

WIPO/INN/ABJ/99/3

ORIGINAL: French

DATE: September 1999



GOVERNMENT OF THE REPUBLIC
OF CÔTE D'IVOIRE



WORLD INTELLECTUAL
PROPERTY ORGANIZATION

WIPO REGIONAL SEMINAR ON INVENTION AND INNOVATION IN AFRICA

organized by
the World Intellectual Property Organization (WIPO)
in cooperation with
the Government of the Republic of Côte d'Ivoire

Abidjan, September 1 to 3, 1999

HOW TO ENCOURAGE AFRICAN INVENTORS IN THE IMPLEMENTATION OF THEIR KNOW HOW

*Document prepared by Mr. Mamadou Traoré, Director General of the Engineering
and Software Analysis Office (BAILO), President of the Ivorian Association
for the Promotion of Inventions and Innovation
Abidjan*

By innovation, one generally means any process for introducing a novelty into any field. According to that definition, the exploitation of a completely new market or one that is relatively undeveloped, the development of new marketing or management techniques, all constitute innovations in the same way as the creation of products or new materials or the discovering of an original manufacturing process.

Innovation may therefore concern just as well products or production methods as commercial activities and services.

Innovation is a social process. It is the outcome of all the know how and activity that has been committed, knowingly or not, by a society in order to face up to its problem of survival or of existence. This starts with the awakening of a child to his environment, to the edification of a lawful society in which each person is free to undertake and to keep the fruits of his labor, where the State guarantees to each and every person a foreseeable environment and respect for rules of good conduct.

That is where innovation is at the very heart of development problems and is why we ardently call for greater involvement of WIPO in development activities in Africa.

It is not easy to deal in half an hour with the topic of “How to encourage African inventors to innovate”, particularly since, in this context, there are many preconceived ideas that circulate, mainly with regard to the funding of innovation.

The funding of innovation represents the sum total of the resources required for the process that takes the invention from the stage of technological research to that of industrial working, and then of marketing.

In this paper, however, we shall use innovation in the restricted sense of the word, that is to say inventions that permit technical progress and whose application implies new manufacture or new production processes.

We make a distinction between several phases between the conceiving of an innovation and its exploitation and each phase presents specific problems in addition to that of funding. Those are:

Research phase, properly speaking, which essentially comprises the scientific and economic aspects.

This phase can be subdivided into:

- Pure research (without economic interest);
- Basic research (which now has an economic interest since its motivation is to solve a problem of applied research);
- Applied research (which develops the possible applications. Although they are not speculative, it is of great economic interest).

As far as pure and basic research is concerned, the continent is lacking in installations. It would be necessary to equip the universities, the technical establishments and the research institutes with advanced laboratories, computer equipment and provide them with operating funds, under strict budgetary control. Unfortunately, more emphasis is placed on the status of the African researcher than on his professional environment.

Adding value to research, comprising:

- Evaluation of the possibilities of economic exploitation;
- Protection of the results of the research (filing of patents);
- The making of prototypes;
- Studies of dissemination, of the market and of advertising.

A small number of countries possess research institutes capable of undertaking the development of research or to add value to research. However, the rarity of expertise in this field and the lack of control over such institutions have turned them into administrations where self-justification frequently takes the place of an obligation to produce results.

One example of success in this field on the continent is the CSIR in Pretoria, South Africa.

Technological innovation centers could be established following that example, with at least one in each country, on a model that could be proposed by WIPO.

Industrial launching and marketing

Industrial launching and marketing of an innovation differ from those of a traditional (already existing) product due to the uncertainty bearing on the commercial success of the operation.

That uncertainty indeed accompanies innovation throughout its cycle.

- How can we foresee technical development?

This process is a long one, starting with the laboratory and finishing with a possible decision to launch the marketing of the product. Science and technology will develop during that period, but also the economic and social environment, competition, and needs will change. Therefore, from the very start and in a continuous manner, it will be necessary to foresee those developments and to integrate them in the process.

- How do we determine for an enterprise or for a nation, at a given time in its technical, economic and social development, the importance of the financial and human resources that it is reasonable to devote to the innovation?

- How do we choose between various research and development projects that are possible?
- How do we share the budget envelope as a function of the objectives pursued and the probability of success?
- How do we program the means and make them coherent with the objectives of the entity that has taken the decision to invest in research and development?
- On average, the share of exploitation profits under a license is between 15 and 30% for the patentee, but who can determine in advance what the profits will be?

Research and development methods and management tools have been developed and refined over the last 40 years under the generic term of **technological evaluation methods**.

On the border between scientific research and economic activity, these methods, that are both numerous and varied, constitute tools to reduce that uncertainty, instruments for preparing decisions, although the decisions themselves are always political.

The continent suffers from a lack of knowledge of such methods and tools. As far as we are aware, the only experience in this field is the teaching given between 1993 and 1997 at the Panafrican Management Institute for Innovation at Pointe Noire in the Congo (Brazzaville). Again, in this case, WIPO could assume the responsibility of organizing, twice a year at least, a training course for French-speaking participants and another one for English speakers in such methods and tools.

We shall not deal here with the methods, but with the funding of the marketing of a new product.

At each of these stages, the innovator needs to incur significant expenditure which the expected revenue will not necessarily cover and then only at a later stage. Such expenditures are highly variable in volume (generally, for one franc spent in pure research, ten will have to be spent in the development phase and 100 for the marketing), and these cannot be controlled over time since they will have to be pursued until the final phase of the process has been successfully implemented.

THE RISK INHERENT IN INNOVATION

On average, only five of 100 research ideas go beyond the stage of experimentation and one only reaches industrial implementation. As a general rule, forty new products must be launched in order to sell five.

These figures do not constitute a fixed rule of course, but they demonstrate an order of magnitude that gives an idea of the uncertain nature of the profitability of investment in research and development.

In addition to this uncertain nature, it also has to be remembered that the profitability of research is very slow to emerge.

Discoveries are made progressively and many years pass between pure research or basic research and applied research and development research. This period has become very short in our days (18 months for domestic electronics) but remains difficult to shorten. The time is all the more difficult to shorten since it confronts two categories of economic players: manufacturers and scientists whose behavior, centers of interest and motivation are far from being compatible.

The passage from invention to innovation is encumbered by the fact that neither the demand nor the offer are instantaneously adjustable; it takes time for the market to learn and perceive the nature of new or improved products and to acquire the necessary experience in order to derive the most from them. For this reason, 90% of new products experience a slowdown of interest in the fourth year of their marketing, and 60% of them do not have a lifetime of more than three years.

Innovation is an operation accompanied by risk when its realization is distant. This characteristic explains the difficulties encountered by innovators in obtaining outside financial help through traditional procedures. The profession of the traditional banker is not to take risks. He is not trained to do that. He participates neither in the profits nor the losses of the enterprises funded by the money he is lending. He lends under conditions that are known in advance and covers all his risks by guarantees.

The preconceived idea that banks do not assist enterprises is wrong, particularly when we consider that in Africa the risk deriving from the unforeseeable environment is such that the simplest of commercial operations become extremely hazardous, with a high level of returns that is unknown in other areas. To take a risk is the profession of the risk capital that funds the credit part of the balance sheet. It shares with the entrepreneur in the profits and losses of his enterprise.

However, the nature and amplitude of the obstacles met vary considerably depending on the specific case and particularly with regard to the origin of the innovation.

Two situations may arise:

1. The concept is the work of an individual

An individual may transfer his rights (patent transfer, exclusive or non-exclusive licensing) to an already existing firm that will work the invention, or may set up his own firm to exploit it. In the first case, the needs for funds concern only the expenditure for developing the invention and presenting it to firms that may be interested. In the second case, the needs derive from the creation of a new enterprise. In these cases but to varying degrees, the risk considerably exceeds what is normally accepted by the banking system which, in absence of very substantial guarantees on the part of the applicant, is usually very reticent to give its assistance. Use has to be made of risk capital, but that is unknown in Africa.

2. The concept is the work of an enterprise

An enterprise, **unless it possesses a sufficient self-funding capacity**, also meets the obstacle of finance. Certainly, a firm may claim that the development and exploitation of an invention corresponds to its normal development and may obtain the award of credit for installations. In comparison with a new enterprise, an existing enterprise has the advantage of being able to give the financing institutions information and elements of assessment in respect

of its preceding activities. Research and development nevertheless considerably lengthens the cycle of production since it is no longer a matter of the firm itself assuming some production activity, but rather of finding a new product that does not today exist but which, in six or seven years, will constitute an important source of revenue. The operation of the enterprise is therefore subject to quite different conditions and earlier references no longer apply or are not sufficient to convince the lending institution to participate in the operation.

At this time of globalization, it is necessary to adapt mentalities to the financial viability of an enterprise. Every enterprise today must build up its viability through a sufficient gross margin of self-funding in order to ensure its continuing existence.

It will therefore seem, whatever the hypotheses chosen, that only a specific source of funding for the credit part of the balance sheet is able to respond to the needs of the innovator.

To review these specific sources of funding is very simple in our latitudes.

There are none that are specific to innovation in Africa and, beyond the cooperation agreements with European countries and the non-profitmaking, non-governmental bodies (NGOs), there exist practically none at all.

There are, however, funding mechanisms and have been set up in the United States and in Europe from which our countries could take inspiration.

The State is central to certain of those mechanisms that use two preferred intervention techniques: direct assistance and tax incentives.

I. FUNDING OF RESEARCH

In the research phase of the new product cycle a traditional distinction is made between:

- basic research;
- applied research;
- research and development, which is more particularly related to industrial implementation of a discovery that has reached technical maturity.

The cost of basic research cannot be amortized by exploitation since that is too distant and too hazardous and far from its results. It is a whole nation that must assume the funding, either directly through the State or indirectly through the private sector.

The applied research and research and development may result in profitable exploitation in the medium or even in the short term. The State's intervention can only be additional or subsidiary to the activities of private enterprise.

I.1 DIRECT ASSISTANCE

The sources for funding basic research in our countries are the Ministries of Education and of Scientific Research, through the budget of the State and funds made available under bilateral agreements. Such funding generally applies to public servants and independent

researchers where private funds are generally excluded. Nevertheless, certain northern NGOs are developing a degree of activity in that sector.

Applied research and research and development also enjoy public funds through the Ministries of Education and of Scientific Research, but also the Ministry of Industry and from bilateral agreements. The prime sector for such assistance is agriculture.

The part played by the NGOs is becoming ever more preponderant in that sector.

The private sector is totally excluded from direct public assistance to research. That is one of the major handicaps of the developing countries.

It should be possible for private enterprises to enjoy research subsidies under contracts concluded with the public authorities in relation to operations of national interest.

I.2 TAX INCENTIVES

The State may indirectly stimulate research by permitting it to be funded through techniques that may be placed under two headings: assessment of the tax base and taxes on registration.

I.2.1 ASSESSMENT OF THE TAXABLE PROFITS OF FIRMS

Enterprises should be authorized to deduct from their taxable profits, for the assessment of the taxation, all those operating expenses committed for scientific and technical research activities (personnel costs, overheads). But such deductibility should not extend to capital as such!

As far as capital assets are concerned, the enterprises that themselves carry out their capital investments, in order to undertake scientific and technical research activities, should be allowed, under certain conditions, to apply an exceptional amortization of 50%, deductible from their taxable profit as from the first year.

Shares subscribed in the starting capital or the increases in capital of public or private research firms or bodies approved by Ministry of Finance should be subject, as of the first payment of the subscription, to an exceptional amortization equal to 50% of the amount of the subscription. The plus value generated by the transfer of shares subject to this procedure should not be taxable under certain conditions.

The equipment and tooling used for scientific and technical research activities as also the prototype manufacturing workshops should be made subject to degressive amortization.

A further major financial incentive would be the deductibility by the enterprises from their taxable profits within the limits of a certain percentage of their turnover (2 % in France) of the donations they make to approved research firms or bodies.

I.2.2 PROVISIONS ON REGISTRATION TAXES

A reduced rate of fees for change of ownership should be extended to the acquisition of real estate made in view of setting up scientific and technical research establishments.

II. FUNDING THE DEVELOPMENT OF RESEARCH

Research development refers to the stage immediately following the finalization of the invention and preceding the industrial and commercial launching.

For the inventor, it is a matter at this stage both of protecting the result of his research and of proving its reliability from a technical point of view and ensuring its commercial exploitation possibilities.

Development covers the funding of patents and their possible assignment, the assessment of possibilities for exploiting the innovation and the relevant advertising.

At that juncture, the commercial prospects of the innovation may be perceived. Therefore, it is logical that the innovator should then assume the major risk of the operation and the State should limit its action to setting up a favorable framework by means of direct assistance or tax incentives.

The development of innovation may be funded by machinery established by private bodies.

An essential condition for financing the development of research is the existence of industrial property rights in the invention, capable of being assumed by the body that seeks financing. **A patent is both a guarantee of the existence of exclusive rights in the invention and, under certain circumstances, a guarantee that the invention has a certain value.**

II.1 DIRECT PUBLIC ASSISTANCE

Within the framework of development assistance contracts, subsidies that are reimbursable if successful, providing funding within the limits of a maximum percentage of cost: (50%) should be awarded to enterprises. This subsidy will enable an enterprise to finance the supplementary studies, the experimentation and the trials, the making of samples, models, the finalization of prototypes or pilot units or new processes.

II.2 TAX ARRANGEMENT FOR INDUSTRIAL PROPERTY

The institution of preferential tax arrangements for the proceeds of industrial property is able to promote the development of the results of research.

The exploitation mode and nature of the industrial property right, which may be a patent, a trademark, an industrial design or a non-patented manufacturing process, will condition the application of such preferential tax arrangements.

II.2.1 DIRECT EXPLOITATION OF THE INDUSTRIAL PROPERTY RIGHT

Such direct exploitation may be carried out either by an enterprise or by a natural person.

II.2.1.1 WHERE THE RighthOLDER IS AN ENTERPRISE

The expenditure incurred with a view to making an invention is deducted as exploitation costs from the profits of the enterprise. Subsequently, the patent may not be the subject of amortization but must be entered in the assets with a value of zero.

II.2.1.2 WHERE THE RighthOLDER IS A NATURAL PERSON

In order to exploit his right, such person may set up his own industrial enterprise. If, in order to do so, he sets up a firm, the contribution of the patent to the enterprise (entry in the assets) should not be subject to any taxation. The proceeds of exploitation of the patent on the other hand, should not enjoy any preferential treatment.

II.2.2 ASSIGNMENT OF THE INDUSTRIAL PROPERTY RIGHT

II.2.2.1 PATENTS

- **The vendor**

Where the vendor is a private individual, the selling price received by him may be fully exempted from taxation under certain conditions (the inventor may not participate, either directly or indirectly, in the exploitation of the invention...) and the assignment exempted from VAT in those countries where it exists.

Where the vendor is an individual enterprise or a firm, the proceeds derived from assignment of the patent or a patent that is pending may be assimilated, under certain conditions, to a long term plus-value subject as such to a reduced rate of tax and exempted from VAT where it exists.

- **The purchaser**

Where a patent has been bought in order to be used and the purchaser enters the patent in his assets, he may not show the acquisition price as a charge that can be deducted from his taxable profits. On the other hand, the patent may be amortized until its exploitation falls within the public domain.

In those cases where the patent is resold, the purchaser is in the same situation as that described above. The vendor's profits constitute industrial and commercial profits and are subject, depending on the case, to income tax or to cooperation tax.

However, where the patent assigned by the enterprise represents an element of which capital assets or where the acquired patent was bought more than two years previous, the profits from sale are simulated to long term plus-values.

II.2.2.2 OTHER INDUSTRIAL PROPERTY RIGHTS

This concerns trademarks, industrial designs, manufacturing processes or formulae.

- **The vendor**

Where the vendor is an individual, the profit made through the assignment of trademarks, manufacturing processes or formulae should be considered as non-commercial profits and not be subject to VAT where it exists. The same should apply to the assignment of industrial designs. The calculation of the taxable profits should correspond to the assignment price reduced by a lump sum deduction of at least 30%, representing the costs borne by the inventor (the inventor may request deduction of actual costs of a higher amount if he is able to provide evidence).

Where the vendor is an individual enterprise or a firm, the profits obtained from assignment of a trademark or an industrial design are considered as industrial and commercial profits. In the case of manufacturing processes or techniques, assignment should enjoy the arrangements for long term plus-values.

- **The purchaser**

In the event of use made by the purchaser himself, contrary to patents, trademarks and manufacturing processes and techniques, although entered as assets in the balance sheet among the intangible capital assets, may not justify amortization. Exceptionally, a depreciation could be recognized by means of a deductible provision on the taxable profits.

Where resold by the purchaser, the tax arrangements are the same as for patents in an identical situation.

II.3 GRANTING OF A LICENSE BY THE INVENTOR

II.3.1 THE LICENSOR

Where the inventor is an individual, the royalties received for the grant of licenses or patents, trademarks, manufacturing processes or formulae or industrial designs should be assimilated to non-commercial profits. The lump sum deduction of costs should be applicable when assessing the taxable basis.

Where the inventor is a firm or an individual enterprise and to the extent that the condition of exclusiveness of the license is satisfied and subject to certain conditions, the profits derived from licensing may be assimilated to long term plus-values whether the license concerns patents, or manufacturing processes or techniques.

II.3.2 THE LICENSEE

The licensee is allowed to include in his exploitation costs that are deductible from profits the royalties paid to the inventor with respect to a license for working a patent or the right to use a trademark, industrial design or manufacturing process.

II.4 PRIVATE FUNDING

Despite the special nature and the size of risks incurred, private financing bodies (banks) have drawn up specific schemes for financing the development of innovation, particularly with respect to assessing the exploitation possibilities of the invention.

The scope of these credit schemes is often limited to financing the studies carried out by consultants and organization experts and excludes those undertaken by the enterprise itself in order to establish a diagnosis on the profitability of an investment.

III. FINANCING THE INDUSTRIAL LAUNCH AND THE DEVELOPMENT

The initial exploitation of innovation and the relevant investments differ from the innovation development period by an absence of any study or finalization work. It is now a matter of launching the manufacture of a product whose characteristics have been finalized. The necessary investments are therefore similar to those required for launching any known product. However, their financing is made more difficult due to the uncertainty accompanying the commercial success of the operation.

Risk capital is a privileged source for this type of financing. Risk capital may have different kinds of objectives. To be effective, it must be based on a credible traditional banking system and on guarantee funds. It would be in the interest of Africa to promote the development of risk capital on the continent. An aggressive policy of technological grafting could be a factor in attracting such firms. Technological free zones (not only from a fiscal point of view) could be one of the elements of such a policy.

In the developing countries, the public authorities have generally established investment codes which could be of benefit to innovators. With the WTO treaties and the new version of the Multilateral Agreement on Investment (MAI), the field of intervention for the State is continually diminishing. However, there is legally a certain margin of action. The State often participates in such enterprises which enjoy priority approval with a State guarantee for certain loans.

These intervention schemes are designed, however, more as sources of subsidy for consumption than as an aid to innovation. That is one of the main reasons for the difficulties that are met when an attempt is made to evaluate government assistance to innovation in the countries of the third world.

The NGOs have been playing an ever increasing part since the beginning of the seventies, in the financing of innovation in Africa. They are behind the relative success enjoyed by solar pumps in the Sahel. (Although it is true that by subsidizing consumption they have in fact financed innovation in the developed countries in that particular case).

Unfortunately, a humanitarian shortsightedness prevents those organizations from playing their full part in the funding of innovation in Africa. Their aim is not to be concerned by economic issues. They deal in humanitarian affairs and do not make use of the technological assessment techniques in order to evaluate the numerous innovative projects that they fund. In the same way as the UN bodies (UNDP), they artificially cut up the whole that is constituted by the market (with its full sociological connotation) from the technology and the product involved in innovation to make up a pair constituted by the technological product and society. They then consume enormous sums, proportionally as much as the specialized agencies of the UN, in carrying out sociological studies which, for them, must reflect the thinking of the moment and produce a description of the problems involved in any innovation.

The innovators and their associations would have a lot to gain in exploring this source of funding since in Africa it is probably today the only source that is truly open to them at the stage of industrial development.

[End of document]