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Innovation Labs: Tackling sustainability through systemic collaboration

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The University of Bath is currently developing a Future Water Laboratory, bringing together scientists, engineers, business people, investors, NGOs, users and social scientists in order to advance the implementation of sustainable water technologies. In this article, Tams and Wadhawan examine existing Innovation Lab practices that inform this initiative.

The global pressures on limited natural resources call for innovation practices that enable effective collaboration across complex social systems. These include scientific and technological research, business, policy-makers, NGOs and users. In other words, finding sustainable ways of living on an increasingly interdependent planet embodies complex problems that cannot be resolved by any single player or solution – be it technology, policy or practice. In recent times however, 'innovation labs' have sprung up across various sectors as an answer to such interconnected problems.

In this article we discuss the role of innovation labs in creating a collaborative space where people from different disciplines can engage with the complexity of sustainable innovation. Our discussion relates to pioneering case studies in this field and considers the implications for developing a Future Water Laboratory that draws on the particular expertise of scientists and engineers at the University Bath in the area of sustainable water technologies.

Tackling societal challenges

Innovating more sustainable ways of living in our global society represents a 'wicked problem'. This notion was introduced by the designers and urban planners Horst Rittel and Melvin Webber to distinguish intractable social and organizational problems from relatively 'tame problems': these are relatively definable and uncontentious and can be solved rationally through technical or professional expertise. In contrast, wicked problems are novel, complex and characterized by a lack of clarity about the problems' origin, having no 'right' or 'wrong' answers. Problems are wicked because the criteria to evaluate possible solutions are different for each stakeholder. This is further compounded by how each solution is part of a larger interdependent system, creating further unintended consequences and problems. In this sense, wicked problems are unstoppable. Such characteristics make wicked problems subject to political and contestable judgment, and to repeated re-solution – not solution.

Sustainable water as a 'wicked' problem

The wickedness of societal problems is illustrated by innovation in the area of sustainable water use. In the UK, abundance of water has traditionally been taken for granted. Yet, climate change and concerns about reducing our dependency on fossil fuels are raising our awareness of this. It has been brought home by water shortages in some parts of the UK, but also growing concerns about the increasing risk of drought in Africa and Asia. A World Bank report, assessing the social impact of climate change, suggests the resulting famine can lead to distress migration and conflicts. Since water is closely connected with our use of energy (e.g. water treatment requiring energy, but water also serving as a renewable source of energy), it is not surprising that some commentators are calling water the 'new oil', signalling the importance of water as a primary commodity that will influence 21st century geopolitics.

Innovation in this area requires systemic approaches because our consumption of water is embedded in a complex system, including the natural environment, the water and sewage services of water companies, government regulation, private and commercial users, and products, technologies and practices that use water and through which we use water. These interdependencies cannot be isolated locally. Global supply chains and the international operations of British business impact the local economies, society and natural environment of the 'water crunch' regions of Africa and Asia. As there is no single solution, various approaches are required – ranging from encouraging consumers to use less water

in the household to stimulating innovation by universities and industry, setting standards, and shaping policy.

However, each approach is prone to limitations. Take efforts directed at influencing citizens to reduce their water consumption. Despite a small percentage of society being willing to change individual behaviours for the sake of the larger good, policy-driven efforts are constrained by cultural habits and social acceptability.

Stimulating innovation

An alternative is to stimulate innovation. For example, industry plays a role in developing new products and services that reduce the water footprint embedded in the lifecycle of consumption. This could include the sourcing of raw materials, production, distribution, consumption and disposal. However, a systemic perspective raises further challenging questions:

- How appropriate are the metrics by which companies determine the water footprint of their products and services? To what extent do these metrics measure the 'real' social and environmental impact of their raw materials?
- How equitable is it for sustainable products and services to be targeted only at a small niche of less price-sensitive and more environmentally-minded consumers in advanced industrialized nations?
- How can industry reduce renewable water consumption on a global scale, including emerging and developing economies?
- What is the role of global standards in influencing systemic change in industry? How should these standards be set? And how do we avoid new standards constraining innovation?

These questions illustrate the various challenges that compound and thus increase the complexity of achieving a more sustainable use of water. As Rittel and Webber argue, these kinds of problems are challenging because our pluralistic society does not allow us to articulate commonly acceptable standards of societal 'goodness'.

What kind of leadership do we need?

Wicked societal problems call on us to engage more explicitly with their inherently political, ambiguous and contradictory character. Leadership expert Keith Grint suggests that these situations demand our ability to "ask the right questions rather than provide the right answers" and also to engage in "a collaborative process to make any kind of progress" (2005: 1478) . Similarly, Tams and Marshall (2011) find that taking leadership in the emerging context of sustainable business involves continuous exploration, linking up with like-minded others, and systemic reflexivity – in other words, repeatedly drawing on one's experiences to probe into inconsistencies between intentions and outcomes.

In sum, the challenges which society and organizations face in managing limited resources more sustainably require a widening of our traditional conception of leadership. Aside from developing the character and capability of individual leaders, they indicate the growing need for leadership which facilitates collaborative learning across diverse constituencies. This leadership probes purposefully into the complexities and contradictions of sustainable innovation.

Innovation Labs

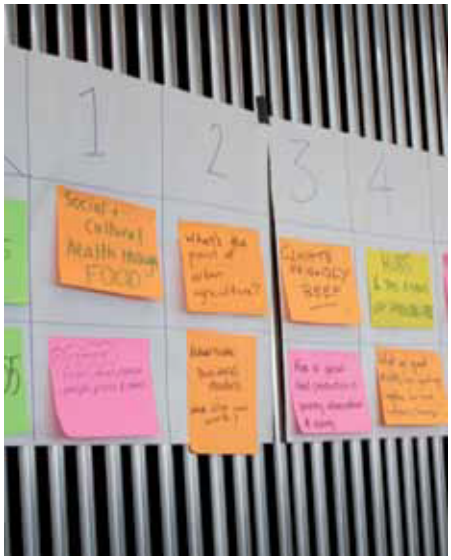
In response to these challenges, we have observed the emergence of innovation labs as a novel approach to management learning. We define an innovation lab as a collaborative space convening people from different disciplines and resources to address complex and systemic issues through a variety of change methods. These methods are often informed by scenario-planning, design practice, and community engagement. Although each innovation lab has its unique purpose and process, they typically combine some of the following practices:

- Convening diverse people who share a common interest in a particular societal or organizational problem
- Mapping systemic issues and tensions
- Building a sense of community and shared identity
- Developing prototypes of new initiatives
- Scaling up initiatives to affect wider systemic change.

Over recent years, innovation labs have been used both in business and multi-stakeholder settings.

IDEO

In large business organizations such as Motorola and Fisher-Price, the design firm IDEO has promoted innovation labs as a means to increase the speed by



Members of 'Tasting the Future', an innovation lab supported by WWF UK

which new products can be brought to market. Here, an innovation lab aims to break down the traditional barriers between patent-driven R&D departments and the core business. It offers a dedicated physical space away from the office that is conducive to group creativity and where employees from engineering, marketing and design meet with subject matter experts. They go out to the field and observe users in their everyday life, brainstorm ideas and build prototypes. Key to the success of innovation labs is their ability to bring people from different disciplines together in order to play with fresh ideas. In that way, they offer an alternative to the barriers of compartmentalized organizational structures.

Innovation labs have gained particular momentum as a forum for engaging people across communities and organizations in social and sustainable innovation. Pioneers in this field are non-profit organizations and consulting firms such as NESTA, Reos Partners, WWF UK, and Forum for the Future.

NESTA

For example, NESTA (the UK's National Endowment for Science, Technology and the Arts) has been running several programmes that address societal problems such as climate change, declining health and a rapidly ageing population under the umbrella of its Public Services Lab. A particular feature of these programmes is that they convene participants through a competitive prize challenge. The open competition stimulates a diverse range of innovative ideas on the chosen topic from individuals, community groups and organizations. Through a rigorous selection process, a small group of promising proposals is selected from among all entries. The Public Service Lab then works with the chosen teams, providing them with seed funding, building their capacity through non-financial support from relevant experts, and sharing learning across the peer group.

WWF UK

Other innovation labs place more emphasis on building a community of

people with common interests first, to then support them in the development of their ideas. For example, WWF UK has collaborated with professional and industry associations in setting up two labs. Its Finance Innovation Lab is run jointly with the ICAEW (the Institute of Chartered Accountants in England and Wales) and aims to create an open environment for social entrepreneurs, investment bankers and anti-capitalists, the NGO community and designers "to explore, innovate and evolve the financial system, so that it sustains people and planet". A second initiative, the 'Tasting the Future' Lab, was set up in collaboration with the Foods Ethics Council, the Food and Drink Federation, and ADAS, and seeks to promote a sustainable food system. These labs are characterized by their openness and diversity, building online networks of up to 1,500 people and regular events of up to 150 participants. The labs encourage people to crowd-source new ideas and cluster around those ideas that inspire them. The organizers then work with these innovation groups to turn ideas into projects and find funding and support. In addition to generating specific projects, the emphasis is on building the capacity of a broad community. People who do not yet want to commit their time to a particular project, but who feel a dissonance between their values and their role at work, or a sense of urgency about sustainability and social justice, are invited to join in and build their conviction and confidence to act.

Food Security Change Lab

Similarly, the Food Security Change Lab organized by the University of Cape Town and Reos Partners (an international consulting firm with expertise in social innovation, scenario-building and labs) convenes communities of diverse people with a common interest in sustainable food security in South(ern) Africa. The unique feature of this lab is that participants ventured out into the field and built relationships across sector boundaries. Initially they interviewed more than 20 key players in the food system. They also conducted three learning journeys to different regions

of South Africa where they visited organizations concerned about hunger and poverty. These included: street vendors in townships, food markets, food retail chains, farmers' cooperatives, community gardens, and food banks. In a next step, they used this field research to map existing initiatives that are tackling food security in the supply chain. Based on this mapping exercise, they identified gaps in the value chain and formed several innovation teams around issues such as promoting food security among producers, distribution in low-income markets, and a "national conversation on food security".

Forum for the Future

In contrast, the innovation lab of Forum for the Future convenes more exclusive groups of business people from leading organizations within particular industries to take a systemic approach to change. The Forum aims to help organizations transform the systems they operate in – like food, energy and finance – onto a sustainable footing. The lab works alongside the Forum's projects to learn and develop more effective ways of doing this, through collaboration, innovation and action research. The Forum's innovation process often begins with participants using scenario-planning to explore the macro challenges to building a more sustainable system within their respective sector. Through this process, participants also develop a common language and vision. Based on this analysis, they then generate 'practical innovations' that they prototype within their respective organizations and develop collectively. For example, in one initiative with leading organizations from the shipping industry, members committed to implementing practical innovations for long-term sustainability such as: financing new technology; reducing the life-cycle impact of vessels; producing a standard of standards to drive improved sustainability performance; and making a step change in energy technology innovation and uptake. The Forum lab is working alongside this initiative, capturing what works and lessons learned as the shipping industry works to transform itself. These collaborative industry initiatives serve as a platform for generating fresh ideas, building the leadership capacity of participants as change agents within their organizations, and exchanging learning about innovative practices. As an initiative moves through these stages and accumulates practical learning, the lab gleans and shares its findings to enable other organizations and sectors to create this kind of system-level change.

A Future Water Laboratory

At the University of Bath, we are currently identifying partners and funding for a Future Water Laboratory that will use these collaborative innovation practices. The project is based on the particular expertise among a considerable group of scientists and engineers at the University of Bath in the area of sustainable water technologies. Although sustainable water management depends more strongly on technologies than many of the previously discussed innovation labs, the Future Water Laboratory is multi-disciplinary. Our assumption is that the key challenges in sustainable water innovations are not related to a lack of technologies, but result from considerable human and institutional barriers in implementing and scaling up these technologies.

The aim of the Future Water Laboratory is to develop and test a toolbox of collaborative, user-centred and systemic innovation practices that integrate the social, economic and environmental dimensions of sustainable water technologies, and that will enable stakeholders to build the business case for sustainable water technologies more effectively.

Identifying water challenges

As a next step, we are engaging with advisors in social innovation and the sustainable water space to identify a series of water challenges with high social impact, suitable partners and participants for the Future Water Laboratory.

As illustrations, we are currently exploring the feasibility of themes such as:

- How the construction and insurance sector can adapt to the increased risks of flooding resulting from climate change
- How companies can manage consumer perceptions in order to reduce the water footprints of everyday consumption across the lifecycle of products
- How to overcome the barriers to transferring technology and building sustainable water infrastructures in water stress areas in Africa and Asia
- How sustainable water innovations can contribute to 'smart city' approaches –

e.g., sustainable urban development that integrates human and social capital and traditional (transport) and modern (ICT) communication infrastructure.

Impacts

Through the Future Water Laboratory we aim to generate several impacts. Central among them will be to build capacity among stakeholders from the water sector for responsible leadership and systemic innovation. For example, this includes:

- Stakeholders from science and engineering research who need to engage and develop networks with manufacturers, water companies, investors, policy-makers and users to develop and implement water system prototypes
- Industries in advanced industrialized countries who are interested in offering more sustainable water services, and/or a faster, less risky and more effective prototyping of sustainable water technologies
- End-users, communities and commercial organizations from developing economies and who lack access to the innovation infrastructures present in advanced economies (e.g. capital investment, information about available technologies).

The Future Water Laboratory would enable these participants to manage the barriers to the development, transfer and implementation of sustainable water technologies more systemically and collaboratively.

The learning generated within the Future Water Laboratory will also be useful to policy-makers and non-governmental organizations. In particular, it will inform our understanding of how policy enables the implementation of complex water technologies and helps overcome the obstacles presented by existing institutional infrastructures and social norms.

Looking beyond the Future Water Laboratory, our aim is also to advance innovation labs by testing and refining a toolbox of innovation practices that integrate technological, human and institutional dimensions. Through this toolbox, we seek to build capacity among research centres, NGOs and commercial technology firms in facilitating collaborative innovation practices.

We are still in the early stages of developing this project and its potentialities. Many of our ideas will evolve as we progress. The direction and impact of the Future Water Laboratory is co-determined by the partnerships we form with other players who are committed to advancing a more sustainable use of water in our society.

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Photography

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