Responsible nanotechnology R&I – Societal engagement practices
Multistakeholder Dialogues

Introduction

NANO2ALL is an initiative funded by the European Union's Horizon 2020 Research and Innovation programme under the Grant Agreement Number 685931. It supports the establishment of Responsible Research and Innovation (RRI) policy and governance on nanotechnologies. NANO2ALL also aims to identify RRI practices, with a focus on societal engagement in nanotechnology research and innovation (R&I) across Europe and beyond, with the purpose to share knowledge, experience and recommendations with other nanotechnology stakeholders and motivate a wider application of such mechanisms in Europe.

RRI is an approach that anticipates and assesses potential implications and societal expectations, with regard to R&I, with the aim to foster the design of inclusive and sustainable R&I[1]. As a dimension of RRI, societal engagement implies interactions between relevant stakeholders (companies, research organisations, policymakers, civil society organisations, consumers, affected citizens and others) in order to align research, development and innovation with the values, expectations and needs of the society. Such interactions can take various shapes, such as brainstorming, scenario workshops, user committees, online forums, dialogues, informal / formal meetings, or other formats.

This short report provides brief insights into the NANO2ALL Multi-stakeholder Dialogue organised at national and European level. During these events participants discussed how societal values, needs and concerns can be better reflected in nanotechnology research and innovation, in particular through an increased uptake of societal engagement in this domain of research and innovation. These dialogues resulted in several recommended directions for changes to be enabled by decision-makers at national and EU level.

Methodology

NANO2ALL employed a three-step dialogue methodology that consecutively encompassed the organization of national citizen dialogues and national multi stakeholder dialogues in six European countries (France, Israel, Italy, Poland, Spain and Sweden) and the organization of a final European stakeholder dialogue event (in Brussels, Belgium) between 2017 and 2019 (Figure 1). Each new dialogue phase built on the prior one, i.e. the outcomes of citizen dialogues served as input for the national multi-stakeholder dialogues, and the outcomes of the national stakeholder dialogues served as input for the European dialogue event. In this report we chose to focus on the two final dialogue phases of our methodology which are further elaborated into national and European Responsible Innovation Agendas.

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[1] https://ec.europa.eu/programmes/horizon2020/en/h2020-section/responsible-research-innovation

The dialogues allowed for deliberation of values and purposes underlying a responsible technological future for nanotechnology, and resulted in the articulation of those processes and preconditions that are needed for the development of socially robust and responsible nanotechnology applications. The described processes and preconditions may serve as an agenda for responsible nanotechnology policy-making as well as research and innovation in the nanotechnology community, both at national and EU level. A final step was taken to translate this agenda into a roadmap that presents an action plan to enhance societal engagement in nanotechnology.
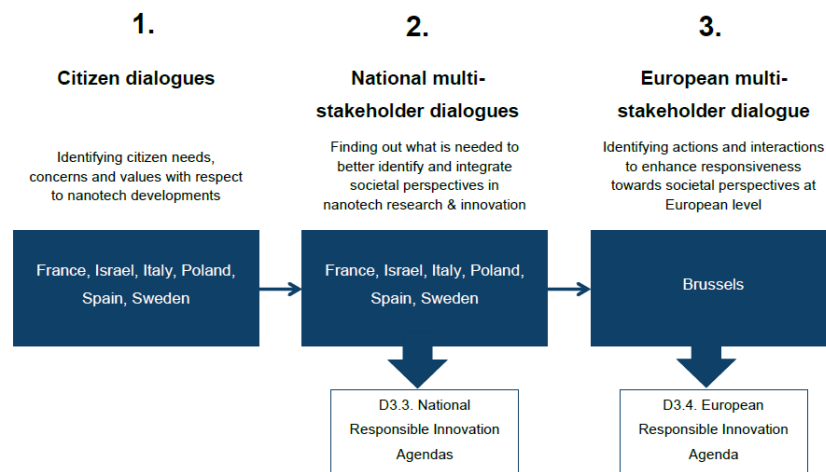

Figure 1 – Overview of the NANO2ALL three-phase dialogue methodology

National Multi-stakeholder Dialogues

The national multi-stakeholder dialogues were conducted as a 7-hour event with approximately 15 participants.

The six National Multi-stakeholder Dialogues aimed to explore both the dynamics of change, as well as future options and challenges. The dialogues allowed to create a shared understanding of stakeholder perspectives on purposeful change, particularly about the processes and preconditions that are needed for the development of responsible and desirable nanotechnology research and applications. This allowed for the collaborative construction of a national responsible innovation agenda. The various dialogue exercises were also aimed at establishing mutual understanding and learning, and also encourage the consideration of citizen perspectives that were expressed in the national citizen dialogues.

*Figure 2 – Scenario exploration at the Swedish Multistakeholder Dialogue*

The dialogue participants were recruited by local science centres, who hosted the dialogue sessions. The project aspired to bring together heterogeneous groups of approximately 12 participants, having diverse views on the topic of the dialogue. A guideline was provided on what types of stakeholder groups should ideally be included in the dialogue process including:

- Policy-makers
- Civil society organizations
- Business and industry representatives

- Nanoscientists
- Citizen dialogue representatives
- Non-fixed position (actors that do not have a formal stance with regard to nanotechnologies, such as a journalist or an artist, and who can, therefore, bring new perspectives to the discussion).

The dialogues explored particular nano-application fields (Nanotextiles in Poland and Italy; Brain-machine Interfaces in Spain and France; Nanomedicine in Israel and Sweden) and applied a three-block methodology, as illustrated in Figure 3.
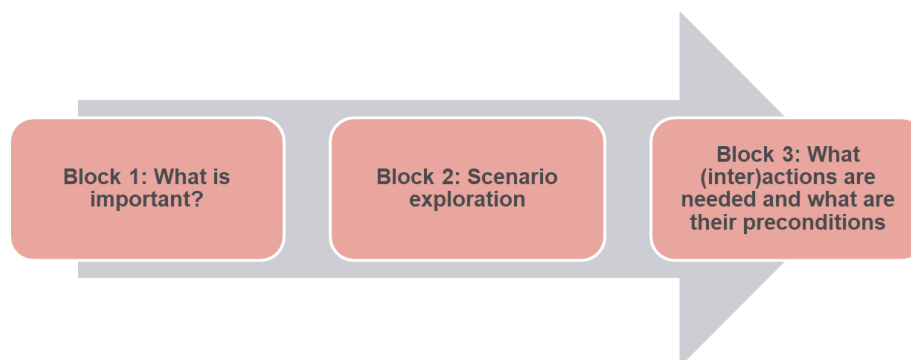
Figure 3 – National Multistakeholder Dialogue methodology

1. The first block constituted a reflection exercise upon citizen needs, expectations and values identified in the previous national citizen dialogues in each country and allowed deliberation over what is important / what is at stake for citizens when it comes to specific nanotechnology applications. These citizen perspectives were introduced in the dialogues through illustrative posters (available at http://www.nano2all.eu/made-by-citizens-objects/).

2. The second block of the dialogue was the Scenario Exploration Game. It is a tool that allows participants to playfully experience and act through alternative futures, by thinking and discussing outside of their usual frame of reference (SES game materials are available at: http://www.nano2all.eu/resources/nano2all-dialogue-materials-and-results/)

3. Finally, in the last block, participants worked in pairs and groups to discuss (inter)actions required to better identify and integrate societal perspectives in nanotechnology research and innovation. The methodology used was a backcasting exercise that helped identify actions and approaches that connect desirable futures to the present.

The outputs of the national multi-stakeholder dialogues are six national responsible innovation agendas and can be consulted at http://www.nano2all.eu/resources/nano2all-dialogue-materials-and-results/. These agendas provide a short description of the directions for change that allow nanotechnology research and innovation to be more in line with the values, needs and concerns of both citizens and stakeholders.

European Multi-stakeholder Dialogue

The European dialogue was a one-day event structured according to a dialogue format that consisted of five main exercise blocks (Figure 4). The two morning exercises were of an exploratory character, focusing on the concept of responsiveness and what this concept would look like in different future worlds and different nano-

Figure 4 – Five Exercise Blocks

enabled application scenarios. The three exercises in the afternoon concentrated on the identification of concrete actions that are needed to make the nanotechnology research and innovation system more responsive and on formulating recommendations to the EC.
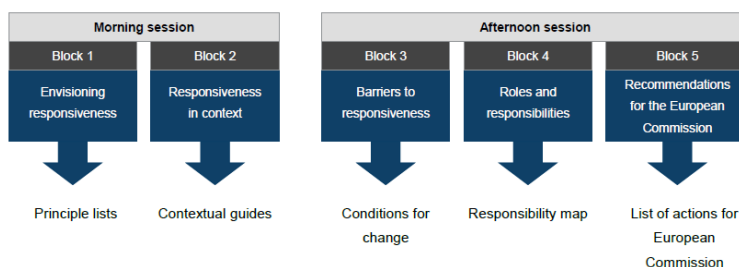
The NANO2ALL project carefully selected relevant stakeholders for the European Dialogue event. The project made sure that the group of dialogue participants varied in terms of backgrounds and perspectives on the dialogue topic. Several participants from previous national dialogue events were also invited to allow inputs from the national dialogues to reach the discussions at European level. At the end, 29 participants attended the dialogue including Nanoscientists, Policy-makers, Industry, CSOs, Intermediaries (including media, RRI experts, ethicists and social scientists) as well as national dialogue participants. Gender balance was also considered when selecting the dialogue participants. At the discussion, the participants consisted of 15 men and 14 women.

Figure 5 – Exercise 2: Responsiveness in Context

The dialogue participants were divided into six groups for the first exercise block to discuss the question "What would responsiveness look like in different future scenarios?" Each participant group explored a future scenario (for the year 2050) depicted on a mood board and used Lego, drawing, and writing materials to "build" responsiveness into that particular world. Subsequently, each group condensed their outputs into a list of principles of responsiveness. These lists of principles were displayed around the room and participants were asked to take a look at each of them and individually write down the three principles they themselves found most important.

Figure 6 – Exercise 3: Barriers to Responsiveness

In the second exercise, the participants formed new groups and collaboratively explored what their most important principles would mean in the context of narratives around various hypothetical nano-enabled applications, which were visualized on A0 posters. Questions including Who should do what? When? And for what reason? were discussed and debated. These details and discussion points were written down on sticky-notes and added to the poster sheets, resulting in so called "contextual guides".

In the third exercise, participants grouped together in their own stakeholder groups to which they assigned themselves. The different stakeholder groups brainstormed about their experienced barriers to bringing responsiveness into practice and considered what would be needed to overcome these barriers.

In the fourth exercise, the participants mixed into new groups in which the different types of stakeholder categories were combined. Participants exchanged what actions they considered necessary to enhance responsiveness in the nanotechnology research and innovation system. Each participant shared what actions he or she wanted to undertake him/herself and what actions they felt other actors could undertake.

Finally, the workshop concluded with a plenary session in which participants shared some main insights based on their workshop experience and suggested specific recommendations for the EC. More on the dialogue outcomes and methodology can be found at: http://www.nano2all.eu/resources/nano2all-dialogue-materials-and-results/

Reflections and recommendations

National Multi-stakeholder Dialogues

The NANO2ALL project developed an interactive dialogue format that aimed to establish an open and stimulating dialogue environment, in which participants could freely share their opinions and learn from each other's perspectives. From the feedbacks it stood out that all dialogue sessions were characterized by a lively atmosphere, in which participants wanted to contribute actively to the discussions. The events did not only trigger valuable discussions on societal engagement in nanotechnology R&I, but also proved an excellent opportunity for participants to network with people from other sectors. The dialogues were thus an important capacity building activity in itself, in the sense that they connected (societal) actors and stakeholder groups that could collaborate in making nanotechnology R&I more inclusive. The 8-hour duration format, however, asked for substantial efforts of participants to remain focused throughout the entire day.

European Multi-stakeholder Dialogue

The organizers of the workshop aspired to work with a stimulating and playful dialogue format that would fuel significant interaction and reflexivity concerning the roles, responsibilities and practices of the different actors and the concept of responsiveness itself. The responses in the evaluation questionnaire showed that many people appreciated the "creative" dimension of the format and referred to the dialogue as "fun" or "stimulating". Generally, the participants seemed more positive about the second half of the event (i.e. working towards recommendations) than the first half (explorative). Participants valued hearing other perspectives on experienced barriers to responsiveness and required actions to overcome these. A final point of reflection on the dialogue format relates to the organizers' choice to not give participants a clear definition of responsiveness up front. Instead, the different interpretations of responsiveness were collectively explored by participants in the first half of the dialogue, resulting in a broader and more diverse overall idea of what the concept is about. The advantage of this approach was that it provided space to become aware of the plurality of underlying perspectives and assumptions that play a role in many of the discussions in RRI contexts. Such awareness could help participants to understand where different points of view with respect to concrete recommendations for change stem from. However, the broad interpretation of responsiveness also allowed people to just focus on one particular aspect of the concept that interested them most, resulting in discussions in which participants did not always respond to each others' statements or talked at cross purposes.