

2 VALORIZATION OF INNOVATION AND RESEARCH RESULTS FOR SOCIAL AND ECONOMIC GROWTH IN BURKINA FASO

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ABSTRACT

The question of innovation and the utilization of scientific and technological research results has come to the forefront in recent years as a significant tool for socioeconomic development in African Countries. However, it could be argued that despite the multiplicity of works managed by different actors, research and innovation results in diverse areas remain unknown and unutilized, and are often unrecognized. This article examines the question of innovation and the valorization of research results in Burkina Faso. It also explores its inventory of research, together with the various constraints and opportunities associated with the utilization of research and innovation results. Finally, it proposes solutions to translate research and innovation into development tools for Burkina Faso.

Keywords: valorization, research issues, innovation, intellectual property, development, Africa

I. INTRODUCTION

Ranked among the poorest countries in the world, the vast majority of African countries have relatively low human development indices and face many challenges, both at present and in the future. Nonetheless, thanks to the increased awareness of the role of research, coupled with the efforts of researchers, inventors and innovators, many results have been generated in Africa in various spheres such as agriculture, environment, technology, health, and traditional medicine that are likely to contribute to the development of the entire continent.¹ Many of the results stemming from research and innovation have been published in scientific journals, papers and scientific meetings, as well as being the focus of topics in national, regional and international exhibitions.

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¹ Daniel P Kabore, *Dissemination mechanisms Analysis improved agricultural technologies and innovations in the ECOWAS*, (2011).

However, it is clear that despite the willingness of various African leaders to consider scientific research and innovation as a tool for socioeconomic development, the general public is largely confused about research and innovation results. These results thus remain largely unknown, unprotected, unvalued and unutilized by the general public². There is a significant gap in Africa between production results from research and innovation and their commercial value. Yet, there appears to be an increased focus on the utilization of research and innovation results in recent years in Africa with the involvement of several actors³. This paradoxical situation gives rise to many questions such as: What is the current state of research and utilization of the results in Burkina Faso? What are the constraints and opportunities relating to the intensive use of research results and innovation? What are the solutions for the utilization of research and innovation results as development tools in Burkina Faso?

II. GENERAL CONCEPTS

Scientific research, inventions and innovation activities undertaken throughout the African Continent have generated several results that could contribute to its social, economic and cultural development. These diverse outcomes or endeavors are applicable to many sectors, yet there is general agreement that they lack valorization. In order to provide some clarity, it seems judicious to define certain concepts such as valorization, assignment and merchandizing, while discussing the rationale for the valorization of research and invention results.⁴

A. VALORIZATION

The term 'valorization' has many definitions and is commonly used, along with such terms as 'merchandizing', 'utilization of research outcomes' and 'assignment'. However, these expressions imply unlike realities.⁵

Indeed, valorization may be defined as a process that is essentially undertaken in universities for the purpose of adding value to research issues, to knowledge, to an invention or to an existing technology, so as to convert them into usable or marketable goods, processes and services. In other words, valorization signifies making knowledge and

² Michel P Sedogo, *Research findings Development Programme and Innovations in Burkina Faso*, 2009.

³ OECD, *Knowledge-based Economy*, Paris, 1996.

⁴ University of Strasbourg, *Good Practice Guidance Valuation*, Strasbourg, 2009.

⁵ Souad Boussaid *Valuation of Research and Funding Mechanisms of Innovation in Tunisia*, 2013.

proficiency stemming from research and innovation usable and marketable.⁶

'Assignment' refers to the transmission and receiving of flow of knowledge and ability between partners, especially in the private sector and research centres, for the purpose of enhancing knowledge and value of one of the partners. Its concrete expression is by the way of a technology transfer agreement between an institute or university and an enterprise, by granting an exploitation licence or by the transfer of intellectual property rights.

Lastly, marketing refers to putting on the market products, processes, and services from the marketing exploitation of intellectual property rights, acquired from a university or institute.

B. WHY RESEARCH AND INNOVATION RESULTS SHOULD BE VALORIZED?

In the present-day context of the economy of knowledge, there are many reasons why States, institutes, research centres and universities are prioritizing the valorization of innovation and research results.⁷

The transfer of research and innovation outcomes toward the productive sector enhances the competitiveness of enterprises and leads to job creation, while also helping to produce research and innovation outcomes, for instance, the development of drugs.

Valorization avoids the use of results by another person without compensation; moreover, it also produces substantial incomes and helps to finance research in universities, institutes and research centres.

The delivery of knowledge and know-how by researchers and innovators in the economics field is a source of recognition, notoriety and enrichment of research through the supply of professional contributions.

Cooperation with the private sector encourages the professional integration of students in enterprises. Hence, research should help to respond to concerns from enterprises and people regarding issues relating to the utilization of results and investment feedback.

⁶ Caudle, *The Commercialization of University Research*, (Quebec 1992).

⁷ University of Strasbourg, *Good Practice Guidance Valuation Good Practice Guidance Valuation* (Strasbourg 2009).

III. STATUS OF RESEARCH

The status of research in Burkina Faso and across the African continent in general is characterized at the political and institutional level by the existing political views, private and public research, valorization structures and lack of valorization and protection available for research.⁸

As for financing of research and innovation, an inventory of fixtures shows a limited amount of state financing is channeled to this particular field; home research centres are subordinated towards foreign structures; and results are exported to foreign financing institutes.

The sector of innovation and research results is characterized by some existing value structures, lack of reward for researchers, a low level of scientific publishing protection, a weak use of innovation and research issues and non-satisfied societal needs of the products brought into focus.

Only less than 2 per cent of annual scientific publishing and 1 per cent of patents filed originate from Africa; despite numerous possibilities, only countries such as South Africa, Egypt, Tunisia, Nigeria, Algeria, and Morocco seem to be an exception, though there is no shortage of inventiveness and creativity within institutions, universities and research centres to meet the Continent's development priorities.⁹

A. CONSTRAINTS AND OPPORTUNITIES OF INNOVATION AND RESEARCH RESULTS

In African countries, there are numerous constraints and opportunities¹⁰ in relation to the valorization of research and innovation results:

(i) CONSTRAINTS

In this regard, African countries are confronted with a bewildering number of economic, political, institutional and sociocultural impediments:

(a) Economic constraints

There are considerable economic constraints, including¹¹:

⁸ OECD, *Science, Technology and Industry Outlook* (2012).

⁹ Pan African Conference on the role and place of the University in the 21st century, Rabat (Morocco) Africa, November 21-23 2011.

¹⁰ OECD, *Science, Technology and Industry Outlook*, 2012.

- Limited public funding granted to research and development, leading to dependence on investments abroad;
- smallness of industries unable to absorb research results;
- lack of training for industry and traders to provide an understanding of the research product and its application or use;
- lack of issues between research and the national research system of production;
- weak level of industrial property protection of the results;
- Lack of researchers' knowledge about issues related to the private sector, precluding suitable technical solutions from being proposed.

(b) Sociocultural and behavioral constraints

The sociocultural and behavioral constraints can be summed up as follows¹²:

- Brevity of training for researchers regarding the protection and valorization of results;
- broadcasting of research results is predominantly limited to exhibitions, publishing, and participation in congresses, conferences and forums;
- lack of a link between the private sector and socio-professional environments, institutions and research centres;
- mismatch between research and enterprise needs and/or realities;
- information withholding is still prevalent among inventors, innovators, and researchers;
- inadequate social recognition of the researcher in the society;
- researchers' lack of information concerning the necessity of filing a patent;

- lack of interest of certain researchers for market research products.

(c) Political and institutional constraints

The political and institutional constraints impeding the effective use of innovation and research results include¹³:

- Lack of buildings and plants dedicated to research;
- high school training is not geared towards current development needs;
- mismatch between major development goals and research projects;
- holding of intellectual property rights (for example, patents) is not taken into account in researcher career value;
- lack of legal texts governing the sharing, utilization and marketing of innovation and research result outcomes;
- influential role of academics in the field of research;
- research projects are conceived in order to respond to career enhancement without taking into account national priorities.

(ii) OPPORTUNITIES

Notwithstanding the foregoing constraints, it is hoped that Africa will eventually overcome these impediments. Several opportunities exist for more effective harnessing and leveraging of the results or findings stemming from inventions, innovation and research, which could translate into a source of a sustainable development and progress for African States.

Indeed, it is now acknowledged that research at the national, regional and international levels is crucial from the perspective of the socioeconomic and cultural development of states. The recognition of the role of research in development across the African continent is reflected in the desire of authorities to support research and the valorization of research results. Since 2006, the Member States of the African Union have decided to earmark at least 1 per cent of their GDP for research. In the

¹¹ Michel P Sedogo, *Research Findings Development Programme and Innovations in Burkina Faso* (2009).

¹² OECD, *Science, Technology and Industry Outlook* (2012).

¹³ Aw Samba, *Information and Optimization of the Results of Agricultural Research in West Africa*, Information Librarian - Sciences (2002).

same vein as the New Partnership for Africa Development (NEPAD), the African Union plans to establish a sub-regional research pole throughout the Continent.¹⁴

From the standpoint of natural and human resources, there are several African researchers and engineers working at present in foreign institutes and in large structured factories; students in well-known international universities can also provide a valuable contribution to supply valorization and optimization. Consideration should also be given to the importance of the richness of the subsoil in certain regions of the African continent that are still not sufficiently explored and hold enormous potential in pharmacopoeia and in other spheres.

Beyond the increase in the structures and actors involved in research and innovation, and the creation of several frameworks for the expression and broadcasting of research, invention and innovation results, it should be pointed out that Africans are looking more and more to entrepreneurship and becoming interested in innovation and intellectual property subject matters.

IV. PROSPECTS

Given the behavioral, sociocultural, institutional, political and economic constraints hampering research efforts and the development process of African countries, research and innovation results should be maximized at the political, institutional, social and economic levels.

A. POLITICAL AND INSTITUTIONAL LEVELS

(i) Reforming universities, institutions and research centres

In the current economic context and the race for knowledge, universities, institutes and research centres are changing their structures to take into account current concerns. These changes may not only involve redefining relations with their economic, social and cultural environment, but also with their traditional mission of valorization.

A new system for rewarding outcomes from the utilization of research results must be clearly established to serve as a stimulant for researchers. In order to promote the creation of enterprises through research results, researcher funding should be introduced, in order to assist contractors. Elsewhere,

a linkage must be made between industrial property title handling and researchers' career system of valorization and appreciation.

(ii) Universities, institutes and research centres must be provided with adequate structures

To improve the management of marketing and industrial activities in universities, institutes and research centres, valorization units should be established. The focus of their work should be on:

- Technical and marketing identification of issues relating to the valorization of various research outcomes so as to gauge potential for trade;
- protection of research and innovation results and findings;
- formulation of strategies for research issue valorization;
- transaction, writing and management of research contracts and allowances;
- development plan for setting up and financing these projects; and
- management of intellectual property title security.

Furthermore, in order to contribute to states' economic growth, universities, institutes and research centres must be allowed to undertake costly activities, create innovative enterprise incubators, exploit patents and licences and market their business products.

(iii) Establishing a framework of incentives for research and innovation

Establishing an innovation and research framework, which is subject to financial constraints, can help ease impediments to research, development and innovation, encouraging loans for the purpose of stimulating enterprises' research efforts.

B. ECONOMIC LEVEL

At the economic level, African countries must respect the agreement from 2006 to grant at least 1 per cent of their GDP to research.¹⁵ Therefore

¹⁴ Pan African Conference on the role and place of the University in the 21st century Rabat (Morocco), Africa, 21-23 November 2011.

¹⁵ Pan African Conference on the role and place of the University in the 21st century Rabat (Morocco), Africa, 21-23 November 2011.

diversification of research financing sources can be achieved through the development of partnerships with the private sector, and international cooperation and economical research results generation for the private sector. In addition, cooperation and collaboration of efforts between intra-nation and inter-African partnerships would enable the optimization of existing infrastructures and plants.

However, developing an appropriate loan system will be crucial to stimulating research efforts of enterprises through support processes.

C. BEHAVIORAL AND SOCIOCULTURAL LEVEL

At the behavioral and socio-cultural level, it is important to emphasize:

- Ongoing training of employees in the area of research and innovation;
- collaboration should be enforced between research units and enterprises to enhance comprehension of their research needs and issues;
- private sector actors' awareness of new technologies;
- promotion of mobility, exchange and inter-African and international cooperation;
- the valorization sector should be taken into account in the preparation of research plans;
- innovators and researchers should be encouraged to share their findings and protect and value innovation and research outcomes; and
- decision makers and partners should be made aware of the role and importance of research results and valorization in the development process.

V. CONCLUSION

The importance of research and development for enterprises and States' competitiveness is well known, especially in the current context of globalization, characterized by increased rivalry and competition and ever more demanding consumers.

In short, promoting research, development and innovation coupled with the valorization of innovation and research results is a real challenge for African countries. Meeting this challenge will lead to the creation of wealth and sustainable economic development in Africa.

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