Socio-economic Study of the Impacts of Botnia S.A. Pulp Mill Project in Uruguay

Executive Summary
May, 2004

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Executive Summary

1. Introduction

The present study provides a systematic assessment of the main socio-economic pros, cons and social challenges regarding the Botnia S.A. pulp mill project in Uruguay. It was carried out by conducting in-depth and quantitative research of predictable macro-economic, regional development, social and forest-sector-specific impacts. The study methods were:

- The prevailing situation and development outlook of the forest sector was reviewed in a comprehensive manner. Specific forestry sector statistical information was provided by public and private sources in Uruguay. A thorough analysis was carried out of present and future situation of the sector, analyzing the different development processes. Forest resources and their structure, institutional and regulatory environment, forest management, wood harvesting, wood utilization, wood trade, timber prices, and existing forest industries were analyzed. The expected impacts of the pulp mill project were systematically assessed.

- The development scenarios of the national and regional (investment region) economies were analyzed (baseline forecast, without the Botnia S.A. pulp mill project). To assess the economic impacts of the project in a comprehensive manner, a tailor-made input-output model of the Uruguayan economy was constructed, using the latest available input-output data (year 2000), and adjusting values to the price situation in 2004. The Botnia S.A. pulp mill project was incorporated into the input-output model by using economic data that relates the project with the Uruguayan forest sector and the overall national economy. The impacts are defined in terms of added value, employment, population, additional private and public investments, and public finances mainly. The estimated impacts were compared with the economic situation in 2004 and incorporated into the scenarios of the Uruguayan national economy and the economies of the investment region (development scenario with Botnia project). The direct and indirect development impacts of the Botnia S.A. project were defined both during the construction phase and during the operations phase, on the key sectors and variables.

- The socio-economic outlook of the investment region (Rio Negro, Soriano, and Paysandú, in Uruguay, and Entre Ríos in Argentina) was analyzed by using available statistical information together with the fresh information of the field surveys. Municipal and other local stakeholders were consulted to develop impact scenarios of the project. The study of Entre Ríos in Argentina was limited by data availability. While a review of its forestry sector and some relevant economic data are included in the study, a deeper assessment of the socio-economic impact and the overall impact to the economy of Entre Ríos would merit more work considering the resource potential of the region once the project moves ahead. The mill will increase demand for example for Argentinean wood suppliers and construction service providers, and will provide working opportunities for people living nearby.
2. The Botnia S.A. Project

Oy Metsä-Botnia Ab is considering the possibility of setting up a world-scale pulp mill in the city of Fray Bentos in Western Uruguay. The mill would produce bleached ECF- (elemental chlorine free) eucalyptus kraft pulp, with the production at full capacity being 1 million tons/annum. Wood raw material would be procured partly from forest plantations owned by Compañía Forestal Oriental S.A., owned by Metsä-Botnia and its shareholder UPM-Kymmene. The Mill would be based in all aspects on the best available technologies, e.g. for forestry, wood harvesting and transport, pulp production itself, environmental pollution control and management.

The investment would amount to USD 933 million including a very large amount of construction work. Both the construction period and the pulp production period itself would induce substantial development impacts in the region. The mill would produce bleached hardwood pulp of consistently high quality at competitive cost, hence enabling exports to Europe, Asia and North America.

The construction period would involve a large number of construction workers who would live and work in Fray Bentos during 2 years. Housing facilities would need expansion and improvements for both the construction and subsequent pulp production periods. The pulp mill would consume about 3.5 million m³ of pulpwod when operating at full capacity. Continuous purchases of pulpwod from the plantations of FOSA and from other forest plantation owners would create good opportunities to further develop the forestry activities in the region. The mill would use purchased electricity when starting up the production, and fuel oil or natural gas for the lime kiln. During normal operation, the mill would supply its excess electrical energy to the national distribution grid on the basis of a delivery agreement to be made. The operation of the mill would involve substantial transport flows of wood, chemicals and pulp export, resulting in an improved transport infrastructure for the benefit of the region.

3. Sociological Aspects

The population of the investment region is about 250 000, of which 40-50% are economically active (less than national average 60%), of which 2/3 in various jobs and 1/3 self-employed. About 1/3 of economically active population does not have an adequate vocational training. The unemployment rate is 9-21% depending on the department.

The investment region suffers from the effects of the recent economic crisis and consequent high rate of unemployment. The economic crisis hit the region strongly and neither the private nor the public sector had means to mitigate the negative effects. Active and educated people have sought better opportunities outside the region. The society at large is lacking development and dynamism. In 2003-2004 the improving economic situation in Uruguay as well as in the neighboring countries has revived somewhat the economy of the investment region.

The views of the local stakeholders regarding Botnia S.A. pulp mill project were thoroughly analyzed. The strategies and methodologies used for the information gathering included (i) socio-historical reconstruction of the socio-economic processes and development processes of the departments, (ii) demographic information analysis, (iii) local stakeholders’ interviews, (iv) analysis of uncertainty issues received from the stakeholders, (v) printed media review.

The interviews and results show a vast majority supporting the project initiative, and a minority refuting the project due to diverse arguments related to the expected environmental concerns of the plant. There are three main position groups of people in the region: (1)
those giving unconditional support to the project, (2) those supporting the project, but requesting additional consideration to certain aspects (2/3 of the interviewed), and (3) those opposing the project.

There are two main issues of general interest regarding the project: new job opportunities and environment. People are keen to learn about the skill requirements as well as recruitment process and training to be arranged, and they regard the transparent access of jobs as utmost important. The participative and communicative approach applied by Botnia has been positively taken and it is very important for the local community (including the public forums, the printed publication of queries and uncertainties and the scientific and informative seminars). People expect that the information dissemination by the project on its implementation aspects, environmental safeguards and social support program of the mill will continue.

The regional people understand that the project will revive the economy and help to move from the past vicious circle of socio-economic decline towards a new ear of socio-economic dynamism. They have some concerns in a minor scale in relation to i.e. the changing life style due to the influences of the development and new activities, increased population and the construction of new dwellings. However, the issue of paramount importance was the new employment opportunities created, with the consequent better income. Following the normal course of improved ways of living and economic development of the region, people expect some negative effects, for example increased traffic; nonetheless, the expected increase in population does not represent a threat to the local environment. The results of the study show that the local infrastructural and social conditions of the region are in a position to accommodate the new large project and capable to integrate the expected increase in population into the society.

4. Forestry Development

4.1. Present Situation

The institutional and government policy framework in Uruguay set the suitable ground for the establishment of fast-growing commercial forest plantations since 1980’s. The incentives include subsidies (to disappear by 2007) and tax exonerations for both forest plantations and forest-industry initiatives.

The forestry sector in Uruguay has developed in the past decade beyond the expectations of the forestry promotion initiatives: (i) considerable increase in the forested area (615,000+ hectares by 2002), (ii) forest management in accordance to international practices for sustainable forestry and a strong process of certification of forests (FSC), (iii) first steps in the development of primary wood transformation industry, (iv) increase in the volumes of roundwood exports and increase in the exports of sawnwood and paper, furthermore, Uruguay became attractive for foreign investments in the forestry sector. The domestic extrac-
tion of wood resources totaled 3.4 million m$^3$ in 2002. Forty-five percent goes to energy production and the rest for industrial purposes. Eucalyptus pulpwood represents 63% of the total industrial roundwood extraction for that year in Uruguay (1.8 million m$^3$), whereas 32% went to sawing and boards industries, and the rest to other forest industries. The eucalyptus plantations are concentrated in the South and the Western Littoral, and the pine plantations in the North. There is a large number of small and a small number of large forest plantation companies.

As tangible results arising from the development of the forestry sector in Uruguay during the past 15 years, (i) it directly increased labor, particularly in non-urban areas of the country, (ii) it transformed low-productive land areas into high-yielding forest plantations, (iii) it consequently, directly and indirectly contribute to the improvement of the living conditions in the forest-areas, (iv) it reinstated social- and economically previously marginalized areas.

4.2. Outlook of the Forestry Sector without the Pulp Mill

The forest resources in Uruguay are expected to continue expanding, although at lower pace than during the 1990's; forest plantations managed for mechanical industries are increasing, but based on the forest plantation establishment rate during the second part of last decade, there is an increasing volume of wood resources (eucalyptus) managed for pulp industry, which will reach 5 million m$^3$ by the year 2008.

Wood harvesting and transportation in Uruguay has presently a handling capacity of 2 - 2.25 million m$^3$ of roundwood per annum. The wood harvesting & transport capacity must be expanded in order to get the wood production potential to the markets Mechanized harvesting is not widely spread in the country (only by main forest owners). No rapid move towards mechanization of wood harvesting is predicted, although semi-mechanized harvesting may become more common. Traditional harvesting methods will maintain a major share since they are cost-competitive in Uruguay. Wood is transported mainly by road, benefiting from the easy topography.

The forest road network in not extensive enough to enable the harvesting of wood supply potential.
Although there are forecasted investments in mechanical forest industry sector (totaling 1 million m³ production between 2005-2012), the production of roundwood for pulp industry will remain as the main item of the sector. Mechanical forest industry production will still be targeted to the local and regional market. The exports share of mechanical forest industries products are not predicted to increase at important rates in the mid-term (a growth rate of increase 2%).

Eucalyptus roundwood will remain as the main export item in the sector (presently 9th in total exports of the country, forecasted to become the 4th export item) and Europe will remain as the main destination for roundwood exports. However, the high volumes of roundwood supply can induce uncertainties to the pulpwood market price in the region. There will still be 3 main ports for roundwood exports: Fray Bentos, Montevideo, and Nueva Palmira, in order of importance.

The forestry sector generates between 12,000 – 14,000 jobs, of which 7,200 are permanent posts. Additionally, it is estimated also approximately 1,000 posts in related services, such as transports and harvesting.

4.3. Outlook of the Forestry Sector with the Pulp Mill

The project represents a positive impact on the sector; as it will further promote the forest sector development ongoing in Uruguay. It will encourage the further development of timber growing and wood harvesting resulting in a more economically competitive production of wood raw material for export and processing in Uruguay.

The entry of Botnia S.A. into the roundwood market will enable to stabilize local roundwood prices, since it highly increases wood local consumption of wood.

The supply potential of pulpwood is forecast at 4.5 – 5.0 million m³ per year by the turn of the decade, of which over the half is non-committed wood; these volumes are maintained by plantations established before 2003, and re-plantation schemes of harvested areas. Additionally, there are considerable volumes of pulpwood resources from the Argentinian provinces of Entre Rios and Corrientes (52,000 and 48,000 has of eucalyptus respectively). Due to the wood paying capacity, the pulp mill will attract some wood resources presently managed (but not adequate quality) for mechanical industries to pulping (up to 60% in the Western Litoral region).

Presently wood industry consists of largely small and old units, with the exception of few new ones. But some investments are forecasted in the mechanical forestry industry sector in the mid term. The presence of the pulp mill will contribute to the attraction of foreign investments, consolidating Uruguay as a new major player in the regional forest sector. The primary wood processing in Uruguay will consolidate and expand, resulting in an improved international competitiveness. The number of companies of primary wood processing may decrease (small companies, with obsolete technologies), as a result of concentration of production in larger production units with higher level of technology and more efficient equipment. The entry into the market of the pulp mill will not cause competition for the acquisition of roundwood for mechanical industries (different wood assortments).
The export structure of the forestry sector will substantially grow and change (less growth of roundwood export, large-scale export of pulp as a new product with higher added value) what will enhance the efficiency of utilization of Uruguayan wood and the total value of the forest branch exports. The total value of the exports of forestry sector is expected to reach USD 747 million (at 2004 values) by 2016; about 50 % more than what would be the export amount without the pulp mill. Estimated exports of the sector in 2004 are USD 253 million. The pulp mill certainly facilitates the commercialization of pulpwood coming to the market, especially during the cyclical downturns of the international pulpwood market. The pulp mill will also stabilize the local wood trade, and hence will enable the further development of the wood harvesting & transport sector, which in turn will enable to better utilize the supply potential of the forests. All in all, the project will ensure more stable and higher prices for wood coming from the maturing forest plantations, and higher taxation revenues for the Government.

After the start up of the activities of the plant, there is a directly increased labor especially in forestry and transport sector, re-plantation and other silvicultural activities. The competitive cost of traditional harvesting methods will help them maintain a considerable portion of harvesting volumes.

### 4.3.1. Forestry sector outlook with the pulp mill in a nutshell

<table>
<thead>
<tr>
<th>Timber Market</th>
<th>Increase</th>
<th>Decrease</th>
<th>Adjustment Mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forestry Primary Phase</td>
<td>Increased domestic consumption of roundwood. Increased efficiency in raw material production per area unit. Re-planting of harvested areas Sustainable forestry concept fully applied</td>
<td>Availability of sawnwood in the Litoral region. Decrease in plantation area rate. Reliability of existing information and statistical methods</td>
<td>Update policies and legislation fostering the development of the sector</td>
</tr>
<tr>
<td>Harvesting and Transport</td>
<td>Up to 60% of wood resources in the Litoral managed for mechanical industries divert to pulping industries Increasing mechanization.</td>
<td>Availability of sawnwood in the Litoral region. Relative decrease in harvesting labor in some regions due to increased mechanization.</td>
<td>Foster investments if present harvesting technologies are limiting the availability of wood.</td>
</tr>
<tr>
<td>Industrial Phase</td>
<td>Investments forecasted in the mechanical forestry industry sector. Additional supply of chips from primary processing sector for pulping. The importance of the sector in the country will attract further foreign investments, enhance competitiveness and technological progress. Increased employment direct and indirect to the sector.</td>
<td>The number of companies of primary wood processing will decrease.</td>
<td>Adequate policies fostering environment for further investments</td>
</tr>
<tr>
<td>Trade</td>
<td>Increase share of forestry sector exports. Export of new products of higher added value. Potential increased imports of roundwood from neighboring countries and inputs for the plant.</td>
<td>After next years increase, decrease in overall roundwood exports. Price instability due to excessive availability of raw material.</td>
<td>Adequate policies and cooperation</td>
</tr>
</tbody>
</table>
5. Regional Economy

5.1. Project Scenario and Present Situation

The Pulp Mill project will mostly impact the regional development in the departments of Río Negro, Soriano, Paysandú in Uruguay, and the impacts will also extend through economic relations to the province of Entre Ríos in Argentina. The impacts will accentuate in the cities of Fray Bentos and Young (Río Negro), Mercedes (Soriano) and Paysandú, and Gualeguaychú in Entre Ríos.

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Rio Negro</td>
<td>50,000 (6 per km²)</td>
<td>1.3%</td>
<td>USD 170.5 million</td>
<td>Expenditure: USD 16 million Income: USD 13.9 million</td>
</tr>
<tr>
<td>Soriano</td>
<td>84,000 (9 per km²)</td>
<td>2.6%</td>
<td>USD 238.9 million</td>
<td>Expenditure: USD 20 million Income: USD 18.9 million</td>
</tr>
<tr>
<td>Paysandú</td>
<td>119,000 (8 per km²)</td>
<td>3.5%</td>
<td>USD 353.6 million</td>
<td>Expenditure: USD 23.4 million Income: USD 21.5 million</td>
</tr>
<tr>
<td>Entre Rios</td>
<td>1,160,000 (14 per km²)</td>
<td>-</td>
<td>USD 2.25 billion (Gross product)</td>
<td>15%</td>
</tr>
</tbody>
</table>

The pulp mill would be set up in Fray Bentos, capital of Río Negro. Río Negro has a low population density (6 persons/km²). The economy is dominated by agriculture, forestry, community services, trade, hotels & restaurants, and tourism, with little industrial manufacturing. Only 40% of employed people have permanent jobs. The per capita GDP is relatively low and the income distribution is quite equitable.

Soriano differs from Río Negro in many respects. The population density is higher (9 persons/km²). Its economy contains relatively less forestry, lamb grazing, tourism, community and financial services, and transport & warehousing activities. It has significantly more intensive agriculture, milk and cheese production, trade & hotel services, and manufacturing. People have a higher level of vocational than in Río Negro. Also the employment rate, the share of permanent jobs, and the average standard of living are higher.

Paysandú has 8 persons/km². The economy and the industry are more diversified than those in Río Negro and Soriano. Also the local economy is more active, partly due to both the diversified economy and the relatively large population in the city of Paysandú.

The province of Entre Ríos (in Argentina) has large and diversified economy, with more export incomes than in Río Negro, Soriano and Paysandú; the main sectors are agriculture, forestry and wood processing. Its capital Gualeguaychú has business links with Fray Bentos and Mercedes, and the new Rosario-Victoria bridge will further enhance the economic connections between Entre Ríos and the Uruguayan side. The province has a low employment rate but a high average standard of living.

The economies of the investment region currently depend to a great extent on the performance of the agricultural sector. The main commodities are meat, wool, rice, wheat, milk, soya, sunflower, and citrus fruits. The international competitiveness and attainable export prices have improved, thanks to internal adjustment of costs and reduced external competition. The regional economy is predicted to grow a little faster than the whole economy of Uruguay, improving the employment and budgets of the departments.

The establishment of the pulp mill would largely expand and change the structure of the regional economy. The impacts of the pulp mill will accrue during the construction phase
(2005-to early 2007) and the during the operation phase (mid-2007 onwards), as highlighted in chapters 5.2 – 5.3.

### 5.2. Plant Construction Phase

#### 5.2.1. Department of Rio Negro

**Value Added:** Rio Negro will attain the highest added value increase during this phase. The added value of the department will increase by USD 79.6 (direct and indirect) million during this phase. The construction sector will be the most benefited (USD 51 million of the total added value generated in the sector during the construction phase), followed by services (USD 7.5 million or 30%) and to a lower scale transport and warehousing (USD 3.7 million or 23.3%) and the manufacturing industry (USD 2 million or 7.6%). The importance of the department is mostly due to the provision of services offered in the city of Fray Bentos.

The added value generated as result of the indirect impact of the plant construction during this phase is also higher in this department (USD 17.8 million or 46.4% of the total indirect added value generated); basically, they are due to the services supply in Fray Bentos. The other most benefited sectors are construction, transport and warehousing, and commerce, hotels and restaurants (70%, 70%, and 60% respectively of the total indirect added value generated for each sector).

**Employment:** Within the overall framework of the project, this phase represents the highest impact in terms of employment generation. Most of the employment demand for this stage can be filled by personnel from the area, due to the required qualification level. In total, it is expected an increase of over 4800 new jobs in the department (direct and indirect), with the total impact during the construction phase representing 3175 in the construction and 1641 in goods and services supply. Rio Negro accounts for 63.5% of total and 68.6% of direct employment during this phase.

Rio Negro presents the highest share of the indirect employment generated during this phase (710+ jobs or 42% of the total indirect employment generated during this phase). The sectors presenting greater increase are services and construction. This increased demand refers to the employment provided in the department, by people traveling daily, and by people moving-in to Rio Negro.

After the impact of the project, the total employment in the department is 32% higher of the situation expected for 2006 without the project. Similarly, the labor force will increase by 35% as consequence of migration to the department (population expected to increase by 10%).

**Municipal Finances:** The project impact on municipal finances is only relevant to the Department of Rio Negro; the impact on Soriano and Paysandú is marginal.

Municipal incomes are expected to grow by 10% of the present level mainly due to dilatory payments. However, by the year 2006, in the situation without the pulp mill project, the Municipality should have additional revenues of USD 1.4 million in order to be able to cope with the various development investments and consumptions. In the scenario with project, another USD 1 million will be needed in 2006 in order to cope with higher liabilities as compared to the situation without project, and the impacts of the project itself (road maintenance, equipment and machinery restoration, infrastructural requirements, i.a.). The additional funding need created by the pulp mill project is 42% of the total need of additional funding. It is foreseen that the financial situation of the Municipality will improve as a result of the pulp mill establishment as the economy will revive.
5.2.2. Department of Soriano

**Value Added**: The value added of the department of Soriano will increase by USD 13.5 million (direct and indirect) during this phase. The most benefited will be the services sector (USD 8 million or 20% of the total added value generated in the sector during this phase), together with commerce, hotels and restaurants (USD 2.5 million or 20%).

Indirect impacts during the construction phase generate USD 6.3 million as added value in Soriano. This corresponds to 16.5% of the total indirect added value generated during this phase. Construction, services and commerce, hotels and restaurants are the most important sectors (20% respectively).

**Employment**: The population in Mercedes has higher qualification level than in the other departments, therefore, there is a more diversified labor offer. The increase in employment, as total impact during the construction phase in Soriano accounts for 6.5 % and as direct impact 5% of the employment generated. The services sector will generate most of the new jobs.

The increase in employment as indirect impact of the construction phase in Soriano represents 11% of the total (185 new jobs); this is mostly concentrated also in the services sector.

Indirect and direct impacts during the construction phase will increase employment in Soriano by 2.8% in relation to the situation expected for the department in 2006 in a situation without the pulp mill. There will be a considerable number of people living in Mercedes, which will daily travel to work in Fray Bentos; as a consequence of the employment demand offered by the department of Rio Negro.

5.2.3. Department of Paysandú

**Added Value**: The highest share of the added value generated in Paysandú during this phase belongs to the industrial sector and the production of cement (61.6% of the total added value generated in the sector or USD 12.5 million). The agricultural sector will also be benefited significantly (27.4% of the total generated in the sector during this phase). The total added value generated in Paysandú during the construction phase totals USD 16.2 million (direct and indirect impact).

Similarly, the highest amount of added value generated as results of indirect impacts during the construction phase, are generated in the construction and service sectors. The total indirect added value in Paysandú amounts USD 1.3 million.

**Employment**: The traditional industrial profile of Paysandú, gives a relative comparative advantage to the labor offer of the department. The increase in employment, as direct impact during the construction phase is also concentrated in the manufacture industry sector; secondly in the services sector in a smaller scale. New jobs in Paysandú represent 11% of the total labor generated as impact of the construction phase (or 820 new jobs).

Out of the total impact there is a minor increase in employment as indirect impact of the construction phase (2% of the total). This is mostly due to the distance to Fray Bentos. The employment in Paysandú will increase by 2.8% in relation of the situation expected for the department in the situation without the pulp mill, as result of direct and indirect impacts of the project, during the construction phase.
5.3. Plant Operations Phase

5.3.1. Department of Rio Negro

Value Added: The most of the direct added value during this phase is concentrated in Rio Negro. The manufacturing industry sector will attain a high share of the growth (95% of the added value), followed by services. In sectors such as construction (maintenance) and commerce, hotels and restaurants 100% of the added value is directly generated in Rio Negro.

The highest added value (direct and indirect impact) is generated in Rio Negro, which together with the effects of forestry production and services assigned to the project, will total an additional USD 144 million in added value or 49.2% additional in relation to the situation forecasted for 2016 without the pulp mill.

Employment: During the operation phase, the creation of direct employment is much lower than during the construction phase (totaling 1724 jobs); and 40 % will correspond to Rio Negro. This represents a 13% increase, in relation to the situation without project for the department in the year 2016. Direct employment is represented by increase in manufacture industry (16.4% of the increase in the department), construction (5%, representing maintenance activities) and transport and warehousing (14.3%).

The indirect employment generated during this phase, will allow the living of much of the population which moved there during the construction phase, and therefore, this will allow keeping high the labor force, in relation to the whole population. There is a total of 1292 new jobs as indirect effect, concentrated in the construction sector together with commerce, hotels and restaurants sector mainly.

As a whole, the total increase in employment in Rio Negro would be 3015 i.e. in the order of 24 % in relation to the situation without the project for 2016.

Municipal Finances: In 2016, the impact of the project generates an income for the Municipality two-times higher than the expected income without the pulp mill project in the same year.

5.3.2. Department of Soriano

Value Added: The direct generation of added value in Soriano arises from the wood production and transport sector mainly.

In Soriano, the plant operation increases the activity in the department for a total of USD 8.4 million in terms of added value. This represents a 2.4% increase in the added value of the department compared with the situation without the pulp mill in 2016.

Employment: During this phase the increase in employment, both direct and indirect, in Soriano is much smaller than in Rio Negro. Soriano will increase its employment by 195 and 531 as direct and indirect impact respectively totaling 726 by 2016. Most of the employment in Soriano is concentrated in the services and construction sectors.

This figure represents a 3.5% increase in the employment expected for 2016 compared with a situation without the pulp mill.

5.3.3. Department of Paysandú

Value Added: Of particular importance in the generation of direct added value is the production of wood raw material and transport (24% of the total generated in the sectors respectively).
The situation in Paysandú shows a 2.8% increase in the added value expected for the department compared with the situation without pulp mill in 2016 (USD 15 million additional).

**Employment**: Similar to the situation in Soriano, the employment during this phase will have minor effect in Paysandú. Both direct and indirect employment will total 1342 new jobs, representing a 5.1% increase in relation to the situation expected for Paysandú in 2016 in a situation without the project.

### Scenario with the project: Increase in added value and employment per department

<table>
<thead>
<tr>
<th></th>
<th>Rio Negro</th>
<th>Soriano</th>
<th>Paysandú</th>
<th>Rest of the Country</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Annual Added Value (USD million)</strong></td>
<td>79.9</td>
<td>143.9</td>
<td>13.5</td>
<td>16.2</td>
<td>15.1</td>
</tr>
<tr>
<td>% of situation without project</td>
<td>41.3%</td>
<td>49.2%</td>
<td>5.2%</td>
<td>2.4%</td>
<td>4.2%</td>
</tr>
<tr>
<td><strong>Employment (# of jobs)</strong></td>
<td>4816</td>
<td>3015</td>
<td>495</td>
<td>726</td>
<td>820</td>
</tr>
<tr>
<td>% of situation without project</td>
<td>47.6%</td>
<td>24%</td>
<td>2.8%</td>
<td>3.5%</td>
<td>3.1%</td>
</tr>
</tbody>
</table>

### 6. Macro-economy of Uruguay

#### 6.1. Current situation

The economic situation in Uruguay depends on regional and global business cycles. The economic policy has moved from import substitution to export promotion, with agro-industry having a key role. GDP is dominated by services (68.1%), industry accounts for 15.9%. Agro-sector make up 75% of exports but only 8.8% of the GDP, reflecting the narrow basis of the economy. The forestry sector totaled USD 105 million in 2002. Investments are in a very low level, inhibiting badly the future improvement of the national economy. Private sector investments amount 10.3% of the GDP, whereas public sector investments 3.3%. Domestic market accounts for over 80% of the GDP.

Five economically strong departments (Colonia, San José, Canelones, Montevideo, and Maldonado) account for 12% of the area, 67% of people, and 75% of the GDP. In 1988-1998 the economy of Uruguay grew almost 3-fold in current USD terms. In 1998-2002 the economy collapsed back to the level 1992, resulting in higher interest rates, loss or real purchasing power of salaries, reduction of imports and exports, further emigration of people, increased unemployment, and increased inequality of the living standards. The adjustments improved the international competitiveness and also the business cycles caused the economy to pick up from the latter part of 2003 onwards. The economy has chronically
suffered from negative trade and current account balance, which the reduced imports turned positive in 2003. The internal and external indebtedness rate of the economy is high.

6.2. Economic outlook without the pulp mill

After the stagnation period 1998-2003, the economic activity is predicted to rise by 7% in 2004, fuelled by increasing export volumes and prices benefiting from better economic situations of neighboring countries and other export markets, increasing industrial and construction activity, improving domestic consumption and investments, increasing supply for domestic and export markets, and increasing tourism. Trade balance is expected to be clearly and current account slightly positive (1% of the GDP).

The balance of capital movements is expected to be somewhat negative (interests and re-payment of capital). Employment is predicted to rise by 4%, reducing the unemployment to 15% and improving the household incomes by 3%. The devaluation rate for USD is expected to be 10% and the general inflation 8%.

Although 80% of the GPD is generated in the domestic market, export performance has an important impact on the economic development. The predicted export increases by 2017 would largely change the structure of the national economy. The exports of the textile sector will suffer from the low prices of the international lamb wool markets, and from the weak domestic demand (0.5% growth by 2017 in relation to 2000 figures). The international competitiveness of metal and chemical products industries leaves to be desired. The fishery sector will increase its exports by 27%. Agriculture, meat and leather, and milk industries are strongly increasing their share of total exports (108%, 47%, 234% increase respectively). Although the exports of the construction industry are constrained by the limited domestic availability and relatively high cost of some mineral-based construction products, the sector will increase its exports by 132% in 2017, relation to the volumes in 2000.

The forestry sector will increase its exports by 146% by 2017, in relation to the volumes in 2000, roundwood will remain as the main export item, followed by paper and paperboard and sawnwood.

The capital intensity (capital/GDP) of the economy is predicted to remain at the current level of 3. The investment rate has traditionally been below the average of the sub-continent, so the export growth (3.3% per annum) scenario assumes that the trend level will rise to 18% and 12% of the GDP, gross and net investment, respectively.

The high level of public debt constitutes a significant bottleneck of the Uruguayan economy. The income side depends decisively on the business cycles. The payment of interest charges alone would require a sustained high economic growth rate or an acceptable level of inflation. The public sector deficit is predicted to continue at a level of 2% of GDP in the medium-term. The devaluation rate of the Peso for USD is predicted to be 1% per annum.
The growth rate of the GDP is predicted to be 4% in nominal and 3% per annum in real terms.

The deficit of the trade balance is forecast to gradually increase first to about USD 500 million and later to USD 700 million per annum by year 2017. To enable the predicted economic development, the economy will constantly need capital from abroad, currently about USD 200 million per annum and by year 2017 some USD 270 million per annum.

6.3. Economic outlook with the pulp mill

An input-output model has been used to evaluate the macroeconomic impacts of the pulp mill as well as the effects on output in different sectors of Uruguay. In a careful economic policy analysis of a large investment project like the pulp mill project it is important to take into account all simultaneous cross-sectoral impacts induced by the investment and output processes of the new plant. Such cross-sectoral links of production are contained in an input-output model, which therefore is a suitable methodological tool to analyze the quantitative effects of the investments and exports of the pulp mill on output in different sectors and whole economy.

6.3.1. Direct economic impact

The direct economic effects of the pulp mill refer to impacts of the pulp mill investment and production on output and employment in those sectors, which are directly connected to the investment and production processes of the pulp mill as described by the input-output model. The largest impact on GDP comes from the pulp mill itself. On the other hand, the largest increase in employment takes place in other sectors, because the pulp mill will employ only 300 people.

Gross Domestic Product: The direct impact of the pulp mill investment including the increase in related sectors’ output on the GDP is on its peak in year 2006 (about 110 million USD, i.e. 0.9 percent), and on the full capacity of pulp production from year 2010 onwards some 170 million USD, i.e. 1.4 percent of the base year 2004 GDP level. The main contribution to GDP growth will come from increased manufacturing output, but pulp production will also be directly reflected in the output of forestry, energy production and transports.

Gross National Product: The direct impact on the GNP volume will be smaller than the growth in GDP due to the marked net income flow abroad (interest payments of loan and repayment of loan capital, and repatriation of dividends) induced by the large amount of private foreign capital invested in the pulp mill.

| Direct impact of the pulp mill on GDP and GNP volume: Difference from base year, % |
|---------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Forestry                       | 0.0  | 0.0  | 18.1 | 21.8 | 24.5 | 25.7 | 26.3 | 26.2 | 26.2 | 26.3 | 26.3 | 26.3 |
| Manufacturing                  | 0.5  | 0.8  | 3.5  | 4.2  | 4.7  | 4.9  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  | 5.0  |
| Energy production              | 0.4  | 0.7  | 0.2  | 0.2  | 0.2  | 0.2  | 0.2  | 0.2  | 0.2  | 0.2  | 0.2  | 0.2  |
| Construction                   | 4.8  | 7.7  | 1.4  | 0.3  | 0.3  | 0.3  | 0.3  | 0.3  | 0.3  | 0.3  | 0.3  | 0.3  |
| Transports                     | 0.1  | 0.3  | 1.2  | 1.3  | 1.5  | 1.6  | 1.6  | 1.6  | 1.6  | 1.6  | 1.6  | 1.6  |
| Other sectors                  | 0.2  | 0.5  | 0.2  | 0.2  | 0.2  | 0.2  | 0.2  | 0.2  | 0.2  | 0.2  | 0.2  | 0.2  |
| GDP                            | 0.5  | 0.9  | 1.1  | 1.1  | 1.3  | 1.3  | 1.4  | 1.3  | 1.4  | 1.4  | 1.4  | 1.4  |
| GNP                            | 0.4  | 0.7  | 0.5  | 0.6  | 0.7  | 0.6  | 0.5  | 0.5  | 0.6  | 0.6  | 0.6  | 0.6  |

Employment: The direct increase in employment will be about 6000 persons in 2007, i.e. 0.4 per-cent of the total employment in 2004. Manufacturing and transports together account for approximately 1000 new jobs, whereas for the forestry sector the direct impact of the pulp mill on employment totals 2200 new jobs. If the increase in output volume and raw
material use of forest industry would lead to equally increasing forest harvesting, employment in forestry alone would increase by more than 3080 work places.

### Direct impact of the pulp mill on employment: Difference from base year 2004, 1000 persons

<table>
<thead>
<tr>
<th>Year</th>
<th>Forestry</th>
<th>Pulp production</th>
<th>Other manufacturing</th>
<th>Energy production</th>
<th>Construction</th>
<th>Transports</th>
<th>Other sectors</th>
<th>Total employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>0.0</td>
<td>0.1</td>
<td>0.3</td>
<td>0.0</td>
<td>1.0</td>
<td>0.0</td>
<td>0.6</td>
<td>2.0</td>
</tr>
<tr>
<td>2006</td>
<td>0.0</td>
<td>0.3</td>
<td>0.3</td>
<td>0.0</td>
<td>3.0</td>
<td>0.3</td>
<td>1.8</td>
<td>5.9</td>
</tr>
<tr>
<td>2007</td>
<td>1.3</td>
<td>0.3</td>
<td>0.6</td>
<td>0.0</td>
<td>1.7</td>
<td>0.4</td>
<td>1.7</td>
<td>6.0</td>
</tr>
<tr>
<td>2008</td>
<td>1.9</td>
<td>0.3</td>
<td>0.6</td>
<td>0.0</td>
<td>1.2</td>
<td>0.7</td>
<td>1.4</td>
<td>4.9</td>
</tr>
<tr>
<td>2009</td>
<td>2.1</td>
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<td>0.5</td>
<td>0.0</td>
<td>1.1</td>
<td>0.7</td>
<td>1.2</td>
<td>4.8</td>
</tr>
<tr>
<td>2010</td>
<td>2.2</td>
<td>0.3</td>
<td>0.5</td>
<td>0.0</td>
<td>1.0</td>
<td>0.7</td>
<td>1.1</td>
<td>4.8</td>
</tr>
<tr>
<td>2011</td>
<td>2.2</td>
<td>0.3</td>
<td>0.5</td>
<td>0.0</td>
<td>0.9</td>
<td>0.7</td>
<td>0.9</td>
<td>4.7</td>
</tr>
<tr>
<td>2012</td>
<td>2.2</td>
<td>0.3</td>
<td>0.5</td>
<td>0.0</td>
<td>0.9</td>
<td>0.7</td>
<td>0.8</td>
<td>4.7</td>
</tr>
<tr>
<td>2013</td>
<td>2.2</td>
<td>0.3</td>
<td>0.5</td>
<td>0.0</td>
<td>0.8</td>
<td>0.7</td>
<td>0.8</td>
<td>4.6</td>
</tr>
<tr>
<td>2014</td>
<td>2.2</td>
<td>0.3</td>
<td>0.5</td>
<td>0.0</td>
<td>0.8</td>
<td>0.7</td>
<td>0.8</td>
<td>4.5</td>
</tr>
<tr>
<td>2015</td>
<td>2.2</td>
<td>0.3</td>
<td>0.5</td>
<td>0.0</td>
<td>0.8</td>
<td>0.7</td>
<td>0.8</td>
<td>4.4</td>
</tr>
<tr>
<td>2016</td>
<td>2.2</td>
<td>0.3</td>
<td>0.5</td>
<td>0.0</td>
<td>0.8</td>
<td>0.7</td>
<td>0.8</td>
<td>4.3</td>
</tr>
</tbody>
</table>

### Government tax income: Government tax income consists of indirect production based taxes, which depend on GDP development, and secondly of direct income taxes and social security contributions, which depend mostly on household taxable wage and salary income, and thus ultimately on employment. Because the maximal direct impact of pulp production on GDP will be about 1.6 percent, but on employment only some 0.6 percent, the direct additional government tax income will largely come from production based and other indirect taxes. All in all, the direct impact of the pulp mill on government finances will result as an increase in annual tax income by 0.5 percent in real terms, i.e. 15 million USD at prices of 2004 without considering the taxes by the pulp mill itself. When including the indirect effects, the impact will be USD 25 million per year.

### Impact of the pulp mill on government tax income: Difference from base year 2004 level, % at prices of 2004

<table>
<thead>
<tr>
<th>Year</th>
<th>Direct impact</th>
<th>Total impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>0.4</td>
<td>0.5</td>
</tr>
<tr>
<td>2006</td>
<td>0.8</td>
<td>1.0</td>
</tr>
<tr>
<td>2007</td>
<td>0.5</td>
<td>0.8</td>
</tr>
<tr>
<td>2008</td>
<td>0.5</td>
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<tr>
<td>2009</td>
<td>0.5</td>
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<td>2010</td>
<td>0.5</td>
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<tr>
<td>2011</td>
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<td>2013</td>
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<td>0.5</td>
<td>0.8</td>
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<tr>
<td>2015</td>
<td>0.5</td>
<td>0.8</td>
</tr>
<tr>
<td>2016</td>
<td>0.5</td>
<td>0.8</td>
</tr>
</tbody>
</table>

### Trade Balance: The pulp mill project will have a negative impact on foreign trade balance and current account during the investment period 2005-2007, when the investment is made by the private foreign capital. The negative impact on trade and current account balance is largest in 2006 when the pulp mill investment outlay is highest. The positive sides from the point of view of the trade and current account position of Uruguay are that the extra deficit will be financed by direct foreign investment, backed by a solid and profitable investment in the manufacturing (pulp mill), and thirdly that in the long run pulp exports will make a significant permanent positive contribution to trade balance and current account as well as currency flows.

### Direct impact of the pulp mill on trade balance: Difference from base year 2004 level, at prices of 2004, USD million

<table>
<thead>
<tr>
<th>Year</th>
<th>Exports</th>
<th>Imports</th>
<th>Trade balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>-138</td>
<td>0</td>
<td>-138</td>
</tr>
<tr>
<td>2006</td>
<td>-581</td>
<td>138</td>
<td>-581</td>
</tr>
<tr>
<td>2007</td>
<td>95</td>
<td>128</td>
<td>53</td>
</tr>
<tr>
<td>2008</td>
<td>135</td>
<td>133</td>
<td>2</td>
</tr>
<tr>
<td>2009</td>
<td>153</td>
<td>149</td>
<td>4</td>
</tr>
<tr>
<td>2010</td>
<td>161</td>
<td>157</td>
<td>4</td>
</tr>
<tr>
<td>2011</td>
<td>165</td>
<td>160</td>
<td>5</td>
</tr>
<tr>
<td>2012</td>
<td>164</td>
<td>160</td>
<td>4</td>
</tr>
<tr>
<td>2013</td>
<td>165</td>
<td>160</td>
<td>5</td>
</tr>
<tr>
<td>2014</td>
<td>165</td>
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</tr>
<tr>
<td>2015</td>
<td>165</td>
<td>160</td>
<td>5</td>
</tr>
<tr>
<td>2016</td>
<td>165</td>
<td>160</td>
<td>5</td>
</tr>
</tbody>
</table>

### 6.3.2. Indirect economic effects

The indirect economic effects induced by increasing employment, household income and private consumption on production in different sectors of the economy have been taken into account by adding econometrically estimated relationships between employment and output volume in different sectors of the economy into the basic input-output equation system. The indirect investment-related outputs have been taken into account by assuming
that the investment ratio (fixed investments / GDP) will remain on the same level as it will be in the base year 2004. This means, that the increase in GDP induced by pulp mill investment and production will also increase the general investment activity in the economy. The increasing investment demand feeds back to output developments in the input-output model similarly to the increasing private consumption demand.

**Gross Domestic Product:** The biggest impact on GDP volume comes from the pulp mill itself and the second largest effect on GDP come from the sectors, which are directly connected to the investment and production processes of the pulp mill. The indirect effect on GDP induced by increasing private consumption and investments will be smaller than the aforementioned direct impacts. On the other hand, the indirect employment effects are close to the same level as the direct ones. This is so, because the largest increase in employment takes place in other sectors than pulp production, which will employ only 300 people.

The **indirect employment** effect means an addition of about 4000 new jobs as compared to the direct employment effect, so that the direct and indirect employment effects together imply an increase in employment by 0.6 percent, i.e. about 8200 new jobs.

**Government tax income:** The indirect impact on government tax income consists of indirect production based taxes, which are determined by GDP growth, and secondly of income taxes and social security contributions, which depend on the growth of employment and taxable income. Because the pulp mill investment and production will lead to a total increase in GDP by more than 1.6 percent, but in employment only by about 0.6 percent, the additional government tax income will come largely from production based and other indirect taxes. In all, the government tax income will increase by 0.8 percent in real terms without considering taxes paid by the pulp mill itself.
**Balance of Payments**: Increasing private consumption and investment activity will contribute negatively to the balance of payments by increasing imports without a compensating increase in exports. However, this negative impact on trade balance is negligible as compared to the positive effect on exports induced by pulp production. Taking both direct and indirect effects of the pulp plant into account, in the long term the pulp mill investment will make a permanent positive contribution of more than 180 million USD per year to trade balance and current account, and almost USD 100 million per annum on the net flow of foreign currency.

7. **Summary of development impacts**

The pulp mill would have several kinds and very significant impacts in the investment region and even in the economy of whole Uruguay. The impacts can be summarized as follows:

**Population and sociology:**

- Population amount moving from emigration to immigration
- Socio-economic decline to change into socio-economic dynamism
- Improving age structure
- Improving and widening range of vocational skills

**Forest sector**

- Increasing local wood demand encourages further reforestation and improvement of forest genetics & management irrespective of incentives
- Existing forest resources, policy, institutional and regulatory framework including certification supports export-oriented forest industry investments
- Increasing local wood demand enables to grow wood harvesting & transport capacity & productivity
- Local usage of wood industry chips enables to expand the capacity and improve the international competitiveness of wood processing
- More comprehensive and efficient utilization of wood from forest plantations
- Increasing value added and financial flows of forest sector
- Potential to process and re-export wood from neighboring countries (Argentina)
- Improvement of forest inventory, R&D, national forest program, etc. to comply with international forest agreements
**Regional economy**

- Very significant expansion and diversification of the economy, especially in Rio Negro, but to some extent in Soriano and Paysandú
- Construction boom in 2005-2006 (pulp mill), which to limited extent will continue for 5-10 more years in residential, restaurant, hotel, office, health and social services, tourism, transport etc fields
- Potential for a number of new enterprises/new kinds of economic activities in the region; introduction of new skills; Increase of vocational training
- Expansion of existing companies
- Increase in employment, both private and public sector
- Improvement of road, energy, telecom, port and other infrastructure
- Improvement of municipal incomes and budget balances

**National economy**

- Injection of foreign private capital investment contributing to economic growth
- Improving regional balance of the economy
- Growth of GDP and GNP
- Improvement of trade and current account balance
- Improvement of currency balance and increase of tax revenues
- Possibility to attract further foreign direct investments