

Grand Challenges of our Future

As identified by international Foresights

Presentation for the

Creativity Workshop

Societal challenges for the Forest-Wood sector

24 April 2013

InnovaWood RTDI Division, Geneva

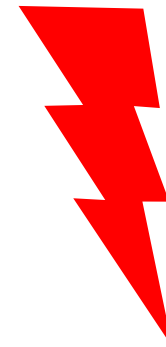
by Dr. Susanne Giesecke, Austrian Institute of Technology

Introduction to Foresight

Foresight is (generally) not:

- Forecasting
- Trend extrapolation
- Mainly expert driven

i.e. foresight is not about predicting the future



Foresights...

- Are concerned about the longer-term development (often 10 years or longer)
- Go beyond (but take into account) predictive approaches
- Are action oriented (trying to influence agenda-setting and decisions)
- Move away from the sole focus on experts
- Aim at including wider societal considerations.
- Are interactive and participative (networking involving e.g. stakeholders and decision-makers)
- Adopt an “evolutionary” approach (in contrast to e.g. linear thinking)
- Are typically explorative, i.e. considers alternative futures (instead of predicting the future)

Foresight is about....

shaping rather than predicting the future

A foresight process can involve a number of different methodological elements, e.g.:

- Methods for forecasting
- Scenario building
- Delphi studies
- Strategy development

Further information:

<http://www.foresight-platform.eu/>

VERA: Forward Visions on the European Research Area

Funded by FP 7 <http://eravisions.eu/>

2012-2014, 10 partners, lead: FhG-ISI, Germany

Task: Scanning and Stocktaking of FLA with a focus on STI addressing the Grand challenges

- 1st the identification of Grand Challenges (GC) and

We identified more than 760 GC in total from a stock of 71 sources.



Definition of Grand Challenges

Need to break long-standing boundaries; need approaches that are:

- Multi-disciplinary in science & technology
- Addressing science & technology as well as social innovations
- Multi-level governance
- Cross departmental in policy
- Multi-actor, multi-agency engagement
- Cross – sectoral synergies
- Applying longer-term horizons
- Highly interlinked across each other with far reaching and possibly unknown implications / impacts

Screening of Forward Looking Activities and Documents

- A. ERA-governance related policy and strategy papers
- B. European FLA addressing the Future of EU and ERA (directly or indirectly)
- C. FLA on national R&I Priorities (not obviously ERA-related)
- D. FLAs on important sectors for Europe
- E. International Scope



Regional Coverage

Predominantly European:

Austria, Belgium,
Bulgaria, Czech Republic,
Denmark, Finland,
France, Germany,
Greece, Ireland,
Israel, Italy,
Lithuania, Netherlands,
Norway, Poland,
Romania, Russia, Spain,
Sweden, Switzerland,
Turkey, UK
Ukraine



Outside Europe: Bahrain, Brazil, Canada, China, Ghana, Ethiopia, India, Iran, Japan, Malaysia, Mexico, Oman , Qatar, Saudi Arabia, Singapore, S. Africa, S. Korea, Sub-Saharan region, Tunisia, US

The 16 Grand Challenges

1 Uncertainty is arising from a multipolar world

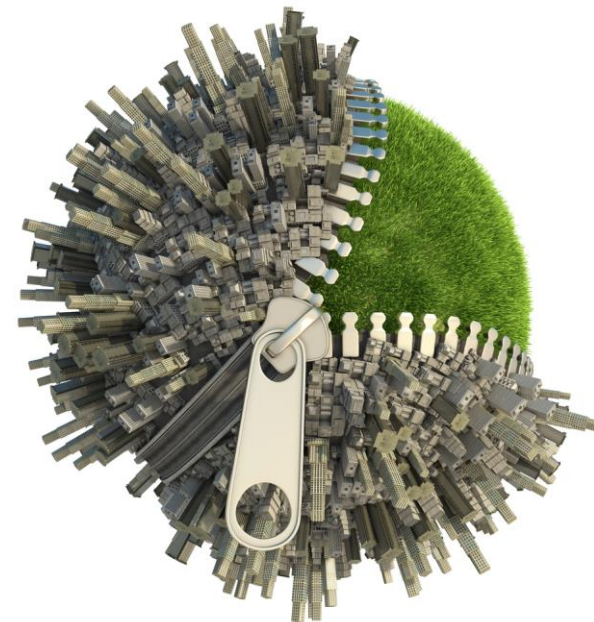
Increasing polarisation and regionalization are driving towards a multipolar world.

- BRICS
- new economic models like state capitalism
- diminishing decisive role of the EU and US in global affairs
- Emerging mega-cities , new players



2 Values and attitudes are changing globally societies and policy need to respond to these changes.

- environmental issues, well-being, global justice, personal autonomy, social cohesion
- New innovation patterns such as “cradle to cradle” and locally oriented production
- personal autonomy, individual empowerment and self-determination



The 16 Grand Challenges

3 The traditional role of the state is challenged

A number of developments are requiring new models of governance that are moving beyond the traditional model of the state.

- conflicting interests between the economy, environment and society
- Need for reducing socio-economic imbalances between geographic regions
- transparent governance model with limited bureaucracy, move towards pluralism and more direct democracy



4 The world is becoming more interconnected and thus more vulnerable

The more the world becomes interconnected and interdependent, the more new forms of crime and security threats are inter-linked and have far reaching consequences at all levels of society.

- Cyber-attacks have far reaching impacts due to increasing systems' interdependence
- Scientific and technological advancements will put privacy and legal issues on the agenda



The 16 Grand Challenges

5 Health concerns of an ageing society are rising

The ageing of populations has diverse implications on science, technology, economy, and society that are proliferated in the context of new health risks and ineffective health systems:

- increase of public spending on pensions and healthcare which is going to be unaffordable in many countries
- increasing intergeneration gaps, and social inequality
- shift from acute to community care could be a first step to reform health systems



6 A risk of financial system failure is emerging

- Chronic fiscal imbalance as well as unmanageable financial systems
- Persistent financial inequality in turn leads to social inequalities and social unrest.
- lack of regulation results in extreme volatility in energy and agriculture prices.
- multiple financial nodes all over the world make spill-overs into other areas of power likely.



The 16 Grand Challenges

7 Current non-sustainable economic model comes under scrutiny

A growing unease with the current model of economic growth calls for alternative approaches to societal progress on a macro-level. Eco-consistent business models are required in all sectors of economic activity.

- A more sustainable model: mending socioeconomic issues, income divides and increase of precarious working conditions as well as environmental effects, loss of biodiversity, overexploitation of the earth's ecosystems services
- uptake of sustainability oriented economic models could provide opportunities for novel endeavors



8 Migration requires responses

The challenge of migration takes many forms as a consequence from other challenges like climate change, food and water shortages, natural disasters, pandemics, etc. each of which requires a specialized and coordinated response at various governance levels.

Migration causes urbanization. As an indication urbanisation and ethnic shifts are expected in 7 out of 8 mega-cities in the Sub-Saharan region

The 16 Grand Challenges

9 Education is struggling to cope with new demands increasing need for tertiary education, for reducing early school dropout. the emergence of new professions, characterized by highly skilled craftsmanship: need new forms and new content of training.

- not enough financial resources are invested in education, access to technologies and the recruitment of skilled personnel for science, education and training
- more information sharing and joint activities, international and inter-agency cooperation as well as multi-disciplinarity in research.



10 The health situation in deprived regions is deteriorating
Impoverished regions around the world struggle with acute and virulent health issues.

- Along with increased global mobility and migration infectious diseases are on the rise worldwide;
- double burden of infectious and chronic diseases in less-developed countries rooted in poverty and undernourishment and the neglect of health provisions



The 16 Grand Challenges

11 Climate change is causing new diseases

New health problems are arising globally due to climate change

- Infections, diseases and other profound effects on human and animal health grow hand in hand with increasingly frequent changes in weather
- Via food chains in related industries the consequences may lead to disturbances in global trade and businesses



12 Providing basic resources for increasing global demands becomes difficult

Without ecologically, economically and politically sustainable solutions scarcities of basic resources may lead to extensive and serious social and political problems in some areas of the globe.



- growing global population, the use and security of basic resources needed by humans such as food, water and energy becomes increasingly critical for all societies worldwide.
- culminate especially in densely populated urban areas, developing economies that lack the human and material resources to apply sustainable and science based solutions.

The 16 Grand Challenges

13 Scarcities in material resources are emerging

Demand for metals and minerals is growing dramatically especially due to fast growth of emerging economies, and increasing strategic demand of minerals in industrialized economies

- more that 50% of major ore reserves are located in poor countries and, even more seriously, a bulk of the critical mines and related strategic materials are located in emerging economies
- Establishing a holistic approach to sustainable natural resources management at international level is seen as absolutely critical



14 Our modes of energy supply and use are threatening the survival of humankind

Adopting sustainable forms of energy production and consumption is one of the key means for mitigating climate change.

- Greenhouse gas emissions have caused the climate change phenomenon, related problems like vulnerability in nature, serious infections and, increasing natural disasters (cyclones, diminishing clean water resources, environmental refugees, drought)
- energy systems towards sustainable direction needed



The 16 Grand Challenges

15 Transportation systems come under strain

Environmental and health impacts from emissions, mitigation of climate change, urbanization, the need for traffic safety and security and avoidance of traffic jams are among drivers towards re-inventing mobility and full-scale transition of existing transportation systems.

- Systemic changes of all transportation forms, logistics and infrastructure (ICT based solutions)
- change towards lighter material solutions, advanced design, sustainable energy solutions and innovations



16 EU Competitiveness is endangered

- due to poor education and skills, rising costs, declining labour force participation caused by demographic change
- fragmentation of Europe that may prevent effective exploitation of the research and innovation potential.
- One way out of the economic downturn is to create growth in regional and local economies and to promote the regional quality and brand names, as well as a more competitive service-based society.



Reflections on the Grand Challenge list ...

- Socio-economic perspective; conflicting philosophies
- Decision for problem formulation changes the tone (“alarmist”). Do we prefer goals anyone can sign up rather than naming threats?
- “European perspective” on implications “for us” rather than solving the global problems
- Framing makes a big difference!

Implications for actions:

Organisation: International collaboration not the norm yet; need for new actors

Paradigm change: Radical changes in the theories and attitudes required; need for new regulatory frameworks

Governance: Grand Challenges have to be understood as boundary spanning and need to be coordinated at system level, often requiring major transformations

Conclusions

- ‘New’ is not that new but needs novel solutions
- Grand challenges are wicked problems challenging long-standing solutions and attitudes followed for many years that now need to change
- Not about technological fixes but about new ways to live our lives and think about the world
- BUT how much are we prepared / able to face our own intentional and unintentional limitations to tackle them?
- What policy tools could lead in this direction to start real transformative change?

For questions & comments:

Susanne.Giesecke@ait.ac.at



Typology of Grand Challenges

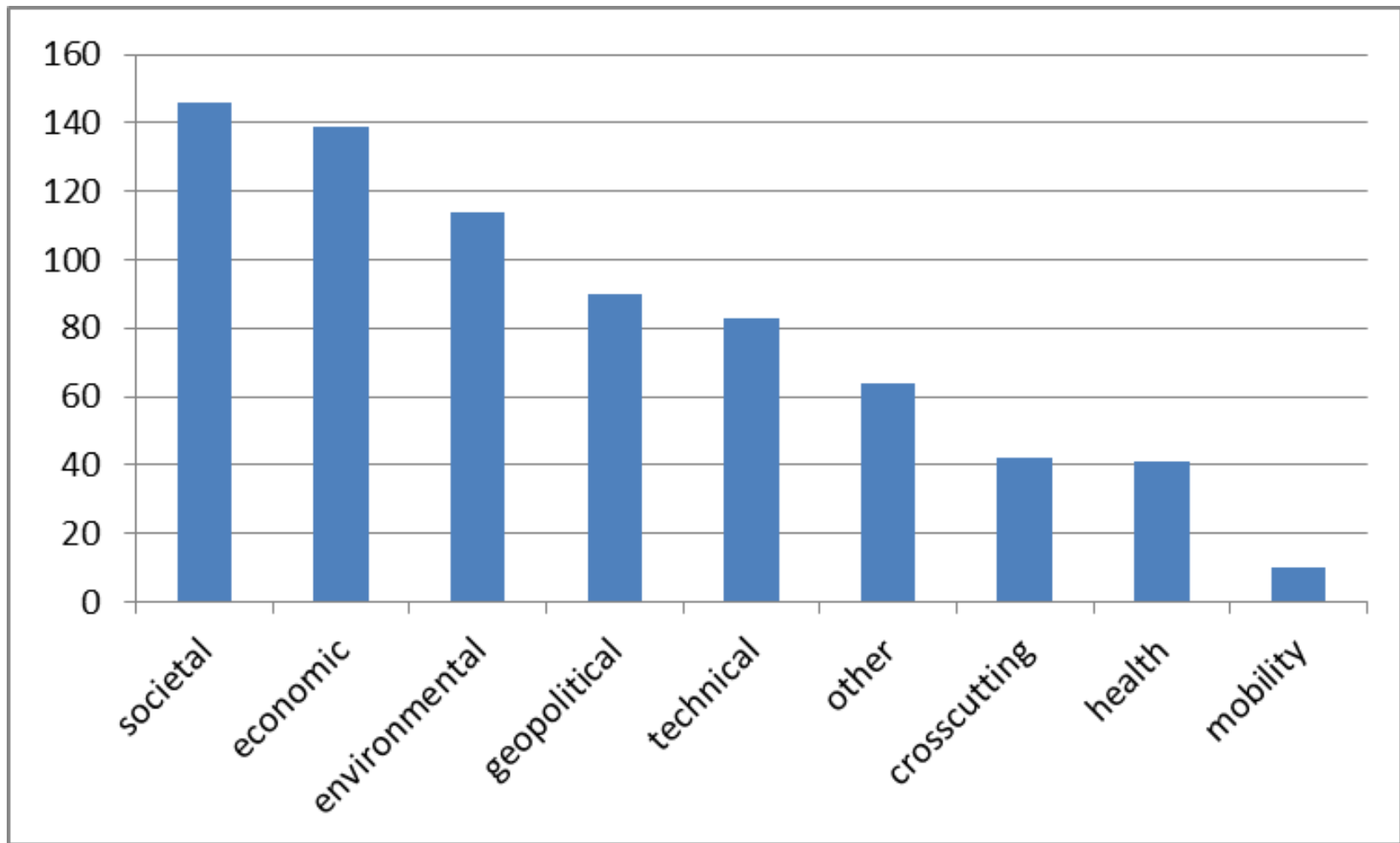


Fig. 1: Number of challenges listed in the 67 FLAs screened by VERA per GC category, $n=726$

