



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

September 28 – October 2, 2020



LECTURE 1: GO→SPIN Programme Overview

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Research on Knowledge,
Innovation, Technology and
Science Organization

www.researchkits.org



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ANALYTICAL PROGRAMME



Research on Knowledge,
Innovation, Technology and
Science Organization

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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/>

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UNESCO GO→SPIN

Methodological and Data Collection

Training Workshop

Republic of Kenya

September 28 – October 2, 2020

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Lecture 2

 Bibliography

 44 files 280M zip

click [here](#) to download



What is GO→SPIN?



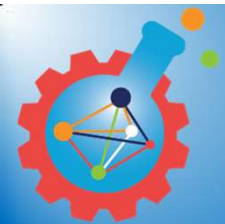
GO→SPIN is a Global Observatory of policies and policy instruments on science, engineering, technology, and innovation (SETI), legal instruments, institutional ecosystems, contextual factors and indicators on research and innovation

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



**Governance
and Analytic
Tools**

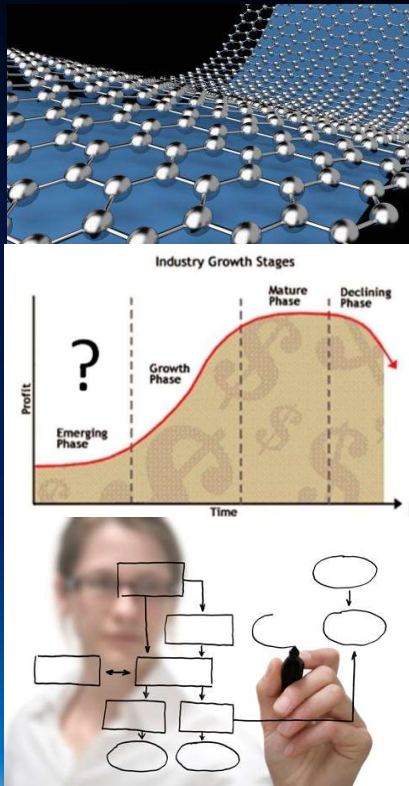


**Capacity
Building
Tools**

**The
programme
has six
different
components**



GO→SPIN
Methodological
approach:
Paris Manual



Since 2011, UNESCO has been working with a group of experts to set up new international standards for the collection of information on research & innovation policies and operational policy instruments. The results will be published within the *Paris Manual*.

GO→SPIN
Capacity
Building:
Training
Workshops



UNESCO is organizing capacity-building workshops to help Member States in the production 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...

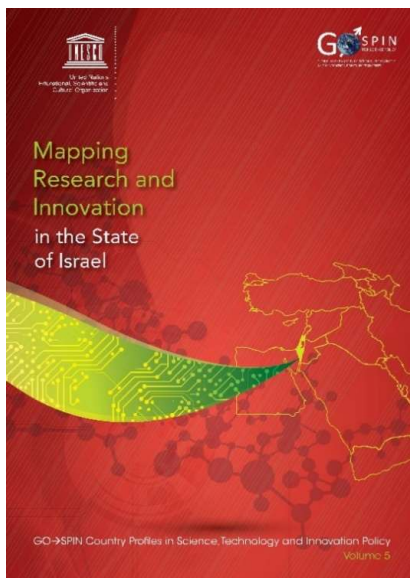
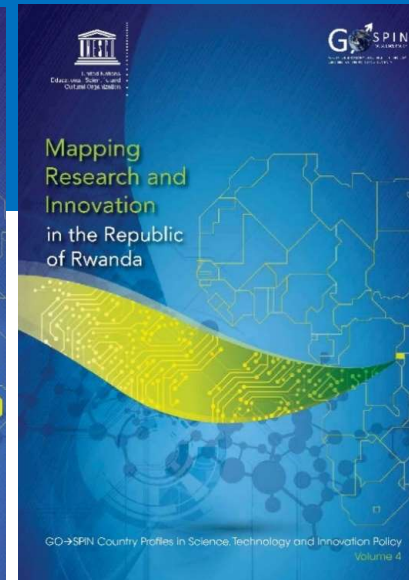
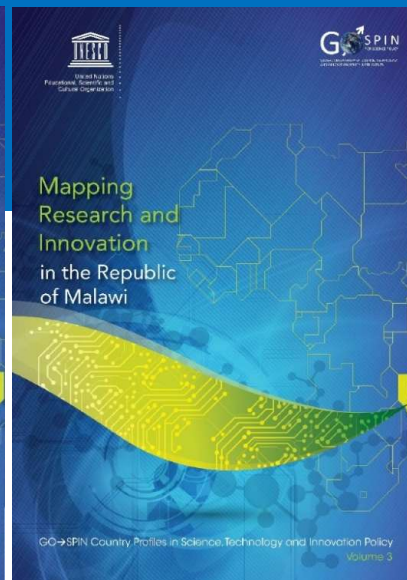
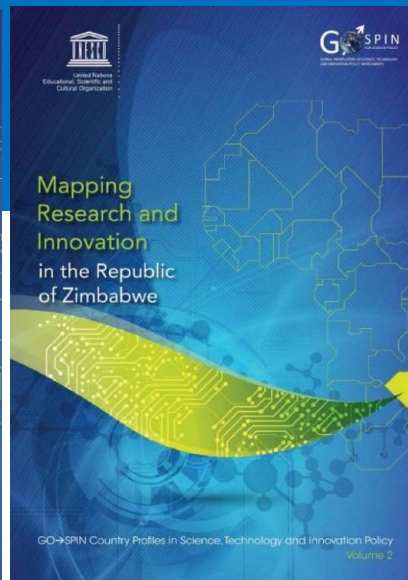
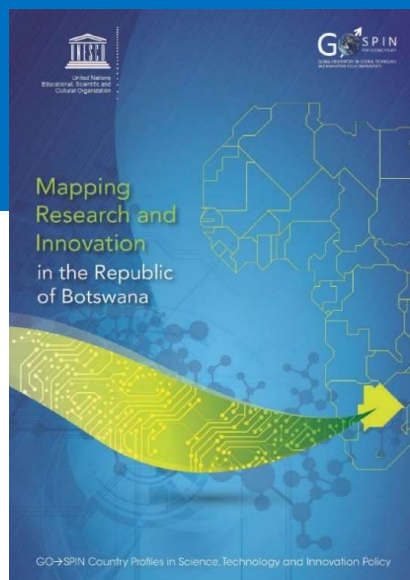




GO→SPIN
Country
Profiles Series



United Nations
Educational, Scientific and
Cultural Organization





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

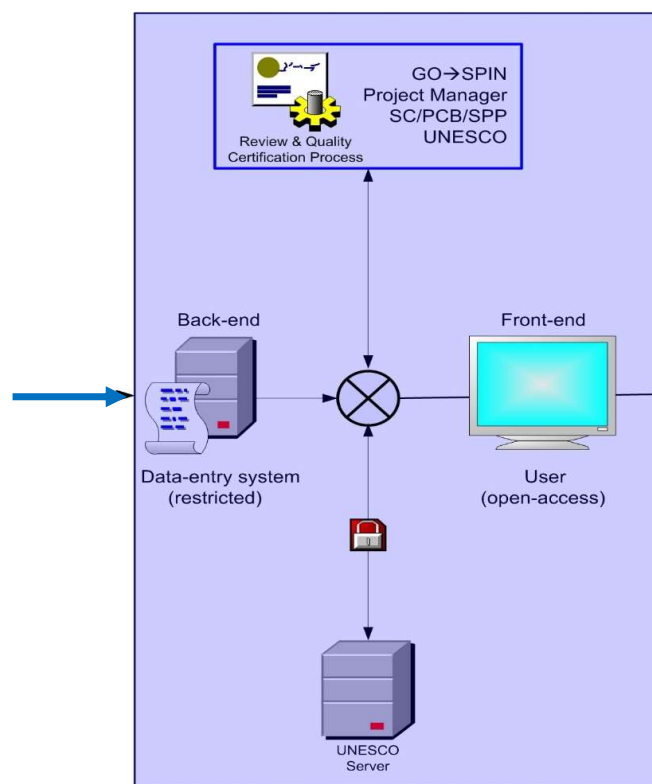
1. A long-term description of the political, economic, social, cultural and educational contextual factors;
2. Analysis of gender in science and engineering national behaviour
3. A study of R&D and innovation indicators;
4. A long-term scientometric analysis of scientific publications, patents, trademarks and utility models;
5. Historical analysis of STI policies and institutions;
6. A standard content analysis of the explicit STI 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 STI policy cycle;
8. A complete analysis of the STI 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 STI government bodies and organizations related both to research and innovation and to science and technology services;
10. An inventory of the STI legal framework, including acts, bills, regulations and international agreements on STI 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.



Who provides the information?

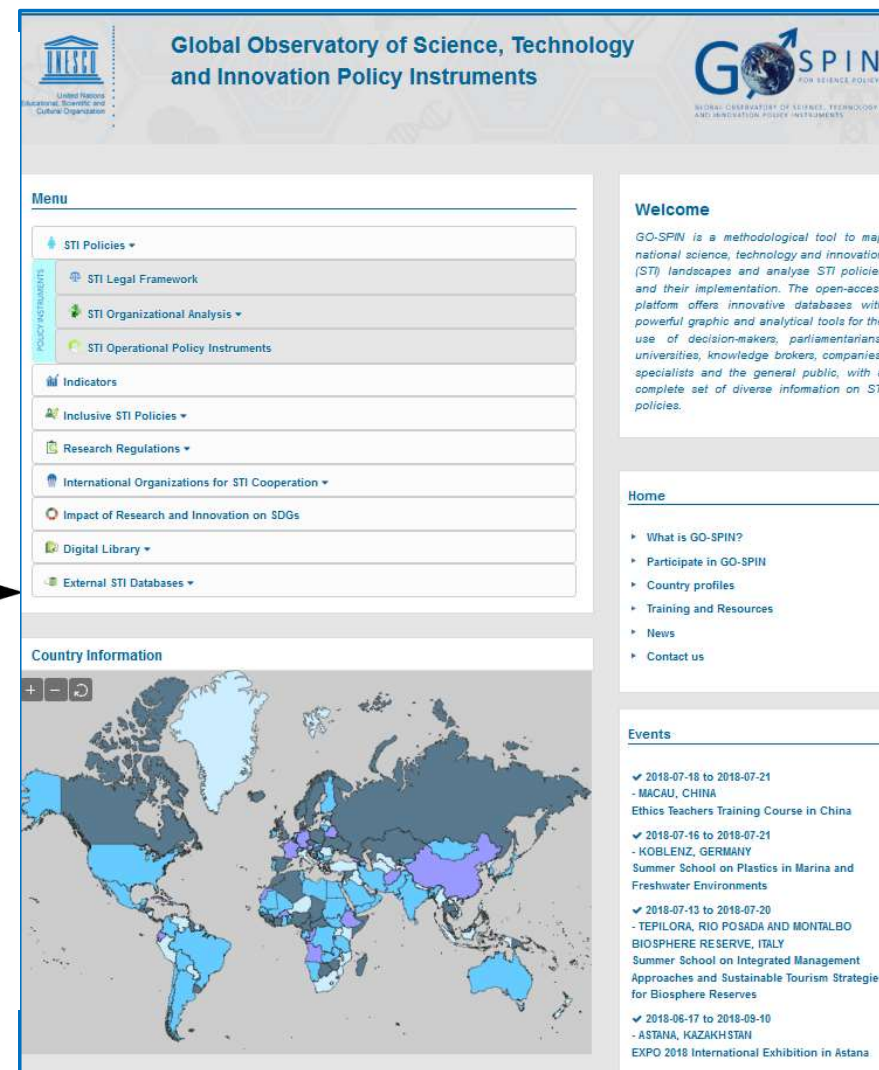


Focal points from Member States will feed the platform through periodical surveys



<https://gospin.unesco.org/>

What users can see..





GO→SPIN
Foresight and
Technical
Studies Series

IsDB
البنك الإسلامي للتنمية
Islamic Development Bank



In partnership with
UNESCO

United Nations
Educational, Scientific and
Cultural Organization

Science, Technology and Innovation Institutional Profile of the Islamic Development Bank Group

Global Observatory of Science, Technology and Innovation Policy Instruments (GO→SPIN)



Oficina de Montevideo

Oficina Regional de Ciencias
para América Latina y el Caribe

Organización
de las Naciones Unidas
para la Educación,
la Ciencia y la Cultura



Los ritmos de las políticas CTI y de sus paradigmas tecno-económicos/ organizacionales en ALC (1945–2030)

Guillermo A. Lemarchand

Apoya:





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.

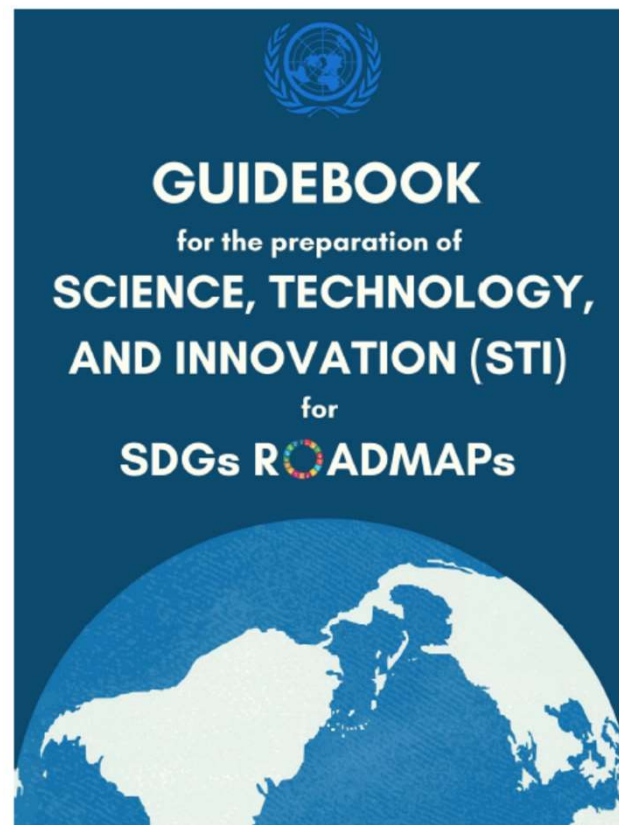
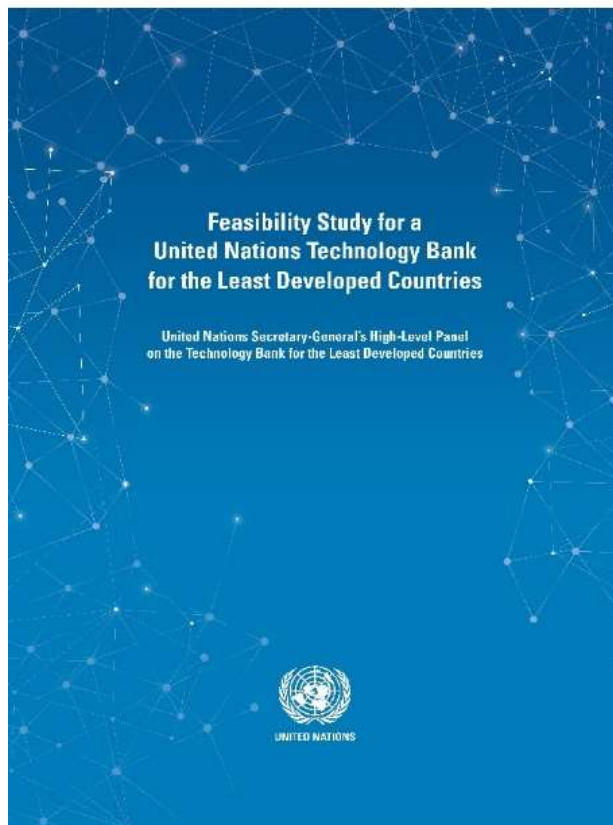
III. Assessing the national experience of implementation

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.



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





United Nations
Educational, Scientific and
Cultural Organization

GO→SPIN milestones

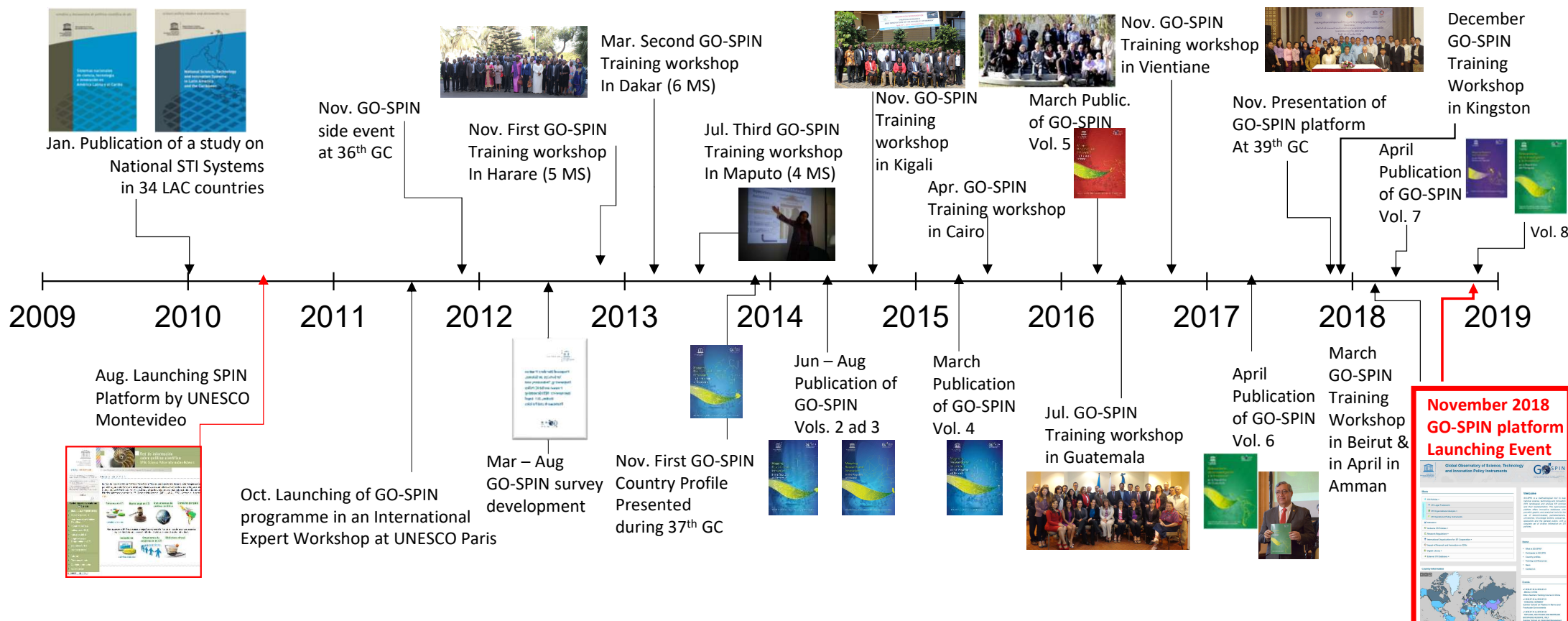


UNESCO MANAGEMENT:

+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)-----]

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

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





Prehistoric age of science policy at UNESCO (1945 – 1960)

DIRECTORY OF INTERNATIONAL SCIENTIFIC ORGANIZATIONS

1950

UNESCO

Distribution: general

UNESCO/NS/107
PARIS, 19 June 1953
Original: English

INDEXÉ

UNITED NATIONS EDUCATIONAL,
SCIENTIFIC AND CULTURAL ORGANIZATION

SURVEY OF NATIONAL RESEARCH COUNCILS FOR PURE AND APPLIED SCIENCE IN THE MEMBER STATES OF UNESCO

PREFACE

1. The Natural Sciences Department of Unesco has frequently been asked, either directly or through its Field Science Co-operation officers, to advise the Governments of certain Member States on the setting up of a national council for the promotion of scientific research. In the course of complying with these requests, it became evident that information concerning the administrative structure of many of the existing national research councils was not easily available except upon direct application to the research council in question.

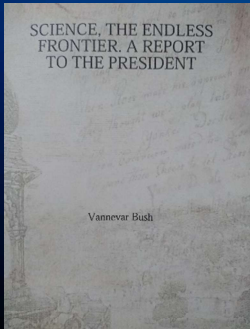
At the Seventh Session of the Unesco General Conference, held in Paris in 1952, the Director-General was authorized "to establish an International Advisory Committee on Scientific Research with a view to promoting international co-operation between the national councils and centres of scientific and technical research in fields of common interest" (resolution 2.214), and it became necessary for the Secretariat to make contact with existing national research councils. Steps were therefore taken at the same time to collect, through the National Commissions, as much information as possible (in the form of Statutes and annual reports) concerning these national councils for scientific and industrial research. On the basis of the material received, a questionnaire (see Appendix) was subsequently drawn up and sent direct or through the Unesco Field Science Co-operation officers, to National Research Councils in the Member States.

2. The present survey, which is based on the replies received to the questionnaire, was thus undertaken to serve two main purposes: (a) to provide background information in connexion with the project of establishing an International Advisory Committee on Scientific Research, and (b) to collect reference material for the possible use of persons asked to advise on the setting up of a new research council.

3. The survey covers national research councils for pure and applied science only. While in many countries research in medicine and agriculture is included under these headings, in others separate councils have been established to cover these fields. These special agencies for medicine and agriculture are not included.



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 outputs 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



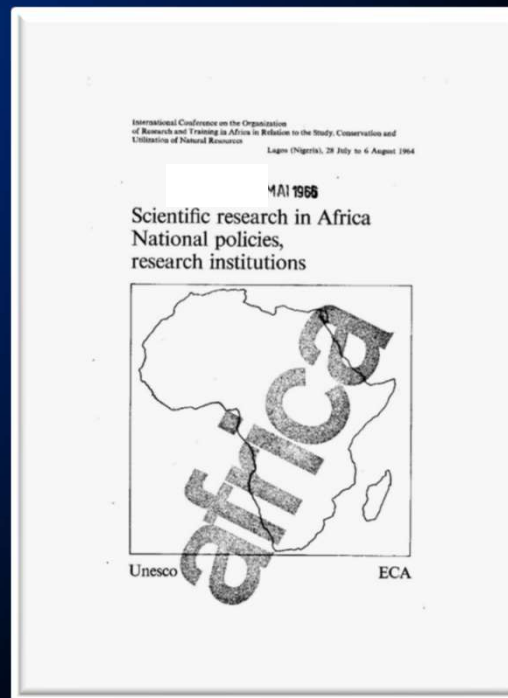


UN & UNESCO:

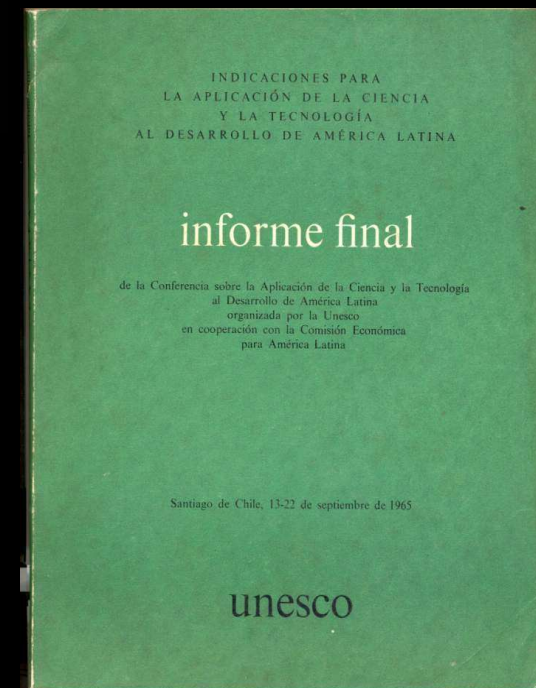
More than 60 years working with S&T policies for development



Geneva, 1963



Lagos, 1964



Santiago, 1965



Final Report

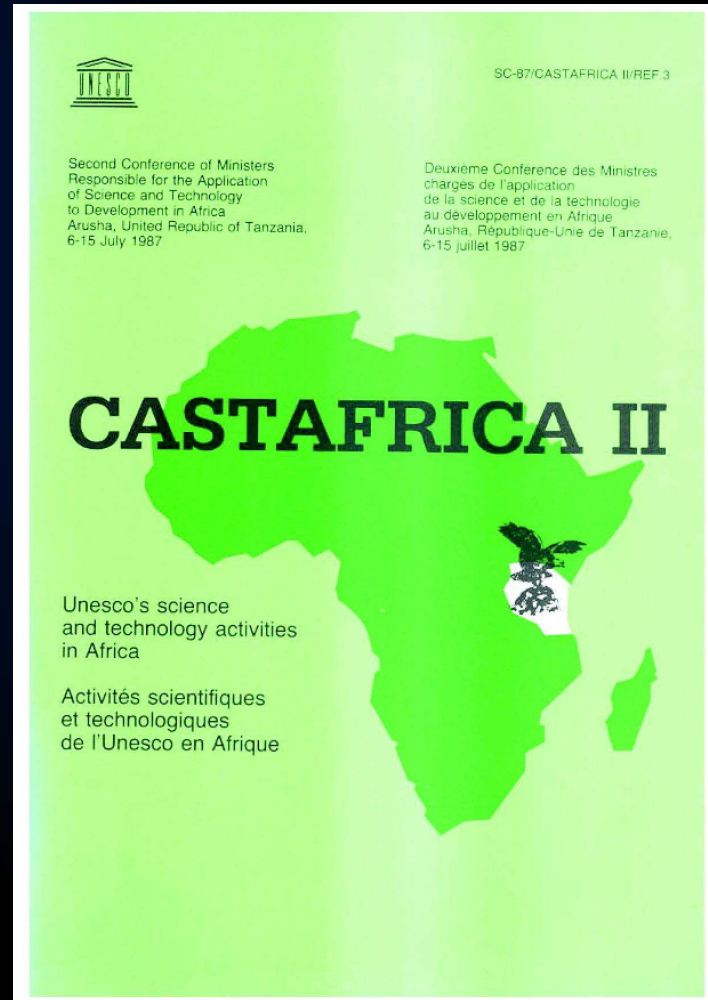
Conference of Ministers of African Member States Responsible for the Application of Science and Technology to Development

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

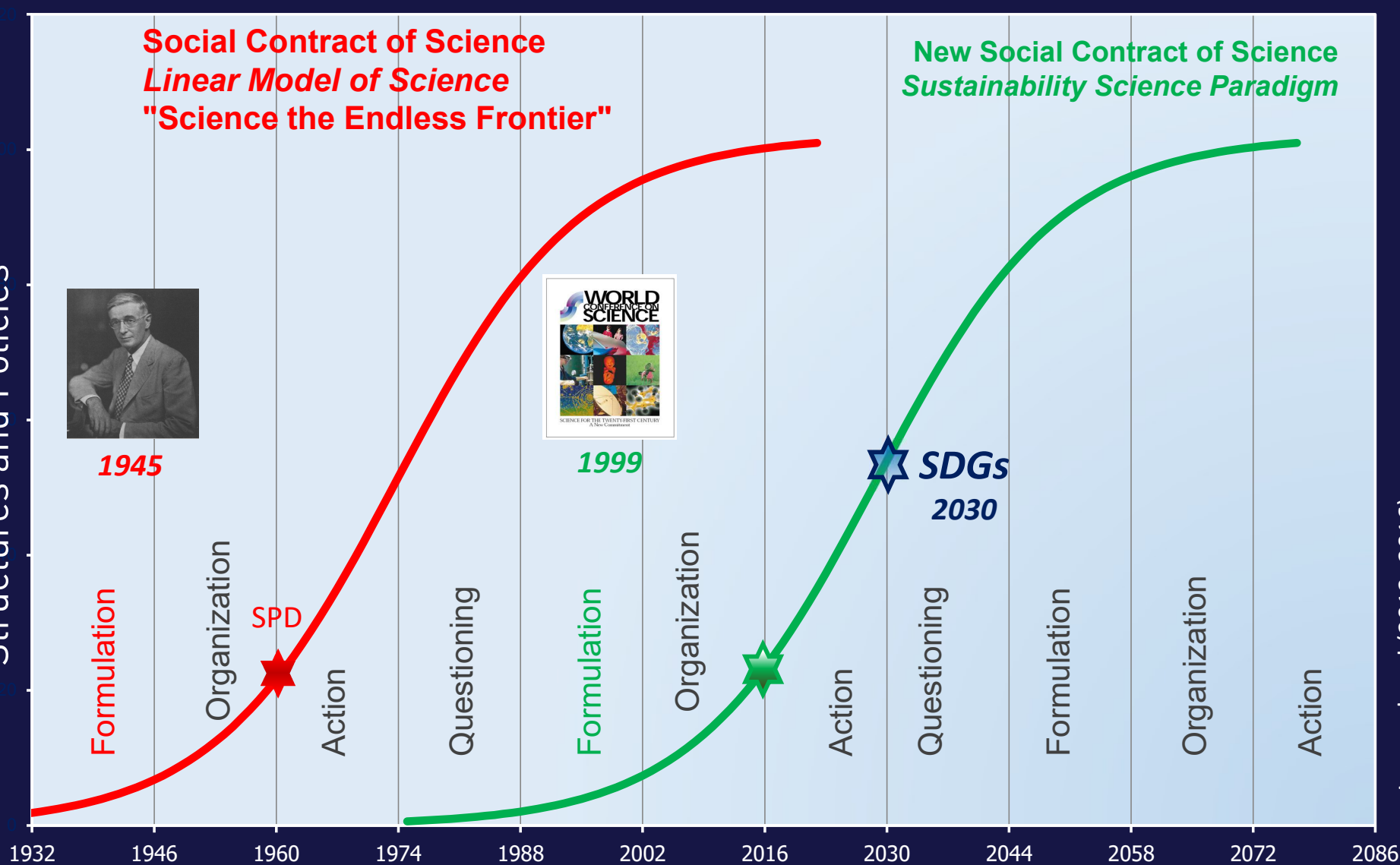
CASTAFRICA I, Dakar 1974



CASTAFRICA II, Arusha 1987



Diffusion of Techno-Economic Paradigms for the Organization of STI Structures and Policies





CASTAFRICA I (Dakar, 1974) excerpts from the Recommendations

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.

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

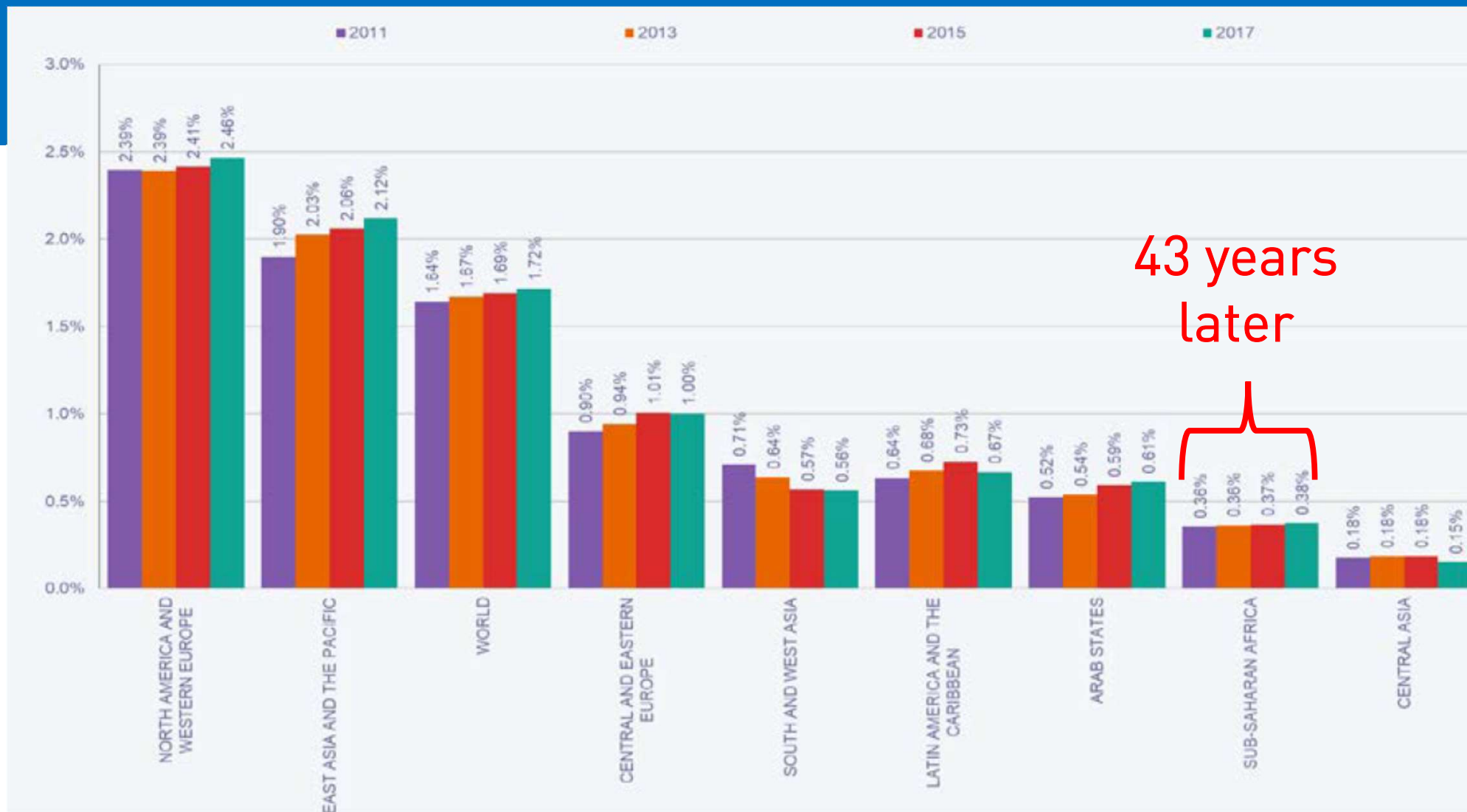
Dakar
21-30 January 1974

Unesco



Source: UNESCO Institute for Statistics, July 2020

Gross domestic expenditure on R&D as percentage of GDP by region, 2011, 2013, 2015 and 2017





CASTAFRICA I (Dakar, 1974) excerpts from the Recommendations

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)
\$

(1)

200 or over
100 to 200
Under 100

Number of scientists
and engineers per
million inhabitants

(2)

2,000
1,400
1,000

Number of scientists
and engineers engaged
in R&D per million
inhabitants (10% of
the figure in column (2))

(3)

200
140
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.

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
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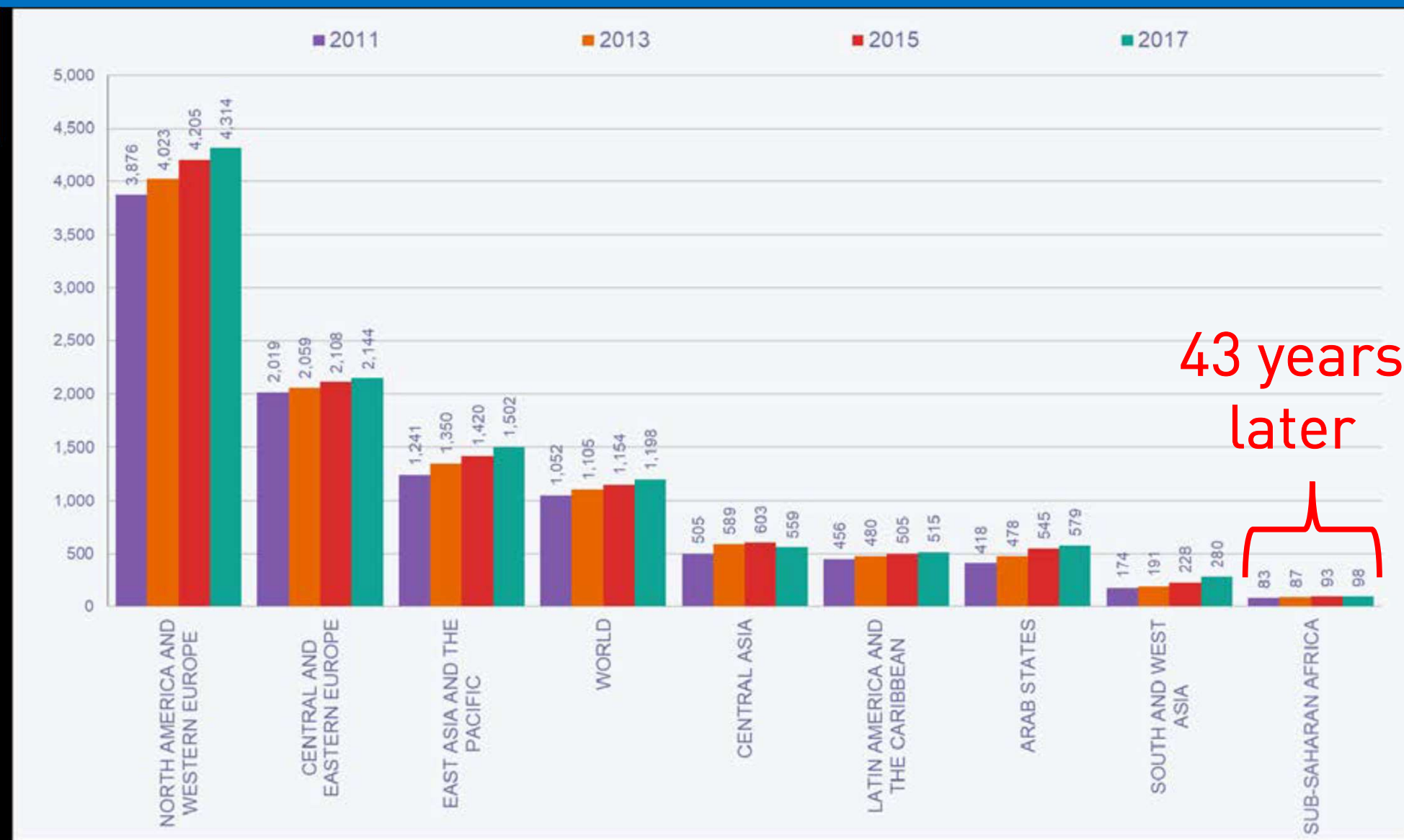
Dakar
21-30 January 1974

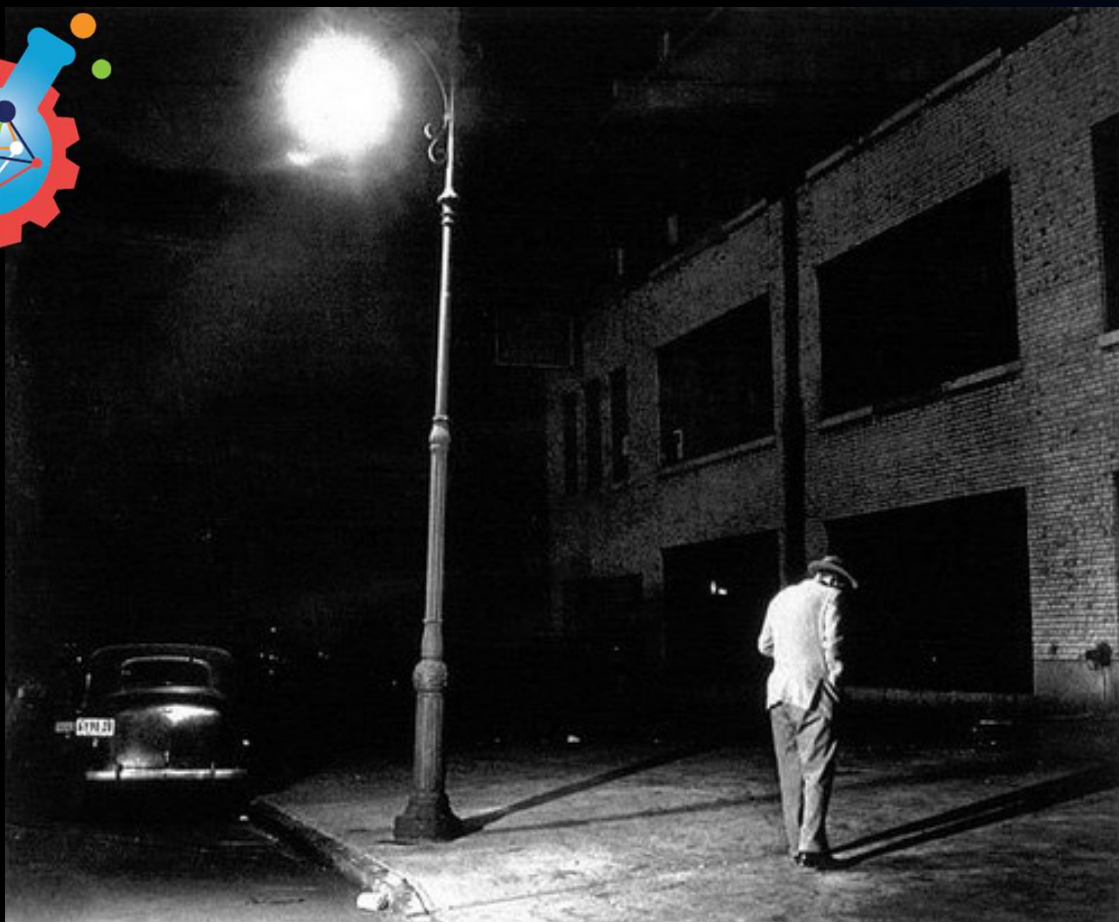
Unesco



Source: UNESCO Institute for Statistics, July 2020

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





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)

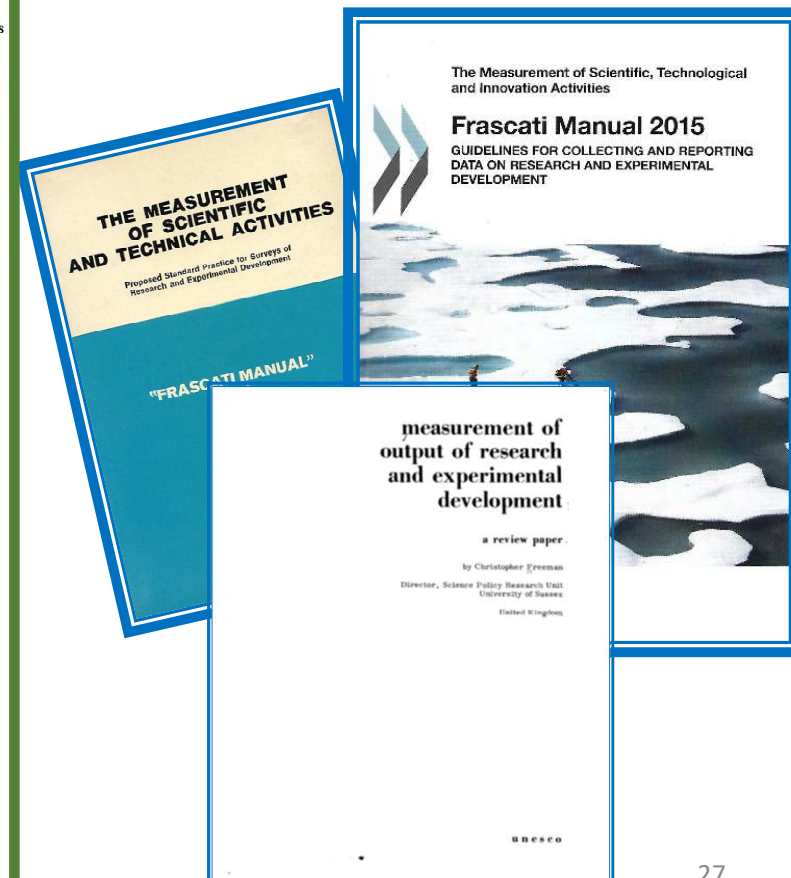
F. Machlup (1962) *The Production and Distribution of Knowledge in the US*, Princeton Univ. Press, pp. 180–181.



THE FLOW OF IDEAS THROUGH THE STAGES OF RESEARCH, INVENTION, AND DEVELOPMENT TO APPLICATION					
STAGE	INPUT			OUTPUT	
	Intangible	Tangible	Measurable	Intangible	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

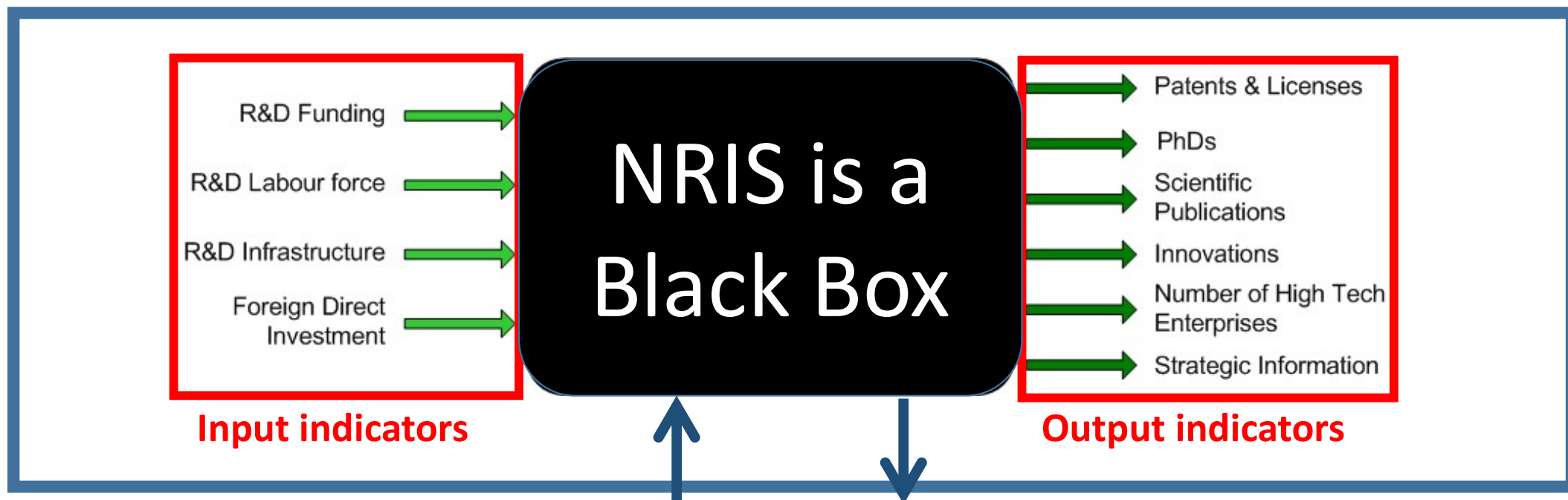
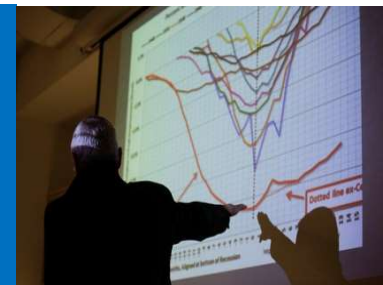


Christopher Freeman
(1921 – 2010)





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

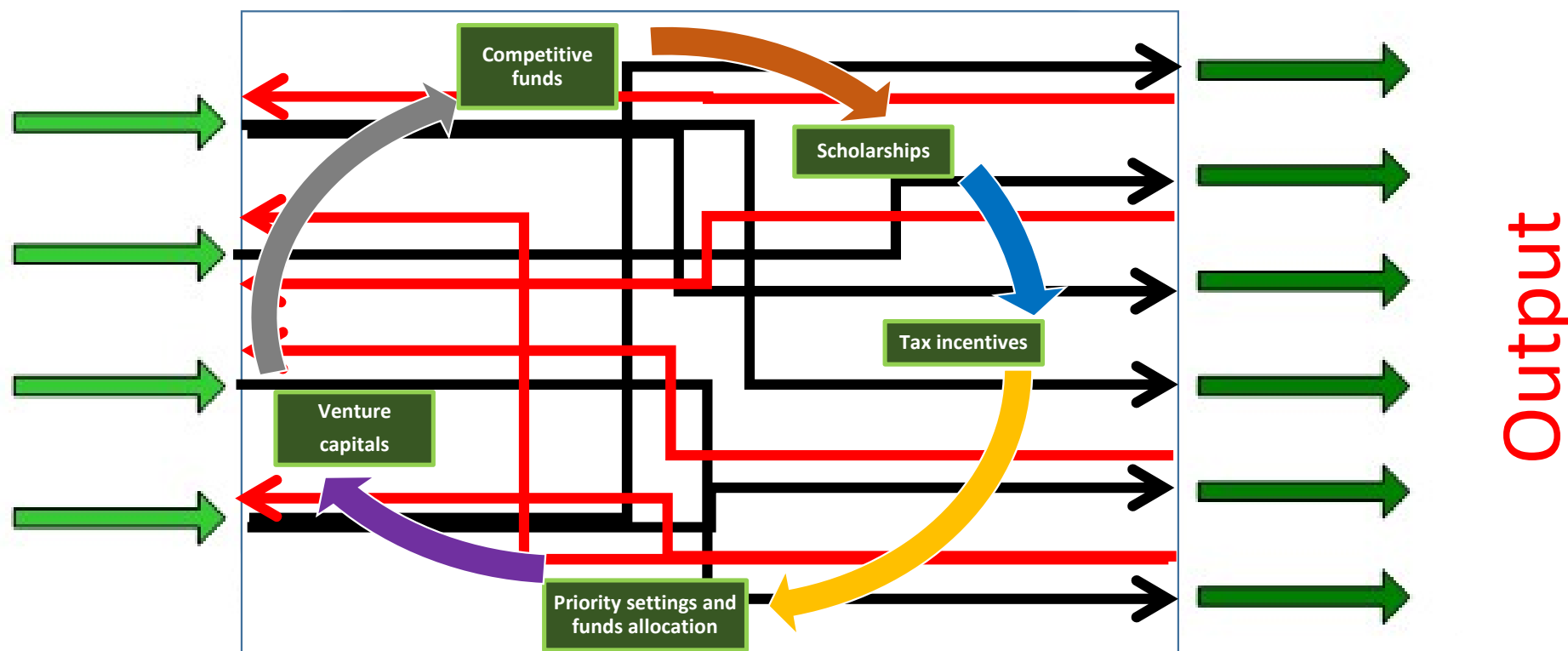


National and international contextual factors, geopolitics, fluxes of goods, human and financial resources, information, etc.



Opening the “Black Box”

by measuring the implementation and impact
of STI policy instruments

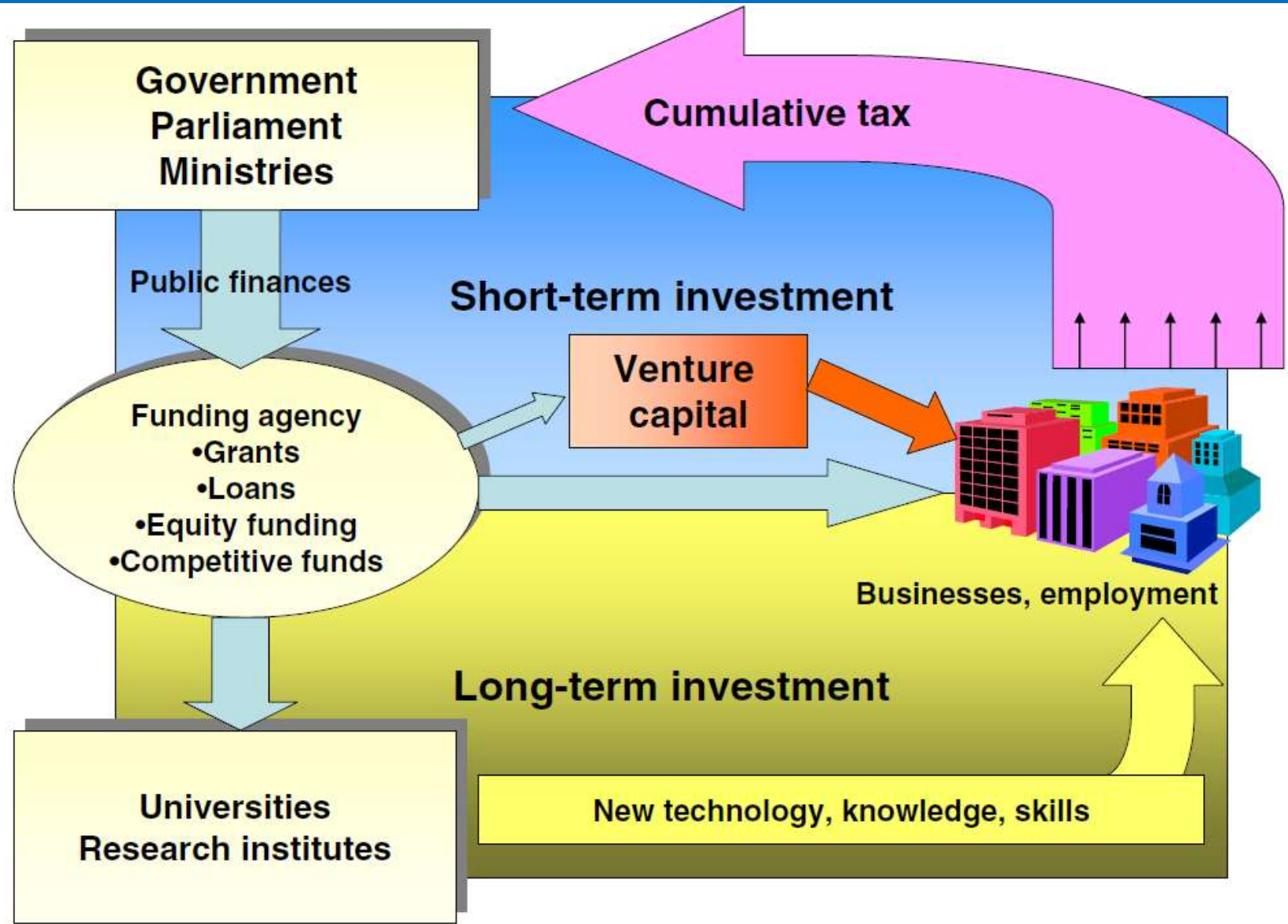




- Policy instruments are the means employed by those who exercise power and authority to influence the decisions made by other agents.
- They induce and motivate individuals, groups, firms, organizations and institutions to behave in accordance with the guidelines and criteria established by the policies.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



Different stages of STI policy instruments implementation





**Explicit
policies**

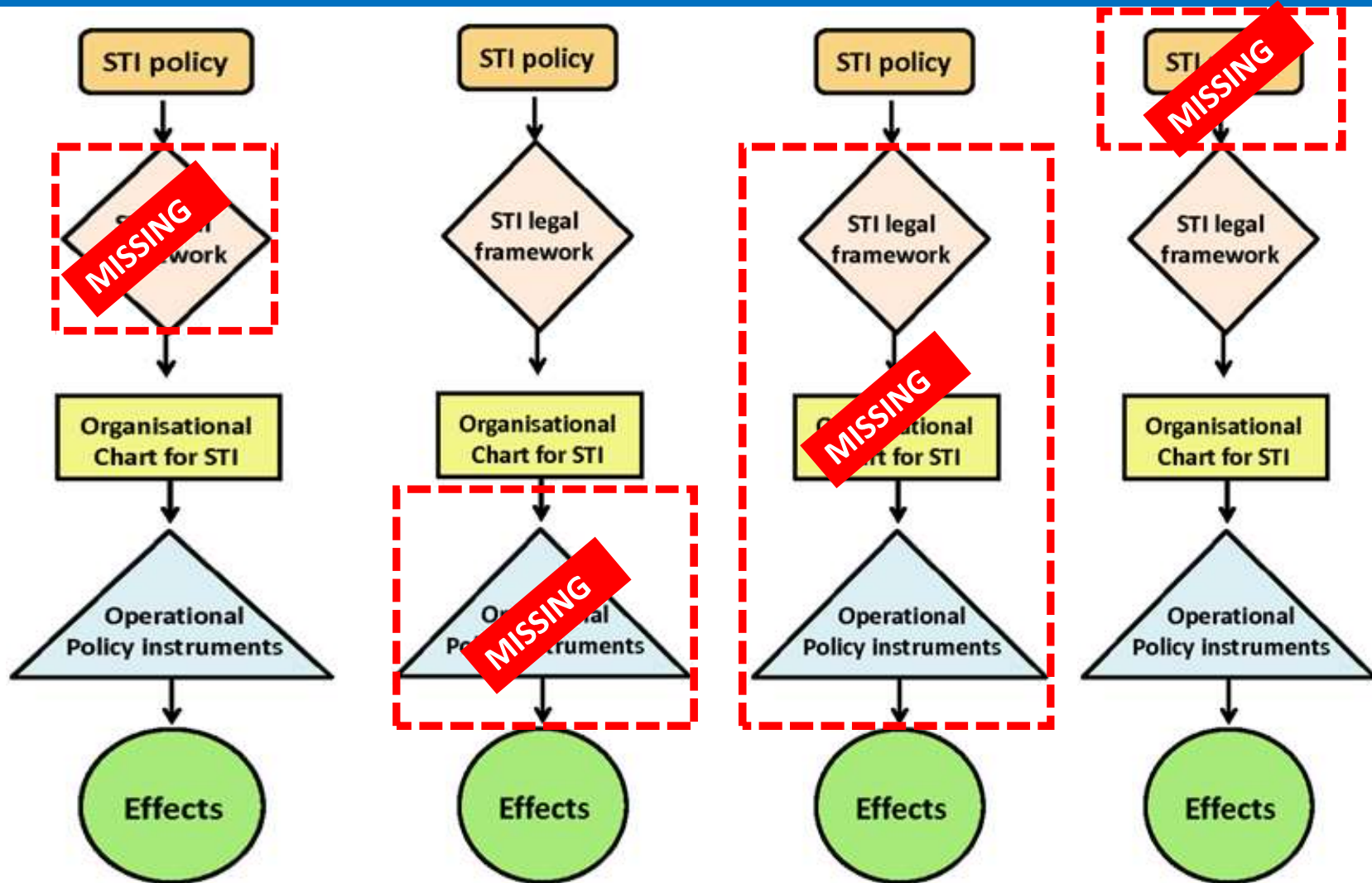


GLOBAL OBSERVATORY OF SCIENCE, TECHNOLOGY
AND INNOVATION POLICY INSTRUMENTS

**The structure of
GO→SPIN analytic
units**

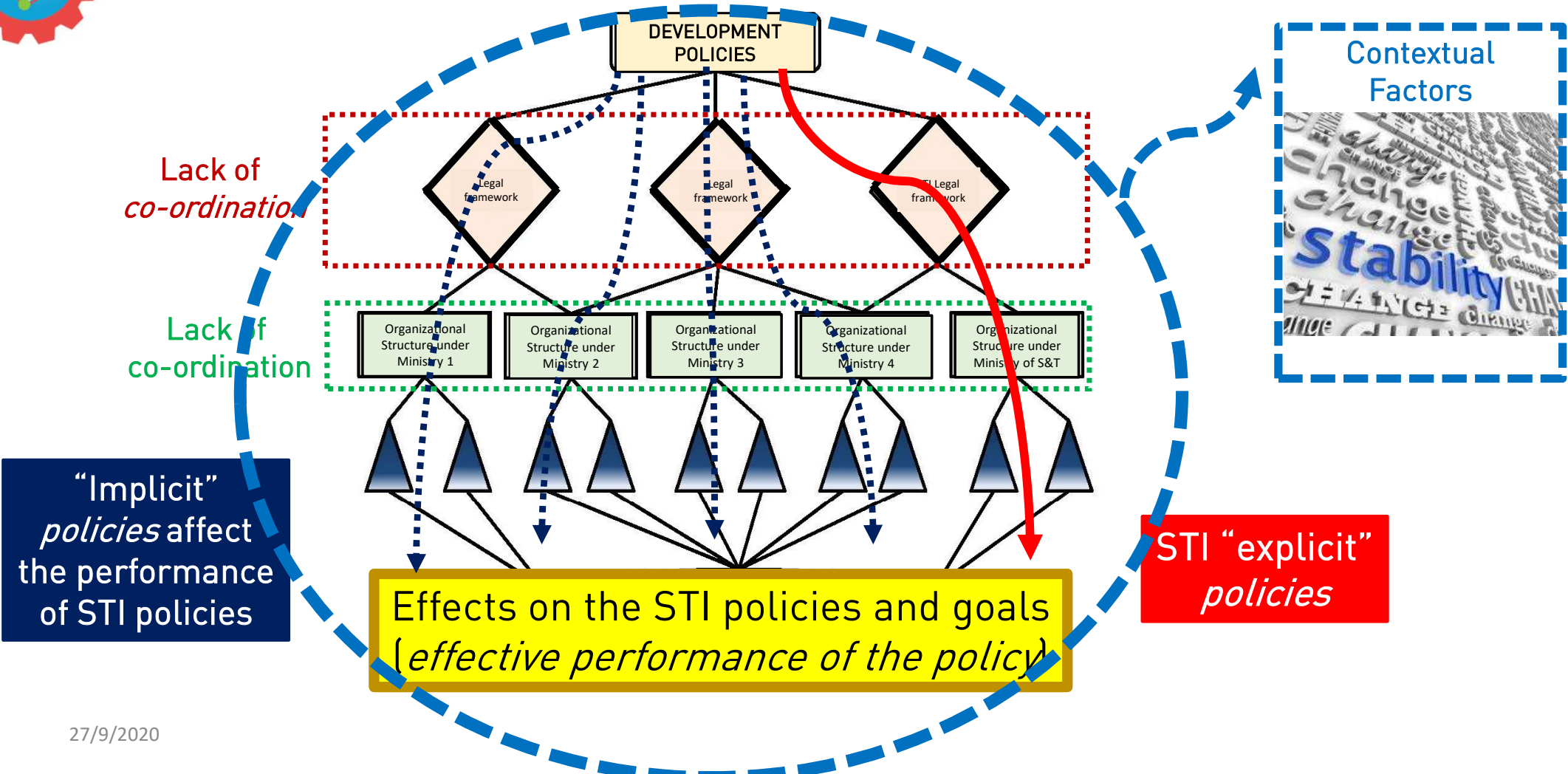


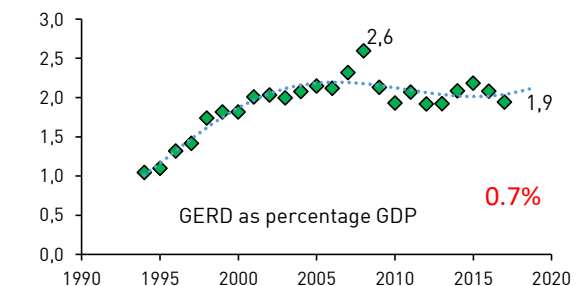
Pathologies of instruments: policy implementation failures



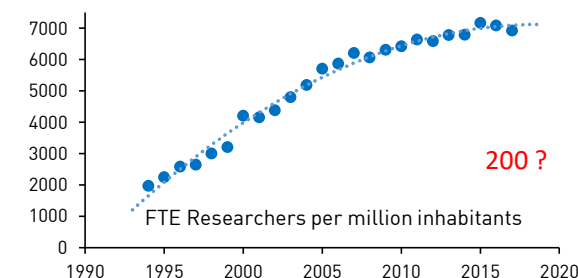


The GO→SPIN mapping represents the interaction between "explicit" policies, "implicit" policies and their contextual factors

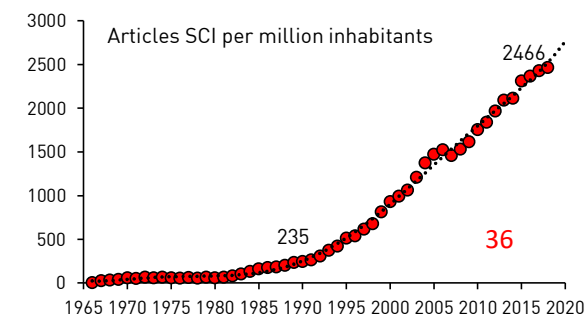




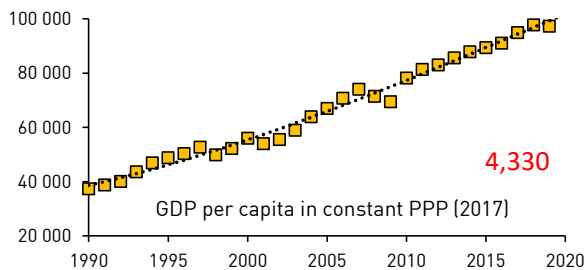
source: Lemarchand (2020)



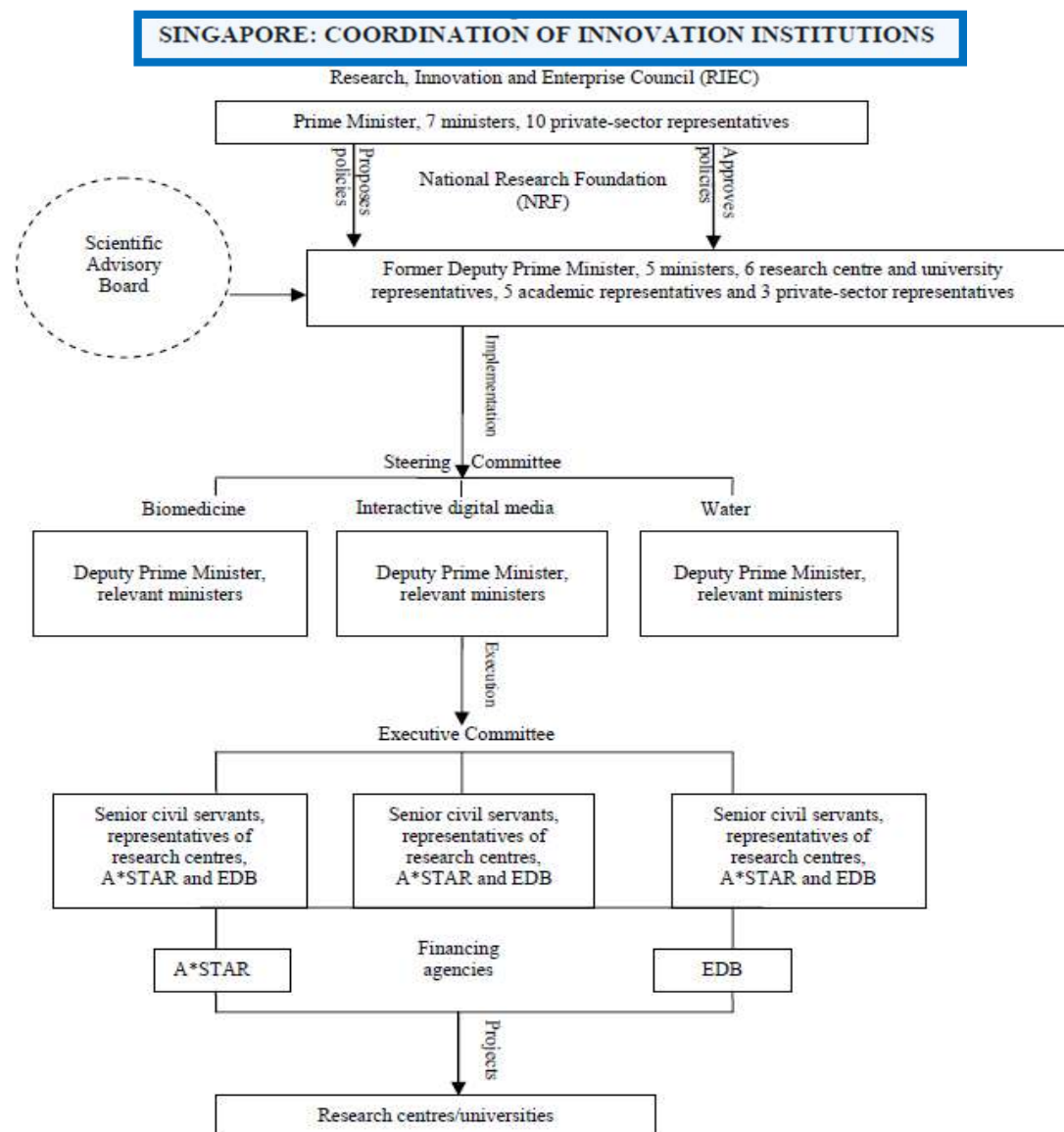
source: Lemarchand (2020)



source: Lemarchand (2020)

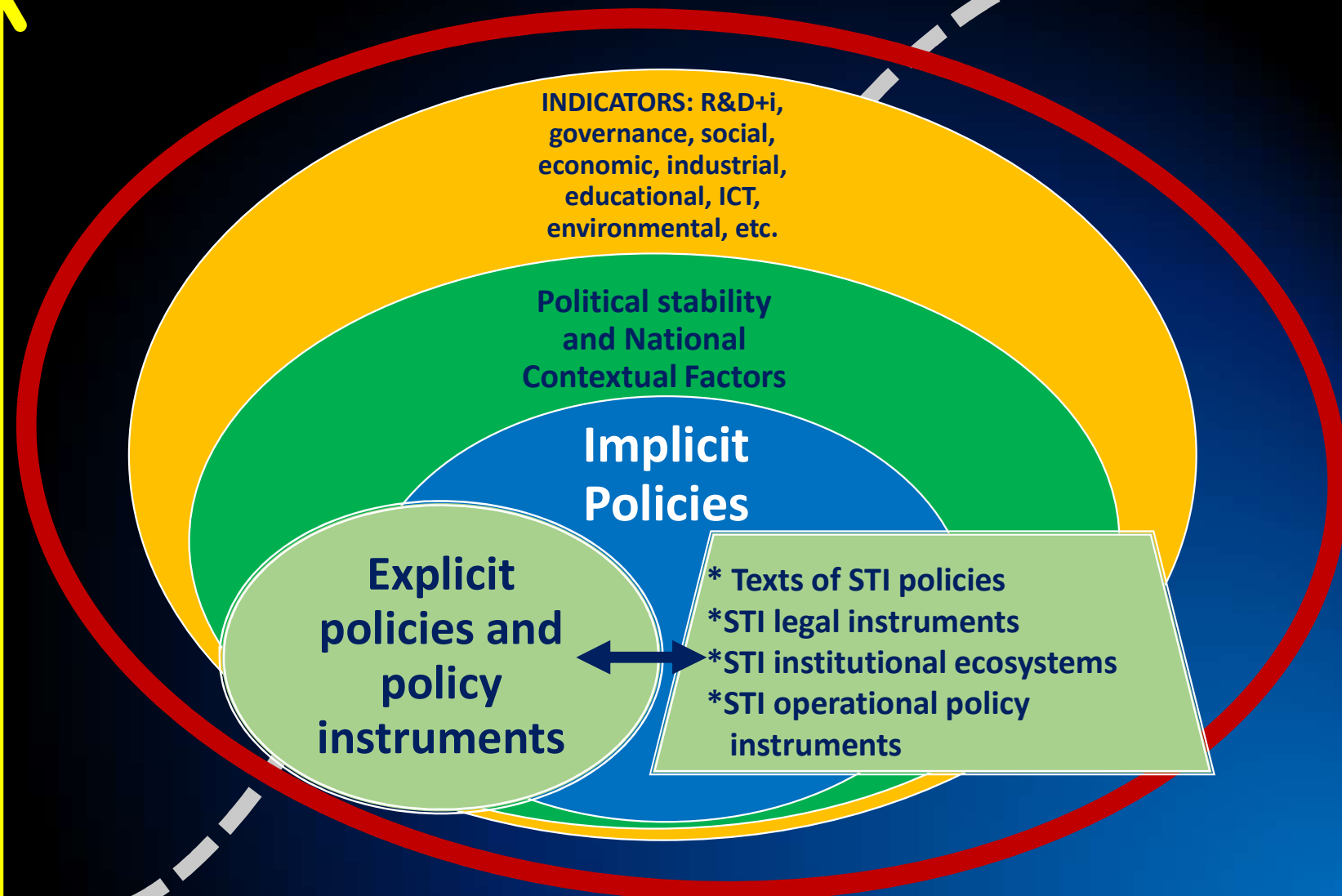


source: Lemarchand (2020)



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 STI policies
- * STI legal instruments
- * STI institutional ecosystems
- * STI operational policy instruments

Time



ASANTE SANA

Time for questions

