



Developing a Transformative Innovation Policy Approach: the case of Senegal

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1 Introduction

Senegal's Science, Technology and Innovation (STI) policy is defined by the Head of State through a letter of mission addressed to the Ministers in charge of innovation areas. The recipient ministries are responsible for submitting a sectoral policy letter and / or policy document to the parliament. Thus, the implementation of STI policies is done at the level of the Ministère de l'Enseignement Supérieur, de la Recherche et de l'Innovation (MESRI) [*Ministry of Higher Education, Research and Innovation*], and other ministries (e.g. Ministry of Industry, Ministry of Agriculture, Ministry of Health), Universities and Research Institutes (Gaillard and Kane 2011). MESRI is the main governing body for science and technology (S&T) policy. In addition, MESRI defines the national priorities for S&T research and funds research through various funding instruments. Furthermore, it coordinates S&T activities and works in close collaboration with the technical ministries on which the research institutes depend.

STI Policy Evolution in Senegal

In Senegal, public authorities have always affirmed their desire to promote scientific and technical research and to make it an instrument of economic and social development. National reflection days (1978, 1998) and many inter-ministerial councils (May 1981, September 1982, April 1984, January 1989) have been devoted specifically to discussions on the role of research and STI in economic and social development. Over the years, MESRI, the ministry in charge of the STI policy in Senegal, has evolved and made progress, despite various instabilities that have negatively affected the ministry's ability to fulfil her mandates.

During the first five years of independence, French institutions present in Senegal during the colonial period provided most of the scientific potentials. These institutions are: la station expérimentale d'arachide de Bambey devenue le Centre National de Recherche Agronomique (CNRA) of Bambey¹, l'Institut Pasteur de Dakar², l'Institut Fondamental d'Afrique Noir (IFAN), le Bureau de Recherches Géologiques et Minières³ (BRGM), Office de la Recherche Scientifique et Technique Outre-Mer⁴ (ORSTOM), l'Ecole de médecine de Dakar⁵ (EMD) which later became l'Université Cheikh Anta Diop de Dakar. It was only during the preparation of the second national economic and social development plan (1965-1969) that a national scientific research commission was set up for the first time to contribute to the study and research component.

¹ The Bambey groundnut experiment station which became the National Center for Agronomic Research

² The Pasteur Institute of Dakar

³ The Fundamental Institute of Black Africa (IFAN), the Office of Geological and Mining Research

⁴ Office of Scientific and Technical Research Overseas

⁵ the Dakar Medical School

In 1966, in order to promote the scientific policy of the State, the *Conseil interministériel de la recherche scientifique et technique*⁶ (CIRST) was set up and the *Bureau des affaires scientifiques et techniques* (BAST) opened and attached to the General Secretariat of the Presidency of the Republic. In 1972, this Bureau was transformed into a *Direction des affaires scientifiques et techniques* (DAST) to be attached to the State Secretariat for Planning. This is a significant development with regard to the objectives of the State. However, these creations had no real influence on the research structures, their objectives and their management mode. From 1973, the Senegalese State established a more visible presence in research, both in terms of its organization and the allocation of resources.

Thus, in December 1973, the *Délégation générale à la recherche scientifique et technique* (DGRST) was created and attached directly to the Prime Minister's office. This Delegation reflects Senegal's political will to ensure coordination and monitoring of scientific and technical research. In addition to its rank, i.e. being attached to the government, the DGRST was in charge of agricultural and agri-food research in the university research sector, thanks to the leverage enabled by the *Fonds d'impulsion de la recherche scientifique et technique* (FIRST). Agriculture is a key sector, in Senegal's economy. The desire to federate all research by integrating them led the DGRST to set up horizontal commissions: medical, pharmaceutical, agricultural, agri-food and social research, scientific and technical documentation.

These committees are responsible for assisting the DGRST, in particular to determine research priorities and evaluate results. This system was reinforced a few years later by the holding of regional research development committees to better take into account regional specificities in programs and research projects. The DGRST consolidated the organization of the national scientific and technical research system in Senegal by setting up two support bodies: *Centre national de documentation scientifique et technique* (CNDST) and the *Institut sénégalais de normalisation* (ISN). The Directorate of External Relations complements these bodies, which is at the origin of the first Franco-Senegalese joint commission devoted exclusively to research.

The DGRST was established as the State Secretariat to the Prime Minister in charge of S&T Research on April 9, 1979. Its role is threefold: to promote, to coordinate and to manage research activities. These mandates led the authorities to abolish the Scientific Directorate and the Directorate of External Relations and to create several directorates: the *Direction de recherches agricoles et agro-industrielles* (DRAAI) ; the *Direction de l'innovation et du progrès technologique* (DIPT) ; the *Direction des recherches en sciences sociales et humaines* (DRSSH); the *Direction des études, des projets et du plan* (DEPP). This period was marked by a dynamic

⁶ Interministerial Council for Scientific and Technical Research

and fruitful cooperation in policy, which made it possible to largely offset the weakness of internal resources with external financing.

Four years later, on 3 April 1983, a Ministry of Scientific and Technical Research replaced the *Secrétariat d'Etat chargé de la recherche scientifique et technique*. In 1986 this was replaced by the *Direction des Affaires Scientifique et Techniques* (DAST) attached to the *Ministère du Plan et de la Coopération*. The Ministry of Scientific Research re-emerged in 1994 and then became part of the Ministry of Higher Education until 2002. From 2002, the governing body of research became a full-fledged ministry until December 2007 where it was merged again with another department to become *Ministère des Biocarburants, des Energies renouvelables et de la Recherche scientifique* (MBERRS).

The Ministry of Scientific Research was reinstated in October 2009 to the ministry of higher education. Since then, research policy in Senegal has been carried out by the current Ministry of Higher Education and Research, which was enhanced in September 2017 by becoming the *Ministère de l'Enseignement Supérieur, de la Recherche et de l'Innovation* (MESRI).

Table 1: Summary of Senegal's STI Policy Institutional Landscape from 1965 to 2019

Year	Institution/Activity
1965-1969	<i>Bureau des Affaires scientifiques et techniques</i> (BAST) - Office of Scientific and Technical Affairs
1972	<i>Direction des Affaires scientifiques et techniques</i> (DAST) - Directorate of Scientific and Technical Affairs
1973-1979	<i>Délégation générale à la Recherche scientifique et technique</i> (DGRST) - General Delegation for Scientific and Technical Research
1979-1983	<i>Secrétariat d'Etat chargé de la Recherche scientifique et technique</i> - State Secretariat for Scientific and Technical Research
1983-1986	<i>Ministère de la Recherche scientifique et technique</i> - Ministry of Scientific and Technical Research
1986-1994	<i>Direction des Affaires scientifiques et techniques</i> (DAST) - Directorate of Scientific and Technical Affairs
1995-1998	<i>Ministère de la Recherche Scientifique et des Technologies</i> - Ministry of Scientific Research and Technologies
1998-2000	<i>Ministère de la Recherche scientifique et de la technologie</i> - Ministry of Scientific Research and Technology
2001-2002	<i>Ministère Enseignement supérieur et de la Recherche scientifique</i> - Ministry Higher Education (HE) and Scientific Research
2002-2003	<i>Ministère de la Recherche scientifique et technologique</i> - Ministry of Scientific and Technological Research
2003-2007	<i>Ministère de la Recherche scientifique</i> - Ministry of Scientific Research
2007-2009	<i>Ministère des Biocarburants, des Energies Renouvelables et de la Recherche scientifique</i> - Ministry of Biofuels, Renewable Energies and Scientific Research
May 2009 - Oct 2009	<i>Ministère de la Recherche scientifique</i> - Ministry of Scientific Research

2009-2012	<i>Ministère de l'Enseignement supérieur, des Universités, des Centres universitaires régionaux et de la Recherche scientifique</i> - Ministry of Higher Education, Universities, Regional University Centers and Scientific Research
2012-2017	<i>Ministère Enseignement supérieur et de la Recherche</i> - Ministry of Higher Education and Research
2017-2019	<i>Ministère Enseignement supérieur, de la Recherche et de l'Innovation (MESRI)</i> - Ministry Higher Education, Research and Innovation

Source: Enquête sur les instruments de politique, les organes directeurs, le cadre juridique et les politiques pour la science, l'ingénierie, la technologie et l'innovation (SITI)

Senegal does not yet have an STI policy document that is in line with international standards. Relatedly, research institutions are fragmented and are under the supervision of different ministries. For example, the *Institut de Technologie Alimentaire* (ITA) is attached to the ministry of industry while the *Institut Sénégalais de Recherche Agricole* (ISRA) and the *Institut National de Pédologie* (INP) are attached to the Ministry of agriculture. This break-up has contributed to the dispersion and fragmentation of research and innovation through a multiplication and superposition of priorities. The weakness and fragmentation of funding sources, lack of visibility, consultation and synergy between the stakeholders are the major challenges to overcome if innovation is to contribute more to socioeconomic development.

2 Frame 1: Innovation Policy in the Context of R&D and Regulation in Senegal

African countries are increasingly aware of the need to invest in STI to meet the challenges they face. Considering research as a lever for economic and social development Senegal attaches great importance to STI through various financing instruments (see Table 2). The implementation of research and innovation activities depends both on state subsidies and on funding from technical and financial partners (Cf Table 3), some of which are obtained by research teams in the context of international tenders or direct contracts awarded by donors. The contribution of the private sector is very small. Only few companies in the telecommunications sector contribute to the funding of research and innovation. Most R&D funding is provided by the State in the form of grants to the various research structures (universities, public scientific institutions, higher schools, etc.), postgraduate scholarships and competitive funds.

Efforts are being made by the Government to strengthen human resources for R&D. According to the UNESCO Institute for Statistics (UIS) in 2015, Senegal had 14335 researchers, 822 technicians and 1443 support staff. Thus, the density of researchers per million inhabitants increased from 2008 to 2015 from 661 to 956. However, the majority of researchers are in the social sciences and humanities sector (Table 3).

Table 2: Main Indicators of R&D

Year	2015	2012	2008
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Indicators	Total	women	Total	Total
Number of researcher	14335	4201	8170	7859
Number of technicians	822	258	605	-
Number of support staff	1443	421	1869	-
Percentage of researchers (women)	29,31%		25%	24%
Number of researcher PhD level	5928	1413	1647	2003
Number de researchers level Master 2	8407	2788	6511	5840
Number of researcher per million of inhabitants	956		636	661
Gross domestic expenditure on R&D as a percentage of GDP	0,8 %		0,51 %	0,37 %

Sources: African Innovation Outlook II, ISU

Table 3: Senegal, Breakdown of researchers by scientific field, 2015

Year	2015	2012
Exact and Natural Sciences	21,09%	18%
Engineering and Technology Sciences	7,07%	2%
Medical and Health Sciences	14,85%	19,6%
Agricultural sciences	1,29%	1,6%
Social Sciences	39,17%	50,7%
Human Sciences	16,50%	6,4%

Sources: African Innovation Outlook II, ISU

Apart from these research-funding instruments, for the reinforcement and promotion of innovation, Senegal has a policy of rewarding excellence through the regular organization of the President's Grand Price for Science and the Grand President's Award for Innovation. An African exhibition of Research and Innovation in Senegal (SARIS) is regularly organized by the *Agence Nationale de la Recherche Scientifique Appliquée* (ANRSA) in partnership with all national components of research and innovation.

Higher education receives a grant from its parent ministry. However, more than 85% of this allocation goes to salary. Senegal has put in place a policy of upgrading the university lecturer and researcher function through one of the highest average pay levels in Africa. To this must be added support for study and research trips, laboratories and scholarships for all PhD and Master II students.

Table 4: Senegal, sources of financing R&D expenditure, 2015

A	Funds from abroad	Enterprise	Higher Education	Private-non profit	Total
51 825 980 828	4 784 867 180	1 265 313 225	60 000 000	2 719 854 779	60 656 016 012
85,44 %	7,88 %	2,08 %	0,09 %	4,48 %	100 %

Source: ISU

The table of sources of financing R&D expenditure shows that in 2015, 85.44% of the financing of this sector comes from the Senegalese State. Thus, the ratio of R&D expenditures to GDP marks a confirmed trend of increase from 0.45% in 2008, 0.54% in 2010 to 0.91% in 2012, 0.73% in 2013 (African Union 2014, World Bank 2013) and 0.8% in 2015 (ISU, 2015). These insufficient state efforts are justified by the many R&D and innovation financing mechanisms put in place such as the FIRST, the GPRST, the *Fonds de Publication scientifique et technique* (FPST), the *Fonds National de Recherche Agricole et Agro-alimentaire* (FNRAA) and the *Fonds de Promotion de l'Industrie Cinématographique et Audiovisuelle* (FOPICA)⁷.

FINANCING INNOVATION

The Fonds d'Impulsion pour la Recherche Scientifique et Technique (FIRST) (Fund for Scientific and Technical Research) was established in 1973 by the Ministry of Scientific Research to support economic growth through research. By aiming to encourage, to stimulate or even to amplify research initiatives, FIRST mobilizes intervention credits that are allocated by the State to the ministry of scientific research. Thus, it is both a financing element for projects and an instrument for supporting and structuring the research sector.

The Grand Prix du Président de la République pour les Sciences et la Technologie (GPRST) (The President of the Republic's Grand Price for Science and Technology) is a national distinction whose objective is to reward the researchers who have particularly distinguished themselves by their creativity, the importance or the originality of their works.

The Fonds de Publication scientifique et technique (FPST) (The Scientific and Technical Publication Fund) is intended on the one hand to support the scientific and technical publications existing in institutions and on the other hand, to finance the regular publication of scientific journals edited under the auspices of the MESRI.

The Fonds National de Recherches Agricoles et Agro-alimentaires (FNRAA) (National Fund for Agricultural and Agro-Food Research) was created on February 4, 1999, as an association of public utility whose purpose is to finance, with the available resources, agricultural and agro-food research projects considered as priorities by the State, the National Agricultural Research System agro-silvo-pastoral (SNRASP), the development partners and the users of the research results. The FNRAA is subject, within the limits of the provisions of its statutes, to the administrative supervision of the Ministry in charge of the Economy and Finances and to the technical supervision of the Ministry in charge of Agriculture. FNRAA's vision is to create the conditions for diversified and sustainable financing of Senegalese agricultural and agro-food research. To this end, the fund develops a policy (i) to promote its activities with development partners, (ii) to promote quality results for users of research products.

⁷ FPST (Scientific and Technical Publication Fund), FNRAA (National Fund for Agricultural and Agro-Food Research) and FOPICA (Fund for the Promotion of the Cinematographic and Audiovisual Industry).

The Fonds de Promotion de l'Industrie Cinématographique et Audiovisuelle (FOPICA) (Fund for the Promotion of the Cinematographic and Audiovisual Industry) was established by the law 2002-18 of April 15, 2002 on the rules of organization of the activities of cinematographic and audio-visual production, exploitation and promotion. The establishment of this fund meets a goal of reviving film production by allowing filmmakers, through legally constituted production structures and in order with tax authorities, to find a continuous activity of creation. The financial contribution of the State to the development of cinematographic and audiovisual activities is done through a fund for the promotion of the film and audiovisual industry whose organizational and operational modalities are set by decree.

Fonds de Financement Formation Professionnelle et Technique (3FPT) (Fund for Financing Professional and Technical Training) was created by decree 2014-1264 of 7 October 2014. The 3FPT was set up by the Government of Senegal with the support of development partners such as the World Bank and the French Development Agency. This fund, which replaces the former FONDEF, was set up as part of the reform of the financing system for vocational and technical training. This reform aims to optimize the available resources and mobilize additional resources to meet the growing needs for vocational and technical training.

Banque Nationale de Développement Economique (BNDE) (National Bank for Economic Development). The BNDE results from an institutional evolution and a transformation of the FPE (*Fonds de Promotion Economique*). The ambition is to establish the BNDE as a successful Bank in Senegal and a true leader in financing SMEs, both qualitatively and quantitatively. It is also a question of making BNDE a dynamic bank, with a vocation of progressive positioning on the whole of the banking activities (bank of deposit, bank of investment, management of fortunes and assets ...) and on the others market segments (large companies, institutions, Diaspora, microfinance institutions...). The objective is also to make the BNDE a national financing tool actively participating in the implementation of the Accelerated Growth Strategy of Senegal and more generally to the development of the country.

Délégation à l'Entrepreneuriat Rapide (DER) (Delegation for Rapid Entrepreneurship) was created on a presidential decision since December 2017, this mechanism was set up to reduce youth and women's unemployment by promoting entrepreneurship and employment. However, failures of innovation financing structures in relation to needs are noted and on the entrepreneurial side, bank financing is almost impossible to mobilize (or with difficulty) in relation to a highly fragmented business sector with small and medium-sized enterprises (SMEs) sometimes from the domestic economy. As for the few large companies, which are often in a quasi-monopoly position on their products, they use externally produced research and still operate in closed circuits too often.

Overall, despite commendable efforts the funding of research requires significant improvement. The orientations favor the research for international academic and scientific excellence rather than endogenous research. Resources allocated to research and innovation

have not exceeded 0.8% of the GDP. In order to encourage R&D in the industrial sector as well as innovation, the amounts allocated to scientific research and technological innovation amount to at least 1% of GDP.

3 Frame 2: Innovation Policy in the Context of National Systems of Innovation (NSI) in Senegal

Although not having an STI policy document according to international standards, Senegal has actively participated in the development and adoption of the STI policy of the Economic Community of West African States (ECOPOST) and the ECOWAS Research Policy (ECORP). Senegal is also participating in the African Initiative for STI Indicators (ASTII).

To enable STI to play a greater role as a driver of socio-economic and cultural development, a *Conseil National sur l'Avenir de l'Enseignement Supérieur* (CNAES)⁸ was held in 2013. It led to the 2013-2017 *Programme de réformes prioritaires* in Senegal "(PRP) and the" *Plan de Développement de l'Enseignement Supérieur et de la Recherche* "(PDESR)⁹, whose objectives have all been translated into presidential decisions, which are in the process of being implemented.

GOVERNANCE OF THE INNOVATION SYSTEM

In Senegal, the governance of research and innovation at the governmental level is characterized by a breakdown of administrative and technical supervision without a unifying, coordinating national framework. The MESRI has the administrative and technical supervision of public and private higher education institutions (Universities, Colleges and Institutes) as well as the *Agence Nationale de Recherche Scientifique Appliquée* (ANRSA)¹⁰.

The *Ministère de l'Agriculture et de l'Équipement Rural* has the administrative and technical supervision of the *Institut Sénégalais de Recherche Agricole* (ISRA) and the *Institut National de Pédologie* (INP). The *Ministère de l'Industrie et des mines* has the administrative and technical supervision of the *Institut de Technologie Alimentaire* (ITA), the *Association Sénégalaise de Normalisation* (ASN), the *Agence Sénégalaise pour la Propriété Industrielle et l'Innovation Technologique* (ASPIT)¹¹ and the *Agence d'aménagement et de promotion des sites industriels* (APROSI)¹². The *Ministère de l'Environnement et du Développement Durable* has under its administrative and technical supervision the *Centre de Suivi Ecologique* (CSE).

⁸ National Council on the Future of Higher Education

⁹ Development Plan for Higher Education and Research

¹⁰ National Agency for Applied Scientific Research

¹¹ Senegalese Agency for Industrial Ownership and Technological Innovation

¹² Agency for development and promotion of industrial sites

The *Centre expérimental de recherches et d'études pour l'équipement* (CEREEQ)¹³ is under the supervision of the *Ministère des Infrastructures, du transport terrestre et du Désenclavement*. The *Ministère du commerce* has under its tutelage among others, the *Bureau de Mise à Niveau* (BMN), the *Agence de Développement et d'Encadrement des Petites et Moyennes Entreprises* (ADEPME)¹⁴, la *Chambre de Commerce, d'industrie et d'artisanat* (CCIA), the *Agence Sénégalaise de Promotion des Exportations* (ASEPEX)¹⁵, the *Bourse nationale de sous-traitance et de partenariat* (BNSTP)¹⁶ and the *Fondation Trade Point Sénégal* (TPS)¹⁷. The *Agence pour la promotion des investissements et grands travaux* (APIX)¹⁸, the *Agence de Développement de l'Informatique de l'Etat* (ADIE)¹⁹ and the *Haute Autorité de la Zone Economique Spéciale* (HAZES)²⁰ are under the supervision of the Ministry in charge of investment promotion. The *Fonds de Garantie des Investissements prioritaires* (FONGIP)²¹, the *Fonds souverain d'investissements stratégiques* (FONSIS)²², the *Fonds spécial de soutien au secteur de l'Energie* (FSE)²³, the *Agence nationale de la Statistique et de la Démographie* (ANSD)²⁴ and the *Banque nationale de Développement économique* (BNDE) are under the tutelage of the *Ministère de l'économie et des finances*²⁵.

This break-up has contributed to the dispersion and fragmentation of research and innovation through a multiplication and superposition of priorities. Added to this is a weakness and fragmentation of funding sources and a lack of visibility, consultation and synergy between the stakeholders.

¹³ Center for Experimental Research and Study of Equipment

¹⁴ Agency for Development and Supervision of Small and Medium Enterprises

¹⁵ Senegalese Export Promotion Agency

¹⁶ National Subcontracting and Partnership Scholarship

¹⁷ Trade Point Senegal Foundation

¹⁸ Agency for the promotion of investments and major works

¹⁹ State Computer Development Agency

²⁰ High Authority of the Special Economic Zone

²¹ Priority Investments Guarantee Fund

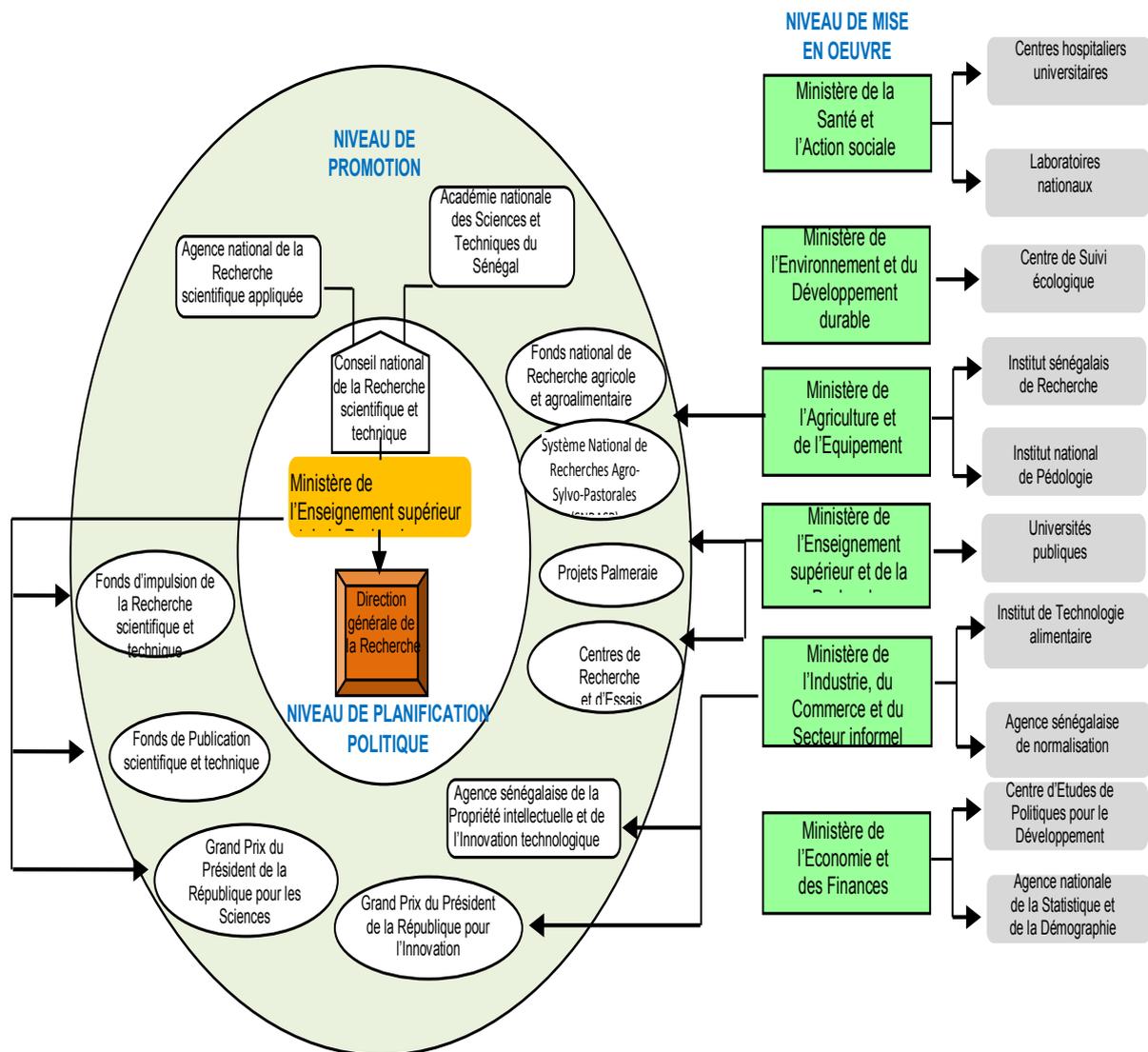
²² Sovereign Fund for Strategic Investments

²³ Special Fund for Support to the Energy Sector

²⁴ National Agency for Statistics and Demography

²⁵ Ministry of Economy and Finance

Figure 1: Système national des sciences, de la technologie et de l'innovation du Sénégal
(Senegal's National Science, Technology and Innovation System)



Source : Enquête sur les instruments de politique, les organes directeurs, le cadre juridique et les politiques pour la science, l'ingénierie, la technologie et l'innovation (SITI) [Survey of Policy Instruments, Governing Bodies, Legal Framework and Policies for Science, Engineering, Technology and Innovation (SETI)]

In 2015, an ANSD study revealed that only 8.7% of companies have maintained relations with research centers. A relatively low level, which reveals the weakness of the research activities in the companies and indirectly the innovation in the Senegalese industry. More than half (52.3%) of companies that have connections to research centers use their products. However, slightly more than a quarter (26.2%), despite having relationships with research centers, do not use the results of their research.

Nevertheless, efforts are being made to improve governance through the implementation of sectoral consultation frameworks like that of the *Système National de Recherche*

AgroSylvoPastorale (SNRASP)²⁶ created in 2008. The creation of the law 2009-17 of 9 March 2009 on the Code of Ethics for Health Research, and its implementing decree organizing the operation of the so-called committee are also improvements in the local governance of health research.

Other improvements focused on the steering of the higher education and research system with the creation of the *Autorité Nationale d'Assurance Qualité de l'Enseignement supérieur et de la Recherche* (ANAQ-SUP)²⁷, the *Direction Générale de l'Enseignement Supérieur* (DGES)²⁸ and the *Direction Générale de la Recherche et de l'Innovation* (DGRI)²⁹. The adoption of the framework law in 2015 and performance contracts instituted in public universities aimed at strengthening the institutional governance of research and innovation. The *Conseil National de l'Enseignement supérieur, de la Recherche, de l'Innovation, de la Science et de la Technologie*³⁰ is being created.

4 Frame 3: Innovation Policy in the Context of Transformative Innovation in Senegal

Pathway towards transformative change: despite significant investments in Frames 1 and 2, Senegal is unable to resolve social and environmental problems in a sustainable manner. Expenditure on R&D so far have not sufficiently provided the necessary boost to the economy, one reason being the lack of applied research and the valorization of research results. Similarly, the systems put in place to facilitate interaction between the actors of research and innovation have so far produced limited results. It is then necessary to find a solution that allows a sustainable transition. To this end, Senegal has decided to adopt a new development model to accelerate its progress towards sustainable socioeconomic growth and inclusive development. This strategy, known as *Plan Sénégal Emergent* (PSE), is the benchmark for economic and social policy in the medium and long term.

PSE aims to improve the well-being of the population through inclusive growth. In this sense it is in line with the aspirations of frame 3 on directionality (Schot and Steinmueller 2018) in that it seeks to put in place “a process for setting collective priorities” necessary for achieving the country’s societal goals.

Since independence, Senegal has implemented integrated policies and programs through its various strategic documents. The objective is to ensure the conditions for sustained and sustainable growth that can significantly reduce poverty. The aim has been to deploy innovation for transformative change in order to address directionality failure in the country.

²⁶ National System of AgroSylvoPastoral Research

²⁷ National Quality Assurance Authority for Higher Education and Research

²⁸ General Directorate for Higher Education

²⁹ Directorate General for Research and Innovation

³⁰ National Council for Higher Education, Research, Innovation, Science and Technology

Indeed, after the implementation of two generations of *Documents de Stratégie de Réduction de la Pauvreté* (DSRP)³¹ from 2003 to 2010, Senegal has opted for a *Stratégie Nationale de Développement Economique et Social* (SNDES)³², for the 2013-2017 period, which constitutes the conceptual framework for coordinating public interventions. Adopted in November 2012 by the Government and all its development partners, this strategy is based on the vision of a National Strategy for Economic and Social Development with the aim of economic development by 2035. The achievement of this ambition is based on the implementation of a major investment program in thriving sectors, capable of stimulating strong and sustained growth momentum. The strategic orientations are based on three axes:

- a structural transformation of the economy through the consolidation of the current drivers of growth and the development of new sectors that create wealth, employment, social inclusion and strong export and investment attraction capacity. This axis is part of a more balanced development option, the promotion of soils and viable economic clusters in order to stimulate the development potential of the entire territory (Axis 1);
- a significant improvement in people's living conditions, more sustained effort against social inequalities while preserving the resource base, and promoting the emergence of viable territories (Axis 2); and
- strengthening security, stability and governance, protecting rights and freedoms and consolidating the rule of law in order to create the best conditions for social peace and to promote the full development of the nation's potentials (Axis 3).

The first *Plan d'Actions Prioritaires* (PAP 1) operationalises the PSE through the alignment of the strategic axes, sector objectives and action lines, with development projects and programs in a budget framework for the 2014-2018 period. The main projects and programs included in PAP 1 focus on the following sectors: transport infrastructure and services; energy; agriculture; education and training; drinking water and sanitation; health; governance, peace and security; communication, telecommunications infrastructure and services; social protection; risks and disasters; and environment. The 2014-2018 PAP consists of several programs and projects among which are the *Programme d'Urgence de Développement Communautaire* (PUDC)³³, the *Plan de Développement de l'Enseignement supérieur et la Recherche* (PDES), the *Programme d'Accélération de la Cadence de l'Agriculture Sénégalaise*³⁴ (PRACAS), le *développement du pôle industriel intégré de Diamniadio*³⁵ and the *Zones économiques spéciales* (ZES)³⁶.

The PUDC aims to contribute to the significant improvement of people's living conditions through a more sustained fight against social inequalities, through sustainable access to basic socio-economic infrastructure and services, and the creation of a local economy.

³¹ Poverty Reduction Strategy Papers

³² National Strategy for Economic and Social Development

³³ Community Development Emergency Program

³⁴ Program of Acceleration of the Cadence of Senegalese Agriculture

³⁵ the development of Diamniadio's integrated industrial pole

³⁶ Special economic zones

The PDES objective is to broaden the university map and build the knowledge city. The PRACAS on the other hand, which is the agricultural component of the PSE, is based on the vision of “building a competitive, diversified and sustainable agriculture”. To operationalize this vision, the PRACAS aims to achieve medium-term food and nutritional security in concentric circles starting from priority products with high development potential and high added value.

Another important development is the creation, by the Law No. 2017-06 of 6 January 2017 of the Special Economic Zones, which is related to the Government objective of achieving the objective of Axis 1 of the PSE: the structural transformation of the economy. The first project of the *Zone économique spéciale intégrée* (ZESI)³⁷ was launched in 2016. It is built on 90 hectares with a 50-hectare industrial park, office space or a logistics platform. A second integrated special economic zone is being developed in Sandiara in the department of Mbour (Thiès).

5. Conclusion

Despite the political will of the Senegalese state to promote human capital, research and innovation through multiple initiatives, various challenges remain. These challenges include (1) the fragmentation of research and innovation institutional framework resulting from the lack of a single consolidated strategy, (2) the weakness and fragmentation of funding sources, (3) the lack of effective engagement between researchers and decision-makers, which constitute obstacles to the development of a transformative innovation policy to both foster and support transition to sustainable development and transformative change.

Senegal’s TIP Africa pilot team hopes to, through this project, explore the potentials for transformative change in Senegal and the roles that STI policy can play in the process. Since there are already initiatives to change socio-technical systems in Senegal in the PSE through the PDES, the PRACAS, the PUDC and in the ZES, the team hope to adopt what Kivimaa and Kern refer to as the *drift and conversion that consists in adding new rationales and goals without changing instruments* in the implementation of the PSE to get in the way of a transformational change.

Case Study: ICT and Higher Education

Senegal’s selected case study will focus on ICT and Higher Education, using the Virtual University for the investigation. This case study will attempt to answer one vital question for Senegal: How to place ICT at the heart of the development of higher education and research

³⁷ Integrated Special Economic Zone

in order to improve access to higher education (including quality and affordability) and the efficiency of the system?

6 References

African Economic Outlook 2015. AfDB, OECD UNDP. Overview.

African Innovation Outlook II April 2014 ASTII/NEPAD:

ANSD, Janvier 2017, Rapport provisoire de l'enquête sur l'état des lieux de l'industrie au Sénégal

Babacar Ndir. 2010. Innovation et transfert de connaissances en Afrique.

Décisions présidentielles relatives à l'enseignement supérieur et à la recherche 2013

Gaillard Jacques et Ousmane Kane (2011) Le système national de recherche scientifique et technique au Sénégal: État des lieux et Proposition d'un cadre conceptuel pour l'élaboration d'un document cadre d'orientation des politiques nationales de recherche, de technologie et d'innovation. Rapport préparé pour l'UNESCO, Division des politiques scientifiques et du développement durable 96 pages.

Ministère de l'Enseignement supérieur et de la Recherche : ENQUÊTE GO-SPIN-Sénégal-questionnaire. FR 09-2013 (actualisé janvier 2016)

Schot, J., and Steinmueller, E. W. 2018. Three frames for innovation policy: R&D, systems of innovation and transformative change