Ecogreen Case Study of Job Creation Effects of IFC Projects

ICF has supported Ecogreen since 2004, helping it become the world’s fourth-largest producer and exporter of natural fatty alcohols and the largest from an emerging market. This analysis, based on interviews and financial data, found that the firm’s capacity since 2005 had created 177 direct jobs, nearly two-thirds of which are skilled—illustrating the role of manufacturing in creating skilled jobs, which is critical because Indonesia is trying to increase high-value added jobs. In addition, about 3,600 indirect jobs were created in the domestic supply chain, 83 percent of which were unskilled or low-skilled. An attempt has also been made to calculate the indirect jobs created in the supply chain using the ratio of domestic purchases to cost of goods sold and the ratio of indirect jobs to domestic purchases. This model results in an overestimation of indirect jobs because it assumes a constant production function, while productivity generally tends to rise with increased capacity. Since more than 90 percent of direct jobs created by Ecogreen’s operations are skilled, its impact on poverty reduction through direct job creation is mostly indirect and induced. Its significant poverty impact comes from indirect employment creation in the supply chain because 73 percent of indirect jobs go to unskilled and low-skilled who are paid more than the minimum wage.

Background and Objective of the Study

This case study is part of a series covering the Manufacturing, Agribusiness, and Services (MAS) industry. Its goal is to estimate the indirect employment effects of IFC support to clients. IFC’s Development Outcome Tracking System (DOTS) usually only measures the direct effects of IFC support to client’s employment figures. But in many cases, including in capital-intensive industries such as chemicals, there are likely significant and potentially larger indirect employment effects that are presently not measured. This analysis of the indirect employment effects resulting from IFC support sheds light on the nature and order of magnitude of such job creation within capital-intensive industries such as chemicals in emerging markets like Indonesia.

Methodology and Limitations

The data for the analysis are based on interviews with Ecogreen staff and suppliers in the most labor-intensive components of its local supply chain. These activities were identified in consultation with the client and IFC investment teams. The study makes several simplifying assumptions that may result in under- and over-estimation of indirect job creation. The methodology rests on analyzing only a share of the client’s supply network where relevant. Further, the underlying assumption is of a constant production function, where ratio of sales to worker remains constant, which may not be the case.

Ecogreen: Sector Context

Ecogreen is an oleochemicals manufacturing company that processes palm kernel oil and coconut oil to produce fatty acids, fatty alcohols, and glycerin. These products are used in detergents, soaps, and other personal care products. The company was established in 1988 and has become the world’s fourth-largest producer and exporter of natural fatty alcohols and the largest from an emerging market. Ecogreen has a production capacity of more than 225,000 tons a year and annual sales of more than $300 million. Ecogreen has two plants in Indonesia, one in Batam with annual production capacity of 183,500 tons and one in Medan with capacity of 41,500 tons, and affiliated marketing and distribution companies in Germany, Singapore, and the United States. These plants are close to sources of raw materials and fast-growing markets for personal care products in Asia. These factors strengthen its competitive advantage through reduced transportation costs. Ecogreen exports 95 percent of its production, half of which is to Asia and the Pacific and a fifth to both North and Latin America and Europe.

Ecogreen and IFC Engagement

In 2004 IFC provided a $30 million loan to support Ecogreen’s investment program consisting of a $16 million investment in a 60,000 tons per annum (“tpa”) in a fatty acid production facility in Medan and a $68 million working capital facility for Ecogreen’s inventory management strategy. Due to a change in strategic direction, the fatty acid expansion plan did not materialize, so IFC’s entire loan was used for working capital.

In 2005 IFC provided a $25 million loan to support the company’s expansion plan in Batam. Ecogreen has a fatty alcohol production capacity of 225,000 tpa, with incremental capacity increase of 115,000 tpa following IFC investments. These data form the basis for estimating the direct and indirect job creation due to IFC engagement. Ecogreen was unable to mobilize financing to meet its
growth plans in the local market, and IFC was able to fill this gap. IFC’s financing helped stabilize the company’s financial situation and achieve its growth.

**Direct Employment Effect**

Ecogreen has 685 direct employees (470 in Batam and 215 in Medan), 177 of whom can be attributed to IFC’s engagement. Before IFC’s engagement, Ecogreen had 508 employees. This increase is based on Ecogreen’s increased capacity since IFC’s engagement. The increase in job creation is not significant, illustrating the highly mechanized nature of the production process. The breakdown of tasks and skill levels of employees is shown in Figure 1 and proves the importance of manufacturing in skilled job creation: 72 percent of employees are directly involved in production; 64 percent of which highly skilled, most with at least a bachelor’s degree in chemistry or chemical or electrical engineering. The rest are in management and administration.

Ecogreen offers attractive benefits including competitive wages, housing allowances, transport allowances, medical benefits, meals, and pension plans. It also has a well-developed employee training programs where employees can learn about new technology and advance their career in the institution. Ecogreen employees are among the most sought after in local and regional labor markets (such as Malaysia and Singapore).

**Indirect Employment Effects**

To identify the main components of the supply chain that contributes to the indirect employment effect, the key cost drivers and labor-intensive processes were discussed with the client. Palm kernel oil (“PKO”) and coconut oil are the main raw materials used to produce natural oleochemicals. Because of its abundant availability in Indonesia, Ecogreen mainly uses PKO as its only raw material. It accounted for 86 percent of the cost of goods used for production in 2011.

Other consumables sourced locally include chemicals (4 percent of the cost of goods), packaging and other consumables (4 percent), and fuel (2 percent). Because 95 percent of Ecogreen’s products are exported using its own jetties, the indirect employment from distribution and transport network is minimal. Hence, it was not included in the analysis of indirect job effects. Yet most of the indirect employment impact is generated from Ecogreen’s supply chain, mainly from its suppliers of PKO.

Job Creation in the Supply Network. Ecogreen has fairly diversified sources for the supply of its PKO in terms of both its size and location across Indonesia. Suppliers vary in tonnage and sources from one year to another, with the few largest suppliers over the six-year period studied providing half of Ecogreen supply requirements, including Sinar Alam Permai PT, Taluk Kuantan, and Agro Jaya Perdana. These companies are mostly medium-size to large. For instance, Ecogreen accounts for about 40 percent of Agro Jaya’s domestic sales, and Ecogreen’s expansion has increased Agro Jaya’s sales by 23 percent since before IFC investment. This has created jobs at Agro Jaya’s facility, particularly for workers directly involved in production.

**Table 1: Ecogreen’s Supply Chain**

<table>
<thead>
<tr>
<th>Cost of Goods Sold (COGS)</th>
<th>2011( US$million)</th>
<th>% of Total COGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKO</td>
<td>234.7</td>
<td>86</td>
</tr>
<tr>
<td>Chemicals</td>
<td>11.0</td>
<td>4</td>
</tr>
<tr>
<td>Coal</td>
<td>6.8</td>
<td>2</td>
</tr>
<tr>
<td>Spare parts and capital equipments</td>
<td>14.4</td>
<td>5</td>
</tr>
<tr>
<td>Packaging and other consumables</td>
<td>5.9</td>
<td>2</td>
</tr>
<tr>
<td>Total cost of goods sold</td>
<td>272.7</td>
<td>100</td>
</tr>
<tr>
<td><strong>Cost of goods sold as % of revenue</strong></td>
<td><strong>84</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Table 2: Incremental Indirect Job Creation Due to Capacity Expansion**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Skilled</td>
<td>646</td>
<td>18%</td>
</tr>
<tr>
<td>Low Skilled</td>
<td>2,245</td>
<td>62%</td>
</tr>
<tr>
<td>Unskilled</td>
<td>755</td>
<td>21%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3,646</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
The interviews highlighted that Ecogreen’s expansion has generated indirect jobs in the supply chain mainly in CPKO, chemicals, and other consumables sourced locally. These estimates were calculated based on interviews with some dedicated suppliers and relied on assumptions based on sales volumes for each supplier, and a constant production function, where ratio of sales or volume to worker remains constant. Derived from interviews with key suppliers and estimations, approximately 7,595 of total indirect jobs were supported by Ecogreen suppliers, of which an estimated 3,646 jobs were created. Table 2 provides the breakdown of the indirect jobs created by Ecogreen activities.

**Job Multiplier Analysis and Its Implication for the Chemical Sector**

Based on the data collected during the interviews with Ecogreen and its key suppliers, the estimated incremental indirect jobs of 3,646 yields a multiplier of 21—meaning that 21 indirect jobs were created for every direct job. But this multiplier changes when using data on total employment for direct and indirect jobs. Using the estimated 685 direct and 7,600 indirect jobs created in 2011, the multiplier changes to 11.

There are two main reasons for the drop in the multiplier: the change in direct jobs as a result of the capacity expansion is not significant due to the high level of technology, and most of the increase in direct employment came from production staff. These multipliers may vary across countries and regions even within the same sector depending on the level of technology adopted in the production of both oleochemicals and palm kernel oil, as well as the source of raw materials (local or imported). So it can be misleading to apply this multiplier to similar projects.

### Estimating Indirect Job Creation Using Domestic Purchases

The initial goal of this study was to estimate the number of indirect jobs created in the supply chain using domestic purchases of goods and services and compare it against what the study found. The underlying assumption is that domestic purchases are closely correlated with the key cost drivers in the supply chain which were to be the focus of the study.

Because most indirect job effects were created in the supply chain for Ecogreen, an attempt has been made to estimate the number of indirect jobs created in the supply chain using domestic purchases share of the cost of goods sold. The key assumption in forecasting the number of indirect jobs using this methodology is that the ratios of domestic purchases to the cost of goods sold and the ratio of indirect jobs to domestic purchases will remain the same.

Using the ratio of indirect jobs to domestic purchases at baseline year (2006), which is estimated at 49 jobs per $1 million, the indirect jobs created in 2011 is 12,642—much higher than the estimated 7,600 based on interviews with key suppliers and using the actual values of domestic purchases. This result validates the presumed concern of using this model as it overestimates job creation since it assumes a constant production function or that productivity will stay the same, whereas it generally tends to increase.

### Poverty Impact through Direct and Indirect Job Creation at Ecogreen

Although the poverty level in Indonesia has declined in the last few years, 18 percent of the population still lives in extreme poverty—below $1.25 a day (at 2005 purchasing power parity) and 46 percent lives in moderate poverty: below $2 a day (Figure 2). Indonesia has an unemployment rate of 8 percent, with higher youth unemployment of 22 percent. In addition, the number of high-value added jobs for new graduates and those looking for better employment have been insufficient.
So creating formal employment for poor and young people is critical for Indonesia to reduce poverty and unemployment. As shown in Figure 1, more than 90 percent of direct jobs created by Ecogreen’s operations are skilled; its poverty impact through direct job creation is mostly indirect and induced. Its indirect poverty impact comes from human skills development by providing high-value jobs to recent graduates to become highly skilled in the local job market, enabling economic growth.

And because skilled manufacturing workers earn higher wages, it generates demand for goods and services. On the other hand, the direct poverty impact comes from indirect employment creation in the supply chain because 73 percent of indirect jobs are unskilled and low-skilled. Unskilled employees are paid above the minimum wage of $108 a month (Figure 3).

Conclusion and Lessons

1. High Direct Skilled Employment. More than 60 percent of direct jobs created by Ecogreen are skilled, showing the role of manufacturing in creating skilled jobs.

2. Large Indirect Employment in the Supply Chain. Significant indirect employment effects in the supply chain have been found. The main reason for the large indirect effects in the supply chain versus the distribution chain is due to the fact that the main raw material used in the production that accounts for 86 percent of the cost of goods is sourced locally while most of Ecogreen’s products are exported using its transportation facilities.

3. High Unskilled Employment. Most of the indirect jobs in the supply chain have been unskilled and low-skilled due to the nature of the jobs—for example, because production of palm kernel oil is relatively labor-intensive.

4. Cautious Use of Multipliers. The applicability of multipliers used in this study for estimating the indirect jobs for similar projects will be erroneous because it depends on the regional and industry context and the supply channel model used by specific clients as well as the cost of labor. The multiplier will be higher in Ecogreen because the raw material is sourced locally, while other projects might depend on imported raw material.

5. Cautious Use of Domestic Purchases for Estimating Indirect Job Creation. Using the ratio of domestic purchase to estimate indirect jobs may result in an over- or under-estimate of indirect jobs because it assumes a constant production function and ratio of domestic purchases to cost of goods that might not always be the case because companies often try to increase domestic purchases to save costs and reduce supply times.

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Endnotes