The Development of a Standard Tool to Predict the Environmental Impacts of Footwear for Deckers Outdoor Corporations

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Problem: Despite Simple Shoes' environmental efforts, the impacts of alternative designs can be anecdotal and inaccurate. Without rigorous analyses, designers cannot be certain that their product sustainability efforts are successful.

Project Goal
To create a model to predict the environmental impact of any pair of shoes during the design phase.

Methods: Life Cycle Assessment
Functional Unit: A pair of shoes to protect a woman's size 7 feet or a man's size 9 feet for 2 years.

Data:
• Data was collected from the client and their supply chain
• Several shoes were disassembled to learn about the shoe parts and generate a list of possible materials.

Scope:

Software Used:
PE America's GaBi4, its extension I-Report, and the Ecoinvent database.

Potential Impacts Assessed:
Acidification (AP)
Eutrophication (EP)
Freshwater Aquatic Ecotoxicity (FAETP)
Global Warming (GWP)
Human Toxicity (HTP)

Do you know how much carbon dioxide is generated from a pair of shoes? 15 kg.

How many pairs of shoes do you own? If you're like the average Bren student you own 15 pairs.

This equates to 67 million metric tons of CO₂ from American’s shoes -- more than the total annual CO₂ emissions of Finland.

By changing materials, designers can significantly reduce the CO₂ emissions of shoes.
Here, the emissions of a suede Satire sneaker is equivalent to that of almost four cotton Satire sneakers.

Simple Shoes environmental footprint.

Many more conclusions are expected to be found through extended use of the model and will hopefully be incorporated into footwear production by Simple Shoes designers.
Once up to 7 shoe designs are entered into EcoSTEP, the model calculates the environmental impacts of each shoe and its parts. The results are displayed in an easy to read output display so that different designs can be compared.