Topics of 2022 ISCES

Global Environmental Solutions Challenge

Contents

Topic 1: Human health

Issue:

A healthy environment on our planet is a prerequisite for economic prosperity, human health and well-being. In order to achieve the 2030 Agenda for Sustainable Development, all should live healthy and fulfill lives for the benefit of all, both the present and future generations.

Unsustainable production and consumption patterns and trends, combined with the increase in the use of resources, put at risk the healthy planet needed to attain sustainable development, which also leads to the deterioration of human health. Covid-19 has worsened the global health situation by swamping the healthcare systems worldwide.

Therefore, urgent actions are needed to reverse those negative trends and restore planetary and human health. The youth shall play an important role in it and they do have the power to bring about transformative changes. Young people need to take daily sustainable actions and develop appropriate skills for green jobs to have a sustainable impact on the environment and human health.

Source: Global Environment Outlook 6

Questions for consideration:

What environmental policies can governments put in place to improve planetary and human health?

What can companies do to improve their sustainability to contribute to a healthier planet and humans?

How can universities encourage and help students to start businesses aimed at human health?

How can young people develop their skills for green jobs to positively impact human health?

What actions can the youth take in their everyday life to be more environmentally sustainable?

What collective efforts should we take to tackle the increasing risks to human health caused by the Covid-19 pandemic at the local, regional and global scale?

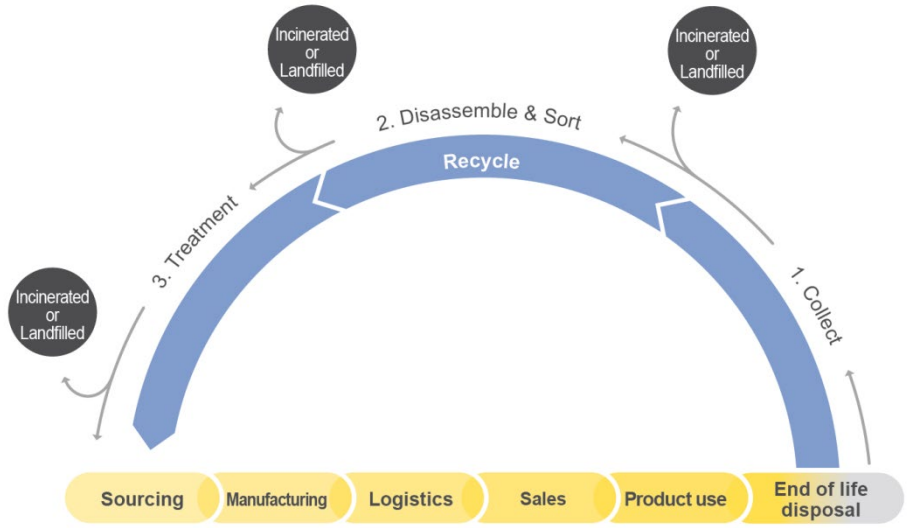
Your proposed solution should focus on the issue but not limited to the sample questions.

Topic 2: Circular Economy

Circular Design to improve value chain resources loop

Issue:

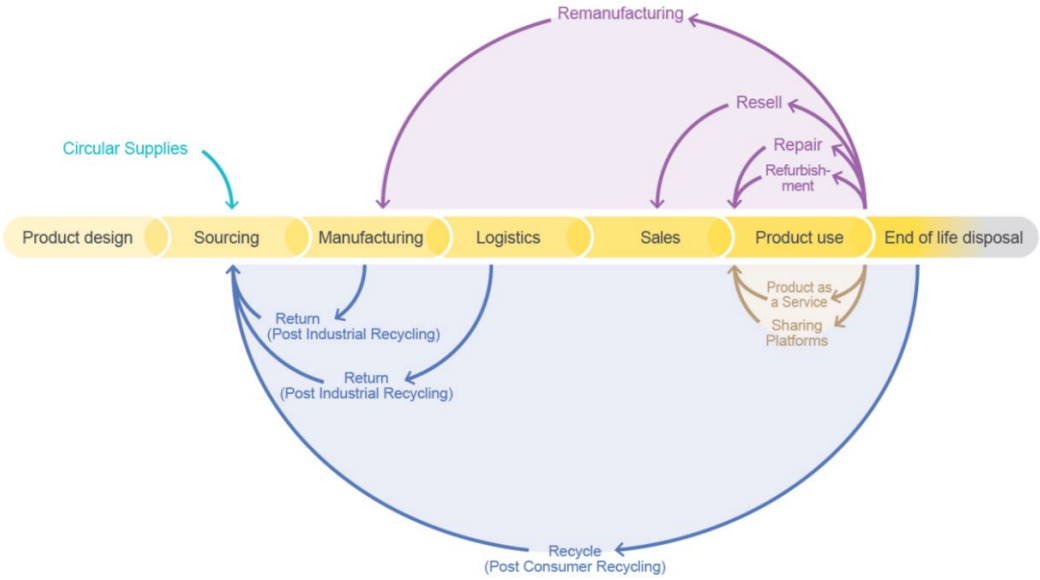
Global warming has become a top environmental challenge worldwide, and many ambitious targets and timelines have been put up to decarbonize economic activities. For decarbonization, a circular economy would be a key contributor. Moreover, the circularity of a commercial product is to be improved in different steps of its value chain.



One of the most typical product value chain descriptions in the linear economy model consists of the following steps: raw material sourcing, manufacturing, logistics, sales, product use, and end-of-life disposal. There are already some activities to collect and recycle waste at the product end of life phase. However, the full potential of a circular economy can be hardly achieved by only recycling waste, which is too late since waste has

already been generated.

Circularity is to be improved before recycling and actually in every step of the whole process. One possible solution the value chain partners can adopt is “Circular Design” principles, in which a phase called product design is added at the beginning of the value chain. That principle emphasizes the importance of considering the circular design principles right from the start. Circular enabling features are also needed during the product design. These principles or circular enabling features are illustrated below:



It is noteworthy that these design principles or circular enabling elements are beyond product design – it touches on different economic activities in the value chain and even the business models, for example, how to sell a product and how to create value for the business and its customers. It is crucial to have holistic approaches and systematic thinking to achieve a circular economy because all economic activities are interrelated and they all matter.

Students are encouraged to choose a product or a business that they are more familiar with, and come up with suggestions/ideas/solutions about how to make this product/business more circular than the current model, using the circular design principles / circular enabling elements mentioned above, with more concrete examples.

Questions for consideration:

How can we design a product, service, or business model to make sharing/repair/refurbishment/recycling easier?

How can we adopt more circular materials in the supply chain? How can we reduce and reuse waste produced in the manufacturing process?

How can we leverage reverse logistics and other strategies to facilitate circular business models?

How can we make circular products more attractive to consumers/customers?

How can we shift a product's business model from the simple "buy-own" one to more circular ones like sharing, rental, and product as services?

How can we improve recycling at the product end of life phase, and other phases as well?

What would be the most important environmental effect of making this product/business more "circular"?

Your proposed solution should focus on the issue but not limited to the sample questions.

Topic 3: Climate Change

Issue:

In recent years, the consequences of climate change, which include severe floods, catastrophic storms, rising sea levels, fires, melting polar ice, and unbearable heatwaves, have been increasingly serious and threatened residents and infrastructures in many cities worldwide. The last two decades saw the highest increase in emissions in human history. The next decade cannot follow the same pattern if we are to hold global warming this century to 1.5°C.

In response to the urgent situation and the Sustainable Development Goals in the long term, more than 190 countries have joined the Paris Agreement to mitigate climate change, strengthen resilience and enhance their abilities to adapt to climate impacts. China is also committed to hitting peak emissions by 2030 and carbon neutrality by 2060, which is a foundation for a sustainable future.

We have the knowledge and technology to get all these targets achieved and the solution has to be in kick-starting the transition to renewable and cleaner sources of energy in all sectors. More-ambitious climate pledges and long-term strategies are also required to help drive such shifts, in order not to sleepwalk into climate catastrophe.

Source: Photo by Chris LeBoutillier on Unsplash

Source: Photo by Roxanne Desgagnés on Unsplash

Questions for consideration:

What measures have local governments and authorities worldwide already taken in response to climate change? Are their current measures different from international initiatives and how can they further push forward their

actions?

How can investment measures from both public and private sectors be improved in disaster prevention infrastructures, ecosystem protection or community development?

How can urban infrastructures be adapted to climate change in terms of flood prevention, energy, transportation and communications?

How can the public response to climate change be improved? For example, how can they help with greenhouse gas emission reductions, water resources protection and ecosystem restoration?

How can the shift be accelerated from fossil fuels to renewable and alternative fuels?

Your proposed solution should focus on the issue but not limited to the sample questions.

Topic 4: Smart Environment

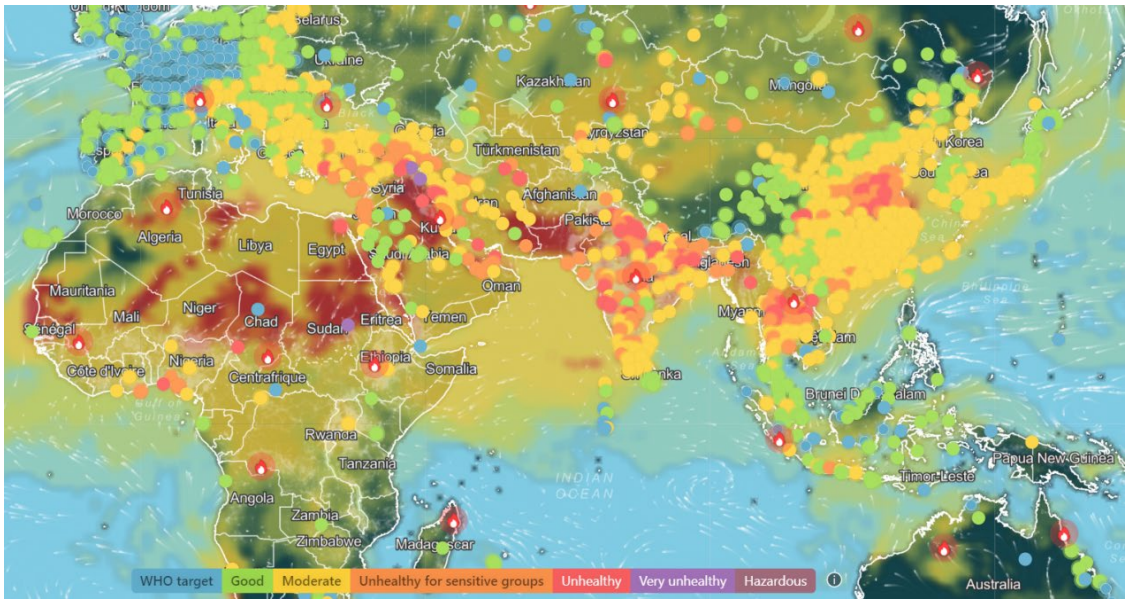
Issue:

The past years have witnessed the new trend of smart environment, thanks to the application of artificial intelligence (AI), which is playing an increasingly important role in environmental protection and ecosystem restoration as well as in interdisciplinary research.

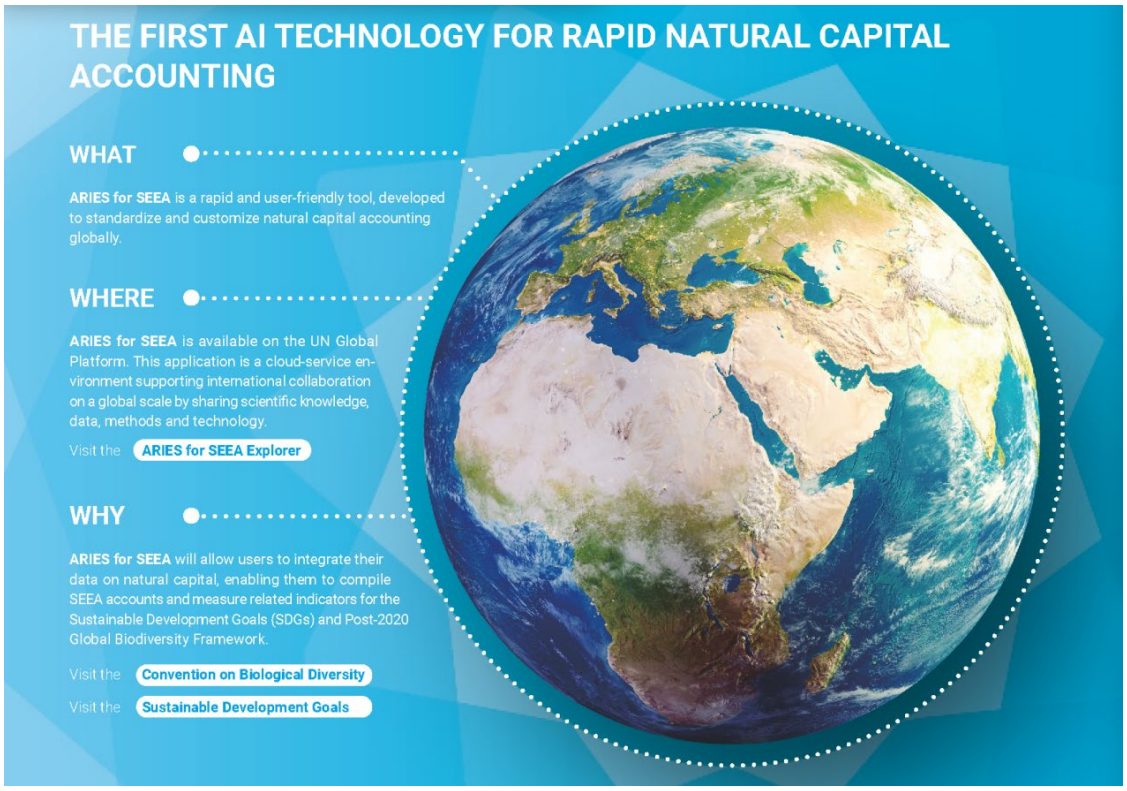
AI can be applied to environmental monitoring. By helping with the construction of environmental models and the analysis of data produced from them, it gives a quick response to the abnormal fluctuations in the environment. AI also serves as a tool for natural capital accounting and ecosystem accounting, which further boost sustainable development. Thanks to advanced visualization technology enabled by AI, various kinds of data can be easily read and understood to facilitate policy making. The whole smart environment system forms huge networks between cities so that a joint scheme can be formulated to improve the overall environmental quality.

AI technology will definitely be applied in more and more sectors in the future and the smart environment system will be more sophisticated. However, this technology is still iterating rapidly and the impact of its development on social sustainability is also worthy of our consideration, such as privacy and other ethical issues. It is critical how we use AI in the

right way with the right perspective. Therefore, while understanding and promoting its development, we also need to think about the application methodology of AI for the environment and sustainable development.



Source:https://www.iqair.com/unep



Source:https://www.unep.org/news-and-stories/press-release/un-launches-first-artificial-intelligence-tool-rapid-natural-capital

Questions for consideration:

How can AI further contribute to environmental protection, urban development and rural vitalization?

How can we popularize the application of AI technology in the construction of a smart environment and meanwhile avoid the potential consequence of unemployment?

How can we make the cutting-edge theories or technologies of AI closer to the public's daily life?

How can we solve the ethical and moral problems caused by the application of AI?

What do you see as the most environmentally valuable use of AI technology?

Your proposed solution should focus on the issue but not limited to the sample questions.

Website links for reference:

https://wesr.unep.org/article/wesr-geospatial-data-and-services

https://www.unep.org/news-and-stories/press-release/un-launches-first-artificial-intelligence-tool-rapid-natural-capital