

Eight reasons to be hopeful about the future of our food system

by The Biomimicry Institute | Sep 30, 2015 | Biomimicry In Design, Blog |



UPDATE – The winners of the open and student challenges have been announced! [Read more here.](#)

In late summer, the ideas started pouring in from every corner of the world.

Thousands of designers, architects, biologists, engineers, students, nature-lovers, and big thinkers had answered the call to completely rethink our food system using design inspiration from nature. The **Biomimicry Global Design Challenge**, hosted by the Biomimicry Institute and the Ray C. Anderson Foundation, provided a platform for these global innovators to practice biomimicry in action, by applying it to one of the most urgent issues of our time – our broken food chain. It makes perfect sense – how are we going to create a healthier, more equitable, truly regenerative food system without learning from the natural ecosystems and organisms that are an inextricable part of it?

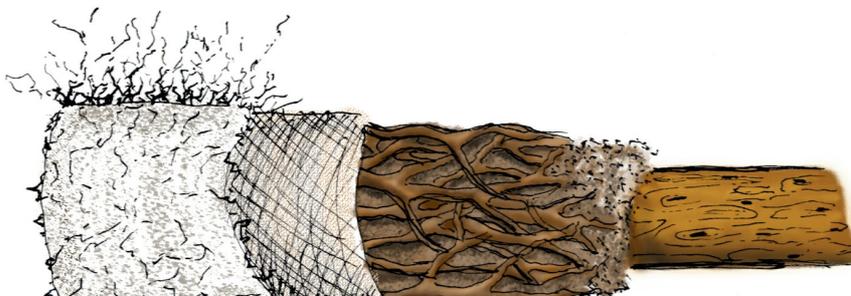
Now here we are. The judges have narrowed the field down to eight finalist teams, who are joining the first-ever biomimicry accelerator focused on food system innovation. Over the next nine months, these teams will work with business, food industry, and biomimicry experts to prototype their designs. In 2016, one of these teams will receive the Ray C. Anderson Foundation’s \$100,000 “Ray of Hope” prize to bring their design to market.

And boy, do these innovations have the potential to shake things up. Teams developed a system to keep nutrients in the soil, a water desalination device, a peer-to-peer networking app, two new ways to grow food in small spaces, a method of capturing edible insects, a device to restore soil and help new seedlings grow, and an aquaponics system designed to help subsistence farmers.

Without further ado, here they are – the eight teams and eight innovations that make us deeply hopeful about the future of food:

1. The Living Filtration System, Oregon, USA:

A biomimetic drainage system that keeps nutrients in the soil.



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The earthworm's digestive system and the human small intestine inspired a University of Oregon team to develop a biomimetic drainage system that keeps nutrients in the soil rather than leaving the field in runoff. The Living Filtration System is an alternative drainage tiling system that was designed to serve as a catalyst for changing current farming techniques. By keeping the nutrients from leaching out of the soil, the LFS system not only cleans the water leaving the fields, but also decreases the amount of fertilizer needed and improves soil health over time.

2. BioNurse, Valparaiso, Chile:

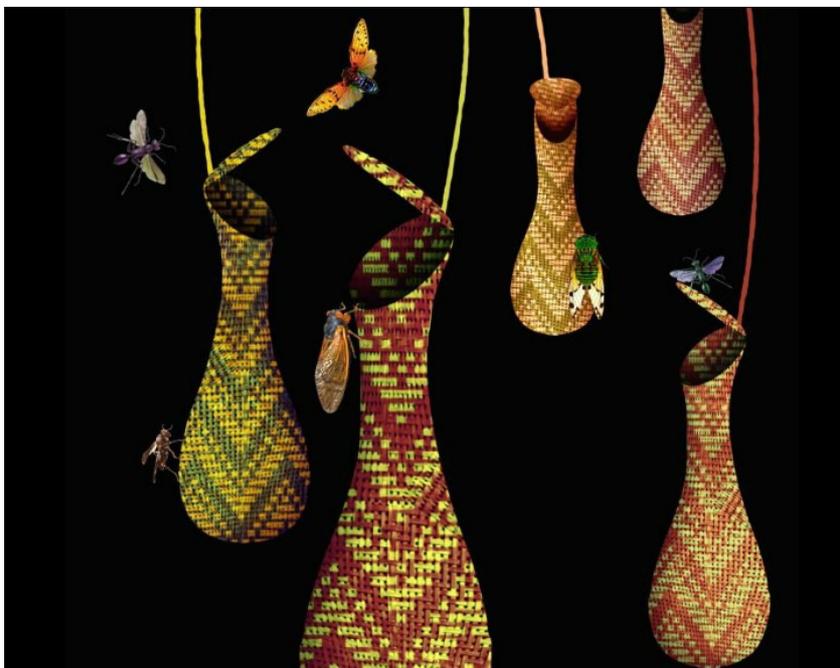
A device to help seedlings grow, while restoring degraded soils.



A team from the Ceres Regional Center for Fruit and Vegetable Innovation in Chile has created a new way to not only help new seedlings grow, but restore degraded soils back to health. The biodegradable BioNurse device returns vitality to the soil by improving conditions for seedlings and exposing them to a mix of nutrients, microbiology, and hygroscopic components. For the Bio-Nurse, the team was inspired by the way that hardy "nurse" plants establish themselves in degraded soils and pave the way for new plant species to grow. With 25% of the world's soils degraded, this innovation provides a way to grow and protect new plants and ensure that the soil can be regenerated to feed our growing population.

3. Jube, Thailand:

A nature-inspired device to incorporate edible insects into the world's diet.



JUBE
FUTURE IS IN THE AIR

**BIO-INSPIRED
SOLUTION FOR
FOOD CRISIS**

By BioX team, Thailand

Pat, Ratchaphak, Purichaya, Tavita, and Alfredo

The BioX team from Thailand developed Jube, a bio-inspired chamber for capturing edible insects, the food of the future. After studying a range of carnivorous plants, the team decided to base their design on the *Genlisea violacea* "lobster-pot trap." This is a Y-shaped modified leaf chamber that is easy to enter, but not to exit due to its inward-pointing hairs, which force the prey to move in a particular direction. This device promotes a more sustainable way to incorporate protein and nutrients into the world's diet by offering an insect-capturing device that is unique and beautifully crafted.

4. Balcony Cultivator, Technical University in Zvolen, Slovakia:

A self-sustaining system that enables people to grow healthy food, without access to green space.



A team from the Technical University in Zvolen, Slovakia devised a self-sustaining system to help city-dwellers grow their own organic food, right on their balconies. The Balcony Cultivator design was inspired by the ability of some lizard species living in arid areas to collect water and moisture with their skin. The Balcony Cultivator draws moisture from a composting feature at the bottom of the device, where it develops into condensation in the top "cupola" of the design. The water then is directed to the plants' roots via channels (or microstructures) on the inside of the cupola that are designed to mimic a lizard's scales. Not only does this device provide a way to grow food for those without access to green space, but it also offers an alternative growing solution for drought-prone areas.

5. Hexagro, Milan, Italy:

A "groundless," modular growing system that enables people to grow more food with a smaller footprint.





Team Hexagro from Italy has created a “groundless” growing system that gives people the opportunity to grow healthy food on a small footprint. Hexagro is made of recyclable, biodegradable materials and has a unique, hexagonal shape that was inspired by geometric patterns found in nature. Hexagro is modular and can adapt easily to a range of urban spaces. Four times more efficient than traditional farming techniques, Hexagro’s modular tree can produce a total of 342 lettuce plants per 2 square meters in comparison to traditional ground farming, which can produce 80 lettuce plants per 2 square meters. Its automatic irrigation system prevents plants from drying or being overfed by nutrients. A digital application will be developed in order to connect the system to smartphones.

6. Mangrove Still, Italy:

A desalination still that costs five times less than traditional solar stills.



This Italian team looked to mangroves and salt marshes for inspiration to address land degradation and water scarcity in coastal areas. Their design is a desalinating solar still that is optimized to produce fresh water for irrigation and costs five times less than traditional solar stills. The team’s goal was to develop a more sustainable, lower-cost way to produce fresh water in arid/semi-arid coastal areas, since current technologies for desalinating seawater are expensive, especially to generate enough water to irrigate coastal farmlands. To inform their design, the team looked at mangroves and salt marshes to learn about how these pioneering species establish themselves in coastal areas, then pave the way for other species to appear. They envision that a network of Mangrove Stills installed in a degraded, arid area could produce enough water revitalize the land and kick off a self-perpetuating microclimate.

7. Holonic Integrated Produce Swarm, South Africa:



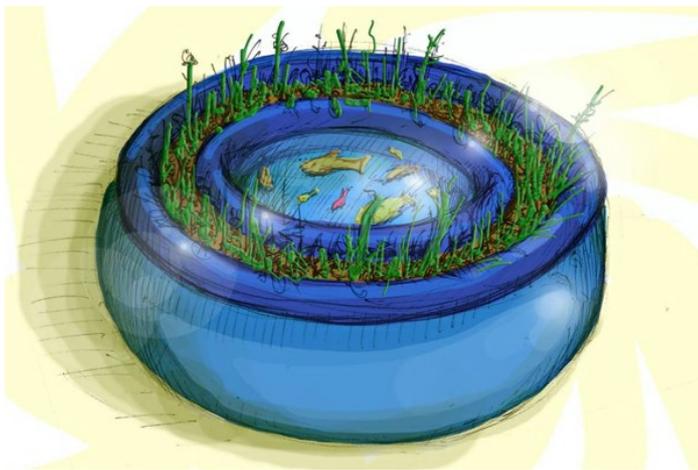
HIPS

Holonic **Integrated** Produce Swarm

A team from South Africa has designed a peer-to-peer networking app called HIPS whose algorithm mimics the way that large collectives in nature, such as a flock of birds or a school of fish, function. The goal is to enable small scale intensive food production systems by providing a dynamically-distributed, peer-to-peer tool to help manage and coordinate their efforts. First, the app will enable food producers to connect with other producers to create a local swarm in which resources can be shared and local exchanges and transactions are conducted. Next, the app connects local swarms with each other to create a regional swarm and establish a produce hub. Finally, it records surplus produce for sale and enables coordination with other swarms and members to facilitate distribution logistics. This software facilitates and optimizes logistics, provides a medium for fair exchange of value, and provides incentives to food producers to employ best practices.

8. The Oasis Aquaponic Food Production System, Michigan, USA:

An affordable, solar-powered aquaponics system designed for subsistence farmers in developing nations.



A Michigan-based team has created a small aquaponics system that is designed for radical affordability. The Oasis Aquaponic Food Production System helps subsistence farmers grow better food sustainably (using less space, less water, and no chemicals), improve nutrition, and generate income. Aquaponics is the co-culture of fish and vegetables in a recirculating biofilter-based system, which allows more food to be grown in a smaller area and with less water than traditional aquaculture or horticulture. Applying lessons from nature, the design team refined this system to reduce structural mass and materials by employing an inflatable ring. The Oasis Aquaponic Food Production System is a solar-powered aquaponics system capable of producing at minimum 200 pounds of Tilapia and 200 pounds of tomatoes or other vegetables annually. With a projected retail price of \$100, and a business model that provides low-interest purchasing credit, the system is both affordable and accessible.

After traveling to Austin, TX next week to pitch their ideas to judges and experts and take the stage at **SXSW Eco**, these teams will continue their journey to bring these ideas to fruition. We'll be posting updates along the way, sharing the ups and downs that come with trying to birth a new idea into the world. Until then, we offer our sincere congratulations to the finalist teams and thank all the teams that submitted to the 2015 Biomimicry Global Design Challenge. You keep us inspired and hopeful about

the potential to create deep, radical, and lasting change.

*Interested in being a part of the fun? The 2016 **Biomimicry Global Design Challenge** launches October 5, 2015!*

