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REVIEW

Mapping Peer-Reviewed Scientific Studies on Plant Trait–Service Linkages Across Ecosystems: A Bibliometric Analysis

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Abstract
The concept of 'ecosystem service' has gained momentum in the twenty-first century to bridge the gap between human–nature interactions. However, the challenge remains to map the flow of ecosystem services (ES) for their efficient management. Among the multiple existing methods, biophysical assessments provide better knowledge of the state of the ecosystem and its mapping for complimentary services. Trait–service linkage is one of the tools to reliably link biodiversity with ES if we better understand the role functional traits play in the underlying ecosystem processes. In this paper, we have performed a bibliometric analysis of published literature on ES and plant functional traits to identify the current state of knowledge on trait–service linkage, biases, research gaps, and challenges. There was a skewed geographical basis for trait–service linkage studies; most studies were conducted in Europe and North America. The majority of the research focused on supporting and regulating ES, mainly carbon sequestration, biomass production, and climate regulation, using a particular set of vegetative traits, such as leaf, root, and plant height, and ignored most regeneration traits, except for a few flower traits. A matrix to quantify the association between ES and selected plant traits (specific leaf area, leaf dry matter content, leaf area, leaf nitrogen content, vegetation height, wood density, canopy density, root length, root density, flowering time, flower color and flower size) revealed that the two leaf traits (specific leaf area and leaf dry matter content) in the linkage have contrasting associations with multiple ES. The study illustrated that there is still a considerable research gap in linking plant traits with essential ES (biomass production, climate and water regulation). Thus, suggest future studies on ES should focus more on trait–service linkage across major ecosystems to underpin key ecosystem processes for better sustenance of ES and human well-being.

Keywords Ecosystem service · Plant functional trait · Trait–service linkage · Carbon sequestration · Climate regulation · Specific leaf area

1 Introduction

With the ongoing human-induced accelerated climate change and mass extinction, it has become imperative to treat biodiversity and ecosystem services (ES) as essential life-supporting system (Watson et al. 2019). The biodiversity-linked ES has a very high economic value, since it accounts for around 44 trillion USD and contributes almost half of the global GDP (Daily and Matson 2008; WEF 2020). The ES research community has always aspired to illustrate the contribution of biodiversity and the ecosystem toward human well-being and to elevate stakeholders' role in decision-making to get rightful ecosystem services (Braat and Groot 2012; Fisher et al. 2009; Mandle et al. 2020; Neugarten et al. 2018). After 2005 when the Millennium Ecosystem Assessment (MEA) report was published, research on ES increased exponentially (Boerema et al. 2016; Costanza et al. 2017). The report highlighted that 16 of the 24 ecosystems evaluated were in a critical stage, which, therefore, led researchers from various continents to set their focus on the science of ES (MEA 2005; Reid et al. 2005). Presently, more than 20,000 pieces of literature on ES are available on Scopus and ISI Web of Science databases and reflect that ES has been widely studied across the first world countries (US, UK, Europe, Australia). China is one of the leading countries in Asia that has published studies comparable to Western nations on ES (Boerema et al. 2016). However, in India, the focus on ES

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research gained momentum a little later after 'The Economics of Ecosystems and Biodiversity: India Initiative in 2012' (Chopra et al. 2022; Verma 2018) report published.

The mapping of ES serves as an essential tool for policymakers and institutions to validate and identify areas of maximum importance in terms of natural wealth (Balvanera et al. 2001; Ivanić et al. 2020). Multiple approaches have been developed to map ES for decision-making with the support from the institutions, such as IUCN, Natural Capital Project, IPBES, etc. (Bennun et al. 2018; Díaz et al. 2015a, b; Hamel et al. 2021; Neugarten et al. 2018; Pascual et al. 2017). The approaches are, to some extent, complementary to each other, as they can provide different sets of results depending on the requirement. There are also various approaches to assess ecosystem services such as economic, social, and biophysical; economic and social approaches consider the direct benefits the society perceives, whereas the biophysical approach illustrates the functioning of the ecosystem and the relevance of each species and habitat toward the supply of ES (Anda Ruskule et al. 2018). Biophysical approach thus increases the emphasis of ES mapping as it provides a better understanding of landscape management, elevates the importance of nature conservation, and offers better decision-making ability for the stakeholders (Duncan et al. 2015; Lavorel et al. 2011).

Under the aegis of biophysical approach, trait–service linkage forms a vital tool to highlight the key characteristics that influence ecosystem functioning (De Bello et al. 2010). Several studies have shown that for effective maintenance of ecosystem processes and services, biodiversity and the functional traits of participating species play a crucial role (Butterfield et al. 2013; Hanisch et al. 2020; Harrison et al. 2014). Studies in grasslands have highlighted the role of leaf traits, especially the leaf dry matter content plays significant role to predict the decomposition of leaf litters (da Silveira Pontes et al. 2015; Gaujour et al. 2011; Klumpp and Soussana 2009; Pakeman et al. 2010). Leaf area was found to play a crucial role by absorbing airborne particulates and enhancing air purification capability of the urban neighbourhood (Weber et al. 2014). In agroforestry landscape, leaf area along with leaf biomass was found to be decisive trait in the regulation of water quality (Cresswell et al. 2019). Similarly, reproductive traits such as flower colour, flower size were found to be important both for pollination in terms of agro ecosystem and also in urban ecosystem toward providing aesthetic value (Balzan et al. 2014; Fornoff et al. 2017). In wetland ecosystem, the rooting depth and total plant biomass was illustrated to have significant ES role in carbon sequestration (Chatanga et al. 2020).

It has already been well-established that sometimes a single trait can be responsible for a particular service; for example, flower colour is responsible for aesthetic value. In contrast, a single service can depend on multiple traits, such as leaf traits and wood traits linked to biomass production. Similarly, a single trait can influence multiple services to certain degrees; for example, leaf area influences fodder quality, carbon sequestration, and phytoremediation (Ali et al. 2016; Brown et al. 2013; Burylo et al. 2014; Butterfield et al. 2013; Campbell et al. 2012; Chaturvedi et al. 2011; Cresswell et al. 2019; De Bello et al. 2010; Garcia et al. 2018). Extending ecological concept of keystone species, some traits are also designated known as 'keystone traits' as they have the ability to influence the range of ES (climate and water regulation) while being indicator to the particular drivers of change (i.e., climate change and land use and land pattern changes). Leaf morphology (specific leaf area, leaf area), vegetation height, flowing time and flower size are also among those traits that designated as the 'keystone traits' (Cameron and Blanusa 2016; Hevia et al. 2017; Hu et al. 2008). Therefore, understanding trait–service linkage provides a better insight into the role of individual species in an ecosystem and the human dependencies on these biophysical realms for their sustenance, as it will be strategic guide to monitor the ecosystem health and functioning in the Anthropocene epoch (Cardinale et al. 2012).

Given all the scientific advancements, the question still looms about how the community of ecosystem scientists can better practice ES research toward a more target-oriented decision-making process (Bawa et al. 2020; Díaz, et al. 2015a, b; Guerry et al. 2015; Mandle et al. 2020). This brings us to our objective, to illustrate the current state of scientific knowledge on trait–service linkage. Notably, we were interested in unfolding the yearly trend and geographical distribution of studies across the globe, finding which ecosystems, services, and functional traits were focused more on studying trait–service linkages. The paper also aims to illustrate the strength of association between particular trait–service links to highlight the significance of further research prospective based on those associations.

2 Methods

2.1 Inventory

Literature was collected from two reputed scientific literature databases—Scopus and Web of Science. The literature query was carried out using a single keyword, 'Ecosystem service*' and 'Plant functional trait*', to avoid missing out on any literature from the respective domain. In all cases, keywords were searched among title, abstract, and author keywords (TITLE–ABS–KEY) according to the widely used protocol (De Bello et al. 2010; Hanisch et al. 2020; Kumar et al. 2022). The combined number of literature collected from both databases was 28,268. The query was set between a particular time frame of 1997 and 2021. Since it is widely accepted that the ES concept was formally established in 1997 with the landmark publications of Daily (1997) and Costanza et al. (1997), we chose 1997 as the beginning year for the literature survey. Before that, there were multiple informal ES concepts, but we avoided including them to minimize any analytical errors in the later stages. The search item from the databases was limited only to research articles published in peer-reviewed journals in the English language.

2.2 Screening

The PRISMA technique was followed during inventory selection (Page et al. 2021). PYTHON software was used for different stages of screening. Figure 1 shows the detailed inventory and selection flow chart with the respective number of literatures added and removed based on the criteria for each step. In the first stage of screening, Python programming was deployed to screen out the duplicate literatures, since two databases were involved in developing the inventory of 28,268 literatures. Python code was developed to remove duplicates, keeping the first one and deleting the later repetitive ones. About 20,753 literatures were shortlisted after screening out the duplicates from the inventory. In the second stage of screening, we further deployed Python coding to shortlist the literatures which have specifically discussed 'trait or traits' and 'service or services' simultaneously in their abstract section. It yielded into 474 literatures, to have discussed those terms. In the third stage, we used manual sorting, all the articles were read thoroughly and scrutinized in detail. The focal parameter of the manual sorting was to see if the literatures have quantitatively discussed the plant trait–service linkages and thereafter 41 articles were found relevant to the parameter. We further carried out snowball sampling, whereby we looked into the references of the shortlisted 41 articles, and found out 27 additional literatures which have discussed plant functional traits and ecosystem services from quantitative perspective. Finally, 68 publications were found suitable for detailed investigation on plant trait–service linkages studies (Supplementary Table S1).

2.3 Analysis

The geolocations of the study areas (if available) or otherwise institutional locations of the principal author were plotted on a world map using ArcGIS 10.8. The plant traits shortlisted for the analysis included specific leaf area (SLA), leaf dry matter content (LDMC), leaf area/leaf area index (LA), leaf nitrogen content (LNC), vegetation height, wood density, canopy density, root length, root density, flowering time, flower size, flower color. All the selected traits were based on prior knowledge available from the published scientific studies illustrating the supply of important ES (biomass production, fodder quality, climate regulation,

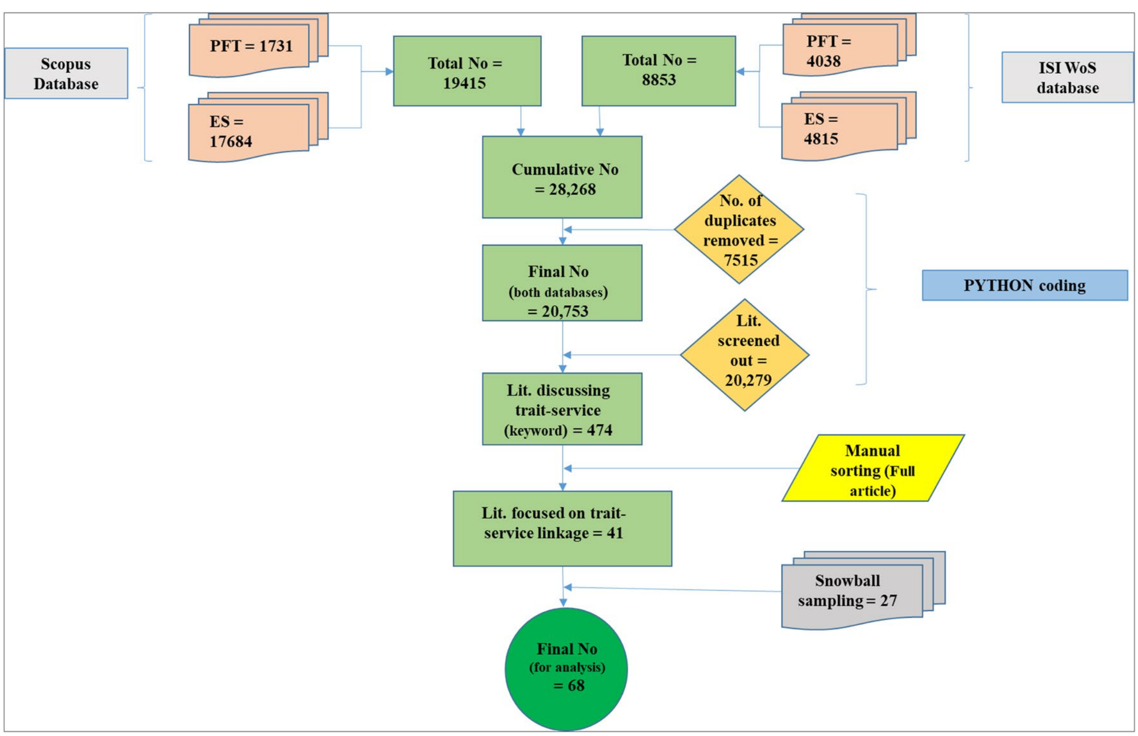


Fig. 1 Flow diagram for screening the literature from Scopus & ISI WoS

carbon sequestration etc.) associated with these traits (Ali et al. 2016; De Bello et al. 2010; Lundholm et al. 2015; Pakeman et al. 2010; Tadesse et al. 2014; Yang et al. 2019). To determine the strength of the association between the specific trait and the service in the trait–service linkage, the following protocol was used: (a) the literature reporting positive associations was denoted by "1", negative association by "– 1", and no association by "0"; (b) traits with a minimum of two associations with any specific ecosystem services were only taken into consideration; (c) the direction of the associations (positive or negative) was only obtained from the result section to eliminate discrepancies, as some experiments described in the method sections of the literature could not yield meaningful reports. Later the overall trait–service association was calculated by adapting the formula by Harrison and colleagues ():

$$\text{Strength of association} = \frac{\sum(\text{literature reporting positive association})(\text{literature reporting negative associations})}{\text{Total number of literature}}$$

2005 (Braat and Groot 2012; Chaudhary et al. 2015; Costanza et al. 2017; Mandle et al. 2020; Mengist et al. 2020). ES researchers felt that there was a need to include various proxies and methods to evaluate the change in biophysical realms and subsequent ecosystem services. If appropriately included, this could be a significant factor in the emergence of trait–service linkage as the proxy to map the delivery of ecosystem services (Brown and Anand 2022; Cardinale et al. 2012; De Bello et al. 2010; Hanisch et al. 2020; Kleyer 2021; Lavorel and Grigulis 2012).

Our review also reveals that, despite some yearly inconsistencies in trait–service linkage studies, the trend is still upward, which also corresponds to an overall upward trend in the publications of the ES literature in general. Furthermore, a rapid increase in publication can be observed in 2021, which could be attributed to the announcement of the UN decade of ecosystem restoration (2021–2030) by the UN Secretary-General in 2019. However, the sharp fall in 2021 can be very well-explained due to the hindrance of the fieldwork and lab experiments during COVID-19 (Gao and Yian 2021). Although the trends in the publication have seen gradual growth, the numbers have been somewhat limited compared to overall publication in ES, which has risen four times in the last decade (Wang et al. 2021). This illustrates that there have been some limitations in field work to collect trait data or a reluctance among old-school ecologists to 'commodify' nature using the word 'services', which might have added to the limited publication and studies on trait–service linkage. Out of 68 selected research studies on

3 Results and Discussion

3.1 Trends in Year and Geographic Distribution of Studies

The first literature on plant trait–service linkage was published by McIntyre in 2008 (McIntyre 2008). After that, gradual growth in yearly publications has been observed in preceding decades (Fig. 2). The maximum number of articles (14) was published in 2020.

The trend of publication on trait–service linkage has been on the rise since 2008, which could be due to the growing consensus on ES research around the globe after the release of Millennium Ecosystem Assessment Report (MEA) in

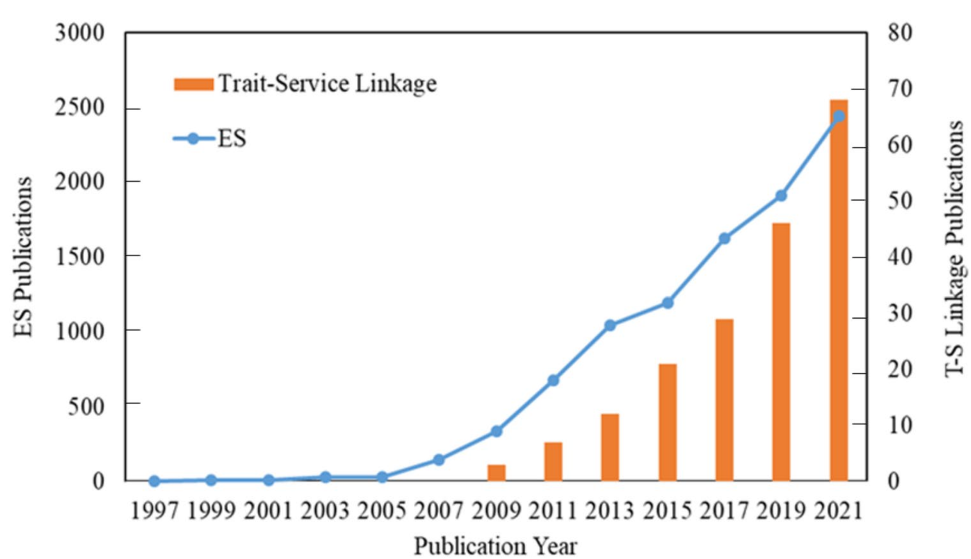


Fig. 2 Trend of ES and plant trait-service linkage publications from 1997–2021

plant trait–service linkages, 54 were carried out in 66 field locations across the globe in different landscapes (Fig. 3).

Result reveals that trait–service linkage studies were primarily done in Europe (28), followed by North America (9), Asia (8), Africa (5), South and Central America (3), and the least in Australia (1). Only six of the 54 studies have been carried out in tropical regions (within the boundary of the tropics of Cancer and Capricorn). The distribution of the study site has been skewed toward the Western first-world countries (US, Canada, UK, and Western Europe), which can be well-established by the fact that the concept of ES and trait based plant functional ecology was conceived early in these countries in comparison with the eastern and southern parts of the globe. Although in the past five years, multiple studies have been conducted in China on the trait–service linkages. Thus, China has emerged as one of the leading country in recent times to conduct research on ES and adopt policies to conserve ecosystems (Daily 1997; Wang et al. 2021).

Despite tropical and sub-tropical regions being rich in biodiversity and dependencies of large populations on ecosystem services (specifically provisioning services), surprisingly only a few (< 5) studies so far have been carried out there. Similarly, less than five studies have been conducted so far near the equator. These geographical distribution biases in studies will lead to an under-representation of the potential trait–service linkage concept held as a biophysical tool, since 90% of the global ecosystem services are delivered from the tropical region (Raven et al. 2020).

3.2 Ecosystem-Specific Studies

The study on plant trait–service linkage has been carried out across all major ecosystems. Of the 68 publications, 66 focused only on an individual ecosystem. The remaining two publications were framework papers and, therefore, excluded from the analysis. Agro, grassland, urban, and forest ecosystems were topped with > 10 studies each (Fig. 4), followed by wetlands/marshes/peat/floodplain (8), brownfield/degraded/mix landscape (5), and oceans/river (2) ecosystems.

The possible focus on agro and urban ecosystems may be due to their characteristics as these two ecosystems are human-modified; therefore, the trait–service linkage in those ecosystems had been already pre-defined and attributed through traditional and scientific understanding (Anand et al. 2010; Santos et al. 2021). However, these studies can be circumstantially relevant as control studies to understand the application of trait–service linkage as a tool for better mapping of ES in natural landscapes (forests, wetlands, etc.). Given that the vast area of Europe is covered with grassland ecosystems (Smit and Metzger 2008), thus, it is not surprising that multiple studies have been conducted on them. In particular, cultural ecosystem services have been well-studied in urban green spaces, since most green spaces

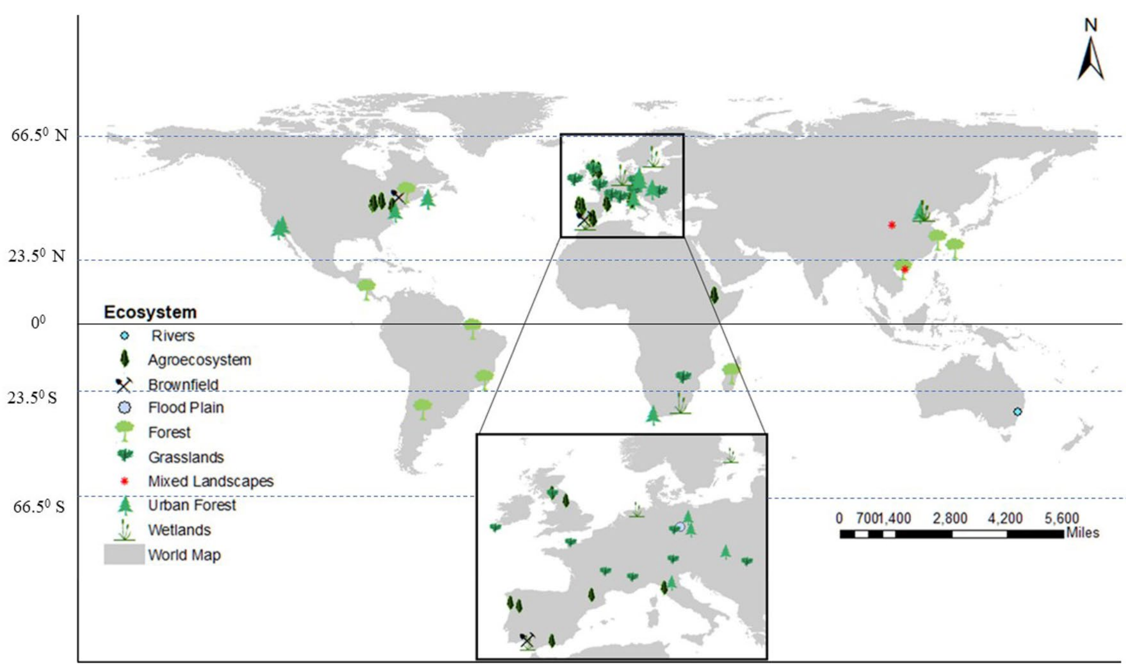
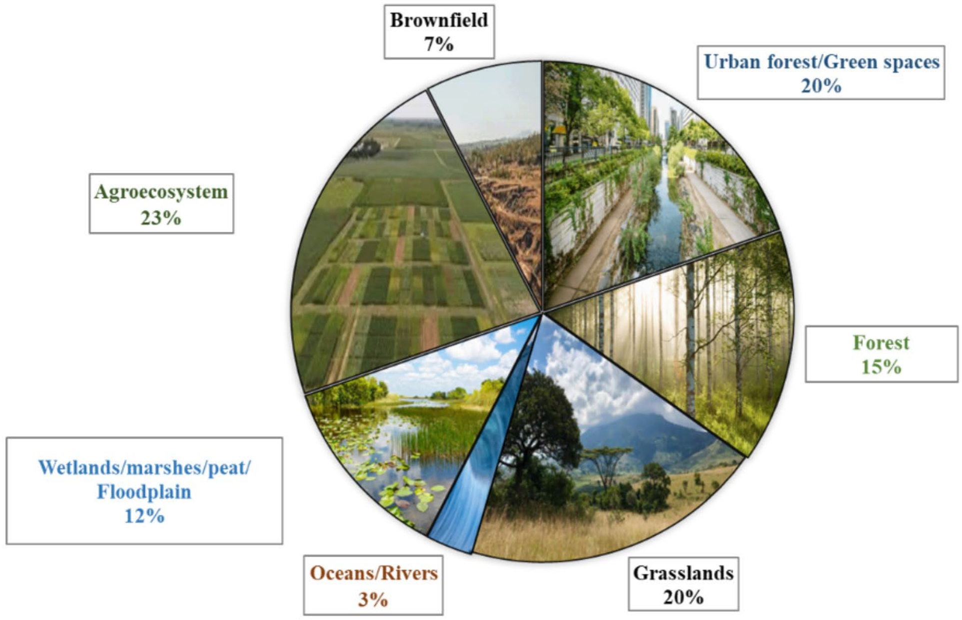


Fig. 3 Geographical distribution of study sites. (Single studies with multiple nearby geo-coordinates have been removed to avoid cramming)

Fig. 4 Percentage of plant trait-service linkage studies in different ecosystems



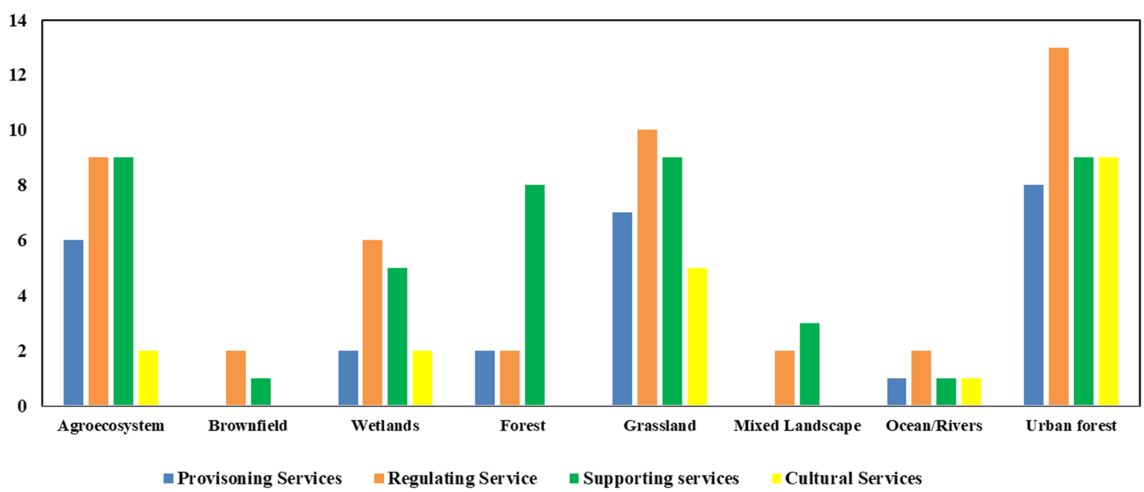


Fig. 5 Number of studies on different ES categories in diverse ecosystems

in urban regions are designed to acknowledge the aesthetic and recreational value of plants (Chan et al. 2012).

There is enormous potential to explore wetlands, rivers, and other aquatic ecosystems, given the importance of macrophytes and corals in providing crucial ES, such as carbon sequestration, water and climate regulation, etc. Studies on macrophytes and corals will also generate information regarding their biological functions and conservation issues that is still short given their ecological role (Hoegh-Guldberg et al. 2017; Moor et al. 2015; Pan et al. 2020).

As per the MEA report (Fisher et al. 2009; Reid et al. 2005), ES are classified into four major categories (Provisioning, Regulating, Supporting, and Cultural). Regulating and supporting services have been widely studied in all ecosystems compared to provisioning and cultural services (Fig. 5). Given its importance and ability to be easily quantified, it is more intricately overlapped at times with ecosystem functions. Only in the case of degraded and mixed landscapes, the study's focus is entirely on regulating and supporting services. Provisioning services have been given better emphasis in the human-modified ecosystem (agroecosystem, urban ecosystem) compared to natural ecosystems (forests, wetlands), given the self-explanatory reasons that the former ecosystems are modified to deliver food, fodder, and fuel (provisioning services). Cultural services were the most neglected category among all ES–trait linkage studies.

3.3 Plant Traits Studied for ES Linkages

Leaf traits have been widely studied across all ecosystem services, especially SLA, LDMC, and LNC (Fig. 6). The reason could be the easy accessibility of both primary and secondary data sources (through herbarium, published literature and e-databases; Kattge et al. 2020). In addition, leaf traits are more relevant for with the essential services, such as biomass production, fodder quality, and nutrient cycling, etc. (Ali et al. 2016; Cresswell et al. 2019; Yang et al. 2019).

Vegetation height and flower traits were the second and third most widely studied, given their linkage with essential regulating services of carbon sequestration and pollination (Balzan et al. 2014; Conti et al. 2013; Cresswell et al. 2019; Everwand et al. 2014; Fornoff et al. 2017; Hoosbeek et al. 2016; Manning et al. 2015). In the case of wood or bark traits, there has been a considerable number of studies in the category of provisioning services, as it is directly linked to timber production, an essential service. Root traits have more or less uniform studies across all the ecosystem services, as they are necessary for all the categories of services (Bukovsky-Reyes et al. 2019; Chaturvedi et al. 2011; Gervais-Bergeron et al. 2021; Marañón et al. 2020).

In contrast to the traits mentioned above, the fruit/seed and canopy traits were the least studied. Given that canopy traits are perceived mainly to assess cultural services, interestingly only limited studies on canopy trait–service linkage were found for urban and forest ecosystems (Lundholm et al. 2015; Randle et al. 2018; Xie et al. 2018). Seed traits are neglected despite their crucial role in the maintenance and survival of ecosystems. Data are generally skewed toward a few selected trait–service linkages, since most publications are from human-modified ecosystems, with a narrow focus on selected ES (fodder quality, water regulation, biomass production, carbon sequestration, aesthetic value, etc.). Researchers strongly advocated that more comprehensive studies on trait–service linkage with multiple trait–service associations in all the natural and human-modified ecosystems are required for a better understanding of ecosystem functionality (Brown and Anand 2022; Cámara-Leret et al. 2014; Duncan et al. 2015; Faucon et al. 2017; Lavorel et al. 2011; Moor et al. 2015; Xie et al. 2018).

3.4 Trait–Service Association

This study is the first to illustrate a comprehensive overview of the trait–service linkage (Fig. 7), showing both positive and negative associations between individual trait–service links using approach proposed by Hanisch et al. 2020; Harrison et al. 2014. SLA and LDMC, the two leaf traits in trait–service linkage, were found to have contrasting associations with multiple essential services (biomass production, feed quality, climate regulation, carbon sequestration, phytoremediation, etc.) of an ecosystem (Gervais-Bergeron et al. 2021; Hanisch et al. 2020; Klumpp and Soussana 2009; Pakeman et al. 2010). SLA was found to have the strongest positive association (+ 1) with most ES, including biomass production, water regulation, nutrient cycling, litter decomposition, and aesthetic appeal, and a strong negative association with phytoremediation (− 1). However, some of the ES (biomass production, water regulation, litter decomposition) has the exact opposite associations with LDMC, which have also been confirmed earlier in several studies focusing on trait–service linkages (Bihuňová et al. 2021; Cebrian-Piqueras et al. 2021; Helletsgruber et al. 2020; Tasset et al. 2019; Yang et al. 2019). LA, LNC, root length, and root density also had similar linkage associations to SLA; however, it varies, probably due to the limited focus on these traits compared to SLA and LDMC. Vegetation height, wood density, and canopy density followed a similar direction of associations with most services, including biomass production, climate regulation, and carbon sequestration. However, canopy density had a unique and strong positive association with recreation value and aesthetic appeal.

Flower traits were found to have a strong positive association with cultural ecosystem services (aesthetic value, recreational value), which is expected given that cultural services are primarily generated from socio-environmental surveys, as the common public notion has always been closely associated with flower color, size, and timing (Balzan et al. 2014; Cresswell et al. 2019; Fornoff et al. 2017). However, the associations and their subsequent strengths are subjective to the drivers of change, which can vary due to environmental or socio-ecological factors (Cebrian-Piqueras et al. 2021).

The limited focus on other traits of the plant may have skewed the direction and strength. This may be misleading for future studies if it only focuses on particular traits in assessing complementary ecosystem services. Since the distribution of publications on trait–service linkage is biased toward specific ecosystems and traits; therefore, there is a need to evaluate multiple traits to link multiple ES across ecosystems and habitats to understand the true strength of the association of trait–service linkage as several researchers are advocating (Brown and Anand 2022; Kleyer 2021; Lavorel et al. 2011).

Figure 8, summarizing the geographical regions, landscapes/ecosystems, plant traits and/or ecosystem services so far have been focused or ignored over the years for service–trait linkages studies in ES research. For example, most of the studies have been carried out in the western countries with special focus on the human-modified landscapes. Thus, encouraging the future ES researchers to carry out further research on service–trait linkages focusing more on diverse natural ecosystems of global south regions using multiple traits.

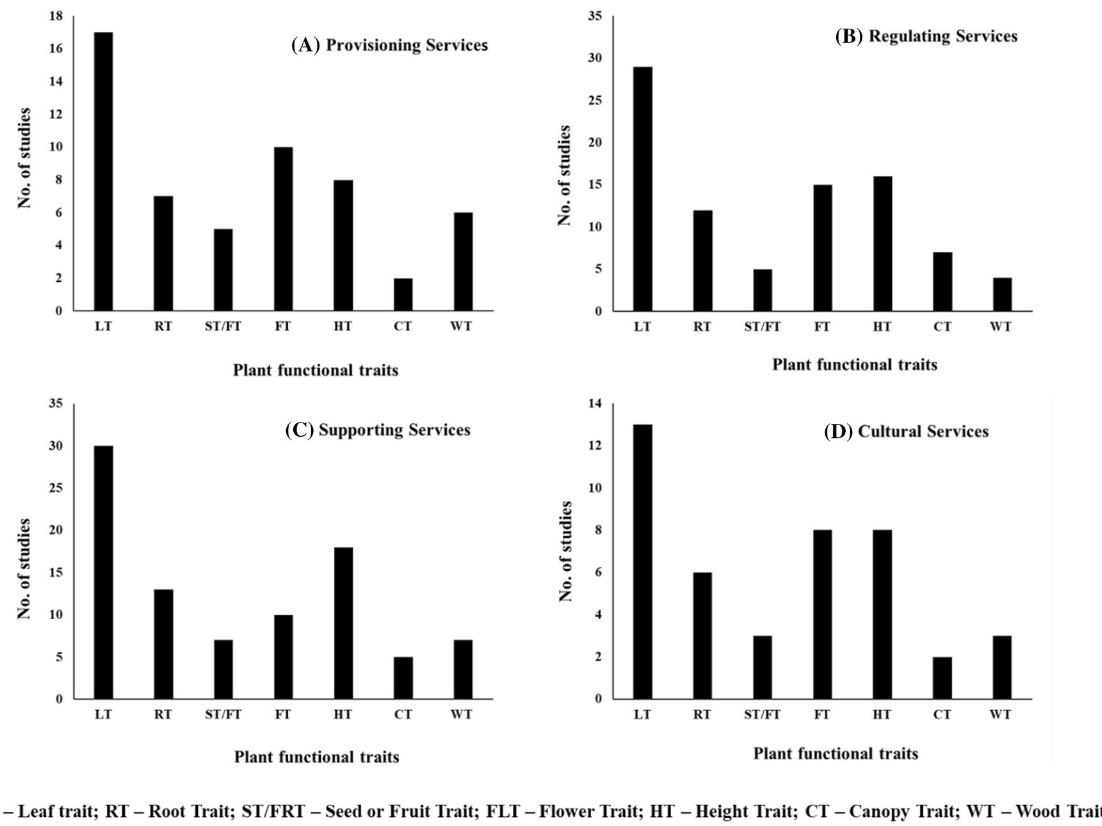


Fig. 6 Number of studies on various plant traits among different categories of ES

Trait/Service	Biomass production	Fodder quality	Climate regulation	Water regulation	Carbon Sequestration	Nutrient Cycling	Litter decomposition	Phyto-remediation	Pollination	Recreation Value	Aesthetic appeal
SLA	1	0.9	-0.5	1	0.1	1	1	-1			1
LDMC	-1	-1	-1		-0.5	0.4		1			
LA/LAI	1	1	1	1	0.5			1		1	0.75
LNC	0.25	0.6	-0.5		0.25	1					
Vegetation height	0.8	0.25	0.6	1	1	-1		1		1	-0.5
Wood density	1		0.25		1						
Canopy density		1	1	1			-1			1	1
Root Length	1		1	-1		1					
Root Density	1	1			1	1		1			
Flowering time		-1	-1			-1			0.25	1	
Flower size									1	1	0.8
Flower colour									1	1	1

Fig. 7 Matrix showcasing trait-service associations. (Black cells in the matrix indicating either no associations or unavailability of data). (*SLA* specific leaf area, *LDMC* leaf dry matter content, *LAI* leaf area index, *LNC* leaf nitrogen content)

Fig. 8 Highlighting the major findings of the study

4 Future Recommendations

This article has illustrated considerable research gaps in the knowledge system of plant trait–service links to various degrees. Based on these gaps, we recommend following future research directions:

(1) More studies need to be carried out in diverse ecosystems from tropical regions that host important and rich biodiversity in diverse landscapes dominated by human population to understand the critical human–nature dependency for ecosystem services.
(2) More keystone plant traits including underrepresented reproductive traits need to be studied and included to better understand linkages between traits and ecosystem services.
(3) In addition, lesser-known plant species including rare, threatened and endemic species should be studied for trait–service linkages to delineate their relationship with ecosystem services for better policy developments in managing and conserving biodiversity and overall ecosystem functioning.

5 Summary and Conclusions

Trait–service linkage is one of the fundamental and essential tools to understand the importance of biodiversity in the sustenance of biodiversity-linked ES; however, there have been only few trait–service linkage studies so far when we compared them with overall studies on ES in general. Majority of these studies were carried out in global north countries, where trait based ecological research has already been well-established. The global south countries are lagging behind despite being rich in biodiversity and large proportion of their population directly dependent on ecosystem services for their livelihood and daily needs. Furthermore, the selection of plant traits for trait–service linkages were biased more toward soft (easy to measure) traits as compared to hard (difficult to measure) traits. A trait–service association matrix revealed that the SLA and LDMC have contrasting associations with multiple ES. The study conclude that the global south countries need to join their global north peers to study more plant functional traits along with ecosystem services from underrepresented geolocations, ecosystems using less represented plant communities. We believe this study may create more awareness among scientists, conservationists, and policymakers to think in this direction of ES research as current knowledge base has its own limitation and biases to draw a generalized pattern/trend about service–trait linkages due to availability of limited studies from limited studied ecosystems.

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Author Contributions AS: conceptualization, formal analysis, investigation, methodology, data accumulation, resources, software, writing—original draft, reviewing, and editing. SSP: supervision, reading, writing—review and editing. PM: software, reading, writing—review and editing. AV: software and reading.

Data availability The litertaure data collected for this study can be seen within supplementary material.

Declarations

Conflict of Interest The authors declare they have no competing interest which could have influenced the work in this paper.

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