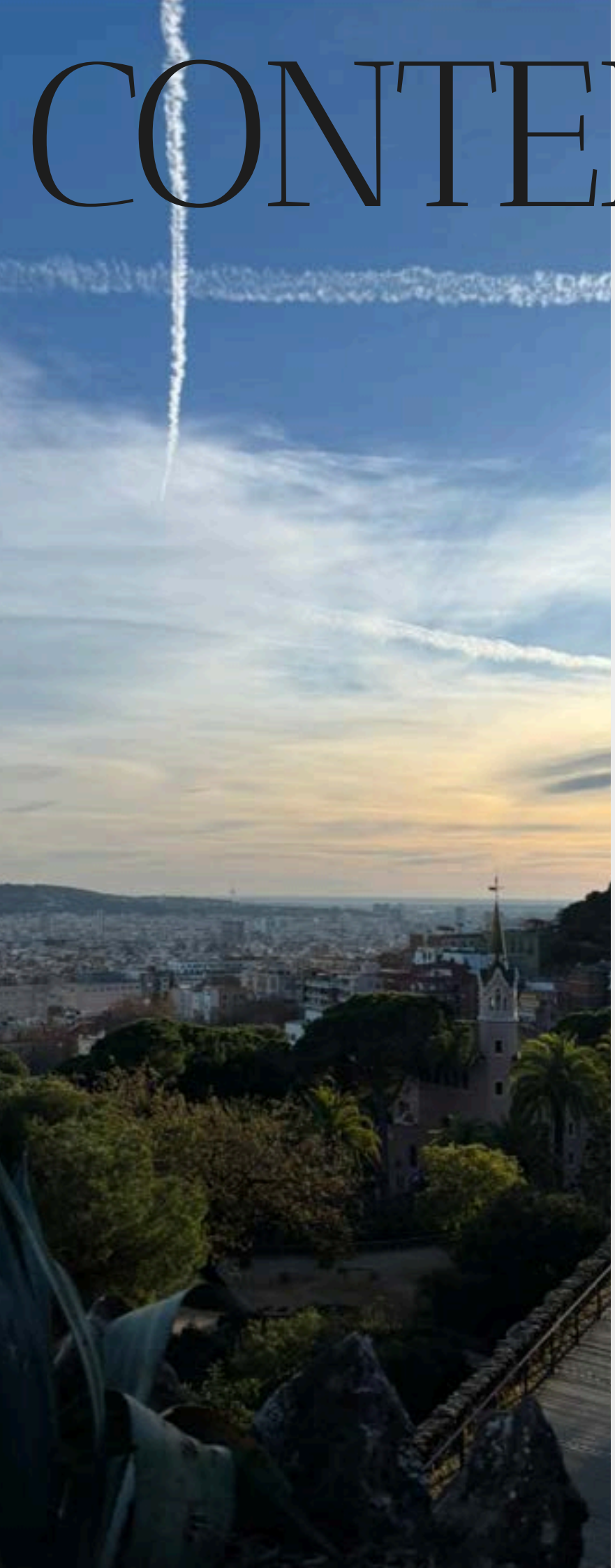
GREEN SCIENCE

Issue No. 02
Winter 2024



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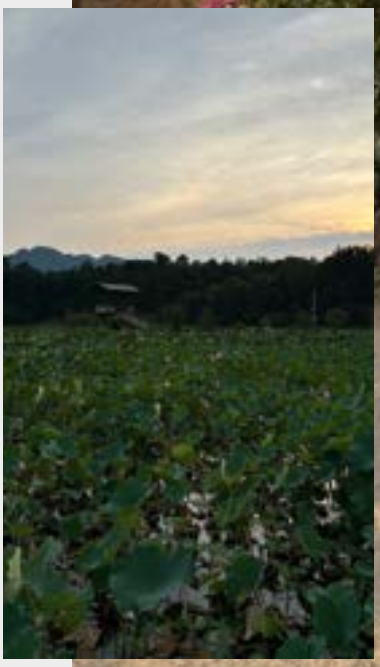
The Winter 2024 GreenScience Issue focuses on student responses to climate change. This issue brings to life the student voice as an active part of larg scale change. This curated selection of proposals and budding ideas offers startling insight.



Technology and Its Role in Environmental Protection

Robyn Davies

In recent decades, habitat destruction, resource exploitation, carbon emissions, deforestation, and disturbances to natural equilibriums have left a detrimental impact on the balance of global ecosystems. With 2,000 new species endangered annually, we must take action now.

First, we must protect habitats. Preservation starts with calling upon national governments to conserve habitats within their regions by restoring deforested areas, reintegrating endangered species into new habitats, and restricting human interference within protected areas. Such conservatories must take equal care to conserve animal life within these protected areas, bearing in mind the detrimental impact of species extinction on the balance of global ecosystems.

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Our second action must be raising awareness, involving governmental bodies, international organizations, NGOs, and individuals alike. This entails not only developing a global climate curriculum in coordination with the UNEP to address topics such as region-specific environmental concerns and individual climate responsibility but also establishing government-mandatory labels defining the sustainability of manufactured goods in hopes of raising consumer awareness.

Both programs' accessibility in virtual and physical formats will be vital to their success. As time will certainly bring new challenges and innovations concerning environmental stability, an annual review by the UNEP will ensure its implementation remains equally relevant, accurate, and effective. However, on our path to a more sustainable future, we must also consider the people currently dependent upon environmentally threatening work.

With concern to farming populations, restorative ocean farming techniques particularly may prevent environmentally-taxing work while equally revitalizing marine ecosystems.

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Whether planting and harvesting aquatic plants, encouraging the farming of sustainable shellfish species, or financially supporting Regenerative Ocean Farming NGOs such as GreenWave's polyculture ocean farming methods, restorative ocean farming solutions can nurture both an ecosystem for endangered coastal species to thrive and natural solutions to balance carbon emissions.

On the point of balancing carbon emissions, Carbon Engineering's Direct Air Capture (DAC) solution must not be ignored. DAC plants directly sequester carbon from the atmosphere and condense it into recycled carbon pellets. Under independent organizations, this carbon can be used as a recycled energy source, approaching net-zero emissions.

Though the climate crisis remains a crisis unsolved, one thing is certain: scientists have the technology. It is now our responsibility, as students, activists, and future world leaders, to implement these technologies as the environmental solutions that revitalize our Earth. Under government funding, this extracted carbon could be removed from our atmosphere permanently.

A Tree A Student

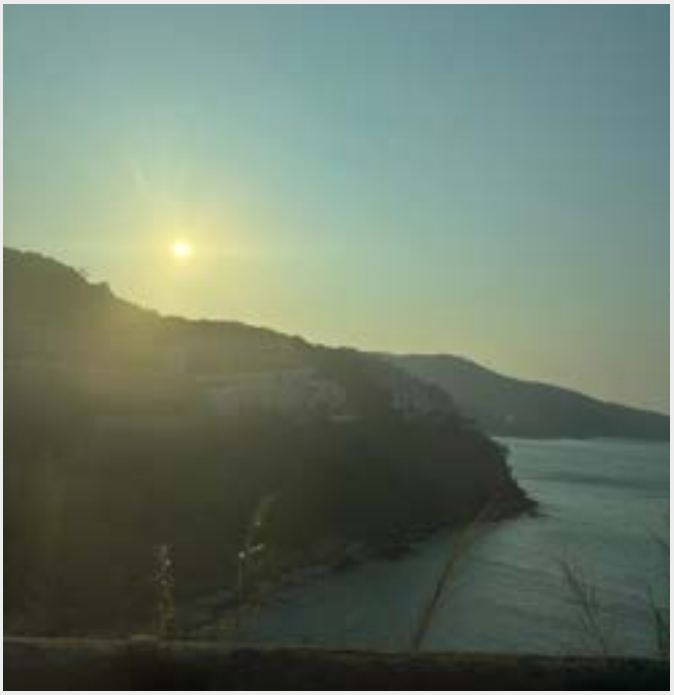
Meg Xu

When I was younger, I heard whispers of a fairytale like school where each student raised a horse. The purpose of this unique program was to nurture responsibility, care, and skill. Turning this idea over in my head, I began to wonder: Why not a Tree? Admittedly, raising a horse is a high bar for each school community and student to reach. Yet a tree simultaneously fosters the same skills, serves as a living laboratory, and offers a powerful solution to one of the greatest challenges of our time—climate change. Thus I would like to propose the benefits of the Seedlings of Change initiative, promoting the mutual symbiosis of seedling scholars and trees.

This concept is simple yet transformative. Upon their arrival at school, each student plants their very own tree. Over the next four years, they become the tree's guardian, tending to its needs for light, nutrients, and water. This hands-on experience fosters essential life skills such as responsibility, patience, and empathy. Additionally through daily immersion in the natural worlds students build a stronger connection with the environments. Students learn the art of gardening, from watering and pruning to understanding soil health and seasonal changes. They also develop a sense of ownership and pride as they watch their tree flourish under their care.

But the benefits of the Seedlings of Change initiative extend far beyond individual growth. Trees act as natural carbon sinks, absorbing carbon dioxide and releasing oxygen. Through the planting and nurturing of trees, students actively contribute to reducing carbon emissions. A school with hundreds of students will plant dozens of new trees each year, creating a thriving green space that benefits the entire community. Over time, this program could transform school campuses into lush, carbon-neutral havens.

The Seedlings of Change initiative also encourages benefits to each the learning experience and the fortification of learning communities. Students can work together to create tree nurseries, share gardening tips, and organize events like tree-planting ceremonies or eco-fairs, thus helping to foster tight knit communities of learners. Additionally, teachers can integrate the program into the curriculum, using it as a living laboratory for lessons in biology, environmental science, and even art and literature. A class on photosynthesis taught in the sunny outdoors under the leafy shade of a walnut tree will surely leave a longer impression. A poet writing while gazing at a nearby sycamore tree– the other half of a student – will draw inspiration from its sturdy roots and evergreen leaves.



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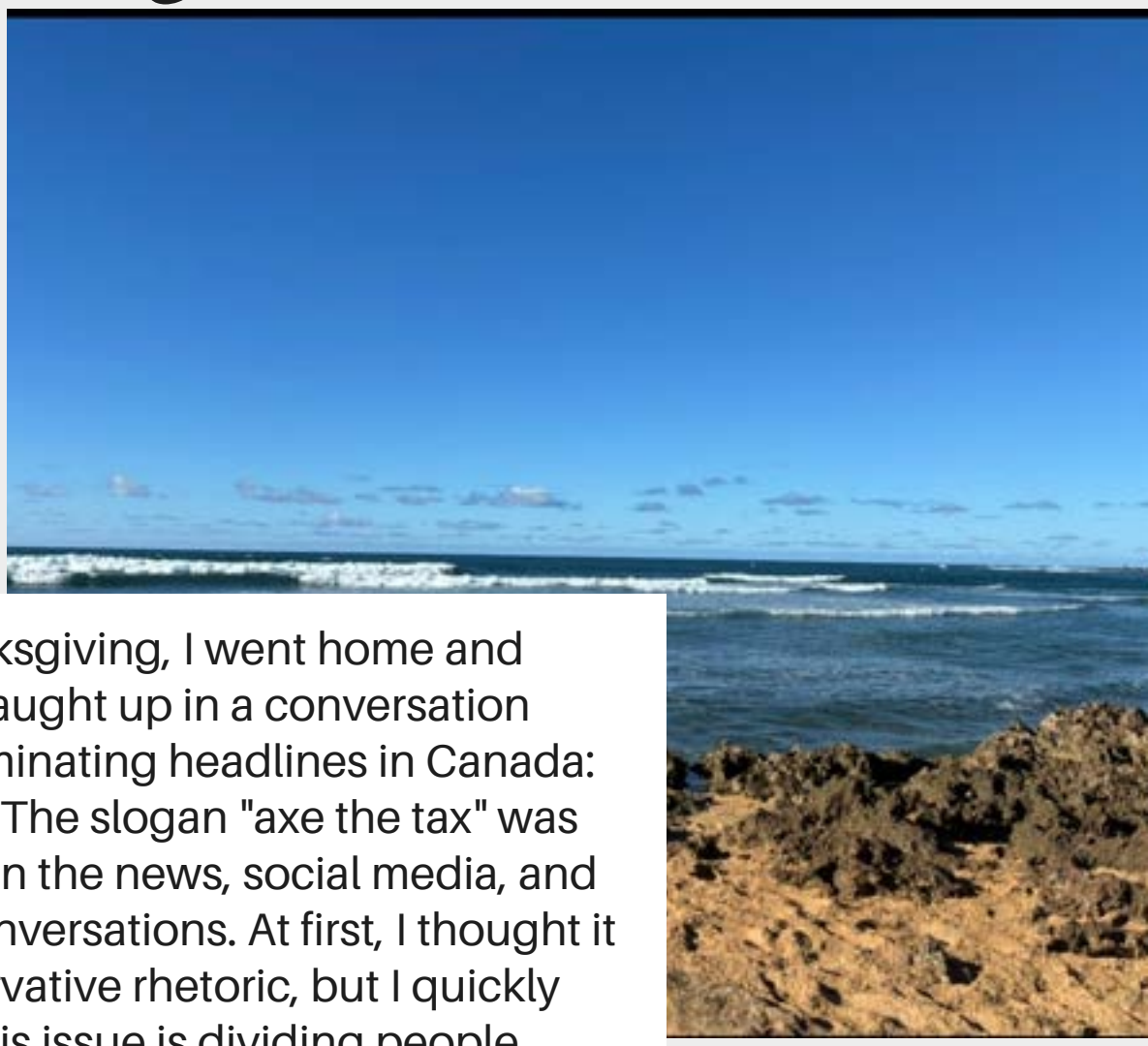
The Seedlings of Change initiative is more than just an environmental initiative; it's a way to cultivate a generation of responsible, empathetic, and environmentally conscious individuals. By nurturing trees, students learn to nurture themselves, their communities, and the planet. It's a small idea with the potential to grow into something extraordinary—a movement where every student becomes a guardian of the Earth, one tree at a time. Together, we can plant the seeds of change and watch them grow into a greener, more sustainable future.

One of the most beautiful aspects of this program is legacy. Even when students graduate, they leave behind a living testament to their time at the school—a tree that will continue to grow and benefit the environment for decades to come. Future students can gaze upon a thriving forest, feeling connected to all those that came before them. The program creates a cycle of sustainability and stewardship that extends far beyond individual participation.

The Carbon Tax

Ruby Jennings



Over U.S. Thanksgiving, I went home and found myself caught up in a conversation that's been dominating headlines in Canada: the carbon tax. The slogan "axe the tax" was everywhere—on the news, social media, and even casual conversations. At first, I thought it was just conservative rhetoric, but I quickly realized how this issue is dividing people, even among progressives.

My school's student body is almost entirely climate activists. If you polled my classmates, they'd likely unanimously support a carbon tax. I still support a carbon tax, too, but a chance conversation on my visit home has made me see things differently. I have not abandoned my belief in climate action, but I've gained an appreciation for the complexity and nuance of the issue.

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I had a long meeting with my neighbor, a progressive, gentle, left-wing man who owns a farm and is deeply committed to environmental sustainability. However, he is deeply concerned about the rising carbon tax costs—from fuel to fertilizers—making his farm increasingly economically unviable. He supports climate action, but the financial burden the tax imposes feels impossible to bear. His perspective challenged me in ways I wasn't expecting.

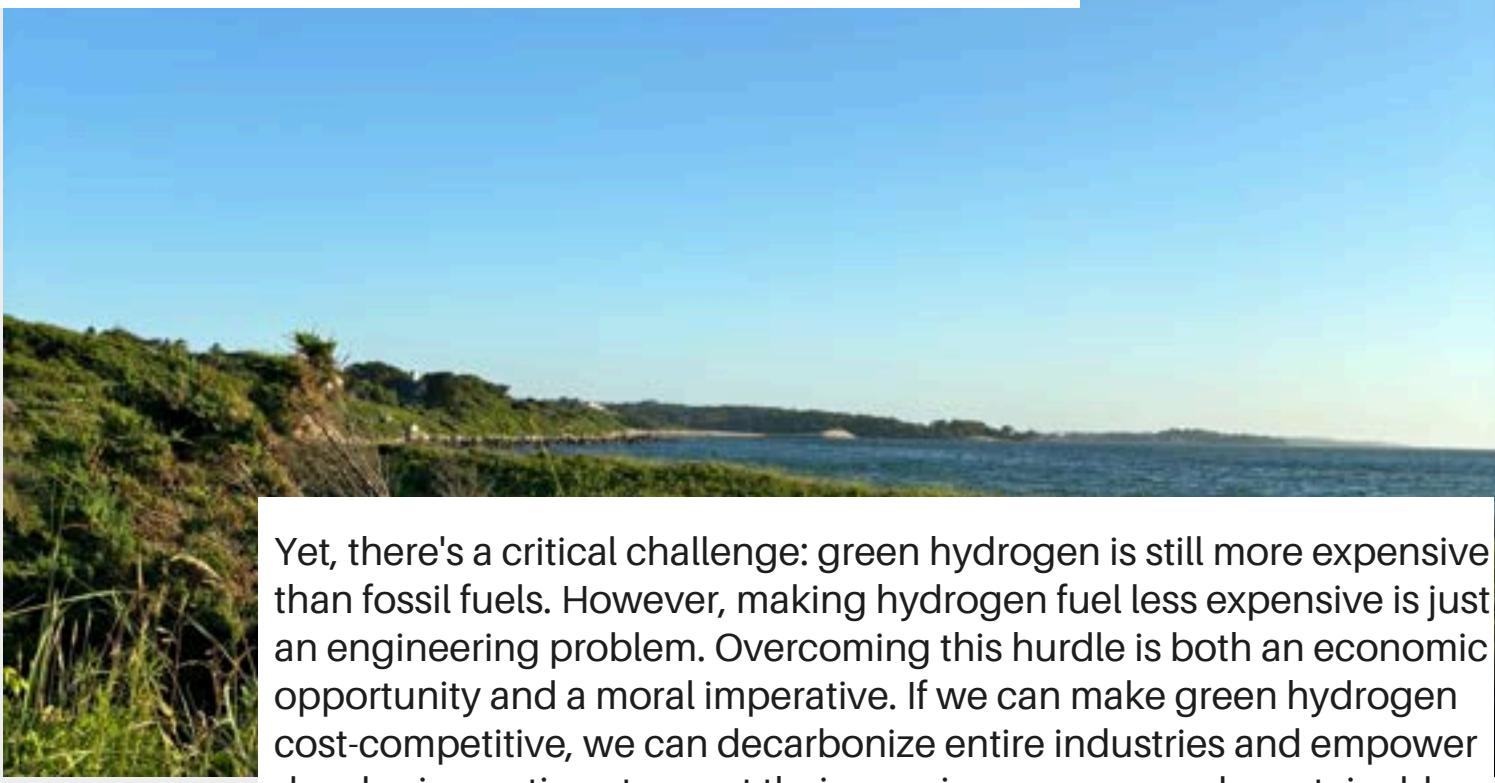
This brings me to a talk my school hosted a few weeks back by Tom Steyer, the billionaire turned climate activist, who came to promote his book Cheaper Faster Better. Mr. Steyer advocates for (among other things) using capitalism to help fight climate change. Some of my classmates were skeptical of him—after all, he had made millions from fossil fuels decades ago. To them, using capitalism to address climate change felt counterintuitive, even contradictory.

How could the system that contributed to the climate crisis also be its solution? But I found myself intrigued by his argument. I read Mr. Steyer's book over the Thanksgiving break. I am now utterly convinced that engineering solutions and capitalist innovation must be critical components of any climate strategy.

Mr Steyer's talk planted a seed, and back home, observing the "axe-the-tax" rhetoric in full force and hearing about my neighbor's struggles, a light bulb went off.

Canada is one of the most politically progressive nations in the world. If we can't build widespread support for a carbon tax here, what hope is there in the U.S. or, for that matter, developing nations? These countries will need more energy in the coming decades, and we can't ethically demand they adopt expensive policies when their populations still strive for basic access to electricity.

This experience hasn't made me abandon my belief in climate action, but it's made me realize how crucial it is to find "win-win" solutions that work for everyone. One such solution is green hydrogen, a technology that could transform our fight against climate change. "Green" hydrogen is simply hydrogen fuel produced using renewable energy like wind, solar, or hydro. Hydrogen fuel generates no greenhouse gas emissions. It is also incredibly versatile, capable of powering vehicles, generating electricity, providing industrial heat, and even serving as a feedstock for fertilizer production. For energy-intensive sectors like farming, green hydrogen could provide a clean, affordable alternative to fossil fuels.



Yet, there's a critical challenge: green hydrogen is still more expensive than fossil fuels. However, making hydrogen fuel less expensive is just an engineering problem. Overcoming this hurdle is both an economic opportunity and a moral imperative. If we can make green hydrogen cost-competitive, we can decarbonize entire industries and empower developing nations to meet their growing energy needs sustainably. And my neighbor will probably happily vote for a carbon tax.

Green Hydrogen is just one example of how engineering innovation can solve the climate crisis, from better batteries to safe nuclear to many others. Mr. Steyer even cites an example of a company he helped fund that uses lightweight refrigeration installed on existing power lines to help get renewable energy to people using the existing power grid.

This story is a call to action for anyone who believes in climate action but is more engineering-inclined. Solving the cost challenge of green hydrogen could unlock a cascade of benefits, offering a path to decarbonization that is beneficial to all. Imagine a world where renewable energy and green hydrogen drive industry, farmers don't have to choose between sustainability and survival, and the fight against climate change unites rather than divides us.

A Poet's Voice

Art is the voice of the soul; a profound language that transcends the limits of words and logic. Brushstrokes on canvas, movements on a stage, or frames of a film capture the depth of emotions and ideals that the mind struggles to articulate. As we are told of our planet's impending doom—species vanishing at an alarming rate, ecosystems crumbling, weather patterns failing—it is only natural to turn to art. In times of crisis, art becomes more than self-expression; it becomes a beacon of hope, a call to action, and a bridge between despair and change.

Through mediums like documentaries, eco-friendly fashion shows, and dance performances, artists and activists alike are raising their voices to protect the Earth. Documentaries unveil the raw truth of environmental destruction, fashion shows redefine sustainability with creativity, and dance performances embody the fragility and resilience of nature. These artistic expressions are not just acts of creation—they are acts of conservation, urging us to see, feel, and act before it's too late.

Below is an example of a student raising her voice up through poetry inspired by a tapestry. Her poem gives voice to those who have lost their homes due to climate disaster. This is her method of making a difference.

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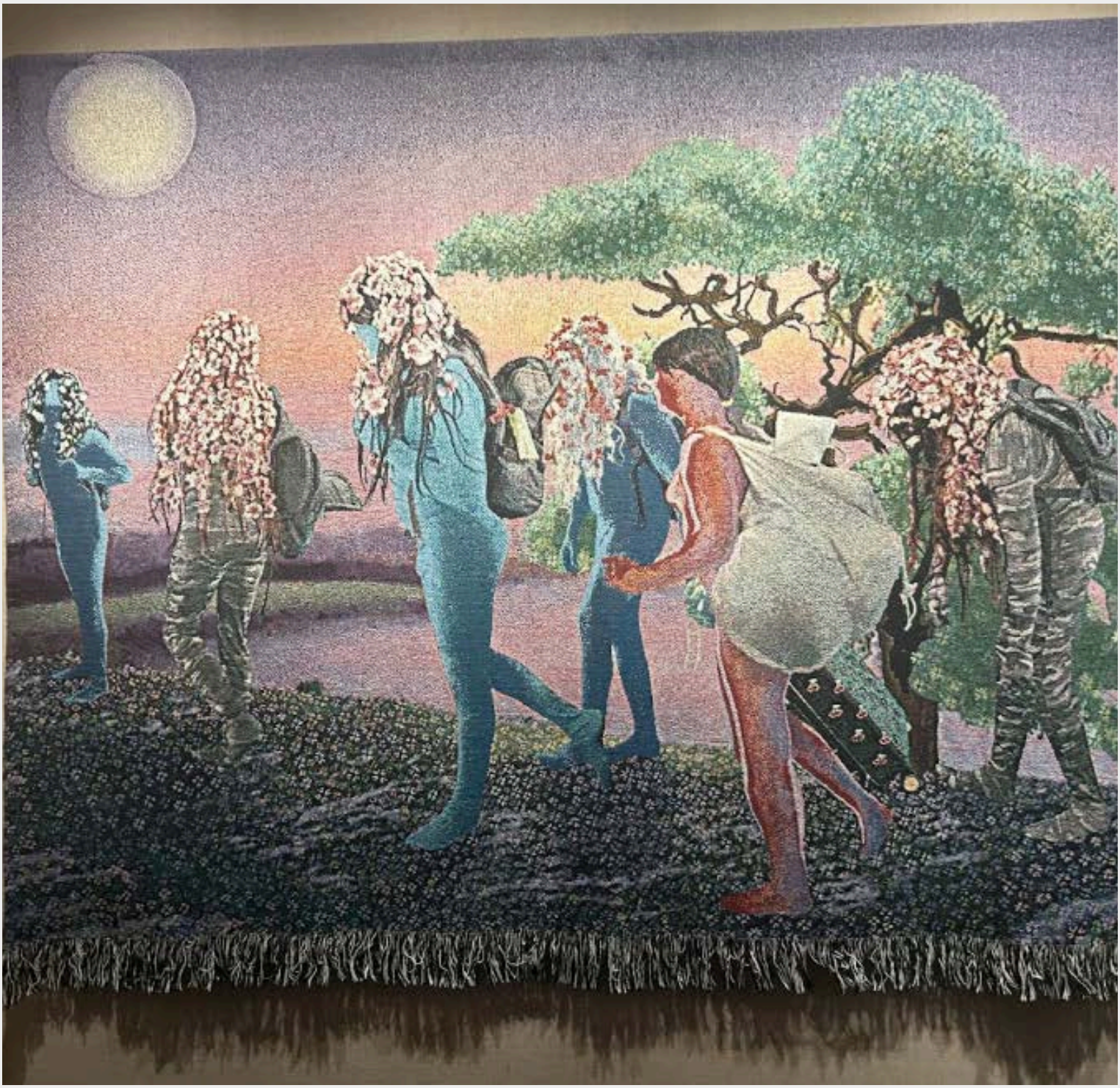
The sky mocks
Its soft pink swirls delicate artistic full of derisive laughter
each wilting blossom intertwined
with locks of precious glossy hair, matted
glass smooth waters .once rising to engulf lives whole pausing only to stare
into each terrified face and say:
You have done this to me
under a setting sun a thousand frayed edges and drowned voices



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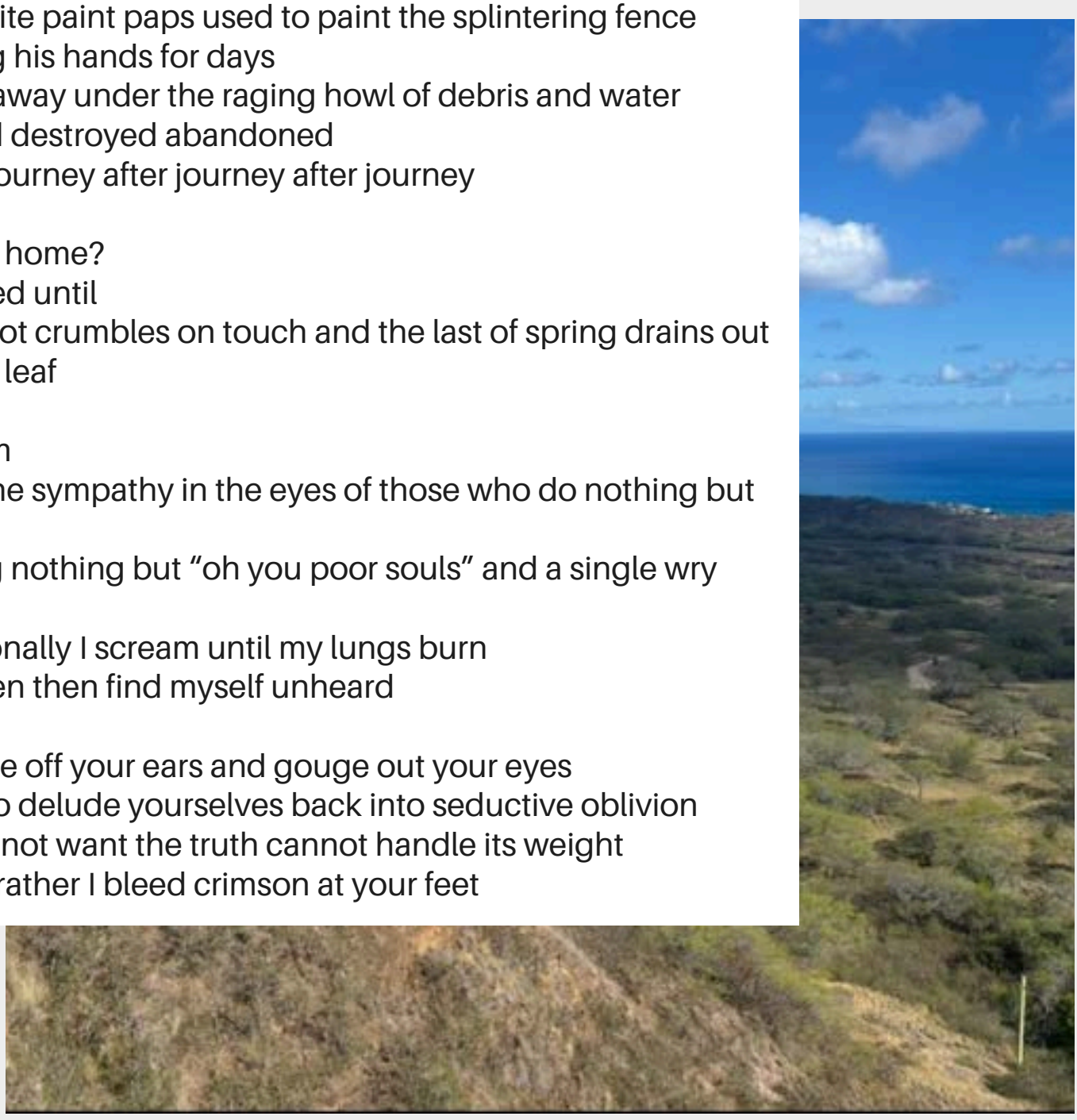
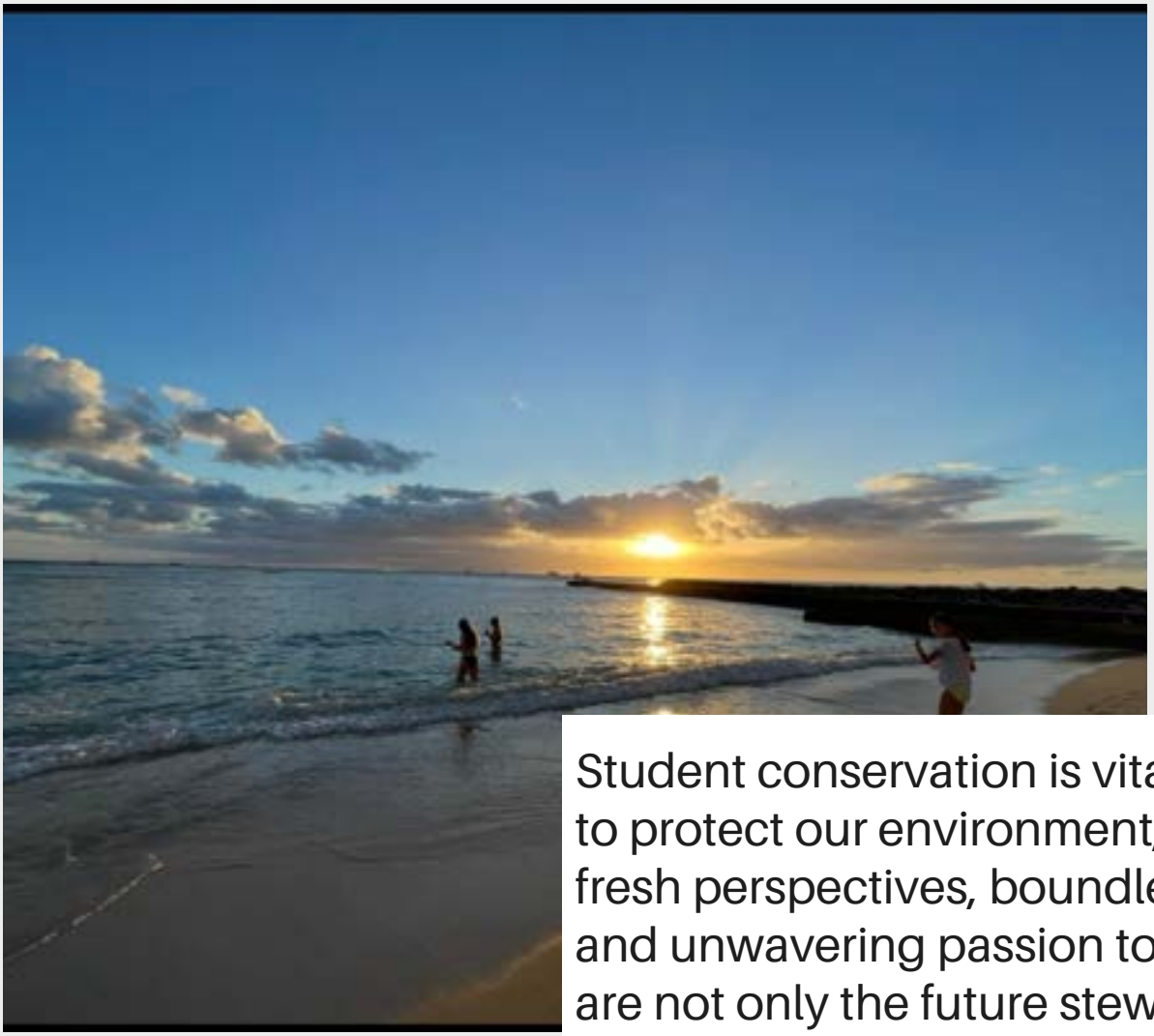
I am screaming to be heard
cherry print suitcase bulging at each seam with the last remnants of
The weeping willow where my we spent a sunny afternoon in each others arms
The checkered quilt mama knit
by hand
The most crimson of roses always the most thorny grandpaps pricked his aged hands on every year for the love of his life
The white paint paps used to paint the splintering fence staining his hands for days
Swept away under the raging howl of debris and water
flooded destroyed abandoned
weary journey after journey after journey
Home
What is home?
uprooted until
each root crumbles on touch and the last of spring drains out of each leaf

I scream
curse the sympathy in the eyes of those who do nothing but pity
offering nothing but “oh you poor souls” and a single wry smile
occasionally I scream until my lungs burn
and even then find myself unheard

you slice off your ears and gouge out your eyes
trying to delude yourselves back into seductive oblivion
You do not want the truth cannot handle its weight
Would rather I bleed crimson at your feet



Conclusion



Student conservation is vital in the fight to protect our environment, bringing fresh perspectives, boundless creativity, and unwavering passion to the table. We are not only the future stewards of the planet but also powerful change-makers in the present. From tree-planting initiatives to technology— student ideas often challenge traditional approaches and inspire broader action.

GreenScience empowers students to lead and contribute, fostering a generation that values sustainability, ensuring a healthier, more resilient planet for years to come.

Got feedback?

Contact us at: shutong.xu@gmail.com

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