



Latinoamerican Science
and Technology Development
Programme
AREA OF SCIENCE AND SOCIETY

Definition of the Area of Science and Society

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(This document was debated between the members of the Area Committee, with special contributions from Alberto Corsín, Alexis de Greiff, Ernesto Medina, Luiz Oosterbeek, Fernando Ortega and Julia Tagueña)



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1 Preliminary conditions

A definition of the mission and functions of the Science and Society Area of the CYTED programme must necessarily arise from an analysis of the Latin American context. Also from the situation of these countries' R&D and Innovation system and the framework functions undertaken by CYTED.

CYTED, Ibero-American programme of science and technology for development:
http://www.cyteted.org/cyteted_informacion/es/presentacion.php

Our main concern must be finding ways to make the C&D and Innovation system effective in mobilizing scientific knowledge in such a way that will generate abilities to *meet the region's great challenges* (a non-exhaustive list of these would include poverty and social exclusion, economic competitiveness, multiculturalism and the creation and negotiation of identities in a diverse and changing world). This means addressing the following two interconnected issues.

1. Establishing the contribution that scientific knowledge and research can make to *building citizenship* in its various forms and trying to incorporate the Science-Technology-Innovation equation (CTI-paradigm) into the public agenda.
2. In order to achieve this inclusion, finding the most suitable *interaction between scientific knowledge and other forms of knowledge*: art, essay, humanistic, traditional and communal knowledge and, of course, other thought systems such as original peoples' modes of rationality. In Latin American countries perhaps more than anywhere else, science has good reason not to take over as the single and dominating form of knowledge. Rather, it must make use of its own values and its capacity to use robust theoretical models and empirical analyses to transform the world. In turn, this will inevitably bring about a positive and productive dialogue with other forms of rationality and production of knowledge.

Thus, the Science area of the CYTED programme must contribute to leap forward in the ideal of **building an Iberian American space of research and knowledge**.

In order to do so we must build on what has already been achieved. The science and Society area was created in 2005. Along with the other the areas of The Iberian American Development Programme for Science and Technology (henceforth Spanish acronym CYTED) it was devised as part of the overhaul requested by the representatives of the Signatory Institutions. The Science and Society Area's

accomplishments have not only granted it a distinct position within CYTED but also include generating a community of interests and relations across the entire Latin American region. A community engaged in professional studies of science and the innovation system to which the Area has contributed a sense of unity and maturity. The sole fact that the last meeting of the Latin-American Society of Social Studies of Science (ESOCITE) held in Rio de Janeiro was attended by 800 specialists speaks very clearly of this trend. It is a merit to be recognized to the team formerly at the head of the Area including the members of its committee. And it is thanks to their efforts that we are now able to move on in our strategy.

ESOCITE and ESCYT's webpage about science and social inclusion:
<http://www.escyt.org/2009/10/26/esocite-2010-buenos-aires/>

2 The Area's main goals

Our main aim must be to strengthen the nexus between science and society, an endeavour for which certain basic principles of scientific cooperation and development cooperation must be incorporated. Obviously this must be achieved while retaining a specific personality within CYTED.

A. Nexus between Science and society

Within CYTED the Science and Society area (henceforth Sc + S) already enjoys a specific personality due to its functions as a nexus between science and society. The Area is of crucial importance in addressing the complications and temptations which tend to isolate these two realms. In a nutshell, its aim is to involve citizens in the production of science in order to reinforce society's capacity to innovate and research. This makes the SC + S Area a particularly complex, multidisciplinary, transversal and rich one, that still shares certain aspects with other areas of CYTED since it deals with such issues as the social communication of science, the promotion of a scientifically literate and aware society, transfers of knowledge, the effects of science on its surroundings, the structure of the R&D and Innovation system, economic and industrial development, etc.

CYTED's Science and society Area:
http://www.cytcd.org/cytcd_investigacion/areas_tematicas.php?a=6&lang=es

However, the present economic and social crisis calls for the *creation of a Public Science*. A type of science that will maximize the public aspects of knowledge and synchronize science with society to develop its public dimension. This means it must help to develop *science with the public* and reinforce the role of science in a public



institutional arena. In this proposal, the phrase “the public” is used to refer to all actors affected by a certain process or decision and who, of the sake of basic democratic principles, must somehow take part in that very process and decision making. The main challenge is thus participation, i.e. finding ways to encourage and capitalize horizontal participation in the production and use of scientific knowledge.

In order to foster this participation we propose a complex picture of reality, one in which the linear and disciplinary paradigm gives way to a transversal and multi-linear approach.

We must endorse a strong model of appropriation of knowledge. i.e., a certain mode of apprehending and intervening in the relations between techno-science and society that will rely on the active participation of all the different groups involved in generating and using such knowledge.

This model broadens our comprehension of the dynamics underlying production and use of knowledge beyond the mere synergies between academic, productive and state sectors to include communities and interest groups within the very fabric of civil society. By doing so, our model places appropriation and innovation at the same level under the common principle of social construction of knowledge. If any form of innovation is to occur, strong appropriation of knowledge must be the basis of it, since knowledge itself is a complex construction, involving the interaction of different social groups. The production of knowledge is not a task to be alienated from the rest of social life. On the contrary, it is within social life that it develops, on the basis of social interests, codes and systems.

Innovation must be understood as the effective social incorporation of knowledge into problem solving, or in the establishment of new relations. For innovation is essentially nothing but interaction between groups, sets of artefacts and social cultures of experts and non-experts. In this theoretical and semantic context, *appropriation* becomes not a passive reception but an engagement in an interpretive exercise and a development of reflective practices.

Alexis de Greiff y Oscar Maldonado, "Apropiación fuerte del conocimiento: una propuesta para construir políticas inclusivas de ciencia, tecnología e innovación". En Antonio Arellano y Pablo Kreimer (directores), *Estudio Social de la Ciencia y la Tecnología desde América Latina*. Bogotá: Siglo del Hombre Editores (2011), pp. 209-262.

http://www.academia.edu/388175/Apropiacion_Fuerte_del_Conocimiento



B. Basic principles in Scientific Cooperation and Development

CYTED is a programme of science and technology for development. This entails the need to incorporate some of the theoretical and practical principles developed in cooperation to the actions that CYTED promotes and finances. The set of principles concerned with Development Cooperation are particularly suited for this. Among them we may highlight the following.

1. *Appropriation*, understood as the fact that all the social groups and countries involved in a certain Action feel that it belongs to them.
2. *Alignment*, in the sense that a specific Action must converge with development policies in participating countries. It is particularly important to see to each country's differences and specific needs.
3. *Triangulation*, understood as the cooperation between associates as well as with third countries.
4. *Co-financing*. *Pay-pay* systems are a way to guarantee scenarios where all involved will benefit (win-win). Given that CYTED only finances marginal costs and not the total expenditure of its Actions, the principle of co-financing is always implicit. Once this principle is made visible and integrated into each specific Action, it shall become a design factor rather than an implicit *a priori* assumption.
5. *Development objectives*, in the sense of establishing development aims that each Action can contribute to. (For example, its contribution to training populations; qualifying specialists; social cohesion, identity and memory; economic development; governability, legislation, structure and organization of science, promoting cultural literacy, integrating scientific subjects into education programmes, etc.
6. *Horizon*, as a way to conceive the sustainability of Actions and their maintenance and future practical profitability, once CYTED has withdrawn from them.

For the pragmatics of Development Cooperation, it is interesting to consider the principles and proposals of the Paris Declaration:

<http://www.oecd.org/dataoecd/53/56/34580968.pdf>

An example how these principles can be applied to the design and implementation of a cooperation policy:

<http://www.maec.es/es/MenuPpal/CooperacionInternacional/Publicacionesydocumentacion/Documents/Plan%20Director%202009-2012.pdf>



All Actions must be explicitly designed to incorporate references and data about the practical implementation of these principles

C. The Area's specific personality

We must ensure that the Sc+S Area does not become a mere opportunity niche for projects from other existing Areas with a clear component of interaction with society. In fact, it goes without saying that all CYTED's actions must incorporate this component by their very nature insofar as they are part of a Science and Technology for Development programme. The science-and-society aspect, seen as "science for society" must be present in all of CYTED's Areas. But neither can this Area become an alternative for projects in the field of Humanities and Social Sciences lacking a specific niche in the CYTED system of announcements.

What the Sc+S Area *can* do is to become a space of reflexivity within CYTED. It can serve the entire programme by using the very actions of CYTED as a laboratory of innovative experiments and processes.

3 Body: From science and society to social innovation

These guidelines, lines of reflection and priorities of action translate into a series of theoretical and practical proposals

One important concern is *how to involve citizens in the production and use of science*, how to engage the public in the process of producing knowledge and not turn it into its final user or, even worse, a mere consumer of works of popular science. This means incorporating the subjects and issues that will attract citizens to science (science and ethics, the role of scientists) and to think of ways to foster horizontal participation in science and to stimulate a co-production of knowledge by different communities (scientists, different audiences, local groups, etc.) to facilitate the integration and social incorporation of innovation.

From public communication of science and technology ...:
http://www.upf.edu/pcstacademy/PCST_Network/network.html
... To the public as producer of science: a citizen fair of research:
<http://www.makerfaire.com/>

A second question is the *analysis of processes of research and innovation* in order to discover how and where innovation happens and, especially, when it becomes socially adopted and incorporated. In connection to this, an assessment of the impact of technologies is needed on the basis that innovation is only possible when brought



about by a process of social construction or even co-construction, since it is only these processes that lead to the incorporation of innovation.

On innovation:
http://www.madrimasd.org/informacionidi/revistas/monograficos/monografias/monografia20/20_bloque1_02.pdf

This in turn leads to the need to define the pragmatics of the interactions between traditional culture and property rights. These become particularly problematic in conflicts over patents on traditional and indigenous knowledge.

Intellectual Property and Genetic Resources, Traditional Knowledge, and Folklore:
<http://www.afsnet.org/aboutAFS/specialProjects.cfm>

Analyzing the gap between scientific production and the Iberian American region's real problems is another fundamental question. This demands a critical examination of the present Science and Technology systems of our countries as well as using the opportunity to imagine what such a Science and Technology system should be like in our countries. It also means addressing the question of what makes science relevant... or irrelevant. It must also be admitted that studies in the economy and sociology of innovation and development have, in the present R&D and Innovation programme, often constituted a mirage.

An example of citizen's answers to real problems:
sustinalbe cartographies of urban habitats: the Open Green Maps project
<http://www.greenmap.org/xxx>

A fourth interest which is closely linked to the former is *discovering the public as a scientific agent in its own life*. Changes in the world are operating changes in the ways and modes of science production. The dichotomy of mode 1 as opposed to mode 2 is no longer effective. New realities have surfaced over the past years; young trends such as "Neighbourhood science" and "Garage science". Research must therefore develop the technologies and tools that will help articulate this type of answers; technologies and tools that promote community and local alternatives. But it also implies the need to recognise and record these changes, to identify when, how and where they happen, to carry out a critical diagnosis and, wherever possible, prospective analyses.

On garage science:
<http://www.madrimasd.org/blogs/tecnocidanos/2006/02/25/14348>
Examples of neighbourhood science:
<http://www.arqueologia-iab.com.br/2009/view.php?show=34&pag=13>
<http://www.fundacaocasagrande.org.br/memoria.php>



A fifth concern is thus discovering how and when a dialogue between different modes of rationality happens, what defines scientific rationality and what arguments it relies on, how it interacts with other rationalities and how to judge which is the most suited in each context. In a world where scientific rationale has to come to terms with multivocality, cultural diversity and the proliferation of hermeneutics, the construction of a public or community science must deepen its concern about the necessary dialogue between patterns of rationality stemming from the region's cultural diversity.

Interactions between scientific, institutional, individual and spontaneous:
Do-it-yourself Biology: <http://diybio.org/>

A sixth concern, derived from the previous, is how to detect, through the adequate prospective analysis, the *ways of institutionalization for these new forms of knowledge* and what their relation to existent institutions might be. There is general consensus in the entire Latin American sphere that Universities' need to rethink their social mission and the means to accomplish it by adapting their educational structures to new learning dynamics. But the impact of these dynamics on research institutions including universities is also obvious. Why maintain Universities when a part of science tends to flourish in industrial corporations or garages? One reason to do so could be their acting as a means to control the quality of new cognitive adventures. But then again, how can Universities and other academic institutions fulfil such validating function without reproducing hegemony or centre periphery patterns?

Diffuse institutions: local answers to the challenge of climatic change in the UK:
Mapping the Big Green Challenge,
http://www.nesta.org.uk/publications/reports/assets/features/mapping_the_big_green_challenge

To summarise, all of this implies constructing a Public Science, a science with people. It is not difficult to propose this at CYTED, after all a Science and Technology programme for Development. Thus, fundamental concepts in Development cooperation such as **appropriation, alignment, or triangulation** must be central to both CYTED'S practice and to the Public Science being developed.

Towards a collaborative science:
The connexion project: <http://cnx.org/>

All of this also leads us to a clear consciousness of *the need to study processes of constitution of memory, identities and values*. In turn we are led to acknowledge the importance, in the Latin American region, of heritage and cultural legacy in and for present science and life. However, this legacy is especially represented by cultural



heritage, particularly (although not only) by the heritage dubbed Intangible. the fifth point proposed above affects heritage primarily. For not only are different forms of rationality interacting in the present (different forms of otherness) expressed, materialized and negotiated through and by heritage but they have also been past producers of heritage, are reflected and formalized in it and continue to produce new heritages.

On the concept of Heritage: <http://digital.csic.es/handle/10261/11212>
On the concept of Intangible Heritage: <http://www.unesco.org/culture/ich/>
An example of the connections between tangible and intangible material:
<http://www.projetoportoseguro.blogspot.com/>
“Heritagisation” as a social process: <http://digital.csic.es/handle/10261/14163>

All these subjects can be studied in a distinctly clear way in the Iberian American region. The region’s present situation, the social dynamics developing within it, the vigour displayed by its communities and civil society, its recent development in science and technology alongside other realms all make Latin America an exceptional laboratory to detect and monitor aspects of tomorrow’s science, to predict what these might be and to respond to the demands and emergencies of the region.

An example of the contribution of science to the future:
http://www.unacar.mx/contenido/prospectivistas_memorias/sintesis_ejecutiva.pdf

4 Instrument: Long term thematic priorities

The aims of the Sc+S Area of CYTED are implemented through priority guidelines, contained in CYTED’s annual announcements. These guidelines must be clear, have a pragmatic outlook and vocation, enable a certain variety within the line and possess a transversal and interdisciplinary nature.

Under these conditions, area guidelines will be maintained over the years with small changes or annual corrections in their working to allow adjustments if either applications or approved Actions were to reveal major incomprehensiveness between the line’s objectives and its character or any other problems were detected in its functioning.

In any case, beyond these small details, lines shall not change annually but will remain constant, while retaining the sufficient aponness to generate competitiveness and thus excellence in proposals. Annual changes cause a certain defencelessness in candidates, send out confusing signs of the area’s aims to those interested in promoting the Actions and causes a lot of efforts to be dilapidated when they could be reconverted and compelted over the years. Not only must applicants be granted



sufficient time to design an application but it should be possible to apply repeatedly if promoters chose to do so in subsequent years, by modifying the design of one particular application based on assessment reports from the previous year.

From the previous analysis we derive three main thematic lines. They all refer specifically to Science, Technology and innovation. Their common aim is to contribute to the study and perfecting of an Iberian American space of research. Making progress in all of them simultaneously shall undoubtedly be a complex task but the construction of a Public Science demands that aims be made compatible and interconnected.

Enunciation of priority thematic lines

Social action and public science

Analysing new forms and expressions of political participation. Creating new forums for scientific debate and participation. The foundations and design of Public Science as a scientific practice developed with and for the people (touching upon such issues as social inclusion, gender, etc.). How to place science within society, particularly in multicultural and decentered societies. The processes of production and transfer of knowledge and technologies, intellectual and industrial property, the interactions between knowledge, law and economy. The communication and promotion of science; its valuing and diffusion, communication of science and scientific journalism. The aim of this line is to reinforce citizen's abilities to innovate and research. The promotion of citizenship and democracy projects and expressions of political empowering including studies in the Sociology and Economy of innovation and development. Strategies of institutional strengthening including juridical studies. The secondary role of the state as a developer of science and technology in bringing about social innovation which would be seen as unprofitable from the point of view of the private sector.

Cultural heritage and multiculturalism

The past, presente and future of cultural heritage in connection with multiculturalism. Studying the processes of constituting memory, identity and values through multidisciplinary methodologies and criteria. The relationships obtaining between memory, identity and development. Intangible heritage as a repository of the social wealth created by cultural traditions. The contribution of traditional knowledge to the creation and social use of new knowledge, to generating innovations and to stimulating the social use of these. The revaluing of heritage and its use as a social, cultural and economic resource.





Studies in the systems of Science, Technology and Innovation

A critical analysis of the science, technology and innovation system to improve its governability, its excellence and relevance as well as increasing the competitiveness of companies in the region. Empirical and analytical studies of national systems of I+D scientometric and bibliometric studies. Defining and applying indicator of scientific excellence and relevance. Analyses and attempts to improve science and the I+D system in its normative, juridical and organizational aspectos. Analyses of the strategies used to strengthen scientific institutions. Analytical and monitoring studies of future technologies. Studies in prospective, technological vigilance and technology assessment that will prepare the region for the technologic convergence to occur in the next few years. This line could generate joint actions with other areas of the programme.

