



# Navigating ecosystem services and access inequalities

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## ABSTRACT

Humans rely on ecosystems to meet their needs and enhance their well-being through the provision of ecosystem services. However, the distribution of these services may not benefit all groups equally. Understanding the complex relationship between human well-being and ecosystem services requires analysing access to these benefits. This study addresses the gap in ecosystem service research by providing a comprehensive analysis of the access mediating factor along the cascade model. By exploring the case of cruise ship tourism in Barcelona, this study sheds light on who gains access to ecosystem service benefits and its implications. A mixed method approach was used by combining the analysis of semi-structured interviews, official documents, and reports, which were qualitatively analysed using grounded theory, as well as a survey of cruise ship passengers ( $n = 755$ ). Our results show that space is a significant factor in controlling access to the harbour, with cruise companies holding long-term concessions. Cruise companies also exercise considerable control over global supply chains through institutional agreements and assets to gain access to ecosystem services, leading to a shift from regional and local suppliers to global suppliers. However, local institutions are identified as a key influencer of social representations, acting as a mediating factor in the ecosystem service flow to cruise tourism, particularly for cultural services. Understanding these dynamics is vital for achieving a more equitable and sustainable management of ecosystems and their services. These findings can inform policymakers, stakeholders, and communities about the importance of considering access issues when managing ecosystems to ensure that ecosystem service benefits are distributed fairly and sustainably. Moreover, this study highlights the relevance of political ecology in understanding access and power dynamics within the ecosystem service framework.

## 1. Introduction

Humans transform ecosystems to satisfy their needs, obtain economic profits, or adapt to social and environmental changes [48]. Ecosystem services (ES) refer to how ecosystems fulfil human needs. This occurs through interactions between humans and nature, resulting in the provision of services that enhance human well-being. However, it is important to acknowledge that the distribution of ES might favour certain groups while excluding or disadvantaging others, resulting in trade-offs and costs [3]. This complexity highlights that the relationship between anthropological welfare and ES extends beyond a simple cause-and-effect correlation. Furthermore, the benefits derived from ES and their impact on human well-being exhibit variations across different spatial and temporal scales. Actors may value these benefits differently depending on the context.

The distribution of ES benefits and their impact on well-being raises a

crucial question about access. Without access to the flow of ES benefits, individuals or social groups cannot reap its advantages [15]. Analysing access involves exploring how particular individuals or groups acquire access or influence others' access, while also comprehending the power dynamics that form the basis of these mechanisms ([49]; Solé 2019). Recognizing the dual nature of access is crucial. In specific situations, excluding particular actors is necessary to facilitate others in enjoying the associated benefits [14,42]. For instance, the enjoyment of recreational and aesthetic benefits of beaches might result in the exclusion of other users, as fishermen who can see their access to fishing restricted. This restriction is considered the antithesis of access, as it limits the ability to derive benefits from resources [14]. Building on the framework developed by Ribot and Peluso [49], access should be perceived not only as the mere ability but also as the capability of humans to obtain benefits from nature. This broader understanding takes into account not just the physical access but also the potential to realize and utilize the

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benefits provided by ecosystems.

Haines-Young and Potschin [28] have conceptualized the ES flow from supply to demand as a cascade model. The access or exclusion to ES affects the whole (co)production process of ES as illustrated in the cascade model (Fig. 1). In this model, human actions transform biophysical processes and ecological functions into ES and benefits which are finally delivered to beneficiaries. At every stage of the cascade, access is influenced by distinct mechanisms and power dynamics [3].

Several authors have studied access mechanisms, the actors involved, and their power relations throughout the ES cascade model. Much of the research in this field has concentrated on the benefits obtained by humans and their value. Researchers have employed a disaggregated analysis to examine the different beneficiaries ([3]; Solé, 2019). These works have aimed to understand and identify differences among social groups, specifically who has access and who is excluded at the final stages of the cascade framework. This includes examining the winners and losers. Therefore, access lenses serve to expand the ES framework to include political ecology interests [3,4]. In this regard, even though the flow of ES benefits has been addressed through the analysis of stakeholder roles and power relations, still access mechanisms have not been fully studied. This research aims to address the existing ES research gap on access to the flow of ES benefits by studying how ES benefits are allocated and who has access and who is excluded. To that goal, and as elaborated in the subsequent sections, we modify the framework proposed by Fedele et al. [21] to study how mediating factors imprint the allocation-appropriation of the flow of ES benefits to beneficiaries in the event of cruise tourism in the city of Barcelona (Spain). Specifically, we investigate how different stakeholders have access to the allocation of the flow of ES benefits, and who is excluded.

## 2. The conceptual approach to access and ES in the case of cruise ships

### 2.1. Access to ES literature

The cascade model investigation has mainly focused on benefit and value stages [3], as outlined in Table 1. Numerous researchers -including, Daw et al. [15,16], Santos-Martín et al. [53], Hicks and Cinner [31], Dawson and Martin [17], Horcea-Milcu et al. [33], Villamagna et al. [65], Chaudhary et al. [13], Robinson et al. [50], Brück et al. [7], and initiatives such as the Science-Policy Platform on Biodiversity and ES (IPBES) and ES for Poverty Alleviation (ESPA)-, have extensively studied how different social groups access and perceive ES benefits for their welfare. Additionally, other authors, as Iniesta-Arandia et al. [34], Jacobs et al. [35], and Martín-López et al. [40], as well as the IPBES, have devoted substantial efforts to tackling the final step of the cascade model. They have focussed on evaluating value pluralism and gaining a deeper understanding of how diverse social groups perceive and value the benefits derived from ES.

Despite considerable research efforts, there remains a gap in empirical research and suitable methodologies to study access during the production and flow stages of the cascade model (Berbés-Blázquez et al., 2017). In simpler terms, there has been limited investigation into access to ES production and flow. Notably, Berbés-Blázquez et al. [3] conducted a study on the access mechanisms concerning ES production within the Bribri indigenous community in Costa Rica. Moreover, a few other authors, such as Felipe-Lucía et al. [22] and Vallet et al. [62], have

studied the different roles of stakeholders in allocating benefits and the power relations among different actors. Their research provides significant insights into how the stakeholders who control the first steps of the cascade, and the stakeholders who oversee the initial stages of the cascade shape the outcomes of the final stages of the cascade; i.e., who benefits in the last steps of the cascade [62] Table 1. Nevertheless, more empirical research linking ES and political ecology is needed to better understand how power relations define ES benefit delivery and who benefits [62], as a better understanding of the mechanisms shaping ES flows could support more equitable and sustainable ES governance [21].

### 2.2. The analytical framework of access and ES

Fedele et al. [21] have purposed a framework to study access along the cascade model step based on the contributions of Spangenberg et al. [56] on human processes that mediate each cascade step. The framework developed by Fedele et al. [21] distinguishes between mediating mechanisms and factors. Mediating mechanisms refer to human interventions at each step of the cascade model aimed at determining in particular ways the delivery of ecosystem services. There are four mediating mechanisms; 1) management: humans modify ecosystems through management actions, e.g., dune restoration projects in coastal areas to enhance coastal protection services; 2) mobilization: addition of human assets (knowledge, labour, etc.) to ecosystem functions and processes to obtain ecosystem services, e.g., food production or fishing requires knowledge and tools; 3) allocation-appropriation: humans distribute ecosystem services and their benefits to different beneficiaries, e.g., milk producers and distribution companies serve milk to different consumers; and 4) appreciation: humans attribute values to the contribution of ES and their benefits to their well-being, e.g., people value forest and natural areas for their physical and mental well-being. Furthermore, mediating mechanisms are imprinted by mediating factors, that facilitate or deter ES provision and access. Moreover, Fedele et al. [21] have identified four mediating factors: rules, assets, values, and space. Rules refer to the formal and/or informal set of principles that regulate the organisational structure of individuals and groups, their behaviour, and belief systems [46]. Through rules, the rights of access, distribution, and participation are controlled. For instance, water distribution can be defined through concession agreements made between public and private entities. Assets can be tangible and intangible goods and capabilities used to facilitate the allocation of specific ecosystem services [21]. For example, water is distributed through pipeline infrastructure to different users. Values are, according to Schwartz [54], a collection of ethical principles that shape the way individuals prioritize actions and assess events. For instance, climate change beliefs and water scarcity perception might change water consumption patterns [9,26]. Finally, according to Fisher et al. [23], space refers to the specific

## 3. Methods

### 3.1. Applying the framework to cruise ship tourism

For the purposes of this paper, the authors adapted some of the mediating factors proposed by Fedele et al. [21]: space, rules, assets, and values (Table 2). These authors consider that rules include institutions, access, rights, and markets. Nevertheless, their definition excludes informal agreements, social networks, and other social relations that are

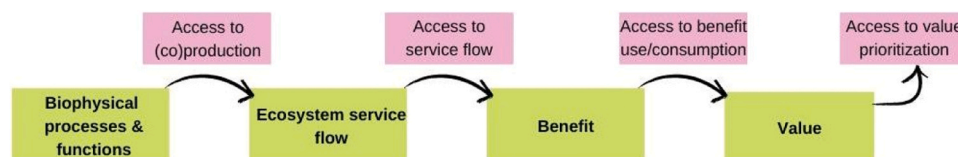


Fig. 1. Own elaboration adapted from the cascade model developed by Haines-Young and Potschin [28].

**Table 1**

Cascade model steps and existing research efforts.

| Cascade model steps                | Transformations  | Description  | Research   | Example   |
|------------------------------------|--|--|--|---|
| Ecosystems processes and functions | From ecosystems processes and functions to ES coproduction | Transformation of the biophysical processes of an ecosystem into ES.   | Berbés-Blázquez et al. [3] conducted a study on the access mechanisms to land, labour, knowledge, tools, markets, and credit necessary for ES coproduction in the case of small-scale plantain farmers in the Bribri indigenous community in Costa Rica.   | Access to financial resources enables investment in farming activities. Traditional systems may have limited access to credit, hindering the ability to purchase inputs or expand production.   |
| Flow                               | From ES to ecosystem benefits flow                         | The ES coproduced become an ecosystem benefit to someone (Berbés-Blázquez et al. 2017).                      | Felipe-Lucía et al. [22], Vallet et al. [62]. Vallet et al. [62] built an analytical framework to identify and assess stakeholders' roles in ES management and benefit in the Mariño River watershed (Perú); i.e., stakeholders who directly and indirectly influence ES flows along the cascade, and stakeholders that benefit from ES. Similarly, Felipe-Lucía et al. (2015) modified the cascade framework to incorporate interactions among stakeholders, capturing power dynamics that influence the flow of ES, as well as delineating the roles of stakeholders (beneficiary, impaired, manager) in the floodplain of the river Piedra in Spain.  | Vallet et al. [62] identified how public institutions and NGOs held significant power in managing ESs related to forest conservation and carbon sequestration. These organizations had the authority to set conservation priorities, allocate resources, and design management strategies. However, local communities—who directly depended on the forest for timber, fuelwood, and grazing—had limited involvement in decision-making processes. |
| Benefits                           | Benefits to human well-being                               | ES benefits contribute to the human well-being of stakeholders (Potschin and Haines-Young 2016).             | Hicks, McClanahan, Cinner, & Hills, [32], Daw et al. [15], Dawson & Martin, [17], Horcea-Milcu et al. (2016), and Villamagna et al. [65], Chaudhary et al. [13], The Intergovernmental Platform on Biodiversity and ES (IPBES), ES for Poverty Alleviation (ESPA), these papers and initiatives addressed the connexion between ES and people well-being. For example, the paper authored by [32] studied how different management approaches and interventions can influence the provision of ES and ultimately impact the livelihoods and resilience of coastal communities. Similarly, Daw et al. examined the potential of ES as a tool for addressing poverty and improving the well-being of marginalised communities. Remarkably, these papers also approached human well-being by a disaggregated analysis among social groups. Thence, they addressed inequalities between social actors in terms of ES provision and human well-being. | Daw et al. [15] to ES benefits due to unclear land tenure or insecure land rights, which can prevent smallholders from participating having access to ES benefits, such as food.  |
| Value                              | Benefit to value   | People assign importance to well-being benefits through different criteria (Potschin and Haines-Young 2016). | Martín-López et al. [40], Iniesta-Arandia et al. [34]; Jacobs et al. [35], IPBES, these papers addressed value pluralism in ES assessments. Individuals might hold different priorities, preferences, and cultural contexts regarding ES. These diverse values shape how ES are perceived, assessed, and managed. These authors highlighted the urgent need to include value diversity in decision-making processes.   | Local communities may prioritize the sustainable use of resources for subsistence, while external stakeholders might focus on conservation or tourism, potentially leading to conflicts or exclusion of local needs and values.   |

Own Elaboration.

important in this case. For example, relations between cruise companies and the harbour authority. Therefore, our adapted categories are: space, institutional agreements, assets, and social representations, see Fig. 2.

Particularly, we change mediating factors rules and values to institutional agreements and social representations, respectively, as explained in Table 2. Social representations, instead of values, aim to broaden Fedele et al. [21] definition – identities, beliefs, aspirations, and preferences- to include any individual or collective value, identity, belief, or preference that determines the way people act and evaluate events.

### 3.2. Research instruments

This research adopts a mixed-methods approach, incorporating both a survey administered to cruise ship passengers and semi-structured interviews with actors involved in cruise tourism in the city of Barcelona (Solé, 2019). The survey specifically focused on evaluating the

utilization patterns and preferences regarding of ES by cruise travellers. The questionnaire (see Appendix 1) included some background questions (age, gender, nationality, etc.), trip questions (how they arrived in Barcelona, how do they move around the city, etc.), places they visited and why they visited them, and valuation of ES and benefits. It is important to be aware of the time constraints of cruise respondents. That is why the survey was designed to be short and easily understandable for a general audience. Concepts such as ecosystem services can be challenging, while place-related activities and experiences are less cognitively challenging (Brown and Kyttä, 2018). For this reason, the survey questions aimed to learn about the places cruise tourist visit, their practises, and experiences in these places. Thus, we aimed to understand what ecosystem service benefits were significant to cruise visitors. For example, if they value aesthetic, cultural, spiritual, or other values when they visit a specific site.

The semi-structured interviews were organised into three primary blocks as outlined in the interview protocol (see Appendix 1). The first

**Table 2**

Mediating factors categories based on [21] and [56,57]. Source: own elaboration.

| Mediating factors Fedele et al. [21] | Mediating factors in this paper | Description   | Examples  | Reference          |
|--------------------------------------|---------------------------------|---|---|--------------------|
| Space                                | Space                           | Space refers to the particular location where benefits are offered, beneficiaries are positioned, or risks are present. Fisher et al., [23] | Harbour terminals for cruise ships                                  | Fedele et al. [21] |
| Rules                                | Institutional agreements        | Institutional agreements refer to informal agreements, social networks, institutions, legislative and labour frameworks                     | Formal agreements between cruise companies and food chain suppliers | [56,57]            |
| Assets                               | Assets                          | Assets encompass both tangible and intangible resources and capabilities that individuals utilize for their livelihoods                     | The global network of food suppliers                                | Fedele et al. [21] |
| Values                               | Social representations          | Social representations pertain to a collection of priorities that influence the actions and evaluations of people regarding events          | Promotion of specific touristic destinations                        | [56,57]            |

block focussed on inquiring about the provision of cultural services and benefits that cruises and passengers demand in the city of Barcelona, and what and how these ES and benefits are allocated. Second, interviewees were questioned about the coproduction and allocation process of these ES benefits flows. In this regard, the interviewer demanded that interviewees describe the process and flow from ES provisioning and benefiting areas. Third, the interviewer asked questions concerning actors and relations involving ES benefit allocation. For example, who are the actors involved in ES allocation and what are the relations among these actors.

### 3.2.1. Data collection and analysis

Initially, the questionnaire underwent testing in December 2017 with a sample of 15 respondents. After some reformulation, the final survey was conducted during two distinct seasons (winter and summer) to capture potential seasonal variations in cruise ship passengers' behaviours and preferences. Our sample was limited to cruise passengers approached in tourist spots, including passengers with pre-arranged tours, and in public transport. Data collection was carried out through random surveys conducted within the harbor area but outside the cruise ship terminals, on shuttle buses transporting passengers to the Barcelona city center, and at key tourist locations such as the Barcelona Cathedral and the Museu Marítim. Due to restrictions imposed by cruise ship companies, researchers were not permitted to conduct surveys inside the cruise terminals. As a result, passengers on pre-arranged tours may be slightly underrepresented, since they were only surveyed at public tourist spots and not within the terminals themselves. We obtained 755

respondents: 234 questionnaires on January of 2018, and 521 survey forms on June of 2018.

The sample size was calculated based on a total population of 3042,217 cruise passengers in 2018 [1], using a 95 % confidence level, a  $\pm 5$  % margin of error, and an assumed response variability of 50 %. Under these parameters, the required minimum sample size was determined to be approximately 384 cruise passengers. However, the final sample was extended to 755 respondents to enhance the robustness of the analysis. This larger sample size strengthens the reliability of the findings and provides a more comprehensive representation of cruise passengers' perspectives, while also accommodating practical considerations in the data collection process.

Secondly, forty-one diverse interviews, detailed in Table 3, aimed to capture a broad spectrum of cruise ship-related interests and knowledge through snowball sampling. Conducted in Catalan, Spanish, and English with recorded consent, all participants in the survey and interviews provided informed consent. Ethical committee approval was considered unnecessary, given the non-interventional nature of the study. The interviewees included 12 academics specializing in tourism, environmental science, air pollution, water management, ecosystem services, and the cruise ship industry from both domestic and foreign universities. Their inclusion ensured a strong theoretical and analytical foundation for understanding the multifaceted impacts of cruise tourism. In addition, 5 activists were interviewed to incorporate civil society viewpoints, particularly those concerned with the social and environmental implications of cruise operations. To ensure the integration of institutional and policy-level insights, 11 political and administrative representatives from key organizations—namely the Barcelona Municipality, Barcelona Harbour Authority, and the Barcelona Tourism Consortium—were also included. Industry perspectives were captured through interviews with a cruise ship company officer, four consignees officers, two ship chandlers, and a representative from the Cruise Lines International Association (CLIA) in Spain. Complementing this were interviews with two tour guides, a spokesperson from a local bus company, two waste management professionals, and a representative from the dockers union, offering insight into the operational, logistical, and labor dimensions of cruise tourism.

Academics and subject-matter experts were prioritized due to their ability to provide in-depth, evidence-based insights across key thematic areas, such as environmental sustainability, urban planning, tourism economics, and public health. Their interdisciplinary knowledge was essential to understanding the broader systemic implications of cruise ship activity. Similarly, political and administrative representatives were selected in larger numbers because they are directly involved in the governance, planning, and policy-making processes that affect cruise tourism and its regulation. These stakeholders are responsible for implementing environmental standards, managing port-city relations, overseeing tourism development, and responding to public concerns. As such, their perspectives are crucial for understanding both the challenges and the institutional responses to the cruise industry's presence in the city.

The use of snowball sampling allowed for the identification of additional relevant stakeholders through referrals, ensuring the inclusion of individuals with specialized knowledge and direct involvement in cruise-related activities. This approach facilitated the development of a rich, multi-perspective understanding of the cruise industry's dynamics in Barcelona, enhancing the depth and validity of the research findings. The number of interviews conducted was guided by the principle of thematic saturation, which was reached when additional interviews no longer yielded new insights or perspectives.

Survey data were used to describe individual cruise tourists' social choices and values. The data collected was not analysed in terms of associations between variables (particularly questions from 4 to 18, see Appendix 1), as it was not subjected to quantitative analysis, but instead used as evidence of how access powers operate on individual cruise tourists' choices (Sayer 1992; Little, 2016); i.e., the reasons that tourists



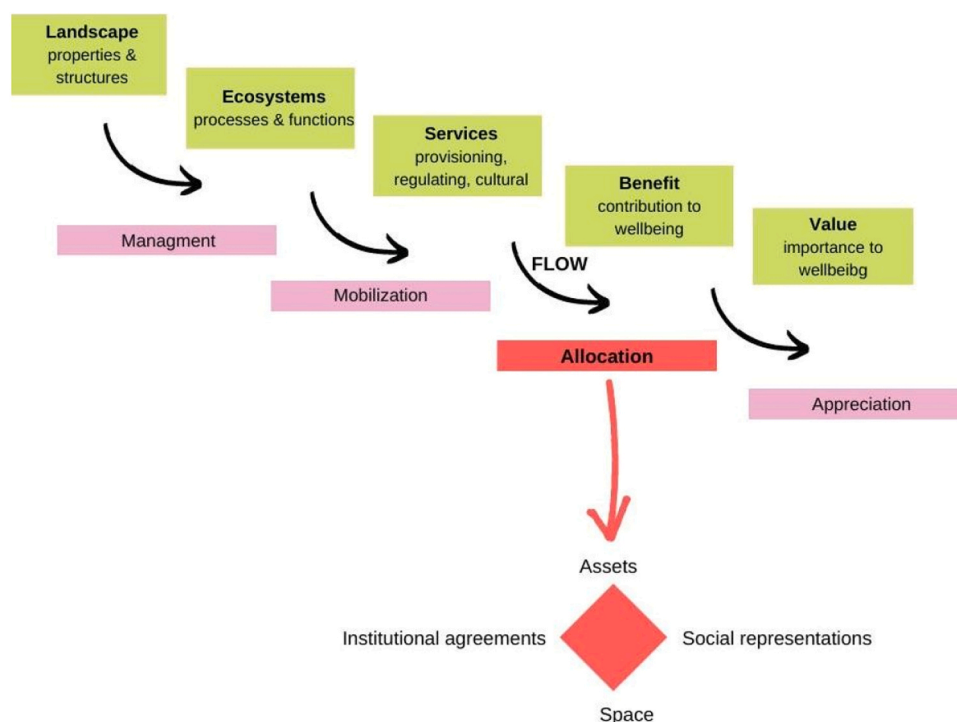


Fig. 2. The conceptual framework adapted from Fedele et al. [21].

Table 3

Interviewed stakeholders. Source: own elaboration.

| Stakeholders                             | Number of interviews | Explanation  |
|--|----------------------|--|
| Experts                                  | 12                   | Expertise in tourism, environmental science, air pollution, water management, ecosystem services, and the cruise ship sector |
| Local activists                          | 5                    | Stop Creuers, Plataforma per la Qualitat de l'Aire, Assemblea de Barris pel Decreixement Turístic (ABDT), etc.               |
| Political and administrative authorities | 11                   | Municipality of Barcelona, Barcelona's Harbour Authority, Barcelona Tourism Consortium                                       |
| Cruise ship companies                    | 2                    | Cruise ship company officer, Cruise Line International Association representative in Spain                                   |
| Suppliers                                | 5                    | Consignee officers, ship chandler officers   |
| Tourist guide associations               | 2                    | Tourist guides   |
| Bus companies                            | 1                    | Bus companies spokesman  |
| Waste management companies               | 2                    | Waste management officers  |
| Dockers workers                          | 1                    | Dockers union representative   |

seek ES benefits.

Semi-structured interviews were analysed after interview transcription using NVivo11 and NVivo12 software (QSR International Inc., Burlington, Massachusetts, USA). All transcribed texts underwent a meticulous coding process, in which each sentence was assigned concise labels (nodes) applicable to the study. Codes were subsequently polished and integrated to form categories and subcategories, following grounded theory analysis principles by Strauss and Corbin [58]. The resulting codebook (Table A1, Appendix 3) was used to operationalize the codes, and theoretical coding was applied to integrate the codes into a theory following theoretical coding [12], based on data analysis without

preconceived ideas or theories [58]. While fully eliminating researchers' views is challenging [12] the authors used existing literature to provide context and enhance understanding of emerging relationships and theories.

Both the codes described in the codebook (Table A1, Appendix 3) and the survey data were integrated into the analytical structure of the results. Specifically, the findings are organized around four thematic dimensions: (a) Space, (b) Institutional agreements, (c) Assets, and (d) Social representations. The interview codes—such as those related to access, allocation, institutional agreements, and assets—were instrumental in defining each dimension. For example, “A-space” and “A-property” shaped the category of *Space*, while codes like “A-trust” and “A-social relations” informed *Institutional agreements*. Similarly, *Assets* encompassed both tangible and intangible resources (e.g., “A-capital,” “A-investment”), and *Social representations* were derived from perceptions and identity-related codes (e.g., “A-city image,” “A-knowledge”). The qualitative interview codes provided depth and context to each dimension, while the survey data supported and illustrated patterns across participants, allowing for triangulation and a richer interpretation of the emerging themes.

### 3.3. Case study: Barcelona's cruise ship harbour

Barcelona has earned the distinction of being the Mediterranean's inaugural cruise ship harbour [2,52,64]. The city's foray into cruise ship tourism can be traced back to the hosting of the Olympic Games, which catalysed the development of its tourism and cruise industry [10]. During the Olympics, eleven cruise ships were deployed as hotel accommodations, effectively testing the harbour's capacity to accommodate large vessels. The success of this endeavour validated the working capability of the harbours administrators and showcased the city's potential capacity as a cruise ship destination [24]. Additionally, Barcelona's cruise ship sector received a significant boost through close collaboration between the Barcelona Harbour Authority and the Barcelona Tourism Consortium, a public-private institution responsible for tourism promotion since its establishment in 1994 (Solé, 2019). Since 1992, the Barcelona Harbour Authority has actively partnered with

cruise companies, establishing secure embarkation facilities and infrastructure while actively promoting Barcelona as an appealing cruise ship tourist destination. Concurrently, the Barcelona Tourism Consortium has successfully cultivated a positive city image. Factors driving the cruise ship sector's growth in Barcelona include competitive prices, strategic location near European markets and Mediterranean hotspots, convenient harbor proximity to the city center, ample leisure infrastructure, tailored cruise tourism products, secure port facilities, and excellent connections, especially with Barcelona's airport [25,24,64]

Between 2001 and 2022, cruise passengers visiting Barcelona consistently rose. Despite the COVID-19 pandemic which significantly decreased the number of cruise ship passengers in 2020 (198,842 passengers) and 2021 (520,519 passengers), the number of visitors started to recover in 2022, with the city welcoming 2329,332 million cruise ship passengers, as reported by the Ajuntament de Barcelona [11].

## 4. Results

In the next sections, we present the results of the study (Table 4). Following our methodological framework, we first show how space serves as a mediating factor to control access to the harbour. Cruise companies oversee investments and terminal management through extended concessions. Additionally, we explore the symbiotic relationships between cruise companies and real estate businesses leveraging Barcelona's brand to align their interests. Furthermore, we detail the role of institutional agreements as mediating factors that govern the benefits derived from the provision and cultural ES. Access to these ecosystem services is characterized by global supply chains, in which cruise companies exert great control. Following, we explain how assets are also mediating factors that are controlled by global supply chains, resulting in the transition from regional and local suppliers to global suppliers. Finally, we present how the Barcelona Tourism Consortium exerts control of social representations, which act as mediating factors for ecosystem service flow to cruise tourism, particularly cultural services.

### 4.1. Space

Cruise industry wields substantial influence over harbor investments, the management of cruise terminal operations, and the control of port services. As affirmed by a recognized academic expert in the cruise ship sector:

These large companies are gaining more and more power, and their extensive concessions almost give them ownership of the terminals, making them influential players in the harbour industry. Personal interview 27/06/2018

In Barcelona, these companies have attained formidable negotiating positions while dealing with harbour authority, rendering them influential actors within the harbour. As a result, they possess the capability to influence institutional agreements, while the harbour authority's control diminishes. This trend mirrors other ports, such as Bonaire in the Caribbean [63], Falmouth (Jamaica) [38], Naples (Italy), Lisbon (Portugal) [47]. Striving to project a "business-friendly" image, Barcelona's Harbour Authority actively advocates for private terminal management and maintains longstanding terminal concessions. It has

emerged as the de facto intermediary and facilitator for the development strategies of cruise companies.

The exclusive allocation of terminals for cruise ships resulted from a collaborative effort between the local government and Barcelona's Harbour Authority, formalized in January 2018. Although the administration board includes representatives from national and regional governments, business organizations, and labour unions, the minimal presence of local and regional government bodies suggests limited influence over the harbour's decision-making processes. As highlighted by a port technical operator officer:

The municipality's influence is limited because it only holds two out of fifteen or twenty votes on the administration committee. Their opinions and votes may not carry a significant weight in decision-making processes. Personal interview 20/10/2017

However, the harbour authority has made concessions, pledging to halt the expansion of cruise terminals near the city, especially the Old Port terminals, at the concession period's conclusion (see Fig. 3). Local social movements have urged the relocation of these terminals to tackle air pollution caused by cruise ships. Nonetheless, these terminals are outdated and unable to accommodate large, modern cruise ships. In response, new and larger terminals are planned for construction in the main cruise ship dock.

Private entities, such as cruise lines, port operators, and investment funds, are responsible for building and managing cruise ship terminals. As interviewees explained, cruise lines invest in developing terminals, including construction, docking facilities, and commercial amenities. Despite the harbour authority retaining ownership of the land in Barcelona's harbour, cruise lines obtain exploitation rights to the new cruise infrastructure through long-term concessions or authorization arrangements granted by the harbour authority.

Cruise companies' power over terminal procedures grants them the ability to manage access to the terminals. According to several respondents, this control ensures preferential berthing for their ships and enables them to gain economic benefits when other cruise companies use their terminals. In these instances, they retain a portion of the port taxes paid by passengers, as explained by a cruise ship academic expert:

The companies cover the construction costs of the terminal and subsequently receive payment for its usage. The port collects taxes, including passenger taxes, for terminal usage, and then reimburses some of it to the companies. Owning a terminal proves to be highly profitable. Personal interview 31/07/2018

The ownership of terminal concessions in Barcelona is not solely vested in cruise companies, yet private investors also held them. Specifically, terminals A–C's concession is owned by Barcelona Port Investments SL, a joint venture between Royal Caribbean Ltd (38 %) and Global Ports Holding Plc (62 %) (refer to Fig. 4). Global Ports Holding Plc is a global cruise ship operator with a presence in numerous harbours worldwide. This company is partly owned by Global Ports Holding B.V., a subordinate company of Global Investments Holding (GIH), a private firm engaged in investments across various sectors, such as harbour infrastructure, real estate, and energy production, among others. Additionally, Centricus Partners LP partially owns Global Ports Holding Plc. Centricus Partners LP is an investment fund that is publicly listed on the London Stock Exchange. On the other hand, terminals D and E are fully

**Table 4**  
Summary of the results. Source: own elaboration.

| ES                 | ES benefits                  | Space  | Institutional agreements                                   | Assets                       | Social representations   |
|--------------------|------------------------------|--|--|------------------------------|--|
| Provision services | food provision and energy    | Terminal ownership                             | Global supply chain and tour operators by ship agencies    | Capacity to supply worldwide | Control of online and media information and the Barcelona Tourism Consortium |
| Cultural services  | Leisure, recreation, tourism | Terminal ownership and real estate investments | Management and control of plans to regulate tourist spaces |                              |  |



Fig. 3. Barcelona's harbour. Source: Barcelona's Harbour Authority. 1. International marine terminal A; 2. International marine terminal B; 3. International marine terminal C; 4. International marine terminal D; 5. International marine terminal E; 6. International marine terminal South; 7. International marine terminal North; 8. International marine terminal Maremagnum. Source: Adapted from Port de Barcelona ([www.portdebarcelona.cat/en/know-port/port-territory](http://www.portdebarcelona.cat/en/know-port/port-territory)).

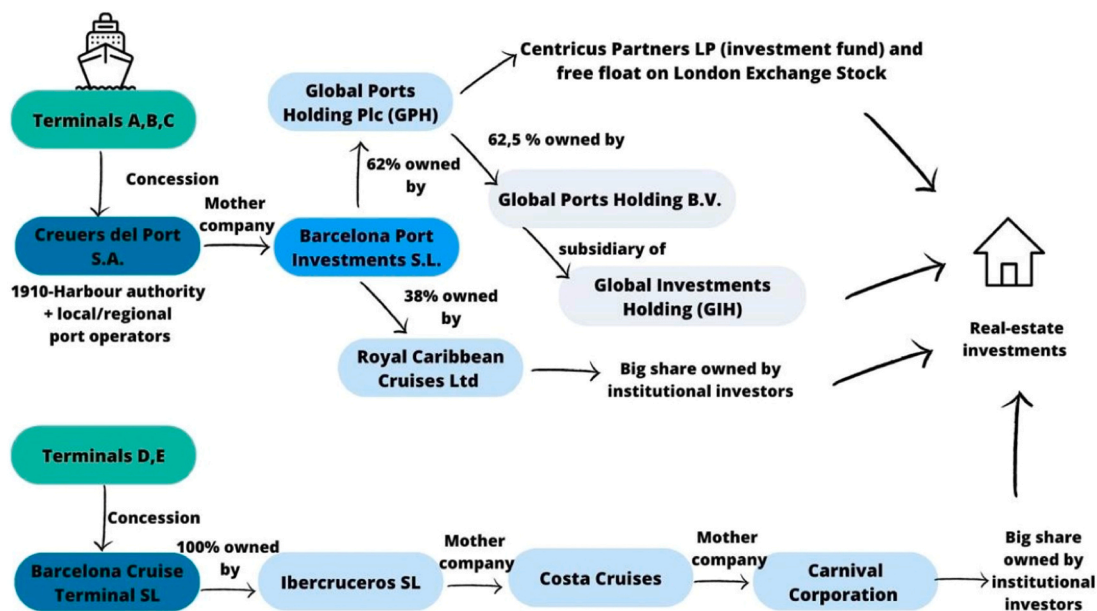


Fig. 4. Illustration of the evolution of terminal ownership and the associated relationships. Source: Own elaboration based on interview analysis and codes: A-space, A-property, A-concession, A-power space.

owned by Iberocruceros SL, which is part of Costa Cruises, one of the cruise ship companies under the Carnival Corporation, the largest cruise ship company globally (Fig. 4). Moreover, cruise ship companies themselves have partial ownership by investment funds, often referred to as "institutional investors," entities that trade securities and other investment assets on behalf of their members.

In the 1990s and early 2000s, local or regional port operators, in collaboration with the harbor authority, managed cruise ship terminal ownership concessions. However, today, these concessions are mostly held by cruise companies and global port operators. Both cruise companies and global port operators have partial ownership by global investment funds, which also have stakes in real estate companies. As global stakeholders, cruise companies and real estate businesses strategically use Barcelona's brand to align their interests.

The global investment entities mentioned earlier also have holdings in real estate (see Fig. 4). Collaborations and synergies between cruise ship companies and the real estate sector exist, as both aim to transform harbor and coastal land into lucrative investments. This strategic leveraging of Barcelona's international brand was elucidated by an academic expert in urban planning.

Both are interconnected, perhaps not directly but related to a territory where they are speculating and through a brand (Barcelona brand). We could argue that real estate benefits from the investments made by cruise companies, while cruise companies, in turn, may leverage real estate investments to compete for attractive routes that yield high profitability. Personal interview 16/06/201

## 4.2. Institutional agreements

### 4.2.1. Control of the global supply chains: from food to onshore handling services

Because of their operational characteristics, cruise companies require significant quantities of food, fuel, and water. On average, cruise ship stores approximately 900 tons of food. The supply of food to cruise ships is dominantly controlled worldwide by four ship-chandler companies: B&S (Dordrecht, The Netherlands), Gebr. Schoemaker (Bremen, Germany), Kuehne + Nagel (Rotterdam, The Netherlands), and Appollo Group (Florida, USA) with a subsidiary company in Barcelona called Europe Supply (BES). These ship chandlers collectively deliver 90 % of the food to cruise ships globally, including those in Barcelona.

The consolidation of food supply in the hands of a few entities is linked to the integration and merging strategies that cruise companies have pursued in recent decades. Four major companies predominantly control the cruise industry, achieved through acquisitions and mergers of cruise lines: Carnival Corporation, Royal Caribbean, Norwegian Cruise Line, and MSC Cruises. Because of this consolidation, these major companies gain increased negotiation power and a greater ability to exert influence over intermediaries, enabling them to enforce their conditions for onshore services, including pricing.

Furthermore, beyond supply operations like provisioning food and fuel, cruise companies have leveraged long-term concessions and terminal ownership to formulate and implement strategies for passenger and port services. They oversee onshore handling services encompassing hotel accommodations, transfers, medical assistance, local tours, and other ground operations, along with commercial areas for passengers. Through mergers, acquisitions, and collaborations with global providers, cruise companies have incorporated services that were traditionally handled by harbor authorities, local, or regional ship providers or agencies. Long-term concessions play a crucial role in facilitating this integration and control of services and products.

As a result, global marine chandlers are main providers of ES to cruise lines. Cruise lines and intermediaries have reached global bidding agreements, allowing cruise lines to be supplied by the same suppliers in any port worldwide. This integration and consolidation have brought considerable control and influence to cruise companies.

Destination-focused tourism services, covering airport transfers, hotel accommodation, medical assistance, boarding, ground handling, and local tours, are mainly provided by global incoming ship agencies. In Barcelona, these agencies, typically subsidiaries of ship agency firms, integrate ship services and land tourism. This integration has given rise to global companies offering services worldwide for both ship services and destination-based tourism. Additionally, global tourist operators have entered the cruise ship's incoming agency service market, proposing comprehensive contracts covering multiple destinations under a single agreement.

Our study, as highlighted by academic experts and ship agency officers, underscores the advantages of globalization and standardization in tourist services. This optimization helps tour operators and incoming agencies cut costs and enhance profit margins.

### 4.2.2. Barcelona's image creation: the local counterpart

The management and control of tourist information in a city significantly influence the value of cultural ES. Both public and private institutions seek to shape the perceived value of spaces and symbols. In this context, the Barcelona Tourism Consortium plays a pivotal role in promoting specific tourist attractions within and beyond the city.

The Barcelona Tourism Consortium comprises of key stakeholders, including Barcelona's municipality, the Chamber of Commerce of Barcelona, and the Foundation Barcelona Promotion. The latter is an organisation established by the Chamber of Commerce to support local business internationalization and attract foreign investments, while also enhancing the city's image as an appealing destination for business ventures. The municipality holds a representation of 43.3 % in the

Consortium, while the combined representation of the Chamber of Commerce and Foundation Barcelona Promotion amounts to 56.7 %.

Our findings indicate the Chamber of Commerce's interests have dominated this public-private institution. However, municipal officers have been actively working since a new city government took office in 2015 to increase their influence and strengthen their authority within the Barcelona Tourism Consortium.

The municipality's role in the governance of the Barcelona Tourism Consortium should be enhanced. Within the Consortium, the Chamber of Commerce and the municipality are involved. Although the Chamber of Commerce manages the executive committee due to the 1993 agreements, this does not imply that the municipality's influence is negligible. Over time, the city council has collaborated with the Chamber of Commerce to establish the rules and guidelines that the Barcelona Tourism Consortium must implement. Personal interview 18/07/2018

Furthermore, the municipality seeks influence the promotion of specific spaces and the exclusion of others through strategic agreements, including mobility strategies and touristic plans. A municipal technical officer elaborates on this aspect:

We (the municipality) have adopted a district-specific mobility strategy to assess the potential of each area to become a tourist attraction, while also identifying places that are better left undiscovered. Personal interview 06/09/2018

Since the late 2010s, the distribution of cultural ES benefits extends beyond the borders of Barcelona's city. Regional institutions, such as Diputació de Barcelona and Turisme de Catalunya, actively promote tourist attractions outside the city's limits and offer them to cruise ship companies. However, only approximately 3 % of the passengers participate in these offerings. Notably, a specific initiative spearheaded by Barcelona's regional government (Diputació de Barcelona) aims to enhance the city brand of Barcelona's region through the 2017–2020 Touristic Marketing Plan of Barcelona's region. While this plan is still in effect, the regional government has been developing a new regional touristic and marketing strategy, named the Touristic Marketing Strategy of Barcelona's destination since 2018. However, because of the COVID-19 pandemic, the implementation process was temporarily halted. The existing plan (Touristic Marketing Plan of Barcelona's Regions 2017–2020) aims to attract more visitors to Barcelona's region, promote tourist mobility throughout the area, and consolidate the region as a diverse and multi-product tourist destination. Furthermore, in 2019, the region of Barcelona obtained the Biosphere Certification for Tourism, an independent certification system grounded in sustainability and continual improvement principles.

## 4.3. Assets

In harbours across the globe, cruise companies exert significant management and control over various sectors of the value chain, including food and energy, in harbours across the globe. This has led to significant shifts in food and energy supply practices also in Barcelona. Over the years, the sector has shifted from depending on regional and local suppliers in the late 1990s to embracing global ship chandlers. However, according to cruise line specifications, the number of marine chandlers capable of handling large quantities is limited. In Barcelona, only very large companies have the capacity to meet the demands of cruise lines. Consequently, access to cruise markets is primarily restricted to these large companies, as confirmed by a marine chandler technical officer:

Being global companies, they develop a worldwide supply strategy (...). If a supply company lacks the infrastructure to cater to a global market, it may be left behind. Personal interview 15/11/2017

Since the beginning of the 21st century, Barcelona has witnessed the



exclusion of certain suppliers from the ES flow distribution due to their inability to meet the global supply demands set by cruise companies. These suppliers, including local and regional food providers and cruise line ship agents, have found it challenging to remain in the market. A marine chandler technical officer sheds light on the evolution of this situation in Barcelona:

Non-local suppliers have vanished. In the past, approximately 10 or 15 years ago, there were approximately seven or eight of them. And about 30 years ago, around 20 local suppliers were operating in Barcelona's harbour (...) The smaller local suppliers have been acquired by larger companies, allowing them to operate on a global scale. Personal interview 15/11/2017

For west-Mediterranean cruise routes, Barcelona is not the main loading harbour for food supply; Civitavecchia (Rome) or other Italian harbours take precedence due to efficient logistics facilities and lower loading costs. Despite higher loading costs in Barcelona due to national regulations on dockers' salary and labour conditions, some cruise ships still choose it as the primary loading harbour based on specific route needs. For example, during the colder months in the global north (November to March), aligning with the Mediterranean's lower season but the Caribbean's higher season, certain cruises stop in Barcelona to load their food supplies before heading to the Caribbean.

Additionally, about 10 % of food products, termed "missing products" by cruise ship companies (emergency items or very specific local products), can be loaded in Barcelona or any other harbour based on the cruise ship's needs. Cruise ship companies often secure these items through local or regional ship agencies, establishing connections with regional ship chandlers or food providers as required.

#### 4.4. Social representations

Passengers rely on their knowledge and use the information available online to make decisions about what to visit during their time in Barcelona, either independently or by opting for pre-arranged tours. According to our findings from the sample of 755 cruise passengers interviewed in Barcelona, only 8 % of them choose to explore the city via prearranged tours, while a significant 79 % prefer to use outside prearranged tours. In addition, our qualitative data highlight the growing trend of cruise ship passengers being well-informed through the Internet. They can make informed decisions about their itinerary, plan, and even pre-book various aspects of their trip online. As a tourist guide affirms:

More and more people are going freely, there is the internet... (...) cruise passengers can easily access information about visiting Barcelona online. For instance, there is a company that provides more affordable city tours than those offered by cruise ships. Personal interview 5/06/2018.

Locally, information disseminated online through various media, blogs, or social networks can be curated and monitored by local public institutions and stakeholders in the tourism sector, including the Barcelona Tourism Consortium. These entities aim to regulate the information as it significantly impacts how cultural ES are perceived and encountered by cruise passengers. Traditionally, this control involved participating in events and using various media. However, the Barcelona Tourism Consortium now utilizes influencers and bloggers to amplify the city's tourism image, as confirmed by interviewees. A Barcelona Tourism Consortium representative emphasizes this modern approach:

Currently, our promotion efforts are predominantly focussed on online platforms. The Barcelona Tourism Consortium actively engages on social networks, with a special emphasis on Facebook and Instagram. We are making significant investments in these channels. Furthermore, our approach to media coverage has evolved, as we now extend invitations not only to journalists but also to influencers,

YouTubers, bloggers, and Instagrammers. Personal interview 12/06/2018

## 5. Discussion and conclusions

Understanding mediating factors is crucial for addressing the challenges and opportunities associated with sustainable cruise tourism in the future. The analysis of access and its mediating factors in cruise ship tourism provides a better understanding of the allocation of ES benefits. As highlighted by Fedele et al. [21] studying mediating mechanisms and factors serves to understand the actions and roles of different stakeholders in allocating ES flows. Moreover, it sheds light on the socio-ecological struggles, ecosystem deterioration, equity, and sustainability implications that result from these actions [20,41]. Thence, it allows to identify of who gains access to ecosystem service benefits and its consequences, unrevealing important conflict obstacles that need to be addressed by policymakers [21]. Therefore, by including the study of mediating mechanisms and factors in ecosystem service studies, policymakers would be better informed and could integrate into decision-making a deeper understanding of ES flow access inequalities and associated conflicts.

The results highlight the mediating factors that influence the control and access to the harbour and the provision of ES in the context of cruise tourism in Barcelona. Space plays a crucial role in shaping the power dynamics between cruise companies and the harbour authority. The findings of the study demonstrate that, currently, cruise companies have substantial control over harbour investments and the management of cruise terminals through long-term concessions. This increased control has elevated them to influential positions within the harbour, enabling them to shape institutional agreements and exert significant influence over the harbour authority. Fedele et al. [21] argue that space act as a mediating factor as certain ecosystem services are spatially constrained or only accessible by some stakeholders because of a lack of infrastructure or transportation. Our results show that space can also shape power dynamics and institutional arrangements between actors. For instance, control over cruise terminal spaces through long-term concessions influences power relations between cruise lines and local or regional authorities. When cruise lines control terminal spaces, they gain greater power and influence over political decisions related to port operations and cruise management within the city.

This study also uncovers the influence of institutional agreements and assets as mediating factors of allocation. Through formal and informal agreements different actors (e.g. global marine chandlers and global incoming ship agencies) negotiate and control the allocation. In addition, assets control allocation, for example, global marine chandlers control food allocation through large global infrastructure (e.g., a global network of warehouses, offices, transports, and brokers). The global supply chains established by cruise companies have enabled them to exert great control over access to these services, particularly provision services. For example, in the case of food provision, allocation is largely controlled by global cruise ship actors, while regional and local suppliers are almost entirely excluded—except for approximately 10 % of supplies, which typically consist of missing. Access to cruise markets is limited to large companies with global supply capabilities, as a result, regional and local suppliers have lost even more ground due to their inability to meet the scale and consistency required for worldwide distribution. These findings further support the conclusions of previous research on ES access, as highlighted by Hicks and Cinner [31] and [3], which emphasise the significance of institutional agreements in facilitating access to ES.

In the context of the cruise ship sector, as observed by Heaven et al. [30], Notteboom and Winkelmanns [45], Notteboom and Rodrigue [44], and Slack [55], the strategy of the harbour authority in Barcelona focuses on attracting and securing cruise business through significant public investment, while paradoxically aiming to reduce its own

decision-making capacity. This approach operates under the assumption that the benefits of cruise tourism will naturally trickle down to local and regional actors—such as product and service suppliers—as highlighted by Lopes and Dredge [39]. However, public resources are inherently limited, and allocating substantial funds to support cruise traffic may divert investment from other pressing urban or regional priorities. This reallocation of funds can exacerbate existing social and economic inequalities, ultimately constraining the broader developmental impact such investments are expected to generate.

The group of entities working together in Barcelona to secure cruise ship industry in the city can be defined as a marine cluster [11]. A cluster is typically defined as a concentration of similar entities located in close proximity to one another [37]. Economists have described clusters as “groups of companies and institutions co-located in a specific geographic region and linked by interdependencies in providing a related group of products and/or services” [36]. This conceptual framework is particularly relevant to the cruise ship sector in Barcelona, where the harbour authority, cruise lines, service providers, and tourism-related businesses form an interconnected cluster. Although these actors share common interests—such as increasing cruise traffic and enhancing tourist experiences—the cluster is also shaped by imbalanced power dynamics. For instance, while public investment aims to secure cruise activity, decision-making capacity is often limited for local institutions, and the expected trickle-down benefits to regional actors remain uneven.

Similar, Brida and Zapata [6], and Brida et al. [5] have highlighted that in the Caribbean, cruise tourism is mainly under the control of global actors, while local and regional stakeholders, such as companies and public institutions, are excluded from decision-making processes and do not receive fair benefits. The results of our research also indicate that global cruise dominance, enhanced by the harbour authority, results in the neglect of regional and local actors’ voices (such as local food providers, local ship incoming agencies, local touristic companies and local authorities), particularly for provision ES. However, in the case of cultural services, the allocation is disputed with local and regional destination actors in Barcelona, such as the municipality of Barcelona, and institutions representing the tourism interests of the city, as the Barcelona Tourism Consortium or the Barcelona Film Commission. These institutions control and promote specific tourist attractions and set value preferences for certain spaces, especially through the control of social representations. In this line, Nieto-Ferrando et al. [43] illustrate how the image of Barcelona, shaped by international film productions drawn in by the Barcelona Film Commission, aligns with the imagery appealing to tourist markets. This alignment also corresponds to the strategic positioning outlined in the City of Barcelona’s 2015 Strategic Tourism Plan. Similarly, Sutton [59] studied the role of Barcelona’s Touristic Consortium on city branding and its relation to urban investment projects.

Fisher et al. [23] highlighted that provision and cultural ES are more accessible to control while regulating and maintaining ES pose greater challenges because of their fluid nature and non-excludability. Provision services are physical and commodifiable objects, that can be distributed by supply chains, where multiple actors and processes can exert access control. Cultural services, while often less susceptible to access control, can still be effectively managed when they are associated with specific locations or when property rights and access fees are imposed [23]. In the case study of our research, global cruise actors aim to control the allocation of cultural ES through standardisation and globalisation of touristic services, nevertheless, local and regional actors are still disputing the control of cultural ES linked to explicit places and where access fees can be applied. The physical and concrete space linked to these ES allows local and regional actors to maintain control and resist the control by global forces.

Overall, the case of Barcelona research emphasises the dominant role of cruise companies in controlling and mediating factors and allocation of ES benefits in the cruise tourism industry in Barcelona, while regional

and local institutions, particularly the Barcelona Tourism Consortium, still dispute the control of cultural ES. The results underscore the power dynamics between cruise companies and the harbour authority, the impact of institutional agreements and global supply chains, the control of assets by global actors, and the significant role of the Barcelona Tourism Consortium in shaping social representations.

Our research indicates that cruise companies, access disparities, and conflicts are intrinsic to globalization and privatization processes [27, 38]. Cruise companies and global investment funds exert significant control over cruise ship terminal access, influencing the allocation of harbor space. This relationship between capital investments and harbors has been extensively explored by authors such as Harvey [29], Bunce and Desfor [8], Desfor and Vesalon [19], Desfor et al. [18]. They focus on the interconnectedness of capital circulation and the transformation of post-industrial harbor areas, drawing from Harvey’s concept of capital accumulation. According to Harvey [29], capitalism addresses over-accumulation crises by restructuring or expanding space. Therefore, capital generates new avenues for accumulation by repurposing existing spaces, exemplified by the transformation of old industrial harbor regions into recreational areas.

The construction of new cruise terminals and cruise ships aligns with the goal of capital accumulation. New terminals represent fresh spaces for capital accumulation during overaccumulation crises. Harbor land holds particular appeal to private actors, including building companies and investment funds, owing to its significant potential for increased value and the more adaptable urban regulations often found in strategic plans [19,18,61,60,8]. Cruise terminals, are open to constant technological innovation, offer continuous opportunities for new accumulation. In the case of Barcelona, for example, the old cruise terminals will be replaced with new and larger ones in the new cruise ship dock once the current concession agreement ends.

Additionally, in line with existing research on the cruise ship industry (e.g., [27,51,66]), our findings suggest a future trend for cruise companies to expand into port services and terminal operations, including the development of tourist amenities near cruise ship harbours. These expansions can be seen a part of capital accumulation efforts aimed at overcoming surplus. Deploying surplus capital into new markets and creating fresh investment opportunities. By gaining control over these new spaces and services, cruise companies seek greater influence over the ES consumed by cruise passengers, such as cultural ES and associated expenditures.

As capital accumulation is an ongoing process continually seeking new opportunities, mechanisms like ES control and space acquisition are intertwined with the dispossession of others from their means of subsistence. For example, the control of cruise terminals through long-term concessions by cruise companies excludes or limits the harbour authority and the institutions represented within it, such as the Municipality of Barcelona, from controlling the terminal space and accessing associated benefits, such as taxes.

The examination of allocation access and power dynamics serves as a starting point for studying the relationship between capital dynamics and ES access. Cruise ship sector analysis provides a deeper understanding of the operation of ecosystem service benefits chains and the exclusion and resistance of regional and local actors. It can serve as a basis for expanding ecosystem service research towards political ecology and ecological economics. Moreover, the integration of spatial relations to study global chains is also a confluence element for geography researchers. Future studies should aim to better integrate political ecologists, ecological economists, and geographers to study allocation access processes in ES flows.

## Authors’ contributions

LS conceived the presented idea, supervised by EA and AC. LS collected the data and analysed the results, helped by EA and AC. EA and AC aided in interpreting the results and worked on the manuscript. LS

wrote the manuscript with input from EA and AC. All authors have discussed the results and commented on the manuscript. EA and AC edited the manuscript.

### CRedit authorship contribution statement

**Eduard Ariza:** Writing – review & editing, Project administration, Investigation, Conceptualization. **Solé Figueras Liliana:** Writing – original draft, Methodology, Investigation, Formal analysis, Conceptualization. **Casellas Antonia:** Writing – review & editing, Formal analysis, Conceptualization.

### Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used Trinkai.ai in order to check English spelling mistakes. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

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### Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.marpol.2025.106799](https://doi.org/10.1016/j.marpol.2025.106799).

### Data availability

Data will be made available on request.

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