Analysis

Preferences for Attributes of Sacred Groves and Temples along an Urbanization Gradient in the National Capital Region of India

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A B S T R A C T

In India, sacred groves have been considered the forested abodes of one or multiple deities and are often managed by communal governance systems. As land development has progressed, the population surrounding these and other green spaces has changed, and responsibility for their protection has shifted to the bureaucracies that manage urban environments. The sacred grove now means different things to different people, and the value of its protection is increasingly difficult to characterize. In this context, we study individual preferences for sacred groves and non-forested temples along an urbanization gradient –defined by land use– in rural locales near the megacity of Delhi, informed by the theoretical perspective of Sanskritization. We use revealed and stated preference data that includes information on visits to forests and worship sites, weighting for relevant forest characteristics, and socio-demographic factors related to culture. Respondents generally place higher value on sacred groves than on non-sacred green space, but more urbanized and sanskritized individuals exhibit higher valuations for non-forested temples and conservation of urban green space. Taken together, these results suggest a potential increase in the perception of non-sacred and non-use forest value among urbanized respondents.

1. Introduction

Urbanization is correlated with, and is possibly a driver of, cultural change (Lambin et al., 2001). The recent realization and progression towards an increasing urban majority at a global scale calls attention to this relationship (United Nations, 2014). The trajectory towards increasing urbanization began during the industrial revolution in the West and was followed by a different type of urban growth in 'developing' economies, where future urban population growth will also be concentrated. Global urbanization coincides with demographic transition, marked by shifts in life expectancy and an aging population with lower fertility (Lee, 2003).

With its booming population, India features prominently in today's urbanization trajectory. The urban agglomeration of Delhi, now administered as the National Capital Region (NCR), is the second most populous city in the world with recent population growth exceeding that of Sao Paulo, Tokyo, Mexico City, and New York City combined (United Nations, 2014). Recent satellite imagery for Delhi over the period of 1977–2015 shows clear conversion of cultivated land to built-up area and from dense forest to scrub and degraded forest (Jain et al.,

2016). Thus, forested areas that hold long-standing spiritual significance among forest-dependent communities – termed sacred groves – are confronted with new cultural and ecological threats. Yet, the plight and persistence of sacred groves amidst urbanization is poorly understood, and represents an important knowledge gap this paper begins to address.

The primary conception of sacred groves in conservation discourse, the canonical model, defines this location as a geographically-bounded forest located centrally within a mythic social geography. While this social conception is informed by and mapped onto physical spaces, it is neither a direct nor linear relationship. Stated differently, the sacred grove only exists in the intersection of physical and social domains, composing a complex socio-ecological system. Of course, this canonical conception of the sacred grove has been critiqued for advancing a falsely homogenous and idealistically ahistorical entity (Gajula, 2007). This study acknowledges heterogeneity in sacred grove institutions – inherent in belief, landscape structure, and tenure – through our inclusion of respondents holding different perspectives on the meaning and value of these forests in addition to alternative, non-sacred forests and non-forested temple sites. The differing narratives around these

resources, many of which are formed prior to rationalization (Levine et al., 2015), also develop alongside trends in cultural change (Mayer, 2014). This argues against a narrow view of preferences based on use or revealed preference behavior alone.

Building on insights from the theory of cultural evolution, our work aims to highlight several cognitive mechanisms – distributed cognition and analogical reasoning (Levine et al., 2015) – that have not previously been considered in economic work on preferences for natural and spiritual assets such as sacred groves. This perspective recognizes that preferences are embedded in physical (geographical) and cultural (social) landscapes, and are shaped over the long-run. We propose that understanding this is key to better predicting how preferences may evolve in response to future cultural and ecological dynamics, which is critical to understanding the likelihood and value of maintaining successful collective action for the preservation of these socio-ecological assets. As empirical work with economic games also argues (Henrich et al., 2010a), ignoring such dynamics is a general deficiency in valuation work related to common property resources, as culture is basic to behavior and thus to collective action.

More specifically, we study individual preferences for three non-market assets – sacred groves, non-sacred forests, and non-forested temples – along an urbanization gradient, as defined by land use and land cover, in four sites in the region surrounding Delhi. We use revealed and stated preference methods to analyze relationships between distance, urbanization, and preferences for forest conservation as well as worship mode. We first apply the travel cost method (TCM) using information on actual visits to these sites. We complement this analysis with contingent valuation (CV) and behavior questions aimed at estimating responses to hypothetical entry fees for visits to non-sacred forests, and to additional travel distance to visit sacred groves. Finally, we use discrete choice experiments (DCEs) to infer the weights respondents place on relevant forest characteristics. Our analyses incorporate data on socio-demographic factors related to culture; this allows us to test ideas related to Sanskritization theory (Srinivas, 1952), which holds that modernization entails a shift from the worship of local, folk deities, to the global deities of the Hindu pantheon (Malhotra et al., 2001).

We find that respondents generally place higher value on sacred groves than on non-sacred green space. Nonetheless, more urbanized and sanskritized individuals exhibit higher valuations for non-forested temples and conservation of urban green space, despite their lower propensity to visit the latter. Taken together, these results suggest a potential increase in the perception of non-sacred and non-use forest value among urbanized respondents.

2. Background

We first provide context on sacred groves as a heterogeneous religious institution in forested areas, or cultural landscape mosaics. We then summarize background from two distinct literatures that relate to this study: cultural evolution theory, and ideas about Sanskritization in particular, and economic literature relating to boundedly-rational decision-making and preferences. Lastly, we provide context on sacred groves in India, and explain why sacred groves in urbanizing areas offer an interesting case study for application of principles from these two literatures.

2.1. The Sacred Grove as a Global Phenomenon

Sacred groves as an eco-cultural phenomenon appear endemic to locations where oral traditions overlap with forest ecosystems, rather than being specific to a particular culture. Ancient myths provide early reference points in the written record, including the Epic of Gilgamesh and the Garden of Eden in the Hebrew Bible. Contemporary sacred grove institutions are particularly noted outside the West, especially in Asia and Africa (Dudley et al., 2010), though a wider distribution is also

suggested by cases in Europe (Bhagwat and Rutte, 2006; Frascaroli, 2013).

Sacred groves are not simply observed in the landscape; rather, these forest patches are prominent in the religious life of adherent co-religionists and among multiple religious groups (for example, Muslims in our sample sometimes also visit these sites). In India alone, sacred groves are referred to by many different names in different regions (Kent, 2013). The term 'sacred grove' appears as a designator in literatures that span from conservation (Gadgil and Vartak, 1976), to colonial forest management texts (Brandis, 1897), to policy-related discussion in international conservation regimes (Ramakrishnan et al., 1998; Verschuuren, 2010). We note that the term sacred grove is not unknown in our study region, though most refer to it using the 'local' name of *Bani*.[1] Heterogeneity in conceptions of sacred groves is also apparent in beliefs, landscape structures, and tenures, leading to the observation that their tendency to be preserved despite local deforestation may be their most common feature (Kent, 2013). Attempts to specify the general concept are apparent in terms of (1) the forest and (2) the basis for its sacrality.

(1) Forest: While some scholars conjecture that sacred groves are "'specimens' of the original ecosystems of the areas where they exist" (Chandran and Hughes, 2000), the suggestion of anthropogenic origins of at least two sacred groves in India, based on paleoecological dating, promotes a cultural explanation (Bhagwat et al., 2014). The former view coheres well with the appearance of sacred groves as forest patch 'islands' in agricultural landscapes where forest land was otherwise converted or degraded (Barre et al., 2009; Decher, 1997; Gadgil and Vartak, 1976), while the latter holds that 'island' sacred groves are not representative of a primeval ecological state (Gajula, 2007). Nonetheless, the value of fragmented forests as refuges for flora and fauna has been promoted (Virtanen, 2002), and sacred groves have been found to have more biomass (Decher, 1997; Salick et al., 2007) and greater tree species diversity and structure complexity, than non-sacred forests (Virtanen, 2002). Even so, the areas surrounding sacred groves (i.e., the matrix) may also be critical to conservation (Wiens, 1995). For example, in a well-connected forest landscape in the Western Ghats of India, sacred groves were no different from non-sacred forests in terms of biodiversity, which was instead related to forest structure and cover (Bhagwat et al., 2005). There is thus a need to better understand how cultural conservation beliefs and mechanisms vary with perceptions of sacrality (Bhagwat and Rutte, 2006).

(2) Sacrality: The sacrality of sacred groves is seen by some as indirect, conferred by a perception that it is the home of a deity (Barre et al., 2009), or direct, where particular geographies are perceived as sacred (Chandran and Hughes, 1997). Avoiding a supernatural explanation of sacrality, materialist-functional approaches have suggested that sacrality is derived from unique provisioning and supporting ecosystem services (Chandrakanth and Romm, 1991); such explanations are difficult to align with the heterogeneity of sacred groves (Ormsby, 2011), and their position within a cultural worldview or cosmology (Allison, 2015). Importantly, the sacred in Hinduism is often noted as set apart relative to some subjects and not others, implying relative rather than absolute restriction (Douglas, 2003). Thus, while the existence of taboos regulating use or extraction from sacred groves is widely noted and can advance conservation (Barre et al., 2009; Colding and Folke, 2001), sacred groves exist in cultural landscape mosaics where material and social flows are linked and sometimes in flux (Allison, 2015). In addition, the relative balance of the 'sacred' within a larger landscape matrix

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[1] *Bani* is not recognized by all in our study area. Another study finds this name in evidence further south, along the Aravalli Mountains in Rajasthan, noting common use of the name *orans* elsewhere in the state (Gujar and Gold, 2007).