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Invited ViewPoint

Ecosystem-centric business continuity planning (eco-centric BCP): A post COVID19 new normal



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ABSTRACT

This article views the COVID-19 pandemic as an opportunity leading to a significant reduction in pollution levels, clean waters in rivers, improved visibility, and other tangible benefit to humanity and the environment. In Post-COVID scenario, to restore the margins and regain the lost production, industries are likely to increase their production leading to a quantum jump in the pollution levels. Having precedence of such a scenario in 2008–09, this article looks at what are the possible avenues to engage the city government and business houses through an a new normal ECO-BCP concept for long term sustainability. All economic stimulus needs to be tied down with the stringent reduction in the emission norms. The Ten Principles for the Eco-centric BCP guide the reopening of MSMEs after lockdown period called to check the spread of the COVID-19 pandemic. The Eco-centric BCP model will help the MSMEs to adopt the new-normal business strategies to align with the country-specific commitments to SDGs, SFDRR and Paris declaration.

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1. Introduction

The COVID-19 pandemic's impact on lives and livelihoods globally are beyond measure as the war against the Virus is continuing. Involving more than 210 countries, more than 428,652 deaths, and about 7.7 million people infected and are still continuing [20 www.worldometers.org on 13th June 2020], the pandemic is looming large on us. This is the first global crisis, threatening human existence, after World War II. A stated mortality rate of 3.4% [21] is much more than seasonal flu's mortality rate. The world was unprepared for this pandemic crisis, and global cooperation at initial stages was negligible. In the absence of any readily available medication and vaccine for the Virus, shortage in preventive gears in the face of a highly contagious virus, all combined to make this public health emergency into a worldwide epidemic. The Governments world over had to take the hard decision to save the lives of the citizens by enforcing lockdown or mass testing first to identify the affected persons [22]. Keeping economic growth was common second priority.

Cities, Industries and businesses are in turmoil [3]. The Micro, Small and Medium Enterprises (MSMEs) are always at risk, and as a result, they

will bear the maximum brunt of the pandemic [1,5]. This has resulted in migration, loss of livelihood mainly for the contract and daily wagers and an uncertain future. The MSMEs had not catered to the fall out of such a highly contagious health emergency.

Past experience of pandemic recovery has shown an increase in production, reclaiming more land for production among other measures to make up for the losses. While making even with the economic losses is important but at the same time, balancing the burden on the environment is important. Recovery from this grim scenario needs to have balanced approaches to reach targets set by entities differently. This article considers the present pandemic as an opportunity to drive economic growth and support livelihood while at the same time, protect the ecosystem and promote wellbeing in the society through an Ecosystem-centric Business Continuity Plan (Eco-centric BCP) model. Analysis of secondary literature has led to the development of the conceptual framework and principles for 'Eco-centric BCP'. The following section delves into relevant literature. Based on this, Sections 3, 4, and 5 presents the conceptual framework, ten principles and strategies for adopting Eco-centric BCP. The penultimate section discusses the possible approaches and integration of the

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ECO-centric BCP concept leading to a series of recommendations for the future.

2. Literature review

A 'Business Continuity Planning' (BCP) aims to prepare for, provide to and maintain control and capabilities for managing organisations' overall ability to continue to operate during disruptions. It establishes strategic objectives and guiding principles for the organisation, and is expected to integrate safe industrial standards for affluent and emission for resilience. A report of the International Labour Organisation [8] discussed the four pillars (4Ps) model to develop a BCP: People (safety and security), Process (internal organisational processes like supply chain, logistical planning), Profit (management of risks to products/services) and Partnerships. With the huge loss of life and capital, the COVID-19 pandemic demonstrates the incredible capacity of societies to stand together to fight against unprecedented, insurmountable challenges and adapt [12].

In the high-level meeting on climate and sustainable during the 73rd session of UN General Assembly, the General Assembly President stated that people have a decade left to combat the worse impact of the climate crisis and recent improvement of the environment set an example that change in approach can show the tangible result [18]. Many businesses that have "in-person transactions" and "foot traffic" model are struggling the most due to nation-wide lockdown, even though the demand remained strong [17]. Countries throughout the world are announcing special economic packages as India announced to spend about 10%, and Japan 20% of the GDP [4,16] globally around \$7 trillion in total committed as a relief package until now [13]. In the post-COVID scenario, to restore the margins and regain the lost production, the industry is likely to increase its production rapidly leading to a quantum jump in pollution levels. Significant reduction in emissions and working towards sustainability may be a wise idea even from a financial point of view [14,15]. Present health crisis and economic consequences of COVID-19 and climate crisis need to be reflected once the business entities conceptualise their BCP [19].

The COVID-19 has redefined the use and design of the public space, utility services in the urban centres. These factors directly or indirectly have a bearing on the business continuity. The real estates and the construction industry will need to come up with a design and legal solutions on building interface with public health. The planning of green spaces, mass transits, industrial units and office space design needs a to revisited and coming up with a set of guidelines to integrate the health component into urban planning and design would be necessary [6].

The countries are focusing on reviving the economy and experts are suggesting that protecting nature can prevent future pandemics; so a parallel approach should be more effective to address COVID-19 pandemic and climate crisis [12]. Learning from the recovery plan and policies of the financial crisis of the year 2008–09, governments are adopting approaches in their guidelines, many of the effective solutions have a concern regarding environmental protection [13]. The German government chose to continue climate protection through helping companies in recovery with setting incentives for reducing carbon emission, promoting modern technologies and renewable energies while announcing economic packages for various sectors [10].

Palahi et al. [11] recommend that any new model framework needs to include transformative policies, purposeful innovations, risk-taking capability, as well as the sustainable business market. Further, they suggest replacing the current economic indicators such as GDP to sustainable wellbeing as an index for a sustainable society. Recently-developed UNDRR and ADPC toolkit [17] to support MSMEs focus on the protection of employees, protection of the business and utilisation of resources available. Similarly, ILO has advocated developing an effective risk and contingency system for any business after a due diligent review of the 4Ps, risk and vulnerability profile and opportunities [8]. ILO proposed toolkit platform in a report about a 'Network of Networks' facility that can help sustainable & resilient enterprises (SRE) to keep on working in conflicts and disaster-prone areas [9]. The tool enables the MSMEs to be adaptive,

customisable and flexible. It focuses on four aspects, namely- decent work supporting Sustainable Development Goal (SDG) 8, promoting positive approach supporting SDG 16, prevention from a crisis, and finally generating investment through private sectors. In these anthropocentric guidelines, the ecosystem discussion is silent.

Media Information confirms [2] that there is a significant decrease in air pollution level due to lockdown China has recorded a 25% reduction in CO₂ emission, which can save about 77,000 lives. In Venice, the water in the canals cleared and experienced more water flow and visibility of fish reported by the government [2]. The social media is flooded with photographs showing clean skies and wild animals roaming around in urban centres. The pandemic provides a unique opportunity to transit our business models towards the ecosystem-centric new-normal sustainable approach.

3. Conceptual framework for ECO-centric BCP

The Sendai Framework, Sustainable Development Goals and the Paris agreement all aim for a sustainable society. Carrying forward the discussion from Section 2, the ECO-centric BCP concept rests on four parameters namely; Parameter-1 Reduction in emission from the industry; Parameter-2 sustainable use and reuse of ecosystem services; Parameter-3 Legislation and implementation, and Parameter-4 Sustainable energy usage and consumption (Fig. 1). While the industry is the centre for providing goods and services, /driving economic growth by providing livelihood opportunities, a sustainable model of business operation will reduce the chances of failure in the supply chain by ensuring available resource in the market and stabilising the cost of procurement. These can be achieved by investing in science and technology and promoting innovation.

Further, comprehensive risk assessment to factor in issues arising due to environmental impact might be beyond the individual business's capability to manage. The recovery planning needs to envision the possible impact of action taken in the post-pandemic phase. This would have a significant impact on the secondary sphere of influence which will help in having access to clean water due to reduced affluent, better health and wellbeing due to reduced emission rates and stable livelihood. In the long-term, this will lead to gender equality, support quality education and address issues of poverty and hunger. It is important to note a scale of influence, where a local action can influence the tertiary sphere at a subnational or national scale.

4. Ten principles of the ECO-centric BCP model

The participatory and reconciliatory attitude, as mentioned by [13] and [11] is the core concept of the new Eco-Centric BCP model. To address the gap areas identified in Section 2, the Eco-centric BCP model proposes reorganised 4Ps to boost economic and ecosystem functions both; they are People, Process, Facility (infrastructure, machinery, finance and partnership) and Technology (including improvisation and innovations). To infuse MSMEs' business continuity, ten strategic guiding principles for 4Ps are proposed (Fig. 2).

5. Adopting ECO-BCP

This section identifies various ways of adopting the Eco-centric-BCP model for ground application.

5.1. Cluster concept

Business continuity for the private sector is directly linked with the essential services provided by the city. Local government is a service provider for its citizens and a custodian of the ecosystem services in its jurisdiction. ECO-BCP concept applies to both city services and business sector. At the city level, the Eco-BCP will aim at maintaining low energy consumption and sustainable use of its various natural resources. A possible approach for doing that is by integrating the Eco-BCP as an integral component of the ongoing urban-centric mission being undertaken by the Indian

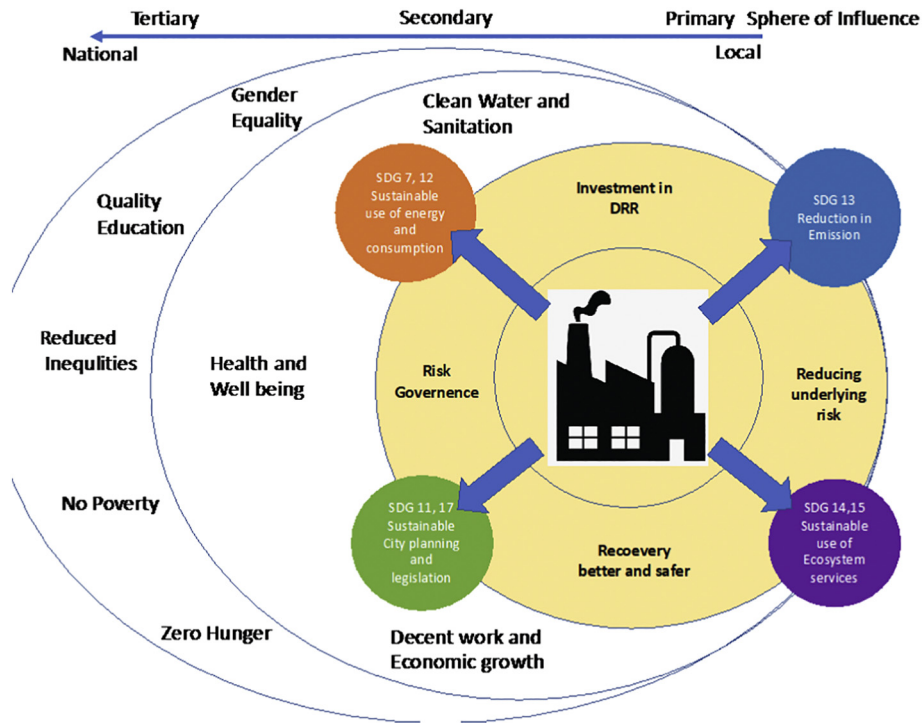


Fig. 1. Conceptual Framework for the 'Eco-centric BCP' connecting SFDRR and SDGs.

10 Essential Targets for the Eco-BCP The Ecosystem-centric Business Continuity Plan	
PEOPLE	1. Preparation of business priority with new learning from new risks, social safety and digital literacy
	2. Reskilling on environmental norms/ Industrial safety and training for employee awareness on sustainability
PROCESS	3. Cluster formation based on spatial proximity, nature of pollution generating business
	4. Introducing process mapping for produce and waste, target setting for reduction in waste
	5. Integration and mapping of new/ improved processes
FACILITY	6. Incentives and access to additional loan integrated with the Eco-BCP package
	7. Effluent and emission treatment and graduated monitoring facility at individual SME and Cluster level
	8. Third-party checking/ certification for sustainable indexing of new-normal eco-centric business/ industry
TECHNOLOGY	9. Right collaboration for circular economy , effective austerity measures and productive technologies to enable partial/ total baseline resilience
	10. Innovations in effluent and emission management by continuous improvement in reduce-reuse-recycle triad, environmental pricing of produce

Fig. 2. The Ten Principles of the Eco-centric BCP Model.

government. In normal times the reduction of CO2 emission, sustainable use of ecosystem services, providing undisruptive basic services and lowering energy consumption is the onus of the city governance. A combination of Business Continuity Planning (BCP) and Life Continuity Planning (LCP) is needed to continue these dimensions in case of an emergency situation for safeguarding life and critical assets while ensuring energy independence (Fig. 3). While dealing with the private sector, especially the MSMEs, two approaches of Individual and Cluster Eco-BCP [7] may be adopted depending on the size and capacity of the MSMEs to boost Economic and Ecosystem Functions. The Cluster BCP will ensure continuity of MSMEs, Community and immediate environment in a group for small scale MSMEs, who as an individual organisation, may not be able to prepare or adopt a BCP. Such clusters can be at ward level in cities or can also happen within further smaller clusters who mutually share the vision for a greener future.

5.2. Graduated adoption

The natural ecosystems, even when severely constrained in urban areas, continuously provide our ecosystem- and resilience services through their ecosystem functions. Graduated Standard Operating Protocol (SOP) adoption to control the flow of emissions and throw of effluents to the ambient ecospheres of air, water, and soil shall be in place. The industries shall adopt the moderate to stringent targets, based on the potential level of industrial wastes' harmful impact and waste treatment standards practised by the said Industries. Fig. 4 explains the concept of target selection.

5.3. Scalability

The inclusive approach within the industry community, starting from top to the last post in the chain need to take responsibilities and initiatives to allow this change to happen. Major handholding needs to come from relevant government ministries at national to local levels, through their organisational arms for policy and planning backup, fiscal policies like access to easy-term loan, subsidies and incentives in terms of a tax rebate. Industrial and business associations, large and medium industries can extend technical support for retrofitting, skilling, training, advanced gears and technology sharing and graduated SOP for the new-normal Eco-centric BCP including reporting protocol, 3rd party inspection. Corporate Social Responsibilities (CSR) components can incentivise the paradigm shift. Networked initiatives among multi-actors will be required to bring the change in Industrial environment (Fig. 5).

6. Discussion

Accelerated economic activity without any string of environmental concerns will worsen pollution condition. Most of the money inflow to revive

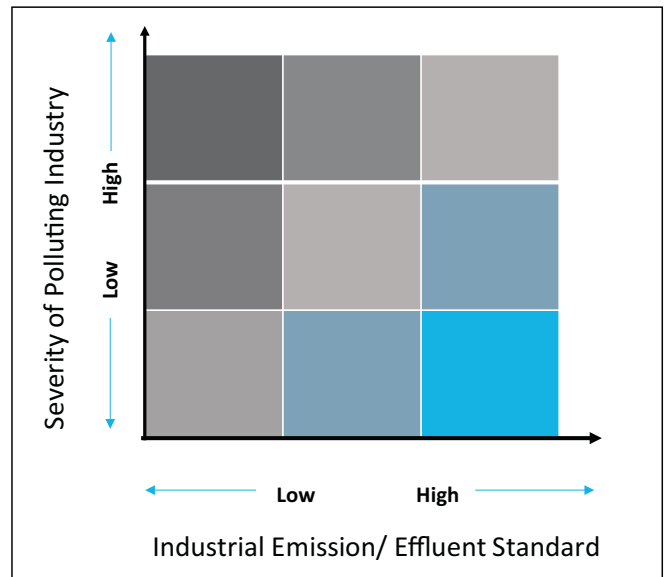


Fig. 4. Graduated SOP target adoption based on the level of polluting industry to control emissions and effluents throw in the ambient ecosphere.

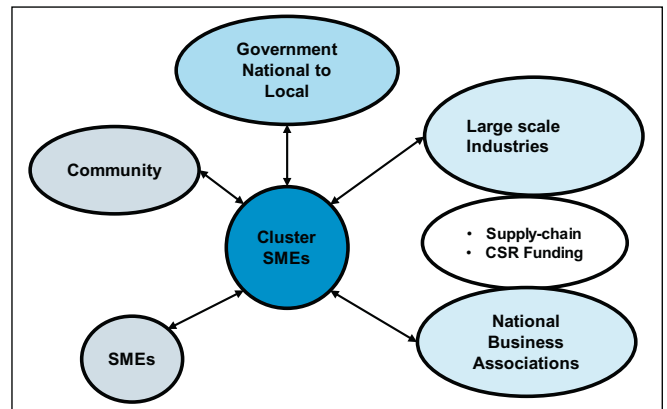


Fig. 5. Networked Chain of Activities and Actors for the scalability of MSMEs' Eco-centric BCP.

the economy has focused on increasing liquidity in global markets without any environment strings attached [13]. An eco-centric approach, an opportunity to produce differently and to help other ecosystems to survive, can serve as a paradigm shift in the investment plan (economic packages) for the 21st-century public services. The authorities need to create incentives for public and public privates industries to direct their investment in the Eco-centric BCP model.

Apart from liquidity measures, industrial bodies need to go for policy formation with major climate benefits such as clean energy and infrastructure, disaster preparedness, zero-carbon transportation etc. All economic stimulus needs to be tied down with the stringent reduction in the emission norms. It is important to ensure funds from the public sources to the objectives of the SDGs and Climate change mitigation while creating jobs and kick-starting economic activity. The rejoined sense of common good for humanity and the environment to be utilised to build a more resilient and sustainable economy by adopting the Eco-centric BCP approach for MSMEs. The Eco-centric BCP model shall not aim to come back to Business as Usual (BaU) level but to recover better. Cities need to identify clusters with possible high emission rates post lockdown and urge sustainable use of ecosystem services, especially water in drought and water scare areas. Integrating the climate-sensitive city planning, restoration of a heritage built forms and ecosystems, etc.

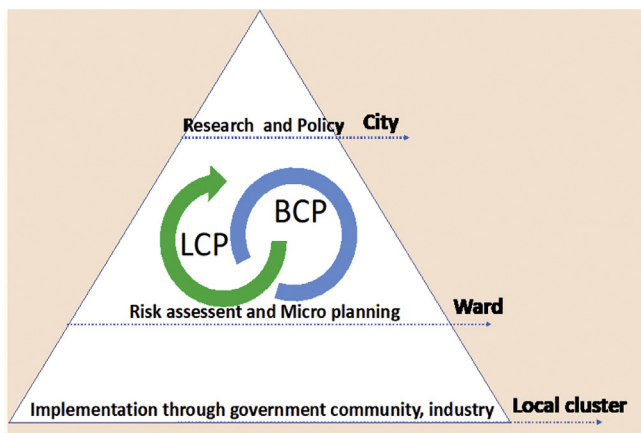


Fig. 3. Level of Services and Plan Activators during Covid 19 Pandemic.

A strong political will and sense of urgency are required towards this critical aspect of integrating scientific advice on sustainability and climate change into policies and guidelines to protect the environment along with rejuvenating the economy. The Eco-centric BCP model will help the MSMEs to adopt the new-normal business strategies to align with the country-specific commitments to SDGs, SFDRR and Paris declaration. The adaptation to new norms and swift change shown by the global community in behaviour and functioning has no precedence in history. This encouraging spirit of collective action towards common goals must be unlisted by sensitising every stakeholder about commitment towards climate change. The Ten Principles for the Eco-centric BCP guide reopening of MSMEs after lockdown period called to check the spread of the COVID-19 pandemic.

Circular economy, alternate green jobs like ecotourism, afforestation, integrated water management shall be Post-Covid MSME sectors getting prime attention from investors. Developing a new normal in the MSME sector will require staggered lifting of the lockdown period with conditional written commitment from the individual industrial units to follow safety practices guidelines. A strong penal and monitoring regime is needed for making these norms non-negotiable. Replacing the BaU recovery plan with robust Eco-centric BCP model will require strong support from service providers who can provide support in terms of financial, technical, managerial, policy and planning. The ecosystem centric BCP planning will be the new normal to boost the economy and the ecosystem functions in the days to come.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

- [1] Chatterjee R, Okazaki K. In: Pal I, Meding J, Shrestha S, Ahmed I, Gajendran T, editors. Risk Governance and the Role of Informal Sector in Disaster Recovery: The Case of 2015 Nepal Earthquake Chapter: Chapter 4. Springer; 2020.
- [2] CNN Travel Blog. <https://edition.cnn.com/travel/article/jellyfish-venice/index.html>; 2020.
- [3] Boissay F, Rungcharoenkitkul P. Macroeconomic Effects of Covid-19: An Early Review BIS Bulletins. accessed online at <https://www.bis.org/publ/bisbull07.pdf>; 2020.
- [4] FICCI. <http://www.ficci.in/ficci-in-news-page.asp?nid=20956>; 2020. March 26, 2020, Accessed on 20 April 2020.
- [5] GAR 13 Report (Global Assessment Report). UNDRR; 2013 accessed at https://www.preventionweb.net/english/hyogo/gar/2013/en/gar-pdf/GAR2013_EN.pdf.
- [6] Honey-Roses J, Anguelovski I, Bohigas J, Chireh V, Daher C, Konijnendijk C, et al. The Impact of COVID-19 on Public Space: A Review of the Emerging Questions; 2020, April 21. <https://doi.org/10.31219/osf.io/rf7xa>.
- [7] JICA Report Natural Disaster Risk Assessment and Area Business Continuity Plan Formulation for Industrial Agglomerated Areas in the ASEAN Region. Accessed online at <https://openjicareport.jica.go.jp/pdf/12235677.pdf>; 2015.
- [8] ILO. The Six-Step COVID-19 Business Continuity Plan for SMEs. no. April: 1–12 https://www.ilo.org/wcmsp5/groups/public/—ed_dialogue/—act_emp/documents/publication/wcms_740375.pdf; 2020.
- [9] ILO. Overview: Supporting Enterprises in Disaster Prone Areas, The Sustainable and Resilient Enterprises Platform. International Labour Organization; 2020; 1–4 <https://conflictdisaster.org/covid19-resilience-toolkit/#141-disaster-resilience-dr/Overview-Disaster-Toolkit.pdf>.
- [10] Nienaber M, Wackett M. Reuters Article: Germany's Merkel Wants Green Recovery From Coronavirus Crisis. <https://www.reuters.com/article/us-climate-change-accord-germany/germanys-merkel-wants-green-recovery-from-coronavirus-crisis>; 2020.
- [11] Palahí M, et al. Investing in nature to transform the post COVID-19 economy: a 10-point action plan to create a circular bioeconomy devoted to sustainable wellbeing. *Solutions J.* 2020;11(2) <https://www.thesolutionsjournal.com/article/investing-nature-transform-post-covid-19-economy-10-point-action-plan-create-circular-bioeconomy-devoted-sustainable-wellbeing/>. Accessed online at.
- [12] Price K. Natural Conservation Blog. <https://www.conservation.org/blog/what-does-covid-19-have-to-do-with-nature-these-5-articles-explain>; 2020.
- [13] Rathi A. Bloomberg News Article: Green Stimulus Finds Support From G-20 Officials, Central Bankers. [bloomberg.com/news/articles/2020-05-04/world-s-economists-agree-economic-stimulus-ought-to-be-green](https://www.bloomberg.com/news/articles/2020-05-04/world-s-economists-agree-economic-stimulus-ought-to-be-green); 2020.
- [14] Stern N. Stern Review on The Economics of Climate Change (pre-publication edition). Executive Summary; 2006 Accessed.
- [15] Teske, et al. Achieving the Paris Climate Agreement Goals, Institute for Sustainable Futures 2018. www.oneearth.uts.edu.au; 2018.
- [16] Times of India (TOI). In Comparison: India's Stimulus Package vs Rest of the World; 2020 accessed at <https://timesofindia.indiatimes.com/world/in-comparison-indias-stimulus-package-vs-rest-of-the-world/articleshow/75710393.cms> on 15th June 2020.
- [17] UNDRR, ADPC. Small Business Continuity and Recovery Planning Toolkit. United Nations Office for Disaster Risk Reduction for Asia and Pacific and ADPC; 2020 http://www.adpc.net/igo/category/ID1583/doc/2020-r74Yp1-ADPC-COVID19_Small_Business_Continuity_and_Recovery_Planning_Toolkit.pdf.
- [18] UN Press. <https://www.un.org/press/en/2019/ga12131.doc.htm>; 2019.
- [19] Vis P. Planting the seeds of a Green Economic Recovery After Covid-19. Euractiv article <https://www.euractiv.com/section/energy-environment/opinion/planting-the-seeds-of-a-green-economic-recovery-after-covid-19>; 2020.
- [20] Worldometer. www.worldometers.info. Accessed on June 13, 2020.
- [21] World Health Organisation. WHO Director-General's Opening Remarks at the Media Briefing on COVID-19. 3 March 2020 <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19—3-march-2020>; 2020. Accessed on April 15 2020.
- [22] Djalante R, Shaw R, Dewit A. Building resilience against biological hazards and pandemics: COVID-19 and its implications for the Sendai Framework. *Prog Disaster Sci.* 2020.