

Plan to turn farm waste into paper earns students \$15,000

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Johns Hopkins engineering students won \$15,000 in a national competition for adapting a traditional Korean paper-making technique into a low-tech method that impoverished villagers can use to make paper for their children's underequipped schools.

The prize—for the design of a machine to convert farm waste to paper, inexpensively and without electricity—was presented recently in Houston during a ceremony honoring top submissions in the 2012 Odebrecht Award for Sustainable Development competition. The contest attracted 422 student entrants from 173 universities. The paper-making proposal took second place.

[Students](#) Sangkyun Cho, Jay Hyug Choi and Victor Hyun Oh developed the plan last spring in a Whiting School of Engineering course called Introduction to Engineering for Sustainable Development, taught by Erica Schoenberger, a professor in the Department of Geography and Environmental Engineering.

"Everyone in class knew that this team had come up with such a neat idea, and the three students worked on it in great detail," said Schoenberger, who attended the award ceremony with the team members. "I think it's more and more the case that young engineers want to turn their talents and skills to improving the lives of the poor and the excluded. This team is a shining example of that trend."

Student entrants in the Odebrecht contest were required to develop and

submit a paper on possible engineering contributions to [sustainable development](#). The Johns Hopkins students focused on the lack of basic school supplies, including paper, in developing nations such as Ethiopia, where more than 70 percent of the population is illiterate.

"Stationary supplies are simply too expensive for millions of families that live on less than \$2 a day, and this is one of many [socioeconomic factors](#) that contribute to plummeting elementary [school attendance](#) rates and poor [learning environments](#)," the students wrote in their entry.

To remedy this, the three students drew on their Korean heritage to modernize a traditional Korean paper-making process for use in places such as Ethiopia. The students prepared a detailed design for a low-cost paper-making device that requires no electricity. The machine grinds up agricultural waste such as grain husks and mixes the material with water boiled over a fire. The resulting pulp is dried on racks to form paper.

So far, the paper-making device exists only on paper. But the students now plan to build a prototype. If the machine works as conceived, team member Oh said, the students will look into working with a nonprofit group or private investors to try to move the low-tech invention into regions where school supplies are scarce. "These people have a very real need," he said. "While we love our idea, we hope that the project continues to move forward for their sake, not so much ours."

Oh completed his undergraduate studies last spring and is now pursuing a master's degree in the Department of Chemical and Biomolecular Engineering. His teammate Cho is now a senior, majoring in chemical and biomolecular engineering. Team member Choi is a junior, majoring in applied mathematics and statistics.

Provided by Johns Hopkins University

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