

## Challenges in Mobilizing means of Implementation at the National Level

Financing, technology and capacity building

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Ambassador Kamau brought us an excellent synthesis of the discussions and recommendations of the STI forum. I would like to highlight some further contributions from the 10 member group and add my personal view :

The recognition that “STI is the main driver of economic growth and development and must be seen as a primary mechanism for achieving the 2030 Agenda doesn’t mean that “technological change is conducive to sustainable development by itself” (STI forum). On the contrary, many disruptive technologies either damage sustainability or benefits disproportionately those in the countries that innovate, or a small fraction of the population.” (SG’s Ten Member Group)

The 2030 agenda and SDGs will not be successful if the prevailing asymmetry among countries on social and economic development remains and STI is not directed to face sustainability challenges. SDGs should be considered both in its specificity and in a holistic approach. Achieving them all will require integrated assessment tools and thus systems analysis thinking with accountability, transparency and participatory approaches becomes essential to address the full spectrum of sustainable development challenges (SG’s Ten Member Group).

It should be stressed that innovation applies to a wide range of fields , from hard technologies to soft technologies and that scientific knowledge comes from many sources, including indigenous and traditional knowledge systems.

Mechanisms of open access, open innovation, co-design and co-production of R&D and innovation are essential to this purpose. A productive and technological standard has a certain societal model embedded in it. Technologies and innovation are capable of embracing universal population inclusion. or creating an insupportable duality between those who can shoulder the costs of technology and knowledge and those who cannot, thus structurally cleaving global society, with nefarious effects on civilization.

Social and sustainability policies cannot be viewed solely as compensating or mitigating the effects of economic, social-environment industrial, and innovation policies, but rather should be considered crucial parts of a sustainable development strategy on a global scale.

For this reason, I would like to bring attention to goal 9 of the SDGs which reasserts the indispensable link between industrial and STI policies to the 2030 Agenda.

I work at Oswaldo Cruz Foundation (FIOCRUZ). Fiocruz has a unique set up bring together a strong academic portfolio , including being the major Brazilian institution for masters and PHDs programs in health – and the ability to implement vertical innovation , comprising, among other areas, the production of vaccines , medicines and diagnostics. We have thus a strong experience in bringing together the culture of research with innovation goals to attend social demands. To this challenge, I would like to highlight and problematize some features of our national experience related to STI forum recommendations:

In the last two decades, the number of master's and doctoral programs in Brazil increased over 200%. In the same period, the number of completed master's degrees increased by 380% and doctorates of 490%. On the other

hand, all indicators related to innovation are considered far behind. Besides the broader issue of innovation culture and infrastructure, one of the reasons for this discrepancy is that research funding was connected to graduate policies, reducing the direction to problem-driven research.

In a positive note, Brazil has outstanding success cases of public platforms for identifying and making available information on human and institutional capacities. The Lattes Platform, supported by the National Council of Scientific Research – CNPq has around 3.5 million CVs from professionals and 1.5 million from students. Other examples are the Scientific Electronic Library On-line – Scielo, with almost 1000 publications from Brazil and other countries with open access. The Brazilian Clinical Trial Register (ReBEC), mandatory for all projects taking place in Brazil, feeding important information for networking, prospecting and social control; and, finally, the Carlos Chagas' Platform dedicated to share funding and collaborative opportunities such as the recent national call for a US\$ 10 million for proposals on Zika epidemics. All this, together with a strong effort in the last two decades to implement a national strategy for fostering innovation, with important improvements in legislative and institutional framework, has helped to change the scenery. One of the most successful areas in this direction is Health with an increasing role of the Minister of Health in the innovation and industrial policies.

I'll address the panel questions from a systematic approach, referring to the Brazilian experience on the health field because we consider Health and Sustainable Development as almost Siamese areas. Health is an individual and collective right, articulating the productive basis and innovation to human rights, equity and social inclusion. Health therefore plays a double role as a prerequisite and indicator to SDGs. World health is the force behind 30% of

research and in the Brazilian case, as in other countries, the Health sector responds for around 10% of the GDP.

We would like also to highlight that the Health sector is a platform of new paradigms with an impact in the countries innovation systems. In the SDGR discussed yesterday, all crucial emerging technologies for the SDGs- **bio**, digital, nano, neuro and green tech- relates to opportunities in the health field.

Zika and Antimicrobial Resistance are two questions that exemplify all the connections between health and development, and the need of a global STI and public health policy coordination.

Here again we find a great challenge of coherence and coordination .The report “Global Health 2030”, led by former US Treasure Secretary , Larry Summers calls for a “grand convergence in global Health” by 2035 that should be obtained by scaling up existing health tools. This would bring, among other results, a reduction of 10 million deaths annually from 2035 onward. A recent collective work coordinated by Gavin Yamey and Carlos Morel came to an important conclusion, contradicting this optimism: “The world cannot reach convergence with today’s tools alone. Tomorrow’s tools will also be needed” and that’s why it’s essential a strong “convergence of the different worlds of public Health and Innovation”

In the same work, Mary Moran reminds that for many decades, innovation was not a subject for public health (...) around 95% of drugs on the WHO’s Essential Medicines were older off-patent medicines”. She gives also an example on how even incremental innovation may have a great impact: “Vaccine monitoring devices are estimated to have saved immunization programs and procurement agencies more than US\$ 140 million in wasted vaccines in the past decade”.

In Brazil we have a good example on how, in recent years, through the shaping of the Health Economic and Industrial Complex policy, Health achieved an important role as an attractor to bring together innovation systems, productive policies and the answers to social needs, integrating PPP partnerships. The health needs and sustainability of Brazilian Universal Health System (SUS) determines the procurement, with Public-Private Partnership, to the development of new technology or technology transfer, with the assurance, if successful, of incorporating products and technologies in the health system: A win-win solution. This has made viable, for example, large scale vaccinations for the entire population, with the most extensive portfolio in the world and free AIDs treatment on a broad scale with recognized results. At present we are entering the field of biological products for chronic diseases, such as cancer, arthritis, hepatitis and autoimmune diseases, among others. In five years there is an estimate of US\$ 1 Bi economy.

Considering this conceptual framework, some global issues that require convergent actions, can be selectively cited.

1. Sustainable development requires the establishment of articulation between the State, society, and the productive sector and there is a need to structure a national mechanism with roadmaps for fostering local capacity, using state's buying power, sanitary resolutions, IPR and R&D infrastructure.
2. The on-line platform once structured should support the conceptual and directives sprung from the STI Forum, shall be a key facilitator to bring together STI and SDGs.
3. The inclusion on global and multilateral agendas of mechanisms for reducing societal asymmetries in knowledge of innovation, thus enabling nations to

gain the liberty to establish their own context-specific social and sustainability policies.

4. The formation of a societal and environmental agenda with a forum for the selection of strategic socio-environmental themes and areas which simultaneously fosters investment opportunities. The areas of public health, climate change, education, mass consumption with poverty reduction, among others, are great opportunities for investment and innovation, and are parts of the same structural and strategic approach.