

# The strangest solutions to global problems

Sometimes the strangest solutions can be the most effective. Here are some unusual approaches to solving global problems.

Our world is full of problems, some of which are global in scope and impact, from dwindling resources to increasing disease. While some of these problems may seem insurmountable, and will probably persist for a long time, we are fortunate that there are so many smart, creative people working on solutions. Sometimes, the strangest solutions can be the most effective. **Here are some unusual ways to solve global problems.**



## Printing new skin to heal wounds

For most people, 3D printing is a fun way to create novel products. In fact, 3D printing could be a revolutionary technology in healthcare. To that end, scientists at the University of Hawaii are developing a potentially revolutionary biological advancement: bioprinting. Just as 3D printers use melted plastic to create Gandalf figurines, this technique would use 'bio-inks' to augment the body.

These bioinks are based on human cells, so they can differentiate into a variety of different tissue types, such as organ-like structures in the body. Since the skin is also an organ, this means that bioprinting could improve treatments for common injuries such as burns, chemical exposure, and other skin-damaging injuries, including antibiotic-resistant bacteria. Additionally, printed tissues and materials could protect and treat soldiers, potentially through future applications such as protective contact lenses. Equally important, bioprinted tissues could enable precise biomedical testing, eliminating the need for animals.

## **Dangerous weeds "commit suicide"**

Parasitic weeds are a global threat. They steal nutrients from the crops that feed the world. In some places, including sub-Saharan Africa, entire fields can be destroyed by parasitic weeds, exacerbating existing food shortages. So researchers at the University of California, Riverside, are looking for a way to make parasitic weeds self-destruct. This requires manipulating a mechanism the weeds already have: they grow when they sense plant hormones called strigolactones, which are secreted through the plant's "skin." The scientists' strategy is to use these hormones to trick the crop-destroying weeds, causing them to germinate before or after they reach maturity, when there isn't enough food. The result is essentially starvation before they can drain the plant of its nutrients.

## **AI knee-worn film measures movement**

Knee pain is one of the most common pains worldwide. According to the American Academy of Family Physicians, knee pain affects 25% of the population and has increased by 65% in the past 20 years. Knee pain can be caused by injury, genetics, poor exercise habits or general overweight. So finding the root cause is part of the battle — for example, by studying the forces that impact the joint on a daily basis. But that's a complicated problem that requires a lab or bulky equipment. So scientists have designed a wearable device, like a film, that can be (gently) applied to the knee to analyze the signals generated by movement. The device is light, cheap, easy to use, and is powered by AI to provide insights based on the forces that impact the knee during everyday movements.

## **Gel absorbs water in the air**

The air contains a fair amount of water, but there's no way to harvest it—not even with a really narrow straw. Luckily, the University of Texas has invented a 'cheap gel membrane made from readily available materials' that can draw water vapor from the air using a porous, hydrophilic structure. The gel can suck up moisture from even the driest air, which could help countless people around the world: water is becoming increasingly scarce everywhere, and a third of the global population lives in arid regions that face chronic water shortages. Yet the gel membrane only costs about a dollar. Depending on the relative humidity in the air, the amount of liquid it can collect will vary.

## **Self watering soil**

Researchers infused hydrogel into soil, creating 'smart soil' that self-waters and releases fertilizer in a controlled manner. The result? Bigger, healthier crops that also save resources: plants grown in the smart soil had 138% greater stem length with about 40% less water use. This could ease the burden on farmers, who need large amounts of water and fertilizer.

As mentioned, water is becoming scarce, and agriculture can account for 70% (or more) of global freshwater use. In developing countries and places with exploding populations, that number can be as high as 95%. Land

reclamation can be an effective and innovative solution to a global problem by reducing the need for irrigation and other resources.

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