policy framings.

Understanding the disconnect between STI policy in Francophone and Anglophone Africa and to seek insights into how and why the STI policies in the latter group have evolved at a considerably faster pace.

Seeking a nuanced understanding of why innovation policy on the continent continues to be ill-defined and recognition of the necessity to train more policymakers.

Mafini discussed the necessity of engaging diverse actors, including Scientists, and to avail ownership of TIPC to local people. Lastly, she reflected on the need for energy to be nurtured against corrupt socio-economic practices, which she identified as a key stumbling block to continental progress and development.

Imraan Patel reflected on South Africa's recent White paper on Science and Technology. He pointed to 3 key terms as defining the evolution of their STI policy landscape; 'Innovation', 'Inclusion', and 'Partnership'.

Imran observed that the main issue in STI policy is the failure to fully capitalise on National Systems of Innovation (NSI). He further highlighted:

Frame 3 will remain a niche area.

Inclusion is seen as the starting point in the South African context.

There is an acknowledgement by diverse players on the need to be clearer about directionality and the identification of specific areas for investment.

Innovation spaces have been created in South Africa.

Questions have been raised regarding how strategic partnerships can be used to drive diversification in sectors such as mining.

Identified intercourse between different policy framings, for example frame 2 was recognised as key to economic development and frame 3 as central in inclusion and inclusive development particularly in sectors such as health.

Questions and comments

Q: How can we define better ways for North-South collaboration?

Q: A suggestion was made to connect entrepreneurs through start-up events, as an exemplar of many possible modes. 'We do not need to be confined to old models of collaboration'.

A: Professor Johan Schot pointed out that the vast unmet needs and present-day societal challenges showed that there was a dire need to chart a new discourse and alternative developmental paths.

He further indicated that there was evidence to show that the STI instruments in use were no longer fit-for-purpose. Experimentation in his view would allow for bottom-up initiatives and provide the

lateral room to move away from elite Research & Development (R&D) oriented strategies and should be pursued with vigour.

Imraan Patel shared a consensual view with Professor Schot on the need to re-imagine collaboration and cited initiatives such as Eureka as a key example of successful attempts to establish the requisite collaborative links between sectors. He highlighted the mutual benefits of North-South collaboration and the possibilities and potential around the formation of regional networks and blocs. Contrary to Johan's perspective, he felt that strong R&D capabilities were required to operationalise areas such as Genomics which forms the core building-block for Personalised Medicine. Imraan rounded-off by articulating the necessity for getting in place fundamental capabilities as a starting point for the STI policy development trajectory.

Concluding remarks

Chux Daniels concluded the panel discussion by reiterating the importance of:

Establishing strong North-South and South-South connections and for diverse actors in the STI space and beyond to coalesce around capacity building efforts.

A critical reflection on Africa's long-term strategy.

Understanding the full value-chain in such areas as housing and the need to establish firm-level engineering capabilities.

Tracing and analysing the STI trajectory over the last 50 years and learning from it.

Avoiding treading on already well-trodden Policy ground - 'let's not reinvent the wheel'.

PARALLEL SESSION 2C: Transformative Innovation Policy: European and National Perspectives

Panellists:

- Matthias Weber, (Chair), Head of Unit Research, Technology and Innovation Policy, Austrian Institute of Technology, Austria
- Elisabeth Gulbrandsen, Special Adviser Research Council of Norway
- Christopher Palmberg, Programme Manager, Business Finland

As a starting point to discuss the present and future perspectives in Transformative Innovation Policy (TIP) in Europe, Matthias Webber, Head of Unit Research, Technology and Innovation Policy in the Austrian Institute of Technology, provided an introduction on the European innovation policy landscape. At the European policy level, there is an ongoing re-focusing process of framework programmes on societal challenges, a prominence of SDGs in programmatic discourses and specific sectoral policies inspired by transition thinking, especially regarding environmental issues. More importantly, there is an emerging intermediary policy level built upon multilateral strategic partnerships that have a crucial role in implementing transformative changes for their experimentation and innovative potential.

EU Horizon 2020, as the biggest EU research and innovation (R&I) programme, was reviewed in line with what TIP imply. New ambitions of incorporating societal challenges in R&I processes are evident, what demonstrates the interest of connecting innovation and new technologies with longer-term agendas.

Some critics were made to the top-down approach that remains present, preventing to turn the societal challenges into practice. Moreover, some ambivalences of Horizon 2020 were underscored: the accelerator vs transformative mission orientation, the technocratic or learning approach, the need for R&I or transversal policies to tackle the challenges ahead. Furthermore, the panel reflected on how experimentation processes are conceived. These require high levels of adaptability that can be hindered if they are mainly Science and Technology led as demonstration projects. There has to be growing attention to social engagement as an essential element for scaling, and actors like the European Innovation Council are critical in this process.

In order to understand how TIP translate into national policy levels, the case of Norway and Finland were discussed. There is an alignment in the objectives, as both countries aim at promoting research to address societal challenges. In the implementation, however, there were some differences: while Norway focuses on research, Finland's efforts go towards business innovation, additionally, the role of civil society in research processes are more present in Norway than it is in Finland. As a result, the discussion highlighted the importance of creating multiple cross-discipline and cross-nation partnerships; to achieve this, the European Commission and each country will have to develop capabilities to moderate and stimulate frame 3 and intermediary policies. Furthermore, greater efforts have to be made to stimulate experimentation and incorporate more actors to R&I activities so that Europe can move beyond the traditional technocratic approach towards a transformative learning approach.

PARALLEL SESSION 2D: Learning from Policy Experimentation in Cities

Panellists:

- Jonas Torrens (CHAIR), SPRU Research Fellow
- Paola Pollmeier, Open Innovation Coordinator at the RutaN (the science, technology and innovation centre of the Municipality of Medellín, Colombia)
- Maria Schnurr, Senior Researcher at Research Institutes of Sweden (RISE)
- Adrian Ely, Senior Lecturer, SPRU

The panel reflected on two central questions:

- What are the experimentation cultures and tools that can be use in the context of transformative innovation policy?
- What are the challenges associated with them, how to move beyond experiments?

Maria Schnurr spoke about RISE's main projects related to transport policy labs. Two case studies that make part of a larger strategic program in Sweden and comprise innovation within autonomous vehicles and electrification. The task was to identify policy related challenges in the projects and develop a plan of how it is possible to work with related stakeholders. Policy labs can connect technology and the market development world with policy-making world. According to the records of Research Institutes, policy lab is an experimentation itself that just started and need to be adapted every time there is a new case.

The Case study of the autopiloten in Stockholm showed that there are a lot of policy related challenges that need to be overcome in the future of autonomous vehicles. For example, infrastructure, type of approvals and certification process for the vehicles, international standards, etc. Involvement of different levels of stakeholders such as national, regional, metropolitan and municipal authorities with different degrees of experiences is vital.

Solution ideas to reforming the process are: learning by doing process, intermediary institutions with experience to deal between stakeholders, functional requirements. Reactions by stakeholders were very positive responses, understanding their motivations for the experiments in terms of attitudes and feelings in spite of limitations in capacities. Peer to peer car sharing and related to it, specific legislation about car rental. Working with tax agencies – most important public authority in Sweden – they can clarify things that were not taken up when legislation was written (e.g. revenues when sharing vehicles). This created the legitimacy for the activity of private car sharing – not illegal even if nobody is talking about it. Besides clarifications, the major effect was that these methods brought attention to the topic.

Q: To what extend did the researcher at Research Institutes of Sweden engage to more marginal stakeholders, for example, cyclist groups or young people?

A: This process was short and only involved operator manufacturers, transport authorities and interested municipalities, therefore they could not include people beyond these formal

stakeholders. Attempts for using autonomous vehicles in public spaces – talk to people who own spaces like parking. Police and fire engines find it difficult to access the places. It is not mandatory to take into account their considerations according to the regulation, you have to listen to them if they have something to say.

Q: how the effects of AV can be in mobility and traffic flows for marginalised groups?

A: There are large projects that take into account these questions about policy but time was short and related pilots had to be postponed because the process was not established.

Paola Pollmeier introduced the context of the Municipality of Medellín: drug violence and economic crisis, traumatising past (1980-1990s). History has changed and nowadays, the city is recognised as an innovation hub, having social inclusion projects and winning innovation awards as well as a city known for its resilience. Central strategies were Cities for Life project (2015) based on citizen co-creation; City to city collaboration based on citizen collaboration; and inclusion of include technology in the experiment, besides creating platforms for citizen engagement

2009 saw the creation of an innovation hub that articulate stakeholders in the city and develop create new projects towards improving quality of life. For Ruta N, innovation is a privileged tool to develop sustainable solutions. From the past until today, there has been join efforts for transformation between academy, businesses and local governments. Citizens and co-creation with citizens were key aspect in this process. Nowadays, they are focussed on transformation towards knowledge-based economy by attracting talent and capital. The STI plan – public policy in 2012 – through which it was possible to work in different kinds of experimentation areas.

The evaluation of the eco-system the key elements are talent, capital, infrastructure and network. In their experiment, networks are used to find how to connect local actors in Medellín and how to connect Medellín to innovation ecosystems in other countries. Other concepts from other cities were adapted for social-inclusion projects (e.g. cable cars, escalators, etc.) in which population of poor areas can access to other areas of the city. In each phase of the innovation processes, different actors need to be articulated. Before initiating projects and experiments, the municipality and other actors such as universities and researchers, need to be integrated. They held Local, regional and global workshops in which there was a discussion about specific challenges and knowledge exchange, and the co-creation of ideas was developed in workshops and in platforms.

Local co-creation processes have been scaling and have been implemented in different cities apart from Medellín. Sharing of experiences and co-creation has occurred between Medellín and other cities in the metropolitan area and in other countries (e.g. Mexico and Ecuador) where they replicate the strategy. More than 50 cities in the network, but there is a need to become more effective in co-creation.

Q: It feels like best practises occurring there. What is the rate of unemployment, informal sector? Being in developing country gives a particular approach, where is the developing country participation in the story? Where is income redistribution and participation?

Q: High importance of getting municipalities involved in the process. Examples of getting these institutions on board? Why was it difficult? Did the transformation challenge threaten their existing role?

Q: To what extent do you build on existing networks or ideas?

Q: How is this contextualised in terms of the long story about cooperation and technical assistance in Latin American countries?

A: Informal sector is huge in Medellín, but the workshops were also held within the ‘comunas’ in which the process of co-creation was very difficult because there was a part of the population that was illiterate or understand the processes and concepts very differently. Inclusion of existing networks – doing that – work with smart cities in other parts of the world (e.g. Barcelona) and co-create with experts that were already invited. It is difficult to include governmental institutions because these entities have plans and projects that are already formulated. If challenges are not articulated with the goals of the institutions’ development plans, they are not attended by these entities.

Adrian Ely spoke on Transformative knowledge networks. There is currently experimentation in 6 hubs around the world. It is academic led process of experimentation that is different from the processes discussed in the conference. Attempt to get a standardised approach across these different hubs whilst leaving flexibility for context specific implementation of a general idea of Transformation Labs (T-labs). Standardisation is difficult not only because of the different context but also because of the different history of engagement.

Transformation lab is an on-going process of convening different actors, co-producing knowledge, decision-making and experimentation. The idea of T-labs comes from Social Innovation labs and from bringing in the socio-ecological dimension. T-labs have been punctuated by 2 workshops across to all of the 6 hubs: cross learning and knowledge across the networks.

China. Sessions about government led experimentation, pilots learning about multilevel experimentation, bringing together policy makers and stakeholders in a novel way.

The UK, Brighton and Hove. Food civil society space, discussions about localising food, struggles to bring in policy makers (municipal government) in experimentation processes. Experimentation approach was drawn on the abilities of researchers to collect data from other parts of the country.

Mexico. Enabling transformative agency. Work with farmers and stakeholders in Xochimilco wetlands and developed processes for agency network analysis to measure changes in collective agency within these groups. Measuring changes in how individuals relate to each other as a potentially transformative group.

India, Gurgaon. Challenges around water availability, pollution and waste management. Program of Water forum that brought together middle class (interested on environmental issues) and migrant working class (who have struggles around water availability and livelihoods) and put together a project about citizen science water monitoring.

Q: Do you feel that the perspective of Citizen Scientists is relevant for your experiences?

Q: Extend the ideas of common tools across the cases. Examples?

A: Useful ideas from the Citizen scientist perspective. In each of these hubs, social scientists are acting as citizen scientists. This perspective is seen differently for each case. Idea of T-labs was challenged in global south. Baseline understanding of when a T-lab is required, requiring participation, knowledge production. T-lab acted as a boundary object to discuss the different approaches in different context, comparability, yet led by local needs.

Questions and comments:

Q: what kind of effort/ideas need for construction of constituency for change? Most experiment fail as they create a bubble and effort disappears when resources appear? Where is the constituency coming from the local?

Q: Discuss about the specific roles of governments at different levels –enabling or constraining the change processes? How these different levels negotiate?

Q: Urban approaches for transformation and experimentation make assumptions about towns or cities as the appropriate spaces for transformative change. It is necessary more reflexivity about why the city level is important in terms of transformative innovation. Socio-ecological system is not an urban system.

A: In the case of the Research Institutes of Sweden, public authorities do not make new legislations but they check if these legislations are fulfilled and guarantee for safety of citizens, therefore they have limited functions. Suggestions of stakeholders: rely on higher government levels to change policies. It is hard to get these levels on board and what researchers can do at the moment is raising attention, creating momentum and hoping that governments respond towards policy change.

A: In Medellin, decentralised labs are very important as enabler. Ruta N also has a more autonomous role by which they can articulate different actors of the eco-system. It is important to integrate the role of governments and to include these bodies as strong partners since the beginning. Approval from these bodies can be difficult at a later stage due to, for example, lack of resources.

A: Transformative knowledge networks (T-labs). It is desirable to involve government in early stages, however transformations are sometimes at odds with the governments' objectives or the way a local

government is working. Parts of the government often disagree with the civil society demands, and then you need to involve other parts of the government that cooperates. How do you make sure that civil society participation is shaping the constituencies of change? In many cities the government plan is challenged by the experiment. This the real challenge for policy experimentation.

PARALLEL SESSION 3A: Reflecting on the experiences of national STI agencies in leading the development of Transformative Innovation Policies: The case of Colombia (Green Book) and Sweden (Challenge Driven Innovation)

Panellists:

- Matias Ramirez, (Chair), Senior Lecturer, SPRU
- Alejandro Olaya Davila, Economist, PhD, former Director of Colciencias, Colombia, currently Chris Freeman Visiting Researcher, SPRU
- Göran Marklund, Deputy Director General, external, matters and head of Operational Development, VINNOVA, Sweden

In this session panellists reflected on the critical role played by national science and technology agencies in encouraging and enacting processes of transformative innovation in their national economies. Unlike previous historical examples of disruptive changes in sociotechnical systems, transformative innovation poses the need to construct new directions in STI that address specific societal challenges that improve human welfare. This means that, particularly in its early stages, the process of transformative innovation has to be “constructed” by agents of the system including actors from civil society, the private sector and universities. However, it is national STI agencies that are likely to be seen as the legitimate leaders of the transformation process, which will be challenged to go well-beyond narrow funding roles and to adopt new narratives, coordinate new networks and use a range of policy instruments that can encourage transformations.

This session drew on the experiences of leaders of two STI agencies that have led comprehensive initiatives of transformative innovation policy: VINNOVA of Sweden who designed the Grand Challenges programme and Colciencias of Colombia that recently produced the ‘Libro Verde’ policy document on how the Colombian STI system can help meet the Sustainable Development Goals through transformative innovation.

Some of the issues that emerged in the discussion include the following:

- Turning the system around: How important was it to develop a transformative innovation (TI) narrative or did this already exist? Did this narrative fit with what actors are doing or want to do?
- Programmes, plans and roadmaps: What might be the first steps for agencies to encourage TI? Lay out roadmaps? Specific calls with conditions?
- Policy skills for TI: Does TI imply a change in how the agency engages and interacts with practitioners? For example from top-down to bottom-up? Assumptions around risk taking?
- In what circumstances might certain top-down initiatives (for example mission-led) be fruitful for encouraging transformative innovation or should the agency limit itself to facilitating bottom-up initiatives?
- What are the main challenges for your agencies in enacting TI?

Further notes shortly available on web version.

PARALLEL SESSION 3B: Re-visiting Science, Technology and Innovation: Country Reviews from a Transformative Change Perspective

Panellists:

- Blanche Ting, (Chair), PhD student, SPRU
- Michael Lim, Economic Affairs Officer, UNCTAD
- Katalin Bokor, Economic Affairs Officer, UNCTAD
- Johan Schot, Professor of History of Technology and Sustainability Transition Studies, Director of SPRU
- Imraan Patel, Deputy Director-General Department of Science and Technology, South Africa
- Ana Lúcia Stival, Senior Analyst of science and technology, Brazilian Ministry of Science, Technology, Innovation and Communication (MCTIC), Visiting Researcher SPRU.

The UNCTAD STIP Reviews started around 1998 but it was in 2011 when a framework to carry out these reviews was created. The STIP Reviews' framework has evolved over time and, as part of this evolution, the framework is currently being revised to take into account the Sustainable Development Goals (SDGs). UNCTAD, in this regard, is actively cooperating with SPRU (among other bodies of expertise) to determine how to integrate SDGs into the STIP reviews better. The process of revising the STIP reviews has represented an opportunity for UNCTAD to explore new ways of thinking and approaches, mutually along the Transformative Policy agenda.

The purpose of the STIP Reviews has been partly diagnostic (through the identification of strengths and weaknesses in the areas above) but they also have sought to identify policy action areas to support technology, increase innovation capacity at the firm and industry levels, and support the systems of innovation in each country. The STIP Reviews were meant to be a long-term assessment process through follow-ups; however, the continuity of those follow-ups has been constrained by the availability of resources at UNCTAD. Currently, when possible, a follow-up is done in a rather informal way. At present, UNCTAD has completed 13 country reviews, with three in the pipeline (Uganda, Ethiopia and Sri Lanka). Iran remains the only country for which UNCTAD has done a second review.

In the last 20 years, UNCTAD has been looking at processes related to growth and structural transformation in developing countries, which are major concerns among the latter since the 1960s. For instance, concerns related to the improvement of productivity in manufacturing and agriculture and the increase in exports have traditionally been tied to the economic side of the Sustainable Development Pillars, in which UNCTAD based its approach to do the STIP Reviews in the past. In this regard, the focus of UNCTAD STIP Reviews has been on firm-level technology and innovation capacity; policy organisations with a mandate on development (primarily those working in the areas of science, technology and innovation); regulation; institutions and infrastructure in each of the countries that took part in the reviews.

To the date, this framework is still a traditional one: based on Frame 2 with elements of Frame 1. However, the framework for the STIP Review is currently being revisited given the mandates prompted by the SDGs. Therefore, UNCTAD posed the question of how to make innovation policy more inclusive and sustainable? They have recognised that, to answer that question, the limitations in the understanding of innovation need to be overcome. For that reason, the opportunity to participate in TIPC and to collaborate with its members is allowing UNCTAD an opportunity to learn new ways of thinking, as well as participate in the processes of experimentation, and assess how the TIPC's ideas are implemented in practice, which remains as a challenge for the UNCTAD.

There exist two questions the new framework wants to address. These are 'how innovation can contribute to tackling major societal challenges (inclusive of economic, environmental and social)?' and 'how can innovation help to improve productive capacities by creating synergies with social and environmental development?' Guided by these questions, the new framework is expected to include an analysis of the main sustainable development challenges faced by the different countries and

address how innovation can help to tackle these individual challenges in different countries. Moreover, UNCTAD will also include an analysis of the STI policy performance in addressing these societal challenges. Other key features of the revised framework are the inclusion of new key studies on the different areas of the SDGs, and the inclusion of new actors (e.g. finance sector, micro and small enterprises, civil society) participating in the elaboration of the STIP Reviews. Additionally, the STIP Reviews will try to provide short, medium and long-term policy recommendations and objectives for policymakers, and more concrete policy monitoring and evaluation indicators and targets. This last point seeks to overcome the challenges UNCTAD faces regarding continuity in the follow-up stages of the previous STIP Reviews series.

UNCTAD is on an early stage in this process and that they have been working with SPRU to revise the framework. Regarding, implementing it on the ground, there are challenges involved in that. For instance, the coexistence of elements from Frame 1, 2 with elements from Frame 3. UNCTAD is largely using Frame 2 with significant elements of Frame 1; however, they are trying to incorporate elements of Frame 3. They have a mandate of taking into account the SDGs, so the challenge lies in how the elements of Frame 3 can be implemented to better account for the SDGs. Mr Lim considers that the initiative taken by UNCTAD to open up the process of doing the reviews accounts for more inclusiveness, which is one of the elements of the SDGs. Nevertheless, in practice, these tasks represent challenges, since in some countries, the actors with whom UNCTAD deal are mostly actors with ideas associated to the Frame 1 (and sometimes not even interested in the ideas from Frame 2). This has been transformed into practical problems while discussing with policymakers. Additionally, there is uncertainty about the scope of experimentation required from the various countries (e.g. budget, resources, actors' involvement etc.).

In line with Frame 3 thinking, UNCTAD is exploring the possibility to build pilot studies with Ethiopia and Uganda (and perhaps Botswana and Zambia), where they believe there is more scope to initiate these processes of experimentation.

Regarding the different frames at stake, there is a need to consider the three Frames. However, Frame 1 needs a debate about directionality in the R&D portfolio, and Frame 2 requires the inclusion of diverse actors in the National Systems of Innovation. Prof Schot mentioned that one of the difficulties that arose in the discussions they had is whether innovation is firm-based or not (i.e. is the system of innovation rotating around firms or not). In this regard, a discussion on different approaches to define what is considered as firms is important, for example the inclusion of the informal economy. In Frame 3, the discussion has arisen around niches and its definition. The Transformative Innovation Policy approach defines niches as spaces for experimentation where people do radically different things. Instead of paying attention to the sectors, UNCTAD, in its reviews, can analyse radical activities taking place and determine their potential for transformative change. They might seem small but, actually, have large long-term potential. This, of course, will depend on the conversations that UNCTAD will have with the countries, since the interests of the countries are the ones that need to be reflected in the STIP reviews. It is important to note that UNCTAD STIP reviews project is driven by member countries official requests, and is therefore, conducted on a needs basis.

UNCTAD and TIPC will keep working together to develop an alternative country review since TIPC is committed to changing certain narratives to build demonstrators, and to generate networks of people who think about innovation differently. In this regard, countries are the perfect vehicles to build new narratives and networks together.

A delegate in the audience mentioned that the European Commission (through the European Commission's Directorate-General for International cooperation and Development - DG DEVCO) had launched an initiative directed to Africa to review and design innovation strategies in the region. She suggested that this work should be done with the participation of UNCTAD and TIPC since they are currently building new narratives about innovation and development. To this intervention, Prof Schot mentioned that the idea is extremely interesting and can encompass TIPC's willingness to experiment with countries. Blanche Ting, the Chair of the session, added that if any of these

countries present a request to engage UNCTAD and TIPC, it would be a good opportunity to start since the reviews are demand-driven.

Another delegate in the audience made a comment directed to Prof Schot. He stated that, to his perspective, firms are a central element in innovation processes. He placed as an example the case of Africa, a region short of infrastructure which, to his understanding, struggles with firms that do not want to train local engineers because they face the possibility that after that after receiving that training, they might want to go to work for another firm. This market failure has prevented to have a pool of engineers contextually trained and able to connect with the business environment. He raised this point saying that Prof Schot did not consider firms as important for innovation, to which he replied that he said that firms were not the only element to pay attention when analysing innovation.

Ana Stival presented her topic on Brazil's STI policy. Ana is a visiting research fellow at SPRU and her work explores the possibilities for Brazil to join the Transformative Innovation Policy Consortium. After presenting some indicators of Brazil's performance in STI briefly, Ms Stival emphasised that she does not observe significant participation of the civil society in the Brazilian system of innovation. She argued that at the political level, nor the executive, the legislative or the society branches exhibit a significant involvement of civil society beyond scientific organisations (e.g. The Academy of Science), private sector and entrepreneurs. Moreover, when the operators of the system are analysed, the civil society is absent beyond the participation of Universities, research institutes and technological parks. For instance, social movements or NGOs, who have shown to be a powerful vehicle to incorporate the demands of society in the development of STI strategies or to stir STI agendas in other Latin American countries (e.g. Colombia and the case of the Wetlands in Bogota) are not being involved.

There are some innovation programmes implemented in Brazil that follow the principles of Frame 1 (e.g. supporting R&D) and Frame 2 (fostering the interlinkage of companies and technology suppliers such as universities or research centres). In addition, since the beginning of the new millennium, the Brazilian government has paid more attention to the issue of social inclusion and sustainability through the implementation of narrowly focused programmes (for example on security or people with physical impairments). Therefore, these areas of social inclusion and sustainability have received minor funding, and subsequently had negligible impact within the Brazilian system of innovation. Nevertheless, she recognised that those steps are important and can be the base for further and more comprehensive initiatives.

Brazil currently has a National Strategy for STI (2016-2022). The pillars of the programme are the promotion of basic and applied research; the modernisation and extension of the STI infrastructure; the increase of funding for STI activities; and the formation, attraction and fixation of human resources and promotion of technological innovation in companies. The pillars are Frame 1 and 2 centred, no instruments are dealing with societal problems. This is particularly contradicting since the strategic themes highlighted in the plan can be related to the SDGs. In this regard, Brazil needs to reflect on the directionality of those programmes: does Brazil want to catch-up, promote innovation and address market and system failures or wants to face sustainability and social inclusion challenges?

Brazil has a STIP country review elaborated by the OECD. Thus, as the new methodology by the UNCTAD country STIP Reviews is being revised at the moment, there is still a way to go in order to establish the differences between both reports in a more structured way.

Imraan Patel shared the challenges he considered exist in order to make STI serve the purposes of the SDGs. In the first place, STI influences all of the SDGs; however, from a science and technology department perspective, it has become clearer that we need to focus more on countries' strategies about STI and industrialisation. Revising the STI under the light of the SDGs and the countries' development strategies is a complicated task. He highlighted that South Africa has not seen any

review that has helped developing countries to figure out how the STI is going to serve the SDGs directly. Moreover, how STIs serve or encompass the countries' national plans and strategies remains as an unanswered question. In the second place, while referring to SSDGs 9 and 17, there is a lack of clarity regarding how to measure the contribution of STI to achieve the SDGs, for example in the case of poverty reduction. Instead of only suggesting that STI is key to achieve the SDGs, the country reviews developed by UNCTAD should include guidelines on how to measure STI contributions to the fulfilment of the SDGs.

Questions and comments:

Q: how can SDGs be observed? There is a broad discussion about how do we measure the progress of countries regarding certain indicators, but they do not necessarily provide a full picture; that is why unpacking the processes to achieve the SDGs is important. This observation can also be extended to the case of civil society participation and the community of practice.

A: The process and methodologies need to change and it is important to move from rankings to the mapping and visualisation of processes and stakeholders. This way to approach phenomena may allow us to identify the strength and weaknesses of the countries involved in this project. At SPRU, there is an interesting project in the context of TIPC: mapping the scientific capabilities. This project already took place in Colombia, and they are preparing the one for Mexico. Mapping capabilities regarding SDGs is an exercise that can and should be done for these reports to have greater impact.

Q: how we can preserve the narratives co-built through the country reports when political agendas are prone to change quickly, mostly in countries such as the Latin American ones?

A: SDGs represent an interesting instrument to give direction and continuity to the common narratives built with the help of the UNCTAD STIP Reviews because they have become a global set of goals. Prof Schot added that he considers that the way in which the country reviews are being thought and, subsequently, its methodology developed represents a sign of hope since the work done in Colombia (for example the *Libro Verde* –i.e. Green Book) has survived the change of governments. Narratives survive over time when they address relevant problems for a large set of nations and when those narratives are felt and experienced by the people. A clear example is the narrative built around R&D in the 1960s that remains in force nowadays. Countries which are currently undergoing major changes in political leadership plays a major role in the issues of continuity of STI policies.

Q: It is encouraging that we are observing a process in which those country reviews are being reconfigured to define societal goals facilitated by the SDGs. There is a strong shift there; however, he feels less confident in other dimensions. For instance, he mentioned that it seems that the societal challenge approach has raised our understanding of innovation as sustainment process, which involves a wider set of actors, but he is less confident that we have a framework that will help to reconfigure the way in which we look at innovation capabilities. For example, in the case of the infrastructure of innovation, cities are being defined as innovation actors, which is not necessarily the case. We are defining certain actors as innovations actors when those not necessarily define themselves as such. These inclusions are reshaping how we think about innovation. If, for example, we take as an example the case of sustainable consumption and production, it is clear to observe that we are changing our perception of innovation in lifestyles and imaginaries, so the question is how the reviews will capture those new dimensions of innovations?

A: UNCTAD cannot pay attention to all the SDGs at the same time. When the countries ask UNCTAD for assistance, they come with particular issues that they already identified and more often this is in accordance to their national development strategies and priorities. UNCTAD has been responding strictly to those requirements. Countries have expectations when they get involved in these processes, and although there is dialogue, UNCTAD respects the agenda of the countries. In addition, the understandings are different even within countries. How innovation or capacity building are defined and what are the implications associated to these processes vary broadly depending on whom you are speaking to. For instance, UNCTAD has had to deal with policymakers focused on

achieving goals associated to Frame 1 and, although UNCTAD tries to encourage them to broaden their perspective and include elements from Frames 2 and 3, a challenging task remains.

General comments:

UNCTAD has the mandate to embrace the SDGs in their Science, Technology and Innovation Policy Reviews. In order to do that, UNCTAD has found in SPRU in general, and in the Transformative Innovation Policy Consortium in particular, a body of expertise that embraces a set of principles that are aligned with the SDGs. In this regard, UNCTAD has been working with TIPC revisiting the methodology for the Science, Technology and Innovation Policy Reviews through the incorporation of elements from Frame 3. However, the discussion that arose in this panel, reflects that there exists a disjunction between UNCTAD's mandate and what countries expect from the STIP Reviews. For instance, the participation of Mr Patel, on behalf of the Department of Science and Technology in South Africa, exemplifies that, in the first place, policymakers in developing countries still struggle to identify how science, technology and innovation can serve the purposes of the Sustainable Development Goals in practice, and second, that countries have areas of development that are prioritised in accordance to their national development plans. Often, these areas, when related to science, technology and innovation, focus on elements of Frame 1 and Frame 2. In this regard, UNCTAD faces the challenge of balance diverse elements of Frame 1, 2 and 3 in the new series of STIP Reviews in a way in which serves the achievement of the Sustainable Development Goals. Perhaps, as is clear from the panellists' interventions, a good starting point to face this challenge is to have a debate about directionality in the R&D portfolio when Frame 1 is at stake, to include more and diverse actors in the National Systems of Innovation (e.g. the informal sector) when recommendations are made for Frame 2, and have a more concrete discussion about how the boundaries of a niche are drawn and what does it mean for a country to experiment when discussing Frame 3.

PARALLEL SESSION 3C: Evaluation for Transformative Innovation Policy

Panellists:

- Joanna Chataway, (Chair), Deputy Director of SPRU and Professor of Science and Technology Policy
- Jordi Molas Gallart, Research Professor at the Spanish National Research Council (CSIC), and Director of INGENIO (CSIC-UPV)
- Alejandra Boni Aristizabal, Professor at the Dpt. of Projects Engineering at the U. Politécnic de Valencia. Deputy Director of Ingenio (CSIC-UPV)
- Daniel Johansson, Head of Analysis, VINNOVA, Sweden

This session reflected on the development and creation of an evaluative framework both for TIPC and for TIP experiments. The beginning of the session saw Jordi Molas Gallart and Alejandra Boni Aristizabal from INGENIO talk about their propositions for an evaluative framework for TIPC. The activities of TIPC are based on a broad range of experiments across different contexts and there is a danger of the evaluation becoming fragmented, and so the issue is how can we create an overall framework for TIPC, but also allow enough room for contextual difference and change? The answer could be to develop general “guideposts” for all experiments.

Normally, evaluations focus on effects and impacts but TIPC has very small activities (niche experiments) with a large overall goal (socio-technical transformation). It may be very hard to track this. For Jordi and Sandra, TIPC should not be overly concerned with long-term impact (or at least demonstrating it) as a first point, but instead focus on the outcomes around learning from TIPC experiments. An evaluation approach must reflect the policy it is evaluating, therefore TIPC evaluation must be participatory and inclusive. The proposal for TIPC/TIP evaluation is to have a

focus on processes, looking at the learning within them rather than the accountability, resource distribution etc. Key elements will be within this:

- Context will matter: interventions rarely work for everyone, it will need to be looked at what has worked for whom and where
- It will be formative: issues of failure will become learning opportunities
- Theory of Change: a TOC approach will enable us to create a community of practice and make explicit a theory and our assumptions behind, while allowing for contextual differences.
- The TOC will focus on deep learning, directionality, networks and new knowledge generation

Daniel Johansson from Vinnova spoke next about how Vinnova's requirements for an evaluation both align and differ from Ingenio's vision. Vinnova is an investor in research and innovation, seeking to promote sustainable growth and change innovation systems. As such, they have wider needs for evaluation than what TIPC is proposing, but they do see the benefit of the focus on deep learning. Evaluation usually entails calls for ex-post audits whether TIPC is talking about something very different, should we change perceptions of what Evaluation is or terminology? Although context is different, there are some things that can be shared across contexts such as generic takeaways, exchange of experiences in challenges in implementing, and triggers for deep learning.

Questions and comments:

Q: Perhaps there is the need for two frameworks, as do have to develop a relationship between experiments and wider socio-technical change?

Q: In the TOC, will there be room for understanding unintended effects of experiments?

Q: Why do we do the TOC at the beginning? Can we take into account everybody's expectations and diverse views at this stage, or is it better to wait?

Q: Actors don't engage without expectations, so therefore we need to see variations within individual TOCs to make sure people aren't marginalised.

General Answers:

- TOC is not rigid, and could and should be adapted as experiments and TIPC continue we need scope for revision and change
- It may be very hard to develop a framework for tracing experiments to wider socio-technical systems, but a focus on learning could still demonstrate this eventually.
- We are developing the TOC and activities at the same time right now, and so the TOC will arise within this.
- We are assuming people will have different views, but this may not be the case.

PARALLEL SESSION 4A: Training and Capacity Building to support Transformative Innovation

Panellists:

- Sarah Schepers, (Chair), Programme Director, Transformative Innovation Policy Consortium
- Cristian Matti, Transitions Hub lead at EIT Climate-KIC and Research fellow at Copernicus Institute for Sustainable Development, Utrecht University
- Ann Kingiri, Senior research fellow in STI with a focus on inclusive and sustainable development at African Centre for Technology Studies (ACTS)
- Geert Wilms, Director of Agricultural Innovation Brabant (LIB), a partnership of the Province of North-Brabant and the farmers' organization ZLTO.

The aim of this session was to not only hear the experience from the panellists but also to receive input from the audience regarding training and capability building in transformative policy. In TIPC there is an ambition to co-create with members a training and capacity building programme that

needs to occur in all levels focused on policy-makers and advisers of policy-makers. There is a desire to bring together a constituency of people in organisations that have the language and the understanding of transformative innovation. This will require a process that can work across a multinational level even though the context will vary substantially. The general aspects of the programme could then be localised for specific programmes.

Training and capabilities building must be distinguished. Training can be used in a very patronising way: “I train you because I know more than you”. TIPC’s approach focuses on co-production, co-creation and co-learning: “I have an understanding and you also have an understanding”. Beyond that, the presumption that there is a solution or a body of ideas that constitutes a solution is questioned. Everything must be reinterpreted in a process of translation. Programmes that expose people to a lot of ideas might be problematic: there must be interaction and learning also from the trainer. Otherwise the experience will not work and TIPC does not want to do that. A translation process where there is no interaction and learning from both sides produces ideas in a very idiosyncratic strange way.

TIPC is built on many concepts such as strategic management, directionality, niches etc., which brings the challenge of translating it to practitioners, policy-makers and even researchers, especially those who do not have a background in social sciences. At the moment they are discussing the construction of the training programme that would work at different levels. For some people, it would be their first time coming across transformative innovation policy. To others, it would work to deepening their knowledge in TIP. Moreover, it would aim to embed this type of narrative into organisations.

Cristian Matti is in charge of the Transitions Hub and the Science, Policy and Practice Interface area of the Climate-KIC, a European knowledge and innovation community that works to accelerate the transition to a zero-carbon economy. The Climate-KIC is the largest public-private innovation partnership focused on climate change in Europe and is supported by the European Commission. They are based in Brussels and they, for example, help regions and cities to make sense of the Euro 2020 Strategy. They have set experimental activities to make innovation happen on local basis. His topic today is a particular programme focused on capacity building in less developed areas of Europe. They do innovation brokering with practitioners and to businesses. They came up with a tool for capacity building connected with technical assistance. A visual toolbox for system innovation was created to address transition issues. It tackles four themes: stakeholder analysis, multilevel perspectives, vision and broadcasting and niche management. It provides elements on system analysis, decision making, gathering information and perspectives for the future. The book comes with learning material and is free for download.

The overall approach undertaken is challenge-led: it combines expert advice, technical advice and participatory process. The challenge is how to help practitioners to get skills and competence to define the challenges and to identify data for solutions. Through workshops, data can be collected and used via knowledge codification and visual networking. It allows for reflections in a different way. It is systematized in order to make it simple for decision-making.

His experience with politicians: they don’t want to be trained, they want solutions. It brings the question of how to think about capacity building or training as part of a problem-solving process. Participatory capacity can offer a way to include other stakeholders such as civil society, companies, and academic actors in the process of acquiring skills that lead to co-creation of solutions.

Anna Kiringi presented her experiences with AfricaLics (African Network for the Economics of Learning, Innovation and Competence Building Systems), a GlobeLics related in building capacity for innovation and development. Launched in 2012, the initial goal of the Network was to build a community of researchers interested in innovation relevant to Africa. At the beginning of the institution of AfricaLics they run a survey among the members and raised around 8 or 9 neglected areas for Africa to focus in terms of development and what they do nowadays is still related to those areas.

They promoted as a first activity a two-week training programme for scholars in order to teach skills on some specific areas those scholars needed to improve. In 2013, now relying on Swedish funds, they could promote more activities related to building capacity and train scholars to undertake analysis in innovation activities in fields they work with (agriculture, information and communication etc.)

Some of the positive points learnt are:

- The focus on individual capacity building has allowed for spotting what could be improved in the institutions those individuals come from
- The institutional capacity building focus contributed to providing individuals with a role in their institutions
- The focus on network building across disciplines, countries and departments has helped AfricaLics with lowering costs and increasing synergies
- Defining of the scope: they want to be very relevant in what they do, which is African development and this may include distinct fields.

Some of the challenges faced were macro, meso and micro and they have to do with the way the African institutions operate: issues with curriculum related to the lack of critical thinking. Also, bringing scholars to understand what innovation studies are and how to assess innovation.

Geert Williams from The Agricultural Innovation Brabant (LIB) is a public-private partnership that started in 1995 with a learning-by-doing experience. Their goal is to contribute to innovation and sustainability in agriculture and to increase the acceptance or how people perceive agriculture in the province of Brabant. The province is located in the south of the Netherlands where 2.4 million people live. The farmers' organisation ZLTO account for 2/3 of all farmers in the area, it is a strong organisation and has been around for more than a century. Every four years since 1995 LIB runs an evaluation.

The LIB approach takes small steps with learning-by-doing. They now have achieved 600 projects supported in 20 years. Between 10-20% of farmers in the province is involved with LIB projects. The projects are the base structure of what they do: they receive 500 thousand euros per year and academic support from local universities. LIB supports around 35 projects per year and around 1000-1500 farmers in a 4-year period. There is a special focus on moral support for innovative farmers because they account for only 2% of the total and are not well accepted among the rest. This is provided on a long-term basis because innovation takes time to become viable. An example of a successful case is the Vegetarian Butcher. It is a protein-based vegetarian "meat" industry that started in 2007 and it is growing fast.

Questions and comments:

Q : how was the multilevel perspective used in the project of Climate-KIC?

A: Every 4 years they are evaluated, in particular using multilevel perspective. It helped to identify where in the big picture they were working, so they could rethink what their approach; to get a better understanding from the policy-makers; to identify tools that were lacking for scaling up; to acknowledge the need to support not only incremental innovation but mainly radical innovation.

Q: regarding the training, will it be in conflict with the other training that is being done in Africa already?

A: The idea is not to create a programme in competition with others that already exist but to learn from them, understand what they have been done and to create an understanding of what is needed. In the first years, the idea is to focus on the members. They want to create a range of resources so people can draw upon it. They hope to complementary.

Q: why is there no content in French in the AfricaLics project?

A: The network is still small and they are still expanding the geographical reach. So far what has been done is a module taken in French in analysis in innovation.

Q: is the learning-by-doing process in Climate KIC project focused only on farmers or does it include other stakeholders as well?

A: The core was to work with farmers in the beginning, but in the last 5 years, new actors have joined: artists, NGOs, designers and healthcare people. It gives a boost to innovation. An example was when farmers were put in contact with artists and they came together to discuss ideas and solutions in common.

Q: how is the visualisation tools used by the participants in the workshops of Climate KIC?

A: they can use different types of visualisations. The point is to get a reflection about what the participants have been discussing and the competencies needed for decision-making by bringing the discussion in a systematised way. And the tools are not difficult to be learnt.

Q: how to combine together in a workshop people from different contexts, different countries and backgrounds and different problems? How to make sure it is a productive experience even if the participants might end up working in a group that is discussing themes very different from theirs?

A: The preparatory work is essential for a training programme. In a particular case, they have worked one month in advance with the particular issues that were addressed beforehand. It allowed for preparation for a discussion that could benefit all. The set-up process for learning is also discussed in advance. In the end, with the right set-up and the right participatory tools, the participants create their own learning experience.

PARALLEL SESSION 4B: Research design and method for Transformative Innovation – Global North Focus

Panellists:

- Stefan Kuhlmann, (Chair), Chair of the Department of Science, Technology, and Policy Studies (STaPS), University of Twente
- Lea Fuenfschilling, Researcher, CIRCLE, Lund University
- Adrian Smith, Professor of Technology & Society, SPRU
- Matthias Weber, Head of Unit Research, Technology and Innovation Policy, Austrian Institute of Technology

The discussion started with an intervention of each panellist, followed by a series of comments to each other's views and questions from the public session. TIPC insights and the result of the different experimentation processes in policy making that are being carried out are of undeniable relevance for both scientific research and policy-making activities. Throughout the discussion, the panellists explored where the significance of these insights rely upon and how to translate them into useful information for scholars and policymakers.

As a global platform, TIPC presents a rich source of empirical material and original insight on how policymakers think, how they interact with each other and what kind of questions they rise. While observing how the policy-making processes unfold in the reality of a specific context, there are first-hand, different inputs for theoretical questions. Moreover, the empirical nature of the material presented from TIPC provides valuable information both to understand and to make policy, creating a virtuous circle between academics and policymakers.

The inclusion of different societal actors while researching is crucial. Interaction is one of the primary stimuli while investigating; therefore the exercise is much more enriching when it involves a broad set of actors. The research results have to be translated into a scholarly output to contribute to the knowledge production around sociotechnical changes and ST policies, but they also have to be translated into practical tools that contribute to policymakers' endeavour. Thus, designing different formats to present research outputs – not just the scholarly scheme- is necessary.

TIPC work does not necessarily follow a standard traditional process of empirical research as it is based on co-creative initiatives with policymakers. The most substantial barrier is to undertake the research process in a way that allows investigating reality in order to transform it, and at the same time that its outputs can be transformed into valid data and research production. The importance relies upon the research processes themselves and their relevance to transform a specific context.

Researches should seek that beyond suitability for scholarly publications. Social sciences have a vast number of empirical research methods that TIPC participants should grasp on; furthermore, the conception of research as a process and not just a project can nurture the outcomes even more.

PARALLEL SESSION 4C: The importance of place-based and regional policy agendas in Transformative Innovation

Panellists:

- Matias Ramirez, (Chair), Senior Lecturer, SPRU (MR)
- Tatiana Rodríguez Maldonado, CENSAT Agua Viva, Colombia (TR)
- Edurne Magro, Orkestra – Basque Institute of Competitiveness (EM)
- Jonas Torrens, PhD student and SPRU Research Fellow, SPRU (JT)
- Claudia Obando, PhD student and SPRU Research Fellow, SPRU (CO)

This session focussed in on key examples of place-based policies being implemented successfully and also the challenges that comes with this. Tatiana Rodríguez's presentation illustrated how participation of civil society takes place and interacts with science, technology and innovation systems to change narratives around issues that are of primary importance for communities. Through the study of the policy "Partners for Prosperity" and the case of the Water Referendum, it was observed that, in both cases, power imbalances –often neglected- are present during the actors' interaction. However, when an initiative is implemented top-down rather than bottom-up, participation is more likely to be de jure rather than de facto.

The policy Partners for Prosperity is an initiative based on a social dialogue methodology that works around the concept of corporate citizenship. This policy was implemented in the region of Antioquia to create spaces in which communities could establish a forefront dialogue with industries with the intermediation of universities (e.g. The University of Antioquia). This policy initiative failed to achieve real participation and had as a consequence the disenchantment of the communities with the government, the universities and the industries. The spaces created under the premise that, 'through dialogue, it is possible to achieve an agreement that will lead to the validity of industrial operations', were spaces in which power imbalances stood out and the industry interests were prioritised. In this context, the communities affected felt that the means used by them in the past (e.g. mobilisations, public forums, etc.) to raise their voices were not considered legitimate by the government, which contributed to the failure of this policy initiative.

By contrast, the case of the Water Referendum was presented, a process that started around 2012 and lasted for five years. Not only the participation and interaction with already established STI systems were bottom-up but also set a precedent that lasts until today. In this regard, although the means used by the communities involved in the Water Referendum were similar to those used in the previous case (e.g. organisation of public forums, mobilisations –navigating the rivers-, signature collection, etc.) the communities felt empowered and wrote a draft of a Law they wanted to see approved for the preservation of the water in their territories; this Law ultimately reached the Congress. Moreover, the power of this initiative was not only reflected on its endurance over the five-year period but also in the fact that it became an example that was followed by other social movements (e.g. a social movement fighting for an energy transition).

It was emphasised that both cases exemplify how communities, within their own territories, are fighting for changing narratives about sustainability by including in the definitions their own views and perceptions (e.g. Buen Vivir or Sumay Kausay). Moreover, they are trying to change these narratives by depicting new imaginaries about participation: plural, bottom-up and democratic. Both cases reflect that a change in the narratives of science, technology and innovation systems cannot take place without a real participation and without being aware of the power imbalances between stakeholders. The question that remains is how we can balance both the participation and narratives of the experts with the ones of local people and communities.

Jonas Torrens exemplified with his presentation that the changes experienced through transformative innovation do not always stem from the policy arena. Whenever we think about innovation policy, often we think about the policy that comes from government agencies; also, it is present in the imaginaries about transformation that these radical changes can only be enabled by a national policy. However, by unpacking the elements of the case study of Bristol, it was seen that transformations actually involve multiple actors, multi-scalar phenomena, are not controlled and organised processes, and that policy-makers themselves can be the disruptors of interesting processes taking place in the ground.

When discussing transitions in a city, often the idea of remaking that city, and the meanings associated with those processes of change, appear. In this regard, Bristol -a city that has become a place for experimentation in energy alternatives- was historically considered an important port and an attractive location to place nuclear power stations nearby and a place through which nuclear waste could be transported. During the 1960s, the city was prone to be redeveloped after the war; this was a push that was complemented by the reluctance of Bristol citizens to the nuclear waste traffic through the city. The combination of these elements created a space to develop an alternative narrative about what the citizens wanted the city to be. Thus, citizens opposed to developing the city in a modernistic way (e.g. big infrastructure projects like highways) and powered their actions through an environmental movement.

The research emphasised the relationship between the transformations and the history of the city. In this regard, not only the war and the disenchantment with the circulation of nuclear waste but also the governance of the city (one City Council among four, and a County Council with the prospect of not being Bristol-centred) gave space for people's agency to act differently.

The previous points are likewise related to the importance of the place-based perspective. In this regard, a place is a site or a location for different elements of the sociotechnical systems come together. The idea behind this approach is that meanings, identities, histories and situations shape the political dynamics of planning and policy making and provides senses of unit or division among communities. For instance, three moments were identified that were important for the transformation of Bristol in which place-based elements interplay. First, around the 1990s, the discussions around sustainable development push forward the local government to become more involved. This had, as a result, a government trying to get more involved with the grassroots movement that appeared during the 1960s. Second, in the 2000s, the reshaping of the governance in the UK enabled the elimination of the County Council, the transference of power to the City Council and a prescription that the city needed to engage more with environmental issues. Finally, in 2010, the environmental movement became a tool for advancing the goal of Bristol's Major to get new ways of financing the city by portraying Bristol as an inspiring example for other cities. The combination of the meanings, identities, histories and situations associated to the city of Bristol ended up changing the directionality of the local policy in terms of sustainable development.

From this case-study, there were three takeaway points: 1. Directionality is often thought as a precondition, but it is often an outcome. 2. More attention needs to be paid to the genealogy of experimental settings and to the question of why, if so, there is a transformative agenda behind them. 3. Politics of leveraging need more attention; for instance, how participation and the agendas set by civil society can favour political agendas like in the case of Bristol.

Claudia Obando's presentation focused on the interplay between sectorial dynamics and STI Policy and how this interplay can enable transformation, particularly in the case of regional diversification. By using the case of Boyacá, Colombia, it was seen that the role of civil society is key to understand the drivers of regional change. It has been argued that the sectorial dynamics might become constraining or enabling factors that influence the way in which industrial change is demanded and emerges. Nevertheless, what has not been explored in depth is that, eventually, these sectorial forces can emerge from the interaction with civil society and social movements since the latter relate to these sectors, and co-create new meanings and expressions that end up shaping processes

of industrial change. Therefore, social movements can be considered as actors enacting industrial change through its involvement in sectorial dynamics.

In Boyacá (the second region in Colombia with the largest number of mining titles given, the interaction between social movements and the mining sector is becoming a driver for change since these are currently challenging the power relationships to unlock STI agendas and influence wider processes of change. This case exemplifies not only the potential of participation of civil society but also the vital importance of a place-based perspective. For instance, these movements are located around the mining camps and, therefore, are directly affected by the mining activity. For this reason, those are precisely the movements that react and interact with the industry to influence change. Social movements, in this case, did not emerge only because of the industrial dynamics. On the contrary, their activity goes back to 1960s and the narratives they posed around the life and the relationship between people and water have remained in force to the date. In short, the continuity of the movements has allowed the emergence of collective responses to the mining sector to protect natural resources through the demand of environmentally protected areas mirroring, thus, the relevance of the local element. In this regard, more than 39 movements have emerged in the past years and they managed to change the direction of the STI agenda.

In the context of Boyacá, public policy emerged as a response to these sectoral dynamics by supporting these processes of change with tools, expertise, support for entrepreneurial projects, among others, and has, at the same time, legitimised the social demands placed by the movements. Sectorial dynamics might create, in some cases, the conditions for change by unlocking STI agendas through the incorporation of the social movements demands in its dynamics.

Eduarne Magro's presentation explored the importance of the spatial understanding of Transformative Innovation Policy (TIP) and the challenges that using this approach poses. All places matter for innovation policy and for transformative innovation policy and that there exist several factors that justify the need for a spatial approach for TIP.

First, the literature about the geography of innovation, clusters and spill-overs support the argument that innovation and knowledge are concentrated in certain spaces. Consequently, there is an uneven distribution of the impact of innovation, which is increasing regional and within-country disparities, and is having a negative overall effect on innovation (e.g. the regions that experience these inequalities are more reluctant to experiment due to these asymmetries in the returns). Second, innovation is contextual; not only the development of knowledge capabilities but also their diffusion is uneven depending on the region. Although this unevenness can be explained by diverse factors, the institutional the context associated with the presence of networks, previous infrastructure investments, culture, economic structures, among others can account for most of it. In addition, the challenges and the understandings associated with innovation policy vary widely across regions, highlighting the importance to translate these challenges into a regional place-based approach. Third, implementation is always local and takes place on the ground. The policy implementers, often, have backgrounds and perceptions that may contrast with those at other levels of policy-making. Moreover, perceptions and understandings, according to the sociotechnical systems literature, may vary from place to place due to the existence of diverse institutional environments, cultures, and economic structures.

Although the idea of using a place-based approach for the implementation of Transformative Innovation Policy (TIP) is widely justified, it cannot be denied that using this approach pose several challenges. First, despite the fact that the TIP approach is new for regional innovation systems, it does not substitute the previous ones. However, the existent place-based networks and structures might help to link and translate the in-place institutional context to the premises of the new innovation frameworks. Second, what is meant by transformation is not understood in the same way in all the different places in which this approach wants to be implemented. For instance, the ideas behind the transformational sociotechnical systems, mainly referred to global challenges, are not translated for the context of regions in which they are being fostered (e.g. poverty is not tough in the same way in one region than in another).

In order to succeed, these challenges must be considered. Not only the language must be accessible, but there should exist common understanding of what transformation means in the regional context. Moreover, previous agendas –for instance, the ones related to economic development– cannot be abandoned; instead, they need to integrate these new approaches by ensuring a balanced participation of the civil society. Additionally, power imbalances and the role of regional elites cannot be neglected; however, they can be an element of support of these new approaches if trade-offs in the short and long run are ensured. To achieve transformations through innovation policy, governments need to negotiate, foster dialogue and participation and ensure multilevel governance. Questions and comments:

Q: How can we enrich our policy views by not only considering language differences but recognising that it is not the same to talk about regions, settings and territories? For instance, the informal economy is often associated with settings, indigenous communities with territories and political arrangements with regions. How innovation policy is addressing these differences?

Q: how are global, national and local processes interrelated and to what extent the transformative innovation policy is aware that often local and regional agendas are influenced by global processes?

A: It is important to recognise that we need to keep the doors open to reality; this means not importing policies from elsewhere without adapting them to local contexts. The failure of implementation, she argued, might lie in the lack of adaptation and, sometimes, reformulation of policies that were the consequence of global trends. The importance of place-based approaches lies in the commitment with the places' own visions. For instance, phenomena like climate change need to be viewed and understood from the perspective of the targeted location (e.g. city, region, territory, etc.) and, even more, we must understand that those perspectives are on the making and are constantly changing. Therefore, a commitment to change, openness and redefining thoughts about systems is necessary.

We need to think beyond physical boundaries and focus more on the people based within the territories we study. To her, territories are also defined in relational terms; this is the relationship between communities. Precisely, these communities and their interaction with their environment have proved to create new imaginaries, mostly in contexts of resource constraints. For her, research and policy-making need to focus more on the relational understanding of the space. Finally, Ms Magro emphasised the importance of recognising that there are silos in policy making and in academia that can be overcome using an evolutionary geography perspective. Innovation needs to be situated in local contexts. In this regard, this alternative look can potentiate the impact of the transformative innovation policy approach.

Place-based approach is central to the concern of the people since it encompasses their worldviews, relationship schemes, problems and the issues associated to the unevenness that power relations create. Regions are a force of diversity and richness but also complexity and resistance, which are the elements that the policy need to manage simultaneously while dealing with innovation from a place-based perspective.