

INTERNATIONAL FINANCE CORPORATION (IFC)

DRAFT REPORT

Economic Impacts Assessment

Cumulative Impact Study For Two Pulp Mills and Wood Sources In Uruguay

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Annex E : Economic Impacts

9.1 Introduction

This socio-economic report for the Cumulative Impact Study (SER/CIS) covers the two pulp mills¹ proposed to be established in the vicinity of Fray Bentos, Uruguay on the left bank of the Uruguay River. The economic impacts relate to the level of gross national and departmental products, the effect on the balance of trade and on the fiscal position of the central and local governments. The social impact relates to national and departmental employment. Other social impacts are not found in this report but rather are located in other sections of the CIS, related to the discussion of the possible cumulative environmental impacts of the proposed projects.

The SER/CIS report is based on documentation received from the International Finance Corporation (IFC) and from the owners of the proposed Celulosas de M'Bopicuá (CMB) and ORION pulp mills, Empresa Nacional de Celulosas Españolas (ENCE) and Metsa ORION, respectively, who commissioned the individual studies of the socio-economic impact of the mills. The data provided has been verified, to the extent possible, by consulting official publications of the Government of Uruguay (GOU) and other relevant documents and through interviews in Uruguay, with government and industry officials.

9.2 Principal Findings

Different methodologies, prices and time periods were used by the consultants engaged by ORION and CMB to examine the impacts of the pulp mills.² The resulting cumulative impacts include some adjustments to reconcile these approaches. As can be observed in the Table 1 the cumulative impacts on the national and regional economy and on employment would be considerable.

¹ Referred to in this report also as the “plants”, “mills” or the “projects”.

² HCG Environment Consultants and Tea, Deloitte, Touche, respectively.

TABLE 1
PRINCIPAL FINDINGS
CUMULATIVE ECONOMIC AND EMPLOYMENT IMPACT
FOR THE ORION AND CMB PULP MILLS

| IMPACT | REGION | UNIT | CONSTRUCTION PHASE (2005-2007) | OPERATIONAL PHASE (TYPICAL YEAR) |
|---------------------|-----------|--------------|---|---|
| Economic | Uruguay | USD Millions | 417 (3.2% of 2004 GDP) | 331 (2.5% of 2004 GDP) |
| Economic | Rio Negro | USD Millions | 206 (112% of 2003 GDP) | 223 (121% of 2003 GDP) |
| Economic | Soriano | USD Millions | 33 (14% of 2003 GDP) | 13 (6% of 2003 GDP) |
| Economic | Paysandú | USD Millions | 41 (13% of 2003 GDP) | 23 (7% of 2003 GDP) |
| Employment | Uruguay | Person-Years | 18,699 (1.4% of 2004 Total) | 12,593 (0.9% of 2004 Total) |
| Employment | Rio Negro | Person-Years | 11,196 (109% of labor force) | 4,773 (47% of labor force) |
| Employment | Soriano | Person-Years | 1,337 (6% of labor force) | 1,108 (5% of labor force) |
| Employment | Paysandú | Person-Years | 2,421 (8% of labor force) | 2,048 (7% of labor force) |
| Balance of Trade | Uruguay | USD Millions | - 1,100 (Similar to “normal” annual average) | +244 (Approx. 22% of “normal” trade deficit) |
| Government Revenues | Uruguay | USD Millions | +83 (2% of 2004 revenues) | +39 (1% of 2004 revenues) |
| Government Revenues | Rio Negro | USD Millions | -1.8 (19% of 2004 revenues) | +0.9 (10% of 2004 revenues) |

The economic impact will be equivalent to about 3.2% of 2004 GDP over the three years of the construction phase and about 2.5% of 2004 GDP in each year of full capacity production. The impact on Gross National Product (GNP) is estimated to be 2.8% for the entire three year construction period and 1.5% for the years in which the plants are operating at full capacity.

The Department of Rio Negro will receive the lion's share of the impacts, equivalent to more than the entire gross departmental product in 2003 for construction phase and for each year of full capacity production during the operational phase. The economic impacts will still be significant, though less, for the neighboring departments of Soriano and Paysandú.

The employment impacts will also be significant, accounting for an increase in the equivalent of 1.3% of the 2004 national labor force over the three years of the construction phase and equivalent to slightly less than 1% of the 2004 national labor force during each year of full capacity production.

As for the economic impacts, Rio Negro would receive the largest employment impact, being equivalent to about 143% of its 2004 labor force over the construction period and 47% of the labor force during each year of full capacity production. However, current residents Rio Negro would not be able to take full advantage of much of this expected job creation, as unemployment is currently reported at less than 600 persons. But it can be expected that persons of working age not in the labor force will enter the labor force and the prospects of increased employment in the department will encourage migration from other parts of the country and day commuters from neighboring departments.

The employment impact on Soriano and Paysandú, while not as large as that for Rio Negro, will be important as both of those Department do have a significant amount of unemployment.

During the construction phase there will be a negative effect on the trade balance, approximately equivalent to the annual deficit registered during the "normal" years prior to the onset of the "River Plate Crisis", at which time imports fell drastically. During the years of full capacity production of the pulp mills the positive trade flow generated by sales of pulp, less negative trade flows of reduced overseas log sales and imported inputs for the pulp mills, will offset about 22% of the "normal" trade deficit.

Central Government revenues should total the equivalent of about 2% of 2004 revenues for the construction phase and for each year of full capacity production of the pulp mills should contribute slightly less than the equivalent of 1% of 2004 revenues.

Incremental expenditures incurred to support the pulp mills by the departmental government of Rio Negro total about USD 1.8 million, equivalent to about 19% of 2004 revenues. When the pulp mills are at full production it is estimated that about USD 916,000 will be collected as additional revenue, equivalent to about 10% of 2004 revenues.

Key reference documents cited in this report are:

- HCG Environment Consultants (HCG), Socio-Economic Study of the Impacts of the ORION Pulp Mill Project, Helsinki, Spanish version May 2004, English translation June 2004.
- Tea, Deloitte, Touche (TDT), Economic Impact Study of the M'Bopicuá Pulp Mill (CMB), Montevideo, November 2003.
- Tea, Deloitte, Touche (TDT), Update of the Economic Impact Study of the M'Bopicuá Pulp Mill (CMB), Montevideo, January 2005.

- CMB, Feasibility Study, M'Bopicuá Pulp Mill Project, 2004.
- United Nations, Handbook of Input-Output Table Compilation and Analysis, New York, 1999.

9.3 Methodology

Different methodologies were used to evaluate the economic and employment impacts of the pulp mills. These approaches are described in the following paragraphs.

The HCG methodology³ is based on an input-output (IO) model, which identifies the flows of goods and services among the various sectors of the economy. The IO model appears well constructed and the results are “user friendly”. The IO model shows the direct and indirect effects of increases in activity in one sector on all other sectors of the economy and is thus an ideal tool for determining the impacts on the economy of construction activity and subsequent production of the proposed mills.

³ Described in HCG June 2004, pp. 129-131.

In 1983 the Central Bank of Uruguay (BCU) constructed a 55 sector input-output table providing a detailed relationship of inter-sectoral flows. This has since been updated using the RAS method⁴. The updates for 1998 and 2000 were used in the studies of the impacts of the individual plants. The 2000 revision contained 16 sectors. On the basis of the 2000 IO table HCG constructed a six sector model for the analysis of pulp mill investments; the sectors being: forestry, manufacturing, energy, construction, transports and a residual comprising all other sectors. For the analysis of the production phase of the pulp mill HCG added a seventh sector – pulp production⁵. These input-output relationships facilitated the estimation of indirect and induced impacts on the different sectors of the economy resulting from the proposed investment. Econometric techniques were used by HCG in order to relate output and employment at the national level.⁶

HCG considered that the updated model was adequate to represent present and future inter-sector relationships and therefore provide indications of the levels of impact from the establishment and operation of the pulp mill.

The IO model treats the economic relationships within the economy in order to arrive at the economic impacts. To translate these impacts into employment, HCG employed econometric relationships, relating output and employment for the various sectors. Some specific discussion on the appropriateness of using of the error correction econometric model, rather than other models, would have been useful to provide an indication of the reliability of the relationships found. HCG comments on the limitations of the input data and the subsequent need to establish common values for some of the parameters, rather than individual values for each sector. It was also noticed from the evidence of the results provided in the IO Model worksheets that there is a somewhat tenuous relationship between output and employment, suggesting that the data available to HCG, and/or this particular econometric model, might be far from perfect as an indicator of likely employment. More discussion on the validity of the econometric technique and of the interpretation of the results might strengthen confidence in the robustness of the results.

⁴ For methods used to update original tables see United Nations (1999)

⁵ See Uruguay, Banco Central, Cuentas Nacionales, 1991 for an explanation of the methodology used in developing the Uruguayan input-output tables.

⁶ See HCG June 2004 footnote P. 130.

On the other hand, TDT, having decided that the input-output models available for the Uruguayan economy were inappropriate, opted for an “eclectic approach”⁷ that relied more on interviews, official surveys and national accounts and employment information, with recourse to the 1998 input-output table in situations where this was necessary to forward the analysis. The calculations made by TDT, unlike those of HCG, which were in the form of a comprehensive internally consistent model, were essentially ad hoc.

There are difficulties in accurately combining the results of the HCG and TDT consultants for several reasons.

1. HCG and TDT use different definitions of impacts.
2. HCG use estimated 2004 base year price levels in USD and TDT use estimated 2003 price levels in USD.
3. HCG works with basic prices, as per national accounting methodology, and TDT works with market prices.
4. Whereas HCG examines the relationships for every sector of the economy, TDT is selective in its coverage.

In order to be useful as a guide of the cumulative economic and employment impacts, the results of the SER/CIS should be in common terminology and should provide the same coverage. Given the nature of the information available in the two SE studies, it was decided to present the results, using the HCG model as a guideline and standardizing the definitions of direct, indirect and induced impacts. The prices are those reported by TDT (USD of 2003) and HCG (USD of 2004)⁸, that is they have been kept at their values given in the original SE studies. It was decided to adopt the HCG framework in order to calculate the cumulative impacts, as the results would incorporate more of the likely impacts, though possibly erring in their magnitude. Where doubts occur on the likely validity of the magnitude of impacts, this has been indicated.

⁷ Described in TDT November 2003, pp.8-17.

⁸ While national account information and many inputs and outputs are in Uruguayan pesos, USD prices are used for all calculations in the reports. National account exchange rates are given in the HCG IO Model. No exchange rates are provided in the reports. The November 2003 TDT report was updated in December 2004/January 2005 and prices were kept in 2003 USD.

9.4 Definition Of Impacts – Construction Phase

As HCG and TDT used different definitions of direct, indirect and induced impacts, in order to provide an aggregation for the two plants it was necessary to rearrange the impacts to fit into a common definition. The definitions adopted were:

Direct impacts – activities of the construction sector in building the pulp mills and carrying out all related work.

Indirect Impacts – activities of all other sectors directly related to building the plants and carrying out all related work and providing services to the mills and its employees.

Induced impacts – activities induced by increases in consumption and investment as a result of the construction of the plants.

This revised classification of the impacts is summarized in Table 1:

TABLE 2
CLASSIFICATION OF IMPACTS – CONSTRUCTION PHASE

| ACCEPTED DEFINITION | HCG DEFINITION | TDT DEFINITION |
|----------------------------|------------------------------|--------------------------------|
| Direct | Direct – Construction Sector | Indirect – Construction Sector |
| Indirect | Direct – Other Sectors | Indirect – Other Activities |
| Induced | Indirect | Induced |
| | | |

9.5 Economic Impact Construction Phase

For purposes of calculating the economic impacts reference investment values of USD933 millions⁹ and USD 471 millions¹⁰ for the ORION and CMB plants respectively have been used.

⁹ Botnia Input-Output Model inputs and HCG June 2004 p. 8 and table 61 p. 114.

¹⁰ TDT Nov. 03 p. 19.

Site preparation for the ORION plant began in 2005. Work on a Free Trade Zone (FTZ) adjacent to the site of the CMB plant also began in 2005. The periods of the construction of the plants may not be exactly similar; but it is assumed that construction will take place over the period 2005-2007.

The timing and the annual percentage of construction expected to be completed each year are shown in Table 3.

TABLE 3
ANNUAL CONSTRUCTION COSTS FOR PULP MILLS
(IN USD MILLIONS)

| | ORION (USD) | CMB (USD) | TOTAL (USD) | ORION (%) | CMB (%) |
|---------------|------------------------|----------------------|------------------------|----------------------|--------------------|
| 2005 (Year 1) | 202 | 99 | 301 | 22% | 21% |
| 2006 (Year 2) | 699 | 166 | 865 | 75% | 35% |
| 2007 (Year 3) | 32 | 207 | 239 | 3% | 44% |
| Total | 933 | 471 | 1,405 | 100.0 | 100% |
| | | | | | |

Sources: HCG IO Tables inputs and HCG June 2004 p. 114; TDT Nov. 03 p. 19.

Note: Totals in this table and in others in this report may not add up exactly due to rounding.

Different construction patterns can be discerned for the two plants: Peak construction activity of the ORION plant will occur in the second year, while for the CMB plant peak construction activity will occur in the last year of the period.

The direct impacts as reported by HCG and TDT are examined in Table 4. There are some differences between the proportion of construction activity by year as reported in Table 3 and the time allocation of the direct impacts as reported in Table 3. But in general the patterns remain similar, with the greater portion of the direct impacts from the construction of the ORION plant occurring in year 2 and that for the CMB plant occurring in year 3.

TABLE 4
PULP MILLS DIRECT ECONOMIC IMPACT – CONSTRUCTION PHASE
(IN USD MILLIONS AND PERCENTAGES)

| | ORION (USDm) | CMB (USDm) | TOTAL (USDm) | ORION (%) | CMB (%) |
|--------|-------------------------|-----------------------|-------------------------|----------------------|--------------------|
| Year 1 | 30 | 11 | 41 | 34 | 30 |
| Year 2 | 48 | 11 | 59 | 56 | 31 |
| Year 3 | 8 | 14 | 22 | 10 | 39 |
| Total | 86 | 36 | 122 | 100 | 100 |
| | | | | | |

Sources: HCG IO Tables and TDT Nov. 03 p. 59,

The distribution by sector of the indirect impacts for the construction phase are shown in Table 5, which provides some indication of the difficulties of applying an “eclectic” approach to estimate indirect impacts, as there are so many inter-sectoral relationships that necessarily get overlooked.

TABLE 5
PULP MILLS INDIRECT ECONOMIC IMPACT – CONSTRUCTION PHASE
(IN USD MILLIONS)

| | ORION | CMB | TOTAL | ORION (%) | CMB (%) |
|---------------|--------------|------------|--------------|----------------------|----------------|
| Manufacturing | 32 | 37 | 69 | 32 | 88 |
| Energy | 8 | - | 8 | 8 | - |
| Transport | 7 | * | 7 | 7 | 1 |
| Other Sectors | 54 | 5 | 59 | 54 | 11 |
| Total | 100 | 42 | 143 | 100 | 100 |
| | | | | | |

* less than USD500,000.

Sources: HCG IO Model and TDT Nov. 03 p. 59.

The distribution, by sector, of the induced impacts for the construction phase are shown in Table 6.

TABLE 6
PULP MILLS INDUCED ECONOMIC IMPACT – CONSTRUCTION PHASE
(IN USD MILLIONS)

| | ORION | CMB | TOTAL | ORION (%) | CMB (%) |
|---------------|--------------|------------|--------------|------------------|----------------|
| Manufacturing | 11 | N.A. | N.A. | 18 | N.A. |
| Energy | 3 | N.A. | N.A. | 5 | N.A. |
| Construction | 8 | N.A. | N.A. | 13 | N.A. |
| Transport | 5 | N.A. | N.A. | 8 | N.A. |
| Other Sectors | 33 | N.A. | N.A. | 56 | N.A. |
| Total | 60 | 23 | 83 | 100 | 100 |
| | | | | | |

Sources: HCG IO Model; CMB - TDT Nov. 03 p.68

The induced impacts were calculated by HCG and TDT on the basis of the chain reaction from the increase in final demand, resulting from construction of the plants. HCG includes both consumption and investment final demand through an assumption of a fixed relationship between fixed investments and GDP. TDT uses a more conservative approach based on the increase in salaries generated, acknowledging a conservative bias in their results. The HCG IO model provides estimates of the indirect impacts by sector, the TDT results are global, as reflected in Table 6.

To compensate for the conservative coverage by TDT, a new table has been drawn up in order to provide a cumulative impact assuming that the magnitude of the impact from the construction of the mills relates directly to the scale of the investment.

In Table 7 these revised calculations of the economic impact of the two pulp mills for the construction phase have been tabulated according to the method suggested in the previous paragraph. It will be seen that the total impact is expected to be USD 417 millions, about 15 per cent higher than implied with the original TDT calculations. The impact in basic prices have been converted to arrive at the impact on GDP in producers' prices through the addition of net taxes less subsidies on products.

It should be noted that these results do not contradict in any way the conclusions of the TDT study consultants, who openly acknowledge in several places throughout their report that their estimates have a conservative bias.

TABLE 7
ECONOMIC IMPACT – CONSTRUCTION PHASE
(IN USD MILLIONS)

| IMPACT | ORION | CMB (1) | TOTAL (2) | CMB (3) | TOTAL (4) |
|--------------------------|--------------|----------------|------------------|----------------|------------------|
| Direct | 86 | 43 | 129 | 36 | 123 |
| Indirect | 100 | 51 | 151 | 42 | 142 |
| Induced | 60 | 31 | 91 | 23 | 91 |
| Total Basic Prices | 246 | 125 | 371 | 102 | 356 |
| Total Producer Prices | 277 | 140 | 417 | | |
| | | | | | |

- (1) Revised calculations based on proportion of impacts using HCG methodology.
- (2) Total of ORION and CMB using HCG methodology to show impacts for both mills
- (3) Original calculations in TDT Nov. 03 and Jan. 05.
- (4) Total of ORION and CMB using HCG methodology to calculate impacts for the ORION mill and TDT methodology to calculate impacts for the CBM mill.

9.6 Employment Impact – Construction Phase

ORION and CMB provided to their consultants the estimates of the direct employment required for the construction of the pulp mills and this is reflected by HCG and TDT in their calculations of direct employment impact, shown in Table 8.

TABLE 8
PULP MILLS DIRECT EMPLOYMENT IMPACT – CONSTRUCTION PHASE
(PERSON-YEARS OF FULL TIME EMPLOYMENT)

| | ORION (Persons) | CMB (Persons) | TOTAL (Persons) | ORION (%) | CMB (%) |
|--------|----------------------------|--------------------------|----------------------------|----------------------|----------------|
| Year 1 | 1,000 | 985 | 1,985 | 24 | 27 |
| Year 2 | 3,000 | 1,155 | 4,155 | 71 | 32 |
| Year 3 | 200 | 1,443 | 1,643 | 5 | 41 |
| Total | 4,200 | 3,583 | 7,783 | 100 | 100 |

Sources: HCG IO Model and Table 63 p. 115. CMB – TDT Nov. 03 p.58

The distribution of employment over the three years of construction for each of the pulp mills roughly follows the yearly allocation of capital investment as seen in Table 3. The data suggests that CMB will have a more intensive use of labor than ORION during the construction phase.

The distribution by sector of the indirect employment impact was derived for the ORION plant on the basis of the HCG IO Model estimates of economic activity by sector and the application of econometric relationships between output and employment. The CMB consultants make estimates for each of the industries directly involved in providing inputs into the construction of the plant: concrete and cement, steel, transport, quarries and other suppliers. The results are shown in Table 9.

TABLE 9
PULP MILLS INDIRECT EMPLOYMENT IMPACT
CONSTRUCTION PHASE
(PERSONS-YEARS OF FULL TIME EMPLOYMENT)

| | ORION (Persons) | CMB (Persons) | TOTAL (Persons) | ORION (%) | CMB (%) |
|---------------|----------------------------|--------------------------|----------------------------|----------------------|----------------|
| Manufacturing | 1,561 | 921 | 2,482 | 27 | 78 |
| Energy | 72 | - | 72 | 1 | - |
| Transport | 65 | 18 | 83 | 1 | 2 |
| Other Sectors | 4,012 | 248 | 4,260 | 71 | 20 |
| Total | 5,710 | 1,187 | 6,897 | 100 | 100 |
| | | | | | |

Sources: HCG IO Model; TDT Nov. 03 p. 58

There is a substantial difference between the calculations of indirect employment by HCG and TDT. TDT provides some detailed information about the industries likely to be closely connected with the construction of the pulp mills but probably underestimates the likely total employment by not including sufficiently the service sectors.

The results of the calculations for induced employment are shown in Table 10. HCG relates induced employment to induced output, but there is no commentary in the HCG study either on the results or their validity. TDT uses a similar method to that employed in calculating induced value added, but assuming that half of the increase in additional salaries would be in the form of an increased number of full time positions.

TABLE 10
PULP MILLS INDUCED EMPLOYMENT IMPACT
CONSTRUCTION PHASE
(PERSON-YEARS OF FULL TIME EMPLOYMENT)

| | ORION (Persons) | CMB (Persons) | TOTAL (Persons) | ORION (%) | CMB (%) |
|---------------|----------------------------|--------------------------|----------------------------|----------------------|----------------|
| Manufacturing | 327 | N.A. | N.A. | 13 | N.A. |
| Energy | 14 | N.A. | N.A. | 1 | N.A. |
| Construction | 459 | N.A. | N.A. | 18 | N.A. |
| Transport | 50 | N.A. | N.A. | 2 | N.A. |
| Other Sectors | 1,662 | N.A. | N.A. | 66 | N.A. |
| Total | 2,512 | 627 | | 100 | |
| | | | | | |

Sources: ORION IO Model, TDT Nov. 03 p. 70.

As for indirect employment there are more substantial differences in the impacts than would be expected from the scale of construction.

The total employment resulting from the construction phase and reported by HCG and TDT is shown in Table 11.

TABLE 11
EMPLOYMENT IMPACT
CONSTRUCTION PHASE
(PERSON-YEARS OF FULL TIME EMPLOYMENT)

| | ORION (Persons) | CMB (Persons) | TOTAL (Persons) | ORION (%) | CMB (%) |
|----------|----------------------------|--------------------------|----------------------------|----------------------|----------------|
| Direct | 4,200 | 3,583 | 7,783 | 34 | 66 |
| Indirect | 5,710 | 1,187 | 6,897 | 46 | 22 |
| Induced | 2,512 | 627 | 3,139 | 20 | 12 |
| Total | 12,422 | 5,397 | 17,819 | 100 | 100 |
| | | | | | |

Sources: As per Tables 7,8 & 9.

In Table 12 the percentage distribution is shown of the calculated amounts of economic and employment impacts.

TABLE 12
ECONOMIC AND EMPLOYMENT IMPACTS
CONSTRUCTION PHASE
(PERCENTAGE DISTRIBUTION)

| IMPACT | ECONOMIC IMPACTS | | EMPLOYMENT IMPACTS | |
|----------|------------------|-----|--------------------|-----|
| | ORION | CMB | ORION | CMB |
| Direct | 35 | 35 | 34 | 66 |
| Indirect | 41 | 41 | 46 | 22 |
| Induced | 24 | 23 | 20 | 12 |
| Total | 100 | 100 | 100 | 100 |
| | | | | |

Note: There are some differences due to rounding.

Source: HCG IO Model and TDT November 2003.

For the economic impacts the relationships for the two mills are almost perfectly similar, the main differences, as indicated above, being the scale of the impacts. For the employment impacts, on the other hand, there are noticeable differences in the distribution as well as the scale of impacts.

For ORION both economic and employment impacts show similar patterns of distribution. The CMB distribution of economic and employment impacts differ considerably; particularly noticeable is the relatively large proportion of employment accounted for by direct employment in the construction of the pulp mills.

In the light of the inconsistencies in the results for the employment impacts of the two pulp mills a revised table (Table 13) has been drawn up, assuming that the level and distribution of employment impacts will be proportional to relative investments in the pulp mills and in accordance with the IO Model methodology used by HCG.

TABLE 13
EMPLOYMENT IMPACT - CONSTRUCTION PHASE REVISED
(PERSON-YEARS OF FULL TIME EMPLOYMENT)

| IMPACT | ORION | CMB (1) | TOTAL (2) | CMB (3) | TOTAL (4) |
|----------|--------|---------|-----------|---------|-----------|
| Direct | 4,200 | 2,122 | 6,322 | 3,583 | 7,783 |
| Indirect | 5,710 | 2,885 | 8,595 | 1,187 | 6,897 |
| Induced | 2,512 | 1,269 | 3,781 | 627 | 3,139 |
| Total | 12,422 | 6,277 | 18,699 | 5,397 | 17,819 |
| | | | | | |

(1) Revised calculations based on ORION methodology

(2) Total of ORION and CMB using ORION methodology to show impacts for both mills

(3) Original calculations in TDT Jan. 05.

(4) Total of ORION and CMB using ORION methodology to calculate impacts for the ORION mill and TDT methodology to calculate impacts for the CMB mill.

The major differences in the CMB results, between the revised Table 13 and the original Table 11, are a reduction in the amount of employment classified as “direct” and increases in the indirect and induced employment. The revised calculations imply an increase in the overall level of employment of about 5 per cent.

9.7 Trade Balance Impacts – Construction Phase

During the construction period HCG and TDT estimate, respectively, that there would be imports of goods and services totaling about USD740 million for the ORION plant and about USD398 million for the CMB plant.¹¹

Both HCG and TDT made estimates of the impact of the construction of the pulp mills on the trade balance. The direct trade balance impact is given in Table 14.

¹¹ Botnia June 2004, p. 109 and TDT Nov. 03 pp. 19,23,56 & 71.

TABLE 14
DIRECT TRADE BALANCE IMPACT – CONSTRUCTION PHASE
(USD MILLIONS)

| IMPORTED MATERIALS | ORION | CMB | TOTAL | ORION (%) | CMB (%) |
|---------------------------|--------------|------------|--------------|------------------|----------------|
| 2005 | 138 | 75 | 213 | 19 | 19 |
| 2006 | 581 | 139 | 720 | 78 | 36 |
| 2007 | 26 | 173 | 199 | 3 | 45 |
| Total | 745 | 387 | 1,132 | 100 | 100 |
| | | | | | |

Sources: HCG IO Model and June 2004 p. 116, TDT Nov. 03 pp. 19, 23 & 56.

In addition to the direct balance of trade impacts calculations were made of the indirect and induced imports resulting from the impacts on the economy during the construction phase. While much smaller than the direct impacts from the import of materials for the construction of the mills, including the freight and insurance components, these indirect and induced impacts are still significant. The impacts are broadly consistent both in scale and with regards to their distribution over time. Table 15 shows the indirect and induced trade balance impact.

TABLE 15
INDIRECT AND INDUCED TRADE BALANCE IMPACT
CONSTRUCTION PHASE - (USD MILLIONS)

| | ORION | CMB | TOTAL | ORION (%) | CMB (%) |
|-------|--------------|------------|--------------|------------------|----------------|
| 2005 | 4 | 3 | 7 | 25 | 27 |
| 2006 | 11 | 4 | 15 | 69 | 36 |
| 2007 | 1 | 4 | 5 | 6 | 36 |
| Total | 16 | 11 | 27 | 100 | 100 |

Sources: HCG IO Model, TDT Nov. 03 p. 56 and p. 71.

Table 16 shows the total trade balance impact.

TABLE 16
TOTAL TRADE BALANCE IMPACT
CONSTRUCTION PHASE - (USD MILLIONS)

| IMPORTED MATERIALS | ORION | CMB | TOTAL | ORION (%) | CMB (%) |
|---------------------------|--------------|------------|--------------|------------------|----------------|
| 2005 | 142 | 78 | 220 | 19 | 21 |
| 2006 | 592 | 142 | 734 | 78 | 35 |
| 2007 | 27 | 178 | 205 | 3 | 44 |
| Total | 761 | 398 | 1,159 | 100 | 100 |

Sources: As for Tables 14 & 15.

The resulting negative trade balance will be about USD1.2bn for the entire construction period, although in the last year of construction there will already be some exports of pulp, which would reduce the negative impact in that year. To put the results in perspective, in 2004 Uruguayan exports (f.o.b) and imports (c.i.f) were USD 2.9bn and USD 3.1bn, respectively, with a slightly positive trade balance. Over the “normal” period 1999-2001 Uruguayan imports (c.i.f) exceeded exports (f.o.b) by USD 1.2 billion per year. This is about the same order of magnitude as the trade deficits seen in the “normal” years, prior to the “River Plate Crisis” of 2002. Since 2002 there has been more of a balance between imports and exports, but as the economy recovers it is expected that the trade deficits will return.

9.8 Impact On Central Government Revenues – Construction Phase

Central government revenues consist primarily of taxes on personal and corporate income, indirect taxes and social insurance payments. HCG calculated these for the ORION mill, but no calculations were found in the TDT reports for the CMB mill. Estimates have been made for the construction period for CMB by scaling the revenues in relation to the relative amount of investment in the plants. The results are shown in Table 17.

TABLE 17
IMPACT ON CENTRAL GOVERNMENT REVENUES
CONSTRUCTION PHASE - (USD MILLIONS)

| IMPACTS | ORION | CMB | TOTAL |
|---------------------|-------|-----|-------|
| Direct and Indirect | 42 | 13 | 55 |
| Induced | 21 | 7 | 28 |
| Total Impacts | 63 | 20 | 83 |
| | | | |

Source: HCG IO Model and CIS Consultants' estimates.

As shown in the above table, it is expected that the central government will collect about USD 83million in additional revenues over the 3 year construction period. To put this in perspective, central government revenues in 2004 were about USD 4bn, indicating that the additional revenue collections over the construction period will be equivalent to about 2 per cent of 2004 government revenues.

9.9 Regional Impacts – Construction Phase

HCG paid a great deal of attention to estimating the regional impact of the project. The methodology employed consisted of taking the results on a national level from the IO Model as a starting point and applying a percentage breakdown for four geographical units: the departments of Rio Negro (where the mills will be located); Soriano (the department directly to the west of Rio Negro); Paysandú (the department immediately to the north of Rio Negro), the departments most affected by the projects; and the rest of Uruguay. The distribution of impacts was made on the basis of best judgment by HCG's team of local economists, each of which has considerable knowledge of the economics and employment situation in the region. TDT considered the regional impact, but provided no specific estimates of the contribution to departmental GDP resulting from the construction phase of the mill.

Consequently, in order to estimate the impacts of the CMB pulp mills, and hence the cumulative impact, it was decided to use the method established for the distribution of the impacts to individual departments from the HCG study and assume an impact proportional to the size of the investment. The results for the economic impacts are shown in Table 18.

TABLE 18
REGIONAL ECONOMIC IMPACTS – CONSTRUCTION PHASE
(USD MILLIONS)

| | ORION | CMB | TOTAL | TOTAL (%) |
|------------------------|--------------|------------|--------------|------------------|
| Rio Negro | 137 | 69 | 206 | 56 |
| Soriano | 22 | 11 | 33 | 9 |
| Paysandu | 27 | 14 | 41 | 11 |
| Rest of Country | 60 | 31 | 91 | 24 |
| Total (Basic Prices) | 246 | 125 | 371 | 100 |
| Taxes on Products | 31 | 16 | 47 | |
| Total (Producers' Pr.) | 277 | 140 | 417 | |
| | | | | |

Sources: HCG IO Model and June 2004 pp.75–82 and CIS Consultants' estimates.

As would be expected the largest portion of the impacts are to the Department of Rio Negro, which amount to about USD206 million over the construction period, equivalent to 56 per cent of the total national impact (measured in basic prices). The Department of Paysandú, which will contribute an important amount of building materials, would account for about USD 41 million during the construction period, or about 11 per cent of the total impacts. The Department of Soriano would account for slightly less than Paysandú. The impact on the rest of the country would be about USD91 million, or about 24 per cent of the total impact. To put this in perspective, the gross departmental products for Rio Negro, Soriano and Paysandú in 2003 were USD184 million, USD230 million and USD321 million, respectively. This implies that during the three year construction period the Department of Rio Negro would increase its departmental product by the equivalent of more than the entire product in 2003. The impact on the Departments of Soriano and Paysandú would be the equivalent of about 14 per cent of departmental product for Soriano and 13 per cent for Paysandú.

Table 19 examines the regional employment impacts for the construction phase of the ORION pulp mill, as reported by HCG. It is expected that 60 per cent of employment would be created in the Department of Rio Negro. This is qualified by a statement that this could include also persons commuting to Rio Negro daily, who are not necessarily resident of Rio Negro.

TABLE 19
ORION REGIONAL EMPLOYMENT IMPACTS – CONSTRUCTION PHASE
(PERSON-YEARS OF FULL TIME EMPLOYMENT)

| | DIRECT | INDIRECT | INDUCED | TOTAL | % |
|-----------------|---------------|-----------------|----------------|--------------|----------|
| Rio Negro | 4,200 | 2,176 | 1,062 | 7,437 | 60 |
| Soriano | | 615 | 273 | 888 | 7 |
| Paysandu | | 1,555 | 53 | 1,608 | 13 |
| Rest of Country | | 1,365 | 1,124 | 2,489 | 20 |
| Total | 4,200 | 5,710 | 2,512 | 12,422 | 100 |
| | | | | | |

Sources: HCG IO Model and June 2004 pp. 88-93.

HCG estimates that a total of 4,200 person-years of full time employment would be created during the three years of the construction phase of the ORION mill. In the peak year (2006) about 3,000 persons, from Rio Negro itself, or day commuters to Rio Negro, are expected to be employed in the construction.

The departmental distribution for employment for the CMB mill was derived from the revised calculations as reported in Table 13, using the HCG methodology to calculate the relevant impacts and the HCG methodology to determine departmental employment allocation. Table 20 reports these results.

TABLE 20
CMB REGIONAL EMPLOYMENT IMPACTS – CONSTRUCTION PHASE
(PERSON-YEARS OF FULL TIME EMPLOYMENT)

| | DIRECT | INDIRECT | INDUCED | TOTAL | % |
|-----------------|---------------|-----------------|----------------|--------------|----------|
| Rio Negro | 2,122 | 1,099 | 537 | 3,758 | 60 |
| Soriano | | 311 | 138 | 449 | 7 |
| Paysandu | | 786 | 27 | 813 | 13 |
| Rest of Country | | 690 | 568 | 1,258 | 20 |
| Total | 2,122 | 2,885 | 1,270 | 6,277 | 100 |
| | | | | | |

Sources: CIS Consultants estimates.

Table 21 summarizes the allocation to departments of total employment for the two pulp mills.

TABLE 21
TOTAL REGIONAL EMPLOYMENT IMPACTS – CONSTRUCTION PHASE
(PERSON-YEARS OF FULL TIME EMPLOYMENT)

| | DIRECT | INDIRECT | INDUCED | TOTAL | % |
|-----------------|---------------|-----------------|----------------|--------------|----------|
| Rio Negro | 6,322 | 3,275 | 1,598 | 11,195 | 60 |
| Soriano | | 926 | 411 | 1,337 | 7 |
| Paysandu | | 2,341 | 80 | 2,421 | 13 |
| Rest of Country | | 2,054 | 1,692 | 3,746 | 20 |
| Total | 6,322 | 8,595 | 3,781 | 18,699 | 100 |
| | | | | | |

Sources: As for Tables 20 & 21.

Table 22 shows, for the construction phase of both of the mills combined, the percentage distribution of the different employment impacts on each department and for the rest of the country.

TABLE 22
TOTAL REGIONAL EMPLOYMENT IMPACTS – CONSTRUCTION PHASE
(PERCENTAGE DISTRIBUTION OF FULL TIME EMPLOYMENT)

| | DIRECT | INDIRECT | INDUCED | TOTAL |
|-----------------|---------------|-----------------|----------------|--------------|
| Rio Negro | 100 | 38 | 42 | 60 |
| Soriano | | 11 | 11 | 7 |
| Paysandu | | 27 | 2 | 13 |
| Rest of Country | | 24 | 45 | 20 |
| Total | 100 | 100 | 100 | 100 |
| | | | | |

The employment impacts would be strongest for the Department of Rio Negro, which will benefit from all of the direct impacts, 38 per cent of the indirect and 42 per cent of the induced

impacts. These impacts would represent, over a three year period, an increase in employment in excess of the equivalent of more person-years employment than would have been supplied by a fully employed departmental labor force in 2004. As mentioned previously, the existing departmental labor force is insufficiently large to supply all of the expected employment requirements and this will encourage day commuting from neighboring departments and migration from other parts of the country.

9.10 Definitions Of Impacts – Operational Phase

For the examination of the operational phase adjustments are made in the definitions of direct, indirect and generated impacts, in similar fashion to those made for the construction phase. These are shown in Table 23.

**TABLE 23
CLASSIFICATION OF IMPACTS – OPERATIONAL PHASE**

| Definition of Impacts Adopted | Impacts in ORION SE Study | Impacts in CMB SE Study |
|--|--------------------------------------|------------------------------------|
| Direct | Direct – Mill Production | Direct – Mill Production |
| Indirect | Direct – Other Sectors | Indirect |
| Induced | Indirect | Induced |
| | | |

HCG and TDT illustrate the impacts of the operational phase of the plants by reporting for a representative year during which the plants will be operating at full capacity.. The years 2008 and 2016 were chosen for this purpose for the CMB and ORION pulp mills, respectively.

9.11 Economic Impact – Operational Phase

It was not possible from the SE reports to determine the off-take price for pulp agreed by each company. This price is important because this would be the price which is reported in Uruguayan international trade statistics and which, when intermediate inputs are subtracted, determines value added and hence the contribution to the GDP. For both mills the commercial accounting information in the reports does not allow ready conversion to national accounting,

which is the framework in which the impacts on the GDP are determined. For example ocean freight on pulp, which would appear in the national accounts of the importing country and not in those of Uruguay, is considered in the ORION report to be an intermediate input.¹²

Some adjustments have been made in an attempt to arrive at a reasonable estimate of the effective off-take price for ORION, given that the HCG have estimated the value-added in the representative year at USD107 million.¹³

For CMB it was brought to the attention of the CIS Consultants that the pulp export price would be USD372/ton. This implies that adjustments have to be made to the estimate of the value added presented in the TDT report of January 2005, as in that document it was assumed that the export price for pulp would be USD 500/ton.

In Table 24 calculations have been made to establish the relationship between various off-take prices and value added contribution to the Uruguayan economy. The first column uses the export price given in the HCG June 2004 report; the second column calculates the effective export price implicit from a value-added of USD107 million and using information on fixed, variable costs and sales as explicitly or implicitly implied in the IO Model and the HCG June 2004 report. The third column takes the pulp export price of USD 500/ton, as given in the TDT January 2005 report and calculates the resulting value added, given the information on sales and costs provided in the TDT report and in the 2004 feasibility study for the CMB plant. The last column employs the off-take price of USD 372 per ton, which it is understood is the price agreed for CMB sales of pulp f.o.b. Uruguay.

¹² HCG June 2004, Table 60, p. 110.

¹³ HCG IO Model and June 2004 Table 61, p. 114.

TABLE 24
DIRECT IMPACT GDP – OPERATIONAL PHASE
(IN USD MILLIONS)

| | ORION | ORION | CMB | CMB |
|-------------------------------|--------------|--------------|------------|------------|
| Off-Take Pulp Price (USD/Ton) | 353 | 328 | 500 | 372 |
| Pulp Sales (USD Million FOB) | 353 | 328 | 240 | 179 |
| Electricity Sales | 2 | 2 | 3 | 3 |
| Total Sales | 355 | 330 | 243 | 182 |
| Fixed Costs | 35 | 35 | 8 | 8 |
| Variable Costs | 140 | 140 | 89 | 89 |
| Amortization | 47 | 47 | 27 | 27 |
| Total Inputs | 221 | 221 | 123 | 123 |
| Value Added | 134 | 107 | 120 | 59 |
| | | | | |

Sources: Based on HCG June 2004, p.110 and CMB, Feasibility Study for the CMB Pulp Mill, 2004.

The direct impacts, for a year of full capacity production, for the ORION and CMB mills have been taken to be USD107 million and USD 59 million respectively. As the value added for ORION is the same as that used as an input for the IO Model there would be no changes in the results for ORION. However, there would be considerable differences in the case of CMB and in order to make these changes the CIS Consultants have made appropriate changes to the results found in the TDT January 2005 report.

Table 25 provides a summary of the indirect economic impact for the representative year in the operational phrase as reported by HCG and TDT.

TABLE 25
PULP MILLS INDIRECT ECONOMIC IMPACT – OPERATIONAL PHASE
(IN USD MILLIONS)

| | ORION | CMB | TOTAL | ORION (%) | CMB (%) |
|---------------|--------------|------------|--------------|------------------|----------------|
| Forestry | 19 | 31 | 50 | 30 | 54 |
| Manufacturing | 6 | 13 | 19 | 10 | 22 |
| Energy | 1 | 11 | 12 | 2 | 18 |
| Construction | 2 | | 2 | 3 | |
| Transport | 21 | 2 | 23 | 34 | 3 |
| Other Sectors | 13 | 2 | 15 | 20 | 3 |
| Total | 62 | 58 | 120 | 100 | 100 |
| | | | | | |

Sources: ORION IO Model and TDT January 05 p.39

The HCG results in Table 25 are derived directly from the HCG IO Model. The TDT calculations include as indirect impacts USD 27.7 million for the value of wood utilized by the plant that would otherwise not be exported or consumed domestically and USD 10 million, the value of excess electricity generated by CMB and sold to the national grid. The impacts on the forestry sector would be the value added by the additional activity caused by the increased sales to the pulp mill, rather than the value of the output. The sales of electricity, considered to be USD 3.09 million in the 2004 CMB feasibility study, would already have been included in the calculation of direct impacts.

Table 26 shows the induced economic impacts, calculated by HCG and TDT.

TABLE 26
PULP MILLS INDUCED ECONOMIC IMPACT – OPERATIONAL PHASE
(IN USD MILLIONS)

| | ORION | CMB | TOTAL | ORION (%) | CMB (%) |
|---------------|--------------|------------|--------------|------------------|----------------|
| Forestry | 0 | N.A. | N.A. | 0 | N.A. |
| Manufacturing | 5 | N.A. | N.A. | 15 | N.A. |
| Energy | 2 | N.A. | N.A. | 5 | N.A. |
| Construction | 7 | N.A. | N.A. | 19 | N.A. |
| Transport | 3 | N.A. | N.A. | 9 | N.A. |
| Other Sectors | 18 | N.A. | N.A. | 52 | N.A. |
| Total | 35 | 4 | 39 | 100 | 100 |
| | | | | | |

Sources: ORION IO Model and TDT January 05, p. 27.

The ORION results for the induced economic impact are derived from the HCG IO Model. The induced impacts for CMB for the operational phase were derived by TDT in a similar fashion to those for the construction phase, namely on the basis of the chain reaction from the increase in consumption, resulting from operation of the plant.

To compensate for the overestimation of the contribution of the forestry and electricity sectors and for the conservative estimates of indirect and induced impacts by TDT, a new table has been drawn up in order to provide a cumulative impact, assuming that the magnitude of the impact from the operations of the mills relates directly to the relative scale of the pulp production. The results are shown in Table 27.

TABLE 27
ECONOMIC IMPACT – OPERATIONAL PHASE
(IN USD MILLIONS)

| IMPACT | ORION | CMB (1) | TOTAL (2) | CMB (3) | TOTAL (4) |
|--------------------------|--------------|----------------|------------------|----------------|------------------|
| Direct | 107 | 59 | 166 | 117 | 224 |
| Indirect | 62 | 34 | 96 | 58 | 120 |
| Induced | 35 | 19 | 54 | 4 | 39 |
| Total Basic Prices | 204 | 111 | 316 | 179 | 382 |
| Total Producer Prices | 214 | 117 | 331 | | |
| | | | | | |

(1) Revised calculations based on the same proportional distribution of indirect and induced impacts as in the HCG methodology

(2) Total of ORION and CMB using HCG methodology to show impacts for both mills

(3) Original calculations in TDT Jan. 05.

(4) Total of ORION and CMB using HCG methodology to calculate impacts for the ORION mill and TDT methodology to calculate impacts for the CMB mill.

Using the methodology described above, it is estimated the combined economic impact from operating the plants at full output will be about USD 331 million per year. Of this, over 50 per cent will be direct impact of plant production and indirect and induced impacts should account for about 30 and 20 per cent, respectively.

To put this in perspective the GDP in 2004 is estimated to be about USD 13.216 million. The economic impact from the operational phase of the mills would therefore represent about 2.5 per cent of 2004 GDP.

Rough calculations were made to establish the impact on gross national product (GNP), which takes into account net payments to the rest of the world. For the representative year the economic impact of the ORION and CMB pulp mills would be the equivalent of 0.9% and 0.6%, respectively, of GNP implying a total impact of 1.5 per cent of GNP.

9.12 Employment Impact – Operational Phase

The direct impact on employment in the operational phase of the mills will be 300 direct jobs in each mill.¹⁴

Indirect employment was estimated by the SE Study consultants using the methodologies described in the section on employment during the construction phase. The results are shown in Table 28.

**TABLE 28
PULP MILLS INDIRECT EMPLOYMENT IMPACT – OPERATIONAL PHASE
(PERSON-YEARS OF FULL TIME EMPLOYMENT)**

| | ORION | CMB | TOTAL | ORION (%) | CMB (%) |
|---------------|--------------|------------|--------------|------------------|----------------|
| Forestry | 2,235 | 113 | 2,348 | 56 | 30 |
| Manufacturing | 326 | 107 | 433 | 8 | 28 |
| Energy | -65 | | -65 | -2 | |
| Construction | 78 | | 78 | 2 | |
| Transport | 656 | 83 | 739 | 16 | 22 |
| Other Sectors | 746 | 77 | 823 | 19 | 20 |
| Total | 3,976 | 380 | 4,356 | 100 | 100 |
| | | | | | |

Source: ORION IO Model and TDT January 2005 p.39.

There is a major discrepancy between the two reports in the estimates of the indirect impact of the pulp mills on employment in the forestry sector. To understand which order of magnitude should be considered to be the best approximation, the CIS Consultants have calculated the employment impacts for a year in which both pulp mills are producing at full capacity and the consumption of wood is assumed to be 3.5 million cubic meters for the ORION plant and 1.71 million cubic meters for the CMB plant. Table 29 provides a summary of the calculations of wood requirements, with and without the pulp mills.

¹⁴ HCG June 2004, p. 24 and TDT January 2005, p. 11.

TABLE 29
WOOD CONSUMPTION AND EXPORTS
SCENARIOS WITH AND WITHOUT PULP MILLS
(IN MILLION CUBIC METERS)

| CONSUMPTION/EXPORTS | WITH MILLS | W/OUT MILLS | DIFFERENCE |
|----------------------------|-------------------|--------------------|-------------------|
| ORION Consumption | 3.5 | 0.0 | 3.5 |
| CMB Consumption | 1.7 | 0.0 | 1.7 |
| Chips Exports | 2.2 | 2.2 | 0.0 |
| Log Exports | 0.5 | 2.0 | -1.5 |
| Other Domestic Consumption | 2.5 | 2.5 | 0.0 |
| Total Consumption/Exports | 10.4 | 6.7 | 3.7 |
| | | | |

Source: CIS Consultants.

The difference in wood production between the two scenarios is approximately 3.7 million cubic meters. For Uruguay the employment multipliers for the forestry sector are 0.0125 full time jobs per hectare and 0.0255 jobs per hectare if seasonal employment is taken into account.¹⁵ These multipliers and an estimated yield of about 25 cubic meters per hectare per year, would imply that it can be expected that an additional 1,845 full time jobs would be created as a direct result of the output of the pulp mills, taking into account lower amount of log exports that would result in the scenario with the pulp mills. In addition about 1,900 part time jobs would be created. This would indicate that the TDT substantially underestimate the indirect employment impact for the forestry sector. The HCG calculations of 2,235 full time jobs for the ORION plant might be slightly, though not excessively, high.

Table 30 provides the results from the calculations of induced employment impacts. The HCG results were obtained from the IO Model and those of TDT seem to be estimated in proportion to the calculations on the induced economic impacts.

¹⁵ SGS in its certification of the plantations of Forestal Oriental, for the Forest Stewardship Council (FSC).

TABLE 30
PULP MILLS INDUCED EMPLOYMENT IMPACT – OPERATIONAL PHASE
(PERSON-YEARS OF FULL TIME EMPLOYMENT)

| | ORION | CMB | TOTAL | ORION (%) | CMB (%) |
|---------------|--------------|------------|--------------|------------------|----------------|
| Forestry | | N.A. | N.A. | | N.A. |
| Manufacturing | 349 | N.A. | N.A. | 9 | N.A. |
| Energy | 13 | N.A. | N.A. | * | N.A. |
| Construction | 955 | N.A. | N.A. | 25 | N.A. |
| Transport | 56 | N.A. | N.A. | 1 | N.A. |
| Other Sectors | 2,505 | N.A. | N.A. | 65 | N.A. |
| Total | 3,878 | 112 | 3,990 | 100 | 100 |
| | | | | | |

* Less than 0.5%

Source: HCG IO Model and TDT January 2005, pp. 26-27.

The induced employment impact in the HCG calculations is particularly strong for “other sectors”, construction and manufacturing.

Table 31 shows the total employment impact during a year of full capacity production. As in the case of the economic impact these calculations are revisions in the case of CMB and use the HCG methodology, which is considered a broader indicator of employment impacts. The original calculations made by TDT are also shown in the same table.

TABLE 31
EMPLOYMENT IMPACT - OPERATIONAL PHASE
(PERSON-YEARS OF FULL TIME EMPLOYMENT)

| IMPACT | ORION | CMB (1) | TOTAL (2) | CMB (3) | TOTAL (4) |
|---------------|--------------|----------------|------------------|----------------|------------------|
| Direct | 300 | 300 | 600 | 300 | 600 |
| Indirect | 3,976 | 2,094 | 6,070 | 381 | 4,357 |
| Induced | 3,879 | 2,043 | 5,922 | 112 | 3,991 |
| Total | 8,155 | 4,438 | 12,593 | 793 | 8,948 |
| | | | | | |

(1) Revised calculations based on HCG methodology

(2) Total of ORION and CMB using HCG methodology to show impacts for both mills

(3) Original calculations in TDT Jan. 05.

(4) Total of ORION and CMB using HCG methodology to calculate impacts for the ORION mill and TDT methodology to calculate impacts for the CMB mill.

The results using the HCG methodology suggest that 12,593 new jobs will be created, only about 600 of which would be provided directly by the pulp mills. An additional 6,070 person-years of indirect employment would be created in other sectors of the economy and there would be induced employment creation of 5,922 person-years, primarily in the service sectors.

As a point of reference it is estimated that in 2004 national employment totaled about 1.37 million person-years. The forestry sector accounted for about 10,600 person-years. The employment impact of the operation of the mills would therefore represent about 0.9 per cent of the 2004 total.

9.13 Trade Balance Impacts – Operational Phase

As Uruguay completes its recovery from the “River Plate Crisis” of 2002, it can be expected that the historic patterns of large trade deficits will tend to resume, hence the importance of these pulp mill projects, which will provide steady stream of exports.

Table 32 shows the balance of trade effect for a representation year with full capacity pulp production.

TABLE 32
TRADE BALANCE IMPACT - OPERATIONAL PHASE
(USD MILLIONS)

| | ORION | CMB | TOTAL |
|-------------------------|--------------|------------|--------------|
| Exports (gross) | 353 | 179 | 532 |
| Wood exports | -28 | -13 | -41 |
| Exports (net) | 326 | 166 | 492 |
| Imports c.i.f. | -155 | -75 | -230 |
| Indirect Imports c.i.f. | -10 | -8 | -18 |
| Balance of Trade | + 161 | +83 | +244 |
| | | | |

Sources: HCG IO Model, TDT January 2005, p. 24 & p.40.

The total trade impact includes the positive effect of the value of the exports of pulp, estimated in Table 24, and the negative effect of the loss of revenue from logs that without the pulp mills would have overseas markets, as well as the negative effect of imported materials for the pulp mill. Additional imports will also be induced as a result of the chain reaction increase in consumption and investment resulting from the operations of the pulp mills. The positive effect on the trade balance in a representative year of full capacity production for the pulp mills represents the equivalent of about 22 per cent of the “normal” trade deficit.

9.14 Impact On Central Government Revenues – Operational Phase

Central government revenues consist primarily of taxes on personal and corporate income, indirect taxes and social insurance payments. HCG Consultants calculated these for the ORION mill, but no calculations were found in the reports for the CMB mill. Estimates have been made for a representative year at full capacity production for the CMB pulp mill by scaling the revenues in relation to the relative amount of output of the plants. Table 33 shows the impact on central government revenues.

TABLE 33
IMPACT ON CENTRAL GOVERNMENT REVENUES
OPERATIONAL PHASE
(USD MILLIONS)

| | ORION | CMB | TOTAL |
|---------------------|--------------|------------|--------------|
| Direct and Indirect | 16 | 8 | 24 |
| Induced Impacts | 10 | 5 | 15 |
| Total Impacts | 26 | 13 | 39 |
| | | | |

Source: ORION IO Model and CIC Consultants' estimates.

As shown in Table 33 it is expected that the central government will collect about USD38 million in additional revenues each year, when the plants are at full production. This would be equivalent to about 1 per cent of central government revenues in 2004.

9.15 Regional Impacts – Operational Phase

The estimate of regional impacts has been made on the basis of the allocation technique found in the HCG SE study, for the reasons mentioned above in relation to the estimation of these impacts for the construction phase.

The total estimated economic impacts for the CMB were given in Table 27 and these were distributed among the regional departments in accordance with the informed judgment of the panel of HCG local economists, who are familiar with the economy and employment situation in the region. The results are shown in Table 35.

TABLE 35
REGIONAL ECONOMIC IMPACTS
OPERATIONAL PHASE
(USD MILLIONS)

| | ORION | CMB | TOTAL | TOTAL (%) |
|---------------------------|--------------|------------|--------------|------------------|
| Rio Negro | 144 | 79 | 223 | 71 |
| Soriano | 8 | 5 | 13 | 4 |
| Paysandu | 15 | 8 | 23 | 7 |
| Rest of Country | 37 | 20 | 57 | 18 |
| Total (Basic Prices) | 204 | 111 | 315 | 100 |
| Taxes on Products | 10 | 6 | 16 | |
| Total (Producers' Prices) | 214 | 117 | 331 | |
| | | | | |

.Sources: HCG IO Model and June 2004 pp. 82-84 and CIS Consultants' estimates.

As would be expected the largest portion of the impacts are to the Department of Rio Negro, which amount to about USD 223 million in the representative year of full capacity pulp production, equivalent to 71 per cent of the total national impact (measured in basic prices). The Department of Paysandú would account for about USD 23 million in that year, or about 7 per cent of the total impacts. The Department of Soriano would account for USD 13 million, or about 4 per cent of total impacts. The impact on the rest of the country would be about USD 57 million, or about 18 per cent of the total impact.

To put this in perspective, the gross departmental products for Rio Negro, Soriano and Paysandú in 2003 were USD 184 million, USD 230 million and USD 321 million, respectively. This implies that in the representative year of full capacity pulp production the Department of Rio Negro would increase departmental product by the equivalent of more than the entire product in 2003. The impact on the Departments of Soriano and Paysandú would be the equivalent of about 13 per cent of departmental product for Soriano and 23 per cent for Paysandú.

The estimates of national employment impact for a representative year of the mills at full capacity production were shown in Table 31. Regional distribution of these impacts was made in the same manner as the distribution of economic impacts. The results are shown in Tables 36 through 38.

TABLE 36
ORION REGIONAL EMPLOYMENT IMPACTS – OPERATIONAL PHASE
(PERSON-YEARS OF FULL TIME EMPLOYMENT)

| | DIRECT | INDIRECT | INDUCED | TOTAL | % |
|-----------------|---------------|-----------------|----------------|--------------|----------|
| Rio Negro | 300 | 1,441 | 1,291 | 3,033 | 37 |
| Soriano | 0 | 195 | 531 | 726 | 9 |
| Paysandu | 0 | 952 | 390 | 1,342 | 16 |
| Rest of Country | 0 | 1,388 | 1,667 | 3,055 | 38 |
| Total | 300 | 3,976 | 3,879 | 8,155 | 100 |
| | | | | | |

Source: HCG IO Model and June 2004 pp. 94-96.

TABLE 37
CMB REGIONAL EMPLOYMENT IMPACTS – OPERATIONAL PHASE
(PERSON-YEARS OF FULL TIME EMPLOYMENT)

| | DIRECT | INDIRECT | INDUCED | TOTAL | % |
|-----------------|---------------|-----------------|----------------|--------------|----------|
| Rio Negro | 300 | 759 | 681 | 1,740 | 39 |
| Soriano | 0 | 102 | 280 | 382 | 9 |
| Paysandu | 0 | 502 | 205 | 707 | 16 |
| Rest of Country | 0 | 731 | 878 | 1,609 | 36 |
| Total | 300 | 2,094 | 2,044 | 4,438 | 100 |
| | | | | | |

Source: CIS Consultants' estimates, based on HCG pp. 94-96.

TABLE 38
TOTAL REGIONAL EMPLOYMENT IMPACTS – OPERATIONAL PHASE
(PERSON-YEARS OF FULL TIME EMPLOYMENT)

| | DIRECT | INDIRECT | INDUCED | TOTAL | % |
|-----------------|---------------|-----------------|----------------|--------------|----------|
| Rio Negro | 600 | 2,200 | 1,973 | 4,773 | 38 |
| Soriano | 0 | 297 | 811 | 1,108 | 9 |
| Paysandu | 0 | 1,453 | 595 | 2,048 | 16 |
| Rest of Country | 0 | 2,119 | 2,545 | 4,664 | 37 |
| Total | 600 | 6,070 | 5,922 | 12,593 | 100 |
| | | | | | |

Sources: Tables 36 and 37.

The employment impact would be significant for the Department of Rio Negro, which would account for about 38 per cent of the national total and would represent the equivalent of about 47 per cent of the 2004 Rio Negro's labor force. The departmental labor force would not be able to supply all of the additional labor requirements and this would encourage day commuting from neighboring departments and migration from other parts of the country.

The employment impact on the Departments of Soriano and Paysandú is also significant but rather smaller than that on Rio Negro, representing increases of 5% and 7% of the respective departmental labor forces. The impact on the rest of the country is almost important as that on Rio Negro, reflecting increased employment in the service sectors and manufacturing.

9.16 Impacts On Revenues Of The Department Of Rio Negro

HCG made estimates of the impact on departmental revenues for a representative year of full capacity production of the mills. No estimates of these revenues were made by TDT; therefore these have been assumed to be proportional to the relative scale of production of the two mills. The results are shown in Table 39.

TABLE 39
IMPACTS ON DEPARTMENTAL TAXATION – RIO NEGRO-OPERATIONAL
PHASE (USD THOUSANDS)

| | ORION | CMB | TOTAL | TOTAL (%) |
|-------------------|--------------|------------|--------------|------------------|
| Vehicular Taxes | 199 | 96 | 295 | 32 |
| Municipal Taxes | 89 | 43 | 132 | 15 |
| Real Estate Taxes | 256 | 123 | 379 | 41 |
| Other Taxes | 74 | 36 | 110 | 12 |
| Total | 618 | 298 | 916 | 100 |

Source: HCG June 2004 pp. 101-104. and CIS Consultants' estimates.

Regional government has limited access to revenues and it is expected that additional revenues will be slightly less than USD 1 million per year, representing the equivalent of about 10 per cent of 2004 revenues.

9.17 Abbreviations and Acronyms

| | |
|---------|--|
| BCU | Banco Central del Uruguay – the Uruguayan Central Bank |
| C.I.F. | Cost, insurance and freight |
| CIS | Cumulative Impact Study |
| CMB | Celulosas de M’Bopicuá, the pulp mill of ENCE |
| ENCE | Empresas Nacional de Celulosas Españolas |
| F.O.B. | Free on board |
| FSC | Forest Stewardship Council |
| FTZ | Free trade zone |
| GDP | Gross Domestic Product |
| GNP | Gross National Product |
| GOU | Government of Uruguay |
| HCG | HCG Environment – the consultants responsible for the SE Study of the ORION pulp mill |
| IFC | International Finance Corporation of the World Bank |
| IO | Input-Output |
| SE | Socio-economic |
| SER/CIS | Socio-economic report of the Cumulative Impact Study |
| SGS | Société Général de Surveillance, an inspection, verification, testing and certification company |
| TDT | Tea, Deloitte, Touche – the consultants responsible for the economic impact study of the CMB pulp mill |
| USD | United States dollars |

