

ASU students create food-security solutions for India

By Mary Beth Faller, ASU News
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Manasvenee Premkumar described a day in the life of a farmer in India.

“Every morning as the sun rises over the golden fields, a farmer wakes up with a heart full of hope,” said Premkumar, a computer science major at Arizona State University.

“He has a loving family of six and a heart that shines with pride that he grows the crops that will not only feed his family but also a thousand others.”

But after the harvest, the farmer discovers that the local storage facility is too full to accommodate his crops.

“He looks for alternatives but has no luck finding any. He sells his crops for less than half of the price,” she said.

“His crops are gone. His livelihood and his labor, gone.”

Premkumar was part of an ASU student project that spent a month researching some of India’s biggest food-security problems and creating workable solutions.

The project was hosted by the [India Policy and Economy Research Club](#), an ASU student-run organization that launched earlier this year. On Oct. 16, World Food Day, the four finalist teams presented their solutions to the problem “Democratization of Agriculture for Global Food Security.”

Premkumar’s team, which included Srihitha Jaligama, a supply chain management major, and Havish Akarapu, a business data analytics major, tackled logistics infrastructure in India. They discovered that while the country grows nearly 328 million metric tons of grains, there is only enough storage for 145 million metric tons, plus no real-time tracking or coordination.

They created a three-phase plan to modernize storage logistics, eliminate middle-man exploitation and empower farmers.

The policy project is intended to create real change, according to Mudit Lal, a robotics major at ASU and the first officer of the India Policy and Economy Research Club.

“At heart, India is an agrarian economy. These are four challenges that the government of India is actively working on solving, and we will be adding on our drop of effort into it,” he said.

At the pitch event, Lal told his fellow students: “We came from all different backgrounds. We didn’t know a thing about agriculture but we went from not knowing anything to where we could understand and answer questions about policies.

“I hope the students feel empowered. It’s not just the officers or lawmakers or politicians who make these policies. It can be you.”

The club members have been in contact with decision-makers in India, including Shivraj Singh Chouhan, minister of agriculture and farmers’ welfare and minister of rural development, who are interested in piloting the ASU students’ solutions and gathering data.

The event was open to all students, not just members of the club, with no experience necessary, Lal said. About 25 students participated, with 10 students in the four finalist teams, who will now create detailed project reports for potential pilot programs.

Over the past month, the 25 participating students worked with professional mentors: Rimjhim Aggarwal, a professor in the School of Sustainability at ASU; Sabyasachi Sen, a PhD candidate in mechanical engineering at Cornell University; and Prakash Jha, an assistant professor of agricultural climatology at Mississippi State University, who attended the policy symposium.

Jha noted that World Food Day marks the founding of the Food and Agriculture Organization of the United Nations after the chaos of World War II.

“Globally, close to 675 million people sleep without food every night,” he said.

He told the students that they need to think globally but act locally.

“Go to these growers and ask about their challenges,” he said.

“When you think of policy, you need to think of humans and their challenges. Whatever design you’re thinking of, think, ‘How can it work in the field?’”

The other student policy proposals presented on Friday at Thunderbird School of Global Management at the Downtown Phoenix campus were:

Better fertilizers: Bhavya Sevak, a graduate student in biomedical informatics and data science, and Yuuvraaj Jain, a mechanical engineering major, discovered that fertilizers used to increase crop yields are leaching into groundwater. They propose subsidizing farmers to use organic or bio-based fertilizers, which will enhance soil health, reduce runoff and lower greenhouse gas emissions.

Sustainable farming: The team of Sayan Basu and Shreya Sett, both graduate students in data science, analytics and engineering, and Takraj Kaur, a data science major, studied how to help farmers transition to more sustainable practices, such as using compost and planting crops that naturally repel pests. They predicted the new methods could improve crop yields by up to 25%,

reduce pesticide use and increase profits.

Promoting indigenous seeds: India produces about 26 million tons of pulse crops — lentils, chickpeas and beans — but demand exceeds 30 million tons. The team of Vindhya Srinivasa, a graduate student in information technology, and Arya Shankar, a supply chain management major, discovered that farmers are avoiding pulse crops because they are susceptible to pests and have volatile pricing. Their idea is to incentive farmers to breed their own seeds.

After their presentation, the student teams answered questions from Eric Heimbecker, assistant director at the [J. Orin Edson Entrepreneurship + Innovation Institute](#).

“I feel like this embodies what ASU is really all about — principled innovation and responsibility for the communities in which we have our presence around the world,” he told the crowd.

Heimbecker encouraged the student teams to reach out to the Edson Institute for more support as they progress, including potential funding from the Demo Day student entrepreneurship pitch program.

“There is a whole community here to support you.”

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Main image



From left: Manasvenee Premkuma, Srihitha Jalgama and Havish Akarapu present their research-based ideas during a pitch symposium hosted by the India Policy and Economy Research Club at ASU on Thursday, Oct. 16, World Food Day, at Thunderbird School of Global Management in downtown Phoenix. Photo by Charlie Leight/ASU News

Gallery



Arya Shankar, an undergraduate student studying supply chain management at the W. P. Carey School of Business, speaks during the pitch symposium hosted by the India Policy and Economy Research Club on Thursday, Oct. 16, World Food Day, at Thunderbird School of Global Management in downtown Phoenix. Shankar's team proposed incentivizing farmers to grow more lentils, beans and chickpeas to close a demand gap.



Sayan Basu (left) and Shreya Sett, both graduate students in data science, analytics and engineering, were on a team that studied how to help farmers transition to more sustainable practices, such as using compost and planting crops that naturally repel pests.



Bhavya Sevak (left) a graduate student in biomedical informatics and data science, and Yuuvraaj Jain, a mechanical engineering major, proposed subsidizing farmers to use organic or bio-based fertilizers, which will enhance soil health, reduce runoff and lower greenhouse gas emissions.



Mudit Lal, a robotics major and the first officer of the India Policy and Economy Research Club, told the students at the pitch event that he hoped their work made them feel empowered. "It's not just the officers or lawmakers or politicians who make these policies. It can be you," he said.