

Strong Sustainability by Design

**PRIORITIZING ECOSYSTEM AND HUMAN FLOURISHING
WITH TECHNOLOGY-BASED SOLUTIONS**

HUMAN WISDOM AND CULTURE



Strong Sustainability by Design

This Compendium has been created by committees of the IEEE Planet Positive 2030 Initiative supported by the IEEE Standards Association (IEEE SA). The IEEE Planet Positive 2030 Initiative community is composed of several hundred participants from six continents, who are thought leaders from academia, industry, civil society, policy and government in the related technical and humanistic disciplines. At least one hundred seventy members of this community from about thirty countries have contributed directly to this Compendium and have worked to identify and find consensus on timely issues.

The Compendium's purpose is to identify specific issues and recommendations regarding sustainability and climate change challenges to achieve "Planet Positivity" by 2030, defined as the process of [transforming society and infrastructure by 2030 to:](#)

- Reduce Greenhouse Gas (GHG) emissions to 50% of 2005 GHG emissions by 2030.
- Significantly increase regeneration and resilience of the Earth's ecosystems.
- Be well on the path to achieving net zero GHG emissions by 2050 and negative GHG emissions beyond 2050.
- Continue to widely deploy appropriate technology as well as design and implement new technological solutions in support of achieving technological solutions designed and deployed to achieve "Planet Positivity."

In identifying specific issues and pragmatic recommendations, the Compendium:

- Provides a scenario-based challenge (how to achieve "Planet Positivity by 2030") as a tool to inspire readers to get engaged.
- Advances a public discussion about how to build from a "Net Zero" mentality to a "Net or Planet Positive" ("do more good," that is, doing "more" than "don't harm") societal mandate for all technology and policy.
- Continues to build a diverse and inclusive community for the IEEE Planet Positive 2030 Initiative, prioritizing the voices of indigenous and marginalized members whose insights are acutely needed to help make technology and other solutions more valuable for all. Of keen interest is how to encourage more in-depth participatory design in these processes.
- Inspires the creation of technical solutions that can be developed into technical recommendations (for example IEEE SA recommended practice for addressing sustainability, environmental stewardship and climate change challenges in professional practice, [IEEE P7800™](#)) and associated certification programs.
- Facilitates the emergence of policies and recommendations that could potentially be intraoperative between different jurisdictions (e.g., countries).

By inviting the general public to read and utilize *Strong Sustainability by Design*, the IEEE Planet Positive 2030 community provides the opportunity to bring multiple voices from the related scientific and engineering communities together with the general public to identify and find broad consensus on technology to address pressing environmental and social issues and proposed recommendations regarding development, implementations and deployment of these technologies. You are invited to Join related IEEE activities, such as standards development and initiatives across the organization.

- For further information, learn more at the [IEEE Planet Positive 2030 Initiative website](#)
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Request for Input Draft (“Version One”) Published June 2023.
First Printing November 2024.
Printed in the United States of America.

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PDF: ISBN 979-8-8557-0935-3 STDVA27090
Print: ISBN 979-8-8557-0936-0 STDPT27090

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How to cite Strong Sustainability by Design:

The IEEE Planet Positive 2030 Initiative. *Strong Sustainability by Design: Prioritizing Ecosystem and Human Flourishing with Technology-Based Solutions*. IEEE, 2024. <https://sagroups.ieee.org/planetpositive2030/our-work/>

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HUMAN WISDOM AND CULTURE

Future Vision

It is 2030.

Human wisdom and culture continue to offer an emotional and intellectual connection that binds humans together. In 2022, a worldwide cultural evolution emerged as humans across the Earth chose a holistic shift toward intergenerational stewardship of the systems we inhabit and impact on the Earth and re-committed to the ancient human wisdom to again become stewards and caretakers of life and nature. All concepts, designs, and implementations of sustainable and [regenerative](#) efforts are now prioritized as being in service to all life, the biodiversity of Earth, which includes humans.

As humans became aware of their environment and understood that their ecosystems provided what they needed to sustain their lives, they developed a caring relationship with Earth and other natural forces and resources.

For example, for more than 60,000 years, Aboriginals of Australia practiced this caring relationship with nature and passed the wisdom to their future generations (AAP, 2023; Nature-Bound Australia, “Aboriginal Culture”).

Introduction

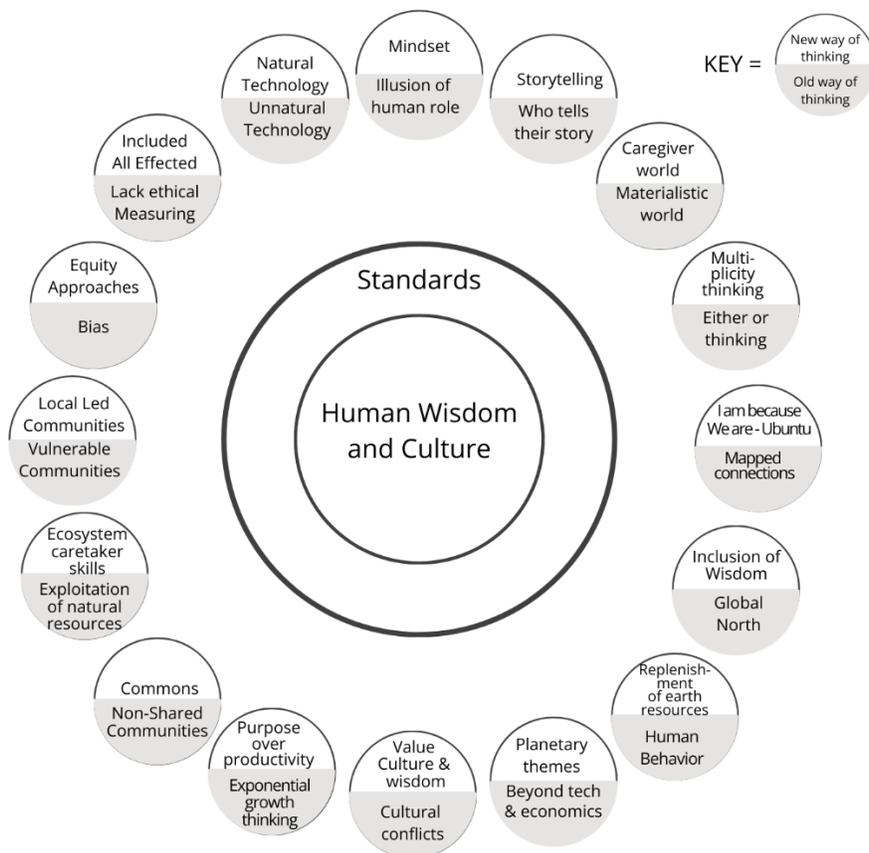


Figure 1. Human Wisdom and Culture Chapter Map

The culture, philosophy, knowledge, values, wisdom, and mindset of any society impact the society’s infrastructure and patterns of governance. To prioritize the focus for any sustainable, regenerative, and [intergenerational initiative](#) initiatives, transformation of the mindset, culture, and society must come first before any technological and infrastructure transformations are developed or implemented.

A shift in consciousness is needed for a future that re-includes intergenerational stewardship that aims to seek and situate scientific materialism in alignment with [non-materialism](#) and [healthier ecosystems](#). These ecosystems include dimensions that can connect humanity to the natural systems of our world and then enable a more holistic engagement with scientific instruments, and future thinking to build the future we want.

Human wisdom may not be gained through calculation as much as it is received through insight, where for brief glimpses, humanity is open to the connection people share with all living beings around them. It takes much work and skill to deprogram and quiet people’s chattering minds. Certain aspects of humanity have transitioned in their cultural beliefs, valuing elements such as unfettered economic expansion, potentially detrimental competitiveness, and the emphasis on individual autonomy. In this context, groups of Indigenous

peoples continue the culture of connection to Earth and intergenerational stewardship as their communities of practice in ancient traditions of mindfulness and conscious connection to the bigger world around us. Therefore, threads of ancient human wisdom and culture continue to thrive in the weave of societies in our world today.

Indigenous wisdom and lifestyles are not exclusive to Aboriginals. As humans migrated to new areas on Earth, they created their own ways of life and consumption, which may not have been in accordance with the ways of the Aboriginal ancestors. Maintaining a culture of respect and care for nature is understood and implemented by many people around the world. However, somewhere along the timeline of human history, humans began to dominate, take, and consume as they wished with no consideration or knowledge of planetary limitations. They lost touch with the wisdom of how ecosystems work and the necessity for care and stewardship to enable regeneration, hence disrupting planetary balances and the chain of life.

Although Aboriginals are the oldest civilizations, many others, Indigenous Peoples, ancestors and regions of the world also have shown wisdom and care for the planet. Notably, the Chinese, Japanese, and other Asian cultures and tribes have tremendous wisdom about nature, Mother Earth, and sustainable living. For example, Persian culture is deeply connected with nature (Yachkaschi & Yachkaschi, 2012)—celebrating every seasonal change, setting the calendar year based on seasons, planting, harvesting, believing in the responsibility to maintain life for future generations, honoring the origin of life and birth, and more.

The deep knowledge of the interconnectedness of all things is held within the ancestral (Indigenous) wisdom from generation to generation. Ancestral wisdom holds collective knowledge of the land, sea, and sky and deepens understanding of how life naturally evolves and of its impact (i.e., climate change) on livelihoods, cultures, and ways of life. It provides the concrete context of communities in relation to the environment and provides practical solutions on how to adapt. It also offers examples of how to act sustainably and [regeneratively](#) to co-create conditions for life to continuously evolve.

Therefore, human wisdom involves integrating ancestral wisdom and modern wisdom to protect the planet Earth and all life's existence that humans depend on while advancing into the future of human well-being and sustainable development. *Intergenerational stewardship* is a phrase that captures this intention of being a steward of the systems of nature in our lifetimes to preserve, protect, and regenerate those systems for the generations to come.

Finally, an effort should be made to preserve and promulgate these advanced skills, applied science, and planet-positive initiatives and to explore how integrating them into human development cycle(s) could be beneficial in solving technological challenges facing current and future societies. The authors recognize that the human element has been missing in many technology- and economy-driven decisions.

This chapter on human wisdom and culture focuses on Indigenous wisdom and the cultures to be considered, included, and asked about, outlining the process through mindset, story, and human experience. This discussion does not focus on technology other than that which comes from nature.

When involving Indigenous participants and communities, please consider the rights of Indigenous Peoples as stated by the Human Rights Office of the United Nations in [Free, Prior, and Informed Consent](#) (UN OHCHR, 2013).

Issue 1: The need for an expanded mindset—the role of humans in the evolution of planet Earth

Background

Humans evolved from all the living species that existed and evolved during the 4.5 billion-year history of Earth (National Geographic, “Age of Earth Collection”). Earth itself evolved within the 13.7 billion years of the universe’s evolution (Ralls, “History of Earth in Exactly 2000 Words”; Peebles et al, 1994).

In the last 0.4 billion years (400 million years), scientists are aware of five major mass extinction events that have occurred (Dutfield, 2021). At every mass extinction, approximately 70% to 95% of all living species died. The last extinction eradicated the dinosaurs. The current rate of biodiversity loss may indicate another mass extinction age. The ability of the changing systems of nature to continue to support the biodiversity of life on Earth has been irreversibly altered in the 70 years between 1950 and 2020. In that same time frame, the human population of Earth has grown from 2.6 billion in 1950 to 8 billion in 2023 ([Worldometer](#) website). Therefore, human thinking now needs to expand to consider this new reality. Intergenerational stewardship thinking is needed more than ever before.

In the context of the regenerative lifecycle of life, it seems that death and life are inherently interconnected within Earth’s evolution in which death becomes compost for the “new.”

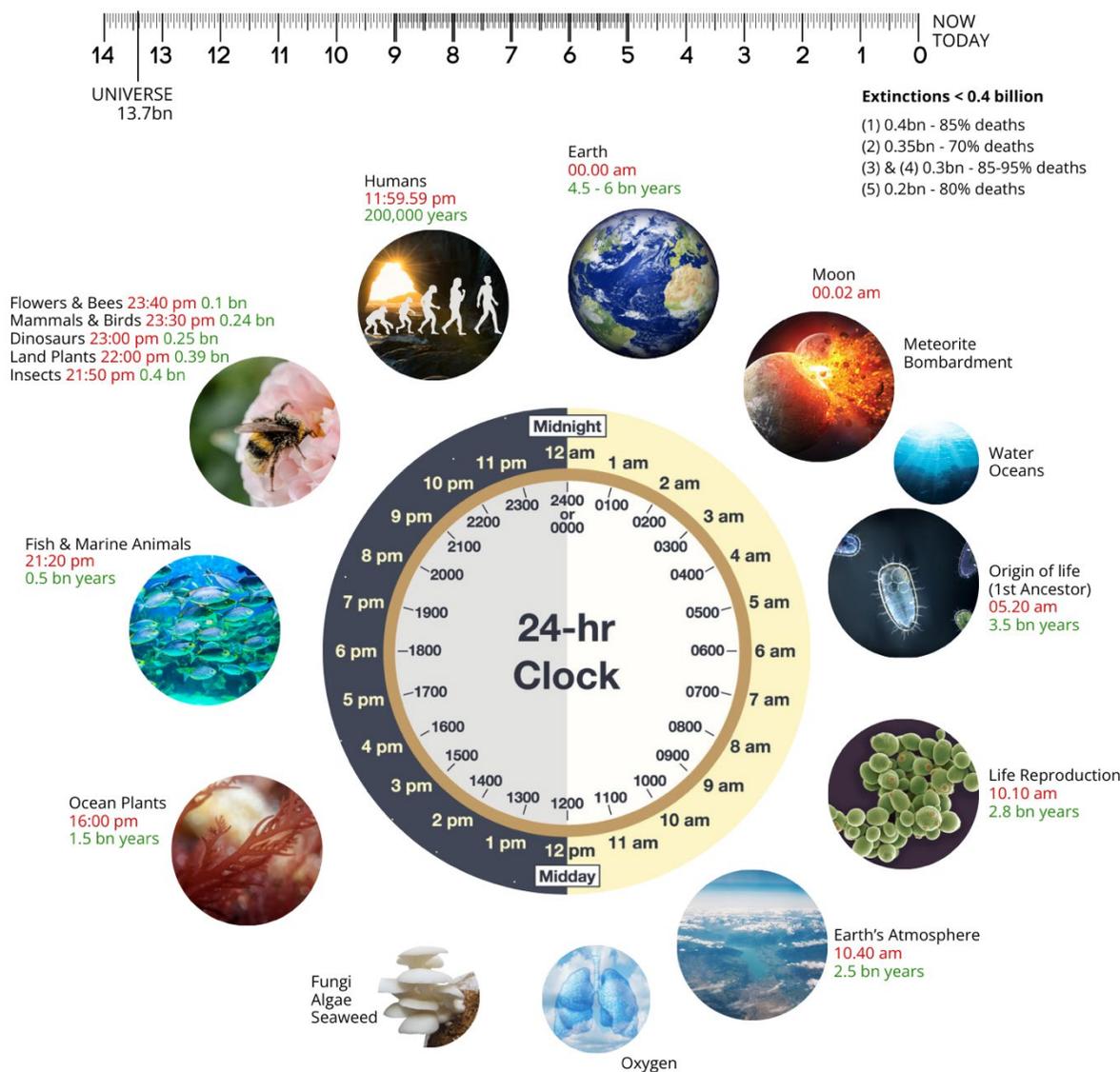


Figure 2: Birth of Earth
(Chart developed by Mila Aliana. Visually created by Co-Chair Cyndi Coon)

The advent of farming and agriculture transformed Earth’s natural landscapes, locally and globally. As humans settled down because they could now produce their own food and increase its availability, human civilization flourished and the human population began to increase dramatically. Only during the last 500 years has technology advanced rapidly.

Indeed, human wisdom is relatively new in the greater scheme of the Earth’s 4.5 billion-year evolution. Yet, we have a misconception that humans are the dominant species on Earth, with the illusion of control over, and separation between, human life and nature (White, 1948).

The Aboriginals of Earth are cognizant of their place in the history of Earth, their traditional ancestral (Indigenous) wisdom and life pathways, and as such, they live accordingly as caretakers of life and nature, as intergenerational stewards.

Recommendations

Guiding the progression of human culture and consciousness should involve encouraging a sense of connection with nature. This subtle shift might help us see ourselves as part of nature's tapestry. In doing so, a natural feeling of responsibility may emerge, leading us to recognize our roles as thoughtful stewards and caretakers of life and the natural world:

1. **Transform consciousness.** One needs to make the system visible unto itself for the system and its participants to be responsible for co-creating a new system from a shift in consciousness.
2. **To transform any ecosystem, a substantial number of its significant participants need to shift their consciousness.** This shift is essential so that the mindset and culture, which gave birth to the old system, does not shape the new one, thereby facilitating a pivotal transition into the new system.
 - a. Dispel the misconceptions of human supremacy over the complexities of nature and the perceived separateness from it and Earth's systems.
 - b. Support growing a sense of connection with nature.
 - c. Encourage the development of a sense of responsibility for, and stewardship of, life and the natural world.
3. **Learn from the existing caretakers of life and nature.** Learn from Indigenous peoples (Aboriginals), their wisdom, and life pathways.
4. **Recognize humans as nature.** Experiment and embrace a culture in all our thinking, being, and doing that is aligned with the flourishing lifecycle of life and nature.

Further resources

When involving Indigenous participants and communities, please consider the rights of Indigenous Peoples as stated by the Human Rights Office of the United Nations in [Free, Prior, and Informed Consent](#) (UN OHCHR, 2013).

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Issue 2: The lack of understanding of the regenerative and sustainability story and concepts

Background

Humans love stories. Stories uphold social systems, help with finding a common understanding, and support trust. Stories are powerful. Stories often influence human behavior. Potentially, some systems that could actually be destroying the Earth may be upheld by a story that is continually reinforced in society as well as in the media.

If a way can be found to change or refocus the peoples' collective story, the story of humans all around the globe, societies can change the/their/our global collective consciousness, and hence make different decisions—different from the decisions that are grounded in the current collective consciousness.

Joseph Campbell's *The Hero's Journey* revealed the commonalities in the human journey through tracing the commonalities in the myths of cultures throughout the world (Wikipedia, "A Hero's Journey"; Campbell, 1990).

Currently, in parts of the world, that is often called the "West", there is a dominant and globalized understanding of "the economic system," money, and capitalist system in which all people—we—are involved. This can be described as a global story.

And yet, there are other stories in common to many and potentially all cultures with varying twists. The opportunity to change from the current "broken" system is given by these "other stories in common."

Charting the similarities in the human experience with the focus on the common regenerative and sustainability story and concepts can bring about a changed mindset and collective consciousness.

Recommendations

- 1. Create a common story that supports a shift in understanding of peoples' relationships to all life.** Identify, by working collectively, similarities of sustainability issues in varying countries and communities to create this common story. Doing so may also help to shift the collective story from one that prioritizes unlimited growth and exploitation of life to a story that does not recommend growth at all costs and prioritizes a harmonious ecosystem:
 - a. Chart the journey societies are going through with a view to a positive sustainable transformation.** The hero's Journey template/methodology (Wikipedia, "A Hero's Journey"; Campbell, 1990) may be adapted to chart this journey.
 - b. Use "story" to enable new consciousness.** Human brains release pleasure chemicals and engage differently with story than with unconnected information. The use of story to engage humans connects them more holistically to new information. Use stories to enable new consciousness.
- 2. Guide humans to explore, experience, and learn for themselves the connections to nature.** Human beings take ownership in what they create and discover, more than in things handed to them. Setting a pattern to guide humans, at scale, to explore and learn for themselves the connections to nature, through story, and to connect emotionally and intellectually to intergenerational stewardship

concepts will contribute to the shift needed to create a more sustainable world, a long-term healthy planetary biosphere.

3. **Share and socialize this story of regeneration and sustainability with other organizations.** Engage and encourage feedback from others to refine the story and help to change mindsets toward enabling collective and sustainable change.

Further resources

When involving Indigenous participants and communities, please consider the rights of Indigenous Peoples as stated by the Human Rights Office of the United Nations in [Free, Prior, and Informed Consent](#) (UN OHCHR, 2013).

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Issue 3: The materialistic worldview is devoid of a wisdom-centric philosophy

Background

The crisis that has engulfed today's society is the result of the continuous desire of human beings to "move forward" at the expense of the natural ecosystems around them. Hence, we have an urgent need to bring about a radical change in the philosophy underlying this worldview by putting nature before thinking about self. The harmonious integration between human beings and nature is possible when the entire universe is seen as one single family, including the ecosystem comprising myriad flora and fauna, the planetary biosphere.

Recommendations

1. **Provide education about caregiving-oriented economics and sustainability.** Beginning at young ages, provide education at multiple levels and institutions globally that demonstrates how caregiving-oriented economics and sustainability can lead to a shift in consciousness and action and, thus, enable leading to holistic planetary and human health.
2. **Include nature in decision-making processes.** When making a decision that has a bearing on nature, it is imperative to include the latter in the discussions in the initial stages of the decision-making process.
3. **Look at the world from a broader perspective when devising a strategy rather than looking at it through a narrow and hollow "self-centered" lens.**
4. **Consider biodiversity exploration in design and organizing principles for any organization, project, product, or service.**
5. **Consider nature as a stakeholder in any project.** This approach applies to any analysis of the strengths, weaknesses, opportunities, and threats of projects and designs.
6. **Adopt a holistic approach to your work.** Consider impacts to the rest of the natural world and how the rest of the natural world interacts with you in your work.

Further resources

When involving Indigenous participants and communities, please consider the rights of Indigenous Peoples as stated by the Human Rights Office of the United Nations in [Free, Prior, and Informed Consent](#) (UN OHCHR, 2013).

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Issue 4: Duality, (either / or) thinking, a human bias, dominates decision making

Background

A consistent bias exists in decision-making processes in which most problem–solution efforts must be one or the other, simplifying options to traditional human wisdom versus modern (technological) wisdom. Indeed, much of modern technology has as its foundation traditional human wisdom and in varied forms continues to be influenced by it.

Recommendations

1. **Identify how communities can endorse, promote, and embrace duality efforts—efforts to “integrate” human wisdom and technology know-how.** Work via transdisciplinary means with diverse population representation to embrace duality efforts. Cognitive diversity is a primary means to implement sustainable solutions for the greater good where both human and technology wisdom can collaborate in sync and human wisdom itself can be viewed as technology in itself.
2. **Promote active participation/workshops in learning and documenting traditional peaceful behaviors by individuals and societies.** Particular attention should be given to human responsibilities/roles applied by First Nations and Indigenous peoples, especially those that could be scalable to other communities and processes.
3. **Train and implement decision makers in the art and science of consensus building.** Working through disagreements to creative thinking is not intuitive to human cultures. The binary approach of thinking and deciding is both a human and a technological standard. Either/or may not always be superior to a both/and outcome.
4. **Implement history and human wisdom educational and recovery programs.** Knowing what has worked or what hasn't worked in other communities, and/or at different times in history. These programs should help acquire more experience and skills to resolve current and future tasks at hand. This concept applies to hard (technical) skills as well as to soft skills, such as human wisdom.
5. **Develop and engage in outreach educational programs on human wisdom, acknowledgment, and realization of deeper self-knowledge and on the impact of humans' actions on others and the environment.**
6. **Foster intergenerational work to learn across generations and to build intergenerational co-creation and stewardship.** This work should incorporate biodiversity in thinking in those intergenerational conversations, explorations, projects, and mentoring and learning relationships.

Further resources

When involving Indigenous participants and communities, please consider the rights of Indigenous Peoples as stated by the Human Rights Office of the United Nations in [Free, Prior, and Informed Consent](#) (UN OHCHR, 2013).

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Issue 5: Lack of awareness of “I am because we are” — Ubuntu philosophy

Background

Ubuntu is a Nguni word that means “I am because you are” and originates from South Africa. A person’s identity is linked to others, especially to the community. This concept resonates with the sustainability crisis. However, not enough emphasis is placed on just how much this is so. For example, a big corporation that dominates a poorer community may have thwarted through business decisions someone from a vulnerable group who may have been the missing link helping to find a cure for a disease that plagued a community member. This holds true for sustainability in general. The actions of a corporate entity may incidentally cause tremendous pain. Yet these dots are not usually connected. Indeed, for every action there are consequences, intended, unintended, and, potentially unanticipated consequences.

Recommendations

1. **Design a methodology that incorporates Ubuntu for sustainability:**
 - a. Explain through a type of system thinking how those who perpetuate harm can also be severely affected. And move beyond the Western human-centric perspective to illustrate this at the ecosystem level.
 - b. Guide experiential learning at scale in organizations as part of the strategic decision-making process to engage leaders in these new patterns of thought and reinforce, through success stories, examples of when this way of thinking benefits the current situation: organizations, societies, employees, colleagues, customers, clients, stakeholders (including the rest of nature), and the generations of all of those who will follow.

Further resources

When involving Indigenous participants and communities, please consider the rights of Indigenous Peoples as stated by the Human Rights Office of the United Nations in [Free, Prior, and Informed Consent](#) (UN OHCHR, 2013).

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Issue 6: The dominance of the Global North in policy development and in the use of technology

Background

As native communities and First Nations have been the Earth's caretakers for the longest time, their vast knowledge and expertise are crucial for a sustainable future. However, there can be a bias toward "human wisdom" being defined by global or developed nations. The language of many Indigenous or marginalized populations is often not even acknowledged by these bodies, thereby immediately ostracizing them from any efforts toward sustainability and the applicability of their valued experience. For instance, most efforts regarding sustainability do not recognize, nor are aware of, the seminal knowledge First Nations stewards can bring as noted in documents like the [6th Assessment Report of the UN IPCC](#) (IPCC, Climate Change 2021).

Which countries are considered part of the Global North?

The Global North generally includes the United States, Canada, England, nations of the European Union, as well as Singapore, Japan, South Korea, and some countries in the Southern Hemisphere, such as Australia and New Zealand.

Recommendations

1. **Prioritize the inclusion of wisdom from Indigenous peoples globally, from regions outside and inside of the Global North, in all "global" efforts.** That includes the teaching of philosophy, ethics, and economics, and including these areas in any "global" institution.
2. **Start every human gathering with the ancient human tradition of land acknowledgment.** When conducting any meeting on known traditional Indigenous territories, the simple act of recognizing those traditional territories and peoples names demonstrates respect and connection to the thousands of years of human connection in that place and invokes ancient human wisdom of connection to place and the Earth.
3. **A conscious effort should be made to include the active participation of first nations and Indigenous communities when defining "human wisdom" guidance/manuals/concepts.**
4. **Promote active participation/workshops in learning and documenting traditional peaceful behaviors by individuals and societies.** Pay particular attention to human responsibilities/roles applied by First Nations and Indigenous peoples, especially those that could be scalable to other communities and processes.
5. **Implement history and human wisdom educational and recovery programs.** Knowing what has worked or what hasn't worked in other communities, and/or during different times in history. These programs should help us acquire more experience and skills to resolve our current and future tasks. This concept applies to hard (technical) skills as well as to soft skills, such as human wisdom.

6. **Develop and deliver outreach educational programs on human wisdom, acknowledgment, and realization of deeper self-knowledge and on the impact of humans' actions on others and the environment.**

Further resources

When involving Indigenous participants and communities, please consider the rights of Indigenous Peoples as stated by the Human Rights Office of the United Nations in [Free, Prior, and Informed Consent](#) (UN OHCHR, 2013).

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Issue 7: Unsustainable resource extraction and economic growth considerations prevail in global policy, technology design, and deployment

Background

“Resource extraction has more than tripled since 1970, including a fivefold increase in the use of non-metallic minerals and a 45 percent increase in fossil fuel use. By 2060, global material use could double to 190 billion tons (from 92 billion), while greenhouse gas emissions could increase by 43 percent. The extraction and processing of materials, fuels, and food contribute half of total global greenhouse gas emissions and over 90 percent of biodiversity loss and water stress” (UNEP, 2019).

Urgent transition is needed in multiple technical fields, including in energy production; the design and installation of the built environment; the manufacturing of goods and materials for human consumption, particularly new transportation, communication, and technology devices; metrics and global methodologies; as well as in many other fields, to shift from a mindset and practice of extraction toward giving back more than what human society takes; that is, to promote circularity and intergenerational stewardship thinking.

These technical recommendations will have minimal effect, however, if a conscious human behavior change does not occur, and such a change must occur from within each individual and collectivity (social group). Having a deep auto-evaluation of our acts, the consequences on the environment and other generations, as well as of our own tolerance for the uncertainties, is our path to wisdom, and so it will be required for the survivability of our human species.

The time to act is now (or more appropriately 30 to 50 years ago). Nature will continue its evolution process with or without humans. Humans must extend positive impact and tenure in this land.

William McDonough and Michael Braungart, in their seminal work *Cradle to Cradle* (McDonough & Braungart, 2002), lay out principles for circular design and production. They strongly encourage the global community of designers and builders of all things that consume materials to consider circularity and their proposed principles for circular design and production.

Recommendations

1. **Apply intergenerational stewardship and circular economy design principles to all things that humans design, build, and manufacture, realizing a “built-in” cradle-to-cradle and regenerative approach.**
2. **Engage in and support the shift from a mindset and practice of extraction toward *giving back more than what we take* as well as toward circularity and intergenerational stewardship thinking.** That includes rethinking current metrics and methodologies, as well as technical fields.
3. **Implement land/natural resources recovery programs hopefully in underserved communities and natural biodiversity-protected areas.**

4. **Consider, promote, and prioritize rural, simple applications with scalable potential over more technologically “advanced” options** (that may take longer time to be implemented).
5. **To scale their adoption, support and enable intergroup exploration of the following concepts:**
 - a. Intergenerational stewardship
 - b. Regenerative approach
 - c. Circular economy
 - d. Regenerative approach
 - e. Cradle-to-cradle approach
 - f. Biodiversity protection
 - g. Land/natural resources recovery
 - h. Rural/simple applications and solutions before technological “advanced” options
6. **Develop and deliver outreach educational programs on human wisdom, acknowledgment, and realization of deeper self-knowledge and on the impact of humans’ actions on others and the environment.**

Further resources

When involving Indigenous participants and communities, please consider the rights of Indigenous Peoples as stated by the Human Rights Office of the United Nations in [Free, Prior, and Informed Consent](#) (UN OHCHR, 2013).

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Issue 8: Lack of inclusion of arts, creativity, and culture in proposed solutions to achieve long-term sustainability

Background

Human/social wisdom should extend beyond "technical" solutions to include the arts, culture, and social pillars, going beyond science, technology, engineering, and mathematics (STEM). Unfortunately, on top of limited exposure and promotion, arts, culture, and other soft skills, like languages and natural sustainable vision, are complex concepts and practices with contested definitions and multiple histories across different geographical regions (see [SHAPE-ID](#)). Therefore, a considerable effort should be made to recognize these disciplines and their potential value add when trying to solve local community and global issues, such as those intended by the IEEE Planet Positive 2030 (PP 2030) Initiative.

Recommendations

As art, culture, languages, and other soft skills could improve pathways to proper implementation of STEM projects/applications in diverse communities worldwide, the following recommendations should be considered:

1. **Promote the inclusion of arts, humanities, and culture in general as equal partners and co-creators in the development of goals and solutions.**
2. **Identify, document, and promote existing STEM + arts and culture (STeAM) programs and/or applications.**
3. **Learn from past sustainable innovations that would not exist without being led by and involving the arts, humanities, and culture.**
4. **Foster education and communications programs for intergenerational stewardship that include STeAM to illuminate, expand thinking, excite the imagination, engage hearts, and make visual and emotional connections between the art and science needed for the necessary regenerative and at-scale solutions to achieve a sustainable future.**

Further resources

When involving Indigenous participants and communities, please consider the rights of Indigenous Peoples as stated by the Human Rights Office of the United Nations in [Free, Prior, and Informed Consent](#) (UN OHCHR, 2013).

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Issue 9: The need to expand knowledge while respecting and highlighting the added value of other cultures and their wisdom

Background

Imitating/copying others is a powerful way to honor people, culture, skills, and overall wisdom. This practice also establishes a close and harmonious relationship in which people or communities are in “sync” with each other, and even with the environment, provided the proper guidance is given or copied.

Unfortunately, this is not always an altruistic goal, and in many cases, conflict can erupt when parties appropriate or don't respect each other's cultural roots and differences. Therefore, an effort needs to be made to avoid conflict and simply focus on the added value that others can have in processes and thoughts. After all, we are all humans, and as such, we are just one. There are no “others” and “us”; there is just “all of us.”

Recommendations

The key premise should be including/emulating/copying the added value of other cultures and their wisdom in peace while respecting others and avoiding conflict, all with the goal of looking toward humanity's future direction and survival.

1. **Promote well-rounded skills, techniques, and social interactions based on peace and ecological harmony.** The intent should be to promote local (soft) skills with a regional, well-founded, and proven basis that could have global scalable potential.
2. **Encourage consensus/agreement-building skills and techniques.** The foundational skills of achieving agreement consist of the use of “appreciative inquiry” techniques. Improving the use of open-ended questions, active listening, restatement for clarification, seeking commonality, and building creative solutions are the primary tools used to “manage the conflict” of disagreement.
3. **Implement history and human wisdom educational and recovery programs.** They are knowing what has worked or what hasn't worked in other communities, and/or at different times in history. These programs should help individuals, teams and communities of any kind acquire more experience and skills to resolve current and future tasks. In other words, having more “tools” in the “tool bag” will make carrying out the work easier. This concept applies to hard (technical) skills as well as to soft skills, such as human wisdom.
4. **Develop and deliver outreach educational programs on human wisdom, acknowledgment, and realization of deeper self-knowledge, and on the impact of humans' actions on others and the environment.**
5. **Create avenues for keepers of Indigenous wisdom to be leaders and owners of processes and their outcomes in ways that allow for nonexploitative communal benefit.**

Further resources

When involving Indigenous participants and communities, please consider the rights of Indigenous Peoples as stated by the Human Rights Office of the United Nations in [Free, Prior, and Informed Consent](#) (UN OHCHR, 2013).

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Issue 10: Purpose over productivity needs to be a priority for positive environmental impact

Background

Individuals and societies with deeper ethical or moral values and self-conscious discipline of serving others while supporting sustainable growth have the proven ability to maintain healthy social communities in harmony with others and with less damaging effects on the environment. Recent ideas in net-positive thinking have been published by Paul Polman and Andrew Winston in their book *Net Positive* (Polman & Winston, 2021). They encourage leaders to embark on a journey of long-term thinking that focuses attention on the whole system being impacted by decisions being made. They challenge leaders to work in ecosystems of purpose to regenerate and give back to the ecosystems that have sustained life on this planet. They map a way forward for all of us humans to engage in the world around us, applying patterns of decision, and taking that to mean “give back more than you take from the world around you.”

Intergenerational stewardship for the children in the current generation and for the seven generations to come must be considered key stakeholders.

Recommendations

1. **A conscious effort should be made to identify and promote role models in lieu of the “greater good,” focusing on higher standards of peaceful living, collaboration, and respect of each other’s point of view.** Current diversity and inclusion initiatives can gain guidance from native and First Nations wisdom, based primarily on cultures of peace and ecological harmony. These efforts can be coupled with a focus on the science of positive psychology that has proven practices of meditation, kindness, and “flow” (living to your purpose).
2. **A net-positive context should be applied to every organization, designing and taking action for the long-term, holistic well-being of all parts of the systems impacted by the human-managed organizations of our world.** Intergenerational stewardship for the children in the current generation and for the seven generations to come must be considered key stakeholders in this work.
3. **Promote active participation/workshops in learning and documenting traditional peaceful behaviors by individuals and societies.** Pay particular attention to human responsibilities/roles applied by First Nations and Indigenous peoples, especially those that could be scalable to other communities and processes.
4. **Implement history and human wisdom educational and recovery programs.** Knowing what has worked or what hasn’t worked in other communities, and/or at different times in history. These programs should help us acquire more experience and skills to resolve our current and future tasks at hand. This concept applies to hard (technical) skills, as well as to soft skills, such as human wisdom.
5. **Develop and deliver outreach educational programs on human wisdom, acknowledgment and realization of deeper self-knowledge, and the impact of humans’ actions on others and the environment.**

6. Enlist communities of the willing across public–private partnerships to spread human wisdom through models like those described in *Net Positive*, ideas that call us all to design with heart, with purpose, with the long term of future generations of all life on Earth, exhorting us to unleash human energy for an inclusive and sustainable future.

Further Resources

When involving Indigenous participants and communities, please consider the rights of Indigenous Peoples as stated by the Human Rights Office of the United Nations in [Free, Prior, and Informed Consent](#) (UN OHCHR, 2013).

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Issue 11: Lack of commons—shared resources and an asset-based approach are needed for a community-based development approach

Background

Asset-based community development (ABCD) (see DePaul University, ABCD), or asset-based community-driven development, is a bottom-up, community-driven way of working that focuses on community strengths and assets rather than on lack of resources and problems.

Assets are seen as more than just money but also as micro in scale. If someone needs a lift and another person needs help with their taxes, they can exchange and barter for a more sustainable outcome for all. These interactions forward a mindset of sustainability with better well-being for all and potentially the environment. ABCD is rooted in an asset mindset and not in a deficit mindset (not in relation to financiers) that everyone lives on this planet with an abundance of assets (not financial) that can support and help others.

Furthermore, the Nobel Prize Winner Elinor Ostrom found that collective action can be effective when using a common-pool resource (CPR) (see Nordman, 2021). This open-access resource environment or domain may benefit all for the social well-being of a particular community.

Recommendations

1. Use ABCD to identify existing resources and strengths versus only what is lacking.
2. Use the methodology of asset-based community development for changing mindsets on what are assets and for supporting and developing community and encouraging bartering and exchange of goods and services.
3. Look at experimenting with a local commons approach within community-driven initiatives.

Further Resources

When involving Indigenous participants and communities, please consider the rights of Indigenous Peoples as stated by the Human Rights Office of the United Nations in [Free, Prior, and Informed Consent](#) (UN OHCHR, 2013).

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Issue 12: Omission to invite existing caretakers of the planet hinders ecosystem regeneration, restoration, and maintenance efforts, as well as intergenerational stewardship thinking and design

Background

One of the main purposes of humans is to be caretakers of our planet, not just the appropriators or exploiters of natural resources for what is usually seen as a financial short-term gain. The sooner humans realize this purpose, of caretakers of the land/nature, the sooner we can work on the solutions and changes needed for our survival.

Currently, 80% of the natural resources and biodiversity are under the care of 5% of the people, most of them First Nations and Indigenous peoples (Raygorodetsky, 2018). And even though these communities have the expertise, and centuries' worth of skills, modern industries, political divisions, and many other elements keep these communities marginalized, underestimated, and in many cases even under the constant pressure of colonization and cultural alienation.

Recommendations

1. **Use expert ecosystem regeneration, restoration, and maintenance efforts.**
2. **Include intergenerational stewardship thinking and design in all things.**
3. **Consciously listen to and emulate the role of Earth caretakers, including the provision of proper scenarios for the First Nations and Indigenous peoples to play their valuable role in global sustainability.**
4. **Promote active participation/workshops in learning and documenting traditional farming methodologies, cultural/social behaviors, and human responsibilities/roles by First Nations and Indigenous peoples, especially those that could be scalable to other communities and processes.**
5. **Implement history and human wisdom educational and recovery programs.** Knowing what has worked or what hasn't worked in other communities, and/or at different times in history. These programs should help us acquire more experience and skills to resolve our current and future tasks. This concept applies to hard (technical) skills as well as to soft skills, such as human wisdom.
6. **Develop and deliver outreach educational programs on human wisdom, acknowledgment, and realization of deeper self-knowledge, and on the impact of humans' actions on others and the environment.**
7. **Foster intergroup learning and co-creation opportunities with leaders at all community levels.** Include leaders from local school board to city, province, state, region, and national agencies and leaders who are able to learn from and incorporate thinking and patterns of being from Indigenous communities and other communities that foster holistic thinking practices.

Further resources

When involving Indigenous participants and communities, please consider the rights of Indigenous Peoples as stated by the Human Rights Office of the United Nations in [Free, Prior, and Informed Consent](#) (UN OHCHR, 2013).

1. McDonough, William. *Net-Positive: Waging Peace Through Commerce by Design*. McDonough Innovation, 2022.
2. McDonough, William, and Michael Braungart. *Cradle to Cradle: Remaking the Way We Make Things*. New York: North Point Press, 2002.
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Issue 13: The lack of a stage for new leaders from vulnerable/marginalized communities hinders the development of sustainable solutions

Background

The leadership teams addressing the global challenges of achieving long-term sustainability and preserving biodiversity lack significant participation by Indigenous peoples and marginalized communities and, hence, do not have access to the vast experiences of these communities.

In some cases, vulnerable/marginalized communities have faced basic needs, such as the needs for clean water, food, education, clothing, communications, and more. These communities may suffer from natural disasters like earthquakes, volcano eruptions, and storms, with potentially fewer resources and less advanced notice than other, technologically more developed societies. These challenging conditions can often require creative, simple (from the manufacturing and sourcing point of view), and timely solutions recognizing the potential lack of resources and the urgency to resolve the tasks promptly.

Recommendations

1. **Involve community group representatives from vulnerable/marginalized groups in the creation of sustainable solutions as leaders and owners in the process. Invite them to share their experience in achieving “the most with the least.”**
2. **Document scalable projects/solutions and foster such projects in other communities.**
3. **Promote active participation/workshops in learning and documenting traditional farming methodologies, cultural/social behaviors, and human responsibilities/roles by First Nations and Indigenous peoples, especially those that could be scalable to other communities and processes.**
4. **Foster and act on *inclusion by design* in industry and government “design shops” and working sessions where decisions are being made and biodiversity, human wisdom, culture, and intergenerational stewardship is an imperative.**

Further resources

When involving Indigenous participants and communities, please consider the rights of Indigenous Peoples as stated by the Human Rights Office of the United Nations in [Free, Prior, and Informed Consent](#) (UN OHCHR, 2013).

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Issue 14: Disregard of past / traditional sustainable technologies can hinder environmental stewardship

Background

A bias exists toward “modern” or “emerging” technology as the key driver to ecological sustainability when, in fact, various traditional practices could potentially produce as much nourished land, water, or air regeneration as any modern technology.

The deployment and application of current industrial and emerging technologies can positively and negatively impact the environment. For example, while technologies can be used to monitor water levels or air quality in a disaster zone and improve city mobility by using optimization and sensors, the manufacturing processes involved in their components, testing, shipping, and so on, and the energy needed to power these sensors and systems, can also greatly impact the environment in a negative way. Hence, the use of modern and emerging technologies should be considered carefully before being applied to mitigate environmental issues. There is no guarantee they will work as expected or surpass well-established natural approaches.

In addition, any potential benefits can be diminished when the environmental impacts associated with producing, shipping, operating, and end-of-use handling of these industrial and emerging technologies are taken into account. This trade-off about the use of industrial and emerging technologies and their impact on the environment should be analyzed to determine whether the pros are higher than the cons.

Yet, as far as the Earth’s millions of years of evolution go, there is no better “machine” to clean air, produce oxygen, reduce global warming, and provide soil/land management than a healthy forest and/or natural reservoirs, including the ocean. In the forests, lands, and the ocean, there are no battery storage, solar panels, or wastewater treatment plants, except what nature engineered or created.

Lasting change will only be possible through the collective actions of many in the industrial, commercial, and legislative fields, so support from multiple stakeholders will be needed where recognition and utilization of traditional practices can be considered in partnership with modern and emerging technologies. Therefore, supply chains will need to be evaluated to identify potential opportunities to involve traditional farming methods, sustainable processes, and systematic change. Transparency and accountability while avoiding a bias toward new or emerging technology in isolation will allow for more pragmatically innovative solutions to be used for a positive effect.

Recommendations

1. **Evaluate innovation in manufacturing, agriculture, built environments, and energy and water production and management, as well as in other product production technologies.** Evaluation needs to be based on traditional and Indigenous sustainable applications to identify how these processes performed and improved through centuries of evolution.
2. **Replace existing approaches with state-of-the-art technology only if the rate of gains and losses is positive and greater than 10%.** Losses must consider energy cost and carbon footprint to create the technology, technology maturity, and so on.
3. **Consider evaluation of applications in light of equity for all people in a community, region, or country, including where the rights of the Indigenous or marginalized residents and planetary**

ecosystems are prioritized above exponential growth. Having these insights should help identify the applicability of sustainable technologies. Traditional practices related to land, water, and air regeneration are often ignored in lieu of favoring modern or emerging technology concepts in current times.

4. **Identify, document, and promote traditional methodologies, that is, experiences from Indigenous communities in various regions of the world.**
5. **Innovate further to meet the challenges of improving transparency and traceability.** Blockchain and vessel monitoring can help, but adoption takes time and further innovation is necessary.
6. **Encourage local/regional sustainable produce and supplies.** This will increase resiliency: for example in the case of pandemics, weather-related events, and political/social unrest which can create supply/demand volatility and interrupt supply chains.
7. **Consider biomimicry and ancient and nature-based solutions in design processes for all things—products, structures, and services.**
8. **Consider circularity and intergenerational stewardship concepts in the process, product, technology, and organizational model, targeting operating model and culture designs.**

Further resources

When involving Indigenous participants and communities, please consider the rights of Indigenous Peoples as stated by the Human Rights Office of the United Nations in [Free, Prior, and Informed Consent](#) (UN OHCHR, 2013).

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Issue 15: Lack of transparent tracking of human rights, the need for ethics-based trackable measurability, monitoring, and accountability

Background

Many multinational corporations/companies (MNCs) and NGOs/governmental organizations (GOs) every year put tremendous amounts of effort and investments in trying to address global or regional issues through impact-driven initiatives, especially in rural and underdeveloped areas. However, due to a lack of evidence-based measurability and accountability information that can be readily shared with all stakeholders, the public may only glimpse what's taken place in an organization's deeply embedded annual corporate social responsibility (CSR) reports or from anecdotal stories on social media.

After being “discovered”, human wisdom and the best sustainable practices are not adequately shared to inspire more efficient resource use and inclusive involvement. As vast amounts of empirical data and inputs are available from both the past and ongoing sustainable development goals (SDGs) and environmental, social, and corporate governance (ESG) efforts, technologies such as artificial intelligence (AI) and blockchain may be able to help unleash aspired and inspired ideas and actions. Specifically, blockchain technologies such as distributed autonomous organizations (DAOs), nonfungible tokens (NFTs), and “smart contracts” can radically reduce the supply chain waste, delay, and obscurity of transactions by democratizing decision-making.

Recommendations

1. **Incorporate Ubuntu philosophy to map connectivity and show links between actions and impacts.** Creating a framework unifying Internet of Things (IoT), AI, and blockchain technology across all countries/regions would help put an end to issues of data availability. Creating a framework unifying IoT, AI, and blockchain technology across all countries/regions would help put an end to issues of data availability. Accountability and evidence-based decisions require metrics, measurement (data) and analysis; they are part of monitoring the impact of actions to progress toward a more sustainable planet Earth.
2. **Work with leading AI experts and representative stakeholders to develop an AI+Blockchain consensus-based platform (such as DAOs, NFTs, and “smart contracts”) to better discover, assimilate, and share human wisdom and sustainable development and deployment practices worldwide.**
3. **Promote and educate NGOs/GOs and MNCs to use this AI data-driven platform to guide and monitor their SDG/ESG efforts and impacts.**
4. **Use this open platform to track and monitor issues associated with the IEEE Planet Positive 2030 Initiative and the SDG implementations.**
5. **Use this platform to give Indigenous or marginalized communities a better chance of letting their voices be heard and getting the best help from other stakeholders.**

6. **Promote the use of home/household/building/office/shop sensors able to detect the presence of individuals, and turn off unnecessary energy usage, so energy is not wasted.**
7. **Consider people-centered Internet design principles (see People-Centered Internet website) for internet, technology, data, process, organization, security, privacy, and network design.**

Further resources

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1. Lane, Anne, and Bree Devin. "[Operationalizing Stakeholder Engagement in CSR: A Process Approach.](#)" *Corporate Social Responsibility and Environmental Management* 25, no. 3 (2017): 267–280.
 2. Nasdaq. "[ESG Reporting Software & ESG Data Tools.](#)" Nasdaq CSR ESG Reporting.
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 4. Project Drawdown. "[Table of Solutions.](#)"
-

Issue 16: Confusion regarding nature versus technology OR nature plus technology

Background

In many societies, one generation tries to make “life better” for the next generation.

In Western societies, especially, this motivation has led to innovation often being the purpose of human life, with the main goal to make lives more comfortable. Wherever humans step, some may want the place to turn into a technological oasis, launching into things unknown and unseen before and thus moving further and further away from nature.

People frequently do not take notice of the sights around them—the beauty of nature, emerging pandemics—until those sights explode and change lives drastically. As humans, we are too busy to look because we spend our time warping reality to our standards. As a result, we play a dirty trick on ourselves.

Humanity has achieved great things, for example: the human genome has been decoded; the development of AI started in the mid 1900’s; artificial fertilizer helps feed people around the globe for about 100 year; hand hygiene, clean water and sanitation services are a major achievement for a healthier populations; electricity generation from wind and sun.

There is something more—for millennia, our ancestors explored the intricacies of science, trying to explain the world around them. They followed a path from simple mechanisms to developing devices that can measure light years in the universe. And, in the late 1800s/early 1900s, they discovered the duality of light—wave and particle (photon) properties, leading to the exploration of the world beyond atoms: the quantum world.

With quantum physics, humanity took a huge step forward in the era of electronics and modern technologies: It brought solar energy, computers, and quantum chemistry.

any of these fundamental discoveries happened “by chance”; others were discovered through careful questioning, experimentation, testing, observation, and analysis. Scientists and engineers found quantum effects in natural processes: genome crossover, photosynthesis, thermonuclear fusion in the sun (Editors of Encyclopedia Britannica, “Thermonuclear Reaction”), and plausibly, a quantum nature of our consciousness.

Therefore, if a newly discovered or developed technology is already incorporated in nature - possibly in every living cell—then such technologies are nothing but mere copies and modifications of what is already present in nature (biomimicry).

Recommendations

1. **In scientific research and the development of technologies, learn to “collaborate” with nature and learn from nature.** Practically, all the discoveries so far may be a tiny drop in the ocean of nature’s “secrets” that are yet to be discovered.
2. **Bring changes to educational systems, which will inspire students and pupils to view monumental discoveries on the edge of life sciences and STEM subjects** (e.g., explain biological effects using physics and math and elaborate modern views upon ecology).

3. **Introduce regular open-air classes for school and kindergarten students.**
4. **Engage intergenerational and interdisciplinary groups in watershed, beach, water body, ocean, and biodiversity restoration, regeneration, and stewardship.** Leverage models like Students and Teachers Restore a Watershed (STRAW) to school children, teachers, parents, and business leaders to converge on plots of land that need restoration and work on them together. Leverage this and other examples at scale across communities and geographies (Point Blue Conservation Science, “STRAW Program”).
5. **Simplify scientific language in textbooks to make them more colorful, so that children can really fall in love with discovering.**
6. **Raise the level of STEM and ecology education in developing countries.**
7. **Give more opportunities to people from Indigenous communities to cooperate in “adjacent to nature” scientific areas, thus, introducing new perspectives to scientific investigations.**

Further resources

When involving Indigenous participants and communities, please consider the rights of Indigenous Peoples as stated by the Human Rights Office of the United Nations in [Free, Prior, and Informed Consent](#) (UN OHCHR, 2013).

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3. Lanese, Nicoletta. “[Why Does DNA Spontaneously Mutate? Quantum Physics Might Explain.](#)” LiveScience.com, 17 Mar. 2021.
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3. Editors of Encyclopedia Britannica. "Thermonuclear Reaction."
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