Transdisciplinary agenda setting for future research and innovation – Comparing results of expert based foresight to large scale citizen centered forward-looking

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From Citizen Visions to Future Research and Innovation Agendas
26 social needs identified from the 179 visions
(Social need clustering workshop in Paris)

179 VISIONS

Resulting in a catalogue of 179 visions produced by more than 1000 citizens
(Visions catalogue)

30 countries* with 36 citizens each producing 6 national visions
(National Vision Workshops held over Europe)

Citizens and experts co-create research programme scenarios based on the 26 social needs, grouped in 12 clusters, and citizens’ visions.
(co-creation workshop in Milano)

Research programme scenarios

48 research programme scenarios

Discussing the 48 research programme scenarios through an open online consultation and through a series of face to face consultations

Defining research topics in a Pan European conference

Leading to enriched and prioritized research programme scenarios
30 countries* with 36 citizens each producing 6 national visions

[National Vision Workshops held all over Europe]

* 28 EU countries + Norway and Switzerland
Resulting in a catalogue of 179 visions produced by more than 1000 citizens

[Visions catalogue]
26 social needs identified from the 179 visions

- Equal and open access to the health care system
- Sustainably produced, healthy, clean and responsible food
- Life-long learning
- Hands-on applied learning and actionable knowledge
- Personal and spiritual development
- Balanced life and meaningful work
- Balanced and fair development of both rural and urban areas
- Social justice
- A society with room for all
- Control and influence through participation in governance

Catalogue of 179 visions received from more than 1000 citizens
Citizens and experts co-create research programme scenarios based on the 26 social needs, grouped in 12 clusters, and citizens’ visions.

[co-creation workshop in Milano]
Discussing the 48 research scenarios through

Online consultations

- Translated to 28 languages
- 3400 participated

Face-to-face consultations

- 30 countries
- 977 citizens and multi-actors
Defining research topics in a Pan European conference
From citizens’ visions to future EU research and innovation agenda

26 social needs identified from the 179 visions

Resulting in a catalogue of 179 visions produced by more than 1000 citizens

Citizens and experts co-create research programme scenarios based on the 26 social needs, grouped in 12 clusters, and citizens’ visions.

Discussing the 48 research programme scenarios through an open online consultation and through a series of face to face consultations

Leading to enriched and prioritized research programme scenarios

Defining research topics in a Pan-European conference
Overview CIMULACT Topic Domains

HEALTH AND WELLBEING

- Personal development (3)
- Holistic health (5)
- Work life balance and wellbeing (5)

FOOD SECURITY, SUSTAINABLE AGRICULTURE AND FORESTRY, MARINE AND MARITIME AND WATER RESEARCH, AND THE BIO-ECONOM (4)

ENERGY (1)

SMART, GREEN AND INTEGRATED TRANSPORT (3)

CLIMATE ACTION, ENVIRONMENT RESOURCE EFFICIENCY AND RAW MATERIALS

- Sustainable consumption (3)
- Urban and rural development (2)

EUROPE IN A CHANGING WORLD-INCLUSIVE, INNOVATIVE AND REFLECTIVE SOCIETIES

- Community building (3)
- Participatory governance (4)

- Economy (5)
- Education (5)

SECURE SOCIETIES-PROTECTING FREEDOM AND SECURITY OF EUROPE AND IST CITIZENS (2)
# 12. Technologies at the service of humanity

Data for All – Share the Power of Data

GRAND CHALLENGES:
- C3. Secure, clean and efficient energy
- C4. Smart, green and integrated transport

CHALLENGE
Today’s data-driven economy and society can exclude people from knowledge and decision-making. Limited citizen access to data, the lack of simple, open data analysis instruments, and curated public participation in the generation and utilization of data for decision-making are all critical challenges this research topic seeks to overcome. Concurrently, there are challenges to overcome in making digital- and data-literate a widespread knowledge base, and in facilitating citizenized, data-driven policy craft.

SCOPE
Research should aim at finding ways of safely and securely sharing the power of data with non-specialists and individual citizens for use in their own lives and for participating in collective decisions.

Two sets of challenges need to be addressed by research on:
- People-centered challenges: data literacy, personal data privacy, co-production of data, data access ethical data use, and
- Data-centered challenges: quality of data, openness of data, standardization of data.

EXPECTED IMPACT
- Increasing citizen participation in decision-making processes
- Urban Management Improvement (traffic, infrastructure, Resources, etc.)
- Fostered knowledge-based decision-making by citizens and communities
- Improving transparency, Limit corruption
- Improved access to quality, standardized, resilient data sets
- Accessible interfaces for data analysis and visualizations
- Improved digital and data literacy
- Demonstrating successful use cases for public access and utilization of data for governance issues

# 4. Sustainable food

Good food research

GRAND CHALLENGES:
- C2. Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the Bioeconomy
- C5. Climate action, environment, resource efficiency and raw materials

CHALLENGE
Food is the most basic need for human beings. Therefore, it is impacting both mental and physical health in the most direct way. We have to continuously research and explore nutrition quality of the food we eat and – if required – change the way we deal with food. Knowledge on nutrition is evolving continuously.
Consumers encounter conflicting nutritional information from various sources ranging from the private sector, academics, governments or media. Information must be more accessible, transparent and user-friendly and tailored to users’ needs in order to allow consumers to make more informed food choices for both individual health and society.

SCOPE
Research needs to explore ways to guarantee the provision of sustainable and nutritious food. Secondly we need to identify impacts of new research driven food paradigms (e.g., biotechnology) on health, economy, environment and sustainability in a comprehensive and systemic way. Applied research can provide the knowledge and information base. It is also important to ensure the relevant dissemination of outcomes or their use in respective regulations, policies etc. Implementation of educational programmes can create awareness and promote the use of new food at schools.

EXPECTED IMPACT
- Minimising the negative impacts of agri-food production and food-related consumer behaviour on land and environment
- Identification and description of possible risks related to the application of new technologies in the food production and processing
- Ensuring the neutrality and objectivity of research, choice of research topics and full presentation of the outcomes
- Providing optimal distribution of water in drought periods
- Assess and describe the influence of nutrition on human health (the role of individual factors and their combination) and disseminate the clear information on optimal eating habits
- New plans for area utilisation, policies and regulations related to the new food-generation techniques
Comparison CIMULACT Results with “Expert Based Foresight Studies” - Rationale

• Discover unique components of citizen based research topic
  – Understanding added value of citizen involvement in R&I priority setting

• Discover blindspots for both citizen and expert based R&I foresight.
Selecting Expert-Based Foresight Studies

• Selection Criteria:
  – Generated in last 5 years
  – Based on expert analysis/assessments
  – Time Horizon within or beyond next framework program
  – Relate to priority setting for research and innovation
  – No theme specific studies
Selected Studies (total 17)

• An OECD Horizon Scan of Megatrends and Technology Trends in the Context of Future Research Policy (2016), Ed. OECD, Kopenhagen: Danish Agency for Science, Technology and Innovation


Assessment Approach

- Starting point: 47 citizen based research topics in 7 Grand Challenges & 13 Domains emerged from CIMULACT
- Screening of each expert based study vis a vis these topics
  - Upfront marking of key aspects to ensure common understanding of topics within the research team
  - Marking of different degree of overlap with CIMULACT topics
  - For each CIMULACT domain: retrieving topics mentioned only by experts based studies and not by citizens
- Each study is screened independently by two researchers (ideally) from two different organisations (ITA and ISI), student and US researcher involved to increase diversity.
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<thead>
<tr>
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<th>A</th>
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<td>15</td>
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<td>20</td>
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<td>3</td>
<td>Cimulact Identified Research Area</td>
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<td>4</td>
<td>I am empowered to lead my changes</td>
<td>yes</td>
<td></td>
<td>yes</td>
<td>yes</td>
<td></td>
<td>2</td>
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<tr>
<td>5</td>
<td>Rethinking (the new) job market needs</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td></td>
<td></td>
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<td>6</td>
<td>Personal and organizational choice management</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
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<td>7</td>
<td>Dissemination and continuous exploitation of research and innovation in the healthcare system</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td></td>
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<td>8</td>
<td>Evidence-based personalized healthcare</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
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<td>9</td>
<td>Access to equal and holistic health services and resources for all citizens</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td></td>
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<td>10</td>
<td>Health empowerment through “Everyone’s science”</td>
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<td>yes</td>
<td>yes</td>
<td></td>
<td></td>
<td>3</td>
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<tr>
<td>11</td>
<td>Deconstruction of age</td>
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<td>yes</td>
<td>yes</td>
<td>yes</td>
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<td>12</td>
<td>Technology as a means of wellbeing</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
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Observation I: Fairly high representation of CIMULACT topics in some “expert based Foresight studies”

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</thead>
<tbody>
<tr>
<td>Nr of matches with 47 CIMULACT Topics</td>
<td><strong>36</strong></td>
<td>26</td>
<td>16</td>
<td>14</td>
<td><strong>39</strong></td>
<td>10</td>
<td>11</td>
<td>5</td>
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Observation II:
A few topics are widely shared

- Some of the 47 citizens topics were mentioned in several expert based studies:
  - Data for all – Share the power of data (7/8)
  - Good food research (6/8)
  - Making dense and growing urban areas more sustainable and livable (6/8)
  - Consume smarter, increase wellbeing (5/8)

→ BUT: Expert based studies take a very different perspective, often more technology oriented, more specific and more problem driven
**Example: Share the power of data**

<table>
<thead>
<tr>
<th>CIMULACT</th>
<th>OECD</th>
<th>State of the Future</th>
<th>Towards a 3rd strategic Programme</th>
<th>OBSERVE (17)</th>
<th>OBSERVE (36)</th>
<th>Ten technologies which change our lives</th>
<th>Recommendations for the implementation of Horizon 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research should aim at finding ways of safely and securely sharing the power of data with non-specialists and individual citizens for use in their own lives and for participating in collective decisions</td>
<td>The reliability of the network is a major issue, since human lives may depend on successful, sometimes real-time transfers of data. The key issue of consent and perhaps the notion of privacy itself are also challenged by the near-continuous flow of sensitive data that the billions of ubiquitous sensors will produce</td>
<td>Security and privacy have become prominent aspects of current developments in Web usage; multimillion-dollar fines have been levied against careless data custodians. The legal complexities of accelerating changes in ICT are forcing new jurisprudence</td>
<td>Whether 'digital citizens' will be empowered or constrained by the systems they use, and who owns or controls their data, are key institutional questions that have profound implications for the research and innovation agenda.</td>
<td>Key idea: Through the internet we now share information - this may allow us to share consensus.</td>
<td>Privacy issues are an important element in current future oriented debates especially in the context of the rising use of big data analytics, face recognition and concepts like the internet of things or industry 4.0 on the one hand and concentration of user data in the hands of very few private companies on the other.</td>
<td>The use of wearable technologies, designed to monitor and analyse our personal information through the 'Internet of Things' (often surreptitiously) raises questions of data protection and privacy</td>
<td>Ethical issues in research should be dealt with continuously throughout Horizon 2020 through institutionalised meetings and seminars encompassing all types of stakeholders</td>
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Example: Consume smarter, increase wellbeing

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<td>-shift our long-term thinking, re-evaluate our consumption and shift the emphasis from material wealth to healthy well-being. -gain knowledge on more responsible handling of the resources and co-responsibility of corporations, public actors and citizens, with a focus on promoting the circular economy.</td>
<td>Changing diets, driven by a growing middle class, will lead to additional demand for more resource-intensive types of food, such as meat.</td>
<td>Global waste has increased 10-fold in the last century, and it could double by 2025 from where it is today.</td>
<td>Understanding individual aspirations is crucial for the issue of sustainable consumption, and for ‘bending the trends’ of environmental impact, in a context of population growth and economic development.</td>
<td>Key idea: Humans move within a cloud of potentially supportive AI artefacts (robotic resources). The artefacts follow different kinds of goals: -some explicit goals preser by factory (e.g. safety, economy) -some learned goals from the key client -some explicitly set by the key client -some level of autonomy improvisation</td>
<td>Approaches towards a sustainable and circular cradle2cradle economy feature prominently in the debate among scientists, innovators, actors from civil society and policy makers. Establishing fully circular resource flows is however extremely demanding both for design and production.</td>
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</table>
Observation III: A few expert blindspots?

• 1 citizen based topic not at all covered and 5 Citizen based topics only once
Observation IV Citizen Blindspots?

- Ressource limits

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<td>Soil degradation will affect the amount of land available for productive agriculture: around half of the world's agricultural land is already affected by moderate to severe degradation and around 12 million hectares of productive land become barren annually due to desertification and drought.</td>
<td>Development planning should integrate the lessons learned from producing more food with less water via drip irrigation, seawater greenhouse and precision agriculture, improved rainwater management and irrigation, watershed management, selective introduction of water pricing, and successful community-scale projects around the world.</td>
<td>Global population pressures (sheer numbers and lifestyles) will put a focus on ways of changing resource limits – through harvesting space or the marine environment, or by using bio processes to generate energy.</td>
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Citizen Blindspots?

- Global warming

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<tr>
<td>The impacts of climate change on yields of the major crops (wheat, rice and maize) will be negative for most countries and commodities, though are likely to affect the poorest populations the most.</td>
<td>Seriously addressing global warming will require better conservation, higher efficiencies, changes in food and energy production, methods to reduce the GHGs that are already in the atmosphere, and adaptations to climate changes already in motion for many years to come.</td>
<td>Climate change is a threat multiplier: it exacerbates poverty and water; it compounds food and nutrition insecurity.</td>
</tr>
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Open questions

• If the citizen based topics are really different (e.g. more holistic) what are the implications for research? Does it matter? Is it better? Is it still a question for research?

• What could be the reason for the absence of the big issues (climate change, water scarcity, soil degradation) in the citizen based topics?

• Problematic notion of „expert based“?

• Legitimate to compare the different types of studies?