

04

INNOVATIVE NATURE-BASED SOLUTIONS FOR ECOSYSTEMS RESILIENCE, CONNECTIVITY AND CONSERVATION, IRAN

Mahmood Yekeh Yazdandoost

General Director of Environmental Impact Assessment (EIA)
Department of Environment (DoE), Iran
Email: yazdandoost3000@gmail.com

How to cite this paper:

Yazdandoost Mahmood
Yekeh (2023) Innovative
Nature-based Solutions for
Ecosystems Resilience,
Connectivity and
Conservation, Journal of
Global Resources, Vol. 09
(02)

DOI:

10.46587/JGR.2023.v09i02.004

Received: 18 April 2023

Reviewed: 28 May 2023

Final Accepted: 25 June 2023

Abstract: *Nature-based Solutions (NbS) as an integrated approach comprehensively provide basis of action to sustainably conserve and manage landscapes and create multi-benefits to society and living organisms, such as; biodiversity and biocultural benefits. NbS to societal challenges are adaptively planned via institutions to deliver benefits to communities. It is taking the capacity of different sectors and actors including local and indigenous people for decision-making into consideration. The result indicates practically all types of ecosystems receive benefits from NbS activities to enhance ecosystem goods and services to society and reduce societal challenges to climate change and biodiversity decline. Well-defined NbS may contribute to ecosystems resilience, connectivity and conservation, and support sustainable development goals programs. Thus, the resilient NbS that consider immediate challenges of ecosystem disconnectivity, biodiversity loss, climate impact and unsustainable development, would sustain ecosystem well-being and human health together for now and future.*

Key words: Nature-based Solutions, Ecosystem Resilience, Biodiversity Conservation, Risk Reduction

OPEN ACCESS

Freely available Online

www.isdesr.org

Introduction

The increasing ecosystem disconnectivity and decreasing environmental resilience capacity is creating social and economic risks to society, and hampering the process of sustainable development. Nature-based Solutions (NbS) as an integrated approach comprehensively provide basis of action to sustainably conserve and manage landscapes and create multi-benefits to society and living organisms, such as; biodiversity and biocultural benefits. Protecting and managing virgin nature would release better ecosystem services and benefits to society (IPBES, 2019; Solan, M., et al., 2020). The worldwide research indicates, NbS can efficiently reinforce mitigation and biodiversity conservation goals (Brancalion, P.H.S., et al., 2019). For being successful, it should be adjusted to local situations.

NbS are designated to apply important eco-social challenges, like; biodiversity conservation, ecosystem connection, climate change, water pollution, agricultural production, economic boost, risk reduction and health promotion. In this regard, NbS consider as an umbrella concept to cover wide range eco-social challenges. On the other hand, we cannot consider all conservation efforts necessarily to be NbS, because NbS efforts usually try to solve societal challenges that are important globally. Reduction in biodiversity and ecosystem connectivity, coupled with adverse effects of climate change, erodes the foundation of Sustainable Development Goals (SDGs), especially with respect to the infrastructures which support human health and development. Biodiversity decline is also reducing nature's capacity to provide medicament.

The reason of biodiversity reduction is firmly rooted in the societal structure, that is why the future of biodiversity basically relies on societal structural transformation by reversing the loss through an improved governance approach and a good management system. Better collaboration, coordination and participation happen when the governance systems are polycentric and got capacity to transform mankind connection with nature. Since governance regimes are not exclusively the outcome of governments view for sustainability program, it would require well coordination amongst actors and stakeholders with full participation. NbS to societal challenges are adaptively planned via institutions to deliver benefits to communities. It is taking the capacity of different sectors and actors including local and indigenous people for decision-making into concern, and promoting Natural Capital Accounting (NCA) into circular economy.

Communities have been working with nature to tackle the effects of ecological collapse and disasters for thousands of years (Berkes, F., et al., 2000). It is just in recent times that such activities and practices have been recognized and signed as NbS and moved the global interests for integrated solutions to disasters management (Seddon, N., et al., 2020). The eco-social challenges we face today are interlinked and cannot be tackled individually (Turney, C., et al., 2020). The ecological systems on which we depend today are deteriorating beyond points of remedy (Rockstrom, J., et al., 2009; Steffen, W., et al., 2015). Well-designed and practiced NbS may bring best partnerships between community and ecological systems/nature. NbS can diminish the vulnerability of the social-ecological interconnected network in the environment to the adverse effects of the environmental change by reducing in exposure and sensitivity to disastrous shock, and strengthening resilient capacity (Seddon, N., et al. 2020).

The main objective of this research paper is to compile and compare the existing information of a given area for nature friendly management.

Method

The innovative Nature-based Solutions (NbS) for ecosystem resilience, connectivity, conservation, and sustainable development require novel knowledge by comparing the existing data and values. In this regard the building knowledge will support methodological approach to comprehensive monitoring and surveillance processes in each area of concern. Moreover, by allowing the degraded forest to regrow, we may restore soil and water, and enhances air quality for better forest connectivity and biodiversity conservation.

Geographical Area: Central Zagros Conservation Zone

Zagros is the biggest mountain in Iran. The region is around 32 million hectares. The arrangement of the natural physical features of the area has created very diverse ecosystems in the landscape. Existence of the endemic species in the region has made the biodiversity of Zagros globally remarkable. Presently, due to unsustainable harvesting, over exploitation of natural resources, population growth, unrecognized indigenous management, and the regional development without respect to nature capacity, have caused the ecosystem connectivity and biodiversity productivity to become highly in danger. If current situation continues, in no time many plant and animal species would disappear from region.

Results and Discussion

Practically all types of ecosystems receive benefits from NbS activities to enhance ecosystem goods and services to society and reduce societal challenges to climate change and biodiversity conservation. Based on existing information, the result indicate, NbS implementation in Central Zagros could bring gain to community/society as well as policy makers/stakeholders in many ways, such as; ecosystem connectivity and its functionality rehabilitation, mitigation and adaptation to climate change, promotion of biocultural and biodiversity conservation, reduction of risks and vulnerability to natural/man-made disasters, water and soil quality improvement, and by promoting in social cohesiveness brings knowledge and awareness to environmental/human well-being.

Ecosystem-based Management (EbM) theoretically and practically arise from ecosystem-based approaches (Gregory, A. J., et al., 2013), to react to existing problems in landscapes (Uy, N. and Shaw, R., 2012). It is an integrative approach that considers the entire landscapes including communities in premises (Leslie, H. M. and McLeod, K. L., 2007). The EbM practices ecological and environmental operations that may be integrated in NbS categories. Moreover, the interlinkages of different eco-social approaches could deal with the Complex Global Systems (CGS). However, in this context, NbS structural action deal with the clearly defined benefits from ecosystem approaches, like ecosystem recovery that may play important function in declining societal challenges.

There is a vast realization that the domain of ecosystem approach is more immense and detailed than the NbS approach. For example, while considering Aichi targets (e.g., 11, 14, 15),

the ecosystem approach may practically deal with all of them, whilst NbS deals with some of the subsets of these targets. Rehabilitating degraded habitats could take up million tonnes greenhouse gas emissions annually from the atmosphere and lowers down global warming potential. NbS use the distinctive aspects and interconnecting network functions of nature, and as NbS seeks protecting nature for people's benefit, it creates conditions as such people become the active supporter of nature (Mace, G. M., 2014). The ecosystems and its diverse services considered the most influential factor for societal health, happiness, and connectivity (Naeem, S., et al., 2015). For obtaining greater benefits from nature, well designed collaboration, and integration across principles of actions is needed. Action plans to conserve biodiversity is benefitting society by enhancing ecosystem services in many ways in a short period of time, and in a long term create resiliency to ecosystem to withstand disaster and recover soon when perturbations are too high (Tilman, D., et al., 2012). In Central Zagros Conservation Zone (CZCZ), when biodiversity and social impacts progress together, through synergistic effects, it may augment the overall achievement of NbS.

Recommendations

- Mainstream Nature-based Solutions into Governance Structure.
- Introduce NbS framework into biodiversity plan of action.
- Sustainably conserve landscapes through NbS policy approaches.
- Use NbS strategy for Nature Resiliency Program (NRP).
- Incorporate NbS into circular economy.
- Mobilize resources for NbS sustainability.

Conclusion

Well-defined NbS may contribute to ecosystems resilience, connectivity and conservation, and support sustainable development goals programs. It is based on introducing new methods and ideas with nature to accomplish more greener and efficient eco-social system. Natural wealth like; air, land, water, minerals, plants, and animals that generates ecosystem goods and services for continuation of healthy life and economy is the limited supply of environmental property. The Natural Capital Approach (NCA) is a method for recognizing and measuring natural stock that combine environmental management with economy and development, and directing the natural assets to become clearly observable for policy-making. The specification of NCA is the restoration of natural stocks for the enhancement of the smooth flow of energy in the system. Thus, the resilient NbS that consider immediate challenges of ecosystem disconnectivity, biodiversity loss, climate impact and unsustainable development, would sustain ecosystem well-being and human health together for now and future. It is highly critical to know which nature-based action of intervening and at what cost is effective on existing challenges.

The Convention on Biological Diversity (CBD) goals and the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) strategy look after secure, diverse, healthy and resilient ecosystems that via delivering essential ecosystem services to bring multi benefits and prosperity to society. The NbS with resilient ecosystems is essential in achieving these goals and bringing better command on tackling human challenges by reducing future threats. Achieving progress on NbS policy and practice require understanding of present knowledge gaps

that confine the implementation process, and also development of conditions that support data generations. Landscape revelation by delivering knowledge can create a basic tool for directing society towards safe and sustainable future. It is much understood that, humanity if put aside its greediness, has developed capacity to transform our world for the better place to live. A sustainable development driven by NbS will create resilient future and peace on earth. The peace with nature besides ensuring human dignity would also allow other creatures to live and stay around us. Thus, environmental policy and decision makers should always anticipate long-term conservation of natural resources and their sustainable use by creating capacity building for Nature-based Solutions that support sustainable human health and well-being.

Acknowledgement

All the scientific literatures released by academia, UN and other agencies including Department of Environment that have been used in this research paper are highly appreciated.

References

1. Berkes, F., et al. (2000) Rediscovery of traditional ecological knowledge as adaptive management. *Ecological Applications*, 10, 1251–1262.
2. Brancalion, P. H. S., et al. (2019). Global restoration opportunities in tropical rainforest landscapes. *Science Advances*, 5, eaav3223.
3. Gregory, A.J., et al. (2013) A problem structuring method for ecosystem-based management: The DPSIR modeling process. *European Journal of Operational Research* 227(3): 558–569.
4. IPBES. (2019). *Summary for policymakers. The global assessment report on biodiversity and ecosystem services.*
5. Leslie, H.M., and McLeod, K.L. (2007) Confronting the challenges of implementing marine Ecosystem-based Management. *Frontiers in Ecology and the Environment* 5(10): 540–548.
6. Mace, G. M. (2014). Whose conservation? *Science*, 345, 1558–1560.
7. Naeem, S., et al. (2015) Get the science right when paying for nature’s services. *Science* 347(6227): 1206–1207.
8. Rockstrom, J., et al. (2009) A safe operating space for humanity. *Nature*, 461, 472–475.
9. Seddon, N., et al. (2020) Understanding the value and limits of nature-based solutions to climate change and other global challenges. *Biological Sciences*, 375.
10. Seddon, N., et al. (2020) Global recognition of the importance of nature-based solutions to the impacts of climate change. *Global Sustainability*, 3.
11. Solan, M., et al. (2020) Benthic-based contributions to climate change mitigation and adaptation. *Biological Sciences*, 375.
12. Steffen, W., et al. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, 347.
13. Tilman, D., et al. (2012) Biodiversity impacts ecosystem productivity as much as resources, disturbance or herbivory. *Proceedings of the National Academy of Sciences of the US*, 109(26), 10394–10397.
14. Turney, C., et al. (2020) Urgent need for an integrated policy framework for biodiversity loss and climate change. *Nature Ecology & Evolution*, 4(8), 996.
15. Uy, N. and Shaw, R. (2012) *Ecosystem-based Adaptation*. Community, Environment and Disaster Risk Management, Volume 12. Emerald Group Publishing.