



Urban commons service generation, delivery, and management: A conceptual framework



Arpit Shah^a, Amit Garg^b

^a Indian Institute of Management, Ahmedabad, Public Systems Group, Dorm 29, Room 30, New Campus, IIM Ahmedabad, Vastrapur, 380015, Ahmedabad, Gujarat, India

^b Indian Institute of Management, Ahmedabad, Public Systems Group, Wing 16B, Main Campus, IIM Ahmedabad, Vastrapur, 380015, Ahmedabad, Gujarat, India

ARTICLE INFO

Article history:

Received 7 July 2016

Received in revised form 16 November 2016

Accepted 15 December 2016

Available online 14 February 2017

Keywords:

Urban commons

Ecosystem services framework

Sustainability

Equity

Urban land use planning

Ecosystem-based management

ABSTRACT

Urban commons are currently not studied holistically under the rationale used by the ecosystem cascade framework. In this paper, we build on the ecosystem cascade framework to present a conceptual model that provides a comprehensive view of urban common resources and allows decision-makers to develop suitable interventions to meet objectives of sustainability and equity. The model looks at the role of and explains the linkages between urban commons' biophysical structures, user population characteristics, power dynamics, use behavior, benefits generated, and management strategies. The model adds to existing literature by focusing on direct benefits and equity and by elaborating on the role of transaction costs and management strategies in governing urban commons. Considering direct benefits allows for a complete picture of overall benefits while making governance decisions, as opposed to considering benefits received only through human effort. Focusing on power asymmetries between stakeholders highlights the inequities created in accessing benefits from urban commons. Elaborating on management strategies provides greater insight into the complexities of managing urban commons and the impacts that governance decisions can have. Finally, including transaction costs highlights the factors that influence costs of managing resources. We illustrate the use of the model with literature from urban India.

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1. Introduction

Ecosystem services are seen as “benefits that humans recognize as obtained from ecosystems that support, directly or indirectly, their survival and quality of life” (Harrington et al., 2010, p.2781). The highly cited Millennium Ecosystems Assessment triggered the current interest in ecosystem services (MA, 2005). This interest has led to the development of ecosystem management approaches that seek to ensure sustainability of ecosystems for human benefit (Kappel et al., 2006). Ecosystem management approaches look at all natural and human interactions within an ecosystem, as opposed to considering single issues in isolation (McLeod and Leslie, 2009).

As the ecosystem service paradigm evolves, increasing attention is being paid to the socio-economic interactions that humans have with ecosystems (Spangenberg et al., 2014). Public values and attitudes are important in human interactions with nature and strategies used to manage natural resources have an important role to play in preserving them for future generations (Barona, 2015). This is especially true at a time when economic development is leading to deterioration in global ecosystems (MA, 2005).

Within the ecosystem services framework, there has been limited work on developing a systematic understanding of urban commons (Fish, 2011). The term ‘urban commons’ itself is not precisely defined in the literature. In this article, we consider urban commons to include urban green spaces, such as urban forests, gardens and green cover, and urban water sources, such as lakes, watersheds, and groundwater. Managing these resources well is important considering the various benefits they provide (Gómez-Baggethun and Barton, 2013).

Understanding urban commons under the ecosystem services framework would provide a comprehensive picture of the human-environment interactions involved in urban ecosystems. In this context, the term ‘urban ecosystems’ refers to the broader urban areas themselves that include interactions between humans, human-built areas, and nature. A deeper understanding of urban commons would enable the use of ecosystem management approaches in urban land use planning, with clear linkages shown between management strategies, the condition of resources, the costs of management, and benefits derived from resources.

From a public policy perspective, a significant issue concerning urban commons is equity in the use of resources. When power asymmetries exist, contestations around rights to the commons result in differential access to resources and inequities in benefits derived. Powerful groups can monopolize access to resources at the expense of

E-mail address: arpits@iima.ac.in (A. Shah).

others (Daw et al., 2011). Deterioration of resources can also lead to inequities as groups more dependent on a resource will get impacted disproportionately (Mundoli et al., 2015).

This paper seeks to develop a conceptual model of generation and delivery of services by urban commons using the ecosystem service framework. We look at natural and socio-economic factors that impact the use of urban commons. We explain the role of each component in our model in ecosystem service generation and delivery. This paper adds to the literature by looking at urban commons under the ecosystem service cascade model and by supporting the use of ecosystem-based management approaches for sustainable and equitable urban planning processes.

We base our starting logic on the ecosystem services cascade framework developed by Spangenberg et al. (2014). We add to their model in key ways. Firstly, we include benefits directly received from the commons without human intervention, while Spangenberg et al. (2014) restrict their model to benefits derived only through active human interventions. Direct benefits would form part of the assessment and decision-making about common resources. Secondly, we recognize the role of power asymmetries between stakeholders and the resultant inequities in benefits derived from common resources. Thirdly, we elaborate on the governance part of the model. Governing ecosystems is a complex decision-making process and uses both economic and non-economic values which get translated to policy making (Primmer et al., 2015). Finally, we consider the role of transaction costs in managing the commons. Resources are likely to be well maintained if the benefits derived from them are higher than the costs of management (Hanna, 1995).

The rest of the paper is structured as follows: Section 2 looks at existing work on the ecosystem services framework. Section 3 outlines the model and its components. Section 4 applies the model to literature from urban India. Section 5 concludes the paper.

2. The Current Knowledge on Urban Commons

2.1. The Ecosystem Service Cascade Model

The ecosystem cascade model was developed as a framework to classify the different steps involved in generation and use of ecosystem services and to assign values to those services (Haines-Young and Potschin, 2010; Potschin and Haines-Young, 2011). We start from the adaptation by Spangenberg et al. (2014), as shown in Fig. 1. All ecosystems have certain biophysical characteristics and processes, which form part of the ecosystem structure. Ecosystem functions are a subset of ecosystem structures that have the capacity to provide services valued by humans (Daily, 1997; De Groot et al., 2002). Ecosystem functions give rise to service potentials if they are potentially usable and valuable from a human perspective. Services are derived through human effort in mobilizing the service potentials (Haines-Young and Potschin, 2010). The services provide benefits that help enhance human quality

of life. Since different people can value ecosystem benefits differently, the cascade shows a distinction between benefits and values. Values attached to ecosystem benefits are thus, positioned at the end of the chain (TEEB, 2010). Finally, the feedback loop from values to ecosystem structures acknowledges the pressures humans exert on ecosystems and the role of policy and governance in managing natural resources. The cascade fundamentally understands ecosystem services as a chain comprising of “ecosystem functions-service potentials-services-benefits-values”.

The feedback loop from values to ecosystem structures suggests that knowledge of valuations is essential to decision-making regarding ecosystem governance. It has been argued that economic valuation helps understand trade-offs between decisions and supports policies that can help conserve ecosystems (Bateman et al., 2011). However, there are disputes regarding the use of monetary evaluation as the only way to assess the value of natural resources (Spangenberg and Settele, 2010). Suggestions have been made to combine monetary and non-monetary values for assessment (Farley and Costanza, 2010).

2.2. Adaptations of the Ecosystem Service Framework

Studies have attempted to adapt the ecosystem services framework for specific uses. von Haaren et al. (2014) propose a practice-oriented evaluation of the ecosystem service framework that is tailored for environmental planning at local and regional levels. He et al. (2016) adapt the ecosystem cascade model for urban green space recreational service generation and delivery. They use policy relevant, measurable variables as indicators for various components in their model to aid in decision-making related to urban green spaces. Felipe-Lucia et al. (2015) incorporate power asymmetries in the ecosystem cascade framework to acknowledge the role they play in determining service flows and creating inequities. Nassl and Löffler (2015) integrate the ecosystem cascade and drive-pressure-state-impact-response (DPSIR) frameworks to develop a richer understanding of cause-effect-consequence relationships in ecosystems. Matthies et al. (2016) combine the ecosystem service and service-dominant framework from marketing science to create a service-centric framework for ecosystem services. Their model allows for a greater role of natural sciences in the ecosystem service logic. Primmer et al. (2015) identify forms of ecosystem governance from the biodiversity and environmental conservation literatures to provide a structure to empirically analyze the governance of ecosystems within the ecosystem cascade framework. The modes of governance they identify include hierarchical, scientific-technical, adaptive-collaborative and strategic.

The models described above make adaptations to the ecosystem services cascade to enhance understanding of specific parts of the ecosystem service chain. From the point of view of urban commons, these models are not designed to provide a holistic understanding of the ecosystem service loop at a conceptual and explanatory level. Given the unique challenges that urban policymakers face in managing urban

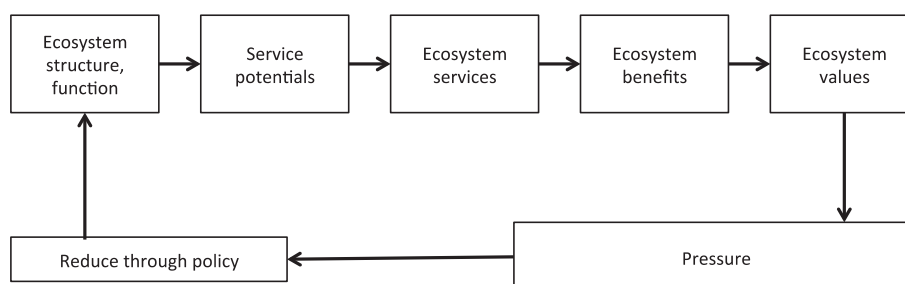


Fig. 1. The ecosystem service cascade from Spangenberg et al. (2014), based on Haines-Young and Potschin (2010).

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