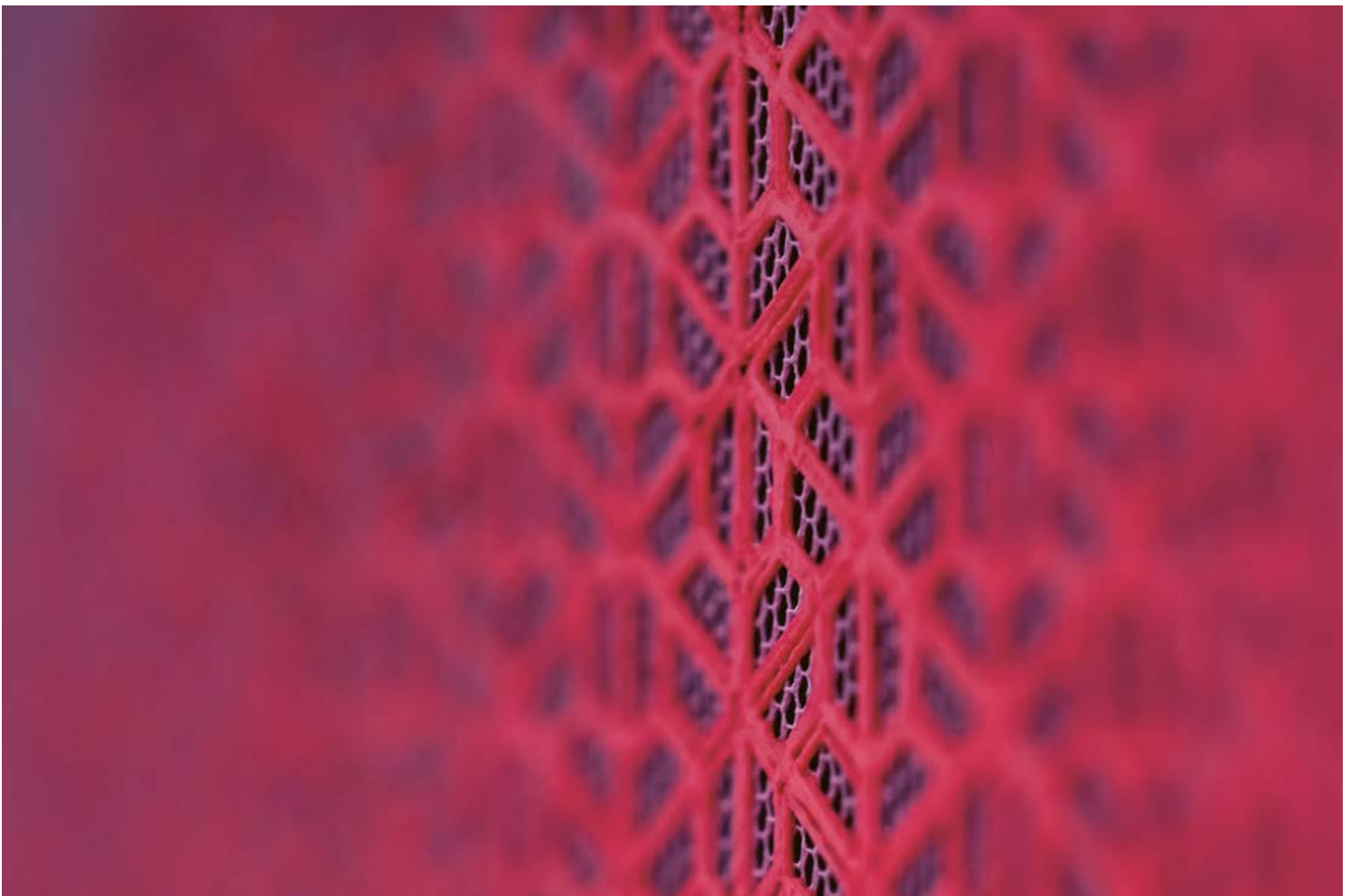


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Innovation for sustainability transformation: Exploring fields of tension

The 2024 saguf annual conference will explore fields of tension that must be addressed to build up enabling framework conditions for innovation for sustainability transformation.

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Innovation for sustainability transformation as a field of tension

The saguf working group on *Innovation for Sustainability Transformation (AG INSIST)*, formed in 2022, explores relationships between innovation, sustainability, and transformation. We argue that considering innovation in the context of transformation opens up new ways of thinking that differ from the established understanding of sustainable innovation. We have developed this in the form of eight conceptual cornerstones (Bornemann et al. 2022). These respond to calls for societal transformation to address multiple and interrelated global socio-ecological crises (Sachs et al. 2019).

In this communication, we introduce intermediary results of *AG INSIST*. Based on the cornerstones, we identified three

cross-cutting themes pointing to tensions that need to be addressed in the governance of transformative innovation. First, the tension between the needs and implications of a sustainability transformation, and a narrow understanding of innovations as technology- and efficiency-oriented. Second, a broader understanding of innovation in the context of sustainability transformation requires dealing with tensions related to diverging and conflicting views. Finally, discussions about societal transformation have also brought to the forefront notions of planetary limits and sufficiency, which has fundamental implications on how we conceive and evaluate innovations. In the following sections, we provide first elements to start discussing how to address these tensions inherent to innovation for sustainability transformation.

From sustainable to transformative innovation

The conceptual shift from sustainable innovation to innovation for sustainability transformation opens new spaces for thinking and action but also introduces new normative tensions as it recasts the relationships between innovation, development, and growth (Leach et al. 2012, Bornemann et al. 2022). While asserting a commitment to sustainability, including concerns for environmental and social issues, the notion of sustainable innovation has increasingly become associated with a progression towards predefined growth and efficiency goals. This is illustrated in the emphasis on sustainable innovation in key policy documents on green growth (OECD 2011, Dutz and Sharma 2012), which has been criticized as preserving a business-as-usual operating model (Hickel and Kalis 2020).

Reflecting the transformative turn in sustainability discourse, as expressed for example in the 2030 Agenda *Transforming our World*, innovation for sustainability transformation becomes closely associated with system change (Leach et al. 2012, Schot et al. 2019). Innovation for sustainability transformation recognizes the complexity and uncertainty inherent in systemic change, acknowledging transformation as a non-linear process with multiple, sometimes conflicting, pathways and outcomes.

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This view invites diverse forms of knowledge and experiences into the innovation process, creating space for pluralistic and participatory transformation. Engaging a wide range of actors – including marginalized communities and social groups, local experts, and interdisciplinary researchers – ensures that various perspectives are considered and solution schemata are co-created, increasing their acceptability and suitability for specific regional and cultural contexts.

Such inclusivity is crucial for addressing the multifaceted nature of sustainability challenges. However, it also brings to the forefront conflicting goals and values,

navigate the complexity of sustainability transformation (Turnhout 2024).

Acknowledging the role of conflict and crisis in sustainability transformation

Sustainability transformations are inherently contested because they alter established systems, from intra-individual processes to entire societies. Governance processes fostering innovation for sustainability transformation must therefore address conflicts that inevitably occur when engaging in transformative endeavours. Maintaining spaces that enable critical discourse and reflective thinking and allow

which would have been difficult to realise otherwise (Meinherz and Fritz 2024).

While social conflict and crises may serve as catalysts for change, relying on them as triggers for transformation is problematic because they tend to cause disruption and suffering. Furthermore, the urgency they create can justify top-down governance approaches to preserve existing structures (Dardot and Laval 2019), which contradict principles of long-term, participatory transformation. Therefore, the challenge lies in creating proactive spaces for innovation that anticipate and address future crises, rather than waiting for crises to force change.

Innovation for sustainability transformation recognizes the complexity and uncertainty inherent in systemic change, acknowledging that transformation is not a predictable process but rather a non-linear one that involves multiple, sometimes conflicting, pathways.

which are intrinsic to transformation processes, especially in pluralistic and democratic societies. Constructively engaging with these tensions requires building capacities for common reflection, dialogue, negotiation, and consensus-building in a naturalistic (scientific methods) and culturalistic approach (societal discourse and normative reflection) (Grunwald 2011). Education and learning pathways play a crucial role in this context, fostering a common understanding of the necessity to remain within the planetary boundaries while following principles of intra- and intergenerational justice.

Enabling such a pluralistic transformative governance requires trust among participants, not only in shared objectives but also in the flexibility to adapt these goals as the transformation process unfolds. In an era marked by polarisation and misinformation, fostering trust becomes increasingly challenging. Therefore, creating spaces for critical discourse and reflective thinking through transdisciplinary research and education is vital. These spaces nurture the competences needed to anticipate and

for experimentation requires forms of interaction that do not forego disagreement but rather build on it as a way to explore central conflicts and contradictions (Stirling 2008). Recognizing conflict as a way to address contradictions limits the risk of falling into post-political forms of governance that disqualify unruly publics, and thus contradict the inclusivity needed for transformative innovation (Buletti and Ejderyan 2021).

Furthermore, profound sustainability transformations sometimes benefit from crises to disrupt the status quo and open spaces for transformative niches, innovations and practices that have long existed on the periphery (Pahl-Wostl et al. 2023). Crises expose vulnerabilities and unsustainabilities of systems, prompting reflection and reevaluation of unexamined practices and providing opportunities for reassembling structures that align more closely with sustainability goals. For example, the COVID-19 pandemic catalysed experimental governance practices in urban mobility, such as the rapid implementation of pop-up cycling and pedestrian zones,

Transformative innovation in a sufficiency context

In contrast to the concept of sustainable innovation, which has been largely integrated within green growth discourses, innovation for sustainable transformation emphasises the importance of sufficiency for systemic change that reorients societies towards sustainable futures (Lage 2022). Sufficiency aligns with transformative innovation by challenging assumptions of growth-centric development and promoting practices that are ecologically and socially sustainable such as rethinking global consumption patterns and paying attention to social well-being. While the sufficiency discourse is gaining traction within transformative innovation debates, it is also contested as it questions a mainstream imaginary of innovation associated with efficiency seeking technologies.

Introducing the notion of sufficiency in discussions about transformative innovation calls for a fundamental rethinking of societal values and practices. It encourages innovations that reduce resource use and environmental impact while enhanc-



BOX 1: saguf-Jahrestagung 2024: Innovation in (der) Transformation: Unterschiedliche Vorstellungen überbrücken

Die Transformation zu einer nachhaltigen Gesellschaft erfordert grundlegende Veränderungen auf gesellschaftlicher, technologischer und institutioneller Ebene. Bei dieser Jahrestagung der Schweizerischen Akademischen Gesellschaft für Umweltforschung und Ökologie (saguf) gehen wir gemeinsam der Frage nach, inwieweit bestehende Verständnisse und Praktiken von Innovation den damit einhergehenden Ansprüchen genügen und inwiefern sie angepasst werden sollten.

Personen aus Politik, staatlichen/öffentlichen Einrichtungen und der Zivilgesellschaft werden in eine moderierte Diskussion treten, um das Verständnis von Innovation für eine Nachhaltigkeitstransformation zu reflektieren.

Ort: Kulturpark Zürich (Großer Saal), Pfingstweidstr. 16, Zürich

Datum: 22.11.2024, 13:30 bis 17:30 Uhr

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ing quality of life. In such a view, social innovations are increasingly presented as a driver of transformation to sustainability. Sufficiency for transformative innovation and social innovations are intrinsically linked together. By promoting reduced and adapted resource consumption and fostering inclusive governance, the transformation to sustainability agenda implicitly calls for sufficiency-oriented social innovations to address environmental and social challenges (Asara et al. 2015).

Social innovations have sometimes been opposed to technological innovation. However, the latter remains crucial in the context of transformative innovation by providing tools to support social and policy goals. Moreover, technological innovation does not only have an instrumental dimension. It can offer imaginaries for transformation to sustainability and thus widen the range of possibilities and drive social innovations (Schot et al. 2019). In return, anchoring technological innovation in sufficiency, “steady-state”, or degrowth discourses can also introduce new ways to conceive technologies with a focus on producing and consuming less (De Saille and Medvecky 2016).

Outlook

The AG *INSIST* invites readers to discuss the tensions associated with the notion of innovation for sustainability transformation at the upcoming saguf annual conference, taking place in November 2024 in Zurich (box 1). We will explore and reflect

on how to address these tensions with speakers from innovation and research policy, academia, and civil society. These discussions will serve as a basis to outline the framework conditions that could enable and support innovation for sustainability transformation.

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