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RESEARCH ARTICLE

Sustainable Forest Ecosystem Management

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Abstract:

This research study comprehensively covers the multidimensional area of Sustainable Forest Ecosystem Management (SFEM) by exploring different types of literature that reveal fundamental concepts and underlying theories, implementation methods, and factors affecting its effectiveness. The review of the literature has been designed according to PRISMA guidelines for systematic reviews and meta-analyses and qualitative research methods have been used to critically analyse works from areas such as social sciences, geostatistical methodologies for environmental services etc. A thematic analysis shows that these issues include biodiversity conservation, community participation, the circular and green economy, accountability in research, and the SWOT-ANP framework, strategic turning in the forest supply chain, and community empowerment in conservation. Practical implications pinpoint the significance of rules in sustainable forest management, first of all, protect rare species and beware of pollutants. The practical implications suggest the provision of sustainable forestry strategies involving targeted scientific technologies, biodiversity conservation, and community participation. The study ends up highlighting the global nature of forests, the consequences of utilization of the forest, and the marvellous role of SFEM in mitigating climate change. The results led to an all-round view of SFEM by identifying what has been done and what has not, and providing a platform for more research and implementation of well-sustainable forest management practices globally.

Keywords: Sustainability, Sustainable management, Management, Ecosystem management, Nature

Introduction

As the global environment is changing at an increasing speed, the sustainability of forest ecosystems and their sustainable management becomes of utmost importance. The forests are not only the lungs of our planet but also hold the key to biodiversity, carbon cycle and the general health of our ecosystem. The latest statistics paint a very worrying picture, as deforestation has been destabilized at staggering heights. Each year, approximately 5 million hectares of forests are lost and according to FAO estimation, it is 29% more than in the past decade (Aspers & Corte, 2019). These statistics emphasize how real the threats are for our forests and the rate at which they are being pressured by factors such as deforestation, illegal logging, and the impacts of climate change. The sustainability of Sustainable Forest Ecosystem Management (SFEM) acquires special significance in the provision of a framework for tackling the intricate interconnections between forest ecosystems and human activities. SFEM aims to be a compromise by embracing ecological and social components in the management of forests. The effectiveness of SFEM has been demonstrated in reducing greenhouse gas emissions as one of the critical arguments supporting the policy. Statistics reveal that jurisdictions taking action to preserve forests experience an 11% decrease in carbon emissions caused by deforestation. In delivering effective resource utilization, SFEM not only contributes to climate change mitigation but also ascertains the continued provision of ecosystem services, ranging from the provision of clean water to habitat conservation (Blicharska et al., 2020).

This study has been done to answer the question "Does Sustainable Forest Ecosystem Management work?" by analyzing its principles and methodologies. The research assesses the efficacy of SFEM in combating deforestation and the associated environmental problems hence it aims to add to the literature on forest sustainability. In addition, a review of the policies and practical solutions that would facilitate the spread of SFEM, and therefore the well-being and sustainability of the forest ecosystem would be done. (Aspers & Corte, 2019).

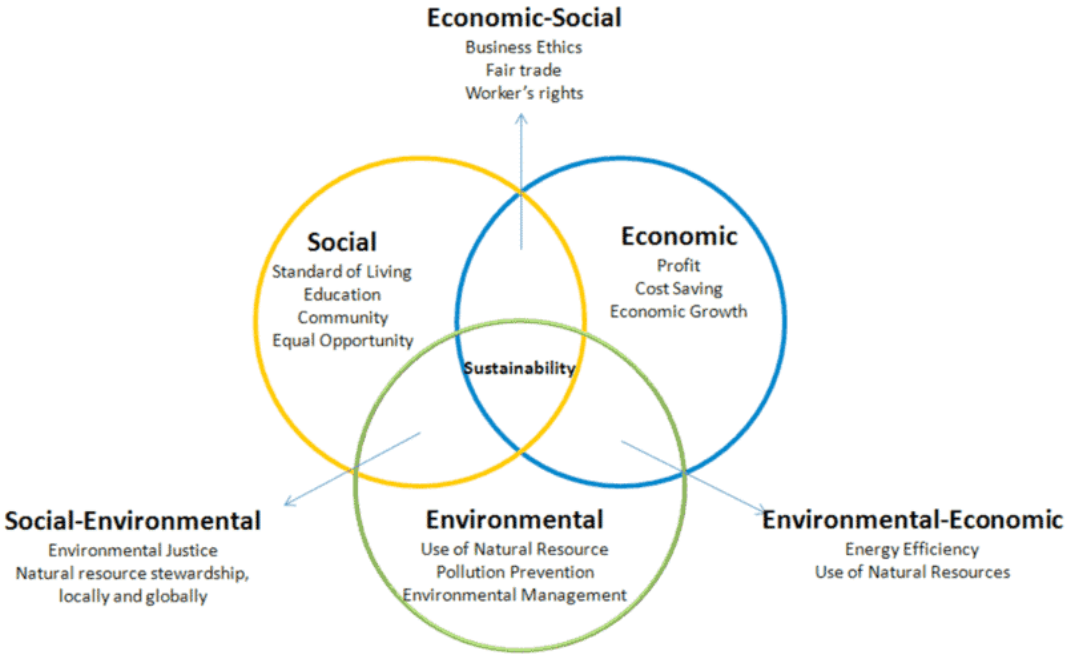

Figure 1 Three Spheres of Sustainability (Aspers & Corte, 2019)

Sustainable forest ecosystem management encompasses the critical integration of three interrelated spheres: the economy, environment, and society. The ecosystem niche is best preserved by sustaining biodiversity and keeping ecosystems healthy with low ecological footprint forest operations. In so doing, it is imperative to preserve the diversity of native flora and fauna, to modulate the impacts of climate change, and to provide for water conservation (Blicharska et al., 2020). Alongside these, the social circle asserts the need of the local people to get involved in the community, honouring their cultural heritage, and making sure that the forests are available for all to use. Community-based forest management strives towards the end of a better life, social equality and joint decision-making concerning. From the economic perspective, sustainability is a combination of keeping follow-up economic viability with securing long-term resource preservation. As a result, susceptible types of forests should be carefully cut down, while green and circular economy principles should be boosted, and economies that prioritize such environmental and social objectives can be created. The application of all three dimensions concurrently is vital and they are inseparable to secure the persistence and sustainability of natural forest habitats (D'Amato, Korhonen, & Toppinen, 2019).

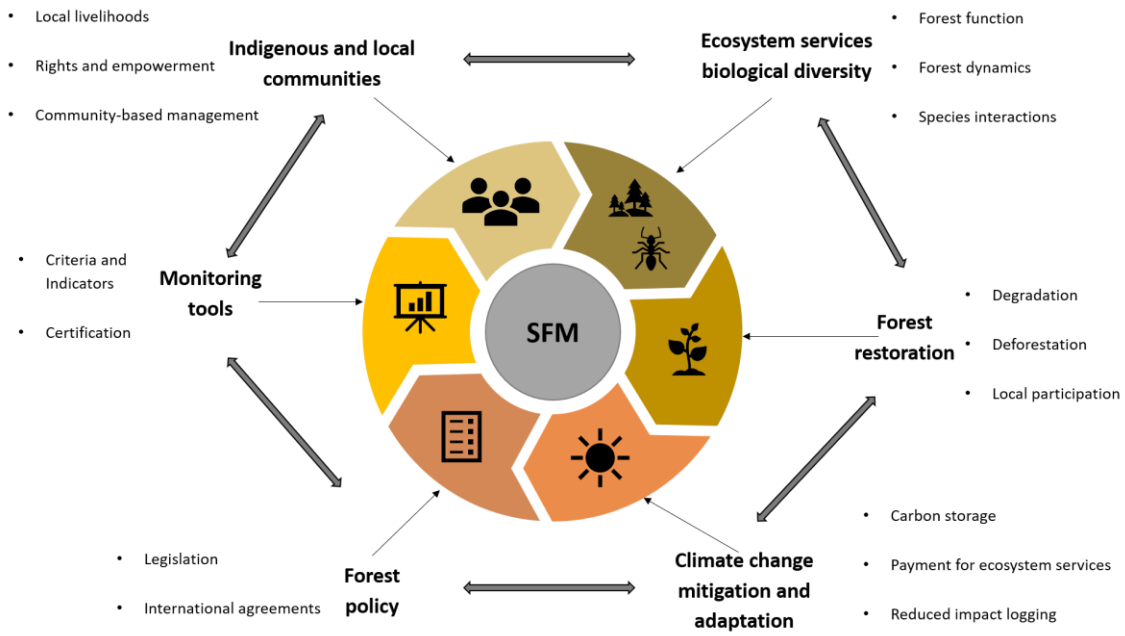

Figure 2 SFM (Sustainable Forest Ecosystem Management)

To overcome this situation forest management development focuses on long-term forest ecosystem management that is socially, economically, and culturally compatible with the environment. Environmental management ideas encourage conservation and best practices for the benefit of current and future generations. Sustainable forest ecosystem management can ensure a steady supply of wood in the future (Korstjens & Moser, 2018). The following study is also based on the described issue and the way to overcome it to replenish the forest deficiencies and manage a proper forest ecosystem management disturbed by various man-made activities.

Purpose

Development in forest management focuses on sustainable forest ecosystem management that collaborates with the environment socially, economically, and culturally. The concepts of environmental management both promote conservation and practices for the betterment of present and future generations. A continuation in the supply of timber is available by sustainable forest ecosystem management (Poudyal et al. 2018). It is known to us and well aware of the importance of trees in our environment. In many ways, trees help to keep the environment clean. The main aim of sustainable forest management is to maintain a healthy environmental society and to protect biodiversity for our future diversity. On the other hand, the sustainable forest ecosystem emphasizes safeguarding and managing the ecosystem of the forest (Mori et al. 2017). Management emphasizes the strategies that are taken by sustainable forest ecosystem management to protect the wildlife in the forests to keep growing the trees of the forests naturally (Bottero et al. 2017). The sustainable forest ecosystem mainly aims at the use of the recycling of paper to reduce the cutting of trees.

It also aims the decrease soil erosion. Also, stated that in the sustainable forest management ecosystem, there are many ideas to promote people a better life and a clean and healthy environment (Schober et al. 2018). It is very necessary for the

better improvement of our environment. Through the process, trees can not alone be benefitted, but it is also beneficial for the whole forest (Asherin, 2017). The forest management practices reduce the pollution of the environment. As mentioned by Krishna and Mohan (2017), the methods of the sustainable forest ecosystem must include a scientific process. The trees of the forests can grow naturally in their climate. The old plants are used in growing the new plants (Hisano et al, 2018). The old forests are known as the habitat of animals as well. On the other hand, as per the views of development, innovative sustainable management also promotes the livelihood of the local people (Halofsky et al. 2018). The sustainable forest ecosystem offers a list of activities that offer a better ecosystem and a better environment in the ecosystem (Nojavan et al. 2018). The people of rural areas depend on the forests in many ways sustainable forest ecosystem management is very helpful for the betterment of their lives.

Research questions

1. What will be the future of the forest ecosystem if sustainable management is not practised?
2. What measures and strategies should be adopted to maintain sustainable forest ecosystem management in the long run?
3. What are the benefits of forest ecosystems in day-to-day human life?

Literature review

This review of literature is shown in Table 1, which incorporates a range of research studies from which various outcomes bring reason for tenacity in sustainable forest ecosystem management. Corte (2019) focuses on the qualitative approach of sociology instead of being solely concerned with quantitative aspects. But they accentuate the reflexive side of research. Blicharska et al. (2020) provide insights into the co-existence of biodiversity with sustainable forest management, particularly in the famous Białowieża Forest case. D'Amato et al. (2019) display the ways Land-based enterprises are consistent with the green, circular, and economic principles. The practical tips for qualitative research interviews' offering can be found in McGrath et al. (2019). Artić and his team of researchers present a novel ANP-SWOT framework to prioritise ecosystem management. Broz et al. (2017) plot a multiobjective and multicommodity framework for the strategic planning of a forest supply chain. As Wali (2017) points out, the empowerment of community and conservation is vital for sustainable positive welfare. Using the sub-Mediterranean coppiced woodlands as a case study, Tardella et al., (2017), shed more light on the role of abiotic factors in the population numbers of the under-storey species. The investigation script addresses varied elements of sustainable forest management illustrating community responsibility, resource planning and ecological considerations also creating a rounded overview of the field. In addition, a limited study to generate knowledge that applies to other ecosystems and contributes to the generalization of qualitative research methodologies for ecological forest management is needed.

Table 1 Literature Review

Article	Research Problem	Research Objectives	Research Findings	Research Gap
(Aspers & Corte, 2019)	Exploring the nature of qualitative research and its role in sociology.	To elucidate the qualitative aspects of research and their significance in sociological studies.	Defines key qualitative research components; emphasizes the importance of reflexivity and subjectivity.	The focus is on qualitative research in sociology; the application to specific fields might differ.
(Blicharska et al., 2020)	Balancing biodiversity conservation and sustainable forest management in the Białowieża Forest.	Assessing the multidisciplinary aspects of the Białowieża Forest case for conservation and sustainable forest management.	Highlights conflicts between conservation and management; calls for integrated approaches in forest policies.	Specific to the Białowieża Forest case; generalizability to other regions may need further investigation.
(D'Amato, Korhonen, & Toppinen, 2019)	Examining how companies in land-use-intensive sectors align with circular, green, and bio-economy concepts.	Investigating the alignment of land-use intensive companies with sustainability concepts in the economy.	Identifies challenges and opportunities for companies in adopting circular and green practices in land-use sectors.	Specific to land-use-intensive sectors; the broader application of circular economy concepts needs exploration.
(Korstjens & Moser, 2018)	Providing practical guidance on trustworthiness and publishing in qualitative research.	Offering guidance on ensuring trustworthiness and effectively publishing qualitative research.	Outlines strategies for ensuring trustworthiness in qualitative research; emphasizes transparency and reflexivity.	Focuses on qualitative research trustworthiness; broader aspects of qualitative research may require additional exploration.
(McGrath, Palmgren, & Liljedahl, 2019)	Offering tips for conducting qualitative research interviews.	Providing practical tips for conducting effective qualitative research interviews.	Outlines twelve practical tips for researchers engaging in qualitative research interviews.	Primarily focused on interview techniques; other qualitative research methods may necessitate distinct considerations.
(Arsić et al., 2018)	Proposing a new approach within the ANP-SWOT framework for prioritizing ecosystem management, with a case study of National Park Djerdap, Serbia.	Introducing a novel approach for prioritizing ecosystem management using the ANP-SWOT framework.	Demonstrates the application of the new approach in prioritizing ecosystem management in National Park Djerdap, Serbia.	Specific to the ANP-SWOT framework; broader applicability to diverse ecosystems and regions warrants further exploration.
(Broz et al., 2017)	Employing a multigoal and multiproduct approach for strategic planning in a forest supply chain.	Developing a strategic planning model for forest supply chains with multiple goals and products.	Presents a strategic planning model addressing the complexities of forest supply chains and multiple objectives.	Limited focus on a forest supply chain; broader application to other supply chains may require adaptation.
(Wali et al., 2017)	Introducing a new approach to conservation, emphasizing community empowerment for sustainable well-being.	Advocating for community empowerment as a means for sustainable well-being in conservation efforts.	Highlights the positive impacts of community empowerment on conservation outcomes and overall well-being.	Specific to conservation efforts; generalizability to other community-based sustainable practices may need further exploration.

(Tardella et al., 2017)	Investigating the effects of environmental features and overstory composition on understory species in sub-Mediterranean coppiced woods.	Assessing the factors influencing the understory species assemblage for sustainable forest management.	Identifies the impact of environmental features and overstory composition on the understory species in coppiced woods.	Limited to sub-Mediterranean coppiced woods; generalization to other forest ecosystems requires further investigation.
(Nojavan, Salehi, & Omidvar, 2018)	Analyzing the conceptual change in disaster management models through thematic analysis.	Examining the evolution of disaster management models and identifying key thematic changes.	Identifies shifts in disaster management models, highlighting evolving thematic elements over time.	Limited to the thematic analysis of disaster management models; broader aspects of disaster management may need exploration.
(Saunders et al., 2018)	Exploring the conceptualization and operationalization of saturation in qualitative research.	Investigating the understanding and application of saturation in the context of qualitative research.	Provides insights into the conceptualization and operationalization of saturation in qualitative research studies.	Specific focus on saturation in qualitative research; broader aspects of research design and methods may require additional exploration.
(Haven & Van Grootel, 2019)	Proposing the preregistration of qualitative research to enhance research accountability.	Advocating for preregistration as a means to enhance accountability in qualitative research.	Highlights the potential benefits of preregistration in improving the transparency and credibility of qualitative research.	Primarily focused on preregistration in qualitative research; broader application to other research areas may need exploration.
(Liu et al., 2017)	Investigating spatial multi-scale relationships of ecosystem services using a geostatistical methodology.	Applying geostatistical methods to explore spatial relationships of ecosystem services at multiple scales.	Identifies spatial relationships of ecosystem services, emphasizing the importance of considering multiple scales in the analysis.	Specific to spatial relationships; broader application of geostatistical methodologies to ecosystem services may need exploration.

Methodology

The methods and data in the study may be elegantly examined using qualitative secondary theme analysis. The secondary thematic analysis enables the work to differentiate from the same subject in a new way. Secondary thematic analysis qualitative analysis is mostly based on the replies of respondents to various inquiries from the inquiry questions. Secondary thematic analysis and qualitative analysis aid in the examination of the paper's data (Aspers & Corte, 2019). It also aids in the resolution of various techniques of long-term forest ecosystem management. Several strategic techniques are required for the qualitative analysis of secondary data. This SLR study uses the PRISMA model for screening the pre-searched articles.

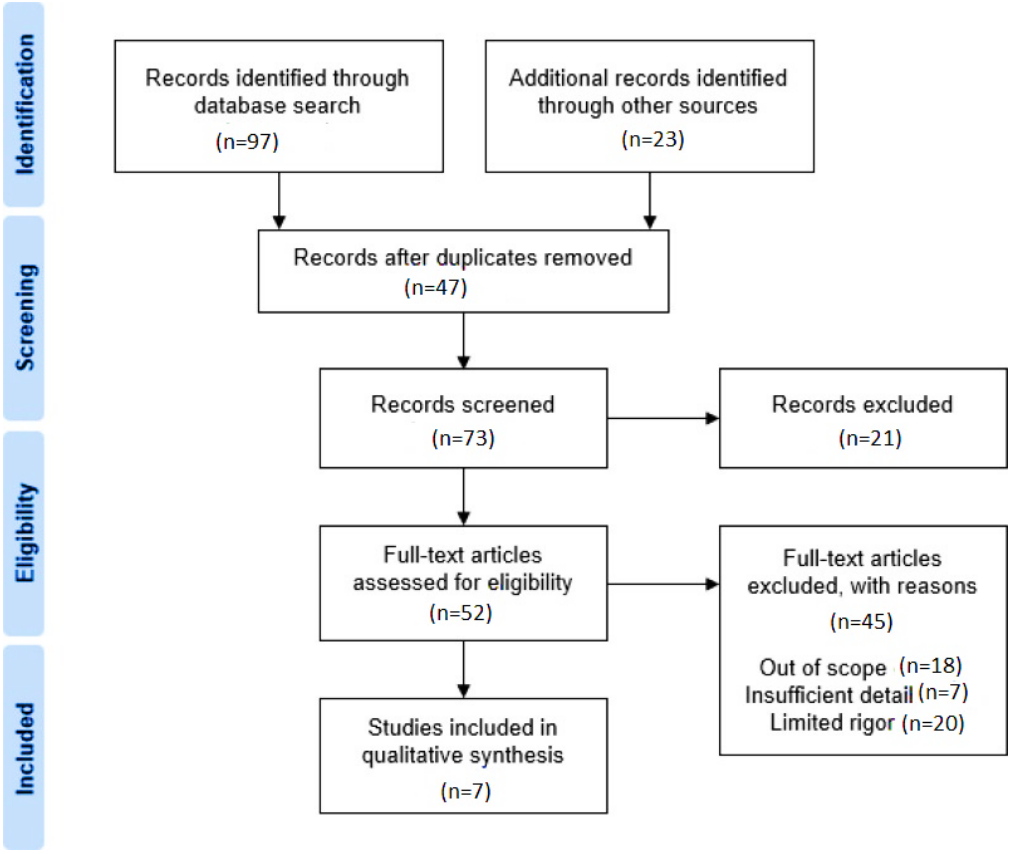

Figure 3 PRISMA model

Figure 1 illustrates that 120 are the pre-searched articles which are filtered using the PRISMA model inclusion and exclusion criteria, and 7 articles are selected for this study. The process must contain several scientific methods. Thematic analysis is the practice of studying anything with the primary goal of locating ordinary people's thoughts, reviews, and remarks (Korstjens & Moser, 2018). There are several ways of qualitative data analysis. It is necessary to have a broad understanding of the issue before beginning a thematic data analysis (Haven & Van Grootel, 2019). The review of the topics is also necessary, according to Liu et al. (2017). Then there's the matter of identifying the topics.

Thematic data analysis is very effective in many ways (Saunders et al.2018). It does not require any money or extra time. So, the effectiveness of the thematic analysis also increases in analysing the various aspects of forest ecosystem management. In secondary data analysis, the data which is required is already cleaned and sorted. So, the researcher of the data does not need any extra data. The data which are collected by the researcher can be simply analyzed. But on the other hand, there are also many disadvantages of secondary thematic data analysis. The main disadvantage of secondary thematic data analysis is that the response of the respondents does not match the exact questions of the researcher, hence, the questions raised in favour of research regarding sustainable forest ecosystem management would not be able to match comprehensively (McGrath et al.2019). Similarly, if the researcher has a set of questions in his mind to analyze the data, then the thematic analysis cannot fulfil his desire. Also, the responses of the respondents do not match with the exact questions (D'Amato et al.2019). The data of the questions can be deferred for the geographical; or regional aspects. Secondary

data analysis is a process of powerful data collection. And the questions in the process can be long and formative. The main aim of the secondary data analysis is to prevent the forests from cutting (Anne et al. 2018). The process of the sustainable management of the forest ecosystem has to keep the balance between economic, and social well-being.

There are a few different aspects of sustainability. The process also has an impact on productivity and the safety of the environment. According to Liao et al. (2020)[17], the process also keeps biodiversity unchanged. In the last few decades, the sustainability forest ecosystem has been a major process to protect the environment and also the biodiversity of the environment (Wali et al.2017). There are also many benefits of the sustainable forest ecosystem. As stated by Gavrilidis et al. (2019) through the process, the emission of greenhouse gases decreases. As a result, the temperature of the environment increases (Nijnik et al. 2018). The level of pollutants in the environment also increases. In the method of a sustainable forest ecosystem, the impact of the harmful gases in our environment decreases. And also through the process, the ecosystem can be well maintained. The endangered species which have been lost through the process of deforestation can be maintained and the number of endangered species can be well managed (Blicharska et al. 2020). In the implementation of the process, the process needs more technologies and scientific methods. There must be some scientific process in the implementation of the process. As suggested, there must be some laws and regulations in the process, and the common people who are related to the forests for their occupation, and livelihood must be disciplined (Arsić et al. 2018). The sustainable forest CEO system management implements some rules and regulations to protect the biodiversity and the species of the forest.

Findings

Results

The importance of various factors in Sustainable Forest Ecosystem Management is illustrated in the thematic analysis in Table 2, so enabling us to develop a comprehensive forest ecosystem management plan. The vision of Biodiversity Conservation is designed to ensure intact nature and to ensure that in case of chaos and instability diverse habitats are available to prevent the adverse impact of climate change. Community Engagement lays the groundwork for an influential process in which each decision made is a conscious one, the culture is preserved with anyone's and everyone's input, the equity is guaranteed and the welfare of each community is enhanced. Among the principles of Sustainable and Green Economy, one can see a guarded approach that aims to reduce unsustainable practices such as overfishing and adopt the cyclic nature of the economy along the sustainability line. The competency of having trustworthiness in Qualitative Research makes it a distinguished quality in research using being reflexive, open and authentic in methodologies and applying effective interviewing techniques impacts on the argument of research. Incorporating the ANP-SWOT Framework and Strategic Planning in the Forest Supply Chain emphasizes integrated models, dynamic management, and cautious resource use, which provide the platform for preferred ecosystem conservation and stability. The thematic analysis in its totality presents a synergistic and positive trend of Sustainable Forest Ecosystem Management where the process of community empowerment, conservation of the

environment, and strategic planning are collectively being utilized as powerful tools for the establishment of the comprehensive and considerate approach to the management of the forest ecosystem.

Table 2 Thematic analysis

Thematic Analysis	Factors	Effectiveness	Impact on SFM
Biodiversity Conservation	Native Flora and Fauna Preservation, Ecosystem Resilience, Climate Change Mitigation	A profoundly positive impact on biodiversity conservation and ecosystem resilience.	High
Community Engagement	Participatory Decision-Making, Cultural Preservation, Equitable Resource Access, Local Well-being Enhancement	Demonstrates a strong positive influence on community involvement and well-being enhancement.	High
Circular and Green Economy	Responsible Harvesting, Green Economy Principles, Circular Economy Practices	Positively contributes to responsible resource use and promotes sustainable circular economy practices.	High
Trustworthiness in Qualitative Research	Reflexivity, Transparent Research Practices, Effective Interview Techniques	Significantly enhances the trustworthiness of qualitative research through reflective and transparent methodologies.	High
ANP-SWOT Framework	Integrated Ecosystem Prioritization, Effective SWOT Analysis, Adaptive Management	Effectively integrates ANP-SWOT for strategic ecosystem prioritization and adaptive management.	High
Strategic Planning in Forest Supply Chain	Multigoal Approach, Responsible Resource Management, Resilience in Supply Chain	Demonstrates a positive impact on strategic forest supply chain planning and resilience.	High
Community Empowerment in Conservation	Collaborative Conservation, Sustainable Well-being, Local Empowerment	Empower communities, fostering collaborative conservation efforts and promoting sustainable well-being.	High
Environmental Features on Understory Species	Impact on Understory Species, Conservation Implications, Ecosystem Stability	Positively influences the conservation implications and stability of the ecosystem.	High
Thematic Analysis of Disaster Management Models	Conceptual Evolution, Adaptive Models, Effective Disaster Response	Facilitates conceptual evolution, adaptive models, and effective responses in disaster management.	High
Saturation in Qualitative Research	Conceptualization and Operationalization of Saturation, Richness of Data	Enhances the depth and richness of qualitative research data through thoughtful conceptualization and operationalization.	High
Preregistration in Qualitative Research	Research Accountability, Transparent Methodology, Enhanced Research Credibility	Demonstrates accountability, transparency, and credibility, positively impacting the quality of qualitative research.	High
Geostatistical Methodology for Ecosystem Services	Spatial Relationships, Multi-scale Analysis, Ecosystem Service Mapping	Provides valuable insights through effective spatial analysis, contributing to a comprehensive understanding of ecosystem services.	High

Importance of sustainable management of the forest ecosystem

There is an international conception of sustainable management in the forest ecosystem. But still, there are many endangered species of plants in the forest. Some of the species of the ecosystem collapse because of the cutting of random trees in the environment. Trees help us in many ways. The main aim of the process is to protect the ecosystem of the environment and to keep the environment healthier and safer (Tardella et al. 2017). The sustainable forest management system is to protect the trees for future generations. The demolition of trees can harm the lives of the common people, so sustainable management of the forest system is highly required. The process mainly covers the land areas and the

biodiversity of the land areas. The process is helpful for the environment. Through the process, the emission of carbon dioxide decreases. For that, greenhouse gases affect the environment. For that, the temperature of the environment increases. Sustainable ecosystem management occurs through many processes (Humphries et al. 2020).

The methods of the process must be scientific and organized. The main object of the process is to help the people who depend for their livelihood in the forest. Sustainable forest management mainly focuses on the whole development of the forests. The ecosystem must be managed in an organized way. The motive of the management is to keep the environment of the trees in a better way. It is very essential to implement the management of the ecosystem in the forests (de Oliveira Neto et al. 2020). The main cause of forest degradation is the industrialization and urbanization. And for that, the number of trees day by day decreases. There is a various important way that helps in the sustainable management of forestry. As a result of deforestation, the number of trees decreases. For that, the level of carbon dioxide increases and, the total human being can be affected by that. But in the process of sustainable forestry development management, carbon dioxide and other harmful gases like greenhouse gases decrease. For that, the environment is very helpful to initiate the system in it. There should be many terms and conditions in the process so that the process can be implemented successfully.

Practical implications

Strategies that can be used for sustainable forestry practices

Sustainable ecosystem management can occur in a well-organized and well-managed way. The process occurred scientifically. Different methodologies are used in the process of sustainable forestry management. There are many strategies by which the ecosystem of the forest can be prevented from degradation. To initiate the process of sustainable forest management, a land area must be needle first. The area of the land must be cleaned. The main aim of the process is to increase the quantitative and qualitative betterment of the forests for the plants of future generations. It should maintain or increase the biodiversity of the area. There must be a process to prevent the endangered species and protect them for the future. The aim of the process is also to prevent soil erosion and to increase the quality of the soil for betterment. There must be a process to maintain the quality and quantity of the water for better plantation, to maintain the recreation of the forests and the opportunities and initiatives for the people who depend for their livelihood in the forests. There must be a strategy to increase environmental literacy among the people. There must be a strategy involving rare species of plants in it. To implement sustainable forest and ecosystem management, certain strategies are important to maintain which the primary is practising recycling of papers that result in the reduction of the harvest of wood pulp trees. It is also important to grow the timber on a long-term time rotation in a period of 100 to 200 years. Another important strategy is to practice cutting of selective type individual trees and small types of tree species (Broz et al. 2017)[6]. Also, to enhance the sustainable management of forestry, it is important to minimize the fragmentation of the larger blocks that remain in the forest. It is important to make strategies while making forestry plans for avoiding the utilization of chemical pesticides and maintaining land by prohibiting logging.

Theoretical implications

Principles of sustainable forest management

The principles of the sustainable management of forests used to be referred to as the forests possessing their complex type of ecology. This ecology is important for the sustainable development of the economy as well as for maintaining every form of life. As stated by Kulakowski et al. (2017), the Principles of Forest Management postulates the right of nations to make a profit from their resources of the forest. However, it is needed to recommend that it is needed for occurring within a framework, and this framework is for the protection of forest and its management as well as for the conservation of forest.

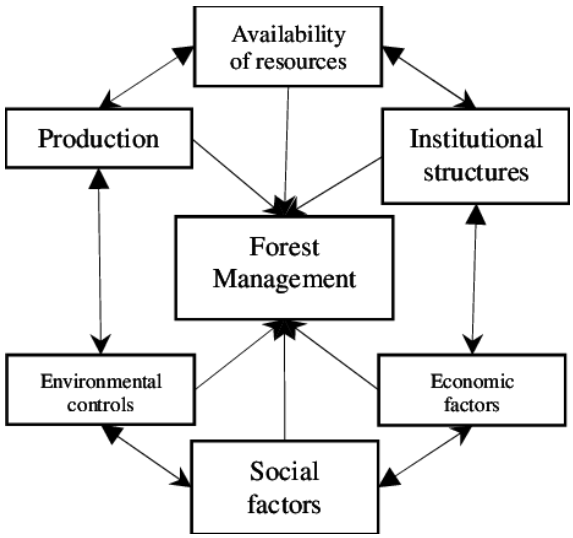

Figure 4 Theoretical Scheme for SFM

The principles of sustainable forest and ecosystem management forest are not used to be binding in a legal way but for providing recommendations on the practices of sustainable development. The Principles of Forest Management used to comprise as follows:

1. Every nation needs to take part in the program "The Greening of the World" by planting as well as by making conservation of forests.
2. Forests are required to be managed to meet the social economic ecological and cultural as well as needs in a spiritual manner of the present time as well as for future generations also (Shackleton et al. 2019).
3. Unique specimens of forest are required to be protected, such as ancient-era ancient-era forests as well as forests having cultural historical, spiritual as well as religious significance.
4. Pollutants that used to possess the feature of harming forests are required to be controlled (Prata et al. 2019).
5. Plans of forestry are needed to consider the values of non-economic of the forests as well as the consequences of environmental management of them. Degradation of Forests has to be avoided.

Discussion

Forests support the livelihoods of more than a billion people around the globe and are essential for biodiversity conservation, electricity production, and soil and water preservation. Forests and trees assist in avoiding droughts and salinization by reducing water-related hazards including landslides and local floods. Forests are also liable for benefiting the environment in several ways like helps as increasing of relative humidity of the air by also increasing the fertility of the surface soil as well. The given study, in its various parts, has explained the importance of the forest ecosystem for the well-being of humans. The forests, in the present times, are not taken seriously by humans and they are being utilised consistently over the period. Overuse of forests has several negative repercussions, including biodiversity loss and resource depletion. Explanation: Overutilization relates to the overhunting of forest resources, which results in natural resource degradation such as soil erosion and the spread of weeds.

The concept behind the sustainable development of the forest ecosystem was first introduced in 1987 in which it was stated that development that satisfies current demands without harming populations' capacity to fulfil their own needs, various strategies are also mentioned as the strategies to maintain the sustainable forest ecosystem management. The major issue which are leading forests in their depletion is deforestation. The most serious dangers to forests are deforestation and forest degradation. From the late '90s, more than half of the world's largest tropical forests have been lost, with more than one plot being burned or severely degraded every second. It urgently needs to be realised that forests contribute significantly to the Earth's capacity to sustain its climate through the worldwide influence of photosynthesis. They are real protection against global warming since they remove carbon dioxide from the atmosphere and produce oxygen. This aids in the purification of the atmosphere and the regulation of rising global temperatures.

Research limitations and future research

The sustainable development goal aims to protect and restore the diversity of the forests. Forests play an important role in decreasing the level of natural disasters, soil erosion, and floods. Through the process of sustainable management, the investment in forest and forestry, mainly in the rural area will develop the livelihood and the income of the rural people. There are some rules and regulations in sustainable forest ecosystem management in the world. Through the process of it, the Institutions increase the scope of the activity of the depending people, who are dependent upon the forests. There must be a strategy in the process to recycle the use of paper for the reduction of harmful ingredients in the environment. Every nation should take part in the process of sustainable forest ecosystem management. Also, in the implementation of the strategies, every nation should take initiatives to protect the natural biodiversity of the ecosystem. Ecosystem management should also take the initiative to resist the use of harmful particles in the environment. Ecology is a vital part of the environment and through these steps, we can save the diversity of the ecosystem. It is important to remember in the implementation of the process that there must be several scientific strategies for the prevention of the ecosystem in the environment. Forests are required to manage the collaboration socially, economically, and culturally. The purpose of sustainability gradually increase the efficiency of forests and also protect and prevent the biodiversity of

the ecosystem. The sustainable forestry management system is a system in which the methods play an important role in the environment.

Paper type

This paper can easily be considered as both empirical and conceptual. The topic of Sustainability is fairly new with only a couple of decades since its conception. Sustainability is still in its formation process with the world not fully aware and still do not accept its existence. Therefore Sustainability and its management are still in the early stages of ideas and concept forming. The article is also conceptual because ideas and questions need to be answered through research and data assimilation. To take care of the forest has been in our minds and some practical work for over a half-century but no proper solutions for its maintenance and running structure have ever been in real-time. This paper provides ideas and concepts that need to be looked at, researched, and practically implied for proper conservation.

Conclusion

Forest management that adheres to the principles of sustainable development is known as sustainable forest management. Sustainable forest management must find the right balance among three primary foundations: ecological, economic, and socio-cultural. Forest protection is critical in the fight against global warming. The given study has analysed various factors affecting sustainable forest ecosystem development and management. From the selection of the type of data in the methodology section from analysing the various strategies to maintain the sustainable development in the forest ecosystem. The method of sustainable forestry management involves a variety of approaches. There are several ways to prevent the deterioration of the forest ecosystem. A land area must be needle first before beginning the process of sustainable forest management. It is necessary to sanitise the land area. The process's main goal is to improve the forest's quantitative and qualitative quality for future generations of plants. The area's biodiversity should be maintained or increased. There has to be a system in place to prevent endangered species from becoming extinct and to ensure that they are protected in the future. In addition to preventing soil erosion, the method aims to improve soil quality.

Finally, this research work offers a comprehensive overview of Sustainable Forest Ecosystem Management (SFEM). It deals with key features and elements of SFEM giving reference to the literature of various disciplines. The principled literature review, based on the PRISMA model, provides a broad view of the important SFEM features comprising the most developed - qualitative research in sociology to the least developed - geostatistics. As a subject of qualitative research, the thematic analysis identifies key factors such as biodiversity conservation, community engagement, circular and green economy, trustworthiness, the six-way table (ANP-SWOT) framework, strategic planning, and community empowerment with their positive influence on SFEM. The theoretical implications emphasize the principles of sustainable forest management, whence the practical implications are complete with acknowledged strategies and scientific methods, as well as community participation. The study ends with considering forests as a global value,

the challenges of over-use and the central place SFEM has in curbing climate change and making it environmentally sound. The results of this research not only feed the science of SFEM with essential information but also show where research still has to happen, using the gap as a gateway to more widespread adoption of sustainable forest management practices worldwide.

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