Chapter 14
Conclusion: Implementation of Responsible Research and Innovation by Social Labs. Lessons from the Micro-, Meso- and Macro Perspective

Erich Griessler and Vincent Blok

Abstract In this concluding chapter, we want to take a broader perspective and, based on the contributions to this book, identify the key lessons from the NewHoRRIzon project about RRI implementation in general and via Social Labs in particular. From a bird's eye perspective, the NewHoRRIzon Social Labs can be seen as interventions that depend on and are affected by several interrelated levels which might be separated roughly in the micro-level of Social Labs, the meso level of organisations, and the macro-level of national and European research and innovation systems and policy making.

14.1 Introduction

This volume is one amongst many results of the NewHoRRIzon project. As has been mentioned several times in this book, the aim of NewHoRRIzon, in a nutshell, was to promote the uptake of Responsible Research and Innovation (RRI) within the Eighth Framework Programme for Research and Technological Development, Horizon 2020.[1] To that end, NewHoRRIzon adopted and adapted Zaid Hassan's

[1] The NewHoRRIzon project ran from May 2017 to September 2021. Coordinated by Erich Griessler from the Institute for Advanced Studies, Vienna, it involved 20 organisations from research, research funding and civil society. The European Commission supported NewHoRRIzon in the "Science with and for Society Programme" (SwafS) with 6.8 Mio Euro (Grant agreement ID: 741402). Project partners were Aarhus University, Teknologian tutkimuskeskus VTT Oy, FFG, Fraunhofer Gesellschaft, Wageningen University, Fondation Nationale des Sciences Politiques,

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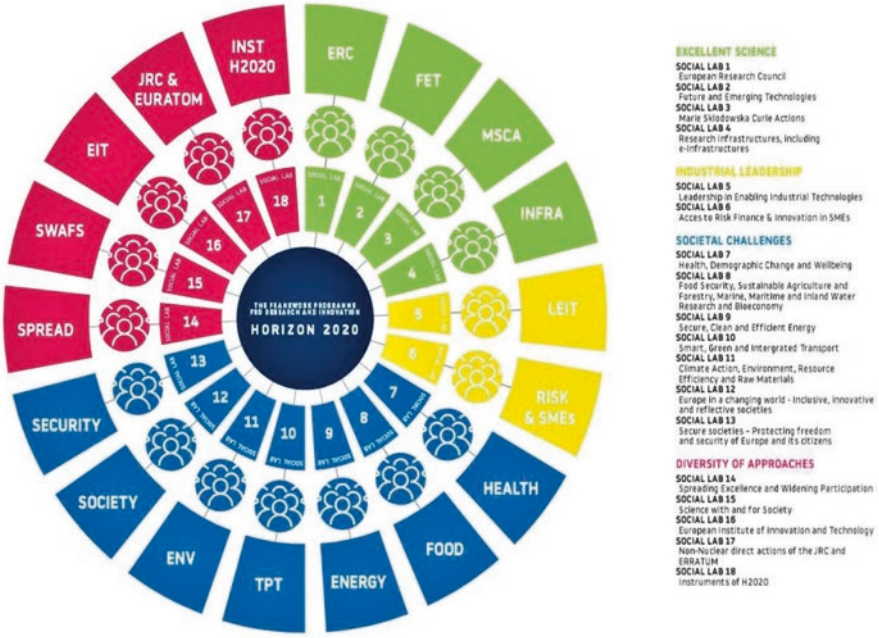

Fig. 14.1 The NewHoRRIzon social labs. (Source: NewHoRRIzon)

Social Lab concept, an approach of bottom-up-, stakeholder engagement to solve complex societal problems (Hassan 2014; Timmermans et al. 2020). After stakeholder mapping of Horizon 2020 and the analysis of the state of RRI in all its Programme Lines (Akca Prill et al. 2018; Bernstein et al. 2018; Griessler et al. 2018; Novitzky et al. 2018, 2020), NewHoRRIzon established 19 Social Labs that covered all programme lines of the European Framework Programme (Fig. 14.1).

The Social Labs were guided by a shared manual developed by the project partners in an iterative process (Griessler et al. 2021) and engaged altogether more than 720 stakeholders from across Europe, stemming from research, and research funding, civil society, policymaking and business. Over about two years, three successive workshops were organized in each Social Lab, in which participants developed and engaged in so-called pilot actions to address RRI challenges in their working environment. The NewHoRRIzon Social Labs developed altogether 59 pilot actions that covered all five RRI keys and were directed at researchers, research funders,

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policy makers, representatives from business, civil society, and citizens. The pilot actions can be explored in the virtual exhibition "RRI.Ex"[2] as well as in a Pilot Action Booklet (NewHoRRIzon 2021). The pilot action process for each Social Lab is documented in individual reports (Griessler and Hönigmayer 2021a, b, c; Daimer et al. 2021), and a Guide to Good Practice is available for practitioners (Cohen and Loeber 2021).

In this concluding chapter, we want to take a broader perspective and, based on the contributions to this book, identify the key lessons from the NewHoRRIzon project about RRI implementation in general and via Social Labs in particular. From a bird's eye perspective, the NewHoRRIzon Social Labs can be seen as interventions that depend on and are affected by several interrelated levels which might be separated roughly in the *micro-level* of Social Labs, the *meso level* of organisations, and the *macro-level* of national and European research and innovation systems and policy making.

On the *micro-level,* NewHoRRIzon sets out to engage relevant and knowledgeable individuals in research and innovation to reflect on responsibility in their work, identify deficits in their practices and create pilot actions to address them. From this perspective, we want to probe whether NewHoRRIzon and its Social Lab approach were able to achieve these aims.

The Social Lab participants, however, are not free-floating individuals, but represent various types of organisations that provide opportunities for, but also pose constraints for RRI implementation. This raises the question, to what extent were the Social Labs, as temporary interventions outside these organisations, able to generate change on the meso-level.

Finally, on the *macro level*, the NewHoRRIzon Social Labs are confined by national contexts of research and innovation systems and national and European policymaking, e.g., the way RRI is promoted within national and European research and innovation funding. This volume provides contributions to the answer to these questions on micro-, meso- and macro levels.

14.2 What Are Social Labs Able to Accomplish on the Microlevel?

Cohen and Gianni set the stage for this volume by conceptually anchoring Hassan's original idea of Social Labs (Hassan 2014) and Timmermans et al.'s (2020) adoption of John Dewey's pragmatist philosophy. Admitting current shortfalls of RRI implementation, they "side" with Nordmann's (2019) reconceptualization of RRI as a collective "experimentation strategy" (Cohen and Gianni 2022: 83). In doing so, they connect with Dewey's pragmatist approach that perceives democracy, not as a form of government but an "ethical way of life in which members of communities

[2] https://newhorrizon.eu/rri-ex/

are able to develop their potentiality through cooperative processes of experimental social inquiry embedded in social practice" (ibid. 84). As a "process of social inquiry" RRI should include a diversity of publics and should guarantee the "social, experimental and public nature of such a process" (ibid.).

Moving on from these normative assertions on to the micro-level, Marschalek and colleagues (Marschalek et al. 2022) show how the Social Lab approach worked well in terms of input and output. Based on the 19 Social Labs that cover all H2020 funding lines and that were populated with adequately large and adequately diverse groups of participants, they identify common problems of public engagement activities in Social Lab implementation, e.g., recruitment of participants, sustaining their motivation and securing funding for pilot activities. They show the success factors of the approach as promising experimentation for RRI implementation. The further establishment of the Social Lab methodology requires further practice and analysis. Social Lab implementation also must find a balance between possible standardization and necessary freedom of improvisation to be able to address individual challenges in different Social Labs. Still, an open question was the impact of pilot activities on the meso-level of organisations, a problem common for research projects which run for a limited time.

The Social Labs showed that diversity of group composition requires special attention since the degree of heterogeneity of participants has an impact on the Social Lab output. Yorulmaz and Bührer (2022) categorized types of output of Social Labs in (1) tangible output, (2) institutional change, (3) awareness, (4) practical cases, and (5) websites and examined whether diversity in terms of gender, stakeholder groups and countries of residence relate to types of output. They considered tangible outputs more, and awareness raising as less original and found that in "social labs with greater heterogeneity (…) across the three examined diversity dimensions, the frequency of tangible results increases with increasing group diversity" (ibid. 132). Their findings underscore that managing and coordinating Social Lab's diversity is particularly significant.

Braun and Starkbaum (2022) investigate the theme of diversity in Social Labs as well. They look at stakeholder recruitment and engagement and focus on two instances of Social Labs - one of them from the NewHoRRIzon project - where a single and strong stakeholder tends to dominate the Social Lab. The European Commission's Joint Research Center (JRC) accepted after some reluctance to support and engage in a Social Lab on the JRC. Although the selection of stakeholders in this Social Lab was broad, the sustained inclusion of stakeholders was low, and the JRC as initiator dominated goal setting and mission orientation within the Social Lab. Braun and Starkbaum concede that "broad stakeholder inclusion and participatory social impact assessment" are very important, but they also emphasize the significance of "building structures that guarantee shared mission and goal determination as well as mitigating the impact of potentially dominant stakeholders" (Braun and Starkbaum 2022).

Frankus and Hönigmayer (2022) also focus on the micro-level of Social Labs and take a single case study approach to clarify whether "the Social Lab approach

can be used (…) to integrate RRI in the EURATOM[3] research field and (…) ensure that relevant stakeholders are included to the R & I process" (Frankus and Hönigmayer 2022). In general, they conclude that the methodology was "valuable in getting different stakeholders together to co-create solutions for their defined societal challenges in EURATOM". However, they also identify major limitations. First, the Social Lab was rather homogenous as concerns variation of gender and stakeholder groups. The only voice, critical of nuclear energy, a civil society organisation's representative, left the Social Lab after the first workshop because this person did not feel the power and agency to generate institutional change in the Social Lab. Attempts to integrate other civil society organisations were not successful because of the same arguments. The resulting low heterogeneity of the group impacted the pilot actions which became small-scale and short-term. Future research should indicate whether an agonistic approach to stakeholder engagement (Blok 2019) in social labs can contribute to more heterogeneity of the group and will generate larger scale impact of the pilot actions. Second, Social Lab participants felt that they had limited agency, power, and financial resources within their organizations to make a change toward RRI. Frankus and Hönigmayer conclude that personal motivation and interest in which Social Labs build are not enough to implement "long-term institutional change connected to RRI" (Frankus and Hönigmayer 2022).

14.3 What Are Social Labs Able to Accomplish on the Meso-Level of Organizations?

Schoisswohl et al. (2022) report on experiences that representatives of research funding organizations had when engaging in the Social Lab. They investigated how RRI can be operationalized within three research funding institutions from Austria, the Czech Republic, and the Netherlands. They experienced that openness to the implementation of RRI was not a problem for these organizations, particularly because RRI could be linked to the increased call for mission- and challenge-oriented research and innovation funding that necessitates multidisciplinary and broad stakeholder engagement. Subsequently, they describe examples of already existing de-facto RRI in their three funding organizations, which provides important lessons for the implementation of RRI on an institutional level. Institutionalization of RRI expertise within the funding organisation was considered a strong instrument for implementing RRI. However, the authors also identified barriers to RRI implementation in research and innovation funding organizations, such as a clear and agreed upon concept of RRI. In addition, funding bodies are themselves constrained by political objectives and financial means set by their political principles.

[3] Within Horizon 2020 EURATOM is "a complementary research programme for nuclear research and training" (https://wayback.archive-it.org/12090/20220124160217/https://ec.europa.eu/programmes/horizon2020/en/h2020-section/euratom, 19.06.2022).

The authors identified in particular the "discontinuity of the SwafS programme"[4] as particularly detrimental. This "had an irritating effect on those parts of the agencies open to participatory elements in R & I and weakened the inclination to seriously consider RRI".

Long and Blok (2022) as well look on the meso-level and investigate how Dutch agri-tech start-ups manage responsibility. They define responsible innovation (RI) as a combination of "doing good" and "avoiding harm" and several strategies these firms used to tackle RI. These approaches include (1) balancing demands, (2) separating business and non-profit parts, (3) openness and engagement as well as (4) an integrative approach, that considers social and environmental objectives at the same time. However, the authors also identify barriers to RI in these firms such as (1) complexity, (2) lack of moral orientation and (3) stakeholder alignment and support, (4) technology factors, and (5) the speed and nature of the innovation process. Long and Blok advocate, and here they meet with findings in the earlier chapters, to align, complement, and bolster the earlier mentioned bottom-up approaches with top-down approaches such as "legislative guidance (…) as well as actions to create level playing fields by making unsustainable and non-desirable business practices less competitive" (Long and Blok 2022). In other words, bottom-up approaches such as pilot actions and the ones identified in Dutch agri-tech start-ups are not enough. They need support from the macro-level of policy making to stabilize on the meso-level of organisations.

Loeber et al. (2022) focus on the question of how to implement RRI at the meso-level. However, different from Long and Blok (2022) they look at how the Social Lab approach aligns with the overall policy approach taken by the European Commission within Horizon Europe. They perceive the Commission's approach to implementing RRI policies in the tradition of New Public Management that tries to generate a centralized policy with a coherent narrative. They contrast this only modestly successful policy approach (Novitzky et al. 2020) with a bottom-up, action-oriented, and learning by doing approach that does not prescribe what RRI is, and how it can be measured and implemented. Often, they observe, standard practices of research and innovation (policy) making, hinder the implementation of RRI. Instead, bottom-up strategies like the Social Labs motivate participants to "design and execute" (Loeber et al. 2022) pilot activities that connect to their ambition for RRI and are meaningful in their working environment. Loeber et al. (2022) perceive the Social Lab approach within the tradition of New Public Governance. As the contributions of their colleagues in this volume (Braun and Starkbaum 2022; Yorulmaz and Bührer 2022), highlight the importance of heterogeneous teams (Blok 2019). "By cutting across organizational and institutional boundaries, die interlinkages

[4] The "Science with and for Society Programme" had the specific goal to implement RRI and "to build effective cooperation between science and society, to recruit new talent for science and to pair scientific excellence with social awareness and responsibility" (https://wayback.archive-it.org/12090/20220124160325/https://ec.europa.eu/programmes/horizon2020/en/h2020-section/science-and-society, 19.06.2022). The SwafS unit was discontinued during Horizon 2020 (see Griessler et al. 2022).

between various aspects of research (funding) came to the fore. In principle, this formed a starting point for actually and practically enabling the uptake of RRI across diverse substantive and administrative contexts of the H2020 funding programme and the European Research Area. The Labs showed that for such actions to be effective, coordination between the actions and various realms of actions is also required" (Loeber et al. 2022: 156).

Warnke et al. (2022) look at the connection of RRI to the meso-level from a different perspective. Their focus is on one of the main keys of RRI - public engagement (see also Cohen and Gianni 2022) - and how it links to established practices of involving actors who are not professional researchers in research. They focus on two research areas, health, and environmental research, and identify four research traditions of public engagement of particular importance, i.e., participatory design, user-led innovation, participatory research, and systemic instruments. Public engagement activities inspired by RRI should engage with the communities and practices of these existing research traditions to enhance their impact.

14.4 What Are Social Labs Able to Accomplish on the Macro-Level of Policy Making?

Just like Loeber et al. (2022), Daimer et al. (2022) embark to explain the limited success of RRI mainstreaming in Horizon 2020. For that, they take up Randles' (2017) concept of deep institutionalisation and transfer it to the implementation of the RRI concept within Horizon 2020. Deep institutionalization comprises the (1) evolution of a dominant narrative; (2) maturation process; (3) Systemic consolidation and (4) vertical multilevel alignment. Daimer et al. (2022) conclude that RRI implementation on the H2020 level fell short in all these dimensions. First, there are several competing RRI narratives that are not yet translated into a "pragmatic approach that paves the way for a broader paradigm shift within the European Commission and the R & I community". Second, there was "no phase of experimental embedding into funding practices" and thus, third, no "preconditions for the systematic consolidation of RRI within the European Framework Programme. As for vertical, multilevel alignment, the fourth element of deep institutionalisation, the MoRRI project showed large disparity in Europe with regards to RRI implementation, with a few forerunners who provide interesting learning examples and, country clusters with less RRI experience.

Griessler et al. (2022) also focus on the ups and downs of RRI as a policy concept within European research funding. They use Sabatier's Advocacy Coalition approach and identify a fragility of the policy concept of RRI with interrelated conceptual, legal, financial, and institutional elements. They identify several competing advocacy coalitions, the main being 'Pro RRI' and 'RRI critics and actors unaware of RRI'. RRI lost ground because of the internal division on conceptual issues within the 'Pro RRI' advocacy coalition and opposition of the 'RRI critics', made

up of powerful actors "holding top positions in policymaking, administration, and industry and thus control(ing) institutional, legal and financial resources" (Griessler et al. 2022) who are committed to the dominant innovation paradigm.

Tabares and Bierwirth (2022) also take up the disparity between EU countries in the operationalization and institutionalizations of RRI and zoom in on the Spreading Excellence and Widening Participation" (SWEP) countries. They observe that "socio-ethical, geo-economics disparities and cultural particularities that can be found in this group of countries seem to play a role" and that "SEWP countries have not greatly benefited from (the) effort" to promote RRI (Tabares and Bierwirth 2022). These cultural differences relate to understanding gender and gender equality, public engagement, or the role and (unequal) distribution of formal and informal social capital. The authors advocate for considering the different cultural particularities and applying a differentiated approach when implementing RRI in these countries and not falling into the trap of taking them as a single and homogeneous cluster of countries.

14.5 Conclusions

The Social Lab approach used in the NewHoRRIzon project showed convincingly the great potential of bottom-up policy implementation. Starting from 'weak' adoption of RRI, the pilot actions strengthened RRI first and foremost on the micro-level. The Social Labs unlocked participants' creativity which generated pilot actions that accomplished RRI, generated awareness for, communicated, formalized, and created capacities for RRI. However, the Social Lab also showed that it is insufficient to act on the micro level only. They showed that RRI needs support on the meso-level of institutions to mature single pilot activities; to anchor them in organisational rules, norms, and routines. Finally, it showed that RRI implementation needs strong and continuous political and financial support from the macro-level of national and EU policy making to protect RRI implementation from the ever-changing winds of policy fashions. Thus, the current Framework Programme must continue the work that has been done in NewHoRRIzon and many other research projects on RRI in particular since the concept no longer has as central a role as in Horizon 2020.

In the new framework program, Horizon Europe, there is no room anymore for a dedicated Science with and for Society (SwafS) program line. A shift is observed from RRI towards OOO (Open Access, Open Innovation, Open to Society), Citizen Science, and Mission Oriented science and innovation. Although these new focus points of R & I policy are promising, they run the risk of comparable implementation problems as we faced with RRI (Novitzky et al. 2020). In this regard, the Social Lab methodology that is explored in this volume could contribute a complementary bottom-up strategy to contribute to the institutionalisation of citizen science and mission-oriented research and innovation. Furthermore, as the mission orientation gives rise to a solution strategy that presents responses of dominant actors (Ludwig

et al. 2022), social labs can facilitate agonistic strategies that focus on reflection on the global challenges and the often-conflicting responses involved (Blok 2019). Agonistic strategies seem to be more suitable in current societal debates, ranging from climate change to the corona pandemics, as the trustworthiness of science is increasingly challenged.

Restoring trust in science and innovation through responsible research and innovation does not only require social labs as a bottom-up approach to change science policy but also require another mindset of institutions and of researchers working in these institutions. For instance, research has shown that Open Innovation in industrial Research and Development (R & D) *can* be aligned with Responsible Innovation objectives but require an explicit normative ethical orientation next to their economic orientation (Long and Blok 2018). The same holds for Quadruple Helix Collaborations to collectively work on grand challenges, that can easily turn from agonism to antagonism (Popa et al. 2021), as the emergence of conspiracy theories and increase of populism across Europe shows. In the past few years, research in RRI has increasingly paid attention to the individual level competencies of practitioners involved in research and innovation, for instance the European projects HEIRRI and ENRICH. It shows the importance to invoke a sense of care and societal obligation in science and innovation, the role of individual competencies for the twenty-first century, and the role practical wisdom may play to increase responsibility in Research & Innovation practices (Meijlgaard et al. 2018; Blok 2018).

Social Labs are all but a panacea. But they might be a powerful remedy to the nowadays allegedly increased distrust in science. The Social Lab's characteristic of bringing stakeholders from very different areas and fields together which otherwise might never had met and motivating them to work together to address a common problem might help to generate mutual understanding between actors and a research and innovation that is truly beneficial to society and the environment.

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