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Editorial

The imperative for ecosystem regeneration by supply chains: sixth industrial revolution

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Abstract: This editorial letter contributes to the ongoing discussions on drawing potential paths for the sixth industrial revolution, which is being proposed. Contributing to the dialogue, this letter suggests laying the groundwork for eco-regenerative industries and supply chains, moving beyond the existing sustainability movement to ecosystem regeneration, as the next big thing in the industry.

Keywords: sixth industrial revolution (IR 6.0); eco-regenerative movement; sustainability

It cannot be denied that industrial revolutions (IR) have brought about numerous benefits. There is an ongoing conversation on outlining potential avenues aimed at the next IR, which is being proposed by both academics and industry professionals. However, the sad truth is that all IRs, including the latest, have inadvertently caused environmental issues by misbalancing ecosystems, depleting the Earth's natural resources, and increasing pollution. As such, the next IR should aim to reverse some of this damage by regenerating the environment, as it is now evident that the Earth is in dire straits. The negative effect of our past IRs is starting to spread even beyond our Earth and into space; there is a need for an informed next IR. The progression from the first IR (late 18th to early 19th century), characterized by the use of steam power, to the ongoing IR has been remarkable, leading to unparalleled growth and advancements. The two initial IRs (late 18th to early 20th century), characterized by the combustion of fossil fuels for energy and the advent of mass production, initiated the onset of environmental degradation. There was progress in industrial automation during the third IR (mid-20th century), but natural resources did not receive significant alleviation. With a groundbreaking period in terms of connectivity and smart technology, the fourth industrial revolution, which gained momentum in the 2010s, still encounters challenges associated with generating waste,

emissions, and energy consumption. The emerging fifth IR began gaining traction around 2021–2022, encompasses more than mere economic considerations, as it places a greater emphasis on social value and human well-being, while also highlighting the collaboration between humans and advanced technologies. However, frequently, this journey has neglected one crucial factor: the planet's state of health. Climate change, loss of biodiversity, pollution, and the Earth's natural resources are some of the most pertinent existential threats that warrant immediate and continuous action. Thus, the sixth IR is a call to arms to swiftly shift from merely sustaining what we have left to actively restoring what we have lost. This involves adopting practices that replenish and rejuvenate the environment while ensuring that industrial and technological progresses positively affect the environment.

While the sustainability-oriented movement exist in parallel to IRs, it focuses on minimizing environmental harms and maintaining a balance of emissions and waste management [1]. This movement has gradually adopted the principles of the circular economy and net-zero with the goal of minimizing emissions and waste and maximizing resource reuse. Currently, there is a growing trend towards integrating industrial development and environmental sustainability [2,3]; however the sixth IR is suggested to advance the practice through the implementation of eco-regenerative industries and supply chains. It promotes the practice of being net-positive, which occurs when a system actively supports sustainability principles, especially when the outcome benefits the environment more than it threatens. The past IRs, while being innovative, have resulted in ecological imbalances, depletion of resources, and a substantial rise in carbon emissions, among other consequences. They have advanced industrial progress but, for the most part, they have extensively relied on Earth's natural resources without frequently considering the long-term consequences. In short, ecosystems are being threatened by human activities [4]. The vision of the IR 6.0, however, should be for industries to operate in harmony with the environment, with technological innovations that not only minimise harm to the environment but actively restore it.

Previous practices have instilled in us the importance of striving to minimize environmental damage, with the ultimate goal being to achieve zero harm [5]. Nevertheless, we have inflicted damage upon the environment in the past, and it is imperative that we rectify the situation now [6]. The IR 6.0 is an imperative for eco-regeneration, wherein industries, including their supply chains, collaborate to minimize the harms caused by the different types of pollution, while also actively seeking opportunities to benefit the environment. The IR 6.0 encompasses a range of positive environmental effects aimed at mitigating past damage, varying in complexity from simple to intricate. Thus, the suggested IR 6.0 measures the success of an industry or technology by its economic impact as well as its positive contributions to the health of the planet. This shift signifies a profound change in what we value and consider progress.

The IR 6.0 concept is not only crucial but also urgently required. The necessity of implementing eco-regenerative supply chains arises from the unfortunate narrative of how we have caused significant distress to our planet's ecosystem. The pollution and damage caused by human activity are not issues that solely affect the Earth; they pose significant threats to our future and are our responsibility to address. The gravity of the situation cannot be exaggerated. The repercussions of not taking action are severe and extensive, affecting various aspects such as One Health and economic stability. It is extremely crucial to change the methods of supply chain management as soon as possible, as the Earth currently faces severe environmental issues, such as climate change, loss of biodiversity, and the depletion of its natural resources. Therefore, the premise of the IR 6.0 is to adapt to the challenges of the day and to shape the future while ensuring that our technological and industrial advancements

rejuvenate the Earth.

As the path that we choose now will define our legacy, the IR 6.0 invites scientists, innovators, and leaders from across the globe to encourage this transformation. The submissions to this special issue show that the regenerative supply chain movement is still in the very earliest phases. This editorial letter thus offers a discussion that should be taken into account by the scholars and practitioners who are offering pathway alternatives for the sixth industrial revolution.

Use of AI tools declaration

The author declares that he has not used artificial intelligence (AI) tools in the creation of this article but has used them for enhancing the language and improving the clarity of this editorial.

Conflict of interest

The author declares no conflict of interest.

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