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## Unruly urbanisation on Delhi's fringe

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# **1 INTRODUCTION: THEORETICAL LEADS, RESEARCH QUESTIONS, AND METHODOLOGY**

Metropolitan cities grow beyond imaginable proportions, particularly in the developing world. Urban issues therefore warrant – and receive – increasing attention. The national capital of India, Delhi, is a city where indisputable economic progress related to urbanisation is accompanied by tremendous environmental concerns, congestion, poverty, and housing shortages. This thesis focuses on the rural-urban fringe, which is the ultimate ‘battlefield’ of the environmental and socio-economic change brought about by urbanisation. The population of urbanising villages is confronted with new problems and possibilities regarding their livelihood and living conditions.

## **1.1 Introduction**

India is experiencing a relatively moderate pace of urbanisation compared to other developing countries. Today, India remains a largely agricultural country: the share of agricultural workers in the workforce has barely decreased: from almost 73 per cent in 1971 to 70 per cent in 1991 (Mohan 1996, p. 97). Meanwhile, the share of population living in urban areas increased from 20.2 per cent in 1971 to 23.7 per cent in 1981 and to 26.1 per cent in 1991 (Mohan 1996). On the basis of the same figures, Krishan (1993) and Visaria (1997) conclude that during the decade 1981-91, the rate of urbanisation slowed down a little. But these figures do not tell the whole story. There is evidence that urban growth is increasingly dispersed and is therefore not reflected in the census of population. Urban sprawl promotes the spread of urban land use into the rural-urban fringe and draws a larger number of people into the rural-urban interface. And even though the growth rate is not rising steeply, the absolute increase in urban population is very large, having doubled from 109 million in 1971 to 218 million in 1991 (Observer 1998). There are no signs that the growth of cities will decrease substantially (Hindustan Times 11-11-1999). In the course of development, it is likely that out of the enormous number of rural people lacking opportunity in the economically underdeveloped places where they usually come from, many will continue to migrate to the cities. Most of the population growth in cities is due to migration; slightly less is due to natural population growth in towns and cities; and villagers in settlements that are integrated into the urban fold account for a small share (Gugler 1996). The last group is often overlooked in urbanisation studies. Brookfield et al. (1991), studying similar issues in Kuala Lumpur, conclude that “the literature on land and population issues in urban fringe areas is remarkably lean” (p. vi).

The rural-urban fringe in general is frequently ignored as a specific area within the study of urbanisation. “It is symptomatic that ‘urban studies’ and ‘rural and regional studies’ prevail over ‘fringe studies’” (Ansari and von Einsiedel 1998, p. 85, and similarly expressed by Stren 1994). The rural-urban fringe of the bustling metropolis of Delhi therefore promises to be a very interesting area in which to explore important aspects of the development of India.

Delhi's population increases much faster than the national average rate. Delhi grows by almost 5 per cent annually, adding 400,000 people per year to the current estimated 13.5 million (United Nations 1995). In 1971, the population was barely 3.6 million, but in 1991 it was 8.4 million (Census of India 1971 and Census of India 1991). In 2015, the urban area of Delhi is expected to contain 17.6 million people (Ansari and Von Einsiedel 1998, p. 3).

The expansion of the city strongly influences the villages in terms of land use and population, both physically and in a socio-economic sense. Its influence stretches far beyond the immediately adjacent area. This study concentrates on the livelihood of the villagers who have lived there for generations as well on that of the migrants residing in the villages. The notion of livelihood is narrowed down here to reflect social and economic household variables; of these, especially the occupational characteristics are studied thoroughly. The traditionally dominant agricultural activities are under increasing pressure, although new chances are emerging for market-oriented agriculture. There are great differences in access to resources and opportunities among villagers, leading to interesting new patterns of livelihood. For non-agricultural occupations, the villagers' options are enhanced by their proximity to the expanding city. Land use and occupational trends are highly interrelated. For example, Brookfield et al. (1991) found that in Kuala Lumpur's fringe, as "educated children leave home to seek wage employment, leaving an increasingly elderly population in the kampung, the land acquires an aspect of neglect" (p. 43). Other sources emphasise the stimulating effects on agriculture (e.g. Mulay and Ray 1973). The dynamic agricultural scenario in the rural-urban fringe prompts "the development of new agricultural areas, which are cultivated by in-migrating farmers" (Hill 1986, p. 27-28). Quotes like these inspired us to find out if and to what extent this is valid for Delhi. A number of other consequences of urbanisation – namely environmental concerns, land markets, and planning for the city's expansion – are also treated in this study.

Although Delhi is a relatively fast grower in the club of Indian metropolitan cities (Delhi Development Authority 1992), the issues examined here are certainly not limited to Delhi. Some of its circumstances are obviously unique. Delhi nonetheless forms a suitable case, since it shows numerous similarities with other (metropolitan) cities as well. Like many other cities in Asia, Delhi is expanding fast. Moreover, it too is surrounded by a populous rural area with productive agricultural land. These are common features of the developing world in general and Asia in particular (e.g. McGee 1991). Such conditions give rise to many conflicts between rural and urban economies, traditions, and people. However, they can also generate mutually beneficial complementarities in the rural and urban spheres. The net outcome is highly selective for different groups and different locations. The empirical results of this study are on occasion compared with other cases gleaned from the available literature.

In order to study the socio-economic impact, the question of which aspects are part of urbanisation has to be considered. Urbanisation is a very broad term. Generally it refers to a society in which the trend is for a higher share of the population to be living in towns and cities. Sometimes it is used in the narrower sense of the morphological aspects of the process. In this research, a more concrete operationalisation was necessary in view of the manifestation of urbanisation on the micro level. Some indications of its scope were derived from the various descriptions in the literature (e.g. Ramachandran 1989, McGee

1991, Nangia 1976, Thakur 1991). But exploratory fieldwork was needed to find leads to relevant aspects of urbanisation at the village level in the study area.

Figure 1.1 Project context of this thesis

The organisational framework of this study is provided by the research project *Environmental degradation and its socio-economic consequences in the rural-urban fringe of Delhi*, project 4.1.1. in the Indo-Dutch Programme of Alternatives in Development (IDPAD), running from 1997 through 2000. This project involves a collaboration between the Department of Geography, Delhi School of Economics, University of Delhi with the Faculty of Spatial Sciences, University of Groningen, the Netherlands. Other researchers involved in the project take different angles, placing greater emphasis on land and water degradation, gender issues, and GIS mapping. This collaboration will result in joint publications and seminars. Although it is mainly an academic effort, it is also meant to inform policy-makers about the future course of planning in Delhi's region.

The following aspects were found to be directly or indirectly caused by urbanisation: land-use changes in favour of urban types of land use; location of urban-related activities in or near the village; better access from the village to urban areas and vice-versa; and expansion of urban types of amenities and infrastructure. All these processes have far-reaching consequences for the livelihood of the village population, as they lead to a diversification of employment and sources of income among the villagers, to different uses of the agricultural land, and to change in living conditions. A period of about 25 years, approximately one generation, was chosen as the time frame for three reasons. First, here are some relevant secondary sources that provide insight into local history and the situation in the 1970s. Second, there are consistent data available for this period from the Census of India. Third, this time span corresponds with the period of reliable 'recall' by most respondents and is manageable for the researcher.

The selected research area is Alipur Development Block, comprising 59 villages situated on the north side of the city within the National Capital Territory (Figure 1.2). This area encompasses a wide range of types of villages: from places that have remained relatively rural, deriving an income mainly from agriculture, to villages that have been entirely enveloped by urbanisation. The land-use pattern and the transformation of the occupational structure are the most important criteria for clustering and selecting villages for further study. Through this method, it is possible to select villages representing the continuum from almost urban to further out on the rural end of the rural-urban fringe. A basic household survey has been conducted to describe the situation in six villages. For the in-depth investigation, the study describes three selected villages that are subject to a strong impact of urbanisation. In addition, one case study concerns a completely urbanised village, which is included to show the ultimate impact of urbanisation on the living conditions of villagers as well as that of numerous migrants who have settled in and around that village. Chapter 2 describes the villages in detail.

Figure 1.2 The study area: Alipur Block in the National Capital Territory of Delhi

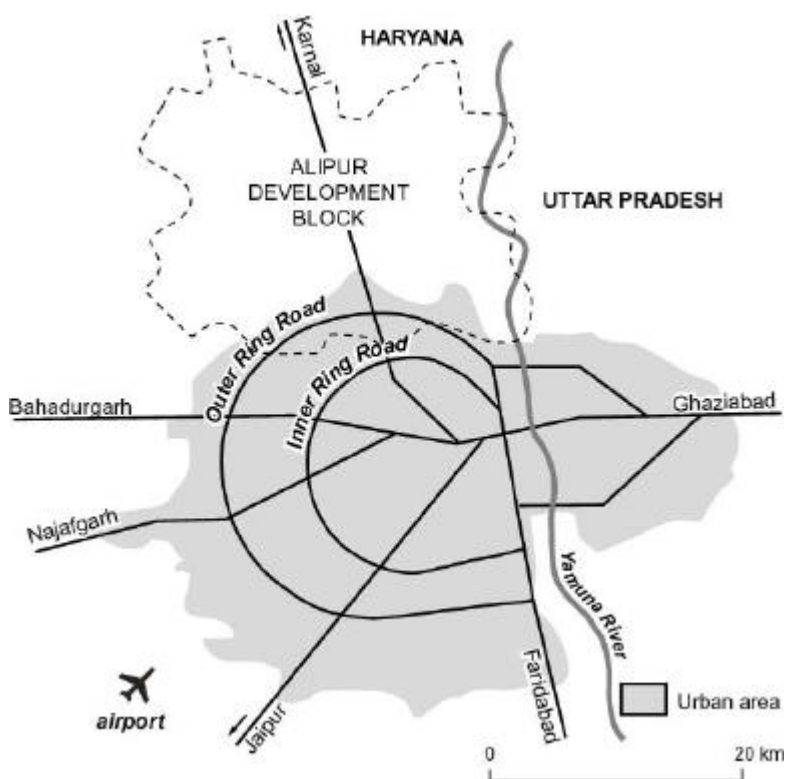


Figure 1.3 The accompanying CD-ROM

A CD-ROM with images, pictures, and maps is included at the back of this book. This medium is particularly useful for presenting remote sensing analysis, which could not otherwise be included in this thesis. That analysis is supplemented with numerous pictures and video's showing types of land use, villages, people, and other scenes in the rural-urban fringe of Delhi. Furthermore, the presentations include data from the Census of India, the primary survey data, and a complete electronic version of this thesis.

The theories that legitimise the research and underpin the approach that is taken here are explained in Section 1.2. In the literature, various approaches are taken to obtain a grip on the complex and multidimensional process of urbanisation, particularly in the case of developing countries. Methodologically, a mix of techniques is chosen as the best way to gather comprehensive and reliable information for the purposes of this study. Most of the research effort is invested in interviews with the local population (a basic household survey and an in-depth survey), emphasising the empirical orientation of the study.

## 1.2 Urbanisation: rural transformation and environmental change

In the present study, five basic issues have been distinguished as topics for research. The first of these concerns the need to refine the concepts relating to rural-urban fringes and rural transformation due to urbanisation, before attempting to model and describe the different types of villages. Second, the study moves on to land-use issues and the pressing problem of how land degradation should be interpreted in a rural-urban fringe. Third, the study shows how local and extra-local 'actors' interact to determine land-use patterns. Then, in the main empirical part, issues related to livelihood are treated, for which the village and household are important levels of observation. The final part discusses the environmental implications of the growth of metropolitan cities for the urbanising villages.

### 1.2.1 Definitions and the descriptive models of the rural-urban fringe

The rural-urban fringe has many different manifestations in the literature in terms of the way it is conceptualised and delimited. As far as the term can be traced, Wehrwein (1942) was the first to use the term rural-urban fringe, applying it in his work on cities in the United States. His example was followed by many others, including Ramachandran (1989), Thakur (1991), Lin (1994), Nangia (1976), Yadav (1987), and Lucas and Van Oort (1993). Many other terms are found in the literature, implying different delimitations and levels of analysis. The following list illustrates the diversity in terminology: *rurban fringe* (Schenk 1997), *urban fringe* (Kumar 1998, Kabra 1980, Hill 1986), *rural hinterland of the city* (Kundu 1991), the *city's countryside* (Bryant et al. 1982), *peri-urban fringe* (Swindell 1988), *rural fringe of the city* (Leeming and Soussan 1979), *peri-urban areas* (Dupont 1997, McGee 1991), *desakota regions* (McGee 1991), and *metropolitan fringe* (Browder et al. 1995, Rao 1991, Saini 1989). Research in languages other than English includes descriptions such as the Dutch *ruraal-urbane overgangszone tussen stad en platteland* (Druiven 1996) and the French *Péri-urbanisation* (Dupont 1997), *le périurbain* (Banzo 1998), *espace péri-urbains* (Vennetier 1989). How far the area around the city extends varies considerably, but many studies do not provide delimitations. An indication of the approximate spatial connotation of some of the above terms is depicted in Figure 1.5.

For the villages near Delhi, it was necessary to translate terms with a profoundly 'Western' bias into their Hindi-equivalent. *Shahari karan* (literally: urban development) proved to be the most appropriate term to explain the purpose of the study during the interviews, as it evoked references to changes in the lives of households and their villages as a result of urbanisation.

This thesis sticks to the term *rural-urban fringe* because a descriptive definition of that term by Ramachandran (1989) is found to be a quite accurate basis to build upon: "the rural-urban fringe is an area of mixed rural and urban populations and land uses, which begins at the point where agricultural land uses appear near the city and extends up to the point where villages have distinct urban land uses or where some persons, at least, from the village community commute to the city daily for work or other purposes" (Ramachandran 1989, pp. 297). The same criteria – urban land use on the urban side of

the fringe and occupation on the rural side of the fringe – are used here to formulate a working definition of rural-urban fringe:

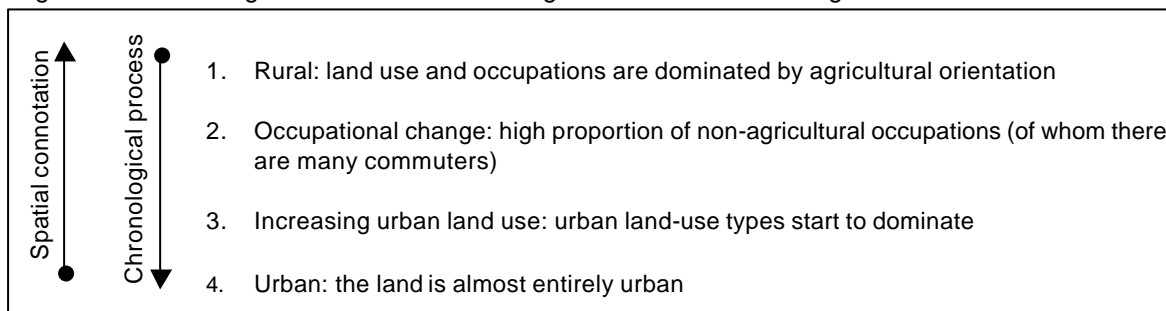
*The rural-urban fringe extends from the contiguous built-up area of the city (no rural land use) to the area where most villages show a majority of workers engaged in non-agricultural occupations (many of whom commute).*

Note the central role accorded to two criteria: land use and occupational structure. Data about commuting is not available in the census. It is therefore assumed, after verification in the field, that a high figure for non-agricultural occupations indicates a high number of commuters.

The second step is to identify stages of urbanisation of villages in a rural-urban fringe. For example, Galjart (1982) gives a typology of villages based on the degree to which they are incorporated into a wider economic system. This typology ranges from more or less remote villages that are completely isolated to urban villages completely incorporated in the city. The present study requires a more limited spectrum: the area within which people commute. Sundaram and Prakasa Rao (1984) made a valuable attempt in this direction, calling it 'stages of metropolitanisation'. However, Ramachandran (1989) developed the most useful concept, which could be altered to serve the purpose of this study. Following his definition of the rural-urban fringe, a 'fringe' village at the rural end of the spectrum has a distinctly rural land use, while the population already starts 'urbanising'. The first transformation of the rural local situation is characterised by a change in land use towards market-oriented agriculture. After that, the villagers start commuting and adopting an urban livelihood. This occurs before urban land use starts to dominate the local landscape. Finally, the village is incorporated into the urban area. Following these steps, Ramachandran (1989) classified the villages according to five stages ranging from rural to urban (pp. 310-318): first, rural (showing no visible influence of the city, either on the population or on the land); second, agricultural land-use change (showing influence of the agricultural markets in the city on the land use of the village); third, occupational change (where the majority of the population is no longer working in agriculture), fourth, urban land-use growth (where urban land-use types start dominating the area around the village settlement); and fifth, urban (where urban land-use types have taken up all rural land).

This study makes one major adjustment to Ramachandran's stages. The second stage is not found to be applicable to the study area and has thus been dropped. The reason is that many of Delhi's food requirements are actually supplied by areas too far away from the city to be included in its rural-urban fringe. Many specialised areas for growing apples, onions, potatoes, and other vegetables are located very far from the city. Besides, the entire alluvial plain, ranging from Punjab to deep into Uttar Pradesh, is characterised by productive market-oriented agriculture. Furthermore, the assumption had to be made that commuting is not the only cause of occupational transformation. The increase in local non-agricultural occupations is considerable as well. A high relative figure of non-agricultural occupations is therefore considered useful for determining if a village is in the stage of occupational change. The above arguments thus suggest the classification of villages as in Figure 1.4.

Figure 1.4 Stages of urbanisation of villages in the rural-urban fringe

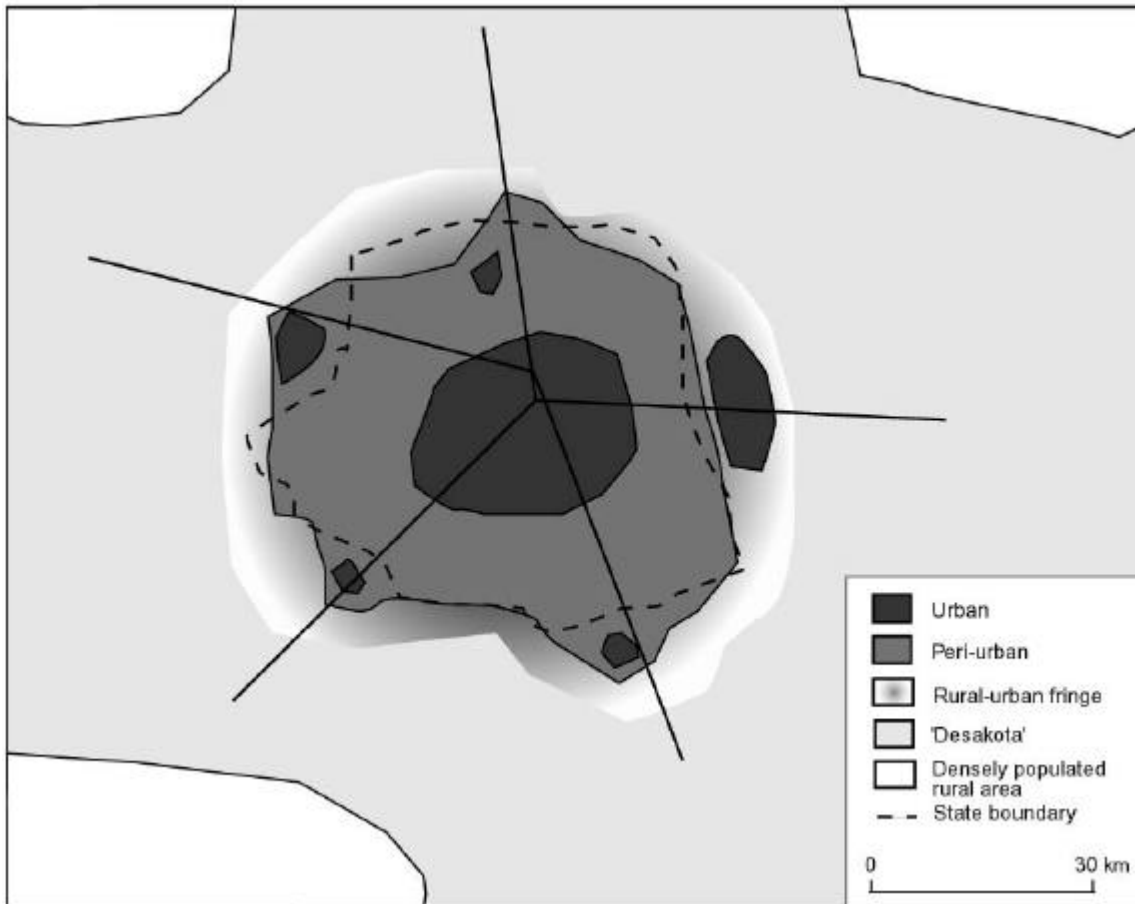


This typology refers to development in the course of time, but it would be valid for development in space as well. The villages in the second and third stage are typical for a rural-urban fringe, which is the case for Alipur Block (see Section 2.4). The threshold values are explained then, but are quite arbitrary. Nevertheless, the resulting maps indicate that the typology is helpful to select study villages for more detailed empirical research. In fact, Delhi's rural-urban fringe extends beyond Delhi's administrative area. The easily accessible villages in Haryana also have strong daily links to Delhi, although nearby cities (such as Sonapat) have their own smaller rural-urban fringes. Besides, there are conceptual weaknesses: "a stages-model should be interpreted carefully, as stages might overlap both in space and time, and some villages might be in one stage permanently while others go through all the stages" (Drujven 1996, p. 7). The diversity of the villages that are studied limits the usefulness of the stages of urbanisation. Within each stage there are profound differences in the course of development of land use and population, which warrant further in-depth research.

Much of the literature on rural areas near cities is descriptive in nature. McGee, however, proposes a descriptive model based on the regional economy specific to the surroundings of Asian metropolitan cities: the *desakota* (in Malay, *desa* means rural or village and *kota* refers to a city or town). He claims that for Asia, the traditional concepts of settlement patterns distinguishing urban and rural areas are not valid, given the emergence of high-growth rural areas close to cities and along highway corridors. In short, these areas tend to combine highly productive, chiefly smallholder agriculture with increasing participation in non-agricultural occupations and high spatial interaction of economic activity. Within the *desakota* region that is closest to the city, namely the peri-urban areas, this trend is enhanced by the possibility of daily commuting to work. This peri-urban area is comparable with what was earlier defined as the rural-urban fringe. Delhi would feature as 'Desakota type II', which refers to the relatively populous and economically strong regions within developing countries. McGee's hypotheses are discussed briefly in the end of Chapter 5. There, additional information is given about the socio-economic repercussions of urbanisation on the villages. Although McGee identifies the main processes, he does not specify which differences exist within the local population. The results of this thesis should provide answers to two questions: First, does Delhi's rural-urban fringe really correspond to the peri-urban area? Second, how are different groups within the local population involved in the transformation?



Figure 1.5 Delimitation of the rural-urban fringe according to various concepts and superimposed on the map of Delhi



Derived from Ramachandran (1989), McGee (1991) and Bryant et al. (1982)

A few sources go more deeply into the micro-level changes in rural-urban fringes in India (e.g. Yadav 1987, Thakur 1991, Chakraborty 1991, and Ramachandran 1989). The study that comes closest to the approach taken here is the one by Brookfield et al. (1991), who study the socio-economic impact of urbanisation in Kuala Lumpur. They rightly refer to *in-situ urbanisation*, implying that the research population experiences urbanisation without actually migrating from a village to a town or city. They also note that urbanisation in a socio-economic sense can occur not only on the immediate fringe, where the city is expanding in physical terms, but also at places that are further away yet effectively connected to urban areas. They conclude that "...analysis of the data showed a much greater degree of transformation than was visible on the ground" (p. 5). This raises the question whether the same is true for the seemingly quiet villages in Delhi's rural area. This also justifies the selection of villages both on the immediate fringe as well as further out into the rural areas.

### 1.2.2 Urbanisation and its implications for land use

Urbanisation consumes agricultural land and takes up other land from villages. Barrow (1991) draws attention to the following: “It is not unusual for urban extension to take some of the best agricultural land for the simple reason that towns have tended to grow up in lowlands or on plateaux, especially near rivers where the soil is good” (p. 238). In India, there is a growing awareness that land needs to be protected. With increasing population pressure, it is imperative to prevent the creation of wastelands (Singh 1985). Is urbanisation creating wastelands? Khan (1997) states that 98 per cent of the urbanised land in Aligarh, located about 100 kilometres from Delhi, was of good agricultural quality, indicating the trade-off between rural and urban interests. This is clearly true for Delhi’s region as well. Besides the direct conversion of farmland into built-up urban areas, there are other effects that have an impact on a much wider area. The issue of soil excavation by brick kilns is important in that respect (Nusrath and Mahadev 1991, Bentinck 1995). Limestone mining poses another threat to the peri-urban land (Chandrasekaran and Ramkumar 1991). Vleugels reveals the implicit negative consequences of urban expansion on peri-urban agriculture. “Rich agricultural lands were transformed into urban land use, and irrigation waters polluted by industries and urban households, which led to considerable production decreases in agriculture” (Vleugels 1990, cited in: Zoomers and Kleinpenning 1996, p. 162). Beyond the immediate vicinity of the city, Asuncion shows less influence on cropping patterns; the net effect is neither positive (intensification) nor negative (loss of productivity). “No clear tendency towards agricultural intensification can be observed in smallholder’s production in the surroundings of Asunción (Zoomers and Kleinpenning p. 166)”.

In view of the pressure on agricultural land as a result of urbanisation, the term *land degradation* would seem appropriate to the present study. However, more than the physical change implied by this term, this thesis is concerned with how urbanisation affects the livelihood of villagers. Specifically, it investigates the mechanisms by which changes in land use affect people’s livelihoods and how land-use patterns are determined by people (or ‘actors’, see next section). Therefore, functional rather than physical aspects of land use are considered relevant. In deciding on the focus of this research, it was evident that looking at land degradation from a purely technical angle – that is, in terms of agricultural fertility, quality of vegetation, and other physical indicators – would not necessarily be relevant to the livelihood of the local population or to other interests with a stake in the land.

Blaikie (1996) argues that “the word degradation is involved with normative connotations” (p. 210). It is imperative to avoid the value-laden and therefore arbitrary and subjective standpoints that the term degradation implies. Blaikie and Brookfield (1987) proposed a state-of-the-art concept of land degradation in the context of the social sciences, arguing that from a socio-economic perspective, “land degradation implies a reduction of the capability of land to satisfy a particular use” (p. 6). The most beneficial use of land varies from place to place and from user to user, depending on its location-specific context. A rural-urban fringe includes many actual users and potential users of the same land. In remote rural areas, the use of rural land is quite straightforward: it is almost exclusively related to agriculture or forestry. For these rural uses, consistent physical indicators can be applied. In the case of a rural-urban fringe, however, this is

much more difficult. The land can be used by, or is useful for, many different individuals, groups of people, and interest groups, leading to a high heterogeneity of land uses. Moreover, there are multiple options for using land, and there are many that could be more beneficial to the owner than agricultural use. This situation lends itself to the actor-approach, as advocated in the field of *political ecology* (Bryant and Bailey 1997).

The preferred or desired use for land is arbitrary, being a complicated sum of uses by many different users. For example, even an individual peri-urban farmer can have multiple interests such as land speculation, sale of land, and non-agricultural sources of income, compared to which the income from agriculture may be negligible.

The arbitrary situation is enhanced by the fact that land is becoming a frequently traded commodity, with prices far above the value that would be justified by agricultural production. The new buyers may apply very different criteria to their use of land than the former owners. Of the possible criteria, location and access are the more important ones in an urbanising context whereas soil profile and elevation are secondary or unimportant. In short, the physical condition of land does not say much about its particular use, and the particular use differs per user. Thus, the concept of Blaikie and Brookfield suggests that land degradation in a rural-urban fringe should be studied through the role that land plays in the economic lives of the population. In that light, it is attempted here to quantify and describe land-use changes and relate these to the livelihood issues that pertain to people residing in the villages.

Area-specific arguments also play a role in an approach based on functional land use rather than on physical characteristics. The research area consists of land that is flat and easy to adapt to almost any beneficial use. The quality of the land can therefore be easily improved at a relatively low cost. Even seemingly dry and barren land can be reclaimed for agriculture. Consequently, the condition of a piece of land may change radically from one moment to the next. This is quite different in mountainous areas, where soil erosion can be irreversible and may do permanent damage to cultivated fields. This leads to the same conclusion as drawn earlier: for our purposes, it is far more relevant to look at functional changes in land use than at land degradation in a physical sense.

The question about how to value land for different uses can be answered from different perspectives. Some approach land issues from a purely economic point of view, taking the price of land as the main factor for determining optimal use (Pond and Yeates, 1994, Wadhwa 1983, Rajalakshmi and Birundha 1994, Amitabh 1997). The basis of many studies is the model developed by Von Thünen, which assumes an optimal allocation of land according to a bid-rent curve of maximum returns, in which distance to the urban market is the most important factor (Haggett 1983). This model is particularly valid for agricultural crops. The neo-classical assumption that the markets allocate properly and users, buyers, and sellers have optimal information holds true to some extent. But the rationality of actors regarding their use of land is determined by various factors that influence decision-making as well, such as political, strategic, and particular household livelihood variables. Another problem with a purely economic approach is that information on land prices and its determinants is very difficult to find. Therefore, for this study, an 'actor approach' focusing on how people deal with land was found more suitable.

### 1.2.3 The actor approach to land issues in the rural-urban fringe

Focussing on what happens with the land and which people or groups are involved, it helps to seek guidance in the principles of 'political ecology' (e.g. Bryant and Bailey 1997, Blaikie and Brookfield 1987, Blaikie 1996). In short, this approach is based on the assumption that the environment (in this case the land) is strongly influenced by the way different actors interact in a local arena. Unequal power relations would imply that weak actors, mostly on the grassroots level, have the least influence and pay the heaviest price if there is environmental degradation. Dietz et al. (1996) explain this academic approach in the following way: "...students of political environmental geography regard landscapes and regional natural resource stocks as contested political arenas" (p. 85). Accordingly, this study describes and analyses how the actors influence the process of urbanisation when conflicting interests lead to disputes and identifies who are the winners and losers in the process. The situation in urbanising areas is rather complex. Many seemingly one-dimensional actors actually pursue conflicting goals. Furthermore, the poorest and seemingly weakest actors often connive with more powerful actors to achieve certain goals with respect to land.

Space for housing is an important issue, especially where land values are rising and land is becoming scarce (Pugh 1990, Prins 1994). Other important interests concern acquiring space for industrial and commercial activities. Government and private actors are often engaged in complementary and conflicting activities, leading to a local power structure based on political strength (Miglani 1993). In a rural-urban fringe, the bargaining that accompanies government acquisition of farmland is strongly related to the identity of the actors (e.g. groups of individuals, businesses, and institutions). Some are more capable of turning a situation to their advantage than others. Government acquisition would happen "at the cost of the poor farmer whose land had been taken away compulsorily by the public authority, giving him only meagre compensation in return" (Acharya 1987, p. 112). In the 1970s, the government used ruthless practices for land acquisition. "Sans aucune information préalable, donc sans avoir pu se préparer aux changements qui allaient les affecter, les villageois ont perdu brutalement leurs moyens d'existence traditionnels" (Dupont 1997, p. 238). This tells us that the villagers were weak actors. The notion of what is a fair compensation for the inevitable land acquisition is a subjective one. This issue also draws attention to the ethical considerations of removing people's livelihood (Spalding and Wood 1998) and the perception of the people involved.

Rural-urban fringes, especially in developing countries, are often characterised by faulty and ad-hoc government planning and intervention. Omuta (1985) observes that the rural-urban fringe can be called an 'institutional desert', leading to filling of the power vacuum by private actors. Hamid (1992) adds that the unstable political situation in developing countries implies that strategies of individual actors depend particularly on the local 'power game'.

Nowadays, there is evidence that the local farmers and other private parties are stronger actors, which limits the scope of formal urban and regional planning. The ambition of the planning authorities to determine the land-use pattern is not realised, resulting in vast areas of 'unauthorised construction' (Breese 1974, Nath 1993). This is not only a result of the limited financial means of the government. It is also because the government bodies

do not always pursue the same objectives, and the behaviour of individuals within the institutions frequently frustrates the formal tasks and objectives.

Bryant and Bailey (1997) claim that the current 'environmental crisis' in rural areas in the Third World can be attributed to the political and economic relations between 'actors'. In that light, environmental issues should be linked to more general developmental issues. The authors identify global, regional, and local actors and consider how each of these actors might experience the impact of the environmental crisis: "... political ecologists attempt to complete the story through work oriented around the idea of a 'politicised environment'. In the process, they agree with their mainstream counterparts that the "Third World is wracked by an environmental crisis but, unlike the latter, ask 'whose environmental crisis?'" (Ibid. p. 27). This thesis discusses the question of who experiences the impact of environmental change (rather than supposing an environmental crisis from the start) and describes the actors at the local level (see Chapter 4).

#### 1.2.4 Choosing the levels of analysis: areas, villages, and households

After reviewing what happens on and to the land and how different actors are involved, the study moves on to how the socio-economic transformation takes place for one group of actors: the residents of the villages. In this context, Rodriguez (1995) remarks that "the conversion of agricultural land to suburban uses is of major importance, not so much in terms of the total area involved, but in terms of its social and economic effects" (p. 34). Hill (1995) adds: "many rural surveys fail to investigate ... manifestations of links with the city as town-to-village flows of money and goods, income from (temporary) urban employment, frequency and nature of visiting pattern and employment change in peri-urban villages" (p. 32). These insights suggest that this topic is certainly worth exploring further.

For this part of the study, other units of analysis need to be selected: the village as the context of change and the household as the unit in which socio-economic change can be explained. These levels of analysis are commonly used in a few other disciplines, such as rural development geography, anthropology, and economics. Lipton (1977) emphasises that rural micro-research receives too little attention in terms of funding and academic prestige. The strength of such studies is that they describe the village economy in great detail while seeking to explain general developments in rural transformation (e.g. Preston 1994, Breman et al. 1998, Lanjouw and Stern 1998, Maria Saleth 1997). There are some studies that describe how the occupational shift occurs in the course of rural transformation, but the authors base their conclusions on secondary data on a much higher (i.e. district/state) level (Bhalla 1997, Haque and Jha 1997).

Village-level research has not yet gone into depth on villages in the rural-urban fringe. More general observations such as "Inhabitants of the fringe villages find employment in lower-paid unskilled jobs in rural industries and in the informal sector" (Chakraborty 1991, p. 305) call for further research. To know how this occupational sorting out occurs in Delhi's rural-urban fringe, one needs to descend to the village level to conduct a survey among village households. It seems challenging to combine the methodology of rural village-level studies with the specific topic that is the subject of research in this

study. The results of the village-level research are given in Chapter 2 and 4, respectively, where the findings are used to describe the villages and analyse the villager's livelihood.

Rural village studies use a wide range of variables to analyse the transformation of the population. Drèze and Sharma (1998) and Lanjouw and Stern (1998) provide us with criteria and variables that are relevant at the village level. The following variables were selected: access to locally available resources; ownership of agricultural land; the significance of the traditional socio-economic division (according to the caste system); the occupational structure of rural households; trends in local and extra-local agricultural and non-agricultural activity; standards of living; links to neighbouring settlements and urban areas; the seasonal and daily mobility of the population; and in- and out-migration.

Much of the village-based research is concerned with only one village. For the purpose of this thesis, it was necessary to study several villages. The study areas were selected to represent the earlier-mentioned stages of urbanisation and the great variety between villages due to different processes of incorporation and differentiation (Galjart 1982). The depth to which individual villages are analysed and the detail in which they are described are consequently not as great as in studies treating only one village. Nonetheless, the basic idea of using the village level to represent the research issues remains intact. A comparison of the results with other rural village studies sheds light on the degree of transformation in rural-urban fringe villages compared to their rural counterparts. In various cases, it is possible to confirm or reject claims about how urbanisation influences rural transformation in the case of Delhi.

In village studies, the household is the most frequently used level of analysis. It is the "lowest level unit within which individuals are collectively organised", and "a household focus permits a better understanding of how and why people organise their activities" (Preston 1994, p. 203). Especially in the developing world, the maintenance and/or advancement of the household as a whole is the prime goal of individuals. Schmink puts it in a broader sense: "the household is regarded as a production as well as a consumption unit in which individuals take joint decisions regarding the allocation of production factors such as labour and capital in order to satisfy common household needs" (1984, p. 87). Drujven et al. add that "there is considerable support in the literature that the household is a relevant entity in micro-level livelihood research, especially in rural areas of developing countries where family and household coherence is strong, and where small household based entrepreneurship dominates" (1992, p. 40). However, the same authors also point out some shortcomings of household-level research. First of all, it ignores the process of decision-making by the individual. Another problem is identifying the 'common' goal of a household. And they emphasise the lack of attention to intra-household relations and strategies (Drujven 1990). Notwithstanding its drawbacks, the household approach is the most workable level to measure material assets, agricultural land and standard of living within a village population. Land and housing variables in particular are of key importance to this study. Furthermore, especially in a traditional rural context, household characteristics determine the cultural and socio-economic status of the individual to a large degree.

Within households, there are structures that determine the actions of households and their individual members. The 'head' of the household is usually considered its decision-maker, although others exert influence too. Despite this individual dimension, decisions about the management of agricultural land, employment, and other economic activities

are usually made according to the possibilities, needs, and availability of labour within the household.

A rigorous definition of the household is a pre-requisite for research on the household level. The definition of a household used in this study is based on a shared cooking unit. This criterion leads to the following definition:

*A household is an entity of people living in the same house or room who have all eaten meals from the same kitchen at least four times per week during most of the past one year.*

The criterion of a common kitchen is based on the assumption that the household functions as an economic unit whereby the resources are pooled to a large extent. There are some problems with this definition, however. Usually, a household has a separate front door and a separate house or a portion of it, but this is not always the case. Households can share a house even if the constituent units do little together. Nonetheless, because the Census of India uses roughly the same definition, applying it here would make both sources of information compatible. According to the census, “The important link in finding out whether there is a household or not is the common kitchen.” (Census of India 1991, p. 53).

Even with the joint kitchen as the defining characteristic, there are ambiguous cases. But for those households who are originally from the village, the definition is relatively easy to apply, as it conforms to the perception of the people themselves. This last argument is important, since a fundamental difference in the definition held by the researcher and respondent would lead to confusion. In the present research in the villages, the ambiguous cases were mostly found among migrants. For example, labourers may live in the same compound but do not always eat together; or groups of migrants may not live together but do eat from the same kitchen (e.g., at their place of work).

Furthermore, migrants are often considered part of other households back in their place of origin, although this study only includes persons residing with the respondent as members of the household. A few practical problems in counting members of a household were related to the temporary absence of a member. Despite a few practical and conceptual problems, the household is still the most workable level for gathering information among residents of villages concerning land ownership and occupational structure.

There is a basic distinction between ‘joint’ (sometimes called ‘extended’) and ‘nuclear’ households. “Nuclear households consist of a married or cohabiting couple and their children”, while joint households “consist of a core nuclear or one-parent family residing with other relatives who share in daily consumption and financial arrangements” (Brydon and Chant 1989, pp. 135-136). In rural areas in India, there is a traditional predominance of joint households as compared to nuclear households. This tradition is often partly explained by the socio-economic strategy that the household pursues in the light of continuity vis-à-vis social and economic uncertainty. With respect to agricultural work, for example, an extended household offers the advantage of flexible labour and prevents the fragmentation of agricultural land. Cultural factors play an important role as well. In the research area, extended households proved to be less prevalent than could be expected in an area with a rural background, although this might just be one of the effects of urbanisation. The interviews also revealed that extended households are definitely less common than a few decades ago. In addition, the most common type of extended

household is limited to one nuclear family with one or both parents in the house. Cohabitation of all married brothers with their wives is much less common. The scaled-down version may indicate the transition to a 'semi-urban society' (Ramachandran 1989), which is discussed in more detail in Chapter 5.

This study does not pretend to fully analyse the livelihood strategies of households, an important topic in the literature (e.g., Drujiven 1990, Ellis 1998, Preston 1994). To do so would require an in-depth analysis on the level of intra-household processes and transfers. Nevertheless, this study shows that the household remains a workable unit of analysis even in an increasingly urban context. Moreover, this study shows that the type of household correlates with distinct patterns of livelihood.

### 1.2.5 Changing environmental conditions for residents in urbanising places

The spread of urbanisation is clearly a cause for concern with respect to land use and environmental issues. International organisations disseminate dramatic accounts of environmental health in large cities of the developing world (e.g. United Nations 1995, World Health Organisation 1993). Lin (1994) points out some key questions concerning the development of 'extended metropolitan regions', as identified by McGee (1991): "...what negative impact does this new form of intensive rural/urban interaction and land use conflict have on the environmental sustainability of development, and what policies and planning measures could be devised to ameliorate the problems of environmental deterioration in these regions?" (p. 18). Ruiters (1996) warns that urbanisation is "a predator of its environment". Disputed and vacant lands become reservoirs of pests and disease (Hill 1986). The evidence, however, is very fragmented or general in nature, specifying neither the scale nor the location of the problems.

Unauthorised colonies have to cope with faulty urban amenities (World Health Organisation 1993). Ali and Singh (1998) and Arya and Abbasi (1995) describe at length the environmental difficulties faced by the slum dwellers in Delhi; many of these slums are located at the city's fringes. Pollution, congestion, and stress on civic amenities contribute to the difficulties of a population that is already economically weak. Pugh (1990) accuses ineffective land management of indirectly causing environmental problems. Because the supply of urban land is insufficient, he argues, the patterns of urban land use are chaotic. In this sense, the fringe areas are vulnerable: "fringes become the easy outlet for industrial activities which are environmentally hazardous, as pollution control is even less effective than in central urban areas" (Schenk 1997, p. 221). Former rural villages are vulnerable spots: "the industries that have come up in the *abadi* (built-up) area of the villages firstly create environmental problems in the village" (Solanki 1987, p. 157).

The number of specific problems caused by pollution is large. A cursory review of the literature yields the following reports. The levels of lead found in the blood is alarmingly high, especially for people living near or and working in factories and for people who are exposed to traffic exhaust (Yueng 1993). Groundwater is polluted due to seepage of polluted water (Centre of Science and Environment 1989, Soni 1998). Of the 246 million litres of liquid waste produced in Delhi, only 46 million receive full treatment and 72 partial treatment (United Nations 1995), making one wonder where all the dirty water



collects. There are dramatic accounts of the exposure of factory labour to communicable diseases, of mental disorders, trauma, poisoning, and burns and other injuries. “Squatters and slum-dwellers are particularly at risk, because they often have no alternative but to live in close proximity to dirty industries, contaminated water courses, or swamps” (World Health Organisation 1993, p. 16). Poor city dwellers have the least means to protect themselves against environmentally adverse situations: “perhaps the least surprising point arising from the review of environmental problems ... is that poorer groups bear most of the ill-health and other related costs” (Hardoy et al. 1992, p. 100).

There has also been a cautious reaction to the environmental rhetoric as well: “is there really an environmental crisis? Now it has become a cliché, with little real proof” (Barrow 1991, p. 10). To dispell any doubt, research should look at both the negative and the positive consequences of urbanisation in large cities. A balanced approach would share the “dissatisfaction with literature associated with negative notions of urban ‘disfunctionality’, ‘overurbanization’ etc.” (Ginsburg et al. 1991, p. xiv). This is why the present study looks at a single case of an urban village where many of the circumstances described above can be found. That village was selected because it allows the study to go deeper into the environmental effects of urbanisation for residents and workers.

### 1.3 Research questions

The objective of this study is to reveal the impact of urbanisation on the villages in Delhi’s rural-urban fringe. The exploratory stage turned up many different aspects, in the light of which the following research questions are formulated:

Figure 1.6 Central research questions

- |   |
|---|
| What is the influence of urbanisation on:<br>1. Occupational features of villages in the rural-urban fringe?<br>2. Land use in and around the villages?<br>3. The actors and their strategies for coping with urbanisation?<br>4. The livelihood of the villagers?<br>5. The living conditions of villagers and workers in urbanising villages? |
|---|

These central research questions can be expanded to form more specific research questions:

1. The rural-urban fringe and the villages (Chapter 2):
  - What are the characteristics of Delhi’s rural-urban fringe?
  - How do the villages differ in type of development?
2. Land use (Chapter 3):
  - How does urbanisation affect rural land?
  - What are the indicators of urbanising land and what are the influencing factors?
  - Does land degradation occur from a socio-economic perspective?
  - How can remote sensing be used to map land use?

3. The actors influencing land use (Chapter 4):
  - Who are the key local and extra-local actors with a stake in spatial developments and what is their relative strength?
  - What are the strategies of the actors in the urbanisation process?
  - How does the interaction between actors influence patterns of land use and the supply of urban land?
4. Household livelihood (Chapter 5):
  - What is the former and current situation regarding agricultural assets, occupational diversity, and sources of income?
  - Which factors influence the integration into urban occupations and income?
  - Which livelihood patterns are emerging and what is the resulting standard of living?
  - What are the prevailing perceptions of urbanisation?
5. Living conditions (Chapter 6):
  - What are the consequences of urbanisation in terms of living conditions?
  - Who is most vulnerable to negative living conditions?
  - What are the most precarious locations?
  - What are the prevailing perceptions about living conditions?

#### **1.4 The research area and the selected villages**

The IDPAD project outline (see Figure 1.1) determined the choice of two research areas: Alipur Development Block north of the urban area of Delhi, and Najafgarh Development Block west of Delhi. This choice was preceded by exploratory visits to ensure that these areas are representative of the studied issues. Both 'rural development blocks' comprise many villages and a few towns. For the present study, the area of the investigation had to be scaled down further. Alipur Block was found to be a good and sufficiently large setting for investigating the research topics. All villages in Alipur Block have been visited. The basic household survey was carried out within Alipur Block, where six villages, representing the stages of urbanisation, were surveyed (see Section 1.5.2). Three villages were singled out for the in-depth study. Analysis of stages in the rural-to-urban transformation according to occupational structure and land use proved to be a useful exercise (see Section 2.3). That information, in combination with practical considerations (such as access, settlement size, and local co-operation), was used to make a representative selection.

#### **1.5 Methodology and data sources**

In order to draw upon a comprehensive range of information, the study makes use of a variety of resources and methods. The census data and other records are used to get a more general picture of the population profile and employment structure. Information on land use is taken from existing maps, remote sensing maps, and field mapping as well as from agricultural land records. Interviews in different forms (surveys and interviews with

key informants) are the main instruments to find out about livelihood issues. Newspaper articles and reports giving details about the situation in the research area are also used and will be frequently cited in the text.

### 1.5.1 Secondary data sources

Secondary sources include information and figures from census documents, local land records, publications, and the media.

#### *Census data*

Census data provide useful information at the village level and, more generally, about the land and population in the area. Census data are used to categorise the research villages within the rural-to-urban continuum on the basis of land use and occupational characteristics (see Section 2.3). The Indian census takes place every 10 years. Because the focus of this study is on developments over the last 25 years, the census figures that are used mostly are from 1971 and 1991, and occasionally 1981. However, it is dangerous to rely exclusively on the census. It contains errors in enumeration as well as inconsistencies in the application of definitions of variables. Census data on land use in particular can be inaccurate and confusing. And census classifications are not always very relevant to urbanising areas.

#### *Local land records*

A village revenue officer (*Patwari*) keeps records on village land, including its use and ownership. The aggregated data on crop patterns at the village level was used to supplement the village description and to sketch the context. Disaggregated data at the plot level are used in the case studies to analyse land ownership and transactions.

#### *Reports and books*

Some background information about the villages is derived from books and government publications, as they provide a historical perspective. Some PhD and MA theses available in Delhi describe the same area. Therefore, these sources have been used to depict the local situations and to describe the villages and surrounding areas.

#### *Newspapers*

Articles from various newspapers have been collected throughout the research period. This is a way to keep track of important events, policy measures, conflicts, environmental issues, and political developments.

#### *Maps and remote sensing*

Detailed maps are crucial to this study because they show the physical aspects of the urbanising environment of the villages. The maps are essential to understand the context of local socio-economic developments as well. The topo sheet maps from the survey of India (1976) at the scales 1:50,000 and 1:25,000 are used for orientation in the field and to generate topographic maps. The outdated map (the survey date is from the 1970s) illustrates the importance of making maps for the purpose of this study. Census maps

show village boundaries, but very imprecisely. Cadastral maps were obtained from the local land administrator providing details about the ownership of individual plots. Satellite images are used as input for the mapping of land use. The resulting maps are particularly helpful, since detailed and recent land-use maps were not available. A Global Positioning System (GPS) was used to determine the location of observations in an exercise known as ground truth verification. Geographic Information Systems (GIS) are used to process remote sensing data.

### 1.5.2 Primary surveys and interviews

#### *The basic household survey*

The basic household survey provides basic information about the village population. It includes 337 interviews in six different villages conducted by MA students from the University of Groningen and the present author, with the help of students from the University of Delhi, in the course of 1997 and 1998.

The basic household survey includes variables on the following subjects:

- Land ownership (agricultural land, how much land sold, use of the land)
- Place of origin (original villager or migrant, caste)
- Demographic structure (age, type of household, number of children)
- Occupational characteristics (type of work, place of work)
- Assets and living standards.

The basic household survey provides quantitative data about the livelihood characteristics of the population. The economic standard of living can be determined through household assets. This survey sheds light on the differences between the distinguished groups in the population. A random sample of around 25 per cent is used in the smaller villages and a sample of 10 per cent in the larger ones. In view of the objective of this study, these sample sizes are considered sufficiently representative. Sampling is done on random basis with the help of village maps, whereby each population cluster is equally represented. The questions are largely concerned with the present population; the consequences of urbanisation are not treated in depth. The results are presented in Chapter 5 in combination with the in-depth survey. Statistical analysis is performed for the main independent variables. It would have been interesting to further split up the data into sub-groups (for example, the types of household within one socio-economic group). But the numbers would have become too low to make significant results feasible.

#### *The in-depth survey*

The in-depth survey includes 67 lengthy interviews (lasting on average 2-3 hours) with people about their households. The author conducted all interviews during two fieldwork periods in 1997 and 1998/99. The input of the three Indian counterparts/interpreters was encouraged, which resulted in valuable insights and additions. The households were selected through purposive sampling with the following eligibility criteria. Some of them had already been selected for the basic household survey and were found suitable to depict the variety and changes in occupational orientation, household size, land ownership, and living standards. Others were added to provide more insight into the actual and potential effects of land acquisition by the government. Since many questions

were of a sensitive nature, the impression whether the informant was responding openly and honestly was also taken into account in deciding about continuing the interview. Besides, the availability of time with the respondent was essential for obtaining all the information. Therefore, it was necessary to improvise during the interviews.

The interviews were held in three different villages (Zindpur, Ibrahimpur, and Pehladpur Bangar), each of which has been subject to strong urbanisation pressures. The purpose of the interviews was to select a number of households that had either different starting positions 25 years ago or have responded to urbanisation in different ways. The list of questions was not entirely fixed because the interviews were long and sometimes improvised according to the specific situation of the household. The following topics were covered in each in-depth interview:

- How households manage their land and what the implications might be for its use
- Land prices and compensation rates for sale or acquisition
- Strategies concerning land transactions
- The local structure of agricultural employment and income
- The longitudinal aspects of change in occupation and income
- Change of occupations between generations (mostly father-son change)
- The spatial aspects of livelihood: urban and other extra-local work versus local economic activities
- Perception of village and household changes related to urbanisation
- Perception of living conditions.

The in-depth survey provides grounds for answering most of the research questions about urbanisation. Specifically, it allows us to generalise about its effects on – and the response by – the village population. Rather than consisting of quantifiable variables, the in-depth survey is an open interview, including longitudinal elements as well. The focus is on changes in employment structure of the households. The questions elicit information on circumstances that influence reactions, choices, and strategies. Furthermore, the interviews cover household histories over the last 25 years. This period more or less coincides with the secondary data analysis. Moreover, it seems to reflect what an average middle-aged respondent can reasonably recall.

### *Key informants*

Key informants have provided useful and sometimes indispensable information at all stages of the research. The local informants could include village headmen, former headmen, property dealers, elderly people who know the village history, and local teachers and other well-informed local people. Persons in relevant positions at government departments, planning agencies, academic institutions, and in the local administration have also been consulted. They were particularly helpful when starting the research. Later they provided a means to double-check dubious information, and they gave feedback on research results. Various people in such positions were interviewed to find out about policy and practice and to appreciate the discrepancy between the two. Most interviews with key informants were conducted in a similar fashion as the in-depth interviews with the help of an Indian interpreter. Some informants spoke English, so the interview could be conducted by the author himself.

## **1.6 Structure of the thesis**

The structure of this thesis more or less reflects the sequence of the research questions. The current chapter formulates the research questions, identifies the most important literature and the academic context, and outlines the methodology used for the study. Chapter 2 describes the regional and local setting. Furthermore, this chapter presents the operationalisation of the descriptive model of phases in the urbanisation process. This model is also used to select and characterise the research area and villages. Chapter 3 concerns the extent of the land-use changes in the research area. The types of land use are classified to reveal the impact of urbanisation on the land-use pattern. In addition, remote sensing images are used here for two purposes: to localise and quantify the land uses; and to compare the types of land-use change with the land classification according to the physical criteria distinguished by remote sensing. Chapter 4 identifies the actors who have a stake in the expansion of urban land. The degree of political and economic strength of each actor, local and extra-local, determines the land-use patterns to a very large extent. This overview is also of great importance for issues on a higher level, such as land supply, the environment, housing and infrastructure. Consequently, actor strategies are crucial to changes in livelihood as well, which is the main issue of this thesis (Chapter 5). This core chapter deals with the effects of urbanisation on livelihood. For that analysis, three different types of households are distinguished: two groups in the original population (historically the resource-rich and the resource-poor) and the migrant group. Chapter 6 concerns the effects of urbanisation on the living conditions for residents and workers. To demonstrate these effects, this chapter presents a case study of an urban village (Samaipur), a settlement where all rural land had disappeared in favour of a mix of urban land uses. Finally, Chapter 7 presents the conclusions of this thesis.