



Land, water & power: The demise of common property resources in periurban Gurgaon, India



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ABSTRACT

This paper describes how urbanization processes and urban expansion intersect with social and power relations to reduce the access of periurban communities to common property resources (CPRs). Unequal power structures mean that certain groups are deprived of access to village CPRs. Processes of urban expansion further reduce access to CPRs, as the latter are acquired to support urban expansion. Though rural–urban transformations are characterized by the emergence of new sources of irrigation such as wastewater, not all are able to benefit from them. The acquisition of common property grazing lands to support the drinking water needs of the city affects the livelihood of livestock dependent population, that shift to casual labor. This also translates into a shift from grazing, the domain of men in the household, to stall-feeding, the domain of women, and thereby creating additional responsibilities for women in natural resource collection. The demise of CPRs such as village ponds with the increased pressure on groundwater resources increase the drudgery of women and marginalized groups in accessing water.

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1. Introduction

Urbanization processes are accompanied by the growth of periurban spaces—that present features of both urban and rural environments (Tacoli, 2003; laquinta and Drescher, 2000; Narain and Nischal, 2007). They typically provide the resources needed for urban expansion, while receiving urban wastes (Narain, 2009a,b; Janakarajan, 2007). Though the links with such periurban spaces are crucial in maintaining the metabolism of cities, they themselves receive scant attention in policy and planning. A conventional, dichotomous focus on rural development and urban planning implies that the linkages between urban centers and the rural areas are ignored. This can have adverse impacts on the livelihoods of those who inhabit these spaces, as they lose out access to natural resources on which they depend for their livelihoods—as the latter are appropriated for urban expansion. There is a need for detailed investigation of how changes in land use impact natural resource access and use practices in periurban contexts, and their implications for the livelihoods of those who depend on them.

Though there is a burgeoning literature on periurbanization processes, limited attention has been paid to the diminishing access of

periurban populations to common property resources (CPRs) that are engulfed to support urban expansion. The periurban literature presents the countryside as posited against the city; the typical problematization is that there is a rural/periurban and urban divide, with a sharp polarization between the residents of the city and the periurban space that loses resources to the former. In the urban political economy literature (Shatkin, 2007), this is presented as a case of unequal power relations between the city and the countryside. A case is made for recognizing the political nature of urban planning processes. The internal power structures within periurban communities, however, remain a black box; that there are issues of equity and access within periurban communities remains overshadowed by the discussion of unequal power relations between the village and the city.

This research makes a departure from this understanding of the periurban interface. While it looks at diminishing access to common property resources (CPRs) among periurban communities and explores the implications of this process for their livelihoods, it places this discussion in the context of their internal power structures, showing how on-going processes of urbanization aggravate the impacts of social relations.

Located in periurban Gurgaon, a precipitously growing outsourcing, recreational and residential hub in the North–West Indian state of Haryana, this research shows that certain individuals and groups are entrapped in a perverse niche created by the intersection of their location in local power structures – that deprive them of access to CPRs – and the on-going processes of urbanization, that

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serve to deepen this deprivation. It traces the trajectory of changes in land use brought about in two villages and their impact on the differential access of social groups, their changing livelihoods and occupational choices and on gender relations around natural resources. Understanding the nature of the periurbanization process in a country like India – urbanizing rapidly in the neo-liberal era post 1991 – can reveal insights into how the ecological footprint (Rees, 1992) of urbanization is borne in expanding cities, and what the equity and justice implications of this process are.

The rest of the paper is organized as follows. The following section provides a discussion of the concept of periurban spaces and their growing importance in contemporary processes of urbanization, while looking at the changing status of CPRs. The second section locates the research in its geographical context by providing a quick overview of the urbanization process in the Northwest Indian state of Haryana. Section three describes the methodology. Section four describes how on-going processes of urbanization and land use change interface with local power structures to shape periurban communities' access to CPRs. Section five examines the impacts of these processes for periurban livelihoods, social and cultural practices and gender relations. It concludes with the paper's policy relevant and theoretical messages.

2. Periurbanization and common property resources

'Periurban' is a loosely used term to denote a variety of contradictory processes and environments that characterize an intermediary space between rural and urban. It denotes the co-existence of rural and urban activities, processes and institutions. It refers to a social, physical and institutional space that is constituted through processes of rural and urban interactions (Allen, 2003; Narain and Nischal, 2007; Marshall et al., 2009a,b; Randhawa and Marshall, 2014; Narain, 2014). Physically, it has been referred to as an 'area outside existing urban agglomeration where large changes are taking place over space and time' (Dupont, 2005). Socially and economically, periurban areas represent a transitional space characterized by a diversity of occupational interests that compete over limited resources. Farmers, real estate agents, tour and transport operators, traders, industrial workers may all compete for space and resources. Institutionally, periurbanization is characterized by a void created by poor institutional cover as rural and urban governance jurisdictions change hands, and institutional mechanisms to address the various environmental and social challenges confronting periurban areas remain absent. Periurban areas thus become grounds for contested resource use and conflict (Douglas, 2006; Simon, 2008; Janakarajan, 2007).

Since periurban areas perform different functions for rural and urban communities, they steadily grow in importance with the onset of urbanization (Douglas, 2006). They serve as sources of land and water required for urban expansion, while receiving urban wastes (Narain, 2014; Narain 2009a,b). They also serve as recipients of polluting industries, often relocated from the core, in a bid to keep the latter clean.

Since urbanization processes involve the appropriation of land and water resources for urban expansion from the peripheral areas, a study of periurbanization processes raises questions about equity and justice, while providing insights into how the ecological footprint of urbanization is borne. Urbanization is often responsible for mushrooming non-farm employment opportunities in urban areas for landless periurban communities (Universities of Birmingham, 1998), while small and marginal farmers may face water insecurity due to private and grazing land acquisition (Narain et al., 2013; Vij, 2015).

Land use change is an important driver of periurban processes. Periurban locations go through changes such as decline of agricultural land—both private and common property, which

may be appropriated for other non-agricultural uses. The latter includes infrastructure to support urban expansion, recreation centres, amusement parks, residential areas, and shopping centers. Along with agricultural resources, the CPRs are diverted to meet urban requirements (Prakash et al., 2011; Narain et al., 2013). These changes may present new threats to the livelihoods of periurban households that traditionally depended on these resources.

2.1. Depleting common property resources

The term 'Common Property Resources' is defined as private property for a group (Bromley, 1989). It refers to a category of natural resources that are owned, controlled and managed by a group of people. It includes community pastures, ponds, forests, and wastelands that are an important form of natural resource endowment in the rural areas of the developing world (Jodha, 1986). They are known to be an important basis for supporting livelihoods especially of small, marginal and landless households that have little by way of alternative means of private assets to bank upon. Scholars have devoted attention to understanding the conditions under which common property resources would survive over generations (Ostrom 1990, 1992), as well as emerging threats to them (for instance, Jodha, 1986).

From the early 1950s to early 1960s, CPRs in India declined in area and quality (Jodha, 1985). This process was caused by several factors, such as growing commercialization, population pressure, invasion of modern technology, large-scale adoption of tractors and mechanization. It was further accelerated by the spread of land reform programmes (ibid.). Strong political lobbying for land reforms in India converted CPRs into land for elites (Pasha, 1991). The loss of community ownership implied that CPR lands resulted in considerable degradation in quality and shrinkage in quantity. For instance, the degraded quality herbage on CPRs subject cattle and other small & large ruminants¹ to many diseases—resulting in losses for small and marginal farmers, dependent on CPR for livestock (ibid.). In the 1970s, Indian administration wanted to apply scientific methods of management on the open wastelands that were previously used as common pastures. This also resulted in decline of CPRs (Bon, 2000). This change in access to the village commons has two negative outcomes. First, large tracts of the pastures have been converted into cultivated lands (Jodha, 1992). Second, there is a decline in the average size of livestock holding (animal units).

In the context of periurban areas, there is strong evidence of the degradation of CPRs, particularly grazing land and water ponds, which is known to have increased the vulnerability of landless, small, and marginal groups by reducing their ability to keep livestock (Rakodi, 1999). There is increase in competition for resource usage between urban, periurban, and rural areas (Vij, 2015; Narain, 2014; Narain et al., 2013; Prakash et al., 2011).

The rising demand for land coupled with an increasing pressure of population has led to encroachment of village water bodies—*Johads* (earthen rainwater harvesting structures or ponds). Moreover, with higher rainfall variability, the lowering of the water table has forced farmers to dig deeper and use costly tube wells to yield sufficient water for irrigation (Rishi and Anant, 2006). The involvement of high expenditure in digging deeper tube wells has deprived marginal farmers of access to irrigation. With the scarcity of water for irrigation, marginal farmers have sold off their land to big and rich farmers (Rao, 2003).

Narain (2009a) notes that the acquisition of the village common ponds hits the livelihoods of potters who have traditionally depended on these as sources of silt. Prakash et al. (2011) draw

¹ This includes mammals such as deer, antelopes, cattle, sheep, and goats.

attention to the loss of tanks in Hyderabad affecting the livelihoods of washer men that have depended on them as a source of livelihoods. However, even in this discourse around issues of equity in contemporary urbanization processes, the question of the interface of local power structures with the processes of urbanization that erode access to CPRs has received scant attention. The research presented in this paper suggests that urbanization trends interface closely with local power structures to shape people's differential access to CPRs. Those who are at the lowest rung of the social and economic ladder bear most the negative impacts of this process. They experience a compounding of different kinds of stresses². However, they remain hidden from a public purview, as they are shadowed by the narratives of millennium cities like Gurgaon that are projected as show-cases of urbanization and modern engines of growth. These narratives keep hidden from view the manner in which the ecological footprint of cities is borne. A periurban conceptual lens makes these linkages more visible and obvious.

3. The location of this research

This research is located in a periurban setting in India, a demographic giant in the Indian sub-continent. The urban population of India has increased from 23.3 per cent to 31.2 per cent during the census period of 1981–2011 (Census, 1981, 1991, 2001, 2011). The exponential growth rate has also increased for the recent decadal period of 2001–2011 (3.3 per cent) as compared to earlier periods of 1991–2001 (2.1 per cent) and 1981–1991 (2.4 per cent). The nature of urbanization processes has undergone a change in the neo-liberal reform period after 1991, with more space being created for private enterprise; real estate and outsourcing services have contributed to this process. With this pattern of urban expansion, the demand for utilities has increased and urban developers and planners propose infrastructure development such as roads, residential buildings, water treatment plants, and sewerage treatment plants. This involves the appropriation of land and water resources from peripheral villages.

The research is located in two such villages, namely, Budheda and Sadhrana, approximately 15 km away from the city of Gurgaon (Fig. 1). Gurgaon is a major residential, outsourcing, and recreation hub of Northwest India that has grown steadily since the 1980s. It is the sixth largest city of the state of Haryana, which has traditionally been India's food basket, and was the cradle of the green revolution in the 1960s.

The state government of Haryana has harnessed the growth potential of the city, particularly since the economic reforms of 1991. Three factors have contributed to this growth; namely, the proximity of the city to Delhi, the National Capital; the short distance to the international airport and the policies pursued by the state government to invite private enterprise. The population of Gurgaon stood at 1.5 million in 2011 against 0.8 million in 2001. With a population increase of 73.9% in a decade (Census, 2001, 2011), a high demand for better utility services has been created. A real estate boom since the 1990s was accompanied by a process of land use change wherein land was acquired by the state as well as by real estate and put to alternative uses.

² Beside these stressors, climate variability is also responsible for the demise of CPRs. Historically, CPRs such as *Johads* used to act as buffer for the rural communities, storing water during rainy spells and releasing it evenly during dry spells (drought season). The maintenance of CPRs by the communities was the anticipatory adaptation strategy before unprecedented natural events such as drought. With the increased variability in the rainfall and temperature patterns, communities no longer find it lucrative to maintain them. See also Jodha et al. (2012).

4. Methodology

A qualitative research design was used in this study, following the case study method (Yin, 1984). Such a design is aimed at understanding the behavior from the perspective of the respondents, and to capture social reality through fieldwork in natural settings. The philosophical understanding of this study relies on a constructivist paradigm, that is, on the social construction of reality (Baxter and Jack, 2008). This paradigm suggests a close relationship between the researcher and the participating community.

The goals of the case study approach are on lines of analytic generalization, where the intention is to generalize at a theoretical or conceptual level, as against statistical generalization aimed at in quantitative research designs. According to Yin (2003), the case study design focuses on answering “How” and “Why” questions, when the boundaries between phenomenon and context are blurred. Further, the case study design relies on multiple sources of evidence.

Data was collected through semi-structured interviews with respondents in both villages over a period of 32 field visits. During the fieldwork 18 people from the two villages were interviewed over a period of about 73 h. The respondents were chosen on the principle of methodological pragmatism (Johnson and Onwuegbuzie, 2004).

Special emphasis was given on interviewing elderly persons of the two villages, which helped in understanding various changes related to the use of and access to CPRs. Several key informants were interviewed to gauge information on crucial aspects of the village profile and the changes in the use and management of CPRs. Individuals associated with different village institutions were interviewed to understand their perspective on the changing socio-economic environment and its impact on CPRs. Key actors like village elders, *Sarpanch*³ (headman) and one official of the Public Health Engineering Department of Gurgaon were included as key informants. Semi structured interviews with village residents shed light on how different groups of people, men and women, were affected by the processes of urbanization and rural-urban transformation in terms of their changing access to village CPRs.

5. Changing land use, power structures and CPRs

Both the villages are socially heterogeneous. Village Sadhrana has 552 households (Census 2011). Budheda has approximately 750 households (Census, 2011). The villages include communities from several caste groups—*Brahmin*⁴, *Bhangi* (Balmeeek)⁵, *Jogi*⁶, *Lohar*⁷, *Rajput*⁸, and *Yadav*⁹. The caste system in India is a system of social stratification – differentiating the communities into various smaller groups based on their occupation. Village Sadhrana

³ *Sarpanch* is an elected person of a village level statutory institution for local governance called the *Panchayat* (village government) in India.

⁴ Brahmin refers to the priest class, the highest in the order of *Varnas* (caste structure based on occupations). They are now mainly artists, teachers, and technicians.

⁵ This caste group was considered untouchable before the abolition of untouchability in the country. They are particularly involved in menial jobs such as cleaning toilets, sweeping, and scavenging.

⁶ *Jogi* emerged from the Hindu community; they are followers of Lord Shiva. In Haryana they are also known as *Padha Jogi*. They are into farming and livestock rearing. However, they do have large size land ownership. Along with these occupations, they conduct *Sadhrana* (prayers).

⁷ They represent a sub-caste among Hindus, Sikhs, and Muslims but they all are traditionally blacksmiths. In the two study villages the sub-caste group emerged from Hindus.

⁸ *Rajputs* are considered descendant warriors of the Hindu ruling class. They are spread all across north Indian states. The primary occupation is now agriculture.

⁹ They are historically considered as pastorals. They worship Lord Krishna and their major occupation is agriculture and livestock rearing.

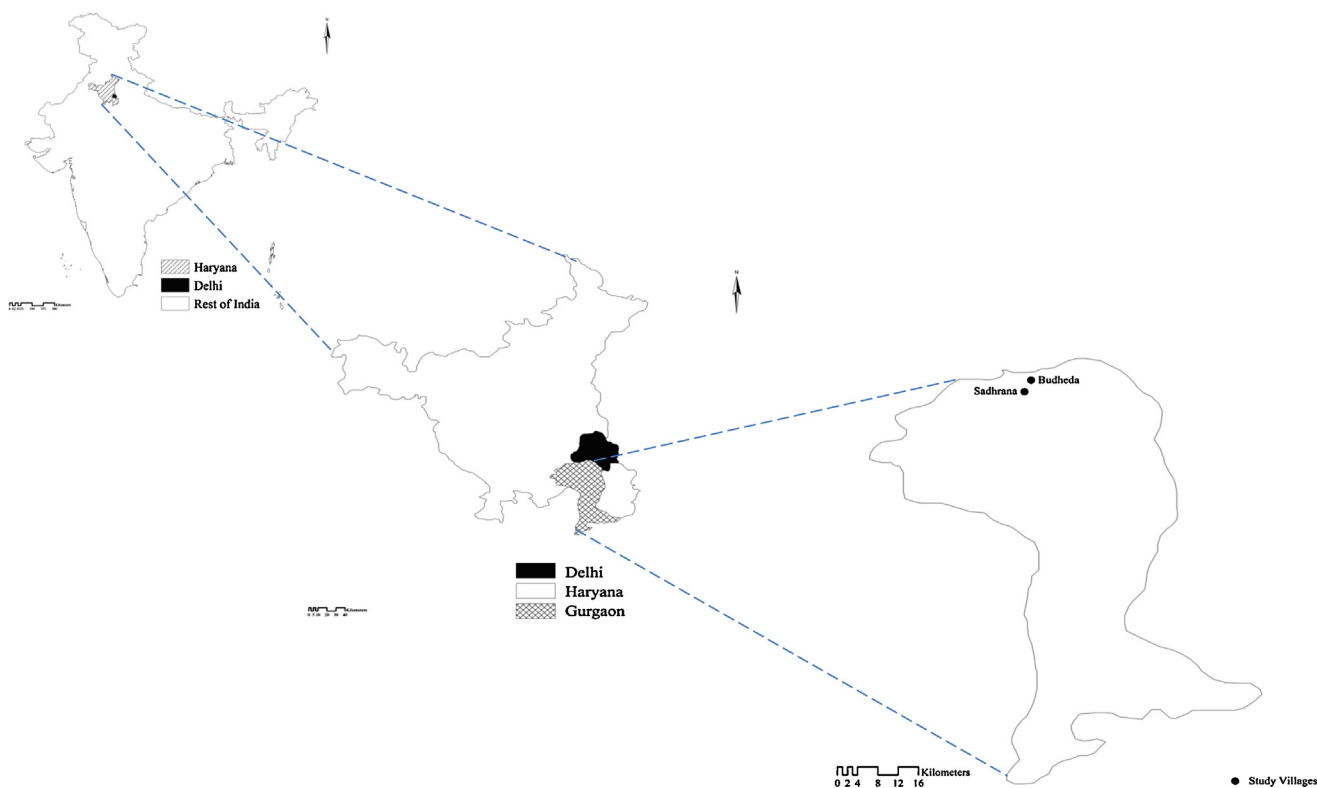


Fig. 1. Location of the study area and villages.

includes a recently migrated community called *Perna*¹⁰. The livelihood of these communities comprises predominantly agriculture and allied occupations such as animal husbandry. Both villages are witnessing land use changes to support the expansion of the city with differential consequences for the marginalized groups.

5.1. Rural urban transformations, land use change and demise of CPRs

State authorities have responded by building new water treatment plants (WTPs) in the periphery of Gurgaon to meet its growing drinking water needs. This is a typical supply side augmentation response, which implicitly assumes the infrastructure needs of the city to take precedence over those of the periphery. At present, the water treatment plant in village *Basai*, about 5kms from the main city, is the main source of drinking water for the city. At the time of this research, a new one was being built in village *Budheda* to augment the supply. Acquisition of private agricultural and common property grazing lands took place in *Budheda* for building this WTP; 230acres¹¹ of land was acquired in the first phase to support this construction. This acquisition deprived the local livestock-dependent village communities, especially, the *Balmeeks*—of access to these grazing lands. The acquisition of an additional 140 acres of land for the expansion of the plant was on the anvil at the time of this research.

In the vicinity of these two villages, industrial conglomerates are setting up large industrial zones to use the cheap skilled labor

¹⁰ The *Perna* were a nomadic tribe, referred to as *vagrant* by British ethnographers, similar in background to the *Nat* and *Bazigar* communities. They were said to be a sub-group of the *Dom* community. As a semi-nomadic community, they were alleged to be involved with prostitution.

¹¹ Acre—a unit of area used in the United States customary system. It is equivalent to 43,560 square feet (~4047 m²).

of the region. Reliance Industries Limited¹² had a plan to procure 25,000 acres of land to set-up a Special Economic Zone (SEZ). They had procured around 1400 acres of land from these two and some neighboring villages. However, this project is hurdled by the strict norms of the Supreme Court in 2006 for protecting the *Sultanpur National Park* that was developed in 1972 to protect the avian fauna of the region. Being close to the National Park, the area has been declared as an ESZ (Ecologically Sensitive Zone). No construction activity is allowed in this region. These acquired pieces of productive land are therefore lying idle since the time of acquisition.

Several aspects of the land acquisition process are worthy of mention. Landowners have two options; first, to sell their lands to private property dealers at market rates and the second, to let the state acquire it at prices that are typically below the market rate. Sales under the first option are voluntary, while under the latter landowners do not have a choice; statutory law empowers the State to acquire land for a public purpose. Very often landowners speculate on the market price of land to increase; in the meanwhile, they are issued notices by the state that their lands are being acquired. In the field, it is common to hear voices of dissent about the low prices offered for land sales, as well as delayed payments that are received in small installments, not sufficient to allow sellers to acquire plots of land elsewhere. Cases of litigation are common. An important observation relates to the loss of plots of land progressively over the years for a wide variety of purposes and the consequent transition of landowners from commercial cultivators to subsistence farmers. Idleness resulting from the sale of land accompanied by fresh inflows of cash often mean that consumerism and alcoholism are on the rise (Narain 2009a; Vij, 2015).

Apart from the village's common property grazing lands, the usage of common property ponds (*Johads*) has also changed. Bud-

¹² Reliance Industries Limited is an Indian conglomerate holding company. The company is ranked No. 99 on the *Fortune Global 500* list of the world's biggest corporations, as of 2013.

heda has a 150-year-old functional *Johad*, used earlier by the community for bathing; however, it is now exclusively used for livestock's drinking and bathing. The Panchayat¹³ has extensive rights over it and it used to take care of it mostly under Mahatma Gandhi National Rural Employment Guarantee Act¹⁴ (MNREGA) activities. The major sources of water for this *Johad* are rainfall and the Gurgaon water supply channel.

An important aspect of rural-urban transformations in periurban contexts is that the locus of control over natural resources moves to outside the village (Narain and Nischal, 2007). In 2010, the *Johad* in Budheda was leased out on a legal contract to a private contractor from *Nuh* (a block in the Mewat district of Haryana) for 7 years (2010–2017) for fishing activities; fishing as an occupation is not culturally acceptable internally in the village. The community in Budheda, however, claim that a democratic process was not followed for the auction. Under the contract the maintenance is the contractor's responsibility. The Panchayat (local governance unit), without following a democratic process of auction and discussing in the *Gram Sabha* (village level meeting) transferred usage rights to the contractor. An important influencing factor was that the *Sarpanch* was a *Pundit* (belonging to the higher caste) and he misused his power to decide about the usage of the *Johad*.

A key respondent from the village stated that the private contractor makes huge profits from the fishing activities, but has paid a relatively meager amount (Rupees 45,000¹⁵ for seven years) to the Panchayat. The respondent further mentioned that in a single catch the contractor makes a profit of around Rupees 40,000 from the *Johad*. Mention of monetary exchanges in return of a favor as bribe between the private contractor and the previous *Pundit Sarpanch* provides some evidence of poor accountability in the functioning of local governance.

In the field interviews, the current *Sarpanch* of Budheda mentioned about a recent auction of 22 trees on the *Johad's* bund (embankment). The Panchayat received an amount of Rupees 1,04,000¹⁶ from this auction. He also explained the process of auction followed by the Panchayat; it contradicts the earlier process followed nor the rules set by the Panchayat for the usage of *Johad* for the contractor. A single auction for trees realized more cash than the *Johad's* auction to a contractor for fishing. This clear difference in the auction amount raises a question on the functioning of Panchayat in terms of financial transparency. Not only did the locus of control over the village's common property pond move to outside the village, but local power relations also allowed the leadership to evade accountability to the members of the village community in this process. Local governance is socially shaped process and power relations shape accountability.

6. Interface of changes in land use patterns with local power structures

6.1. Changes in agriculture, livestock pattern, & cost of irrigation

The acquisition of land to meet the household water demand of the city has affected the livelihood of small and marginal farmers and landless households. There is a sharp decline in the livestock as both the grazing and private agriculture land has declined.

¹³ Panchayat is the system of village level governance in India/ south Asia.

¹⁴ The MNREGA is a central government programme that aims at providing a minimum of 100 days wage employment in every financial year to every household, whose adult members volunteer to do unskilled manual work.

¹⁵ Exchange rate for 45,000 Indian Rupee to US Dollar is ~\$750 (Exchange rate of \$1 = 60 Rupees)

¹⁶ The amount received after the auctions of tree was ~\$1733 (1,04,000 Indian Rupee).

Table 1
Per day expenditure on feed/fodder per cattle unit.

Sr. no.	Fodder inputs	Amount (INR)
1	Mustard/wheat (green fodder)	40
2	Jaggery (2 Kg)	80
3	Vegetables (carrots, ridge gourd, and gourd)	30
4	Dry fodder (6 times/day)	150
5	Wheat (1 Kg)	30
6	Binola (flat cotton seed) (2 Kg)	100
	Total	430

Source: Data collected during an interview with a key informant.

Most of the green fodder for livestock is procured from the agricultural fields. The *Pundit* and *Yadav* community, the higher caste groups who still own agricultural land obtain green fodder and do not share with the small and marginal farmers due to its reduced availability. People from the lower castes, such as *Chamar* and *Bhangi* do not own agricultural land. The maintenance cost of livestock has increased as fodder prices have sharply increased in the last two decades and landless families do not find it lucrative to keep livestock.

While raising a single cattle unit¹⁷ (cattle or buffalo), more than 70 per cent of expenditure is incurred on feed and fodder (NDDB, 2010). The households from higher caste who own land can save some proportion of this expenditure, while lower caste households who do not own land have to pay a higher input cost. This high feeding cost of cattle or buffalos is a major factor responsible for such households to shift from animal husbandry to unskilled labor jobs in urban centers like Sohna¹⁸ and Gurgaon. This provides some insight into the processes behind occupational diversification, widely understood to be an important process in periurban contexts. The Table 1 demonstrates the per day expenditure for one cattle unit.

6.2. Crop loss with declining *Johads*

Changing availability of water as a result of changing patterns of rainfall and growing stress on groundwater from competing uses has further altered the cropping practices in the two villages. Budheda was very famous for *kharbuja* (Musk Melon) and the village used to attract marriage proposals due to availability of sweet water and muskmelon. Now, due to salinity and depleting water levels—on account of a decline in rainfall and growing pressures on groundwater from the surrounding areas—the cultivation of muskmelon has completely ceased. In *Sadhrana*, *Chana* (Black gram) was grown in the past but due to saline water, it has been discontinued. Farmers have started cultivating wheat and mustard in the Rabi¹⁹ season. Three major closely related reasons are behind this phenomenon (a) decline in rainfall post 1980 (b) drying of sweet water open-wells and (c) increasing salinity of the water accessed through the tube wells due to the decline in ground water table.

There is a strong linkage between drying of *Johads*, decline in ground water table, and drying of sweet water wells located in

¹⁷ An animal unit is defined as a mature (1000-pound = 453 kg) cow or the equivalent, based on an average consumption rate of 12 kilograms of forage dry matter per day (Society of Range Management, Arizona).

¹⁸ Sohna (also called as Greater Gurgaon) is a municipal city in Gurgaon district. The Haryana government has notified the Gurgaon-Sohna Master Plan, 2031. After the approval of new master plan, developers and promoters have started acquiring land banks in the area and those with SEZs (special economic zones) are mulling land-use change after the notification. Labourers from nearby villages of Gurgaon district find employment in the factories of Sohna.

¹⁹ Winter Cropping Season in India (November to March)—retrieved from FAO (1999) <http://www.fao.org/climatechange/20614-017a90cd4602b18a5e958eac8be083ab.pdf>.

Sadhana. Technically, *Johads* feed rainwater to the wells and also maintain the ground water table in the surrounding area. With the increased rainfall variability, *Johads* receive less water for feeding wells. Further, because of the drying of *Johads* coupled with the emergence of a large number of tube-wells and submersible pump sets, ground water level has decreased and sweet water open-wells have dried. Apart from drinking, the sweet water open-wells were also used for filling *khed* (common drinking spots for the livestock) and agriculture purposes; these activities have completely ceased due to dried wells. In case of Budheda the *Johads* are no longer taken care of, and, as noted above, one of the nine functional *Johads* has been leased to a contractor for fishing purposes. The functional *Johad* is far away from the village residential area, therefore only few people depend upon it. Currently, the only source of water in *Johads* is the wastewater from the village drains.

Respondents in Budheda often referred to a decline in rainfall after the 1977. That year had a high rainfall and the village experienced rainfall flooding. After this, villagers note a decline in rainfall. The only exception was 2010, which was a year of high rainfall, in which rainfall flooding was again experienced. The village's agricultural lands lie in a low-lying area called *jheel* in local parlance. Rainfall flooding meant that the year's paddy crop was destroyed and farmers missed the sowing season for wheat. Most vulnerable to these impacts were the landless, tenants and sharecroppers who pay to the landowners a pre-agreed amount at the time of taking the land on contract, regardless of the actual harvest. Most of these tenants and sharecroppers, once again belong to lower castes, with little private assets to bank upon.

6.3. Gender-caste nexus with changing land use

The diminishing access to CPRs described above has created additional natural resource collection and management tasks for women and led to a transformation of gender relations.

Gender is understood as the socially constructed identities, roles, and responsibilities of women and men and the relationship between them (Ahmed, 2008); it determines the ideas and practices of what is to be a female or male (Reeves and Baden, 2000). Gender relations are dynamic (Ahmed and Zwarteveen, 2012). They are understood to intersect with other axes of social stratification such as class, caste, ethnicity, age, and marital status to shape men's and women's differential access to resources.

A water hand pump near the Gurgaon canal was installed in the village in 1985 and the piped water supply facility by the Public Health Engineering Department (PHED) was introduced in 1990. The PHED water supply facility has reduced the women's drudgery to fetch water for multiple purposes in a day. However, water availability is erratic during summers and users are not satisfied with the taste of water.

Earlier women used to collect water from the nearby wells. The village had 15 open sweet water wells, which were used by different caste groups. As noted above, all the wells have dried due to the depleted *Johads*; the entire burden has shifted to one sweet water hand pump, located outside the village. The lower caste women of the village face discrimination in accessing water from there. In times of scarcity, they feel the impacts disproportionately. This was echoed by one of the lower caste *Balmeeek* female respondents in Budheda, who said,

"Every day during my visits to the hand pump near the Gurgaon canal, I observe women from higher caste wasting scarce water cleaning the hand pump after my use. Moreover, during summers when the hand pump gets dry the upper caste households do not show the willingness to share drinking water."

Petty scuffles often emerge among women. These daily struggles are an expression of caste and class relations.

The time and drudgery of women, particularly from the lower castes, in collecting natural resources has further increased with reduced access to CPRs. Due to the depleting grazing and Panchayat land, there has been a switch from grazing to stall-feeding. Socio-culturally, grazing has been the domain of men, while stall-feeding is the responsibility of women. This has created additional fodder collection tasks for women. Even after fodder is collected, women help men to cut the collected fodder and prepare the mixture for feeding the livestock. Due to the depleting common lands, further, there has been a decline in the availability of fuel wood. Instead of fuel wood, therefore, cow/buffalo dung cakes are now used for cooking, bonfire, and even for funeral rituals among economically weaker sections (especially the scheduled caste communities). The depleting commons are thus causing the socio-cultural behavior to change.

6.4. Changing irrigation facilities with the emerging periurban interface

With the declining patterns in rainfall and depleting *Johads*, farmers are completely dependent on tube wells and other newer water sources such as the wastewater canal. The Gurgaon and NCR water channel pass through the agricultural land of the village. Farmers are not allowed to use this water for irrigation. A wastewater canal also passes through these agricultural lands whose water can be used for agriculture, called the Gurgaon-Jhajjar²⁰ wastewater canal. The farmers have to pay Rupees 50 per annum to *Lambardar* (village level officer) to irrigate 1 *Kila*²¹ of land. This revenue is paid to the Haryana Irrigation Department in Delhi.

However, here, too, there are important equity dimensions. The farmers' ability to benefit from wastewater irrigation depends on the location of their fields, which shapes the diversity of irrigation sources that farmers can access. The wastewater canal has been provided with the water outlets for irrigation. Farmers feel that these outlets are not effective as there is usually very less water in the canal. It takes a long time to irrigate the fields and sometimes the level of water is very low to use these outlets. Thus, they prefer using the diesel pumps to extract water. Due to varying affordability of the diesel pumps, water markets have emerged. The buyers are the small and marginal farmers whose fields are far away from the wastewater canal and the sellers are the ones with higher economic status with an ownership of diesel pumps.

Aspects of the economic viability of wastewater irrigation were explained by one of the farmers interviewed during the course of the research. There is a requirement of six liters of diesel to pump out water for 1 *Kila* (~one acre) of land for wheat cultivation. It approximately takes 6–8 h to irrigate 1 *Kila* of land. Average expenditure of single irrigation for 1 *Kila* of land is Rupees 250. Other neighboring small and marginal landowners, who do not own diesel-pumps, have to pay Rupees 250 as a rent. This makes Rupees 500 for irrigating 1 *Kila* of land. The cost of using diesel pumps is very high as compared to rainfall and *Johads*. The small and marginal farmers away from the wastewater canal find the cost of installing a tube well to be very high as compared to using water from the *Johad*, wastewater canal and rainfall.

The wastewater canal has created differential opportunity for farmers. People owning land near the canal use this water for the growing of crops/vegetables as it is nutrient rich and does not require intensive use of fertilizers. However, small and marginal farmers away from the canal have to either buy water from the

²⁰ Jhajjar is an adjoining district to Gurgaon in the state of Haryana, India.

²¹ Kila is a unit of land measurement. According to Department of Land Resources in Haryana one Kila is equal to four Bigha. Further, four Bigha is equal to one acre, thus we can infer that one Kila is equal to one acre in the state of Haryana.

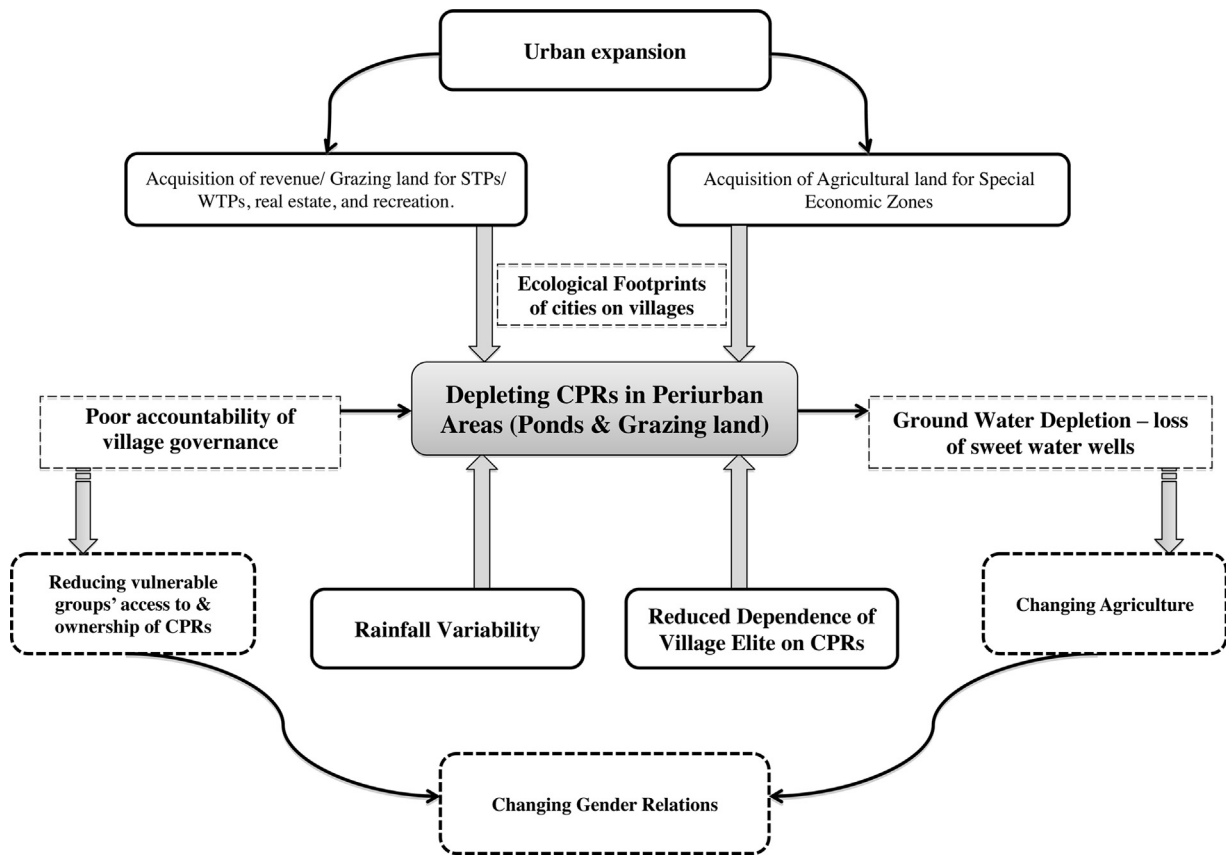


Fig. 2. Causes and impacts of CPRs depletion.

neighboring farmer with a tube well facility or have to spend on diesel pumps for pulling water from the wastewater canal.

Interestingly, none of the farmers interviewed use the wastewater irrigated crops for self-consumption, as they fear the negative health impacts of consuming the wastewater-irrigated crops. All the wastewater irrigated produce is instead sold in the wholesale market in the city of Gurgaon. This is an important aspect of rural-urban flows of goods and services in periurban areas; the flow of wastewater from the city to the village, and the reverse flow of agricultural produce from the village to the city.

7. Conclusion: power and politics in urban planning

This paper has described how urbanization processes interact with local power structures to diminish the access of individuals and groups to village CPRs. Situated in a periurban location in North-West India, the research provides insights into how ongoing processes of urbanization and land use change alter natural resource access and use practices in periurban contexts, deepening social and economic vulnerabilities and altering gender relations around natural resources. Processes of urban expansion and elite caste domination intersect to deepen the deprivation of CPR dependent households. Climatic variability and declining rainfall further accentuate some of these impacts. Most adversely affected by these processes are small and marginal farmers or the landless households.

The demise of common property resources and natural resource degradation together lead to a transformation of gender relations. The reduced availability of fodder and water add to women's workloads. Due to daily migration of men—who move away from their traditional occupations of agriculture and animal husbandry that are no longer seen as lucrative, women's responsibilities on the

farm and the household are bound to increase. Fig. 2 presents these relationships.

In understanding the implications of the demise of CPRs for vulnerable communities, the question of power is relevant at two levels. First, at the intra-village level, unequal power structures deprive certain social groups of access to CPRs. Power relations allow local leaders to evade accountability to village communities in processes such as the auction of village ponds; local accountability is a socially shaped process. At a more macro level, the increasing vulnerability of periurban residents is the result of a politics of urban planning that favors the pre-emption of rural and periurban resources for urban expansion (Narain, 2014; Shatkin 2007). Land and water resources are engulfed to provide for the growing city; there are implicit biases in the urban planning process about who modern cities are meant for. This research supports the findings of similar recent research on periurbanization in India (Kundu, 2008; Janakarajan, 2007; Reddy and Reddy, 2007; Arabindoo, 2009; Narain and Nischal, 2007; Randhawa and Marshall, 2014), which questions the top-down nature of urban expansion policies that has created pockets of marginalization and deprivation. It is here that this research contributes to the literature on urban political economy.²²

There is now in India a growing demand for more transparent and equitable processes of land acquisition and stakeholder engagement with a specific focus on periurban communities, including efforts at the formation of multiple stakeholder platforms (MSPs) (Janakarajan, 2007; Narain 2009a; Vij, 2015; Randhawa and

²² Urban political economy emerged as a critique of the urban ecology paradigm. It emphasizes the spatial competition for resources by individuals and institutions. For a review of some of the ideas in the urban political economy literature, see also Weiss (1987), Walton (1993) and Molotch (1976).

Marshall, 2014). This may be one way forward, though questions of power structures may still be relevant to the functioning of such MSPs. Counter-narratives about the adverse impacts of the land acquisition processes on the livelihoods of the marginalized groups may be needed to reverse this process and place urban planning in a new perspective, taking cognizance of the impact of urbanization beyond the cities. This needs to be accompanied by an informed debate on alternative models of urbanization and advocacy to protect the commons that remain.

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References

- Ahmed, S., 2008. Gender and integrated water resources management in south asia: the challenges of community-managed alternatives. In: Dutt, K.L., Wasson, R.J. (Eds.), *Water First. Issues and Challenges for Nations and Communities in South Asia*. Sage Publications, New Delhi, pp. 185–201.
- Ahmed, S., Zwartveen, M., 2012. Gender and water in South Asia: revisiting perspectives, policies, and practice. In: Zwartveen, M., Ahmed, S., Gautam, S.R. (Eds.), *Diverting the Flow: Gender Equity and Water in South Asia*. Zubaan Publication, New Delhi, pp. 3–30.
- Allen, A., 2003. Environmental planning and management of the peri-urban interface: perspectives on an emerging field. *Environ. Urbanization* 15 (1), 135–148.
- Arabindoo, P., 2009. Falling apart at the margins? Neighborhood transformations in periurban Chennai. *Dev. Change* 40 (5), 879–901.
- Baxter, P., Jack, S., 2008. Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers. McMaster University, West Hamilton, Ontario, Canada, retrieved from http://scholar.google.co.in/scholar_url?url=http%3A%2Fmedia.usm.maine.edu%2F~lenny%2FCAMP%2520USAN%2520CURTIS%2Fbaxter-CASE%2520STUDY.pdf&hl=en&sa=T&oi=gga&ct=gga&cd=0&ei=vLiwVPL-PibCagGFnYCYDQ&scisig=AAGBfm0593oj1yZbXg3CSJ3zJb9GulntA&nossl=1&ws=1584x709 on January 3, 2015.
- Bon, E., 2000. Common property resources: two case studies. *Econ. Political Weekly* 35 (28–29), 2569–2573.
- Bromley, D.W., 1989. *Economic Interests and Institutions: The Conceptual Foundations of Public Policy*. Oxford and New York, Basil Blackwell.
- Census (India), 2001. Census—Data 2001 Online. Retrieved from <http://www.censusindia.gov.in/2011-common/censusdataonline.html> on December 9, 2012.
- Census India, (2011). Provisional Population Totals Paper 1 of 2011: Haryana, Retrieved from http://censusindia.gov.in/2011provresults/prov_data.products_haryana.html on March 20, 2014.
- Douglas, I., 2006. Peri-urban ecosystem and societies: transitional zones and contrasting values. In: McGregor, D., Simon, D., Thompson, D. (Eds.), *The Peri-urban Interface: Approaches to Sustainable Natural and Human Resource Use*. Earthscan, Sterling, VA, pp. 18–29.
- Dupont, V., 2005. Peri-urban dynamics: population, habitat and environment on the peripheries of large Indian metropolises: an introduction. In: Dupont, V. (Ed.), *Peri-Urban Dynamics: Population, Habitat and Environment on the Peripheries of Large Indian Metropolises. A Review of Concepts and General Issues*. Centre de Sciences Humaines, New Delhi.
- Iaquinta, D., Drescher, A., 2000. Defining periurban: understanding rural-urban linkages and their connection to institutional contexts. Tenth World Congress of the International Rural Sociology Association. Available at: http://www.ruaf.org/sites/default/files/econf1_submittedpapers.11iaquinta.doc.
- Janakarajan, S., 2007. Urbanization and periurbanization: aggressive competition and unresolved conflicts—the case of Chennai City in India. *South Asian Water Stud.* 1 (1), 51–76.
- Jodha, N.S., 1985. Common Property Resources and Dynamics of Rural Poverty (Field Evidences from Dry Regions of India). International Center for Integrated Mountain Development (ICIMOD).
- Jodha, N.S., 1986. Common property resources and rural poor in dry regions of India. *Econ. Political Weekly* 21 (27), 1169–1178.
- Jodha, N.S., 1992. Common property resources: a missing dimension of development strategies, World Bank Discussion Papers, No. 169, World Bank, Washington, DC.
- Johnson, R., Onwuegbuzie, A. J., 2004. Mixed Methods Research: A Research Paradigm Whose Time Has Come, American Educational Research Association, Vol. 33, No. 7 (Oct., 2004), 14–26, retrieved on 1 March 2013 from <http://www.jstor.org/stable/3700093>.
- Kundu, A., 2008. Socio-economic segmentation, inequality in micro environment and process of degradation peripheralization in New Delhi. In: Singh, A.L., Fazal, S. (Eds.), *Urban Environmental Management*. B.R. Publishing Corporation, Delhi, India, pp. 45–75.
- Marshall, F., Waldman L., MacGregor H., Mehta L., Randhawa P., 2009a. On the edge of sustainability: perspectives on peri-urban dynamics, Working Paper Series 35, STEPS Centre, Institute of Development Studies: Sussex, UK.
- Marshall, F., Waldman, L., MacGregor H., Mehta, L., 2009. On the edge of sustainability: perspectives on peri-urban dynamics. Working Paper Series 16. STEPS Center, Institute of Development Studies: Sussex, UK.
- Molotoch, H., 1976. The city as a growth machine: towards a political economy of place. *Am. J. Sociol.* 82, 309–332.
- NDDB, 2010. Annual Report 2010–2011, National Dairy Development Board (NDDB), Anand, Gujarat.
- Narain, V., Nischal, S., 2007. The peri-urban interface in Shahpur Khurd & Karnera, India. *Environ. Urbanization* 19 (1), 261–273.
- Narain, V., 2009a. Growing city, shrinking hinterland: land acquisition, transition and conflict in peri-urban Gurgaon, India. *Environ. Urbanization* 27 (2), 501–512.
- Narain, V., 2009b. Gone land, gone water: crossing fluid boundaries in peri-urban Gurgaon and Faridabad, India. *South Asian Water Stud.* 1, 143–158.
- Narain, V., Khan, A.S.M., Sada, R., Singh, S., Prakash, A., 2009. Urbanization, peri-urban water (in) security and human well-being: a perspective from four south Asian cities, *Water International*; 38: (7) 2013, 930–940.
- Narain, V., 2014. Whose land? Whose water? Water rights, equity and justice in a peri-urban context, *Local Environment: The International Journal of Justice and Sustainability*, Routledge, Taylor & Francis Group, London, UK.
- Ostrom, E., 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press, Cambridge, United Kingdom.
- Ostrom, E., 1992. *Crafting Institutions for Self-governing Irrigation Systems*. ICS-Pr, Washington, USA.
- Pasha, S.A., 1991. Sustainability and viability of small and marginal farmers: animals husbandry and commons property resources. *Econ. Political Weekly* 26 (13), 27–29.
- Prakash, A., Singh, S., Narain, V., 2011. Changing waterscapes at the periphery. Understanding periurban water security in urbanizing India. In: *India Infrastructure Report*. Oxford University Press, New Delhi.
- Rakodi, C., 1999. Poverty and wellbeing in the peri-urban interface of developing country cities: a review, prepared on behalf of the UK Department for International Development Natural Resource Systems Research Programme. Final Report, 70.
- Randhawa, P., Marshall, F., 2014. Policy transformations and translations. Lessons for sustainable water management in peri-urban Delhi, India. *Environ. Plan.* 32 (1), 93–106.
- Rao, M.V.R., 2003. Farmers in his Constituency waiting for water. *Indian Express News*, retrieved from www.indian-express.com/ie/daily/20010203, on January 10, 2010.
- Reddy, V.R., Reddy, B.S., 2007. Land alienation and local communities. *Econ. Polit. Wkly.* 42 (31), 3233–3240.
- Rees, W., 1992. Ecological footprints and appropriated carrying capacity: what urban economics leaves out. *Environment and Urbanization*. Available at: <https://books.google.co.in/books?hl=en&lr=&id=fA7kxrsy2FwC&oi=fnd&pg=PA121&dq=Rees+1992+ecological+footprints&ots=bivKoX4Lb&sig=VkJQz5T35MxQwoVsjb1i6R9YskfQ>.
- Reeves, H., Baden S., 2000. *Gender and Development: Concepts and Definitions*. BRIDGE, Institute of Development Studies, University of Sussex, Report No. 55, 18.
- Rishi, P., Anant P., 2006. Dying Johads in India: recapturing the potential through participatory behavioral analysis, European Water Association (EWA), Official Publication, 4.
- Shatkin, G., 2007. *Global cities of the South. Emerging perspectives on growth and inequality*. *Cities* 24 (1), 1–16.
- Simon, D., 2008. Urban-environments: issues on the periurban fringe. *Annu. Rev. Environ. Resour.* 33, 167–185.
- Tacoli, C., 2003. The links between urban and rural development. *Environ. Urban.* 15 (1 April), 3–12.
- Universities of Birmingham, Nottingham and Wales, UK, 1998. Baseline study and introductory workshop for Hubli-Dharwar city-region, Karnataka, India, Final Technical Report, Vol. (1), 128.
- Vij, S., 2015. Urbanization, common property resources and gender relations in a peri-urban context. *Vision: J. Business Perspect.* 18, 339–347, Available at: <http://vis.sagepub.com/lookup/doi/10.1177/0972262914553259>.
- Walton, J., 1993. *Urban sociology: the contribution and limits of political economy*. *Am. Rev. Sociol.* 19, 301–320.
- Weiss, M., 1987. *The Rise of the Community Builders: the American Real Estate Industry and Urban Land Planning*. Columbia Books, MY.
- Yin, R.K., 1984. *Case Study Research: Design and Methods*. Sage Publications, Beverly Hills, California.
- Yin, R.K., 2003. *Case Study Research: Design and Methods*, 3rd ed. Sage Publications, Thousand Oaks, California.