MINISTRY OF SCIENCE, TECHNOLOGY AND INNOVATION

United Nations Educational, Scientific and Cultural Organization

GO SPIN FOR SCIENCE POLICY

GLOBAL OBSERVATORY OF SCIENCE, TECHNOLOGY AND INNOVATION POLICY INSTRUMENTS

UNESCO GO→SPIN Methodological and Data Collection Training Workshop – Republic of Uganda

12–16 April 2021

LECTURE 1: GO→SPIN Programme Overview

Guillermo A. Lemarchand
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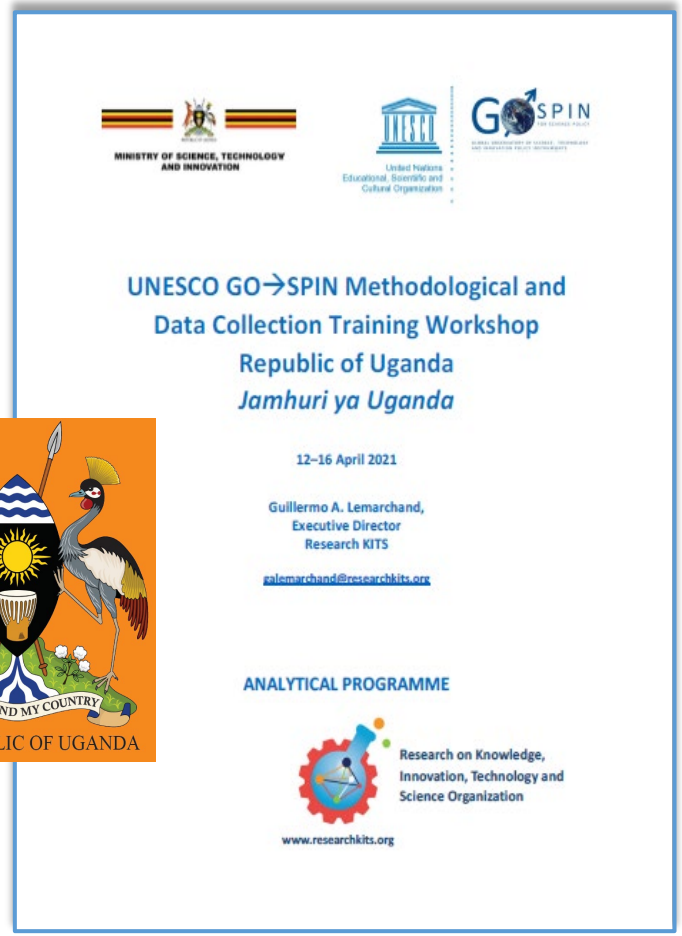
Research KITS

galemarchand@researchkits.org

Research on Knowledge, Innovation, Technology and Science Organization

www.researchkits.org

Contents of the training workshop


MINISTRY OF SCIENCE, TECHNOLOGY AND INNOVATION

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GO SPIN

UNESCO GO→SPIN Methodological and Data Collection Training Workshop

Republic of Uganda

Jamhuri ya Uganda

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Guillermo A. Lemarchand, Executive Director Research KITS

galemarchand@researchkits.org

ANALYTICAL PROGRAMME

Research on Knowledge, Innovation, Technology and Science Organization

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FOR GOD AND MY COUNTRY

THE REPUBLIC OF UGANDA

LECTURE 1: GO→SPIN Programme Overview.

LECTURE 2: GO→SPIN Methodological Framework.

LECTURE 3: Evidence based policies through the analysis of temporal series of indicators. Theory and Practice.

LECTURE 4: Using the GO→SPIN online platform.

LECTURE 5: Completing the GO→SPIN surveys on operational policy instruments, legal instruments and institutional ecosystem.

The presentations and the complete bibliography can be downloaded from https://researchkits.org/training/Uganda/

UNESCO GO→SPIN

Methodological and Data Collection

Training Workshop

Republic of Uganda
Jamhuri ya Uganda

12–16 April 2021

Contents of the GO-SPIN Training Workshop

click here to open and download

What is GO→SPIN?

GO SPIN
FOR SCIENCE POLICY

GLOBAL OBSERVATORY OF SCIENCE, TECHNOLOGY AND INNOVATION POLICY INSTRUMENTS

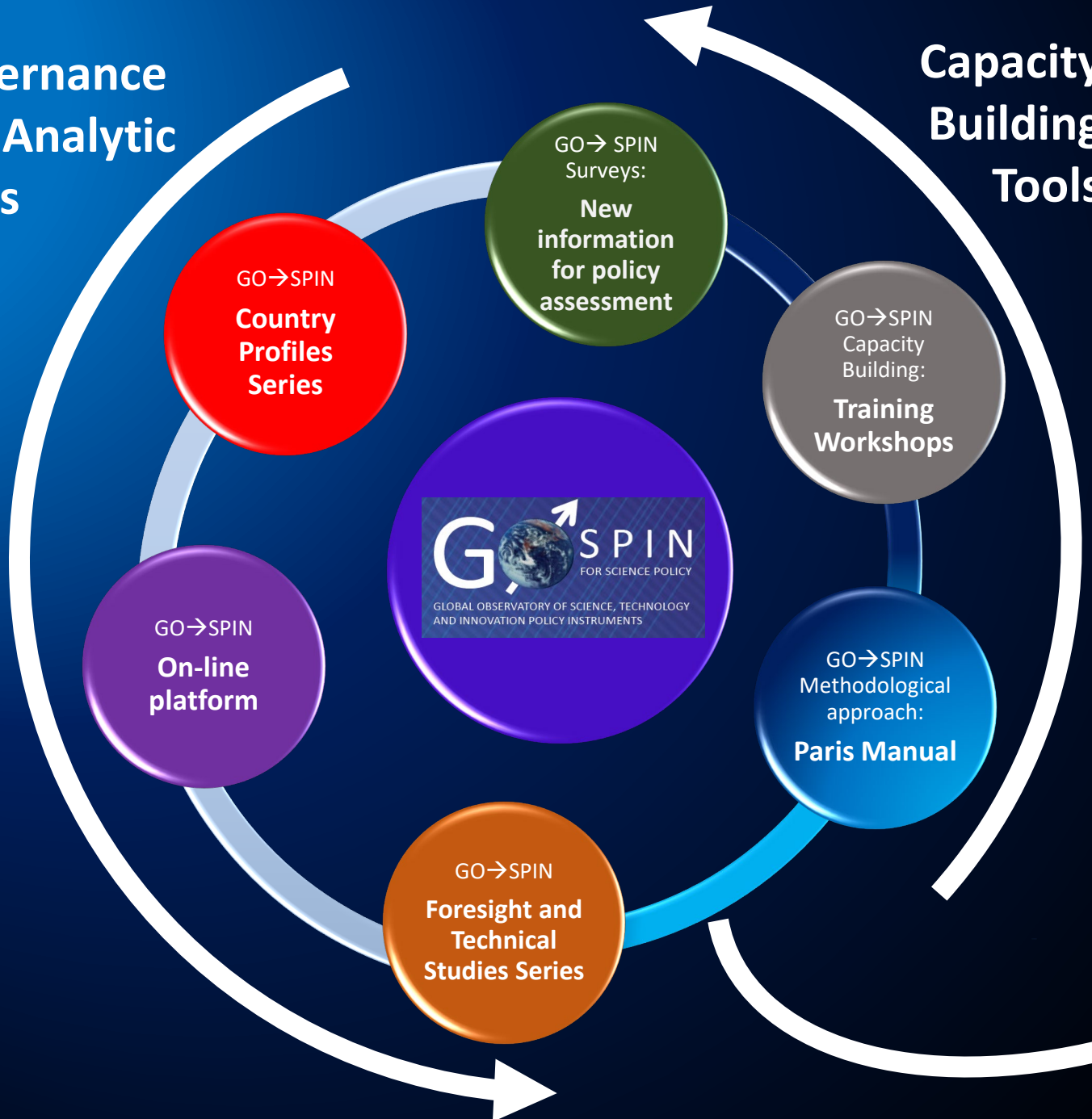
GO→SPIN is UNESCO's Global Observatory of policies and policy instruments on science, engineering, technology, and innovation (SETI), legal instruments, institutional ecosystems, contextual factors and indicators on research and innovation

Users are: The national developing planning agencies, more particularly the government bodies responsible for formulating and co-ordinating national SETI policies and other national bodies involved in the application of science and technology (S&T) to sustainable development; Parliamentary groups especially concerned with SETI policies; SETI information brokers, consulting groups and advisory bodies; Teaching and research departments engaged in SETI policy studies; the governing bodies of R&D institutes and S&T services; the boards of management of productive enterprises heavily reliant on R&D or engaged in the transfer of technology and innovation; international governmental and non-governmental organizations concerned with SETI and their application to sustainable development; etc.

Why GO→SPIN?

- Effective SETI policies are key to achieve SDGs and GO→SPIN is an excellent monitoring tool for them to define new STI Roadmaps.
- GO→SPIN is a methodology for mapping information on SETI policies, national SETI ecosystems and their organizations, SETI legal frameworks, operational policy instruments and indicators for providing evidence-based policy analyses.
- GO→SPIN performs capacity building activities, collects new information on SETI policies, publishes country profiles, provides standard setting instruments (GO→SPIN Manual) and the GO→SPIN online platform is a tool for analysing SETI policies and for monitoring the implementation of the 2017 *Recommendation*

The original programme had six different components

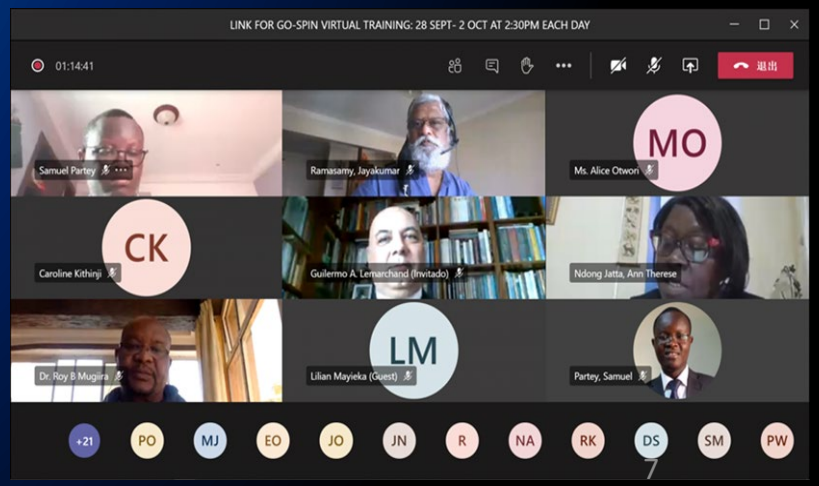


New component: Follow-up of 2017 Recommendation

GO→SPIN Capacity Building:

Training Workshops

UNESCO is organizing capacity-building workshops to help Member States in the collection of information on STI policies based on the GO→SPIN methodological approach and is training national focal points to feed the new GO→SPIN online platform…



GO→SPIN
Country Profiles Series

After a national GO→SPIN training, Member States need around 3-6 months to collect the raw data. Then we need another 3-6 months to process, write the draft, make the peer reviewing, validate the content with National authorities and UNESCO's boards, proof-reading, etc.

The first 10 volumes of the "GO→SPIN Country Profiles Series"

Contents of UNESCO's GO→SPIN Country Profile Series

Malawi: mapping the landscape of a small-economy innovation system **1**

Women in Science and Engineering **2**

R&D indicators for Malawi **3**

A scientometric analysis of Malawi **4**

Historical background to SETI policies in Malawi **5**

The SETI policy cycle in Malawi **6**

The analytical content of Malawi's SETI policy **7**

Analysis of the SETI organizational chart and flows in Malawi **8**

Inventory of SETI Institutions in Malawi **9**

Inventory of Malawi's legal framework for SETI **10**

Inventory of SETI operational policy instruments in Malawi **11**

SWOT analysis of Malawi's research and innovation system **12**

Contents of UNESCO's GO→SPIN Country Profile series

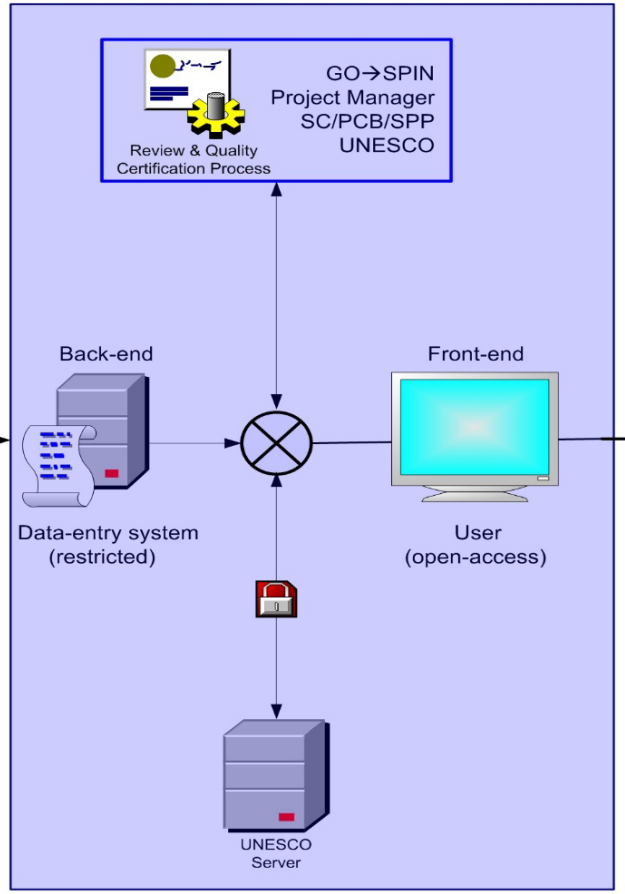
1. A long-term description of the political, economic, social, cultural and educational contextual factors;
2. Analysis of gender in science and engineering national behaviour
3. A study of R&D and innovation indicators;
4. A long-term scientometric analysis of scientific publications, patents, trademarks and utility models;
5. Historical analysis of SETI policies and institutions;
6. A standard content analysis of the explicit SETI policies, including those research and innovation policies implemented in other sectors, such as the agricultural, energy, health, industrial and mining sectors;
7. A description of the SETI policy cycle;
8. A complete analysis of the SETI organizational chart at five different levels (policy-making level; promotion level; research and innovation execution level; scientific and technological services level and evaluation level);
9. An inventory of all the SETI government bodies and organizations related both to research and innovation and to science and technology services;
10. An inventory of the SETI legal framework, including acts, bills, regulations and international agreements on SETI issues;
11. A standard inventory with 18 different analytic dimensions of all the SETI operational policy instruments in place;
12. A SWOT analysis of the country's research and innovation landscape.

GO→SPIN
On-line platform

GO SPIN
FOR SCIENCE POLICY
PLATFORM

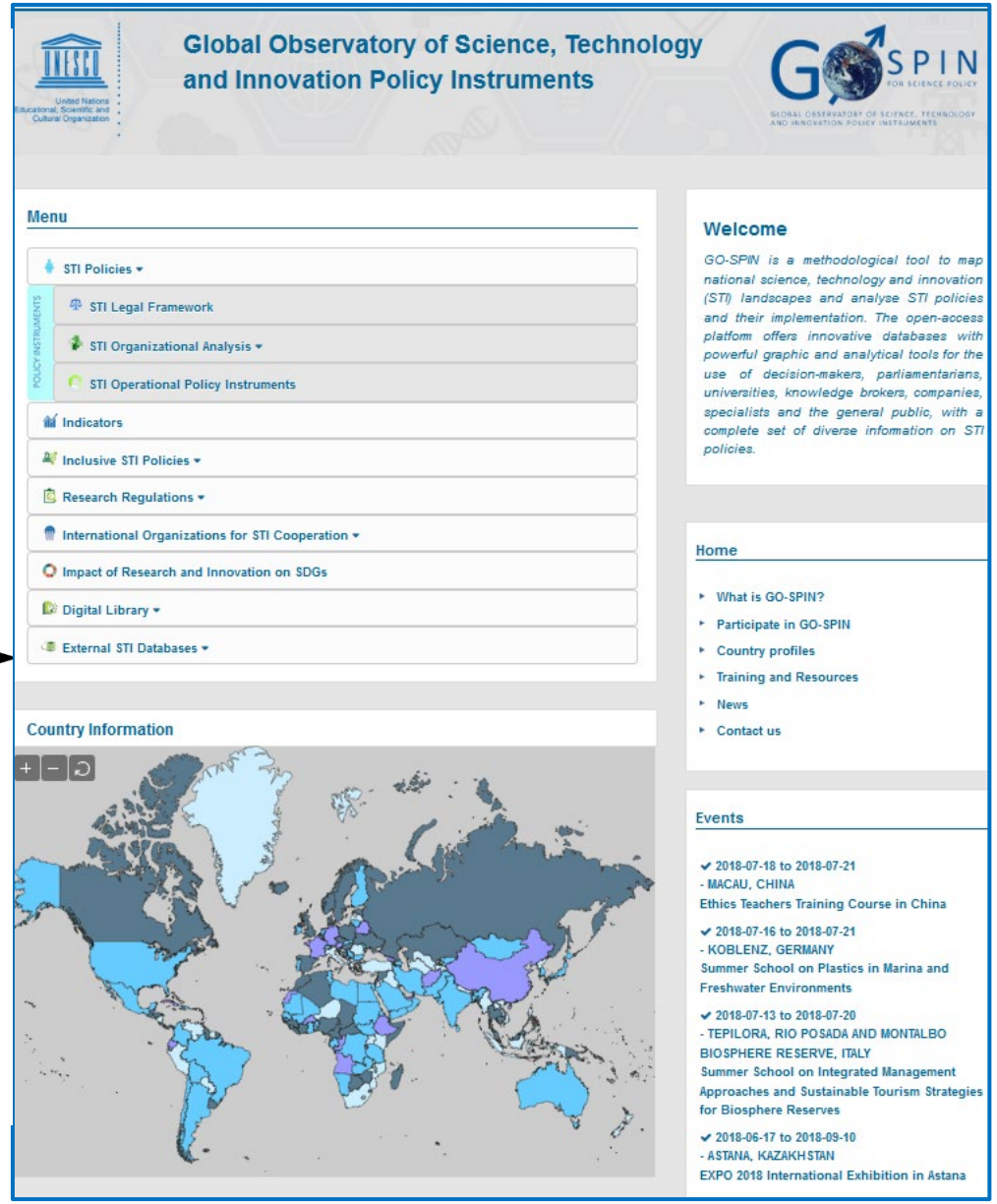
Who provides the information?

Focal points from Member States will feed the platform through periodical surveys



https://gospin.unesco.org/

What users can see..



GO→SPIN

Foresight and Technical Studies Series

GO→SPIN as a tool to make the follow-up of international recommendations

GUIDELINES FOR THE PREPARATION OF A REPORT ON A UNESCO MEMBER STATE's IMPLEMENTATION OF THE RECOMMENDATION ON SCIENCE AND SCIENTIFIC RESEARCHERS (2017)

I. Introduction

1. The Recommendation on Science and Scientific Researchers (hereinafter, the "Recommendation on Science") was adopted by some 195 states on 13 November 2017 meeting in the General Conference of UNESCO at its 39th session (39 C/Resolution 85). The Director-General transmitted the certified text in six languages by her letter of 10 May 2018 (CL/4253) to all UNESCO Member States, including your government. In that letter, she reminded each government of its duties to transmit and implement the Recommendation as well as to report back to UNESCO's Secretariat by the second quarter of 2021. The present document invites these reports, explains how to submit online, and proposes that Member States may use the online questionnaire (a copy of which appears in Annex A). Other formats are also welcome before 31 March 2021.

II. About the Recommendation on Science

2. This Recommendation to UNESCO Member States provides the internationally-agreed model set of framework policies, regulations and institutional practices for national science technology and innovation (STI) systems in all countries. It is in place for the long term, and Member States are meant to comply.

3. The overall aim is to strengthen science per se, while ensuring other interests including peaceful uses of the knowledge and other benefits that science can produce. This framework addresses all of science technology and innovation together, including even science publishing and international travel. It addresses all disciplines of science, including the social sciences, and the conduct of research and innovation in all settings, including the private sector, or citizen science.

4. There is a particular focus today on strong research institutions and regenerating human capital in relation to delivering sustainable development goals, as well as moving quickly toward more inclusive and more global science. There is a particular focus that each State develops capabilities to use scientific knowledge and advice for decision-making and public policy. Sharing data and knowledge across borders involves risks that must be managed.

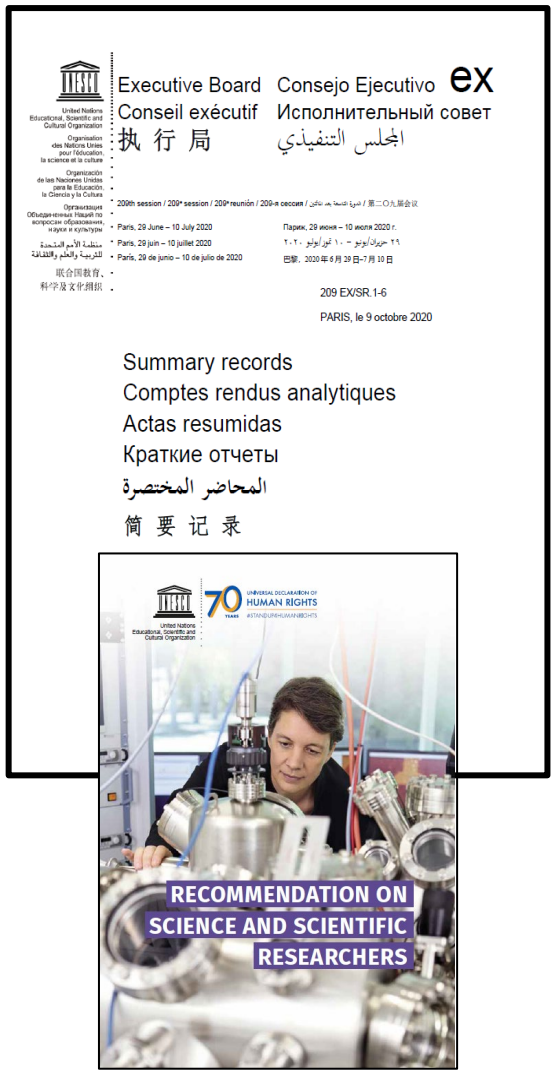
5. One signature feature of this Recommendation is that it makes explicit an internationally-agreed balance of rights and responsibilities based on integrating science in society. The legal basis for scientific freedom is clarified, as based in internationally-agreed human rights including gender equality, but it is also, by this Recommendation, applicable for all institutions of science. Further information and background, as well as free online publicity and communications materials can be found online at en.unesco.org/recommendation-on-science. Member States are now in a phase of implementing this Recommendation.

III. Assessing the national experience of implementation

6. On a four-yearly basis, each Member State is meant to report on its experience implementing the Recommendation on Science (this is an obligation in the UNESCO Constitution). Having comparable assessments over time can be extremely valuable for decision-makers being able to develop and achieve the common global standards of the Recommendation.

7. Each report is an evidence-based self-assessment in which compliance is substantiated by documentation and references, involving analysis that typically is based on some data collection and consultation to assess the impact of measures that have been taken. Where there is less data, it may take longer to substantiate.

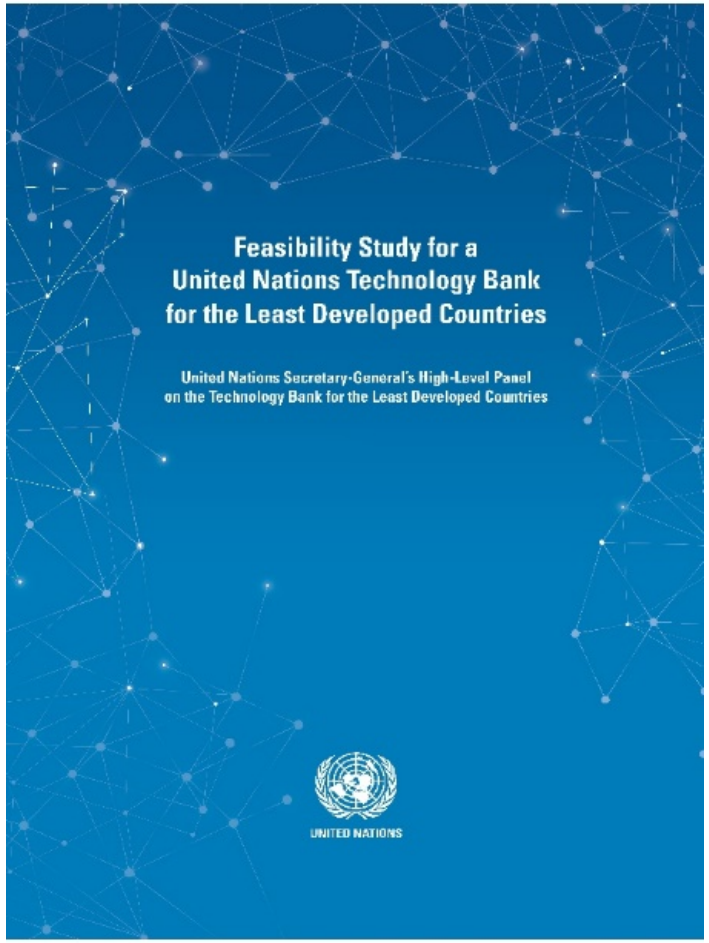
GO→SPIN and the 2017 *Recommendation*

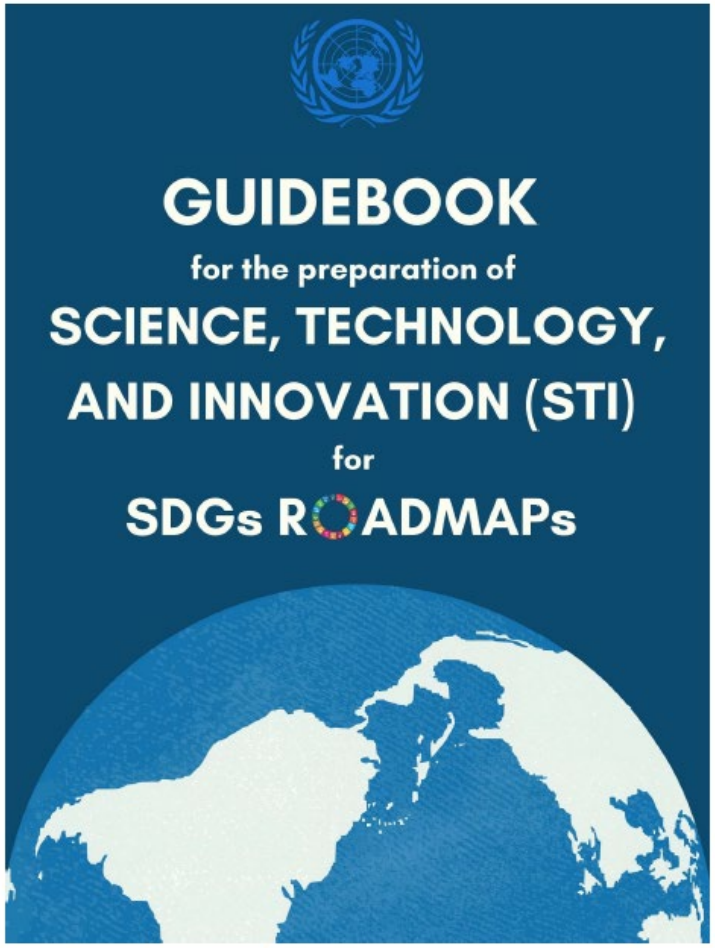


- **For the national reports by Member States on the implementation of the *Recommendation on Science and Scientific Researchers* (2017), the UNESCO Executive Board approved guidelines that call for the national reports to be submitted online through the GO→SPIN online platform (209 EX/Decision 18.IV).**

- **The same Committee meeting that handled the item had some discussion of (even favored) without decision that future national reports against future science-related instruments could be foreseen in the same platform, aiming to eliminate duplication and to make the national reports' information more accessible and in one place.**

The GO→SPIN methodological approach is used by the United Nations Inter-Agency Task Team on Science, Technology and Innovation for the SDGs (IATT), Sub-Working Group on STI Roadmaps co-led by World Bank, DESA, UNCTAD and UNESCO





TECHNOLOGY FACILITATION MECHANISM | SUSTAINABLE DEVELOPMENT GOALS

WORLD BANK GROUP | United Nations | Department of Economic and Social Affairs | UNCTAD | JST | UNIDO | UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

GO→SPIN milestones (2010-18)

United Nations Educational, Scientific and Cultural Organization

GO SPIN FOR SCIENCE POLICY
GLOBAL OBSERVATORY OF SCIENCE, TECHNOLOGY AND INNOVATION POLICY INSTRUMENTS

UNESCO MANAGEMENT:
+-UNESCO MONTEVIDEO-Jorge Grandi (DIR)--+------- UNESCO HQ Div Science Policy & Capacity Building- Lidia Brito (DIR)----------+-UNESCO HQ Section SPP S. Bahri /S. Arico (CS)-+-----UNESCO HQ Section SPP Ernesto Fernández (CS)----------]

M

D

F

+----------**Project Design and Implementation by Guillermo A. Lemarchand UNESCO Senior Consultant and Principal Investigator**----------+

+--------UNESCO RP FUNDING----------+-----AECID FUNDING-----+---------- SIDA FUNDING---------->+


Jan. Publication of a study on National STI Systems in 34 LAC countries

Nov. GO-SPIN side event at 36th GC

Mar. Second GO-SPIN Training workshop In Dakar (6 MS)

Nov. First GO-SPIN Training workshop In Harare (5 MS)

Jul. Third GO-SPIN Training workshop In Maputo (4 MS)

Nov. GO-SPIN Training workshop in Kigali

Apr. GO-SPIN Training workshop in Cairo

March Public. of GO-SPIN Vol. 5

Nov. GO-SPIN Training workshop in Vientiane

Nov. Presentation of GO-SPIN platform At 39th GC

December GO-SPIN Training Workshop in Kingston

April Publication of GO-SPIN Vol. 7

Vol. 8

2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019

Aug. Launching SPIN Platform by UNESCO Montevideo

Oct. Launching of GO-SPIN programme in an International Expert Workshop at UNESCO Paris

Mar – Aug GO-SPIN survey development

Nov. First GO-SPIN Country Profile Presented during 37th GC


Jun – Aug Publication of GO-SPIN Vols. 2 ad 3

March Publication of GO-SPIN Vol. 4

Jul. GO-SPIN Training workshop in Guatemala

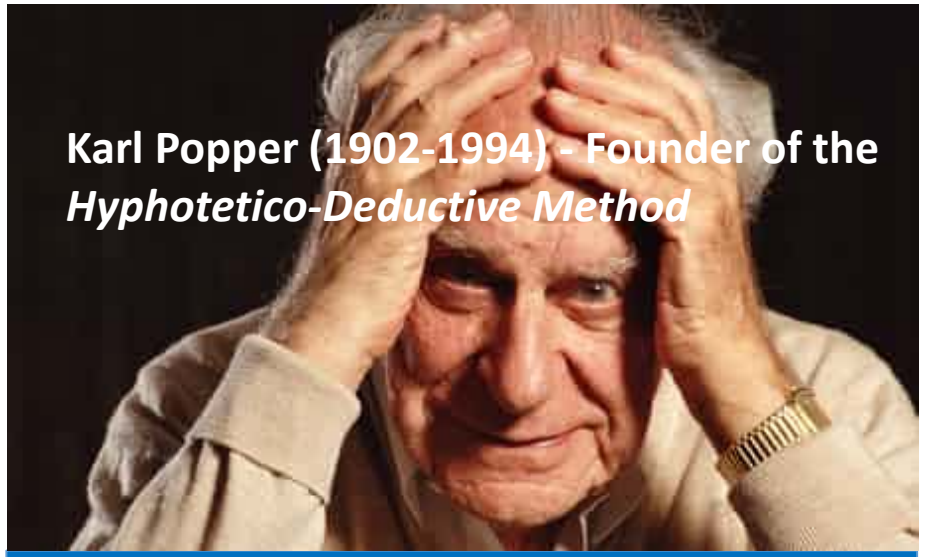

April Publication of GO-SPIN Vol. 6

March GO-SPIN Training Workshop in Beirut & in April in Amman

November 2018 GO-SPIN platform Launching Event

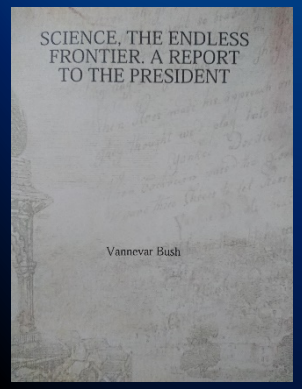
An overview on the GO→SPIN Methodological Approach

The Constitution of UNESCO establishes five main functions for the organization: *(1) laboratory of ideas, (2) standard-setter, (3) clearinghouse, (4) capacity builder* and *(5) catalyst for international cooperation*. Based on this mandate, UNESCO has developed a *"theoretical framework"* to help Member States to evaluate and design their own national research and innovation ecosystems, their SETI policy instruments, and their SETI regulatory frameworks through the GO→SPIN Methodological Approach.



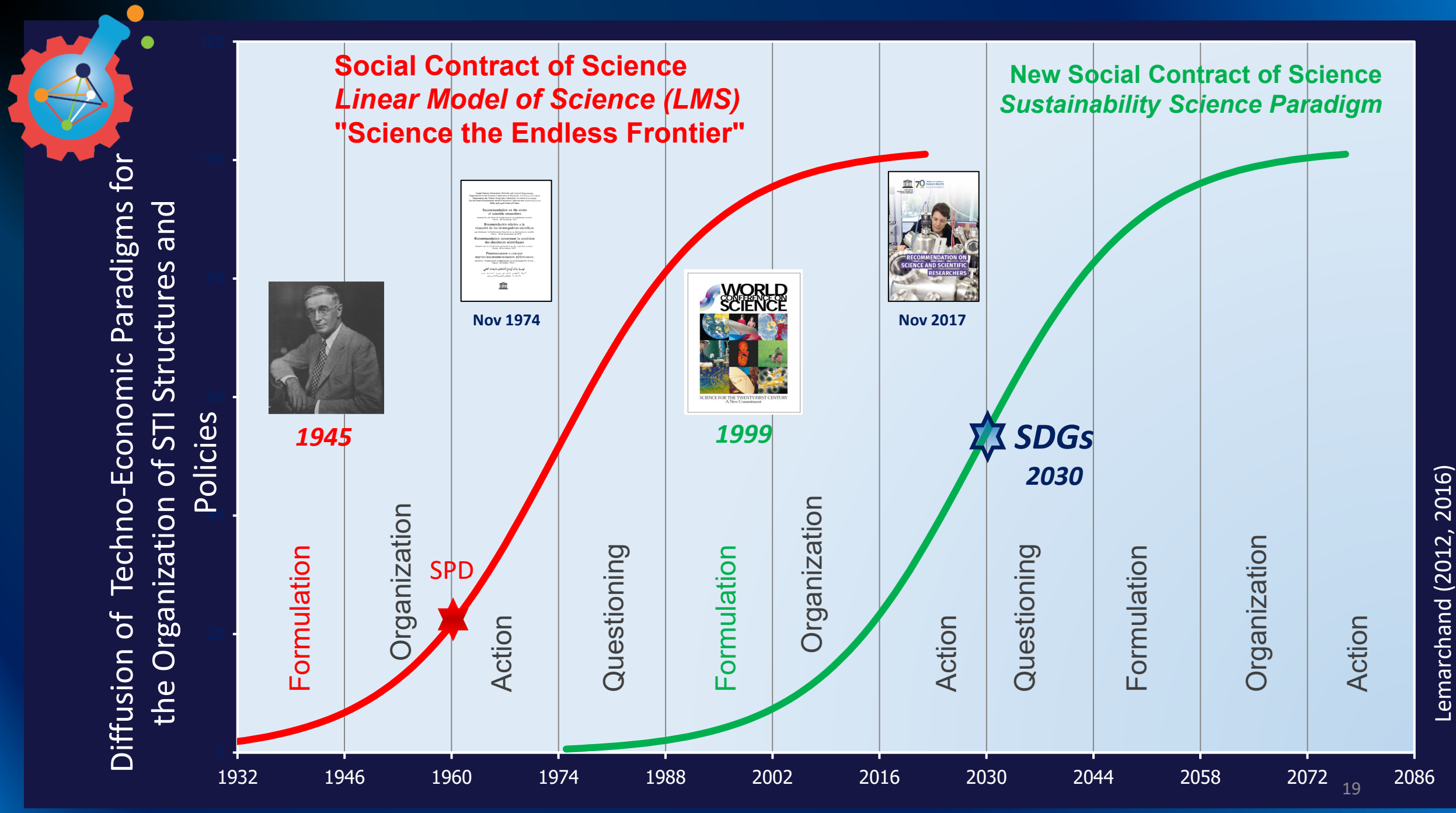
All measurements, observations, experiment results, or **"indicators"** are always implicitly or explicitly "theory-dependent" and paradigm-dependent.

1. Before the Second World War there wasn't any "explicit" science and technology public policy, research and innovation activities were driven by the industrial sector and by the military arm races (demand side)



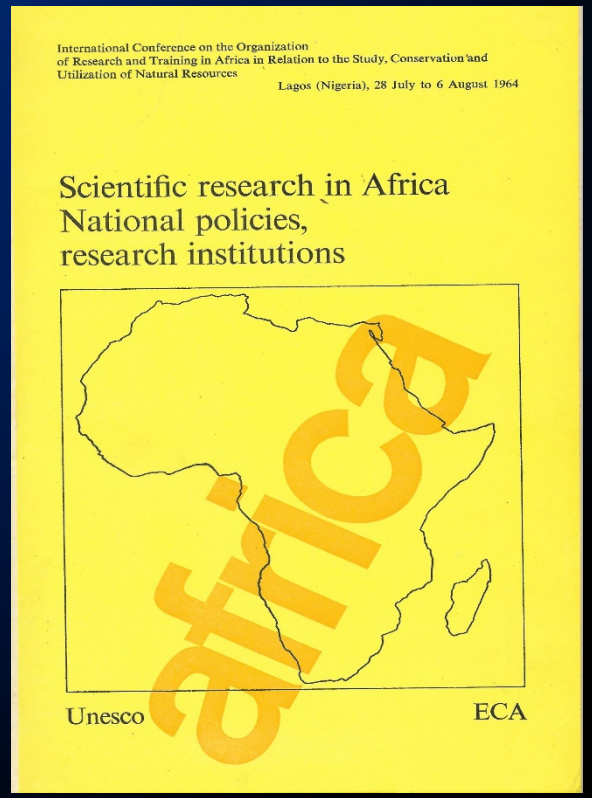
2. After the Second World War, the first "social contract of science" was established (V. Bush's *Science the Endless Frontier*) and the first explicit policies appeared with the goal of maximizing the ouputs of research and innovation, by applying specific incentives, mechanisms and policy instruments

3. Between 1960 and 1988, UNESCO played a fundamental role diffusing the creation of national institutions to design, promote and monitor science policies worldwide

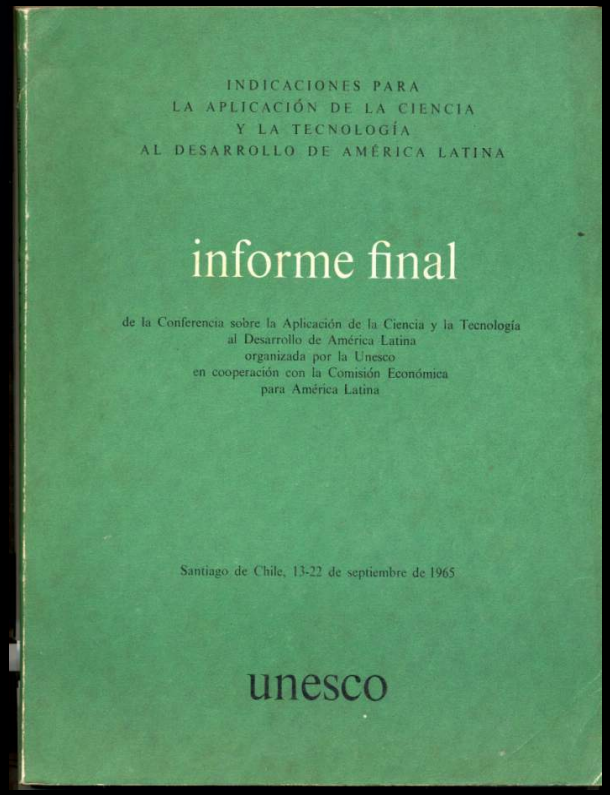

Diffusion of Techno-Economic Paradigms for the Organization of STI Structures and Policies
Social Contract of Science
Linear Model of Science (LMS)
"Science the Endless Frontier"
New Social Contract of Science
Sustainability Science Paradigm
1945
Nov 1974
1999
Nov 2017
SDGs
2030
SPD
Formulation
Organization
Action
Questioning
Formulation
Organization
Action
Questioning
Formulation
Organization
Action
0
20
40
60
80
100
120
1932
1946
1960
1974
1988
2002
2016
2030
2044
2058
2072
2086
Lemarchand (2012, 2016)

UN & UNESCO:
More than 60 years working with S&T policies for development

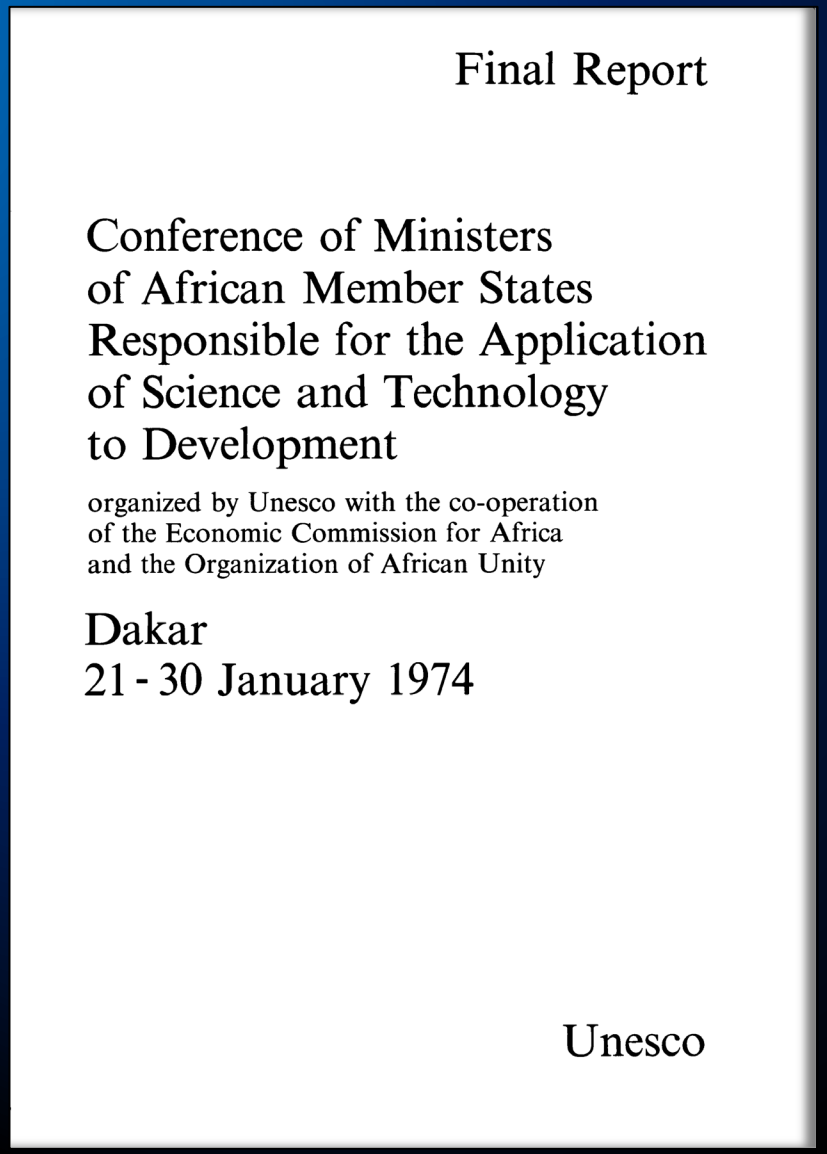
Geneva, 1963



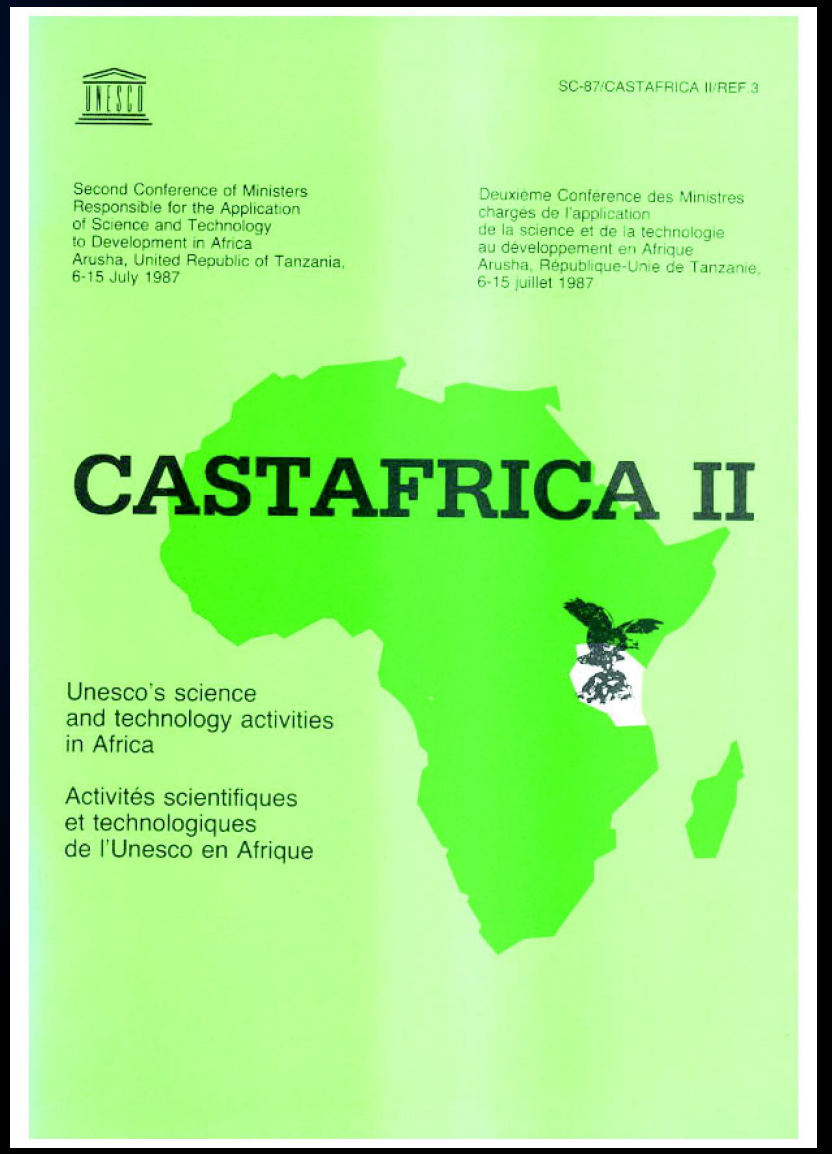
Lagos, 1964



Santiago, 1965

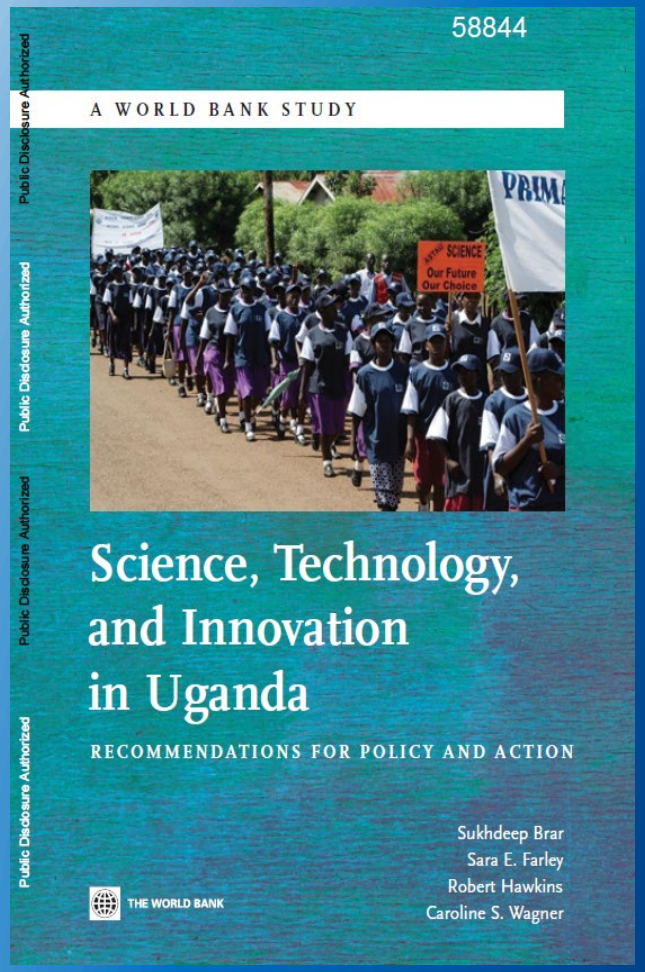


CASTAFRICA I, Dakar 1974



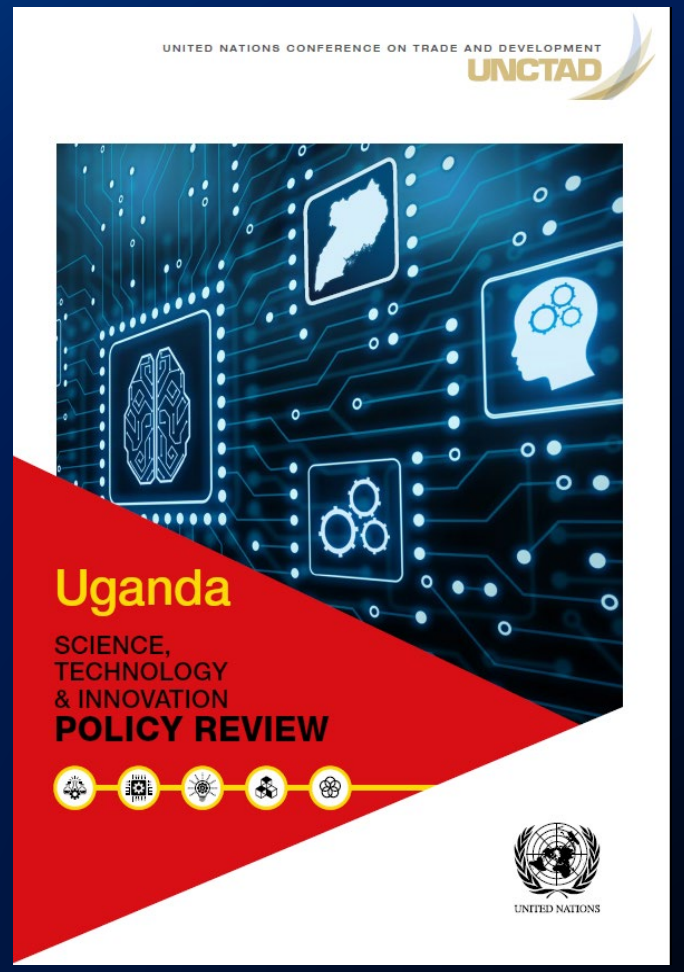
CASTAFRICA II, Arusha 1987

Examples of recent publications under the new “paradigm”



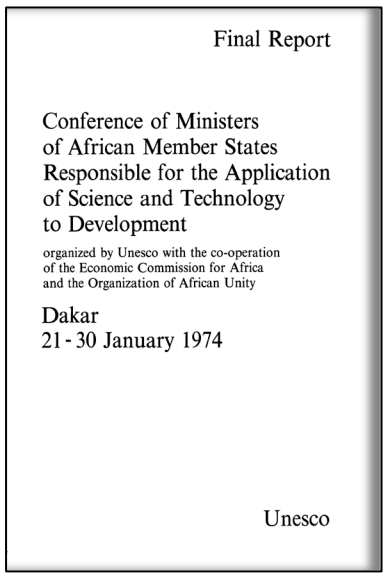
2011

2019



2020

FIRST PARADIGM: CASTAFRICA I (Dakar, 1974) excerpts from the Recommendations



Final Report

Conference of Ministers
of African Member States
Responsible for the Application
of Science and Technology
to Development

organized by Unesco with the co-operation
of the Economic Commission for Africa
and the Organization of African Unity

Dakar
21 - 30 January 1974

Unesco

Recommendation No. 1: FINANCIAL RESOURCES DEVOTED TO R&D

Recommends:

1. That the African Member States improve their budgetary procedures and national accounting systems in regard to R&D proper and the supporting scientific and technological public services, so as to enable them to compile serviceable statistics in this regard, according to the standards proposed by Unesco and to carry out comparative international studies in this field;

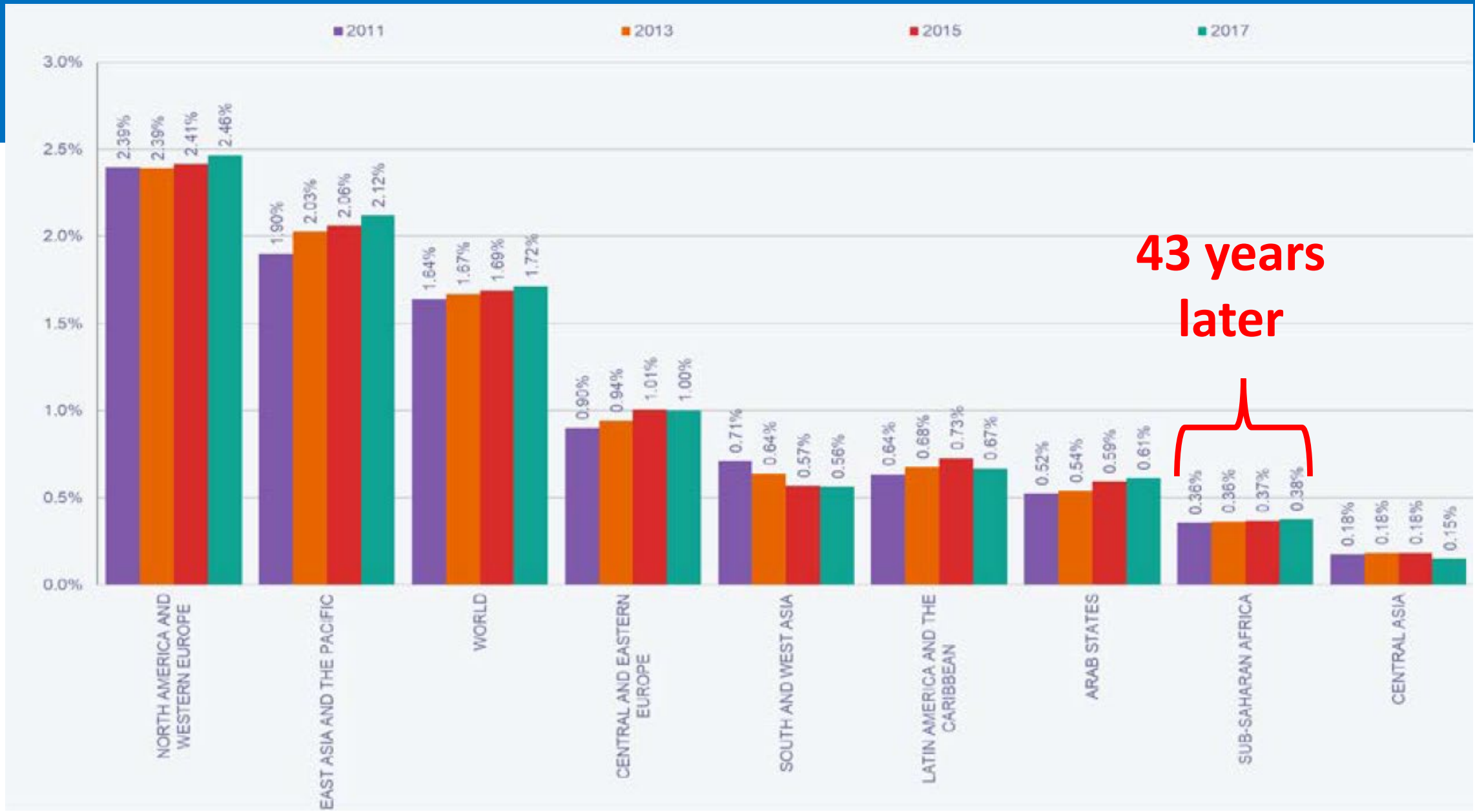
2. That African Governments improve their financing, fiscal and customs regulations so as to enable R&D institutions to operate with a high degree of efficiency and with the maximum possible freedom for the management of their financial resources;

3. That public expenditure for R&D and supporting scientific and technological public services (STS) be recapitulated in the annual state budget in the form of an aggregate functional budget constituting, as it were, the total budgetary allocation for R&D and supporting scientific and technological public services (STS);

4. That Member States, taking into account national demand for R&D, increase their annual expenditure on R&D and supporting scientific and technological public services (STS) so as to attain, if possible before 1980, the target figure of a minimum of 1% of their Gross National Product as proposed by UNACAST in the World Plan of Action;

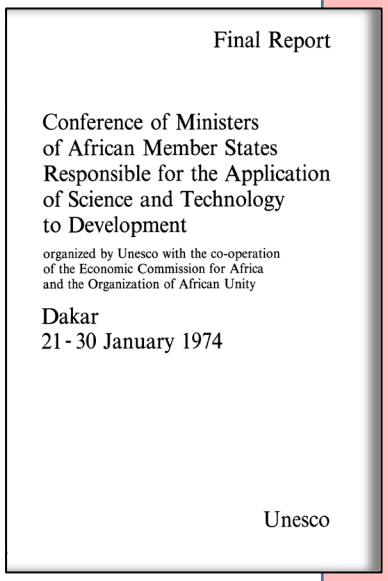
5. That the African Member States undertake a careful study, with the technical assistance of Unesco if they so desire, in regard to the budgetary and programming procedures that are needed for the purpose of preparing functional budgets for R&D and supporting scientific and technological public services (STS) and formulating long-term plans for inclusion in their National Development Plans.

Gross Domestic Expenditure on R&D (GERD) as percentage of GDP by region, 2011, 2013, 2015 and 2017



Source: UNESCO Institute for Statistics, July 2020

FIRST PARADIGM: CASTAFRICA I (Dakar, 1974) excerpts from the Recommendations


Final Report

Conference of Ministers of African Member States Responsible for the Application of Science and Technology to Development

organized by Unesco with the co-operation of the Economic Commission for Africa and the Organization of African Unity

Dakar
21 - 30 January 1974

Unesco

Recommendation No. 3: HUMAN RESOURCES FOR SCIENTIFIC AND TECHNOLOGICAL ACTIVITIES

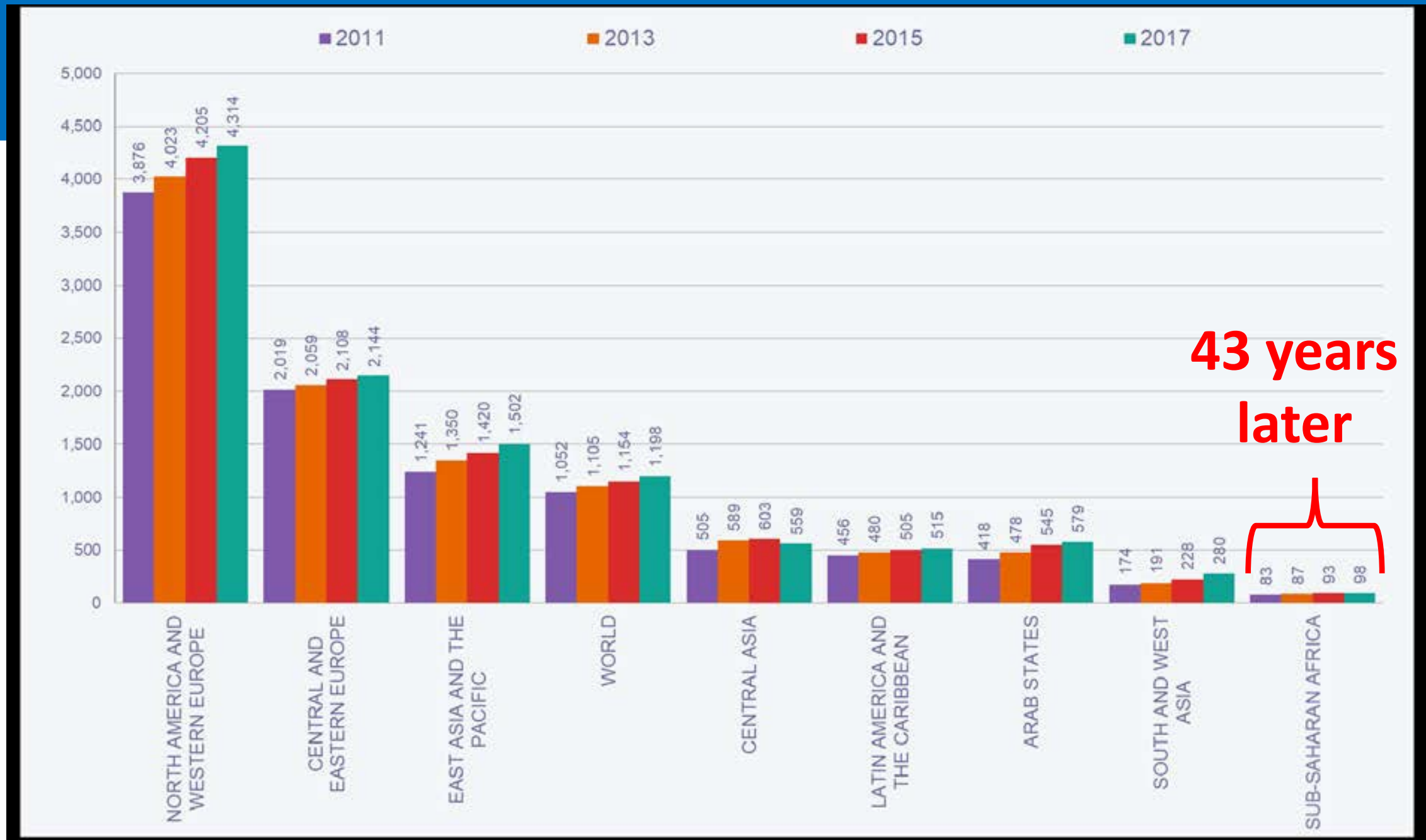
Recommends:

1. That Member States take the measures needed to attain, if possible before 1980, the targets set out in the table below, having regard to the fact that the target of 200 scientists and engineers engaged in R&D activities per million inhabitants is that adopted for Africa by UNACAST in its "World Plan of Action" and that it is barely half of those established for Asia and Latin America:

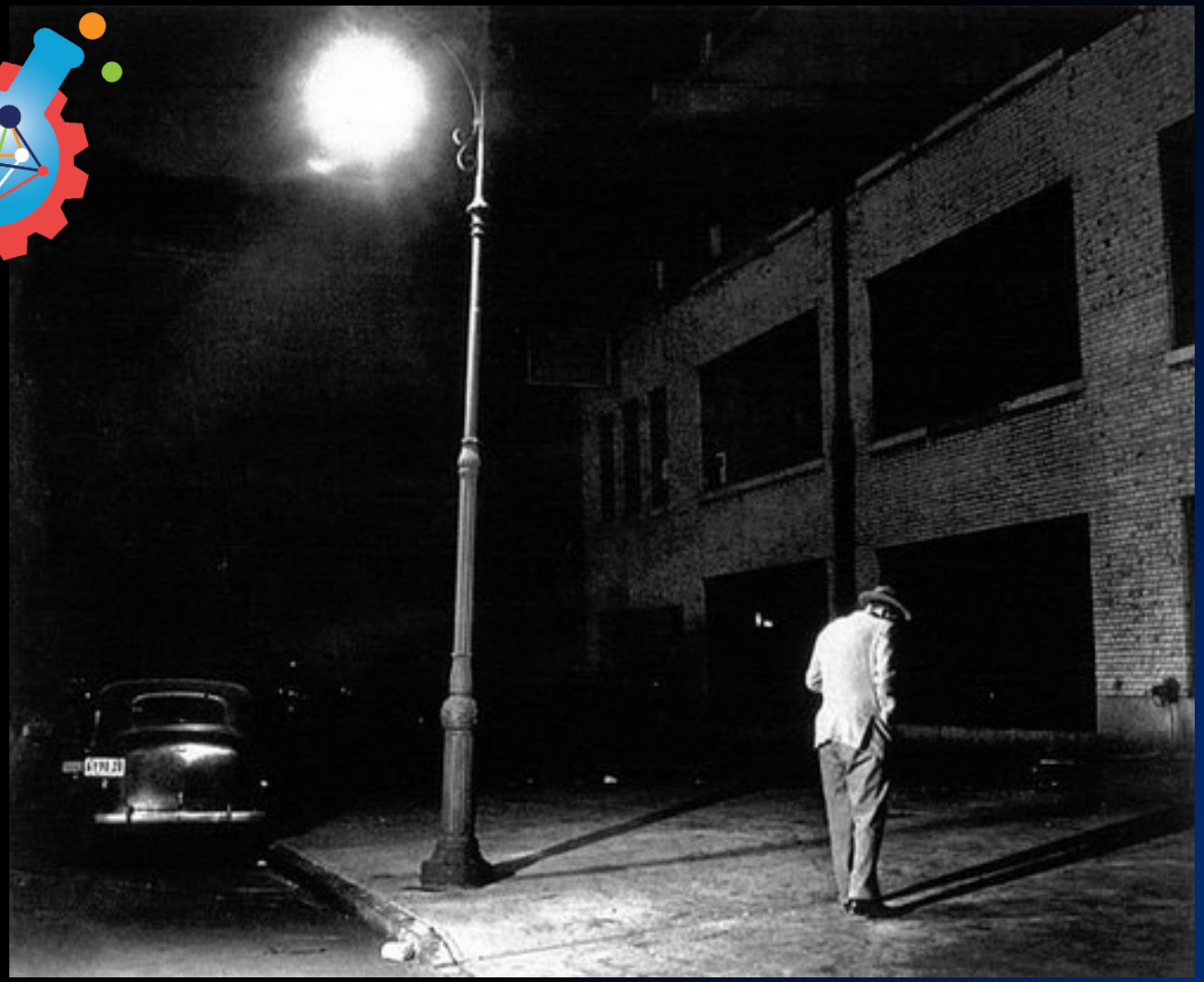
Economic development level (per capita GDP) $	Number of scientists and engineers per million inhabitants	Number of scientists and engineers engaged in R&D per million inhabitants (10% of the figure in column (2))
(1)	(2)	(3)
200 or over	2,000	200
100 to 200	1,400	140
Under 100	1,000	100

2. That Member States continue their efforts to implement the Lagos Conference recommendation advocating the training of two specialized technicians for each scientist or engineer engaged in R&D activities.

Researchers per million inhabitants by region, 2011, 2013, 2015 and 2017

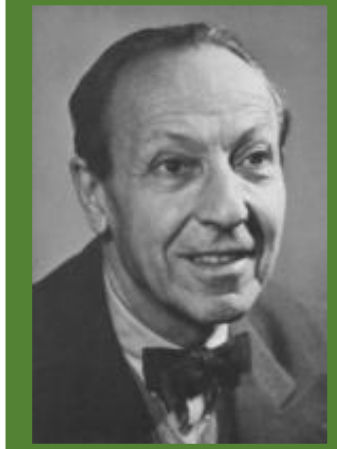


Source: UNESCO Institute for Statistics, July 2020



Usually, we are groping in the dark

Are STI indicators the appropriate tool to understand how STI policies generate effects on societies or to understand how "National *Research* and Innovation Systems" work?

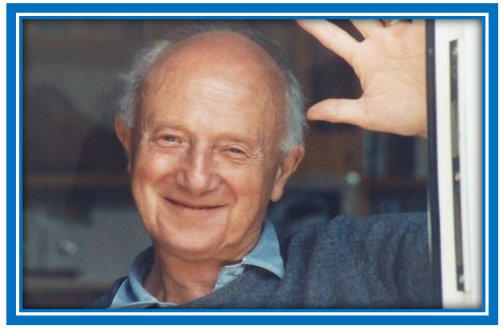


Fritz Machlup (1902 – 1983)

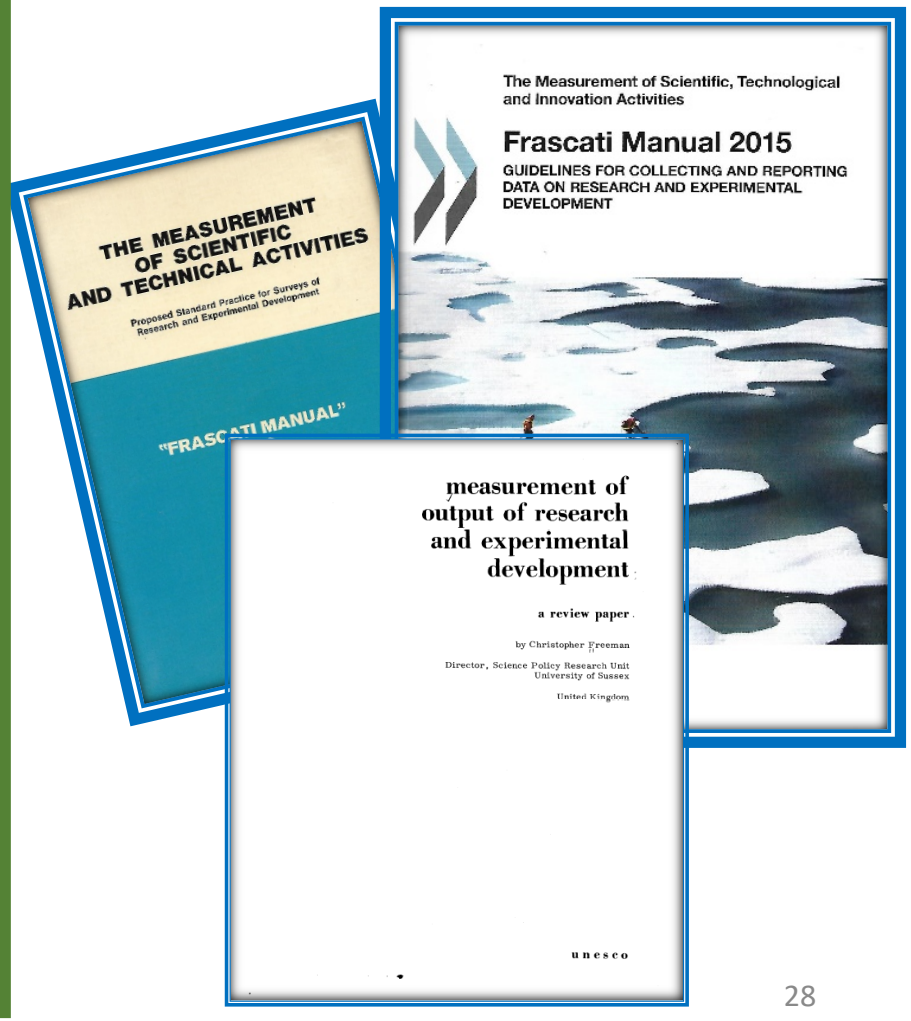
F. Machlup (1962) *The Production and Distribution of Knowledge in the US*, Princeton Univ. Press, pp. 180–181.

THE FLOW OF IDEAS THROUGH THE STAGES OF RESEARCH, INVENTION, AND DEVELOPMENT TO APPLICATION

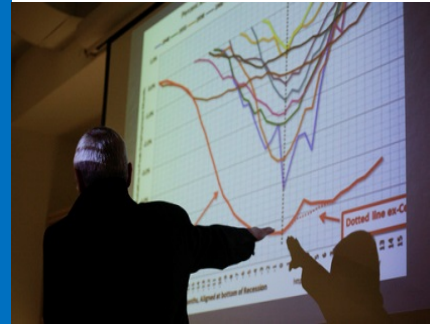
STAGE	INPUT: Intangible	INPUT: Tangible	INPUT: Measurable	OUTPUT: Intangible	OUTPUT: Measurable
I "Basic Research" [Intended output: "Formulas"]	1. Scientific knowledge (old stock and output from I-A) 2. Scientific problems and hunches (old stock and output from I-B, II-B, and III-B)	Scientists, Technical aides, Clerical aides Laboratories, Materials, fuel, power	Men, man-hours, Payrolls, current and deflated Outlays, current and deflated, Outlay per man	A. New scientific knowledge: hypotheses and theories B. New scientific problems and hunches C. New practical problems and ideas	Research papers and memoranda; formulas — —
II "Inventive Work" (Including minor improvements but excluding further development of inventions) [Intended output: "Sketches"]	1. Scientific knowledge (old stock and output from I-A) 2. Technology (old stock and output from II-A and III-A) 3. Practical problems and ideas (old stock and output from I-C, II-C, III-C, and IV-A)	Scientists, Non-scientist inventors, Engineers, Technical aides, Clerical aides Laboratories, Materials, fuel, power	Men, man-hours, Payrolls, current and deflated Outlays, current and deflated, Outlay per man	A. Raw inventions: technological recipes a. Patented inventions b. Patentable inventions, not patented but published c. Patentable inventions, neither patented nor published d. Non-patentable inventions, published e. Non-patentable inventions, not published f. Minor improvements B. New scientific problems and hunches C. New practical problems and ideas	a. Patent applications and patents b. Technological papers and memoranda c. — d. Papers and memoranda e. — f. — — —
III "Development Work" [Intended output: "Blueprints and Specifications"]	1. Scientific knowledge (old stock and output from I-A) 2. Technology (old stock and output from III-A) 3. Practical problems and ideas (old stock and output from I-C, II-C, III-C, and IV-A) 4. Raw inventions and improvements (old stock and output from II-A)	Scientists, Engineers, Technical aides, Clerical aides Laboratories, Materials, fuel, power Pilot plants	Men, man-hours, Payrolls, current and deflated Outlays, current and deflated, Outlay per man Investment	A. Developed inventions: blueprints, specifications, samples B. New scientific problems and hunches C. New practical problems and ideas	Blueprints and specifications — —
IV "New-type Plant Construction" [Intended output: "New-type plant"]	1. Developed inventions (output from III-A) 2. Business acumen and market forecasts 3. Financial resources 4. Enterprise (venturing)	Entrepreneurs, Managers, Financiers and bankers, Builders and contractors, Engineers Building materials, Machines and tools	$ investment in new-type plant	A. New practical problems and ideas	New-type plant producing a. novel products b. better products c. cheaper products

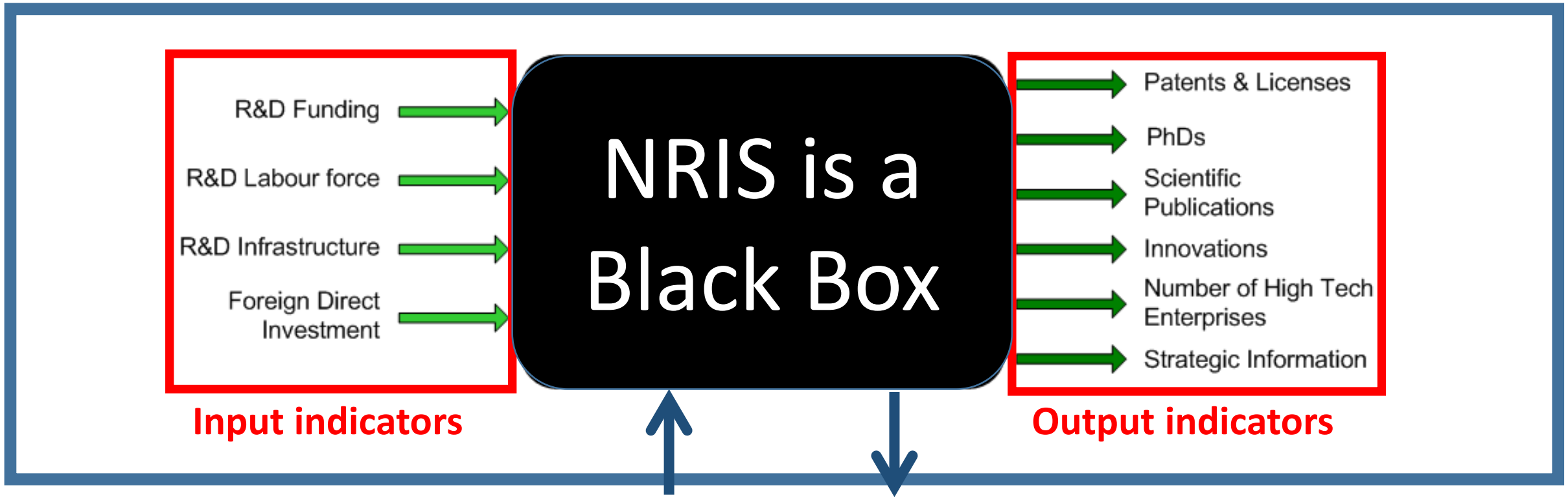


Christopher Freeman (1921 – 2010)



How suitable are the indicators of the Frascati–Manual family to generate "evidence-based policies"?

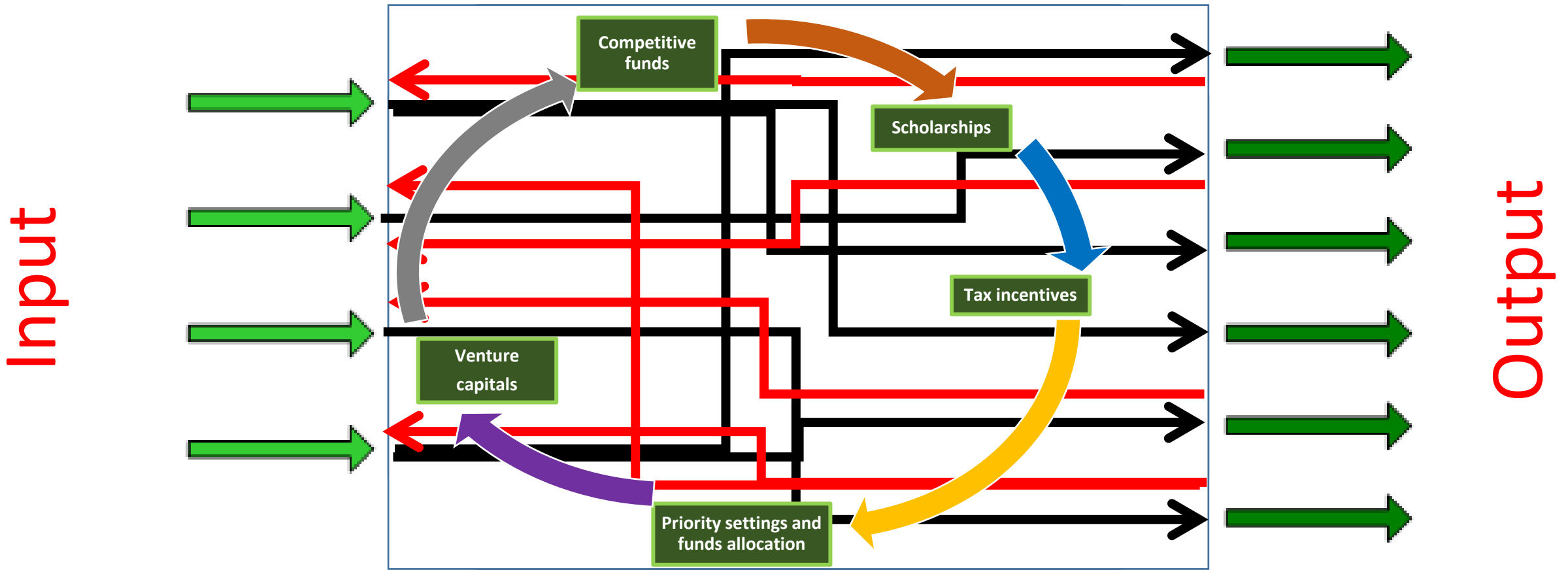




National and international contextual factors, geopolitics, fluxes of goods, human and financial resources, information, etc.

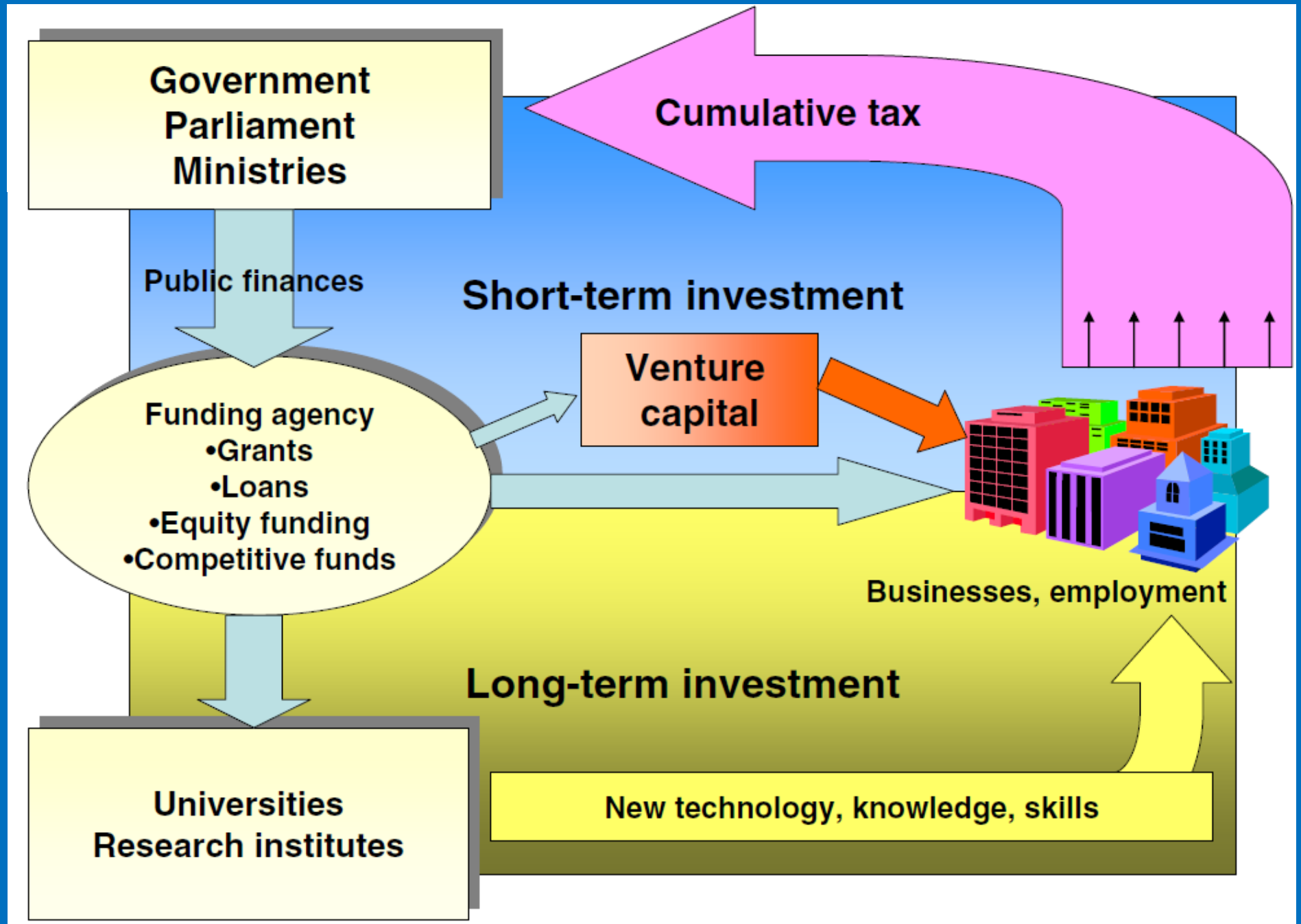
Opening the “Black Box”

by measuring the implementation and impact of SETI policy instruments



- Policy instruments are the means employed by those who exercise power and authority to influence the decisions made by other agents.
- They induce and motivate individuals, groups, firms, organizations and institutions to behave in accordance with the guidelines and criteria established by the policies.
- They are the connecting link between the purpose expressed in a policy statement and its implementation in practice.

Different stages of SETI policy instruments implementation



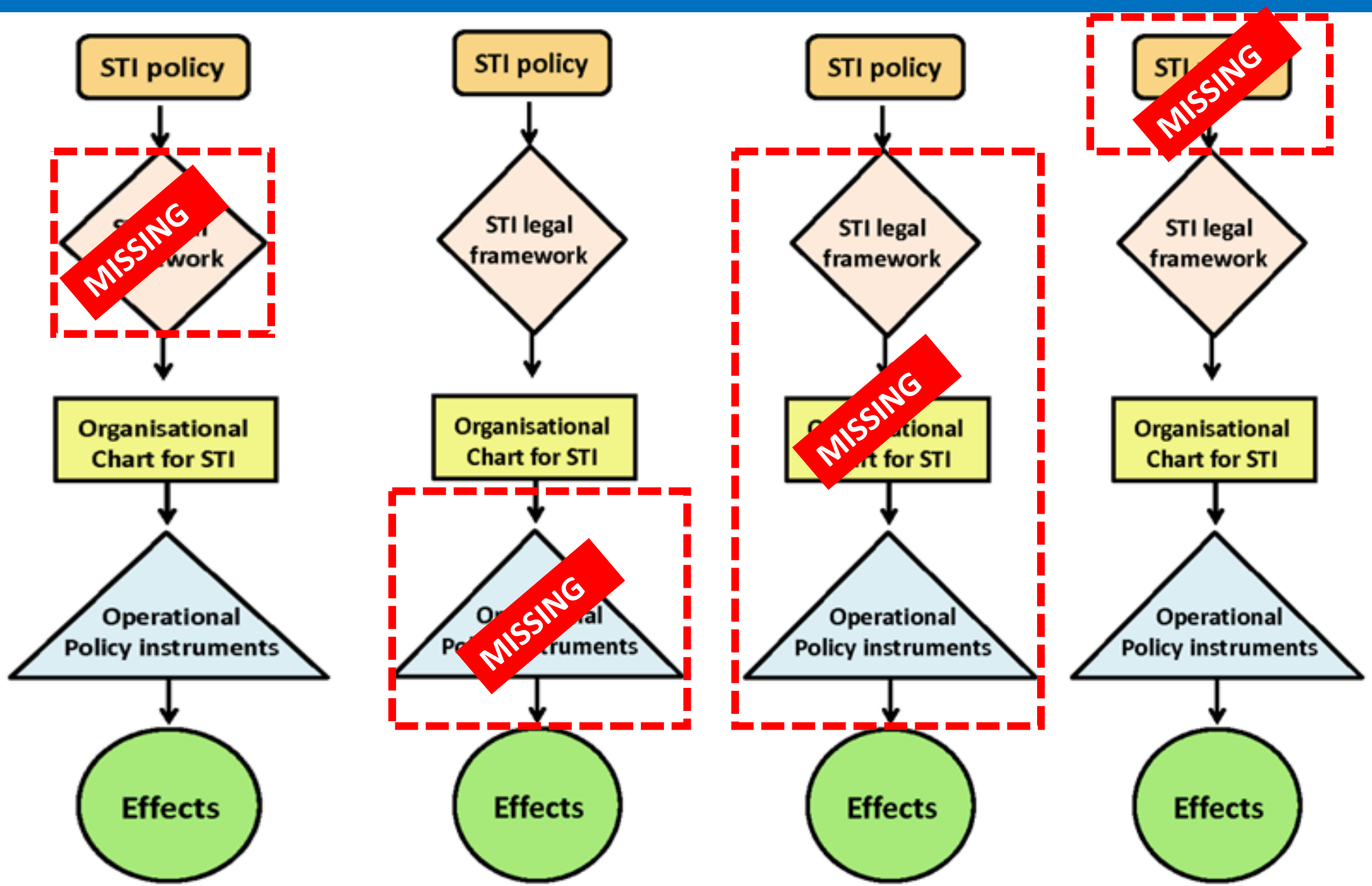
Explicit policies

GO→SPIN
FOR SCIENCE POLICY

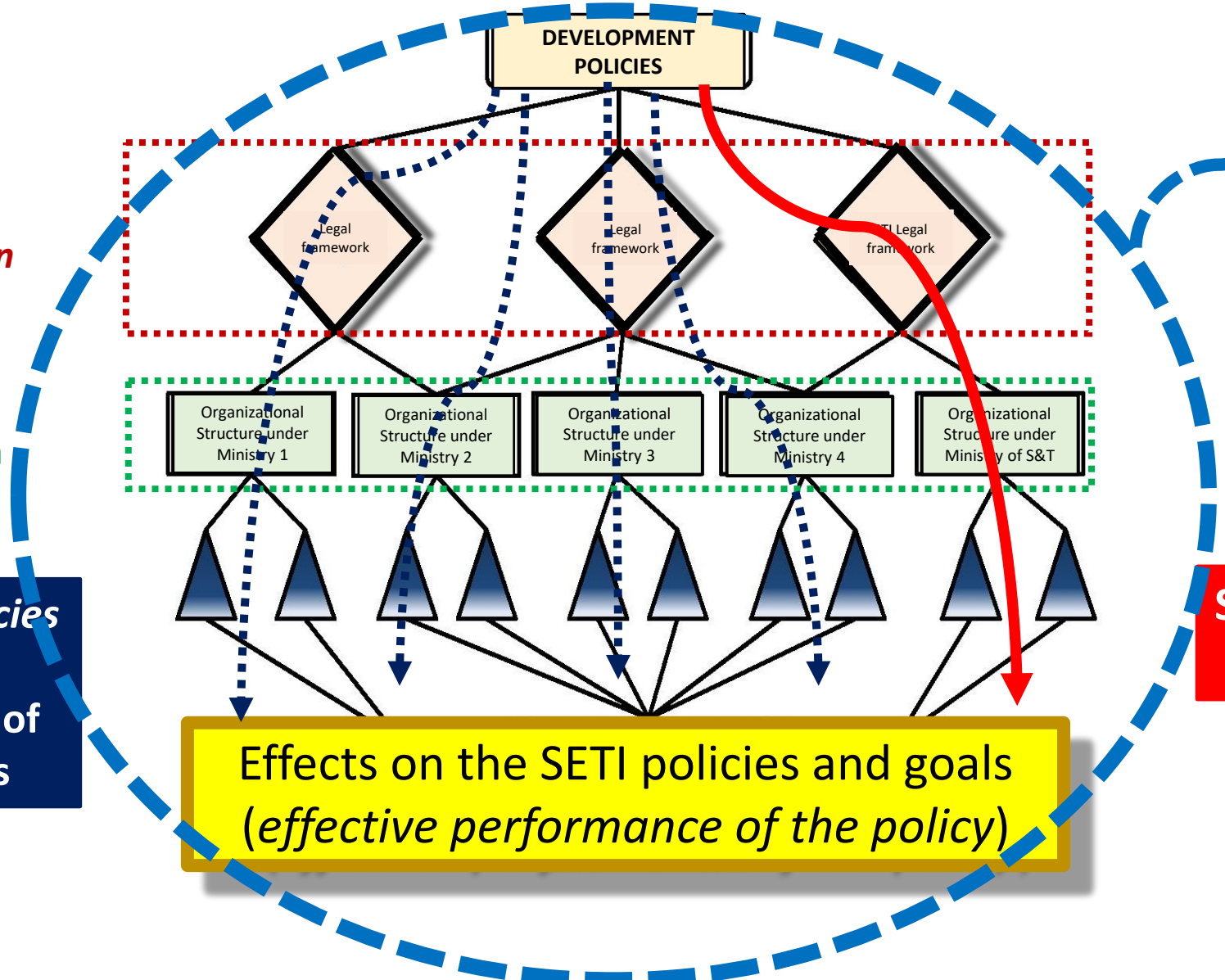
GLOBAL OBSERVATORY OF SCIENCE, TECHNOLOGY AND INNOVATION POLICY INSTRUMENTS

The structure of GO→SPIN analytic units

Pathologies of instruments: policy implementation failures



The GO→SPIN mapping represents the interaction between "explicit" policies, "implicit" policies and their contextual factors



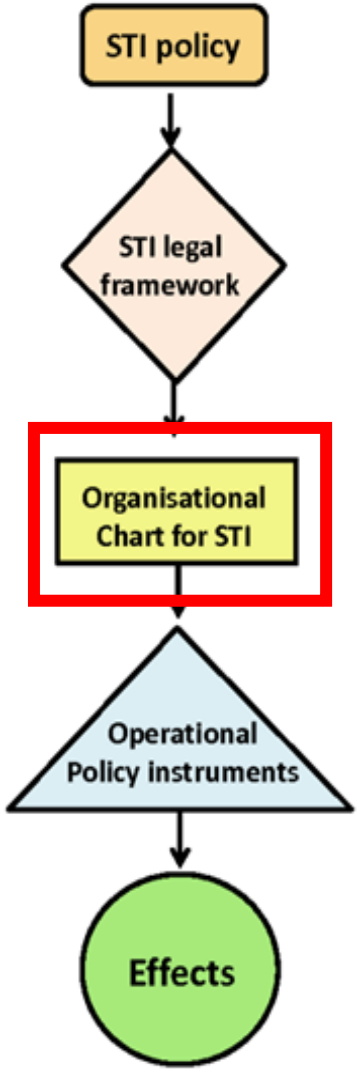
Lack of *co-ordination*

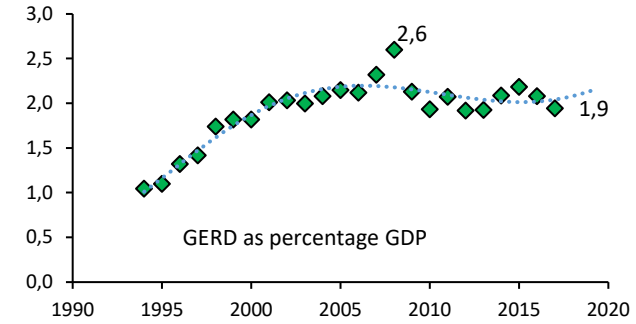
Lack of co-ordination

"Implicit" *policies* affect the performance of SETI policies

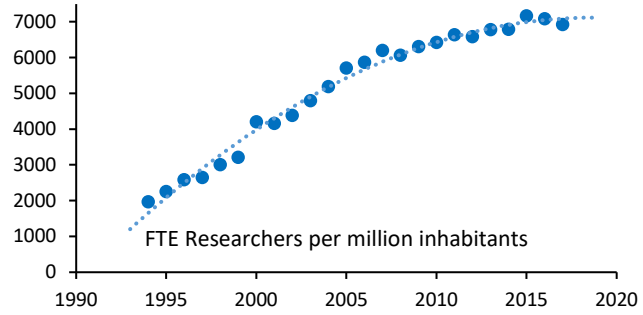
Contextual Factors

SETI "explicit" *policies*

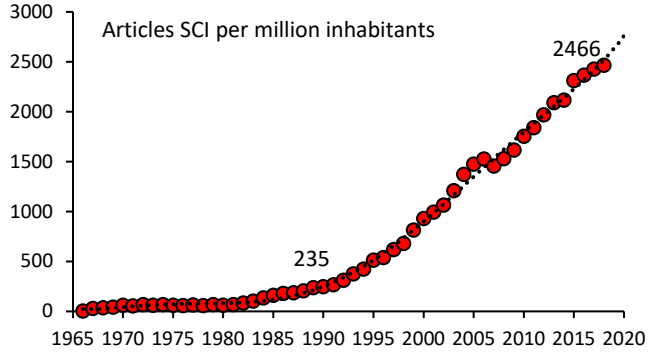




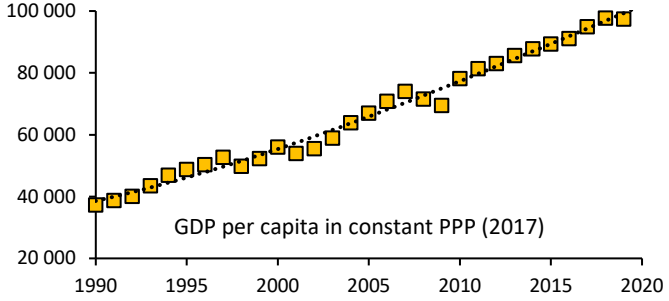
source: Lemarchand (2020)



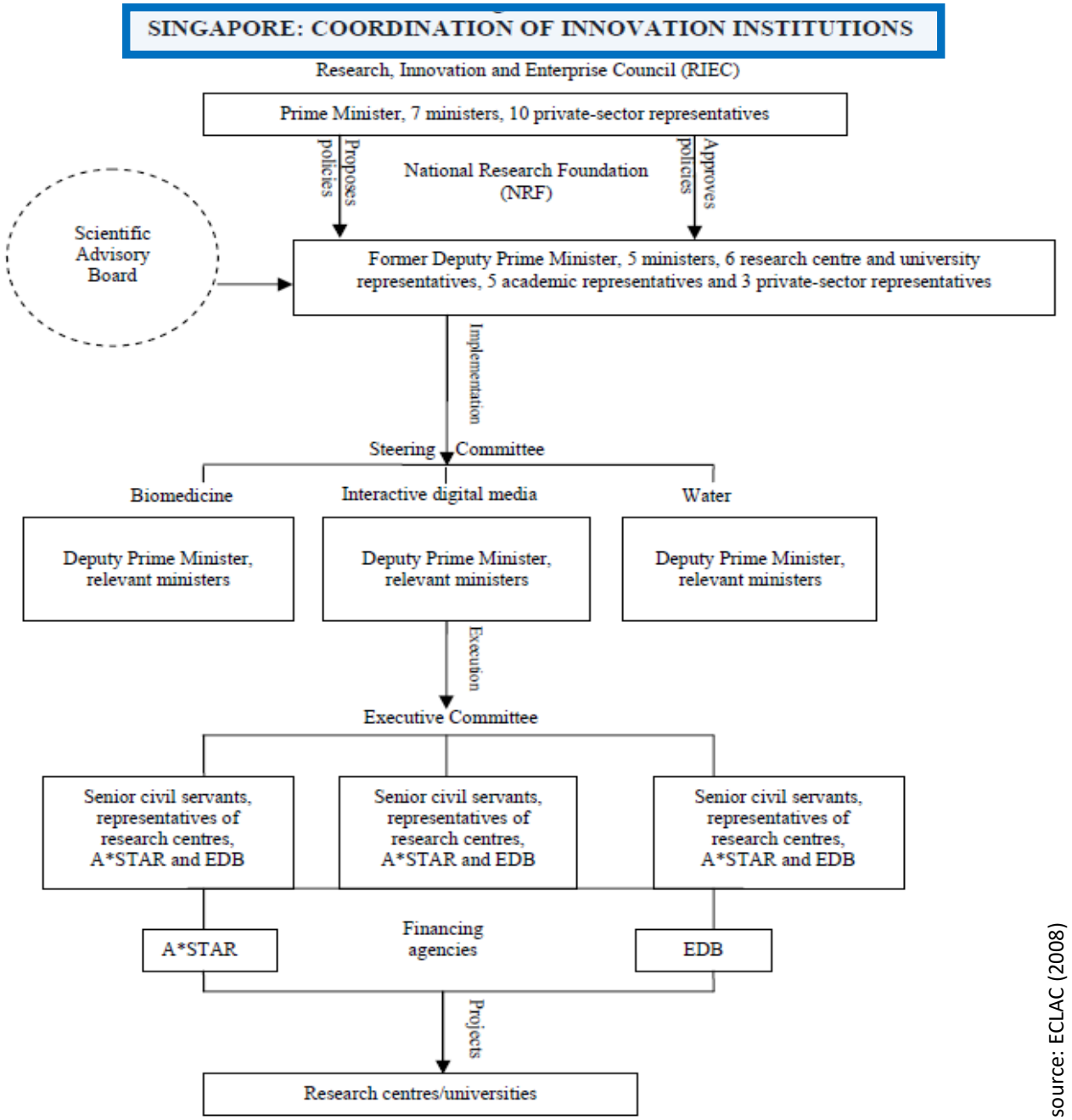
source: Lemarchand (2020)



source: Lemarchand (2020)



source: Lemarchand (2020)



source: ECLAC (2008)

Variable analysed

INDICATORS: R&D+i, governance, social, economic, industrial, educational, ICT, environmental, etc.

Political stability and National Contextual Factors

Implicit Policies

Explicit policies and policy instruments

* Texts of SETI policies
* SETI legal instruments
* SETI institutional ecosystems
* SETI operational policy instruments

Time

ASANTE SANA


Gracias
Merci
Hvala
Ngiyabonga
Thanks
Danke
Obrigado
Mahalo
Arigato

Time for questions