A Case Study on Green Jobs

Hulas Wire Industries Ltd.
Morang, Nepal
I. Introduction:

The Hulas Wire Industries Ltd. is a large scale industry, located in Tankisinwari VDC, Ward No. 5, Morang District, Nepal. It produces about 2800 t of HTGS and LCGS galvanised iron (GI) wires per month. The HTGS wires are exported to India whereas; LCGS wires are consumed in the domestic market. The major raw materials used by the industry are imported from India. It has a workforce of about 450 people. The industry is spread over 6.18 ha land area.

II. Production Process:

The industry’s production process comprises of wire drawing, pickling, galvanising etc. It uses wire rods, zinc, lubricating powder, zinc ammonia penta chloride, HCl, charcoal and other raw materials to produce HTGS and LCGS wires. It is highly water consuming industry, which uses ground water source to meet water demand. Apart from electricity, fuel oil and diesel are major fuels used in the industry, which also uses rice husk to produce energy in Gasifier.

III. Production process and environmental effect:

Some of the environmental issues in the industry are related with discharge of wastewater, solid waste, energy use, water use etc.

A. Water consumption:

The industry extracts water from boring, which is collected in reserve tanks and the industry uses as per need. The water consumption per day is 500,000 lit. at present. About 80% water is used for manufacturing processes it gives rise to discharge of wastewater.

B. Wastewater:

Wastewater is mainly produced during acid pickling and cleaning operations. The main source of water pollution is discharge of acidic water, which is about 100,000 lit. per day. The pickling and GI plant each produces about 50,000 lit./day acidic water. However, industry has taken some measure to minimize its effects.

C. Solid waste:

The main solid waste produced by the industry is rejected scrap. The others are zinc ash, Dross, and ashes of rice husks. The following table depicts the scenario of solid waste of the company.

<table>
<thead>
<tr>
<th>Materials</th>
<th>Solid waste (kg/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Municipal waste</td>
</tr>
<tr>
<td>Rejection</td>
<td>56000</td>
</tr>
<tr>
<td>Zinc ash</td>
<td>42000</td>
</tr>
<tr>
<td>Dross</td>
<td>140000</td>
</tr>
<tr>
<td>Rice husk ash</td>
<td>1050000</td>
</tr>
</tbody>
</table>

Since the major solid wastes are easily recyclable, the industry collects them in especially provisioned Scrap yard and sells them afterwards. The ash is used in filling of low land area in the vicinity.

D. Air pollution:

The industry uses considerable amount of fuel oil and diesel for manufacturing processes. In the process, gasses such as CO2, NOx and SO2 are emitted. The industry however has
been using an alternative energy source such as rice husk in Gasifier. The acid fume coming out during pickling operation is another major source of air emission.

### IV. Environmental Management

Hulas is an ISO 14001 and 9001 certified company and has been implementing Environmental Management System (EMS). It was involved in Cleaner Production (CP) and Occupational Health and Safety (OHS) study as well. The industry has also been working on OHSAS.

It has been constructing Wast Water Treatment Plant (WWTP) mainly to treat acidic water. The capacity of the plant is 1.5 m³/hr. It also installed 4 acid fumeless plant with support from Strengthening of Environmental Administration and management at Local Level (SEAM-N) Project. It erected 9 chimneys to manage indoor air pollution. The SEAM-N also supported to install 4 roof exhaust fans.

In order to minimize excessive noise pollution in wire drawing machines, it installed rubber pad under wire drawing and distributed air plugs to the workers. The solid waste is mostly recyclable in nature. The rejection is collected in scrap yard and then sold to the scrap dealer. Similarly, the industry sells zinc ash, dross and other scraps.

### V. Action and impact

The industry has been adopting following best practices on green jobs:

A. **Implementation of Management Systems:** The industry has been implementing QMS and EMS. It is ISO 9001:2008 and ISO 14001:2004 certified company. It means that the company has been continuously improving its environmental performances for sustainable industrial development. The company has defined environmental policy and carries out environmental review every year. On the basis of existing environmental situation, it sets environmental objectives and targets and prepares and implements Environmental Management Programmes (EMP) to meet them. The performance is also reviewed by third party on regular basis. Recently, it received Pollution Control Certificate from District Development Committee (DDC) of Morang District.

The industry also implemented Cleaner Production (CP) programme, which helped them to minimize environmental pollution at source by taking several preventing measures. It is also developing Occupational Health and Safety Management System as per OHSAS 18001.

B. **Acid Fumeless Plant:** The acid fume was considered one of the major environmental pollutants in the industry. It not only caused air pollution in the environment but also significantly deteriorated employees health as the emitted gas is very much carcinogenic in nature. In order to minimize its adverse effects, the company with support from SEAM-N Project installed four acid fumeless plants. It significantly reduced fume emission and improved working environment.

C. **Gasifier:** The industry requires excessive use of fuels such as furnace oil and diesel to fulfill its energy requirements. These fuels produce greenhouse gases, which significantly contribute global warming. These fuels are often not available in the market. Considering
this, the industry installed Gasifier, which produces gas using rice husk. The present capacity is 5 t rice husks per day. The 6 kg rice husk produces the same energy as produced by use of 1 lit. Oil. This Gasifier is very cost effective to the company. It is also an alternative source of energy, which does not produce carbon gases.

D. Wastewater Treatment Plant: During pickling, the industry is required to use hydrochloric acid, which is very detrimental to the human health and environment. It used to discharge into roadside drain which caused misunderstanding with neighbors in more than one occasion. The acidic wastewater used to flow in the drain, which is used for irrigation and drinking purpose by cattle. Moreover, the industry has to comply with effluent standard in order to maintain ISO 14001 certificate. The ISO 14001 standard requires that the industry has to comply with all legal and other requirements. Considering this, the company has been constructing WWTP with an estimated amount of NRs. 3.5 million. The construction of 1.5 m³/hr capacity plant is near completion. The operation of this plant will significantly improve environmental performance of the company.

E. Solid waste management: The recently promulgated Solid Waste Management Act, 2011 made industries responsible for managing industrial waste. However, very few industries are managing waste. But Hulas Wire segregates wastes at source and provides for off-site recycling. It provisioned scrap yard for storage. It sells scrap wires, zinc ash, zinc dross to the scarp dealers.

F. Air Fan: The industry installed 4 Air Exhaust Fans in the main factory building, which operated without consuming energy. This natural system of exhaust fan saves energy equivalent to about 3 KW in the industry.

G. Transparent Sheets: The industry has several big halls, where labours also work in the day and night time. It used considerable amount of energy for lighting. Recently, it installed transparent sheets in the roofs of GI unit, pickling unit and wire drawing section. It is estimated that the natural lighting system saves about 25% energy used for lighting.