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THE POTENTIAL IMPACT OF INTELLECTUAL PROPERTY RIGHTS ON THE FORESTRY CHAIN IN URUGUAY [*] – SUMMARY

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1. The Annex to this document contains a summary of the study on the potential impact of intellectual property rights on the forestry chain in Uruguay, prepared as part of the project on intellectual property and socio-economic development (CDIP/5/7 Rev.). The present study has been prepared by Mr. Guillermo Anlló and a work team from the Interdisciplinary Institute of Economic Policy (IIEP) of the Faculty of Economics of the University of Buenos Aires (Argentina).

2. The CDIP is invited to take note of the information contained in the Annex to this document.

[Annex follows]

[*] The opinions expressed in the present study are the sole responsibility of the authors and do not necessarily represent the points of view of the Member States or Secretariat of WIPO.

SUMMARY

This study is the result of an initiative by the World Intellectual Property Organization (WIPO) to analyze the impact which intellectual property rights (IPRs) have on the development of forests, an activity identified as strategic by the Government of Uruguay. For that purpose, the operation of the global value chain for forestry production was studied in order, subsequently, to evaluate in which area and in what way IPRs affect both its current development and its future prospects, through the consultation of an abundant bibliography and the holding of a series of interviews with reference sources and players involved in the activity.

Sustainable production of wood as an industrial component

Renewable biological products are beginning, more and more, to be considered raw materials for multiple industrial applications, thereby modifying their traditional production logic. This phenomenon is occurring throughout the majority of value chains of biological origin, where the challenge ranges from being able to control ever more closely the unpredictable variables of the process of nature, with a view to reducing uncertainty, making the process more efficient and, thus, adding greater value through greater productivity by empowering certain specific features in the product to be obtained. An additional alternative is the growing diversification and segmentation of the final products. A large part of these interventions in natural processes in order to achieve greater control of biological variables depends on the incorporation of innovations.

In the particular case of sustainable forest-related activity, the length of the production cycle is more than 15 years. This leads to the need to plan the whole chain from its beginnings, which means first deciding what will be planted, in order then to await its optimum maturity and thus be able to access the raw material for the purposes of subsequent industrial conversion.

This introduces certain features specific to forest activity which must be taken into account when discussing IPRs in the sector.

The forestry sector as a value chain

The forestry sector consists of traditional activities which begin with the extraction of wood from forests for its industrial conversion. The final use is predetermined, to a large extent, by the type of tree to be planted and even by its variety; each variety, in turn, has a life cycle span. This leads to the different cycles of business in wood and products. Wood is therefore the most valuable resource to be extracted from forests, and is used both for the production of energy, and for sawdust, the panel and plank industry and the production of pulp and paper. Other non-wood forest products may also be important: food, additives for foodstuffs (mushrooms, fruit, grasses), fibers (used in construction, furniture, clothes or utensils), resins, rubbers and products used for medicinal, cosmetic or cultural purposes (Food and Agriculture Organization (FAO) 1999).

In Uruguay, during a number of decades of forest development, the value chain down stream has three production sub-chains: cellulose, processed wood (treated wooden cylinders, wood turned into sawdust, planks, carpentry work, furniture, moldings etc.) and energy. The three are based on different forms of logic and although the first two and the production of energy from the residues they generate may be complementary, the three compete for the same raw material: trees. Although the trees to be planted may be used as material for the three forms of production, the output of each variety differs according to its ultimate purpose. Moreover, mention may be made of a fourth sub-chain associated with the chemical industry (resins, essential oils, bioplastics, etc.), which throughout the world has advanced significantly, but in Uruguay there scarcely exist any signs of productive enterprises.

The assets of Uruguay, within the forestry chain, are focused mainly on the primary phase of the value chain and on the first stage of industrial conversion. Uruguay has one-fifteenth of the forests planted in Latin America – 0.4 per cent of the world total – with the possibility to quadruple the area under cultivation. In accordance with FAO data, in 2010 Uruguayan exports of forest products represented 0.54 per cent of forest exports throughout the world. When broken down, it can be seen that this ratio has the following values: wooden cylinders, two per cent; wood pulp, 1.9 per cent; fiber planks: 0.14 per cent; sawdust, 0.13 per cent; and paper and cardboard, 0.04 per cent.

Innovation in the forestry sector

At the global level innovations in the forestry value chain have resulted in increased competitiveness for the sector. Relevant innovations have been introduced in the mechanization of the harvest, the implementation of new logistics practices for the transport of cylinders, the introduction of plantations in various regions, the development of new methods for the extraction of fibers and new products, etc. Satisfying the current challenges – such as adding value, complying with environmental regulations or satisfying the growing demand for wood – also requires additional innovative efforts.

The launch and development of the majority of forestry activities in Uruguay have rested on the adoption of foreign knowledge and technology. In this regard, local efforts at innovation – undertaken both by enterprises based on Uruguayan capital and multinationals – are directed mainly towards three areas: adaptation to local conditions of technologies from abroad (for example, logistics issues and use of imported machinery); the development of new specialized materials that need to be adapted to local conditions (such as new varieties of trees that may be adapted easily to the Uruguayan soil and climate), and technologies developed to resolve local needs (such as the generation of energy).

The use of intellectual property in the forestry sector

The development of forestry activity – be it by private enterprises or public organizations – requires technical knowledge, major investment and strategic assets for its organization. On these grounds, establishing the scope and limit of ownership of the knowledge generated, as well as the protection thereof, is a crucial matter resulting in genuine concern for IPRs in the forestry sector.

The concepts traditionally associated with human inventiveness and its application in the forestry industry are based – at least partially – on pre-existing biological material. To a certain extent, this opens up new challenges. In this connection, the incentives for the private sector to invest in this type of activities (which are socially desirable) may be limited by the lacunae – be it through absence or insufficiency – of the IPR system of rules in force at the global level.

In this regard, at the global level the use of IPRs to protect genetic improvements in trees is relatively recent and expanding slowly. This is due mainly to the fact that the progress made in biotechnology has expanded the range of tools available to modify trees, which has meant that firms are inclined to protect their developments. The application of these modern technologies has been crucial in bringing the genetic improvement of trees up to a level of sophistication comparable to that achieved by agriculture (Merkle and Dean 2000). However, compared with seeds, the application of genetic engineering to forestry activity in order to obtain genetically modified plants is experiencing delays. On a different level, forestry activity is strongly regulated by a system of certification used to prove that the products derived therefrom were generated in an environmentally responsible manner. It is the case that the guidelines followed by certifying organizations are strongly opposed to the genetic modification of trees, which is still at the research stage (Carson et al 2004).

Similarly, those forestry enterprises based in Uruguay have made almost no use of the system of protection for plant varieties (PPV) in order to register their genetic improvements, with a number of exceptions. The same thing is happening with the patent applications, where very few applications have been filed in Uruguay and of those, virtually all of them are of foreign origin. Local efforts have been directed to the use and adaptation of said imported technology.

In the practice of forestry activity at the global level, there are other forms of protection for the knowledge generated which are much more extensive. For example, the exchange with other firms of genetic material for research purposes is undertaken generally speaking by means of private contracts. The same legal instrument is also frequently used when material is transferred to a subcontractor. Furthermore, the vertical integration of the suppliers of genetic material is very common and these mechanisms are the most widely used in Uruguay.

The forestry chain in Uruguay

The most relevant forestry market in Uruguay is fiber, a fundamental element for cellulose, both domestically and for export. ***The cellulose sector****,* although it is not the only one, has become the main industrial activity within the chain in the past few years (more specifically from the start of operations of the UPM plant in 2007). In 2010, the relationship of harvested wood intended for cellulose production, with respect to any other purpose, was 6 to 1 (Forestry Agenda 2011, Uruguay). For this precise reason, the major proportion of harvested species belong to eucalyptus (ideal for this industry), and the harvesting of pine trees is, relatively speaking slightly smaller in scale.

The ***production of cellulose*** is concentrated in two plants of enterprises based on multinational capital, of which one is in operation and of which the activities of the other are planned to begin in 2013. Each plant installed has entailed an enormous investment project for Uruguay, with great impact for the national economy. As regards innovation, although various adaptation-related developments have occurred at the local level, the most relevant assets come from overseas. Proof of the impact of these new undertakings is that, since 2008, the main product exported by the forestry chain in Uruguay has been “Cellulose paste”, representing in 2010 64.5 per cent of the total amount exported. The second exported product was “Chips” with 13 per cent of the total, followed by “Paper and Cardboard” with 9.3 per cent in 2010 (Uruguay XXI, 2011). All these are elements in the paper chain.

In order to guarantee good uniform quality of raw materials, the major ***cellulose*** production enterprises have introduced their own nurseries and forestry plantations, which in turn allows them to resolve the aspects linked to the appropriation of the knowledge generated through vertical integration.

The ***solid wood sector*** includes everything which is not fiber. Initially, there were prospects for significant industrial expansion with the installation of more large-scale factories for panels and sawmills. However, the fall in property investments in the main end markets for these products has limited their expansion. Although there are more firms than in the paper sector, production is also highly focused. Only the two largest companies have the capacity to compete internationally. It is important to emphasize that, owing to its characteristics, Uruguay cannot compete at the international level in relation to large-volume products. For this reason, it must produce to a high standard, in order to be able to compete in terms of quality; this is only possible if high-quality wood is obtained, hence the relevance of the programs to improve original species.

The ***sector for mechanical conversion of wood*** is the second in terms of levels of production and is basically located in the north of Uruguay. Its main products are sawdust, plywood panels

and medium density fiber (MDF), which currently account, in cumulative terms, for US$100 million in annual exports. It is important to point out that sawmills and laminate plants undertake technically separate processes. Uruguay has firms carrying out both activities.

As in the case of cellulose firms, the manufacturing plants installed by firms for this activity (be it sawmills or multi-laminate factories) were ready made plants brought from abroad, whose technology is also imported. In all cases, the interviews mentioned that there was a process of adaptation that took place at the local level. Although this is desirable for the country, since it involves the development of local skills – with the unique exception of marks, there has been no evidence that these changes have been translated into intellectual property applications. Another shortcoming detected is that, in relation to the production of solid wood, the chain should be integrated inside the country.

For 1990, 60 per cent of forestry production was intended for ***the energy sector***, given that the whole of Uruguayan industry was supplied with wood for energy-generation purposes. Although the relative values have changed (the wood sector for cellulose grew strongly from that time onwards), the absolute values for wood intended for energy production have been maintained or increased slightly – since the industry continues to be supplied with wood for this purpose. Currently, there are firms in the sector which have plants that generate electrical energy from biomass[1]; the energy industry advocates benefiting from this, since the use of a joint product which is previously unused involves greater benefit from woodland and enhanced development for foresters. In 2006, Uruguay conducted a mathematical analysis of the future availability of biomass, which was more than considerable. According to this system, the major firms in the sector are of note, since they set up plants for their own consumption, but return the surplus to the national network. Such surpluses are relevant values within the country's energy matrix (Uruguay XXI, 2011). At the same time, there are a number of projects for plants to process biomass and provide energy exclusively to the electricity grid. There are now eight plants which are generating electrical energy with biomass.

The protection of knowledge in the forestry chain in Uruguay

According to the information gathered in the interviews conducted for this study, there is no market for clones. Each firm develops and produces varieties for their own use. In particular, the multinational firms that operate in Uruguay – both for wood and pulp – have their own improvement programs – since they are large-scale operations. In the cases in which these firms do not plant their own forests, they give the genetic material to their producers – clones or seeds – with 20-year contracts known as "promotion agreements". These agreements are typical in the places where work is done on implanted forests – as is the case in Uruguay – which leads to the existence of relevant local development. In Uruguay, even though this type of development is undertaken with local qualified manpower, it is usually owned by multinational firms. By contrast, these developments do not occur in those places where the exploitation is in relation to natural forests – for example Finland, where the native forest is very important.

Within the group of **nurseries** that exist in Uruguay, five which are *clone-based* are worthy of note – those that can develop clones, for which reason they are those that have more advanced technical capacities – which are in turn those that are larger in size. Three of them belong to the major multinational firms in the sector based in Uruguay, a sign of the vertical integration strategy employed by these firms, which helps to protect their strategic assets since they do not sell them to third parties. There are, however, cases of transfer of genetic material, but always under a rental contract or association with the producer. In these cases, the genetic material (in

[1] In 2011, 18 per cent of the Uruguayan energy matrix was made up of biomass residues and 12 per cent of firewood (Ministry of Industry, Energy and Mining (MIEM), National Directorate of Energy (DNE), Energy Evaluation 2011)

the form of seeds or clones) is supplied and the subsequent purchase of wood is guaranteed, subject to a confidentiality agreement, based on the non-propagation of the material transmitted.

In addition to their reproduction development programs, firms in Uruguay do not use the system for protecting plant varieties (POV) for genetic improvements. For the time being, only the public sector and a private firm have registered any material. Various reasons might help to explain such conduct. In principle, not all firms have material that can be protected, since reproduction programs have recently been in their initial stages. On the other hand, Uruguay still has little experience in the development and protection of genetically improved trees – this is a relatively new activity, given the time it takes for the trees to mature. At the same time, there is no market for improved trees (although there is a market for seeds in relation to agriculture); the developments undertaken by firms are therefore for their own consumption, reducing the need for external legal protection. Finally, according to those interviewed the POV system does not appear to be the most appropriate for forestry activity, at least as this is currently devised.

It is also clear from the interviews conducted that dissemination or exchange is not viewed as a problem or threat. There are few nurseries with cloning capacity – although the technology is simple, it requires infrastructure and knowledge alien to a common producer – and a large firm would not do it since the size of the market imposes a high-cost prestige factor. There are also indications of limitations on qualified staff, as a result of which the entire demand in the sector cannot be met[2].

Apart from the influence exercised by nurseries on the whole of subsequent productivity in the chain, there is also a strong influence due to the concentration of ownership of implanted forests. The two pulp processing plants that exist today in Uruguay control, through ownership or legal contract, half of the hectares of implanted forests – around 400,000 ha – while the two main producers of semi-manufactured products – pine and eucalyptus respectively – administer about 100,000 hectares (Forest Agenda, 2011). In turn, there is a series of investment funds (four based on foreign capital and the other one on local funding), each of which administers an area ranging between 10,000 and 30,000 hectares, which might suggest that there are another 150,000 hectares. We can therefore be sure that some 75 per cent of the ***forested area*** is under the control of a little more than ten firms or investment funds, which are those that impose the logic of the system on the whole of the chain (including the technology to be used, the future possibilities for expansion and other key issues).

When the patents applied for in Uruguay are analyzed, the vast majority of those relating to pulp and wood production come from abroad. Only one patent for the production of wood was filed by a Uruguayan applicant (out of a total of 25 patents). Eighty-eight per cent of patents belong to firms located in the United States of America or in Finland. In relation to patent applications for cellulose production, 100 per cent are filed by foreign applicants from Finland (17), United States of America (5), Brazil (5), the Netherlands (2), Spain (1), United Kingdom (1), Austria (1) and Canada (1). Local efforts have been directed toward the use and adaptation of said imported technology.

In turn, in Uruguay there are patents for inventions relating to energy generation, based on residues (filed by local applicants). In addition, a patent has been filed in the United States of America for a drying apparatus and a process for using wood as a fuel.

[2] Interview with Mr. Monteiro (Maresia forest cloning nursery), El País newspaper, 2011.

Intellectual property challenges in the forestry sector

In sum, a couple of decades ago, the natural conditions specific to Uruguay were lent support in the form of an incentive-based mechanism that first gave rise to a large number of artificial forests and, more recently, substantial industrial capacity (in the local industrial context); as well as the present this is the product, to a large extent, of such measures from the past, while the future (a possible second stage expanding and replacing forests that are beginning to enter the industrial phase) depends on current public measures and private strategies. In the current context, it would appear that there is little to do in terms of IPRs in the first links in the chain; in the future, the scenario is open-ended. Reality shows that there are various critical points of view in relation to IPRs; one of them refers to what happened in terms of access to genetic materials.

What do we know about what happened?

(a) That genetic materials are controlled by integrated firms;

(b) That such firms have the best technologies and, as such, make these a competitive asset;

(c) INIA is the public counterweight to small producers, but an ever increasingly unreliable counterweight;

(d) Downstream, the vast majority of the developments come from overseas, almost ready made;

(e) The process of local adaptation is still of relatively little significance, but its future development may be promising;

In precise terms, in the future (i.e. in terms of repopulation of future forests and possible replantations), it is to be hoped that:

(a) biotechnology continues to grow in its decisive role;

(b) the development of varieties will continue to be relevant, since the gene patenting model also involves that of the variety;

(c) new technologies (e.g. genetic imprint) will be important in third-party supply contracts. If these are not resolved through public or decentralized bodies, they will be implemented by means of private agreements.

In terms of intellectual property and its impact on the forestry chain in Uruguay, in view of the above the strategic value of the management of forests should be noted. The development of what is planted upstream will determine the development of the activity downstream. In this regard, as the study shows, 75 per cent of forest areas is owned by a small number of firms. Those which own more land under their supervision are, at the same time, multinationals which, although they have set up the most advanced nurseries together with laboratories, hold the vast majority of their research investments in their head offices, for which reason it may be concluded that the intellectual property problems they may encounter – or the relevant strategies that they devise for themselves – will be dictated from outside the country.

Furthermore, if Uruguay plans to diversify its forestry chain and make progress toward more complex links, it would be desirable to study which IPR instruments might accompany and stimulate growth in those areas (biomass and derivatives other than wood, in the main).

[End of Annex and of document]