



ASSESSING NATURE'S CONTRIBUTIONS TO PEOPLE

Hyeonju Ryu^{1*}, Luca Coscieme², Nils Droste³, Sonali Ghosh⁴, Lovisa Nilsson⁵, Sakshi Rana⁶ and Uttam Babu Shrestha⁷

¹EU FLEGT Independent Market Monitoring, Seoul, South Korea

²School of Natural Sciences, Trinity College Dublin, Dublin, Ireland

³Department of Political Science, Lund University, Lund, Sweden

⁴UNESCO C2C on World Natural Heritage Management and Training for Asia and the Pacific Region, Wildlife Institute of India, Dehradun, India

⁵Center for Environmental and Climate Research, Lund University, Lund, Sweden

⁶Wildlife Institute of India, Dehradun, India

⁷Global Institute for Interdisciplinary Studies, Kathmandu, Nepal

YOUNG REVIEWER:



ANNA-MARIE

AGE: 15

Do the misty mountains, fast-flowing rivers, and sandy beaches leave you in awe and fill you with insatiable wonder? Does nature bring you a jubilant feeling? Nature contributes to our quality of life in multiple ways. Some of these gifts are easily visible, like the clothes you wear, the food you eat, and the water you drink. However, some contributions, such as flood protection and pollination of food crops are hardly ever seen. Scientists warn that we are now losing many of these gifts from nature, and this is why in this article we want to talk about it. In fact, one of the things we need to conserve nature is to understand why and how it is important for our lives. In this article, we introduce you to nature's contributions to people and why it is important to assess them.

QUALITY OF LIFE

The general well-being of a person or society, defined in terms of health and happiness, rather than wealth.

CONCEPTUAL FRAMEWORK

A group of concepts that are broadly defined and systematically organized to provide a focus, a rationale, and a tool for the integration and interpretation of information.

NATURE IS EVERYWHERE

Imagine being in nature. What scenes come to your mind? Walking into a forest, or lying on a sunny beach? We are surrounded by nature of some sort all the time. Look around and try to find a couple of things that came from nature. Your desk may be made of wood that once was a tree. Clothes, food, air, medicines, and electricity also come from nature. A novel you are reading might be inspired by nature. All of these things lead to a good **quality of life**, keeping us healthy and happy. There are numerous ways in which nature enriches our quality of life.

WHAT NATURE PROVIDES US WITH

Identifying how nature affects our life is sometimes straightforward. Other times contributions from nature might not be apparent at first glance. Not recognizing the hidden inputs of nature can threaten the survival of humanity. For instance, if we overlook the fact that a forest purifies water and prevents floods, we might clear the forest to build a luxury hotel and suffer from polluted water and floods. Assessing nature's contributions to people helps us understand what benefits it provides us, which may guide us to make appropriate decisions and to take sufficiently good care of nature and our lives.

THINGS TO CONSIDER ABOUT NATURE'S GIFTS

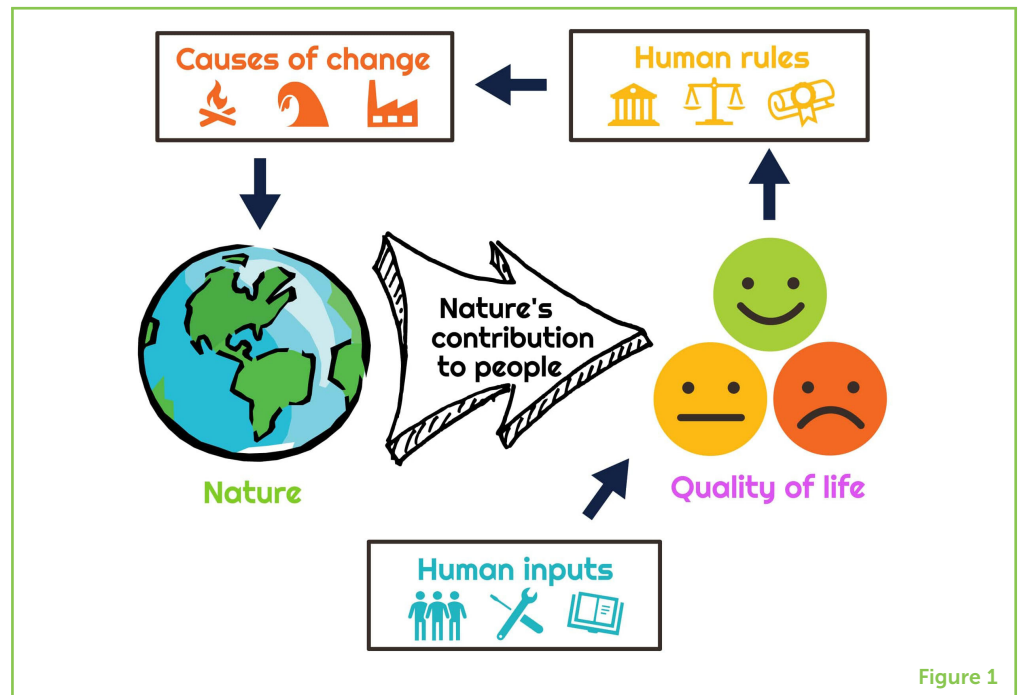
To take good care of nature globally, experts across the world have developed an idea about how to assess what nature gives us, called the **Conceptual Framework** of "Nature's Contribution to People" (Figure 1). The Conceptual Framework depicts the complex connections between humans and nature. In the framework, there are five important elements: *nature*, *causes of change*, *human rules*, *human input*, and *quality of life* (Figure 1).

"*Nature*" means all of the natural world and the diversity of beings within it. Nature is the source of many things we need for a good quality of life, which are provided through its functions and processes.

Nature changes due to various causes. The causes that directly change the state of nature can be called "*causes of change*." Sometimes nature changes by itself. For example, earthquakes change the shape of lands, floods affect rivers, and lightning causes forest fires. On the other hand, humans can also change nature. Humans for example clear forests to use the land for agriculture or pollute the air with factories. This affects both wildlife and causes climate change. When

Figure 1

The Conceptual Framework of nature's contribution to people by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). This is a simplified version of the original framework [1].



the state of nature changes, its contributions to people can change as a consequence.

However, we humans also indirectly affect nature by how we organize and govern ourselves. We can call such things “*human rules*.” These include the laws, policies, and institutions that we have designed to organize society. For example, to prevent rhinos from becoming extinct there are laws that forbid hunting them. What we allow and do not allow ourselves to do, affects how we use resources, how we alter nature, and also how nature contributes to humans.

Often humans use their knowledge and technology to better deliver nature’s gifts to them. We can call this “*human input*.” Human input includes the infrastructure we have built (such as dams to control floods or generate electricity), knowledge on how to use medicinal plants, technology, such as laboratories, and of course human labor like, for example, the farmer working their field. Human input plays an important role in the process of nature’s contributions to people. For example, humans collect materials like wood and metals from nature and make them into a sturdy desk using their labor, knowledge, and technology. Therefore, most of nature’s gifts are co-produced by nature and humans.

It is also important to understand “quality of life” also called human well-being. Quality of life or well-being is what makes us as humans feel good, such as being well-fed, happy, and fulfilled. It can be considered a combination of all these factors, *nature*, *causes of change*, *human rules*, and *human input*.

Figure 2

Assessing nature's contributions to people. An assessment identifies various types of contributions including material, non-material, and regulating contributions.

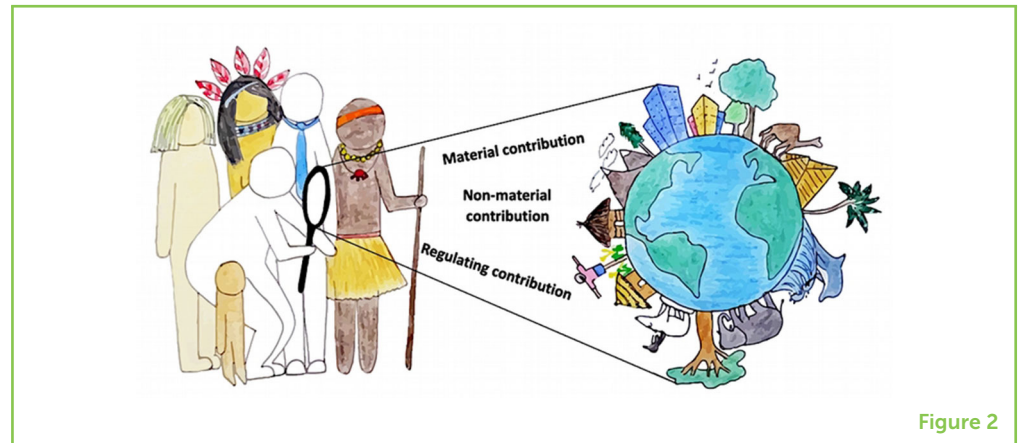


Figure 2

ANALYZING WHAT HUMANITY GETS FROM NATURE

Culture is one important thing to consider. We have different perceptions about good quality of life, nature, and the relationship between humans and nature, depending on our nationality, worldviews, and beliefs. For example, in India the elephant is worshiped as Lord Ganesh, the Hindu god that brings goodwill for humankind. The importance of elephants to Indians is different to their value in different parts of the world. For Indians, elephants are perceived to contribute to thriving and good fortune, beyond **biodiversity's** protection.

BIODIVERSITY

The variety of living organisms, including the diversity within and between genes, species, and ecosystems.

EXAMPLES OF NATURE'S GIFTS

Nature's contributions to our quality of life are diverse. Some of these we can touch and use, such as food, wood, and water. These tangible contributions are called "material contributions." Others are intangible, such as the enjoyment when looking at a lake from the top of a mountain: they are called "non-material contributions." Nature also contributes to our quality of life by regulating the climate on our planet and by circulating nutrients from leaves to soils as a natural fertilizer: these are called "regulating contributions." We will now look into some examples of material, non-material, and regulating contributions of nature (Figure 2).

Material Contributions—Food

Food is primarily a *material contribution* because we can touch it and it can substantially fill our bellies. Food can be jointly produced by humans and nature. Farmers and their machines work hard to till the ground, plant seeds, care for the crop, and harvest food. Then they sell their products on the market where we can buy them. Nature also does its part in food production by enabling the growth of crops. Soil and its fertility are, for example, important for growing crops. The sun, the water, the air, the work of the farmer, their machines and tools, and the many small soil organisms living below ground, together produce the food we eat (Figure 3A). If we do not take care of the soil, we can

Figure 3

Different contributions of nature to people. **(A)** Rice production (material contribution); **(B)** camping in a forest (non-material contribution); **(C)** invention of hook-and-loop fasteners inspired by burdock seeds (non-material contribution); **(D)** pollination by bees (regulating contribution). Photo credits: **(B)** Free Stock Photo courtesy of pixnio.com. **(C)** Trazyanderson [CC BY-SA 4.0 (<https://creativecommons.org/licenses/by-sa/4.0/>)] from Wikimedia Commons. **(D)** Free Stock Photo courtesy of pixnio.com.



Figure 3

degrade and damage its ability to produce vegetables and fodder. It is therefore important to understand how nature, for example the soil, and humans co-produce food. By assessing and understanding these co-contributions properly, we can better manage human input and labor such that we take good care of the life below ground.

Non-material Contributions—Health and Learning

Nature offers non-material contributions, such as happiness, health, experiences, supporting our identities, inspiration, and learning. Research shows that being close to vegetation, such as trees, shrubs, and grasses improve our mental health by reducing stress, anxiety, and depression [2] (Figure 3B). Nature is also a source of learning. It provides a variety of new things, such as plants and animals in various shapes and colors, and different experiences like lightning, snowfall, and birdsong. Several discoveries and technologies have been possible because of the careful observation of nature. For example, the invention of hook-and-loop fasteners (Figure 3C)—you can find them in your shoes, jackets, and many other things—was inspired by burdock seeds. Burdock seeds can cling to clothes and hair pretty firmly using hundreds of tiny hooks [3]. The way the hooks are caught to loops of hair enabled the development of hook-and-loop fasteners. These non-material gifts are fundamental for human well-being. A loss of biodiversity means a loss in new inspirations that bring happiness and learning opportunities. But little attention is paid to nature's non-material contributions because they are not easily recognized. Assessments can help recognize such invisible gifts from nature.

POLLINATION

The transfer of pollen from a male part of a plant to a female part of a plant.

Regulating Contributions—Pollination

As mentioned above, many natural processes are involved in the making of food. One such process happens when animals, like bees and bats, collect nectar and pollen from flowers. When the animals move from flower to flower to collect their food, they carry pollen grains between the plants and thus help them reproduce and produce fruit, vegetables, or seeds. This process of transporting pollens between flowers is called **pollination** (see Figure 3D). More than three-quarters of leading global crop types depend on animals for pollination [4].

Without pollination by animals we would be in trouble. Today many pollinators in the world are threatened and some have already gone extinct because of changes we have made to nature. In order to use big machines on farms, we have drained wetlands and taken away small remnants of wildlands that were once home to pollinators. Moreover, we use pesticides to get rid of pests. These pesticides, however, can hurt pollinators. While all the advancements in farming have enabled us to feed more people, it has harmed nature and caused a loss in pollinators. Assessing regulating contributions, such as pollination can help us find solutions to produce food without harming the soil or pollinators.

CONCLUSION

Nature affects our well-being in many ways. Scientists and decision makers attempt to better understand nature's contributions to people and how human activities affect nature's gifts. This helps us understand how humans affect the natural world and how much we depend on it. Still, a lot of nature's gifts remain mysterious and hidden, which obstructs good decision-making for a better future. If we continue doing what we are currently doing to nature, we might permanently lose the gifts nature provides. Therefore, it is essential to assess nature's contributions to our quality of life by taking good care of nature, including ourselves.

ACKNOWLEDGMENTS

The authors would like to express their special thanks to the Delegation of Young Ecosystem Services Specialists to the 6th IPBES Plenary—Andrew Kadykalo, Giovanni Avila-Flores, Albaluz Ramos Franco, Catalina Gutiérrez Chacón, Marcia Carolina Muñoz, María Dolores López Rodríguez, and Paloma Vejarano Alvarez for bringing their ideas forward in initiating this project to communicate Nature's Contributions to People to children. The authors would also like to thank Hien Ngo for her insightful review on the manuscript.

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SUBMITTED: 27 September 2019; **ACCEPTED:** 02 July 2020;

PUBLISHED ONLINE: 12 August 2020.

EDITED BY: Didone Frigerio, University of Vienna, Austria

CITATION: Ryu H, Coscieme L, Droste N, Ghosh S, Nilsson L, Rana S and Shrestha UB (2020) Assessing Nature's Contributions to People. *Front. Young Minds* 8:98. doi: 10.3389/frym.2020.00098

CONFLICT OF INTEREST: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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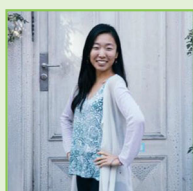
My favorite subject is biology, I like bionics. In future I would like to work on new materials, new substances. I am curious about the mysteries of the universe, there is so much to discover.



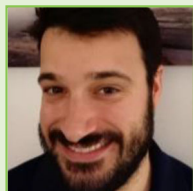
AUTHORS

HYEONJU RYU

Hyeonju Ryu is a data analyst at EU FLEGT Independent Market Monitoring (IMM). She develops tools to monitor effectiveness of forest policies for policy makers and businesses. She also serves as a coordinator of the youth delegation of Young



Ecosystem Services Specialists (YESS) to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). She is passionate about strengthening bonds between humans and nature and encouraging sustainable actions. *hyeonju.ryu@protonmail.com



LUCA COSCIEME

Luca Coscieme is a researcher at Trinity College Dublin. He started studying how humans relate to the environment because he believes we are losing our relationship with nature and planet Earth. His research tries to find solutions for improving the quality of the environment and our quality of life.



NILS DROSTE

Nils Droste is an Assistant Professor at the Department of Political Science at Lund University, Sweden. He is interested in applied econometric research on public finance institutions for sustainable land use. He works on policy instruments for nature conservation and participatory governance. My webpage: <https://nils.droste.io>



SONALI GHOSH

Dr. Sonali Ghosh is a practicing forester with over 20 years of field experience living and working in Protected Areas. Her area of expertise is related to the sustainable use and conservation of biodiversity, natural heritage, and tropical forestry. She is also a designated UN-IPBES fellow for the Asia-Pacific regional assessment. <https://www.ipbes.net/users/sonalighosh>



LOVISA NILSSON

Lovisa Nilsson works at the Centre for Environmental and Climate Research at Lund University, Sweden. The overarching theme of her Ph.D. research was ecosystem services in agricultural landscapes. She is particularly interested in trade-offs and synergies between biodiversity conservation and ecosystem service management.



SAKSHI RANA

Sakshi Rana is a Ph.D. scholar at the Wildlife Institute of India. She is assessing key forest ecosystem services of a protected area in India and how they are linked with the quality of life of local communities. Her areas of interest are ecosystem services approaches in biodiversity conservation, mapping and modeling of ecosystem services, human-nature interaction, and the science-policy interface. She enjoys bird-watching and educating people about wildlife and conservation through her writings and photographs.



UTTAM BABU SHRESTHA

Uttam Babu Shrestha is a research fellow/Director at the Global Institute for Interdisciplinary Studies. His research interests range from mapping and modeling ecosystem services, land use change analysis to climate change. He is also a fellow for the global assessments at the IPBES.