Knowledge as Our Common Future

a declaration

"Knowledge as Our Common Future" aims to promote an inclusive, open science culture through responsible Science and Technology (S&T) policy actions at a global level, by engaging scientists, policy makers and experts in continuous and long-term processes of constructive dialogue with society at large. It has been established to foster the legacy of José Mariano Gago by engaging government leaders, policy makers and experts worldwide to deepen the intellectual foundations of S&T policy with the imperative of building knowledge-based societies in a world highly interconnected through Information and Communication Technologies (ICTs). The ultimate goal is to support and promote new opportunities for generational change.

Background

The imperative of building knowledge-based societies demands an investment in our collective institutions to enable them to provide worldwide access to quality science education and scientific practices to everyone, regardless of age, origin or social and economic background. People at large will need to access knowledge and modern learning practices at all ages to build future generations who are becoming increasingly knowledgeable, creative and able to adapt responsibly to the challenges of a rapidly changing world. The futures of different people on earth are woven in a single garment. We all gain from the joy and benefits of discovery when all people participate in learning and the productive use of knowledge. This means reaching out and engaging our colleagues, scientists and lay people with young people in all parts of the world.

Each generation should be able to explore new things and have the opportunities to do so.

With this framework in mind, we propose that governments together with public and private stakeholders worldwide effectively give priority to science, to education and to related public policies and this should occur across all our societies and regions worldwide. We argue that the effective institutional autonomy and integrity of modern research and education institutions should be promoted in a context where building knowledgeable human capital is a major priority. It involves creating alliances and partnerships across public and private institutions and organizations worldwide. Those are the conditions to engage in a new stage of global scientific collaboration and true science diplomacy.

The adoption of the 2030 Agenda for Sustainable Development and of the Sustainable Development Goals (SDGs) explicitly recognizes the role of science, technology, and innovation is moving the world towards meeting the universal aspirations of leaving no one behind and protecting the planet imbedded in the Agenda. This is also recognized in the Addis Ababa Action Agenda, the outcome of the 3rd International Conference on Financing for Development, which underline the importance of technology, alongside finance, to enable the implementation of the SDGs.

On the future of knowledge societies: signs, threats and opportunities[1]

Building knowledge-based societies in an evolving world is a process that needs to engage people, effectively motivate their participation in research agenda setting and to recognize factors for change. This involves the recognition of signs of anxiety, signs of change and signs of perplexity.

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[1] As based on José Mariano Gago´s concluding remarks as "Thinker in Residence" at the Royal Flemish Academy of Belgium for Science and the Arts, 2014 (Brussels, Palace of the Academies, 28 November 2014), under the title "A Knowledge-based Society under Catalysis: A Personal Summary, and Some Naive Proposals for Action".

Signs of anxiety - *emerging issues*:

- The decreasing and quasi-stagnant investments in science and technology in many countries and regions worldwide, together with the lack of adequate job opportunities;
- The perception of a lack of motivation for studying science, technology, engineering and mathematics (STEM), together with the anticipation of a strong deficit of teachers;
- The increasing bureaucratization of scientific and academic environments in many institutions, regions and countries, including the irresponsible usage of metrics for assessment purposes;
- The perception of a lack of well-trained professionals in certain technical areas;
- The lack of significant progress in fighting gender inequality in several parts of the world.

Signs of change – *questions for further reflection*:

- Are the school systems effectively contributing to a sustainable world, with employment opportunities, social welfare and scientific culture?
- Are secondary school pupils and post-secondary school students properly informed, coached and oriented?
- Will the existing systems remain as they are, or are they going to be disruptive?
- Are the pedagogical programs appropriately designed to have a better use of ICTs? Are the teachers well prepared to optimize the contents of the courses based on information and pedagogical tools available through ICTs?

Signs of perplexity – *among many relevant issues*:

- How to face the impossibility of reproducing social rigidity and segregation and at the same time help encouraging and supporting innovation and creativity, especially in our youth?
- How to increasingly assert the right of political self-determination and at the same time move towards a more diverse and open society?
- How to invest creatively and generously in transforming exclusion into inclusion?
- And, in the emerging context, will immigrants be considered a problem or an opportunity, and are societies prepared to invest the money and resources needed to transform this problem into an opportunity?

But there are many opportunities and conditions to build platforms for concerted actions to solve these problems. They should stimulate competition and cooperation among political and social actors and include:

- Promoting scientific and technological culture in society by disseminating knowledge and fostering dialogue;
- Guaranteeing science and technology education for everyone;
- Fostering life long learning and vocational training and addressing perceived social and economic

qualification gaps;

- Promoting science communication in the media, which requires strong public policy efforts;
- Bringing together social, cultural and economic constituencies for science and technology, which requires the "external energy" of governments, in democratic societies, at all national, regional and sub-regional levels.

These opportunities require firm political convictions and political programs of any democratic government should consider the following issues:

- Investing in science (all sciences) and technological education, formal and informal, must be guaranteed. In contrast with the expectations of those who live within the science sector, the youth and even some of the most creative youth, are not keen on science and technology. This is a disease of rich societies and requires effective science policies to permeate youth culture and be appropriated by youth. Science is about pursuing the truth: proof, not authority; it is about knowledge, not ignorance; it is about experimentation and technical training, not definitions. And the importance of science for society must be spelled out;

- General science and technology education in schools is key to lifelong learning, to social adaptability and to social and political participation. It has to be handled with care and expertise, with the ultimate goal of promoting scientific and technological culture of society at large. And barriers should not be created between science, technology, engineering and mathematics education (i.e., STEM) and all the rest;

- The failure to address poverty and conflicts, and to address the increasing inflow of refugees and (illegal) migrants as an opportunity, are major threats for the development of highly advanced knowledge based societies in Europe and elsewhere;

- The whole scientific community must take the perceived lack of science and technology-based professions in the economy and in society seriously. This is the only way to build a social constituency for science;

- The lack of highly proficient science teachers has been predicted for many years and only the empowerment of science teachers and their social recognition by society, but mainly the empowerment of teachers in schools, is a key for success of sustainable science and technology policies;

- Devising and funding large-scale stable national and international initiatives and supporting independent initiatives aimed at bringing together schools, research centers, science-based professionals, as well as industry and science centers, are key to opening the gates of an inclusive, curiosity and innovation driven knowledge society.

- Promoting the link between learning and discovery on the one hand, and advancing the professions and the humanities on the other.

Declaration

We challenge governments, along with public and private stakeholders worldwide, to consider the following main propositions, which should be subject of a constructive dialogue engaging scientists, policy makers and experts with society at large.

Proposition 1: POLICIES - *Promoting new Opportunities for Generational Change*

The rapid development of science and technology at a world level, the emergence of open science in a world highly interconnected through information and communication technologies (ICTs), and the prospects for the rapid evolution of higher education in many developing countries in the years to come, call for new policy frameworks in diverse national and regional contexts at a global scale. *We challenge governments, alongside public and private stakeholders worldwide, to strengthen public and private expenditure in education and in research and development (R&D) and to foster a new generation of science policy leaders who will guarantee advancements for meaningful generational change.*

Proposition 2: INSTITUTIONS AND INTERNATIONAL COOPERATION - *Building the Future*

A new paradigm of international academic and scientific cooperation has emerged as a major factor in shaping development. It requires understanding of local characteristics of technical change and of specific regulatory and institutional constraints. It calls upon us to tailor our knowledge of the social construction of technological systems in a globalized society, but adapted to by local characteristics. *We challenge governments, alongside public and private stakeholders worldwide, to help strengthen scientific institutions and foster international cooperation in a way that builds sustainable knowledge-based societies worldwide.*

Proposition 3: KNOWLEDGE DYNAMICS - *Stimulating Participatory Agenda Setting for Research*

The recent explosion in demand for higher education by millions of young people around the world, associated with growing perceived evidence of the potential benefits resulting from economic appropriation of the results and methods of science by society, have changed the perception of the "academic divide" or "scientific divide" at the world level. *We challenge governments, alongside public and private stakeholders worldwide, to frame new bottom-up and participatory actions to actively foster knowledge networks and flows, as well as engage people at large in R&D agenda setting, in a way to further reduce existing gaps and divides.*

Proposition 4: EDUCATION and CULTURE - *Towards "Science for All"*

Countries and societies face different challenges, have different needs and require different solutions. But achieving the successful creation of knowledge-based societies requires a firm foundation for science, technology, engineering and mathematics education that is common to all. Beyond any single measure, it is the public nature of education, together with the public understanding of science and the related level up to which people trust in academic and scientific institutions, that determines the success of knowledge-based societies. It requires promoting scientific culture as means towards development (in every sense), which in turn requires quality. As a result, we argue for a better international involvement in processes of detection/selection, adoption, development and diffusion of 'good practices'. *We challenge governments, together with public and private stakeholders worldwide, to foster science awareness, science education and the promotion of scientific culture in a globalized digital society.*

To sum-up, we argue in favor of our collective responsibility to facilitate a generational change movement to foster a dynamic and learning environment that guarantee the systematic development and promotion of activities to foster science education and the role of science in the daily life of citizens around the world.

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> *by participants in the event in Honour of José Mariano Gago and released for public subscription worldwide*