ESAT Environmental and Social Assessment Tool

Sector Fact Sheet

Pulp and Paper

Processing of wood into pulp and paper, which may be further processed into cardboard and paper articles.

Related Sectors:
- Printing
- Forestry

Production Processes

The primary raw material for pulp and paper manufacture is wood. The trees are debarked, chipped and washed before the fibers may be used for paper production. The raw material is first converted into pulp, a concentrated mixture of fibers suspended in liquid. Part of the raw material may also stem from recycled paper. Fibers have to be separated from impurities and washed. Usually they are also bleached or dyed in order to alter the appearance of the final product.

The pulp mixture is then further diluted with water, resulting in thin slurry. The diluted slurry is drained through a moving fine-mesh screen to form a fibrous web. This moving web is pressed and dried into a continuous sheet of paper. Alternatively, in the molding process, a quantity of the pulp is placed into a mould with a wire-mesh base, so that the fibers are left coating the mesh and excess water can drain away. At this time, pressure may be applied to squeeze out more water. The paper may then be removed from the mold, wet or dry, and go on to further processing.

Paper that contains only pressed and dried pulp is very absorbent (for example, blotting paper), and does not provide a good surface for writing or printing. Hence, a variety of additives such as dyes, china clay or glue are used to improve the structure of the paper. It may also be dried several times during its manufacture. In the finishing process the paper is cut and packaged for sale or further processing.

Cardboard is produced employing a similar production process as for paper. Cardboard is thicker, stiffer and more durable than paper, because of its heavy wood-based type of paper.

Risks & Opportunities

- **Pulp and paper production consumes large amounts of energy for pulping and bleaching.** Chemical pulping requires energy in the form of heat, which is mainly supplied as steam generated by incinerating production waste. Mechanical pumping requires mechanical energy, usually supplied as electricity. Cost savings from energy efficiency improvements may be considerable.

- **Effluents from paper mills may contain toxic and non-toxic substances, both of which may have a negative impact on water quality.** Examples of non-toxic substances are organic solids, resins and fatty acids from raw materials, pulp and paper. These are an issue for water quality as they may be discharged in very large amounts.

- **Emissions to air can be a nuisance in the surrounding areas of pulp and paper plants and entail material risks to human health.** Typical air pollutants emitted by pulp and paper productions are: Dust, sulfur, nitrogen oxides. Emissions depend primarily upon production processes, sources of energy and the level of technology.

- **A reliable and sustainable supply of high-quality fresh water is essential.** Producing pulp and paper may require large amounts of fresh water. A reliable supply is essential for ensuring continuity of production. Where water supply is limited, conflicts with other uses may arise.

Sustainability Issues

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Sector Rating

- High risk issue
- Medium risk issue
- Low risk issue