# Fair Pricing of Land and its Compensation in an Emerging Economy: Case for India

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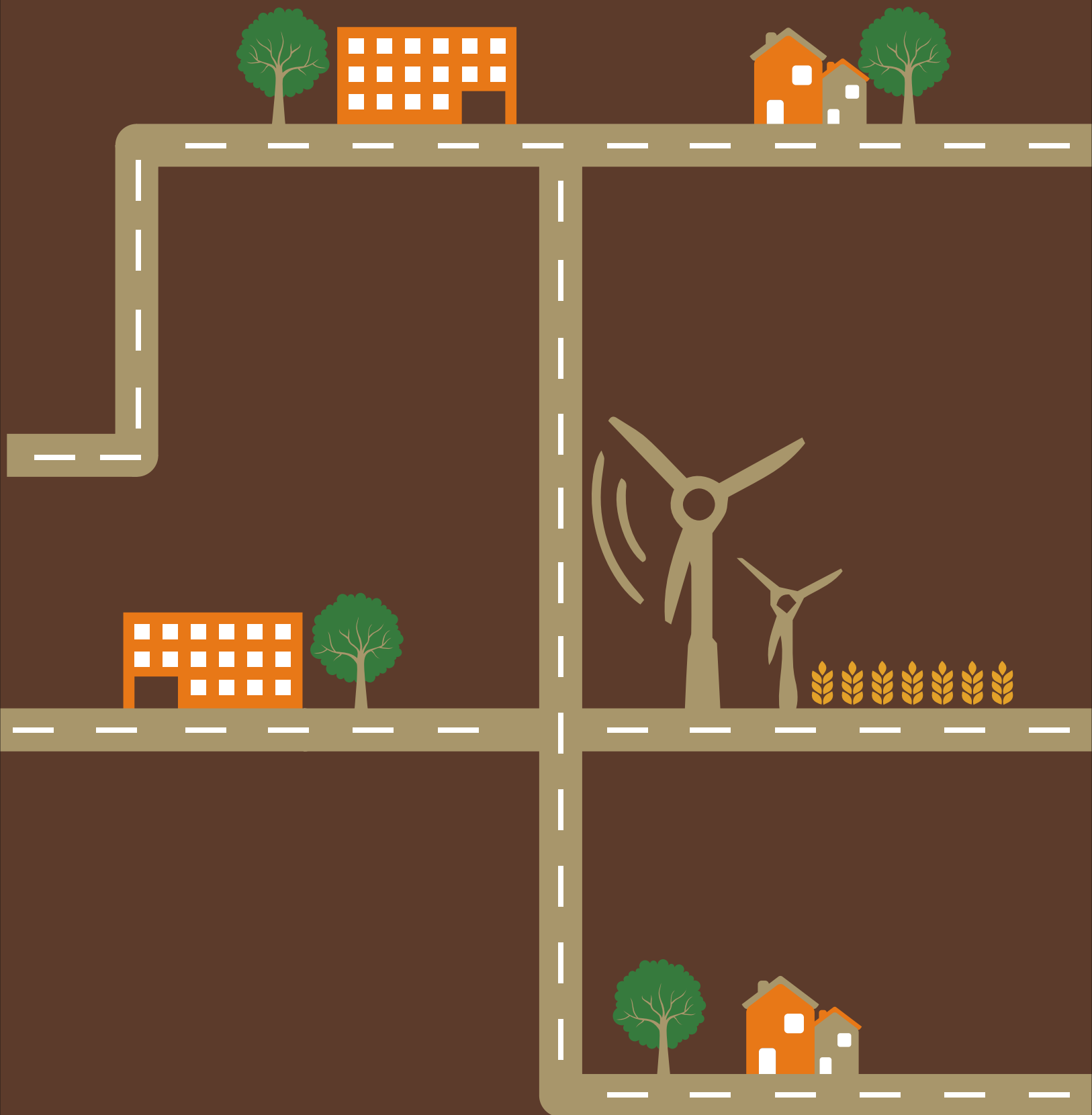
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Acknowledgements

Preface

For an emerging economy the size of India, a major constraint or enabler of growth and development will emanate from how land – a critical but limited resource – is priced, acquired, bought, and utilised. Needless to say that in India where agriculture remains the mainstay for nearly 60 percent of her people, land becomes a multidimensional asset, providing them economic and emotional security. Large scale revitalisation of the Indian economy since the early 90s, however, has not only put increasing pressure on land as a resource, but has also gradually introduced new factors that determine how land is transacted. The land market in India, however, is neither transparent nor balanced in how it responds to these new factors that include social, political, geographical parameters in addition to the productivity of land.

There is an emerging consensus that existing methods of valuation of land, using the circle rates and mean or median are too simplistic and not scientifically defensible. This study contributes to the discussion around fair land pricing based on an analysis of land sale and purchase data over thirty years in four districts. By fair land pricing this report refers to an equilibrium solution to land pricing, where land sellers want to maximise the transaction value while land buyers want to minimise their cost. While this

report does not suggest a model that can be replicated throughout the country, it suggests an approach of using land data from each of the districts to define a model best suited for that particular district in a scientifically defensible manner. The report highlights the importance of digitisation of land data, in order to use any sophisticated valuation model and possibly include additional variables such as land use. This will only increase the robustness and accuracy of the model. While changing land use practices are key to determine fair pricing, a lack of data made it impossible to include this variable in the current model. We expect this model to be useful not only for government, but also for the industry. Government has greater access and a better, unbiased database for basing the land pricing model. Industry, without access to this data, would only have a skewed database on land transactions.

Moreover, the report contributes to the discussion in emerging economies that face similar challenges like India in balancing industrialization and development objectives: joint efforts between governments, public and private enterprises as well as emerging market multinationals are needed to bring economies on a sustainable growth path. GIZ India through its bilateral technical cooperation

programmes with the Government of India aims to facilitate the emergence of innovative solutions to sustainable development, for example through advisory services, capacity building or creation of consensus and collaboration. Global initiatives such as the Emerging Market Multinationals (EMMs) Network for Sustainability, a part of the Global Partnerships Programme funded by the German Federal Ministry for Economic Cooperation and Development (BMZ)[i], provides an opportunity for managers from EMMs to exchange their experience in sustainable business practices with their peers and to reflect on the challenges they face. The Network provides a platform for a truly global sustainability debate in which peers from all over the world equally contribute and learn from each other to intensify and multiply their efforts to introduce sustainable business practices and therefore to contribute to global development goals. This report contributes to the goals of the Network as it provides rigorous groundwork on a central challenge for emerging market multinationals and other private sector players: how to acquire land in an equitable and sustainable way in a business environment of strong uncertainty and asymmetric information.

GIZ congratulates TARI for carrying out this study with the necessary rigour,

objectivity and a peer review process. We believe that the study is timely in the backdrop of the new Land Acquisition Act 2013, and will provide useful inputs into establishing rational mechanisms for land transaction that are conducive to India's growth and equitable development.

Team GIZ

Disclaimer:

The present document aims to stimulate thinking among public and private stakeholders in India and other emerging economies on fair land pricing methodologies. Note that this document is neither exhaustive nor complete on fair land pricing.

Foreword

The economic transformation and modernization of rural societies inter alia entails the transfer of factors of production labour, capital and land from agriculture to the more productive modern sectors on a vast scale. The terms of these transfers have the potential to generate social conflict. The historical experience is that these modern sectors develop under the stewardship of new and relatively small but dynamic social groupings, rather loosely termed the middle class. Wherever modernization has succeeded, the new middle class has had strong support from the Sovereign who queered the pitch in their favour. Indeed, the modern State has itself been an active contributor to this through building modern infrastructure such as all-weather roads, mass transportation systems, public health, education, etcetera, and also large production and service units.

While this conflict was apparent in western societies during their economic transformation and modernization, much of the critical large scale transfers were effected before universal suffrage was well established. Enlightened despotism, as also small interest groups, had a much greater impact on public policy. The potential for such conflict is also relatively muted in extant developing societies where democracy has still to take firm root. This perhaps explains why relatively small and dynamic entrepreneurial groups could exercise much greater influence on state decision making in such societies than is possible in countries such as India, where universal suffrage has preceded economic transformation. Globalization has made things even more difficult, because if the terms of transfer are too adverse the fledgling modern sectors may find it difficult to compete in the increasingly integrated global marketplace. Ironically, continued backwardness extracts its own costs of social upheaval. At the best of time modernization is a messy and often brutal affair, although the final outcome undoubtedly enhances human welfare all around.

The stresses and strains in the public discourse on 'land acquisition' in India, including the rationale for the replacement of the old colonial Land Acquisition Act of 1894 by the newly minted *Land Acquisition, Rehabilitation and Resettlement Act*, 2013 can perhaps be better appreciated against this backdrop. The current study tackles a critical component of the problem, namely the factors influencing the price of land in India. Its findings are the result of an impressive, painstakingly detailed empirical study that drilled deep into the record rooms of four districts in two States, namely Haryana and Madhya Pradesh. Its main finding are that land owners look out for price signals including inflation to industrialisation irrespective of wherever they are located. The study also argues that proximity to important infrastructure and areas of urban and industrial concentration -- is the chief determinant of the price of land compared with irrigation and fertility of the soil and this is discernible in extremely backward districts too. Its other finding that the price paid for land acquisition by government is far below the market prices is however unsurprising.

Will the new land acquisition, rehabilitation and resettlement act now tilt the scales against middle class entrepreneurs in the more productive modern sectors of the economy? At least four factors need to be considered while coming to a reasoned conclusion in this regard. First, the act is a recognition of the systematic undervaluation of land acquired through the old Act which led to social friction and unnecessary litigation. This could actually make implementation of large projects, at which the act is directed, faster, more transparent and easier. Second, the devils will lie in the details, in the rules that have still to be written, and without which the new Act cannot be implemented. Third,
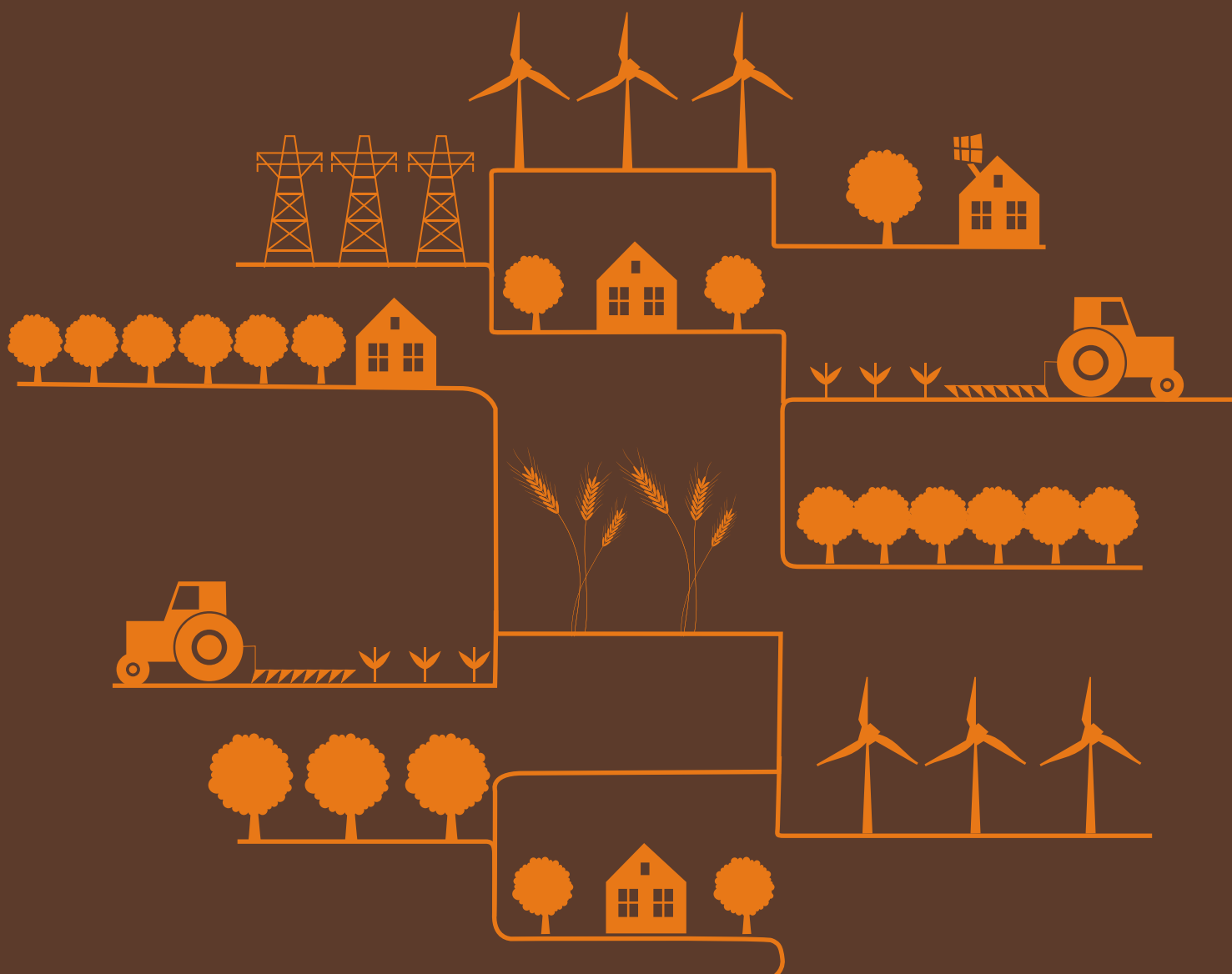
competition by State governments in promoting industrial and infrastructural development could increase or lessen the blow of certain provisions of the Act. Fourth, the restructuring of terms of transfer of a critical factor of production under the new act is more likely to see an increase in the share of returns accruing to the original land holder rather than to a decline in global competitiveness. To that extent it can be seen as contributing to inclusive growth, although it could be argued that this would at the same time increase unearned incomes from inherited assets which is never good

for overall productivity levels in the economy.

The study uses a variety of statistical techniques to analyse the large volumes of data mined, and also uses these to develop pricing models for predicting future acquisition prices. I am however somewhat sceptical about modelling market behaviour. To be fair, the study draws attention to the limitations of the modelling exercise, as a failure of the assumptions could lead to a breakdown of the model itself.   The informed reader would no doubt be in a better position to

evaluate the persuasiveness of this exercise. Be it as it may, the collation and analysis of vast amounts of real land acquisition data over three decades would be invaluable to experts in the field and to all those involved in pricing land acquisitions in future.

Alok Sheel,
Secretary
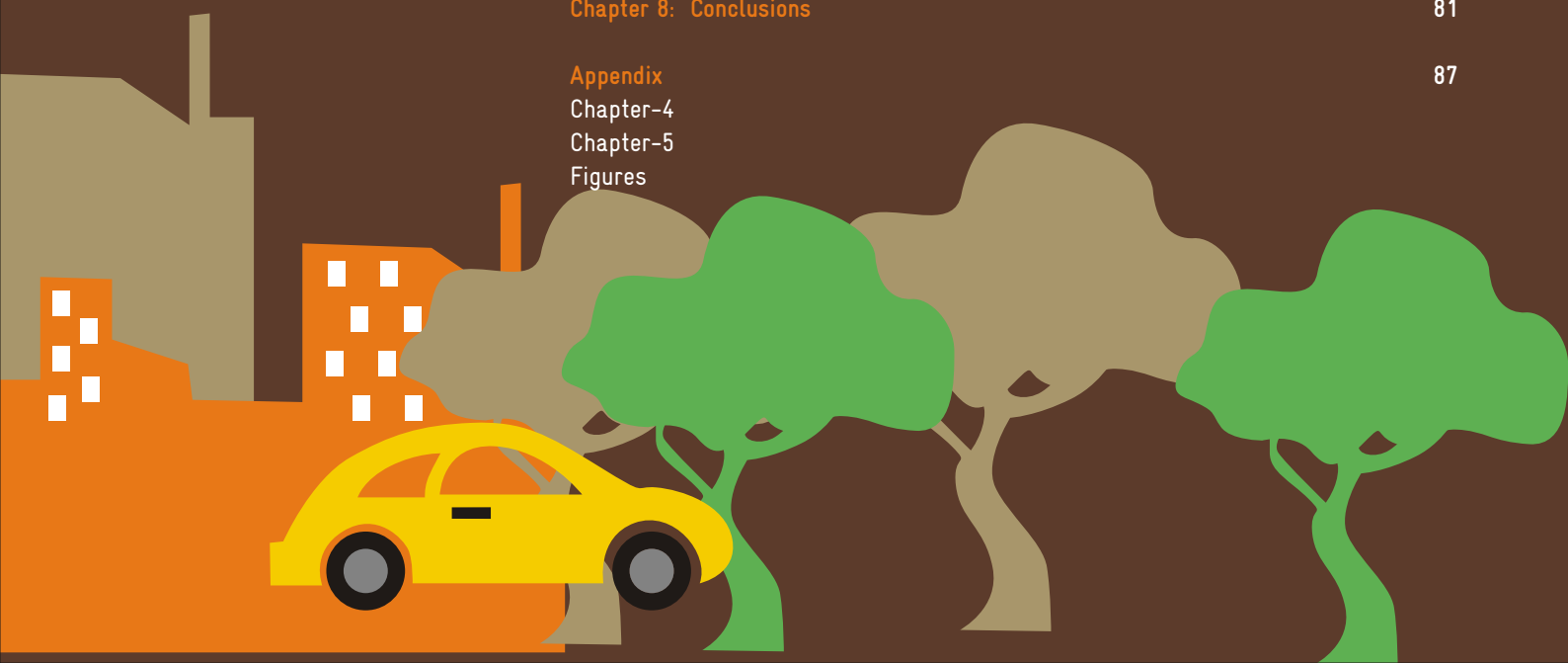Economic Advisory Council to the Prime Minister
January 9, 2014

Contents

Executive Summary

Recent academic literature on land has tended to incorporate a fair degree of putative arguments that often substitute for empirical knowledge, exceptions notwithstanding. This has been often more so in India, ever since land became a subject of discourse in the early 2000s.

According to an Outlook Survey conducted by Confederation of Indian Industries in 2009, land acquisition by project developers was perceived to top the concern for implementation of projects. Simultaneously, the public discourse over acquisition of land echoes the concern of not just the project-affected people but also reflects the ecological and environmental concerns associated with the land use change. The evidence of the clear divide is the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013, till recently

called the Land Acquisition, Relief and Resettlement Act. The Act was conceived in the year 2007 but has gone through several changes. It was introduced in the Lok Sabha in September 2011 and was promulgated in September 2013. Industry is opposed to several of the provisions while civil society is concerned that safeguards against acquisitions are not adequate. In the backdrop of this, it may be pertinent to understand and find answers to the question as to whether we can have a market-based solution to these problems and the feasibility of a more scientific approach to pricing of land in India. For instance, instead of acquiring land under the Land Acquisition Act (LAA), 1894, and facing a consequent social unrest, is it possible to replace the procedure with voluntary market-based transactions that will be more socioeconomically desirable to meet rising demand for land?

The issue sought to be addressed is whether the Indian economy can expect to return to an 8%-plus rate of growth without a set of reforms in land pricing. While there have been some excellent studies in this area, field-level studies that undertake empirical analyses of these questions are few. The associated question sought to be answered is whether a price model can be created that will be applicable for anybody who has a business with land. In this context it is worth recollecting that LAA of 1894 does not work alone. Over time, several departments have framed their own laws to suit their special needs. The common thread for all of them was that LAA is often not fast enough and tends to get bogged down in litigation. For example, at the Central level there are 16 Acts besides the LAA, 1894. This is necessary to understand as piecemeal efforts to prise LAA out of the equation will not solve the purpose.

The plan for an alternative approach depended on developing a coherent methodology that will stand the test of rigorous analysis. For the present report, the field study was conducted in two states. We shall explain the choice of states in the following section. Preliminary research was carried out to identify the possible factors that have an impact on land prices. Following this, a quick discussion with the officials at the land revenue departments gave us an idea of the information that can be extracted from land record deeds, which in turn gave us a fair idea of the information available through primary data collection. It was now clear that the remaining factors which could not be extracted from the land record deeds had to be extracted from publicly available resources or databases. Thus, secondary data collection had to be carried out separately. Although this did not involve physical exertion, it proved to be a difficult exercise altogether as very limited data on these factors was available on the government portals. A uniform method was applied in all the districts to obtain the data. The group of enumerators visited the state capital to inform and conduct a dialogue with the top officials about the nature of the study. In the next stage, the same process was repeated, often several times with the district officials to sensitise them about the project and establish the line of responsibility. The aim was to gather together the results of sampling data on land sales from a few districts over a long range of years to discover some trends. It was also expected that these trends can be to some extent be an analytical tool to understand how land prices move in India. The states and districts that were zeroed in for the purposes of the study are as follows:

A subsidiary issue that did influence the choice of states, but certainly not that of the districts, was that of language. The language used in every state to record land data has often remained unchanged for close to a century. Merging the data collected from the four districts for a period of 30 years yielded close to 6,80,000 lines of entry. This is massive by any standards and far larger than any comparable study in this area. Still, this was a small sample of the total volume of data which is available for perusal. This was followed by a laborious exercise of sifting through the complete dataset to arrive at a reasonable subset to be used in our analysis for developing the model.

The objective of the study was to build a model of land pricing from the data

Table 3.1 States and Districts Chosen for the Purpose of Study

State	District	Land Area Characteristics with Respect to Population
Haryana	Faridabad	Highly urban
Haryana	Ambala	Intermediate
Madhya Pradesh	Singrauli	State-led industrialisation
Madhya Pradesh	Mandla	Base level

obtained and then use the validated simulation techniques to project the same into the future. For the purpose of the present exercise, the authors primarily investigated the following questions

A)   To what extent do land prices respond to the price environment in the economy? In this study this is measured through consumer price index for industrial workers.

B)   Which parameters or predictor variables do land prices respond to?

C)   Does urbanisation impact the relative weightage of these factors and if so to what degree?

D)   Can the trend in prices be also mapped on the data for land acquisition?

E)   And finally, is there any basis for the oft-quoted information asymmetry between the buyers and sellers in land transactions?

To analyse the data, a number of mathematical approaches including game theory, artificial neural network algorithms and a stochastic pricing model were considered. The one chosen was the multivariate regression model. This method has its obvious advantages but like any other model used in the social sciences, it is subject to caveats including sensitivity to outliers in the data and assumptions of linearity and normality.

It was decided to enumerate data from the year 1980 to 2010 to reflect the two eras of the Indian economy. By the 1980s, states had abandoned the system of land revenue collection, even at the low rates being collected. The choice of terminal date was selected to bring it as close as possible to the current period of study. It was found after discussions with the district administrations in the selected states of Haryana and Madhya Pradesh that the number of sale deeds per month (each sale of land is recorded as a sale deed) was close to 15,000, including both urban and rural areas. Since the deeds are all stored with the district administration, agnostic of geography, this created the challenge of trying to sort through them. Again, since inter-year variations in the sale of land were expected to be minimal in a set of five years (as also borne out by a test check of the data collected), the authors decided to sample batches of two years from each decade. Accordingly, the years 1985 and 1986 were selected for inspection of the sale records and the same was repeated for the next two decades. However, for completeness, data was also collected for the years 2009 and 2010 to bring the records up to date, as explained above.

The regression analysis was conducted on multivariate and univariate models for the following parameters. These included:

• Size of the land being sold and adjustments for inflation.

• Fertility factors and type of land– agricultural or not, irrigated or not.

• Rate of industrialisation of the district.

• Geographical parameters including
    ▪ location of the plot in a village or a municipal area ;
    ▪ distance from railhead;
    ▪ distance from airport;
    ▪ distance from the leading town of the district

The answers that emerged are that movement of price of land from urbanised Faridabad to Mandla in Madhya Pradesh, one of the 50 most backward districts in India, responds in a typical way to a broad set of economic factors, such as price, as measured by the consumer price index.

The data shows that for pricing of land, location is the key yardstick. Extending the debate to flash points like Singur, it can be hypothesised that it was the location that had the potential to drive up the prices rather than the multi-cropping capacity of the land. The decade-wise data for say, Faridabad, shows how this is happening. The explanatory power of irrigation is at its peak in the eighties, but after that it falls sharply.

Given below are the key findings of the study-

Impact of size of land holdings and Inflation on land prices

- The study shows that land sales in any region are mostly guided by economic and market considerations agnostic of the decade considered. There is a close correlation of land prices with variables including inflation and size of the land being sold\purchased.

Impact of fertility on land price

- Significance of fertility factors varied across districts but what was clear is its lower ranking in the relative importance of all the factors under consideration. For instance, irrigation was found to be statistically significant in Faridabad which is known to be a well irrigated district. However, the same variable was insignificant in the other districts. Explanatory power of the fertility variables was at its peak in the eighties but has been on the decline since then.

Impact of Geographical factors on land prices

- The geographical factors were seen to play a very important role and gained importance with every decade. For instance a railway link was conspicuous by its absence in the calculations a farmer would make when deciding to sell land in the 1980s. But post 2000s this is a very important variable impacting the pricing of land.
- The geographical factors were seen to affect land prices irrespective of the state of development of the districts. Where there is a difference is in the relative impact of the individual geographical factors. Proximity to the airport as a factor was much less important than proximity to a railway station, a major road or highway and the distance from the nearest district city to which land prices were seen to react sharply.
- The location of the land parcel within a municipal corporation area and the distance from the railway station turns out to be a significant factor across all districts. Distance from the nearest city in the district emerges as the next important factor.

Location vs fertility as a determinant of price and the impact on food security

- The other major change is that location factors have superseded fertility factors in deciding prices. The decline in fertility as an important factor in deciding prices implies that acquisition for industrial purposes may acquire agricultural land, no matter how fertile it is, for a lower price. This would not only lead to loss of agricultural land but provide less incentive for people to buy agricultural land for farming and poses a threat to food security in the country. Hence, this necessitates a balanced policy which neither compromises on food security nor does it make acquisition of land a harrowing experience for the industry.

Impact of Industrialisation on land prices

- Not surprisingly in a district like Mandla even now, industrial activity has less of a demonstration effect than say Ambala. In the developed district of Faridabad, investment and the number of registered Medium, Small and Micro enterprises has a sizeable effect on land prices. The impact of the proxies for industrialisation in a district for land price determination is a clear enough reason to include the same in any plan for pricing in the land markets of India.

Land Acquisition

- The study also discovered that land acquisition by government agencies is thus undervalued. The only factor that has been considered in the impact attributing to a general price rise or inflation is very limiting and that too often arbitrarily. Hence the extent of correction in our sample is less than 25 %. Worse, as the pace of industrialisation is accelerating, this could lead to potentially more political and economic disturbance.

Information Asymmetry

- One of the reasons for sellers to under quote the price of land is the extent of information asymmetry between them and the buyers. This in turn is a factor of the lack of development in the land markets. However, this asymmetry is declining over the past decade. While the structural factors are the domain of a separate study the ingredients of a pan-national pricing regime can be constructed from analysis conducted in this study.

Cost Benefit Analysis

- A proper cost benefit analysis of land prices, it goes without saying, is something that private or public sector companies are unable to carry out at present. They may even lack the tools to do so. The valuation principles which have been enumerated in chapter 5 are the basis on which the same can be constructed. The net result will allow the economy to make the most appropriate use of a scarce resource that in turn will maximise welfare.

Plotting these results against government-led acquisition shows there is a huge bias towards under correction when it acquires land. A model based valuation as this project deploys will be far more equitable for them. The most useful ally in this process will be the use of geographical factors as enumerated since they smoothen out other variables like size of land and fertility as those favour the richer farmers. Finally, the painstaking exercise also shows that information asymmetry in valuation of land between buyers and sellers is gradually narrowing. Both the corrections of price and the spread between individual prices have narrowed in the three decades studied.

All the methods enumerated above provide the means to assess the true value of land. As shown above, they can all be used to derive a better price of land than the one currently deployed. This is the most significant fallout of the processes enumerated above. Counter-posing these trends in the pricing of land against the way government agencies deploy the Land Acquisition framework can then be a highly valued additional exercise for any industry that needs to acquire land for its projects.

01

Land Markets in India:
The Contemporary Scenario

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Section 1.1—Land The Diminishing Factor of Production

The surge of interest in land issues in India is an effect of the push for manufacturing-led growth that began in earnest from around 2003-04. From a position where it did not even merit a mention in government documents like the annual Economic Survey for the most part of pre-liberalisation period except when twinned with reforms, land has now assumed a position which is far more contentious than labour.

As we shall see later, it is used as an excuse for control and use of natural resources which has become an overwrought exercise in the political economy of India.

Land acquisition has become one of the impasses for investments by industry in core sectors of developments[1]. According to an Outlook Survey conducted by Confederation of Indian Industries (CII) in 2009, land acquisition by project developers was perceived to top the concern for implementation of projects[2]. Simultaneously, the public discourse over acquisition of land echoes the concern of not just the project-affected people but also reflects the ecological

and environmental concerns associated with the land use change.

The evidence of the clear divide is the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (earlier called the Land Acquisition, Relief and Resettlement Act), 2013). The Act, which was conceived in the year 2007 and has gone through several changes, was finally passed in 2013. Industry is opposed to several of the provisions while civil society is concerned that safeguards against acquisitions are not adequate.

Section 1.2—Land A Critical Resource

Classical economists of the nineteenth century were among the first to identify the importance of land. Among the three factors of production, it was assumed that since land was fixed in supply, the returns on it were only in the form of rent and it received only tertiary attention. This has already been documented in the literature.

This hypothesis changed when economists realised that for population-heavy, agriculture-based

economies, especially in Asia and West Africa, the returns from land were compelling enough to impact the economic well-being of a sizable section of the population, who were not able to migrate to the expanding industrial economy for lack of adequate skill sets.

Yet, this did not preclude acquisition of land by the government for an increasingly disparate set of projects that were often difficult to classify as public good. Simultaneously, urbanisation created its own demand where builders continued to acquire land through private negotiations with the sellers. The two proceeded apace till the manufacturing sector, moribund till 2003-04, began to see scope in expansion beyond the limits of urban areas. This is where the flashpoints developed.

In India, attention on land and its allocation, therefore, began as a political subject before expanding to a more rigorous understanding of the same. This has also coloured the literature on the subject. The initial reaction to the hubbub about land in India was one of disbelief which eventually changed to a grudging acknowledgement of its importance and

1   Morris, S. & Pandey, A. (2009). Land Markets in India: Distortions and Issues. India Infrastructure Report 2009, pg. 13-19, Oxford University Press.

2   http://cii.in/full_story.php?menu_id=78&news_id=1786

finally a position that land should not be acquired, unless proven otherwise.

The discourse on the current Act demonstrates this position clearly.

Can industrialisation (rapid economic growth) occur without displacement and dislocation of livelihoods and communities? Can benefit from industrialisation exceed costs social, political and economic involved in claiming the land by dispossessing original owners?

A related question in this context is the way to address the pressure on land that has emerged from the rapid urbanisation of the country post 2000. The Indian urban population is expected to rise from under 380 million in 2011 to 800 million by 2050. The addition of a whopping 500 million people "will also place an enormous strain on existing urban centres and the many new ones that will come into existence"[3]. But land questions in urban areas differ in some key aspects from rural areas offering, on the one hand, the option of developing a well-organised market to trade in it, yet at the same time suggesting the downside risk of a larger co-option into a cycle of vested interests, if not handled well.

In the backdrop of this, it may be pertinent to understand and find answers to the question about whether we can have a market-based solution to these problems. For instance, instead of acquiring land under LAA, 1894, and facing a consequent social unrest, is it possible to replace the procedure with voluntary market-based transactions that will be more socioeconomically desirable, to meet rising demand for land? The issue may be resolved through efficient functioning of land markets. However, land markets have their own inherent characteristics of the problem, further aggravated by the interference of the state through laws in the name of protecting susceptible sections of the population or for achieving orderly industrialisation and urbanisation.

This chapter aims to provide a basic understanding about land as an economic resource, land markets and their inherent characteristics inducing imperfections and inefficiencies in the market.

Section 1.3—Land Markets Critical and Peculiar

Between land, labour and capital, the three basic factors of production, land has several distinguishing features that make it difficult to measure using standard economic production functions like Cobb–Douglas.

- Land is not produced or reproducible
- Land as a site is permanent and recyclable
- Land supply is fixed
- Land is immovable in space and uncontrollable in time
- Land does not turn over. It is recycled and is versatile
- Land is not interchangeable with capital
- Land rents are subject to market forces that differ from those that determine interest rates (the price of the capital)
- Land prices guide investors and determine the character of capital as a substitute for land
- Land is a physically limited asset
- Land value is not an economic fund

Why is it important to have an efficient land market? It is important as it brings into a level field of transaction a vast range of people for whom land may be the only significant piece of value they enjoy. Even for others such as large farmers and landowners or

estate agents and valuers, to know how land prices will move in the future, it is important to derive confidence in the market rather than use inefficient information asymmetry for deriving bargains[4].

Land markets, therefore, have wider significance and implications on society as a whole and the country. The nature of land as a commodity or resource subjects it to ever-increasing and competing demands of society over the years[5]. The choice of competing opportunities and demand of land use by different individuals (also corporations as a separate legal entity) necessitates defining land use rights, restrictions and responsibilities with legal validity. The rules and regulations are indispensable for legal rights but need to be complemented through

proper institutional changes through land reforms for maintaining equitable distribution and rights on land by different segments of society. So there is a necessity to create a proper land market in the country for efficient functioning of the entire community.

However, there are also some peculiarities that colour land usage and which also induce some imperfections in this market.

1. Imperfection in Substitutability
Unlike other goods and services markets, land markets are different in the sense that no two pieces of land are alike. This immobile and non-reproducible characteristic of land imposes imperfection in the land market. Each chunk of land is peculiar in characteristic, such as its size,

shape, fertility and irrigability which makes a pure substitution with another chunk of land unattainable[6].

2. Agricultural Dependence
In a developing economy, while land is owned predominately by a limited fraction of the population, the majority of population of the country has livelihood and dependence that is agriculture dependent. The marginal rate of productivity in agriculture (in term labor) does not match with its returns, but it provides a sense of social security to the people who are dependent on it. This imposes imperfection in the market. Further, based on economic theory, there is a proposition that a significant portion of support to farm returns provided on support prices of agricultural products by governments capitalises on the

4   Harvey, David R. (1989). The Economics of the Farmland Market, paper presented at One Day Conference at The Agricultural Land Market, The Royal Society, London, December 15th, 1989.

5   Sarkar, Runa, Overview of Report. India Infrastructure Report 2009, Chapter 1, pg. 1, Oxford University Press.

6   Morris, S. & Pandey, A. (2009). Land Markets in India: Distortions and Issues. India Infrastructure Report 2009, pg. 13-19, Oxford University Press.

value of land[7]. This points to the fact that only land owners are benefitted rather than tenants or peasants and other people whose livelihood is dependent on land. This induces significant distorsions in this market and necessities to provide for efficient policy on behalf of the government on land reforms and agriculture policy.

3. High Transaction Cost

In land markets, for transactions to take place voluntarily and freely, one-on-one negotiations should take place. In this case, the buyer has to negotiate with each of the land owners individually about the price of land which a seller owns and is willing to sell. The time and effort expended by the buyer to carry out these negotiations, referred to as a transaction cost, can become prohibitively high[8].

4. Imperfection in Demand and Supply

As mentioned earlier, land is a limited, immovable and recyclable resource. Further, it is held by a limited population while the majority of people utilise it. With the ever-increasing population, there is significant pressure and imperfections in demand and supply of land as a commodity needed for different purposes. The imperfections are aggravated by the fact that there is a huge income disparity between different classes of people. This gives rise to disparities known as bargaining strength between the suppliers and the buyer. Further, the difference between market value and private value of land also induces this imperfection[9].

5. Land Use

The price of land is also significantly dependent on its use. It is also contingent upon the developments happening around a given area. For example, in an area, if it is perceived that industry will be set up or a township is proposed, the price of land suddenly shoots up. Neighboring areas under expectations of change in land use also provide momentum to rise in land prices. At any given place, the perception of potential economic benefits arising from alternative use of land is mirrored in the price of land of that region.

6. Hold-out Aspect

The important problem recognised with regard to functioning of land markets, particularly in urban areas, is "hold-out". This problem arises when a large piece of land is required for a certain use and involves acquisition of land from many land owners. The problem of "hold-out" surfaces when some land

7   Harvey, David R. (1989). The Economics of the Farmland Market, paper presented at One day Conference at The Agricultural Land Market, The Royal Society, London, December 15th, 1989.

8   Gangopadhyay, Shubhashis (IDF), Developing the market for land, February 2010.

9   Morris, S. & Pandey, A. (2009). Land Markets in India: Distortions and Issues. India Infrastructure Report 2009, pg. 13-19, Oxford University Press.

In a developing economy, while land is owned predominately by a limited fraction of the population, the majority of population of the country has livelihood and dependence that is agriculture dependent. The marginal rate of productivity in agriculture (in term labor) does not match with its returns, but it provides a sense of social security to the people who are dependent on it.

owners hold out on land in expectation of extracting greater benefit from the land acquirer with the idea that the project necessarily needs their land for the project to be feasible[10]. This rent-seeking behavior by the land owners for harnessing greater economic value by virtue of their ownership rights on land causes imperfections in land markets.

landholding pattern was perpetually disrupted to ensure land acquisition for entrepreneurs at very affordable prices (the last version is the Land Acquisition Act, 1894) and also to have regular and handsome revenue for the kingdom. The system of private property rights infringed with the common property rights held by tribes. Further, the popular *Zamindari* System for revenue collection through land instigated through the Permanent

tenants. In this system, the landlords/intermediaries had no interest in introducing land improvements; neither did the tenants who had no incentive or resources to do so. Consequently, it resulted in a progressive socioeconomic deterioration in the country without much agricultural productivity and bad economic condition of tenants at the time of independence.
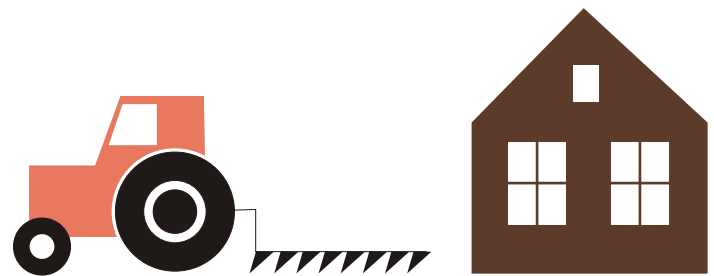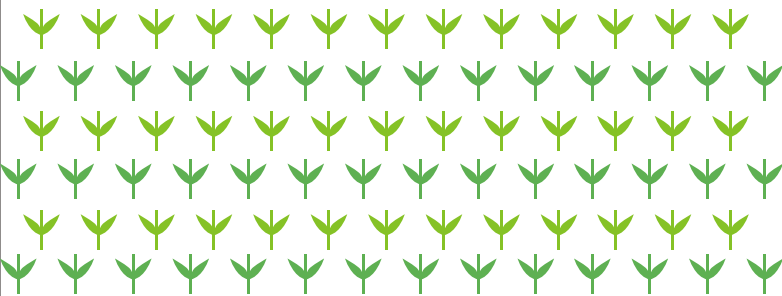
Section 1.4—Land Markets and Land Reforms: A Perspective

The problem of land markets and inequitable distribution of land in India may be attributed to the semi-feudal agrarian system inherited by independent India. During the two centuries of colonial British rule in India, significant socioeconomic imbalances were induced in the country. During the British reign, the country's conventional land use and

Settlement Act, 1793, structurally altered the land ownership system. This system allowed ownership and control of land to a very small number of people called landlords[11]. The people only had motivation to maximise rent from the land directly or indirectly. A pervasive system of subletting, often several rungs deep, deteriorated the state of affairs by reducing the holdings to uneconomic proportions. A small lot of intermediaries rack-rented a large mass of ill-fated

In the aftermath of independence of the country, emphasis was placed on land reforms for the socioeconomic imbalance in the society which was based on a semi feudal production relationship. Land reform meant distribution of surplus land to small farmers and landless tillers, accrued as a result of the implementation of the ceiling on agricultural holdings[12]. It was based on the policy makers' views to effectively distribute land among the landless, tenants, and other small

10 Morris, S. & Pandey, A. (2009). Land Markets in India: Distortions and Issues. India Infrastructure Report 2009, pg. 13-19, Oxford University Press.

11 Sethi, Manpreet (2006). Land Reforms in India: Issues and Challenges. In Promised Land: Competing Visions of Agrarian Reform, (eds.) Rosset, Peter M., Patel, Raj, Courville, Michael Chapter 4, pg. 73-92. Institute for Food and Development Policy, New York.

12 Chakraborty, Gangotri (2006). Land Reforms and Corporatisation of Agriculture. Retrieved from http://iipa.org.in/common/pdf/Paper_14%20Land%20Reforms.pdf

cultivators with an aim of effective diffusion of wealth, increasing agricultural productivity and growth in income. The land reforms in the country post-independence were instigated primarily through three key ways: abolition of intermediaries; laws on tenancy reforms and land ceiling act. These land reforms are briefly discussed here.

1. Abolition of Intermediaries

It was understood by the policy makers that the intermediary's privileges had an adverse impact on agricultural productivity as well as denied the tiller of the soil his rightful place in the economy. Therefore, initial land reforms in the first and second Five-year plans particularly focused on the abolition of intermediaries. Indian agricultural land was administered under three broad types of land tenure systems[13]: the *Zamindari* system (57%), *ryotwari* system (38%), and *mahalwari* system (5%). Between 1947 and 1954, a law for the abolition of the *Zamindari* system was adopted by the state legislature to abolish the role of intermediaries. The most important of this was the Zamindari Abolition Act of 1952 in Uttar Pradesh. However, the control of land remained intact in most of rural India as it did not affect land ownership in the *ryotwari* or *mahalwari* system areas where no intermediaries existed. Hanstad (2005) observes that

these laws did not fulfill what was envisaged of them for reasons such as shortcomings in the law, implementation and role of the judiciary.

2. Laws on Tenancy Reforms

Following the abolition of intermediaries, agriculture cultivation was predominately based on a uniform tenancy system. Post-independence, tenancy reforms were launched to confirm the rights of occupancy by tenants, regulate rents on leased land and to secure their possession of tenanted land in order to boost agricultural productivity of the country by motivating these tenants. There were no laws in place to safeguard and recognise the legal rights of tenants.

Tenancy reforms were first envisaged in the first Five-year plans and subsequently have been embodied in every Five-year plan policy documents. The first Five-year policy documents provided a policy document on tenancy reforms, which were to be instigated in the states through legislatures. The central government efforts on tenancy reforms in bringing in efficiency in agriculture ensured that every state had legislation on tenancy reform by the end of the third Five-year plan based on national policy guidelines. However, policy analysis done in the fourth and fifth Five-year plans

observed that laws on tenancy reforms were not adequate, and, combined with ineffective implementation, did not meet the desired objective of bringing in social justice. The fourth plan policy objective called for ending laws on tenancy. Nothing much changed in subsequent policy plans on this issue. In the 10th Five-year plan, it was observed that the prohibition of tenancy has not resulted in the ending of this practice and recommended a fresh approach in this field.

3. Land Ceiling Acts

The land ceiling acts in the aftermath of independence were promulgated with the intent of redistributing land in excess of the ceiling to very small, marginalised and poor farmers to bring in some equity. It was aimed at correcting extremely skewed distribution of land to remove disparity in agricultural income of farmers. The land ceiling acts were enforced by states from 1960. Till 1972, these were enacted without any national policy guidelines and had regional variations. The reforms and laws on land ceilings during this period were full of ambiguities easily exploited by land owners. In this vein, National Policy Guidelines on land ceilings were released in 1972 to remove the loopholes.

13 Hanstad, Tim (2005). Improving Land Access For India's Rural Poor. Paper presented at National Seminar on Reforms in Land Policy for Accelerated Growth,(New Delhi, January 5-6, 2006) .Available at http://siteresources.worldbank.org /INTINDIA/Resources/Hanstad.pdf

Appu (1996) suggests that "the imposition of ceilings has not led to any worthwhile redistribution of agricultural land in the rest of the country"[14]. It was observed that land reforms by virtue of land ceiling laws are ineffective and results are not satisfactory on account of high ceiling levels, significant number of exemptions and ineffective implementation along with illegal ways of subverting the law[15].

Section 1.5—Current Trends of Land Markets in India: Analysis

As we noted above, the demand for land is a function of faster economic growth. Those who berate the level of growth, which incidentally has secularly plummeted again, fail to realise that it is the higher growth which has generated possibilities of better compensation for land owners.

The chorus against growth has demonstrated the pitfalls of urging for equity at the cost of growth. The debate on land illustrates this vividly. For instance, the successive Five-year plans failed to acknowledge this problem and instead advocated a policy of land reforms that failed in most states spectacularly changing neither usage nor ownership patterns. For instance, agricultural productivity improves with larger holdings than the handkerchief-sized plots dotting the country but the course of land reforms went to the other extreme. As a result, India has one of the poorest levels of agro-productivity while 49% of the working population is still dependent on agriculture and the industrial sector is starved of skilled labour.

The economic liberalisation of the country after the 1990s did not address this issue either. As stated earlier, the question of land markets was foisted on the state as a sequel to the SEZ experiment and is still being debated.

The increasing population and person to land ratio (population density) is also putting pressure on an effective market for land in the country. The Indian

Table 1.1 Number and Area of Total Holding by Size Group (000 hectares)

Sr. No.	Size Group	1995-96		2000-01		2005-06		2010-11	
		Number	Area	Number	Area	Number	Area	Number	Area
1	MARGINAL (below 1 ha)	71179 61.58%	28121 17.21%	75408 62.88%	29814 18.70%	83694 64.77%	32026 20.23%	92356 67.04%	35410 22.24%
2	SMALL (1-2 ha)	21643 18.73%	30722 18.81%	22695 18.92%	32139 20.16%	23930 18.52%	33101 20.91%	24705 17.93%	35136 22.07%
3	SEMI-MEDIUM (2-4 ha)	14261 12.34%	38953 23.85%	14021 11.69%	38193 23.96%	14127 10.93%	37898 23.94%	13840 10.04%	37547 23.58%
4	MEDIUM (4-10 ha)	7092 6.14%	41398 25.34%	6577 5.48%	38217 23.97%	6375 4.93%	36583 23.11%	5856 4.25%	33709 21.17%
5	LARGE (10 ha and above)	1404 1.21%	24160 14.79%	1230 1.03%	21072 13.22%	1096 0.85%	18715 11.82%	1000 0.72%	17379 10.91%

Source : Agriculture census database (http://agcensus.dacnet.nic.in/)

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14 Appu, P.S. (1996). Land Reforms in India: A Survey of Policy, Legislation and Implementation, L.B.S. National Academy of Administration, Mussoorie.

15 Planning Commission, Draft Fifth Five-Year Plan, (1974-79); Das, Sukumar (2000). A Critical Evaluation of Land Reforms in India (1950-1995) in Sinha & Pushpendra (eds.), Land Reform in India: An Unfinished Agenda, (2000); Thakur, D. (1989). Politics of Land Reform in India. New Delhi: Commonwealth Publishers.

population as per 2011 census is 121 crore, which is expected to rise up to around 140 crore by 2026[16]. The concern for population moving towards urban areas is well founded as it has increased from 25.7 % in 1991 to 31.2 % in 2011. The increasing urban population pressure results in greater land requirements putting the burden on the rural–urban land divide.

unless they are equipped with satisfactory solutions for allocating land use that maximises aggregate welfare. Information on the ownership of land in most Indian states is concentrated in a structure that combines political power with economic power. Much of the problems surrounding land acquisition in India, for instance, which have been outlined

Table 1.2 Population Growth and Distribution of India

Year	1991	2001	2011
Population (in millions)	846	1029	1210
Population Density (per sq. Km)	267	325	382
Population Growth (exponential)	2.14	1.97	1.64
Urban Population (% of total population)	25.7	27.8	31.2

It is in this context that this project was started. The issue sought to be addressed is can the Indian economy expect to return to an 8%-plus rate of growth without a set of reforms in land pricing in India? While there have been some excellent studies in this area, field-level studies that undertake empirical analyses of these questions are few. The associated question sought to be answered is whether a price model can be created that will be applicable for anybody who has a business with land.

In the final analysis, industrialisation and urbanisation in India cannot become broad based and expansive

in detail stem from these imperfections prevailing in India's land markets. The principal imperfection that hurts true price discovery in land markets is the asymmetric information patterns. In fact, it can be argued that unequal access of information about land and, by extension, about most other state-controlled assets is at the root of the crony capitalism debate in India. The debate about the usefulness of the auction to parcel state resources among competing claims is therefore a fundamental line of inquiry in this context and assumes great significance in the contemporary scenario.

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16 Selected Socio Economic Statistics India, (2011). Ministry of Statistics and Programme Implementation. Retrieved from
http://mospi.nic.in/mospi_new/upload/sel_socio_eco_stats_ind_2001_28oct11.pdf

02

Land Regulations: Resisting Modernity

Land Regulations: Resisting Modernity

Land control legislations constitute a critical piece of reform in India, given the country's need to balance the challenges of social inequity and industrial growth imperatives.

Post-independence, the country saw many efforts being made to reform laws on land use, aimed at balancing the socio-economic dynamics of land acquisition with that of the country's growing industrial development needs. The Land Acquisition Act (LAA) of 1894, which is the primary legislation on the subject, or its present avatar, The Right to Fair Compensation and Transparency in Land Acquisition, rehabilitation and Resettlement Act, 2013 (henceforth referred to as the "Act"), both seems to have failed to promote an environment of socio-economic growth and development. Needless to say, the land reform regulations have witnessed a chequered history, when we look at them from the perspective of developing an equitable society.

The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Bill, which was earlier called the Land Acquisition, Rehabilitation and Resettlement (LARR) Bill, was promulgated as an Act on September 27, 2013.

This chapter will track how the land legislations that were brought in as harbingers of modernisation and economic development have gradually atrophied into rigid systems of controls and associated problems. It will also show that this atrophy has led to the emergence of a class of other acts that have bypassed the primary legislation and have created a legal architecture which is very consistent yet independent of the land legislation problems.

The singular evidence of this development is the system of property rights in India. The gamut of acts and regulations which determine property rights in India have been separated from the land records by introducing the concept of deeds. Consequently, property rights have expanded to emerge as a flourishing market in land in urban areas but void of land transfer-related issues.

In the final section, the chapter will also discuss another aspect of land laws which is the mutation of the LAA to a smorgasbord of acts at the centre and state levels. The range of government acquisitions that have happened over a century in India are thus not the result of one act. In fact, one can argue that unless consistent changes to these acts are also made, many future acquisitions will continue to be guided by archaic laws. We will also consider instruments like ceiling and zones that tend to suppress prices in addition to what the LAA does.

Section 2.1—Effecting a Property Sale and Purchase

Two acts principally guide the sale and purchase of property in India. These are the Registration Act, 1908 and the Indian Stamp Act of 1899. Underlying each of them is a system of deeds. A deed is a record of a transaction between two parties underlying which is a public repository. In other words, the deeds system accepts that a transaction in, say, a piece of land is valid if it is based on documents which are part of a public record. So the recording of the document will, for instance, give a public notice of the transaction and, sometimes, can also be nullified if it can be shown that in the records there is another such deed which has not been extinguished. This is different from the titling system where the public register contains a record of explicit public titles to a land and everything else has to be sourced from it.

The reasons for this evolution were obvious. Even in colonial India, establishing ownership of land was not mandatory. Post-independence, once states let the land revenue system fall into disuse, the land revenue records just died out. So the deeds system of recording of transfer of property that was in vogue gained strength and the need to develop a titling system for

land records was gradually allowed to lapse.

At this stage, we will not get into the legality of deeds versus titles but note that for any land deed to be accepted as legally valid; it has to be registered. Unregistered deeds are not acceptable. Over the decades, stamp duty has become one of the highest sources of revenue for state governments. As per RBI data, stamp duty collections rank third in the total tax revenue of the states just after VAT and state excise. The World Bank supported project across states worked on the two pronged formula of cutting the rates to encourage more people to declare the true value of their property and making the payment system easier.

The collection of duties soared from the transactions in land and houses. In Maharashtra for instance, just after the rates were slashed, the collections soared from an average of Rs.1,500 crore to Rs.5,300 crore within two years. The states also realised that they could do even better if they introduced the concept of 'circle rates', i.e., the minimum rates below which a land or a house in an area cannot be transacted in and have improved on it to revise it regularly. Consequently, in the absence of "Clear Titles", the registration of deeds under the Registration Act has served to determine encumbrances of properties. The values shown in the sale deeds serve as an indicator of land values in an area, including urban areas.

What happens to agricultural land in this scenario? For determining the value of agricultural land where sale is less frequent than in urban areas, such a divorced system from titles was obviously risky for the states to contemplate. The land records maintained by the state governments under the State Land Revenue Act gave an indication about the 'other attribute data' or Khasra Girdawari that mentions the soil types, irrigation sources, cropping pattern, types of crops, areas and average yields of crops, fallow land and so on. Again, remember that none of these are a substitute for a titling system as they are meant to establish the extent of land revenue but as a subsidiary role these attributes in combination are helpful in determining the ownership of the tract when it appears on the market.

So the absence of titles is almost as great a handicap in the evolution of a vibrant land market in India as the LAA. This is scarcely recognised. As we noted, the only documents to fall

back upon are the land revenue records which are not title records but records maintained for the purposes of collecting land tax on surplus produce. This is a dangerous situation. Land revenue has become extinct in most states and even where collected, the total sum is never more than Rs.2.5 crore as in Madhya Pradesh. Since no one collects revenue, the department in charge finds it difficult to convince a cash-strapped government to keep the records up to date. For the government, the maintenance of records is then a public service, that too a dubious one, and the demands of other departments take precedence. The results were clearly visible where the teams did the field work.

Titling has been recently cleared by the Central Cabinet as one of the plans of action the government will undertake soon. To be effective, titling will need to be developed simultaneously with satellite maps supplemented with cadastral maps. The entire exercise will take time.

FOR SALE

Last year, rural development minister Jairam Ramesh conceded this point in an interview to a newspaper.

Twenty-five years ago, I believed like many others that we should move from presumptive to conclusive titles. I still believe that we should make the move, but that has to be the end objective. There are a large number of intermediary steps we need to take - land records have to be digitised, mutation has to be online - before we can make that move. It will take us time to get there, may be another 10 years.

(The Economic Times, June 25th, 2012)

Mr. Jairam Ramesh was referring to the fact that in states where land revenue has been abolished, these records have fallen into disarray and there is inertia in updating them due to the time, effort and costs involved.

It is useful to know that the Land Revenue Act did not operate alone. It was sort of at the apex of a clutch of acts, some regressive that kept in operation a revenue-derived system of rights on land in rural areas. These are the Zamindari Abolition and Land Reform Acts, the Tenancy Act, the Limitation Act, 1963, which includes the law of Adverse Possession, the Land Survey and Settlement Act and the Prevention of Fragmentation and Consolidation of Holdings Act which guided the revenue machinery in the preparation and maintenance of the land records. It is the same with the LAA.

Section 2.2—Interplay between Land Control Laws, Conflicts and their Abuse

The great myth as we have noticed in the analysis of the LAA of 1894 is that it works alone. This is incorrect. This is not the only act under which acquisition of land takes place in India. Several departments have framed their own laws to suit their special needs over time. The common thread for all of them was that LAA is often not fast enough and tends to get bogged down in litigation.

At the Central level there are 16 acts besides the LAA, 1894, namely:
1. The Ancient Monuments and Archaeological Sites and Remains Act, 1958 (24 of 1958).
2. The Atomic Energy Act, 1962 (33 of 1962).
3. The Cantonments Act, 2006 (41 of 2006).
4. The Damodar Valley Corporation Act, 1948 (14 of 1948).
5. The Indian Tramways Act, 1886 (11 of 1886).
6. The Land Acquisition (Mines) Act, 1885 (18 of 1885).
7. The Metro Railways (Construction of Works) Act, 1978 (33 of 1978).
8. The National Highways Act, 1956 (48 of 1956).
9. The Petroleum and Minerals Pipelines (Acquisition of Right of User in Land) Act, 1962 (50 of 1962).
10. The Requisitioning and Acquisition of Immovable Property Act, 1952 (30 of 1952).
11. The Resettlement of Displaced Persons (Land Acquisition) Act, 1948 (60 of 1948).
12. The Special Economic Zones Act, 2005 (28 of 2005).
13. The Coal Bearing Areas Acquisition and Development Act, 1957 (20 of 1957).
14. The Electricity Act, 2003 (36 of 2003).
15. The Railways Act, 1989 (24 of

1989).
16. The Works of Defence Act, 1903 (7 of 1903).

In addition, there are 284 acts in the Ninth Schedule of the Indian Constitution, an overwhelming majority of which are land related. The schedule is a nice construct of the constitution which gives immunity from court proceedings for any act that is listed in the schedule.

But each of the 16 listed above have self-contained provisions that provide for take-over of land by the government for public purposes. Of course, the ambit of each is more limited than the omnibus LAA, yet land has been taken over by the government under their rubric and so too under the Ninth Schedule Acts.

In addition, there is a treasure-trove of several state laws too which guide land acquisition. Of these, the first is the state-level LAA. Since land acquisition is a subject in the concurrent list of the Indian Constitution, the states brought in separate LAA to suit their local conditions.

To complicate matters further, the states have developed more legislation to aid the process of land acquisition. So there is often an Industrial Development Act conceived for planned industrial development under which the respective state-level Industrial Development Corporations are set up. Several of the acquisitions for

industrial estates have been run through by these acts instead of the state-level LAA.

In addition, there are Urban Development Acts and/or Town and Country Development Acts under which city-level development authorities are set up for planned urban development. Functioning usually under the control of the state governments' town and country planning department, they too purchase land and fairly extensive tracts at that.

The justification for including land issues in these acts is that they have faster methods to acquire land and consequently give the states more leeway than the LAA. Towards this, what comes to the advantage of the states is that the LAA is a very basic type of legislation which just sews together the older regulations into a national act that has run for 119 years.

The new acts, thus, gave more powers to the state to decide on the use the

land being acquired into demarcated areas of operation. These are concepts like zones and ceilings.

Section 2.2.1—Urban Development Laws

Under the Urban Development Acts and/or Town and Country Development Acts, the tool of zoning was introduced by many state governments through the concept of Master Plans. At the central level, the most famous application of the concept is the Special Economic Zones. In urban projects, demarcating of areas as zones has become controversial. Zones allowed the government concerned to either charge higher prices when the plot is sold onward or for the developer to realise a higher value. For instance, a plot of land that is allowed to be used as a residential property attracts a higher value than a plot meant for industries. This has led to disaffection among land losers who feel they should benefit from the higher prices of lands falling within the zones of higher land prices. The rate paid by the government for the acquisition is similar.

Table 2.1: Zoning at Greater Noida

Development Plan (Phase 1) for Greater Noida Master Plan Year 2021		
Land use	Area (ha)	Area (%age)
Residential	5000	23.2
Industrial	4227.3	19.6
Commercial	1200	5.6
Institutional	3502.7	16.2
Green areas	5000	23.2
Transportation	2600	12.1
SEZ	40	0.2
Total	21570	100

Section 2.2.2—Land Use Laws

State governments have regulatory control over land use and changes to that land use, for example, from agriculture to non-agriculture. In some states, land use change is under the control of the revenue department for rural areas and under the control of the town and country planning department for urban areas. Irrespective of which department exercises this power, these restrictions do affect land prices.

The intended effect was to restrict the diversion of land from farming to non-farming, but in effect the restriction depresses the sale price of agricultural land for the farmers. This too can be possibly quantified and the impact on the depressed farmer to farmer sale measured. In any case wherever the restriction exists, it will be incorrect to label sales of agricultural farm land as free sales.

Section 2.2.3—Land Ceiling Laws

Nearly every state has land ceiling laws for rural areas. While the Urban Land Ceiling and Regulation Act (ULCRA) has now been repealed by most states, they still in several cases forbid leasing of agricultural land beyond the limits set by ceilings.

The Agricultural Land Ceiling Acts too had a lofty motive when they were passed. Post-independence India wanted to eliminate the menace of

Zamindari and other scourges that saw vast land holdings parceled out among the few. These acts blocked anyone from buying land beyond the ceiling limits and were also meant to make those who had excess surrender the same.

It will be a long story to recount what happened to the land reforms plan, but suffices to say now that while the demand for urbanisation, and to some extent industrial development has released a pent-up demand for land, this act blocks the ways to meet it. There is evidence that because of this act private companies in several cases have found it easier to obtain land through the LAA than through direct transactions with the farmer/landowners. This again results in undercutting the benefits for them. In urban areas, while ULCRA has vanished, a separate grouse has stemmed from building bye-laws and laws regulating population density in an area. For instance, the Development Authorities and Boards created under the State Town and Country Planning Departments and the Central Urban Development Ministry lay down the building bye-laws and thereby control population densities of urban areas.

Bye-laws increasing for FAR (floor area ratio) and allowing for greater density of population tend to enhance property values. While in settled urban geographies like Delhi or Kolkata, this

can only be of academic value from the viewpoint of original settlers, for the large swathe of new towns coming up, including those in the under construction Delhi-Mumbai Industrial Corridor, these are live issues.

Section 2.2.4—Laws of Land in Scheduled Area

The Indian Constitution under its Fifth Schedule has declared certain regions and in some cases the entire state, like Chhattisgarh, as a scheduled area. The constitution itself declares there will be restrictions on sale or purchase of land in these areas, and especially the land held by a resident scheduled tribe in the area, to someone else.
Since most of India's minerals are coterminous with these tribal belts, the government has moved in opposite directions. While the restrictions are in place, the efforts are also on to relax those. The Mines and Minerals (Development and Regulation) Act of 2013, for example, says "compensation shall be paid to every person or family holding occupation or rights of the land surface for which a license is granted. The holder of a mining lease will pay a specified amount of money each year to the District Mineral Foundation, which will be used for the benefit of persons or families affected by mining related operations. This amount is equivalent to 26% of profit in the case of coal and lignite, and is equivalent to the royalty paid during the financial year in case of major minerals."

Section 2.3—Key Provisions of Land-Related Acts Since 2000

Section 2.3.1—The Land Acquisition (Amendment) Bill, 2007

The Land Acquisition (Amendment) Bill, 2007, which is now an act, was a part of the legislative efforts by the dispensation to amend the LAA, 1894, governing the acquisition of privately owned land for public purposes. In the wake of rising protest and litigations by the number of groups and people over the issue of displacements and rights over the land, it was planned to completely amend the LAA. Towards this effort, the Land Acquisition (Amendment) Bill, 2007 and a separate bill titled Rehabilitation and Resettlement Bill, 2007 were presented in Lok Sabha in October 2008. The bills were passed by the Lok Sabha on 25th February, 2009. However, the bills lapsed due to the dissolution of the 14th Lok Sabha.

Among the key provisions of the bill, it redefined 'public purpose' as land acquired for defence purposes, infrastructure projects or for any project useful to the general public where 70% of the land has already been purchased. The bill barred acquisition for companies except under the 70% condition. It stated that for acquisition resulting in large-scale displacement, a social impact assessment study must be conducted. Tribals, forest dwellers and those with tenancy rights are also eligible for compensation. The bill provisioned that acquisition costs will include payment for loss or damages to land, and costs related to resettlement of displaced residents.

Section 2.3.2—Land Acquisition, Rehabilitation and Resettlement Bill 2011

The Land Acquisition, Rehabilitation and Resettlement Bill, 2011 was introduced on 7th September, 2011 in the Lok Sabha. It was referred to the Standing Committee on Rural Development. The committee made a number of recommendations and submitted its report in the Lok Sabha on 17th May, 2012.

The LARR Bill, 2011, was intended to make the land acquisition process a more "fair and transparent process". The process for land acquisition involves a Social Impact Assessment survey, preliminary notification stating the intent for acquisition, a declaration of acquisition, and compensation to be given by a certain time. All acquisitions require rehabilitation and resettlement to be provided to the people affected by the acquisition. As per the provisions of the bill, the compensation for the owners of the acquired land shall be four times the market value in case of rural areas and twice in case of urban areas. The bill states that in case of acquisition of land for use by private companies or public private partnerships, consent of 80% of the displaced people will be required. Purchase of large pieces of land by private companies will require provision of rehabilitation and resettlement. The Land Acquisition, Rehabilitation and Resettlement Bill was finally passed by Parliament as an Act on September 27, 2013.

Section 2.3.3—The Coal Mines (Conservation and Development) Amendment Bill, 2012

The Coal Mines (Conservation and Development) Amendment Bill, 2012 sought to amend the Coal Mines (Conservation and Development) Act, 1974. The act provides for the conservation of coal and development of mines. Besides this, the Act provides for imposition of excise duty and customs duty. According to the Statement of Objects and Reasons, the bill increases the maximum excise duty that can be levied on coal. A part of the excise duty funds the implementation of a master plan that is with regard to dealing with fires, subsidence and rehabilitation in the Jharia and Raniganj coalfields. The increase in the excise duty is in order to bridge the gap in funding the implementation of this master plan.

Section 2.3.4—The Petroleum and Minerals Pipelines (Acquisition of Rights of Users in Land Amendment) Bill, 2010

The Petroleum and Minerals Pipelines (Acquisition of Rights of Users in Land

Amendment) Bill, 2010 sought to amend the Petroleum and Minerals Pipelines (Acquisition of Rights of Users in Land) Act, 1962, which provides for the acquisition of right of users in land for laying pipelines for the transport of petroleum and minerals. There has been a large number of incidents of pilferage and sabotage of pipelines. To curb such incidents, the bill provides for more stringent punishment.

Section 2.3.5—Mines and Minerals (Development and Regulation) Bill, 2011

The Mines and Minerals (Development and Regulation) Bill, 2011, was introduced in the Lok Sabha on December 12th, 2011. It seeks to consolidate and amend the law relating to the scientific development and regulation of mines and minerals. Among the key provisions which concern land use is included one which requires that every mining lease will have a Mine Closure Plan prepared in terms of a Sustainable Development Framework that includes details of closure, rehabilitation and restoration activities. The holder of a mining lease shall pay either a yearly dead rent or a royalty in respect of every mineral removed or consumed by him, whichever is higher. Compensation shall be paid to every person or family holding occupation or rights of the land surface for which a license is granted.

Mining companies shall, according to the provision of the bill, allot at least one non-transferable share at par to each person of a family affected by mining-related operations. The holder of a mining lease shall also be liable to provide employment in addition to other compensation payable to affected persons or families.

03

Methodology

Methodology

An empirical study on land prices in India is fraught with two basic problems. The available literature and its supporting data are limited and the scope of study is difficult to estimate.

Land records in India have enjoyed a patchy history. The pre-independence period was the high noon for the records for fiscal reasons. The colonial government had to keep the records updated since as much as 53% of its total revenue came from taxation on land. Independent India began to move away from this tax rapidly and the need to maintain the records correspondingly fell away. In current times, the costs of collecting land revenue in most states exceed the costs of collection and hence a number of states have abolished taxes on land revenue. Hence, the records of land which were maintained and updated every year for revenue collection purposes, moved away to recording only change of ownership once a transaction takes place.

This issue has been discussed in the chapter on regulations. The result was not obvious till land showed up its 'true price' in this century. This made the land revenue department in state governments a vestigial one figuring only when its budget needed further pruning and was also used as a shifting ground for inconvenient officials. Such an environment suited the interests of land holders as any expansion of their land boundary was almost impossible to be cross-checked from existing records.

The scenario changed as land moved centre stage once economic growth assumed an upward trajectory. While this creates a reason to explore the data on land, the collection of data was difficult.

A study on land records has to answer some basic questions, a priori. These are:
- What sort of data is available with the state governments to study;
- Which of this data would be conceivably available dropping the proverbial red tape; and
- Which state government(s) would be willing to share their data as land issues have flared up repeatedly in each state.

This is important to note as the availability of data circumscribes the scope of the study.

For the present report, the field study was conducted in two states. We shall explain the choice of states in the following section. Preliminary research was carried out to identify the possible factors that have an impact on land prices. Following this, a quick discussion with the officials at the land revenue departments gave us an idea of the information which can be extracted from land record deeds. This gave us a fair idea of the information available through the primary data collection. It was now clear that the remaining factors which could not be extracted from the land record deeds had to be extracted from publicly available resources or databases. Thus, secondary data collection had to be carried out separately. Although this did not involve physical exertion, it proved to be another difficult exercise altogether as very limited data on these factors were available on the government portals.

The method applied in all the districts for obtaining the data was uniform. The group of enumerators visited the state capital to inform and conduct a dialogue with the top officials about the nature of the study. This also included a PowerPoint presentation of the scope of the study and included the help sought from them. In the next stage, the same process was repeated often several times with the district officials to sensitise them about the project and establish the line of responsibility.

As the data on sales have monetary significance and were potential revenue court records, the teams had to be very clear about the risks being undertaken and the authority being divested to them. Any wilful or accidental damage to any of the records would have a cascading impact. Keeping this in mind, the teams at every centre took time to learn from the staff about the state of preservation especially of the older records. They were in turn given the assurance that no confidential document was sought to be extracted or being made use of in transgression

of any academic study. All land records displayed in the study are consequently subject to this caveat.

Section 3.1—Land Data Sources

After deciding the parameters on which information was to be sought from the authorities and finalising the method of doing this, the next concern was the time period of access to the data. As we discussed earlier, the budget of each state land revenue department is dismal. Yet it has to also record each sale of land, which incidentally has multiplied in the past few years. This takes the primary time slot for the staff. Gaining access to them for perusing land records is difficult due to these circumstances. In one of the districts, the DM took the unusual but effective route of declaring a holiday in the department to cut out public interface for the day and hence create spare time for the staff to provide the files to us.

The final challenge was to wade through the dust and grime of each office usually located in the most dingy part of the collectorate to copy the data painstakingly. Pre 2004, no district has kept data on land records in computer format and hence for each year and month our enumerators had to physically sift through the data.

Section 3.1.1—Choice of States for Primary Data Collection

With these caveats, the team carried out their field work in four of the largest districts in two states in the country. The number of districts in India is 671. Obviously a universal study of them all or even a sample study would be a humungous one. The authors were clear right from the beginning that this was not being attempted. Instead, the aim was to gather together the results of sampling data on land sales from a choice of few districts over a long range of years to discover some trends. It was also expected that these trends can to some extent be an analytical tool to understand how land prices move in India. Hence the choice of the states had to be made carefully. Transactions in land have gathered pace in most states of India in the past decade, visibly and also from anecdotal evidence.

The transactions have led to the development of densely populated urban areas. In the middle are districts that are metamorphosing rapidly. These

again include regions where trade and commerce are pushing the transition and there are regions where it is the state playing an active role much as it is expected in countries like China and in multipurpose SEZs in India. It was, however, impossible to quiz the state governments all over India to discover a relative ranking table of them all and so make the choice accordingly.

It is here that the authors decided to utilise their experience to choose a sample set that will have elements of the entire spectrum. Among the North Indian states, Haryana has gone through the fastest urbanisation spell and so presented itself as an automatic choice. Punjab had traversed the same route but over a longer period. Himachal Pradesh and Rajasthan had lower population density than Haryana and so offered a less challenging terrain in terms of the factors sought to be discovered.

While Bihar did present some interesting possibilities, there was little to choose between its districts. Also, due to political disturbances, anecdotal evidence showed that large percentages of land sales were not true economic transactions. There was also a related problem as there were few districts in North India where state-led industrialisation had played a key part. Bihar did not offer any such. For several reasons, the authors did not consider Jharkhand in the sample set. The choice was then narrowed to Madhya Pradesh and Haryana. The

former also presented more than one district of heavy land acquisitions.

So Faridabad was chosen over Gurgaon as it had a longer period of land records. Ambala, far enough from Delhi and outside the NCR, presented itself as a district where urbanisation pressures are becoming strongly manifest.

In MP, while Singrauli was the clear choice, the authors debated over the choice of a base level district. Mandla was chosen as it is perhaps one of the few districts where no industrial project has come up in the past few decades. It has a tribal population but also has a non-tribal population and more importantly, lacks a well-developed rail connection which the authors were confident would shape up as an important parameter in the study and indeed it does as will be clear from the next chapter. The states and districts chosen for the purposes of the study are mentioned in table3.1.

A subsidiary issue that did influence the choice of states but certainly not that of the districts was that of language. The language used in every

state to record land data has often remained unchanged for close to a century. In the limited time available the authors had to make a choicetry ornate Tamil or battle with Urdu. It is a measure of the real difficulty in this aspect that even the local help provided by the district administration often proves unequal to the task. This immediately restricts the choice of states to those that at least have some Devanagari parentage.

Section 3.1.2—Secondary Data Sources

The secondary data includes data on distance of villages from the nearest railway station, roads, whether villages fall within the Municipal Corporation Area, etc., which were believed or were observed later to have a bearing on the prices. Most of this information was not available from the primary data collection exercise. To add further to our problem, this information could not be found on any government website such that it could be used in our study. Thus began another phase of data extraction from the web.

Some information on the geographical location and distances was painstakingly aggregated from Google maps or other tourist websites which

Table 3.1: States and Districts Chosen for the Purpose of Study

State	District	Land Area Characteristics with Respect to Population
Haryana	Faridabad	Highly urban
Haryana	Ambala	Intermediate
Madhya Pradesh	Singrauli	State-led industrialisation
Madhya Pradesh	Mandla	Base level

were found to be reliable sources. This was then merged with the dataset compiled after the primary data collection.

Section 3.2—Type of Land Data

Land revenue is a state subject and so too is maintenance of its records. As pointed out earlier with nil revenue, the departments fell in disrepair. For instance, in Madhya Pradesh, the government had been collecting meagre land revenue. This meant the department had to be kept functional to account for the funds that came in (just Rs.2.5 crore for the state in a year). In Haryana, where there was no such need, the caverns of the land record office are in a wretched state. In both states the governments have sort of used the year when they began computerising the records as the year of the great divide. The records are clean and efficient from there on.

Land sale deeds in Indian states have a set of uniform data columns. They contain the name of the seller and the buyer, the name of the village or town where the land is being sold, the size of the plot, the price at which it is sold, the circle rate (there are wide variations in its nomenclature), the stamp duty being paid and often the reasons for the sale. There are minor variations but the deeds do not offer any data on key variables like a) the quality of the soil b) whether it is irrigated, c) proximity to any major

economic centre like a warehouse or a railhead (for land in rural areas), d) the presence or absence of traditional landless labourers as sharecroppers and comparable economic data.

The Haryana government has developed two computerised systems of such matching data but only with effect from 2004. Typically too the two systems, Harris and Harland, are maintained by two departments and do not exchange information. In Madhya Pradesh, the state is still in the process of updating records to the computer platform. So to collate the data, one has to obtain the registers from the two departments and then collate them.

The common process in maintenance of sale of land record in each state is as follows.
For each subdivision of a district the sale deeds, power of attorneys and other transactions on land including mutation (change of names of ownership after a sale for which too there is a separate application process) are bunched into a set of hundred each. They get a running serial number for the year.

Madhya Pradesh and Uttar Pradesh also maintain a brief register for each bundle. Both the original papers of stamp duties and the register are tied up in red cloth packets and stored in cavernous record rooms. The language used in each record was unchanged Urdu written in Devanagari script. With the introduction of computers, the

language has now become Hindi.

The differences emerge in the accuracy of the data. For example, in one of the Haryana districts, the land records have literally gone to dust from before a certain period. So there is no way those sales can be verified unless there have been subsequent sales from which fresh records can be constructed. This does not seem to have happened in Madhya Pradesh where even maps from the pre-independence era are maintained.

Our enumerators thus had to conduct detailed interviews for each entry to bring completeness into these entries. As the number of missing entries as presented in the next chapter in

chapter 4 show, the exercise had to reject them since corresponding data on economic and geographical variables was not available for them, despite the efforts made.

The data collected from the two states also suffered from the following problems which made the analysis difficult. The data on the sale of the land often does not square up with the actual size of the land on the ground. This lacuna has a simple explanation. When the state gave up collection of land revenue, the Patwaris charged with the measurement of the land found no reason to measure the land parcels. The measures written in the records, therefore, have an error. But in the absence of counterfactual evidence,

it is difficult to put a measure to the error. Madhya Pradesh for instance has granular maps for each area but the process of updating them has fallen into disuse.

Often the sales recorded in rural areas (about 30% in Haryana) were priced at very low rates. This was especially so in the pre-2000 data sets. The price quoted was less than the circle rates/collector rates but the sales were allowed to go through. In a test check of some of these data it was found that these were sales within the family.

Rural sales do not often mention whether the transaction is for changing the use of land from agricultural to other use. It also suffers from collection error. The information provided by the sellers and buyers about the amount of land transacted are rarely if ever validated by the district officials.

Section 3.3—Complete Dataset

Merging the data collected from the four districts for a period of 30 years yielded close to 6,80,000 lines of entry. This is massive by any standards and far larger than any comparable study in this area. Still, this was a small sample of the total volume of data which is available for perusal.
As is obvious, the data collection exercise was strenuous, to put it mildly. There were several reasons for

this. The study had set out to investigate if the data on sales of land over a secularly long period would yield any reasonable hypothesis of how prices behave and whether factors like growing urbanisation affect the trends.

Consequently, the authors needed a size of data that would span about 30 years or more to arrive at a usable hypothesis.

- This implies sifting through the data to weed out dud sales, distress sales and simple errors of entry. Since there is no yardstick to determine the frequency with which they occur, one option was to use a random sampling. But given the way the data is stored it was difficult to put into practice. Second, there is no way to figure out the percentage of dud sales by, say, inspection of the records for any one year. The percentage could vary across years and districts in any fashion.

- Hence the team took the voluminous but safe route of manually recording relevant data for the entire year for each of the eight years, i.e., 1985, 1986, 1994, 1995, 2005, 2006, 2009 and 2010.

- There is a strange but unaccounted coincidence in the terminal years of each decade for India. Those have also been the years of economic distress. To avoid the

bunching of the data in those years, the authors decided to use the middle years instead.

- Taking the above factors into consideration, it was obvious that the data collection and the subsequent processing would take enormous time. It did.

- A common problem in both the states was the difficulty in getting the state government officials to provide access to the data and the time to sit with us to answer questions. State government officials, though willing to help, found it difficult to parse through the nature of the study and given their extremely tight schedule through the year, it was a difficult exercise for them to spare time.

No state government office in India offers a prepossessing experience and the condition of the record rooms in all these offices was uniformly dismal.

Section 3.4—Data Cleaning, Modelling and Implementation

Once we have the complete dataset for all the districts, the next big task is to clean the data and format it to a usable form to aid further statistical inspection. Broadly speaking, there are two types of errors that could creep in that one needs to be wary of. Firstly, as mentioned before, given the method

of data extraction from various sources, errors in data entry are inevitable. Thus, removing errors arising due to data entry becomes a major part of the formatting process. Secondly, preliminary inspection of data throws up observations which are unrealistic, termed as outliers. Although, these outliers may in fact be real observations, too many of these will impact the model and perhaps even provide skewed results in contradiction to the reality in general.

Given the sample size of the data we had to sift through, this process proved to be an arduous one. Having once removed these discrepancies, we

proceeded to actually defining the model and its parameters. At this stage, this dataset had to be converted into a common set of identifiable symbols to be configured for the subsequent analysis. This was necessary as the figures used in the sale deeds, again pre 2000s, were often idiomatic. Further, at this point in time it was realised that there could be certain additional factors at play for certain districts and hence, this too was taken into account.

This completes the data handling and formatting phase and sets the stage for giving a more solid structure to our model and its implementation. The

process of developing the model is explained in detail in the following chapter. Additionally, dealing with such large datasets obviously calls for the use of a statistical programming package. Among the many available statistical programming languages available in the market, the researchers decided to use R. Although R requires extra effort in terms of programming, its analysis and graphical representation ability is far superior to most other statistical software.

04

Land Pricing Model: Analysis of Data

Land Pricing Model: Analysis of Data

As discussed in the chapter on Methodology, getting access to land record data was an arduous task. Of the many problems, a significant one is the difficulty in accessing government records, quintessential to studying the trend in land sales. In this chapter, we will analyse the results that follow the analysis of data. Based on the analysis, the study finds that instead of random factors, changes in land prices in India take place in response to a clearly identifiable set of parameters. Identifying the parameters and the intensity with which they impact the price of land is, therefore, essential. It will also be shown that each of these parameters emerges from different sources and hence their behaviour too is different.

To get a sense of how the parameters change over a sufficiently long period of time, the authors conducted the study in widely varied geographical zones of India, examining data on land sales for 30 years. The strength of association of these parameters with the measured variable, the price of land, will help a buyer of land in understanding how the price scenario will play out in the future. The number of these parameters and the nature of their measurement have been discussed in Section 4.3.1.
The purpose of the study was to discover if land prices respond only to economic parameters or a larger set of parameters. Some authors have hypothesised that other than economic ones like most notably inflation, geographical parameters like location should also be brought into the analysis. Going further, some have also hypothesised there are other unquantifiable subjective parameters which can influence the pricing of land.

Leaving subjectivity aside at this stage, the location parameters could be of particular salience as both literature and government policies in India have rarely accepted the role of a larger body of parameters. One can extend the hypothesis to argue that not accepting these factors may possibly lie at the centre of much of the agitation on this issue. However, while non-economic parameters are interesting areas of exploration, the problem is how to measure them. There is also the associated problem of discovering if those parameters vary sufficiently enough, i.e., fast enough to impact land prices in the sample tested.

For much of this chapter, the report will explore how these relations play out. In the next chapter, these results will be posed against the parallel set of government estimates for acquisition under the Land Acquisition Act (LAA), 1894.

Finally, the chapter will also show how a little understood phenomenonthe asymmetry of information in the pricing of landplays out. It has always been postulated that this asymmetry leads to a loss of value for the sellers but the extent of it is difficult to measure in the absence of adequate data to measure it either way. As the results will show, the intensity of this asymmetry behaves in a very interesting pattern. In urban districts, the spread of this asymmetry has declined, which is on expected lines. This is manifest in the earlier observations with regard to the transaction prices in the districts of Haryana, which were generally greater than the circle rates, in contrast to the reverse trend in Madhya Pradesh. It has also responded to the pace at which the economy has globalised in addition to the larger number of such transactions making available a wider range of source of information; in all a more democratic process.

In this context, the roles played by an agency like the National Housing Bank to develop a city-wide reference level for land prices becomes even more important.

Section 4.1—Why do we Need a Pricing Model?

At present, the land prices in India vary from state to state, each having its own set of guidelines for fixing the "circle rate". The circle rate method was put in place to limit the number of black money transactions. These circle

rates are revised from time to time but there is no clear rationale behind how the rates are fixed.

The circle rates are intended to be treated as benchmark rate or the minimum rate at which the transaction is carried out. This condition is repeatedly violated as seen from our experience. As a result, not only has the move had no impact on the number of black money transactions, it has in fact left the entire system susceptible to manipulation at the hands of those who are aware of its shortcomings. For instance, an average person with no or minimal education and awareness is at a much higher risk of being offered an inadequate price. This was clearly visible from our preliminary observations during our data collection stage in a district in Madhya Pradesh. The land transactions among the scheduled tribe population in Madhya Pradesh were lower in value than the market values in general. Although there were cases where tribals, with some level of education or awareness of the market values, received compensation commensurate with the prevalent market rates, these were few in number.

There has been rampant violation of circle rates. It has been observed that the frequency of violations in the districts covered in Haryana was lower as compared to Madhya Pradesh which showed a much higher incidence. One of the reasons that explains this trend is the fact that in the wake of

industrialisation and development in the districts in Haryana, land owners are aware of the true price of their land and can negotiate for a better deal. Hence, the frequency with which the violations occur is low. Contrasting this trend is the district of Mandla in Madhya Pradesh, where it is found that the numbers of violation were far more with most transactions registered at a cost lower than the market value. This was particularly true for the land belonging to the scheduled tribes. According to one of the senior officials in the District Magistrate's Office in Mandla, land transactions pertaining to the scheduled tribes can be carried out only within the community. This presents two problems. First, the price that can be offered by a person from a scheduled tribe is very low owing to their overall weak economic condition. And secondly, this isolates people belonging to scheduled tribes from the thriving market. Although this may be a well-intentioned measure for protecting the community, it actually defeats their purpose for selling land while virtually creating a separate market for their dealings with abysmally low prices. These inferences are drawn purely from the primary data collected from the regions mentioned above.

This provides us with the necessary evidence to bolster our assertion that the circle rate method of fixing the price of land is very far from being seen as a reasonable pricing method. Despite heated debates and controversies regarding the

compensation offered to the land owners in recent times, so far there has been no study which looked into this aspect. Understandably, any study attempting this would require a reliable database on land sales information. The absence of data on land sales has been the biggest weakness in deciding the efficiency of land markets in India. This chapter attempts to bridge this gap and present a scientific method for pricing land.

Section 4.2—Modelling Approaches

Any mathematical or statistical framework trying to model real world phenomena should be structured in three stages. The first stage is formulation of the problem and translating it into a mathematical or statistical problem. Secondly, the information that feeds into the model must be well defined and devoid of errors. The third stage concerns preparing the output of the model; which must be free of any manipulation to support a particular notion or theory. The final stage would also include checking the validity of the results. Hence, the first stage of our research exercise revolves around defining the problem mathematically.

Pricing of any commodity follows a combination of qualitative factors affecting the price and a mathematical/statistical approach depending on the commodity. For instance, pricing of financial

instruments involve rigorous mathematical methods like solving stochastic differential equations to model the randomness in the stocks. Pricing of products and services is dependent on demand for the product and various other factors like the target audience of the product, etc. Hence, prices are very sensitive to changes in any of these factors.

Our problem is to develop a model which takes into account the factors influencing the land prices and gives us a reasonable estimate of future prices. To this end, a number of mathematical approaches have been considered.

The most widely used tool in this area is a multivariate regression model. This method has its obvious advantages. It's a fairly simple model in terms of its implementation in a statistical programming language. It aims to fit a linear equation to the observed data. Once the data on the response variable and predictor variables is at hand, the task reduces to a programming exercise. However, multivariate regression models, like any other model used in the social sciences, are subject to a caveat. This model ignores the randomness or "noise" in the data. Moreover, the model is sensitive to outliers in the data and assumptions of linearity may not reflect the actual scenario.

A game theoretic approach to model land prices is equivalent to a non-zero

sum game where the buyer of land wants to minimise the price of land and the seller wants to maximise the price he receives, and an equilibrium solution to this problem represents a fair price. However, this is a theoretical framework and the demand function has to be estimated followed by an optimisation exercise. This method can be extended from the previous model.

Other approaches considered and consequently dropped were applying Artificial Neural Network algorithms and a Stochastic Pricing Model. While land price modelling by applying artificial neural network algorithms has been suggested before, this approach has not yet picked up steam. The reason is apparent. Despite a superior capability of calibrating linear as well as non-linear models in capturing trends, it requires high-frequency data for optimal results. It suffices to point to our data availability travails as sufficient reason to drop the idea. The advantage of a stochastic pricing model is that it makes limited assumptions and models randomness or "noise" in data. Although this is a novel approach, it is immensely hard to implement given the fact that the present study is constrained by time and other resources.

Thus, we narrow down to the choice of modelling approach which is best suited to our requirements a multivariate regression model.

Section 4.3—Multivariate Regression Land Pricing Model

In our case, the response variable in the regression model will be the land transaction values. The predictor variables or factors which are expected to influence land prices in India have been identified after much deliberation. Some of these have been discussed briefly in the previous chapter and the preceding sections.

Although certain factors that affect land prices like consumer price index and size of land remain constant across all districts, some factors were also seen to be variable. Section 4.3.1 gives a full description of these variables and the logic behind certain assumptions.

4.3.1—Assumptions and Predictor Variables

The authors made the following assumptions in their pre-data collection meetings.

- The time line of 30 years was chosen as the period of study to iron out all impact of yearly variations which the sale of land in any area could be susceptible to. It was also necessary as there was an independent exercise being carried out to capture such short-term variations like land acquisition for large scale projects.

- The time line from the year 1980 to 2010 was also chosen to reflect

two eras. By the 1980s, states had abandoned the system of land revenue collection, even at the low rates being collected. So the sale of land from this period was expected to be free of any pressure, even if nominal, to meet the cost of paying land revenue.

- The choice of terminal date was selected to bring it as close as possible to the current period of study.

- It was found after discussions with the district administrations in the selected states of Haryana and Madhya Pradesh that the number of sale deeds per month (each sale of land is recorded as a sale deed) was close to 15,000, including both urban and rural areas. Since the deeds are all stored with the district administration, agnostic of geography, this created a challenge of trying to sort through them.

- Again, since inter-year variations in the sale of land were expected to be minimal in a set of five years (as also borne out by test check of the data collected), the authors decided to sample batches of two years from each decade. Accordingly, the years 1985 and 1986 were selected for inspection of the sale records and the same was repeated in the next two decades. However, for completeness, data was also collected for the years 2009 and

2010 to bring the records up to date, as explained above.

- Since state GDP of all states till the late 1990s has moved sluggishly, establishing a correlation with the sales did not look promising. Instead, the authors decided to use consumer price inflation data for industrial workers as it is available state-wise going back into the eighties too. Data on CPI for agricultural labourers is not available for that period although this may have been a better indicator. For purpose of comparison the inflation data was normalised.

Given below is a brief description of the predictor variables in their functional form used in the multivariate regression model:

- size_acre: is the area of land sold in acres. The dimension of agricultural land is given in kanal and marla, bigha and biswa, hectares, ares or decimal which has been converted into acres for the entire dataset. The same has been done for residential land, which is usually measured in square yards, square meters or square feet but has been converted to acres to preserve uniformity.

- cpi: is the consumer price index used to calculate the inflation-adjusted transaction values. The inflation-adjusted transaction values have been calculated with the Consumer Price Index for Industrial Workers with base 85 and 82.

- type: is the type of land being sold, i.e., agricultural or residential land.

- irrigation: is a dummy variable which indicates whether the piece of land is irrigated or not. It is expected to have a direct bearing on prices for agricultural land. What is interesting to note is the variability of this factor as a determinant over the three decades, as will be shown in section 4.3.2.

$$\text{irrigation}(x) = ; \begin{cases} 1, & \text{if village is irrigated} \\ 0, & \text{otherwise} \end{cases};$$

where x is the village in a particular tehsil.

- mc_village: is a dummy variable, essentially an indicator function, which indicates whether the transaction of the land carried out is within the Municipal Corporation area. This is one of the important factors which capture

the effect of the location, favourable or unfavourable, on the price of land. There is variability in the effect of this factor on land prices where it is seen to be a significant factor in some districts but not so in others.

$$mc\_village(x) = \begin{cases} 1, & \text{if village x is within the MC area} \\ 0, & \text{otherwise} \end{cases};$$

where x is the village in a particular tehsil.

- **rail_dist**: is the distance of the village, in which the plot of land is situated, from the nearest railway station. In case information on the exact distance of the plot from the railway head is not available, as is the case quite often, this variable acts as a proxy or an approximation of the distance of the piece of land from the nearest railway station. The coding for this variable is given below.

$$rail\_dist(x) = \begin{cases} 0, & \text{if distance of village x} \leq 5 \\ 1, & \text{if 5< distance of village x} \leq 11 \\ 2, & \text{if distance of village x} > 11 \end{cases}$$

where x is the village in a particular tehsil.

- **airport_dist**: is the distance of the village, where the piece of land is situated, from the nearest airport. Although this does not seem to have any direct bearing on the price of land, it is a factor which partly takes into account the state of infrastructure or development in the area. The functional form is as follows :

$$airport\_dist(x) = \begin{cases} 0, & \text{if distance of village x} \leq 30 \\ 1, & \text{if 30< distance of village x} \leq 40 \\ 2, & \text{if distance of village x} > 40 \end{cases}$$

where x is the village in a particular tehsil.

- **dist_district_city**: is the distance of the village in which the piece of land is situated from the main city in the district.

$$
\text{dist\_district\_city}(x) =
\begin{cases}
0\,, & \text{if distance of village } x \leq 10 \\
1\,, & \text{if } 10 < \text{distance of village } x \leq 20 \\
2\,, & \text{if distance of village } x > 20
\end{cases}
$$

where x is the village in a particular tehsil.

- **road_dist**: is the distance of the plot of land from the nearest main road. This data was almost impossible to find for most districts, even from secondary data sources. However, this was available in Mandla district in the pre-2000s period.

Good connectivity of an area by road, rail or air definitely affects the prices of land in the vicinity. The limits were set after inspection of the data and finally these bounds emerged as reasonable limits. The above four variables, road_dist, rail_dist, airport_dist and dist_district_city, capture the impact of connectivity on land price.

- **investment_adj**: is the investment made in lakhs of rupees in the district by micro, small and medium scale enterprises (MSMEs). This figure was then adjusted for inflation and used for each of the eight years selected in our study. However, this measure could not be found for the district Singrauli.

- **num_reg_units**: is the number of registered micro, small and medium scale enterprises in the district. This too is introduced to account for the impact of industrialisation.

The above two variables were brought into the picture to understand the impact of industrialisation on land prices.

- **number_crops**: is the number of crops cultivable on the plot of land under consideration. This information is rarely available. The land deed records in Mandla were the only ones across all the districts covered that included this data. This was expected to have a bearing on the price of agricultural land and hence was enumerated and used as a predictor variable only for Mandla District.

- **tribe**: is an indicator function which describes whether the seller of land belongs to the scheduled tribe. This information was available on the land deeds only in Mandla and was also introduced as a predictor variable for the district-wise regression of Mandla. As was mentioned in section 4.1, this was a visible factor.

4.3.2—Scope of Study and Results

The objective of the study was to build a model of land prices from the data obtained and then use the validated simulation techniques to project the same into the future. A data collection exercise of this scale will assuredly throw up far more results the more the data is trawled. But that is for the future.

For the purpose of the present exercise, the authors primarily investigated the following questions

A)   To what extent do land prices respond to the price environment in the economy? In this study this is measured through consumer price index for industrial workers.
B)   Which parameters or predictor variables do land prices respond to? These are size of the holdings, morphology of the land and so on. Other than inflation, the economic parameters examined were
    I) Size of the land being sold
    ii) Type of landagricultural or not, irrigated or not
    iii)   Rate of industrialisation of the district.
    iv)   The geographical parameters were i) location of the plot in a village or a municipal area; ii) distance from railhead; iii) distance from airport; and iv)distance from the leading town of the district.
C)   Does urbanisation impact the relative weightage of these factors

and if so to what degree?
D)   Can the trend in prices be also mapped on the data for land acquisition?
E)   And finally, is there any basis for the oft quoted information asymmetry between the buyers and sellers in land transactions?

Each of these questions will be referred to as Query A, Query B, etc., from here on. The following sections in this chapter will discuss certain analytical results followed by answers to the above mentioned queries, Query A to E, first at the aggregate level and then at the district level.

For what follows, do remember that the results are based on free sale of land. Sales that are based on compulsory acquisition follow a different logic. This means it has to be assumed that the trends ascertained here are reflective of what the sellers and buyers actually want.

The multivariate models in the results show land prices respond to factors like inflation, acreage and geographical factors including proximity to the city at an all-India level. The univariate models will be examined later. The hypothesis that was being tested was that land prices reflect the impact of several economic and geographical factors against the null hypothesis that the associations are not significant. Analysis of the data yields a linear regression model as given below in equation (1). A visual inspection of the scatter diagram of the time series of the land sale prices (see appendix) shows this as an accurate call.

4.3.2(a)—Regression Analysis Results on Complete Dataset

Applying the formula given in equation (1) on the entire sample set, the extent of explained deviation (statistically speaking) turns out to be high. The adjusted R squared regression run on the entire data set is 52.64%.

```
Log(transaction_value) ~ size_acre + cpi + type + mc_village + rail_dist +
airport_dist + dist_district_city                                    - (1)
```

The entire set of independent variables is significant as this shows:

```
F-statistic: 20.05 on 7 and 113 DF, p-value: < 2.2e-16
```

Is the deviation not overly impacted by prices as the LAA is predicated on since there are other significant variables? As will be shown later, this is a key result from this study.

Again, remember this data stretches back over 30 years where the Indian economy went through two economic eras. Also the data was generated for a range of districts that traverse the range from possibly the highest degree of urbanisation and industrialisation to almost untouched territory.

Returning to the expanded regression, the residuals show the range of oscillation does not reflect multi-collinearity either.

Min	IQ	Median	3Q	Max
–2.1897	–0.4160	0.0538	0.5440	2.1664

A small note here is relevant. As explained in the chapter on methodology, the data collection exercise was highly susceptible to introduction of errors. To ensure the authors were not imposing an unwarranted linearity over a long time series data, even after filtering out incomplete points, a log adjusted scale was used to control for variations. On the same aggregate regression, the hypothesis testing turns out as given in Table 4.3.1 in the appendix.

Findings of Regression Results

- *Except for proximity to airports, each of the other variables impact price of land*

- *The impact increases as one moves closer to the present era across every district, and*

- *The quality of the land sold is often less important than how close it is to towns; this will become apparent later in this section. An ANOVA test shows that for each independent variable like the distance to railhead and proximity to municipal towns and district towns, the price of land reacts and rapidly at that.*

Again, remember this is a result emerging out of study of very different types of districts. So, for example, had distance to municipal town been important for Faridabad and less for Singrauli, they would have cancelled out. The weightage of each district is the same in the above regressions.

While movement of price of land in Faridabad will be exactly as one would expect in a metro city, Mandla in Madhya Pradesh is one of the 50 most backward districts in India as per Crisil Financial Inclusion Index. Yet all of them show land prices respond in a typical way to a broad set of factors. This is important, as it also calls into question the assumption that there is a

subjective determinant of price which cannot be captured in land statistics. All the districts show owners are keenly aware of the marketability of their plots. Also as economic growth has proceeded, the awareness of such factors has deepened.

This is also to some extent bringing down the skew in information for the sellers against the buyers.

So going through our questions, the answers which emerge are:

A. Land prices respond to price movements in the economy as measured by the consumer price index. The results thus challenge the first level conventional estimate that land prices over a long term react to price conditions in the economy but slowly. The implications which follow are that sales of land in rural areas (as the chapter on methodology shows) are in most cases not sham and not a transfer of land only within the extended family. These are genuine sales and show that the district administration errs when it restricts sales data of outliers as those too demonstrate an economic logic. Also, over the period covered, the number of transactions on land has ballooned which again shows in association with the

tractability of prices realised that a vibrant market for land has begun to emerge in the economy.

B.   How does the size of the plots affect price? It does, but not as sharply as one would expect. There is no doubt that larger land holders can, and do, extract a better price for their holdings. The implication is that a uniform price for plots irrespective of the size of the holdings could generate suboptimal results when the government steps in to acquire land. Prices estimated for land, therefore, often underestimate these influencers. Yet the correct answers to these questions yield estimates to avoid the errors as in The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. The application of those errors can have a significant effect. For instance, the act makes these assumptions in creating a multiplier for compensating landowners. This multiplier is based on the circle rate estimated without any reference to the underlying factors. We will throw more light on this in the next chapter.

But these are tentative numbers and we would have to analyse this topic

more at the disaggregated level. To answer the remaining questions from c to e, it is necessary to examine the data at the district levels.

4.3.2(b)—Regression Analysis Results for District-Wise Comparison

Query A: It is assumed that inflation will impact the price of land. What stands out from this study is that its intensity has changed rapidly in different periods. In Singrauli, for the period prior to the 2000s, the coefficient of determination for CPI in the univariate analysis is just 0.03.

The number is quite similar to the position in Faridabad. In the 1980s in this district, the CPI as a variable gives an R^2 of 0.00016. The lower explanatory results for this district should not be put down to a smaller data base. Both years data (1985 & 1986) were culled from a sample of 30,000 sales records. This is not surprising when one takes a closer look. People were not selling land gratuitously but it was difficult to extract a good value for it and often the reasons for which they sold were not overtly price sensitive. Notice the use of past tense here since the picture changes rapidly later.

It also shows, in case of Faridabad, that size of land holdings rather than inflation explained prices better in that period. Since the

district would have more land aggregations than Singrauli, size of land sold would do better in this respect. Compared to inflation, size of the plots does better at 0.009. From then on, it has risen continuously and by post 2000s, the percentage is 40.

In the same period, inflation as an explained variable, rises to 0.063 in the data set for the post 2000s period. But this does not hold true across other districts. The numbers from Mandla are useful as a hold out set. Since the district is relatively untouched in the sample period, a univariate regression for the 30-year period shows R^2 for inflation explains the price variation by 35%. What happens to the impact of the size of the holdings? It declines.

The same is the case for Singrauli. Why? There are two reasons
1) In a LAA-dominated environment the location is more important than size per se.
2) The more backward the district, the location factors, even without government or private sector-led acquisitions, become significant.

Is the importance of size of land holdings as a determinant of price, shrinking in the period, a useful non-quantifiable variable? As long as the size of the holdings is important in determining the price, the larger guy in the village

dominates the market. It presumably gives more staying power to the holder to bargain for a better price and perpetuates land asymmetry.

But across the districts this tends to fall in the time series data spanning the 30-year period. In its place other parameters step in. This immediately questions the usual assumption that backward districts are not able to take advantage of price signals. They do, but are constrained by the lack of a land market about which we shall have more to say in later chapters.

Thus, focussing on inflation as the single most important determinant of price of land creates a wrong conclusion in all the four chosen districts.

Query B: The geographical parameters are the most novel aspect of this study.

The first impression one gathers about this subset is they matter equally in poor or in well-developed districts. None of the statistical tests used here disprove the hypothesis that they are significant explanatory variables. The difference is in their relative ranking.

A caveat is necessary here. In a highly diversified country, a list of relevant geographical factors would be very long. A seashore cannot obviously impact prices in Jaisalmer but prices at Sindhudurg would be impossible to

explain otherwise. Also since different zones have begun to get developed rapidly, the impact would be widely variable across districts.

Also, there are plenty of new geographical landmarks coming up all over but in the absence of data to measure their distance from the land sales in the area, this is a fraught exercise. In what follows, the impact of each variable will be low but each will nevertheless be significant.

To get a sense of how these variables move, the Mandla numbers are useful to get started as shown in Table 4.3.2.

Fertility of the soil (variables like irrigation and cropping) has no impact on the price of land even in this district. The same trend is also visible in other districts. As expected with a highly rural district, industrial factors do not impinge on land prices.

But what does? Are rail and road connectivity more important factors affecting prices?

As the significance test on univariate data for the district shows, it is clear that except for the geographical factors, the presence of other variables reduce the explanatory powers of the model. Rail connectivity for instance is 26.1% (adjusted R^2) in the model whereas the overall price sensitivity is 36.3%.

Let us now carry over the results to districts with more geographical features. For instance, in Singrauli, rail as a factor accounted for almost nil variation. In the current decade, just observe the power of the F statistic.

F-statistic: 2.86 on 1 and 335 DF, p-value: 0.09176

The same trend is visible for proximity to municipal areas. In all districts this was used as a proxy for good roads as that data was not always obtainable. In Singrauli, urbanisation was thin in the pre-2000s era. Yet the impact was clearly visible in each of this set of statistics.

As an explanatory variable it was significant and R^2 was 0.0003. Just observe also the low value of the residual error here. Post 2000s, the proximity to municipal towns was accounting for over 10% of the variations.

Look at the statistics on regressions for rail connectivity in each decade in Faridabad.

●   In the **1980s** the effect of this variable was not visible.

Multiple R^2 : 3.337e-06	Adjusted R^2 : -0.005615
F-statistic: 0.000594 on 1 and 178 DF	p-value: 0.9806

●   In the **1990s**, the difference is clearly visible

Multiple R^2 : 0.01241	Adjusted R^2 : 0.005869
F-statistic: 1.897 on 1 and 151 DF	p-value: 0.1704

●   In the post **2000s**, the significance has leapt

Multiple R^2 : 0.03808	Adjusted R^2 : 0.03646
F-statistic: 23.44 on 1 and 592 DF	p-value: 1.648e-06

The same patterns can be discerned across all sets, but the answer is clear. Geographical factors are getting to be a determinant of land prices in the Indian countryside. One can do the same analysis with the proximity to municipal towns and district towns; the results will only be strengthened.

Query C: The geographical variables are also the determinants of the location factors in setting the price of land. Authors like Sanjay Chakraborty have argued that price of land is often a sum of location and fertility. But as this analysis shows, even in predominantly backward districts fertility plays a very subsidiary role in explaining prices. Location does much better as gleaned from actual sales data.

When extended to highly urbanised centres like Faridabad, while the sizes of the holdings remain important, location factors climb up the significance scale. In this district, however, a subtle change occurs. The relevance of distance from the municipal town to the village as an explanatory variable improves from the 1980s to 1990s, from an R^2 of 0.0074 it improves to 0.032 but then declines to 0.026.

The reasons are obvious. In an urbanised setting almost every plot commands a premium as being within or outside the district—say Delhi prices. What sets them apart are more granular features, like a mall or a metro project that impact prices more than the nearness to a town.

What happens in the intermediate districts?

In Ambala district, the price of a plot (see table below) responds more significantly to its distance from a town and the results keep getting stronger in Singrauli, and are strongest in Mandla.

Let us introduce another factor that impinges on urbanisation. This is the level of industrialisation in the districts. To measure this, the authors have depended on the data from the all

India District Industries Centre under the Ministry of Small and Medium Enterprises.

For the base case scenario, the results from Mandla are as follows:

Multiple R^2 : 0.003867	Adjusted R^2 : 0.002851
F-statistic: 3.804 on 1 and 980 DF	p-value: 0.0514

Often, more than the index of industrialisation, what works for an individual is a visible demonstration of change. There are just a few small-scale factories working in this district and yet as a variable, the number of registered units working has a hugely significant presence.

Multiple R^2 : 0.3184	Adjusted R^2 : 0.3177
F-statistic: 457.7 on 1 and 980 DF	p-value < 2.2e-16

Singrauli is a highly industrialised district so the numbers are richer there but the full extent of this will be made available as the central government is updating the database. The study on urbanisation has also shown how limited is the value of fertility factors in determining land prices. To judge their impact on pricing, the authors used irrigation and, where available, data on cropping patterns in each district to evaluate their impact. In no district covered by the study do these play a sizable impact. Table 4.3.3 shows the two tailed t-hypothesis for Mandla for irrigation and number of crops. The impact is equally poor in Singrauli and the indifferent run extends to Faridabad too.

The reasons for the low ascribable role of irrigation and other indicators of land fertility are evident in the nature of sales, as shown in table 4.3.3 in the appendix. More than the earlier decades, frequency of land sales has gone up as land is being converted for non-agricultural purposes. Nowhere do the variables satisfy the hypothesis under the two tailed t-statistic.

This is a very important yardstick in the debate on fertility of soil and its role in the setting of price for agricultural land. Land losers, unlike what the debate would show, do not set much store by these factors when conducting their own sales of land that they hold. In semi-tribal Mandla, the farmers make the same assessment as their brethren do in Delhi's neighbour, Faridabad.

The data shows irrigation, for instance, is far less a predictor of land prices than its location. So extending the debate on flashpoints like Singur, it can be hypothesised that it was the location that had the potential to drive up the prices rather than the multi-cropping capacity of the land. The concluding chapter will have some more to say on this.

The decade-wise data for, say, Faridabad shows how this is happening. The explanatory power of irrigation is at its peak in the eighties, but after that it nosedives. There is of course more study needed on the pace of this decline, but for the purpose of this study the authors will focus on the geographical factors.

Section 4.4—Summary of Results

This chapter essentially answered the queries posed in section 4.3.2. The table given below summarises the main points which emerged out of our model:

To what extent do land prices respond to the price environment in the economy?

- Price movement in the economy affects land prices, as measured by the consumer price index for industrial workers.
- What is interesting to note is how the impact of inflation varies over the three decades and for different districts. As is explained in detail in section 4.3.2(b), inflation as a predictor has a much lower significance in the districts of Singrauli and Faridabad before the years 2000s. In fact, size of the land holdings had a higher significance in those decades. However, inflation as a determinant gains significance in the post-2000 years, for the developed districts of Faridabad and Singrauli but not for all the districts. In this period, impact of inflation on prices is lower in Mandla than others.

Which parameters or predictor variables do land prices respond to? These are size of the holdings, morphology of the land and so on.

- **Size of land holdings:** this factor obviously has an impact on the price of land but only up to a certain extent but not to a degree as was previously believed or expected.
- **Type of land:** as a factor influences price but only up to whether it is an agricultural land or residential. Irrigation is seen to be more important in the pre-2000 era but loses significance completely in the post-2000 timezone. Location of the plot within or outside the Municipal Corporation area is a very significant determinant for some districts. Fertility of soil as a factor turns out be unimportant.
- Geographical factors play a pivotal role. Distance from rail, road, main district city – all play important roles across the districts. The magnitude of its significance, however,varies across districts. The significance of rail connectivity in Faridabad, consistently improves for every decade.

Does urbanisation impact the relative weightage of these factors and if so to what degree?

- Apart from the impact of geographical factors on urbanisation, as discussed in the above point, the level of industrialisation was investigated. Investment and the number of registered small and medium scale enterprises do not impact the prices as much. For certain districts and time zones, they do but still not very significantly.

And finally, is there any basis for the oft quoted information asymmetry between the buyers and sellers in land transactions?

- Sellers are generally aware of the the true price of land as is evident from our analysis in section 4.3, which in investigated in much greater detail in chapter 5.

05

Extending Our Results into the Future

Extending Our Results into the Future

We are now in a position to discuss the question by how much do land acquisition prices trail a free land sale?

A study of the data set of over 6,80,000 data points in the last chapter shows the trends pricing of land has taken in the past 30 years across India. This could set the basis to evaluate how these prices could be a far better guide to price reforms of this resource. Tracking the data across the districts, we found that apart from inflation, a host of factors including industrialisation and urbanisation along with location, developmental or geographic factors impact the fair value of land. The impact of these factors has begun to expand over the decades in relation to valuation and some factors affect the results more than others, as we saw in the previous chapter. This causality has begun to happen across all the districts surveyed.

It is then an easy postulate that in theory land prices should reflect these variations or improvements in their vicinity at all times. It also brings up the issue of whether all sellers of land are aware of such factors and does information asymmetry have any impact on discovery of fair value. To the extent sellers are aware, the sales will be more transparent and satisfying for obviously the sellers but also for the buyers, especially the private sector

companies, as the costs of post transactions disputes get significantly reduced.

These companies can realistically expect that the correct price has been paid for a resource and plan ahead without the need to reopen the awards accordingly. The spectre of a Posco project mired in land acquisition issues for the past seven years can then be conceivably avoided, if not altogether eliminated. For the private sector, a resolution of this issue is therefore compelling since their investment plans hinge on the success or otherwise of land purchases.

But before that, let us investigate issues of information asymmetry and its effect on land prices. We will deal with a more proximate issue –

Do land acquisition prices by the government move in tandem with prices of free sale of land?

Before moving ahead, it will be illuminative to scrutinise table 5.1 alongside. This is an indicative sample set of data from Singrauli district where land was acquired by the district administration for a large power project in 2011. The land was acquired through the due process of the LAA.

The rate at which the government acquired the land was at one go in this area and so the rate is uniform. The

final award is often slightly different from the assessed value as there is an element of solatium and interest paid for the delay in the payment of the award.

Now compare those numbers with the mean value of sales of land transacted by people for the same geographical area in the same decade in table 5.2 (in the appendix). The general government formula for land acquisition is to pick up a sample of land sales in the same area for three/five years, eliminate the outliers and take the median as the representative price. For land parcels ranging from 0.01 acre to 0.05, based on the data collected by the team, it is obvious that the median is quite above the rate set by the LAA team. (Column 2 of Table 5.1 in the appendix)

The same exercise was repeated for a larger sample of free sales for land parcels up to 0.075 acre. Again, compare the median value of the sale for this lot with the award under LAA. The element of under valuation becomes more visible.

The differences are visible from the raw data itself. The bias towards under correction emerges as the data collection exercise in most land record offices was manual till recently and needed a painstaking exercise in gathering a large enough record from the sale deeds.

The general government formula for land acquisition is to pick up a sample of land sales in the same area for three/five years, eliminate the outliers and take the median as the representative price.

But let us move a step ahead and apply an inflation correction to the same sample. As table 5.3 (appendix) shows, the element of under correction in the government-led acquisition process becomes even more visible. The inflation adjuster is again the consumer price index for industrial labourers with base 1985. Although the consumer price index for agricultural labourers could possibly have been a better measure, it has not been used at present as these values may be undervalued. However, this could be considered for future research projects in this area.

One notices that the sale price of land does not gradually rise as the acerage increases. One can only speculate at this stage about the reasons for the dip. These could include sales under distress and related party sales too. What they do demonstrate, however, is the bias created by information asymmetry which we will address later.

As table 5.3 (appendix) shows, the divergence between sale price and the government-led acquisition price is already becoming steep. What follows next shows that this increases as

additional variables are introduced. Using the regression model from the previous chapter reveals an interesting trend.

Before applying it, some caveats are in order. The regression has to be tested across districts to ensure consistency. Also the geographical variables used are measured from charts in terms only of physical distances. Their economic impact would need to be modelled further. The regression also has to account for a more consistent measure for irrigation. And finally since in districts developing faster than Singrauli the economic measures will change more rapidly, like with industrialisation, there could be large elements of under correction. The regression equation for Singrauli District is given in Table 5.4 in the appendix for reference.

The report shows how bringing in just an inflation adjuster changes all transacted price in the district. If the regression model is used with the variables as noted above, the extent of the differences becomes even clearer, as in table 5.5. Admittedly this is a short table. But the trend in values is

unmistakable. For instance, the difference at the level of large valued land acquisition is immense. As pointed out earlier, the size of holdings does play a very significant role in land acquisition and under-pricing, as revealed here, can be a recipe for disturbances. Juxtaposing some of these trends with the pricing model of land could provide an indication of how the land acquisition process has led to suboptimal results for the economy.

Using the results thrown up from the earlier chapter here, we can then estimate the price points where parcels of land will be available in a wide range of geographies across India. This will call into play some of the models used in India but mostly those used abroad to do the sensitivity analysis. Counter-posing these trends in the pricing of land against the way government agencies plan to use the amended Land Acquisition Act can also be replicated by any industry that will need some land purchase when their projects demand it.

However, there is a limitation here as projects in the pipeline will not be revealed. Instead, it will check the

numbers against the proposed cost of several projects to do a cost-benefit analysis.

Alternative Methods for Valuations

- ### Mass Valuation
  This is the method most readily applied by real estate companies in India. Properties are valued in groups or what can be called components. The land parcels in each component are similar or broadly reflect changes in their value in a similar way. So representative properties in each component are individually valued at a specific time of the year or decade to determine how much their value has changed from the previous decade. The change can then be applied to all properties in the component to determine their new values, with sampling tests.

  This is the method we have applied to evaluate the sample for each decade and then the new values have been applied to the land parcels in the current decade to discover the new values.

- ### Comparable Sales
  This is a relatively easy method to apply. The comparison is based on an analysis of sales of comparable unimproved land parcels, but after accounting for any differences in size, location, and features. This is easy to apply in rural areas and gets progressively complicated as the stretch becomes urban. The advantage of this method is that it provides an important check for estimated values that are arrived at from other approaches.

  In our study, comparable sales has been difficult primarily because except for municipal areas it is extremely difficult to figure out what comparable sales would be.

Cost Analysis:
This method moves from the other end of valuation. It relies on estimating the price of land after deducting for depreciated cost of the improvements. The underlying principle is that structures can be worth no more than their cost of construction, and assigns all remaining value in the improved parcel to the land itself. However, as the construction becomes older, the reliability of the estimate is compromised. The offsetting plan would require estimating for the various forms of obsolescence by the examination of sales data for buildings. The depreciated cost of land can be arrived at after deducting for fertility variables. This can be done over a longer period.

Time Series Analysis:
By using discrete data for a particular period, the analysis can hope to extract a set of meaningful statistics on the valuation of land. A common method is to plot the data on a time line and check if the rise in valuation has been spread around a trend line. A further sophistication of the same will be to conduct a regression analysis of the same to develop a forecasting model for future values based on the previously observed values. This is a self-evident exercise.

Lucas County Approach:
This is a new approach that uses GIS tools to develop models to include the effect of location on land value. For this purpose the area under study is fitted to a three-dimensional surface that represents a percentage adjustment to land that can account for improvements based on locations too. The analysis can include geographical coordinates and distances from important features, including critical changes like value of recent sales, institutions, amenities, etc. The three dimensional analysis is particularly useful for urban parcels that can then be evaluated with others, such as land and building size, quality, condition and depreciation, to produce a total estimate.

The geographical factors enumerated earlier provide the starting point for this analysis. The authors have used the geographical distance of each landmark like a road or a rail link to measure their relative importance to land parcels. The value of each can also be deduced from an index number of productivity but that goes beyond the scope of this study.

The authors would like to call attention to this equation to derive a sense of the same. This is for Faridabad for the data for the 1980s, but the principle is the same. There are four such examples.

A) log(transaction_value) ~ rail_dist

Variables	Estimate	Std. Error	t value	Pr(>|t|)
Intercept	9.015917	0.087922	102.544	<2e-16
rail_dist	-0.002064	0.084691	-0.024	0.981
Residual standard error: 0.9536 on 178 degrees of freedom				
(44 observations deleted due to missingness)				
Adjusted R-squared: -0.005615				
F-statistic: 0.000594 on 1 and 178 DF				
p-value: 0.9806				

B) log(transaction_value) ~ airport_dist

Residuals:

Min	1Q	Median	3Q	Max
-1.9128	-0.7050	-0.3033	0.7463	1.9584

Variables	Estimate	Std. Error	t value	Pr(>|t|)
Intercept	8.82052	0.08955	98.503	< 2e-16
airport_dist	0.40166	0.11838	3.393	0.000852
Residual standard error: 0.9242 on 178 degrees of freedom				
(44 observations deleted due to missingness)				
Adjusted R-squared: 0.05548				
F-statistic: 11.51 on 1 and 178 DF				
p-value: 0.0008516				

C) log(transaction_value) ~ dist_district_city,

Variables	Estimate	Std. Error	t value	Pr(>|t|)
Intercept	8.99779	0.10807	83.261	<2e-16
dist_district_city	0.01818	0.08775	0.207	0.836

Residual standard error: 0.9535 on 178 degrees of freedom
(44 observations deleted due to missingness)

Adjusted R-squared: -0.005376
F-statistic: 0.04291 on 1 and 178 DF,
p-value: 0.8361

D) log(transaction_value) ~ rail_dist + airport_dist + dist_district_city,

Residuals:

Min	1Q	Median	3Q	Max
-1.9279	-0.5600	-0.1930	0.5862	1.9433

Variables	Estimate	Std. Error	t value	Pr(>|t|)
Intercept	8.4694	0.1596	53.060	< 2e-16
rail_dist	-0.2577	0.1482	-1.739	0.0838
airport_dist	0.6079	0.1395	4.358	2.22e-05
dist_district_city	0.4408	0.1696	2.599	0.010

Residual standard error: 0.9107 on 176 degrees of freedom
(44 observations deleted due to missingness)

Adjusted R-squared: 0.08283
F-statistic: 6.389 on 3 and 176 DF
p-value: 0.0003918

The residuals in the above cases show normality as the magnitude of the first and third quantiles and the min and max are same. Notice that here the regression is built entirely from geographical variables that flow entirely as distance parameters.

Valuation under Section 23 of the Land Acquisition Act:

Valuation or more correctly, compensation, is determined by taking the market value of the land at the date of the publication of notification for acquisition under section 4 of the act. Assessing then the damage sustained by any standing crops or trees on land and also measuring the damage (if any) and injury sustained in cleaving the land from other contiguous parcels of land owned by the same person at the time of the Collector's taking possession of the land. This includes issues like making the person change his residence or place of business. In all such cases, an interest is charged at the rate of 12% per annum on the sum.

All the methods enumerated above provide the means to assess the true value of land. As shown above, they can all be used to derive a better price of land than the one currently deployed. It does not matter if the price of land under one of these methods turns out to be less than, say, a land acquisition process. No matter how high there will be a question mark against the latter but not the former. This is the most significant fallout of the processes enumerated above.

Query D: A key question rarely answered in land economics is the extent of asymmetry in information between its buyers and sellers.

The graphs and the regression model for the district Faridabad is given in table 5.7 in the appendix. It is a simple regression based on aggregating the data on sale of land for the last 30 years from the district.

The plotting in the figures 2 and 3 given in the appendix for this period shows the best fit line is visibly linear. The transaction values in these figures clearly reveal how prices have risen in the 30-year span. There is, however, something more than the scatter. For each year one can speculate that the highs and lows of the prices demonstrate the difference between the information availability for principally the sellers.

Average Transaction Values Vs Size of land in Singrauli
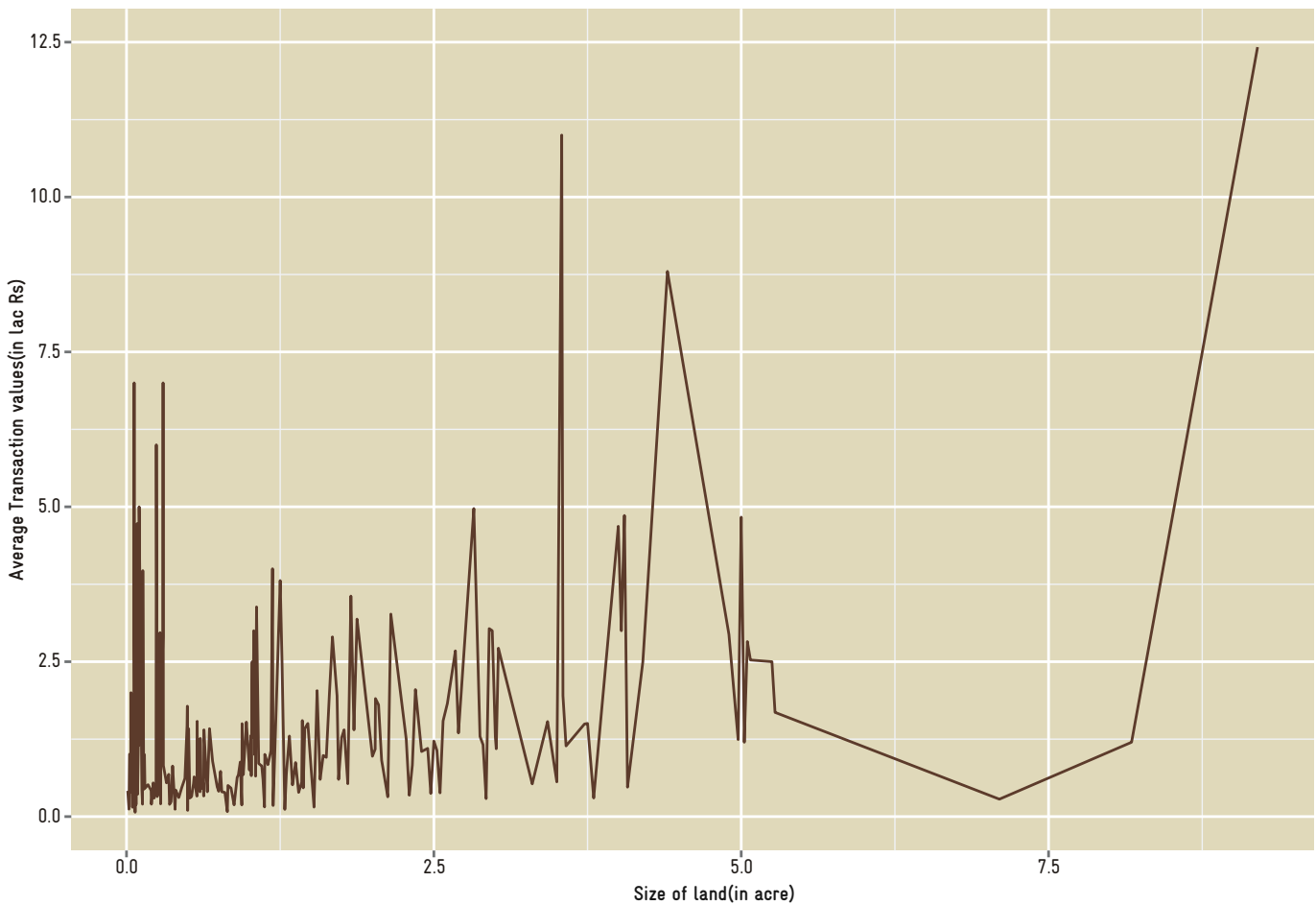
Observe a detailed sample of plotting of such transactions in just one area in Singrauli in the above figure, of the average transaction value for a size of land. There is simply no pattern evident in the diagram for a fit. It is only when the

data size expands that the law of large numbers comes into play. It also shows that for large plots the bargaining power is high enough for each landholder to approach each possible sale as a separate point.

Returning to the larger curve we observe that till the mid-nineties the heads and shoulders of the curve tended to become the new reference point for the years thereafter. In other words, the curve was correcting and so demonstrating an upward bias. However, since then, the graph has turned flat with no bias in any direction.

Further Inferences

- The heads and shoulders are not directional any more. In other words, the level of information percolating into the market has risen, so it is not possible for any agent to keep those as a tool of leverage. One should remember this is a Faridabad market where the options for the agents on two sides to correct for misinformation are very high.

- It is also visible that the peaks of the sales value in each year are turning out to be higher now than in the past. This is pushing the prices in the upward direction. However, this will need more work. As of now, the relatively flat trend in the price in the post 2000 years is because of the global downturn and what it did for the Indian land markets.

- Overall, the degree of asymmetry in the market is possibly declining. However, this will need more work to be validated.

06

Land Pricing Model: Limitations, Uses and Future Direction of Research

Land Pricing Model: Limitations, Uses and Future Direction of Research

The multivariate regression model developed in chapter 4 can have myriad uses, such as forecasting future trends in land prices or for ascertaining the relationships between variables to determine the important factors affecting prices. The benefits of having such a model in place notwithstanding, one needs to exercise caution while using these models. Any mathematical or statistical model is based on certain assumptions. Failure of meeting the assumptions may affect the results. Hence, it is important to address these concerns and understand the limitations of the model.

The pricing model developed in the previous chapters essentially explores the relationship between the response variables and the predictor variables. This chapter will discuss the uses and limitations of the model with the help of particular scenarios, possible solutions if any and possible extension of the model for general applicability and the possibility of using more sophisticated modelling approaches.

6.1—Limitations

The methodology has been discussed at length in the previous chapters, which clearly mentions the assumptions and the method of data collection. The reason for inclusion of predictor variables has also been discussed. The limitations of the present study arise out of the structure and availability of data and the consequent assumptions.

It can be broadly classified into the following three categories

Geographical area covered in the study

The geographical area covered for data collection in the present study is limited only to two states. However, a robust model applicable in general for all regions should cover a more diverse range of states.

Inclusion or exclusion of additional parameters in the model

A careful analysis, including literature review and a detailed data analysis, of the factors influencing land prices was carried out to identify the factors affecting land prices significantly. However, for certain districts, it may happen that some additional factors may have to be factored in. At the same time, some variables may need to be dropped in certain districts as they lose their significance. A detailed list of parameters and their inclusion/exclusion for the districts covered in the study is given. Further, a scenario analysis where the model may fail is also mentioned.

Assumptions of the model and data sources

A multivariate regression model assumes that the data is normally distributed, there exists a linear relationship between the response and predictor variables and is homoscedastic. Our model satisfies these assumptions reasonably well. However, there are inherent assumptions in the data that could not be controlled. For instance, the transaction values have been used from the land records which does not account for the black money transactions. These concerns too will be discussed in section 6.1.3.

6.1.1—Geographical Area Covered in the Study

The data has been extracted from only two districts for each of the two states, Madhya Pradesh and Haryana with a sample size of more than 6,50,000 land records. Hence, the number of data points extracted from each of the states is more than sufficient to obtain robust results from the regression model. The present model developed in chapter 4 can thus be used to price land in these districts and other similar districts. However, the present model cannot be used as the most general model applicable for all other districts and states in India. This is because other districts and regions may have additional factors which have an impact on land prices but have not been covered in the present study.

Consider, for instance, the district Mandla in Madhya Pradesh. During the data collection and preliminary analysis stage, and also through meetings with local district administration officials, it was clear that an additional variable had to be included in the model. The additional variable was a dummy variable indicating whether the land owner selling the plot is a tribal or not. This variable proved to have a significant impact on the prices as it was observed that tribals were offered a much lower price than the prevailing market rates. This variable did not need to be factored in for any other district covered in the study.

Also, certain districts may show a greater significance for certain parameters than others. For instance, in the highly urbanised district of Faridabad, geographical factors such as distance to road and railway station were less important than in less urbanised districts. The significance tests for geographical factors like distance from nearest railway station and road are much stronger in Mandla than in Faridabad.

The above examples show that there could be a number of other factors which may have not been considered without a preliminary examination of the data done for each of the districts. This poses a drawback for the current model. In future studies and for a broader applicability, the same model can be extended by covering a more diverse range of states and districts. This will also allow for factoring in

other variables which may affect land prices significantly elsewhere. The next section illustrates how the model can be extended.

6.1.2—Inclusion or Exclusion of Additional Parameters in the Model

The broad parameters identified as an important determinant of land prices have been discussed in detail in the previous chapters. However, limitations due to the kind of data or information available for these predictor variables have not yet been addressed. Some variables which have been included already may turn out to be statistically insignificant and hence may be dropped. Also, a need for including more variables may arise due to local conditions in certain districts. This too will be discussed. This section will also analyse some scenarios when the model may be unable to perform well.

The predictor variables are classified as following

- **Size of land being sold and the effect of inflation over time**
  - Size of land holding
  - Consumer Price Index for industrial workers for the 30-year period

The size of the land holding was obtained from the land deed itself and the CPI numbers were obtained from the Labour Bureau, Government of India. The statistical significance of size of land holding and effect of inflation is expected to remain constant over all districts and is seen to be so even in practice.

- **Type of land and Fertility**
  - Agricultural/Non-agricultural Land
    Although a more generalised variable which takes into account whether the land parcel is for commercial, mining or industrial purposes would have been more suitable for our needs, this data could not be found either from the land records or secondary data sources. Since the record

books only kept record of whether the parcel of land is agricultural or non-agricultural, this was the next best information that could be used for the model. It was available for the 30-year period and proved to be an important factor statistically over all the districts in the two states.

- Irrigated/Non-irrigated Land
  Information on irrigation was not available for all the districts and years. But this was used in the analysis whenever the data was available. Its significance was not consistent over all the districts. For the more urbanised district of Faridabad, this variable was statistically insignificant and could be dropped for this district. Whereas in Mandla, a less urbanised district in Madhya Pradesh, it proved to be a statistically significant factor influencing price.

- Number of Crops
  Information regarding the number of crops sown on agricultural land was hardly available. It was only available for transactions in Mandla and Singrauli districts in Madhya Pradesh and that too not for all the years. Moreover, the number of

transactions involving agricultural land were fewer and hence there is expected to be a bias in the statistical significance test for this variable. In any case, it doesn't emerge as an important factor for either district in the present analysis. However, an intensely agrarian zone or district may defy the above statement and this variable may have to be brought back into the picture for land pricing in such zones.

- **Rate of industrialisation in the area**
  The following indicators or proxies were used to measure the level of industrialisation in a district. The data is available for all the districts, except Singrauli, from the Ministry of Micro, Small and Medium Enterprises over the 30-year period.

  - Investment (in rupees) in the district.
  - Number of registered micro, small and medium enterprises (MSMEs) in the district.

While this variable is statistically significant in the more urbanised district of Faridabad exhibiting very high t-values, it is statistically insignificant in Mandla.

- **Geographical parameters**
  The data for these variables was collected through a combination of

secondary sources like Google maps, government databases or from the land records. However, these were discontinuous for almost all the districts and time periods. Also, the use of various data sources implied that these data points were susceptible to minor errors. The following indicators were used to account for the variation in land prices due to location of the land holding.

- Whether the land holding is within the Municipal Corporation area
- Distance of the land parcel from the nearest major road
- Distance of the land parcel from the nearest railway station
- Distance of the land parcel from the nearest major district city
- Distance of the land parcel from the nearest airport

A land holding near the railway station or near a major road was seen to fetch a much higher price than the same holding in an isolated region. In the previous chapters, all the geographical parameters have been shown to be statistically significant over the other predictor variables. However, their relative importance varies both over districts and time periods. Distance of the land parcel from the nearest airport was included for relatively urban areas, like Faridabad, where it was seen to be statistically significant

than in a less urbanised area such as Mandla. In Mandla, this variable was dropped as it turned out to be statistically insignificant. Distance of the land parcel from the nearest municipal corporation area was found to be an important determinant of prices across all districts as the development in and around municipal areas is better. Rail distance is seen to be more important than the distance from the airport. This is obviously because the railway is more important for trade in these districts.

An additional parameter describing whether the land being sold belonged

- Agricultural/Non-agricultural land

If additional information is available on whether the land is for commercial, industrial, mining, etc., purposes, then this too will have to be factored in.
- Whether the land holding is within the Municipal Corporation area
- Distance of the land parcel from the nearest major road
- Distance of the land parcel from the nearest railway station
- Distance of the land parcel from the nearest major district city

In addition, the inclusion of the other variables listed above will depend on

positive impact on land prices. Hence, a proxy dummy measure for capturing this needs to be factored into the model. Indicators which capture the local factors can be added as predictor variables for extending the model.

The scenarios given below highlight some general situations when the model may not be able to predict the prices fairly. In such situations, the user of the model will need to decide how to include or drop variables so as to make the model complete.

Scenario A:
Consider the following scenario.

to a tribal or non-tribal was also added to the analysis for the district Mandla. Similarly, other districts which have not been covered in this study may have other factors which impact on prices. Hence, the model is subject to further improvisations as per the need in different states.

For an extension of the present model, the factors that must be included are
- Size of land holding
- Consumer Price Index for industrial workers

the significance of these variables in particular districts. Further, in some areas, other possible factors which may be found to have a bearing on the price of land parcels may be environmental or ecological sensitivity of nearby areas, presence of natural resources in the vicinity, famous tourist locations nearby, etc. Although this list is not exhaustive, it gives an idea of the local factors that may be pertinent to land pricing in a particular district. Moreover, certain policy measures in some states have been seen to have a

Suppose we want to find a fair price for a land parcel in village X which is situated near a nuclear power plant, which adheres to all regulations and norms and has been operational for a few years without any glitches. The presence of a nuclear power plant in the village itself would have a very positive effect on the price of land. Our model would take this into account through the predictor variable in our regression equation which measures the investment climate or level of industrialisation in the region.

Now consider a situation where the nuclear plant suffers a failure. There is no doubt that such a situation is rather rare, but not impossible. The occurrence of such an event in village X would obviously impact the value of land and is in fact expected to negatively impact land prices in the region in a big way. The recent Fukushima Daiichi nuclear plant disaster is a grim reminder of such unfortunate events. The earthquake in that region culminated in a disaster which still has ramifications for the residents near the plant. The leaks in the plant have resulted in making the neighbourhood uninhabitable. Clearly, our present model does not take such rare events into account. However, there is always scope for including another variable in the equation having a weight zero in normal situations except when a natural or manmade calamity hits the region.

Scenario B:

Consider the sale of a landholding in the mountainous regions of Uttarakhand or Himachal Pradesh. The topography of this region necessitates a different approach to land pricing. This is because the use of landholdings has to be carefully monitored for long-term sustainable development as per the carrying capacity of the region. Excessive conversion of agricultural plots for industrial or commercial purposes is bound to threaten the ecological balance of the region. The present model thus will not be a good model for land pricing in the hilly

areas. Hence, factoring in the ecological sensitivity of the region into the model will be of utmost importance in this case.

Scenario C:

It is well known that on many occasions, political parties often get involved in large economic transactions. Consider a politically sensitive area inhabited by relatively uneducated poor farmers where many small landholdings are being acquired for industrial purposes. Any political party wanting to take advantage of the situation may instigate the landowners approached for such an acquisition and give them false hopes of a higher market price than the price offered by the company attempting to set up the industrial complex. This may result in the acquisition deal being stalled as neither party involved in the deal will agree to an equilibrium price due to false information believed to be true by one party. The present model does not in any way account for the behavioural aspects in such dealings nor does it include political aspects in pricing.

Despite the drawbacks, the existing model can be made more versatile by adding more significant variables and dropping the insignificant ones restricted to particular areas. However, adding or dropping variables from the model cannot be randomly done and has to follow a scientific method of checking for the statistical significance of these variables. In addition, practical users of the model will benefit by using

an intuitive approach and exercising discretion in selection of parameters.

6.1.3—Assumptions of the Model and Data Sources

The standard assumptions of a multivariate regression model are a linear relationship between the predictor and response variables, normality of the distributions and homoscedasticity. Suitable statistical tests and checks through graphical methods were done to ensure these assumptions were satisfied to the best of our ability. Further, it was observed that the data in its raw format did not satisfy all these conditions at the same time. In such cases, various permutations and combinations of the possible transformations of the response and predictor variables need to be done to ensure that the conditions are met. Hence, we had to take the logarithm of some variables used in the regression analysis, like transaction value, etc., to ensure that all the assumptions hold ground.

The model is based on the data collected from the land deeds or records. These records were based on the prevailing circle rates set by the district officials. It has been suggested by many academicians and others that the actual land transactions are not captured well enough through data gleaned from land deeds as the transactions take place at a much higher rate, i.e., the involvement of black money. While this assertion may be true for dealings in the urban areas

and cities, especially for metropolitan cities, it is not likely to be true in the rural areas.

Also, the more recent land records obtained from Faridabad, which were in the digitised format, recorded both the market price and the actual transaction values. This enabled us to see the variation, if any, in the prices due to black money transactions. However, we avoided using data points which seemed to involve black money and only used those in our analysis where the market price for the plot coincided with the actual transaction value.

6.2—Uses

Regression models are widely used for forecasting future trends and exploring relationships between explanatory and response variables. However, in the present study, the scope was limited to the latter, i.e., exploring the relationships between the predictor and response variables. Hence we have refrained from making any out-of-sample predictions. Chapter 5, however, uses fitted data to compare how the land acquisition figures of the government data differs from the figures predicted by our model.

The present model could find usefulness in a number of ways.

- **Predicting a fair price** for a plot of land given information about land characteristics, like type of land being sold and other information.

  Suppose a firm wants to acquire

land in Singrauli to set up a power plant by aggregating small land holdings in the region. Given the information about the type of land, its location within the village and the level of development in the region, the model can estimate a fair price for each parcel of land and the aggregated sum of these would be the price that the firm should pay.

- **Forecasting the future trends in prices in a particular region**
  For example, if one wants to estimate how the prices will move in the next five years in the district of Mandla, this too can be done using this model.

- **Exploring relationships** between the various factors affecting land prices and how they evolve over a time period.

  The model can help scientifically establish and pinpoint the factors which affect land prices in a particular area and how its importance changes over time.

6.3 Future Direction of Research

The present model can be extended into a more generalised form which could then be used as a standard model for land pricing in India. The present model has been derived from data extracted from only two states. Clearly, a sample of two states may not give an accurate model of pricing

for the country as a whole.

However, if data is collected from other states as well and the multivariate regression model is implemented after using the same approach to identify factors pertaining to individual states, then this model could be a fair way for land pricing in India. Such a model would provide a scientific and fair tool for pricing land in India and put an end to many existing controversies regarding land deals. This method would be acceptable not only to the industry but also to the farmers or landowners as the model takes into account all possible factors affecting prices and offers a fair price to both parties involved in the transaction.

In the wake of the current controversy regarding the unaffordability of acquiring land for industrial purposes given the high costs due to The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013, this model would be a scientifically accepted method of valuing land. It could prove to be an invaluable tool for superseding the present circle rate method of land pricing which merely computes a mean and completely ignores important parameters for pricing. An emerging economy like India needs to have a scientific framework for pricing not only to avoid land disputes, which are only growing in number of late, but also to attract foreign investments and ensure a pro-growth environment.

The importance of the geographical parameters forms one of the most interesting aspects of this study. A geographically weighted regression model thus is worth exploring in greater detail in the future with the use of GIS mapping. In fact, this method is in use in various developed countries. Further, some of the other modelling approaches, such as artificial neural networks have already been mentioned in chapter 4. Given the timeframe for the current study, these models could not be implemented. However, it will be an interesting exercise to employ some of these methods and compare the results with the multivariate regression model and then deploy the model for land pricing which gives superior estimates.

The following chapter discusses land issues in other emerging countries and how these countries sought to deal with land.

07

Land Issues in Emerging Countries: A Comparative Perspective

Land Issues in Emerging Countries: A Comparative Perspective

Emerging countries are faced with two pertinent challenges. One is their incessant struggle to attain industrial growth momentum and the second is that their social priorities often turn into political compulsions and come in the way of the former goal. In the pursuit of attaining high growth through rapid industrialisation, land forms a divisive line between the dual goals of industrialisation and social equity for all emerging countries. This has led to a structural debate as to what should be the model for industrial development in such countries, which would allow them to balance both these goals. In this chapter, we will delve into the issues facing emerging countries that share almost similar social and economic challenges as India.

Across the world, land has been a matter of debate, with experiences of land acquisition mired in complexities of a diverse nature. While India has experienced a chequered history when it comes to issues related to land acquisition as a result of the need for rapid industrial growth, densely populated nations have almost uniformly experienced some or all of the vicissitudes narrated in the previous chapters. At its heart, the problem is the same. Land is finite and extracting it from one pursuit, mostly agricultural or pastoral, to put it to industrial use is a fraught exercise. For most emerging countries, land is an emotive issue, making it difficult to convince the original holders to sign away their ownership.

Yet, as a World Bank report on large-scale land acquisition points out about the strains of land acquisition, land will be needed for deploying into needs other than subsistence farming. "A combination of higher and more volatile global commodity prices, demand for bio-fuels, population growth and urbanisation, as well as globalisation and overall economic development are likely to imply that such investments will be of great importance in the future", the report states.

"In many contexts, large-scale acquisitions of land highlights renewed interest in plantation-based agriculture that is fuelled by scepticism regarding the effectiveness of market mechanisms to guarantee access to basic food supplies and the belief that large scale production can help modernize the agricultural sector", the World Bank report has stated.

While the report points to several dimensions of land acquisition by the state, the key issue we survey here is the rising demand for land fuelled by economic growth. A real rate of growth of 5%-plus per annum pursued over a sufficiently long time (at least over a decade) in an economy feeds into a sufficiently high per capita income, which in turn reduces poverty and creates the appropriate ground conditions for migration from rural areas to urban ones. This leads to the question of how best a balance in objectives can be reached.

But even as the end results are positive for the people, there are pains in the intervening period. Sacrifice of land is one of these and it is not clear if those who lose the land are co-terminus with the gainers of economic development in the first round, when the friction is at its most severe. This is where it is felt the regulatory scenario must stand strong through clear and strong land rights which would enable existing owners to directly negotiate with investors, obtain higher payments for land transfers and make sure investments benefit the public and the local economy, the World Bank study suggests.

We will now assess land scenarios across emerging countries that have demographic features similar to India, assessing challenges and analysing steps to address those challenges.

Africa

The land question facing Africa has its origins in geo-political, economic, social and demographic factors further compounded by emerging global and strategic imperatives.

Sub-Saharan Africa is home to nearly

"A combination of higher and more volatile global commodity prices, demand for bio-fuels, population growth and urbanisation, as well as globalisation and overall economic development are likely to imply that such investments will be of great importance in the future"

half of the world's usable, uncultivated land but so far the continent has not been able to develop these unused tracts, estimated at more than 202 million hectares, which if done could bring down poverty and boost growth, jobs and economic prosperity. Africa has the highest poverty rate in the world with 47.5% of the population living below USD 1.25 a day.

According to a World Bank report, "Securing Africa's Land for Shared Prosperity", released in July 2013, African countries and their communities could effectively end 'land grabs', grow significantly more food across the region and transform their development prospects if they can modernise the complex governance procedures that control land ownership and management over the next decade.

Surging food commodity prices and foreign direct investment have increased the potential return on investment in effective land administration through higher agricultural yields and better market access and prices. Most African countries already have the basic land

laws in place that recognise customary land rights and gender equality which are essential to reinforce needed reforms. With only 10% of Africa's rural land registered, inefficient land administration means that it takes twice as long and costs twice as much to transfer land compared to industrialised countries, and weak governance is the leading cause for corruption in the land sector.

In October 2012, some of the aid agencies suggested a moratorium on funnelling of aid to African countries, particularly the sub-Saharan region, as they raised concerns that the money could be used for buying of land or land grabbing. These agencies noted that the investments for development of agriculture were leading to buy out of land that could be regressive. For instance, one of these reports claimed that a tripling of investment in agriculture by donor agencies from $2.5 billion in 2002 to nearly $8 billion by 2012 "could trigger conflict with small scale food producers".

But the evidence is unclear. A World Bank assessment of the region noted

that while there could be concerns, it pointed out that a) the world needs investment in agriculture "which is two to four times more effective in raising incomes for the poor than growth in other sectors" and b) to move from subsistence to commercial farming; 1.5 billion people of the region (World Bank estimates) will need access to credit, knowledge, assets and risk management that can only come from large scale agricultural enterprise.

It is expected that the demand for Africa's agricultural land will remain high, as structural factors, such as population growth that led to rising food prices, remain unchanged. Domestic investments and FDI in agriculture, as is the case in other productive sectors, could offer opportunities to link excess capital to production resources with potential positive impacts such as increasing productivity, total output and income through interventions that facilitate access to productivity enhancing inputs, value adding agro-processing and market access. With regard to the achievement of poverty-related goals in Africa, these gains will depend on how

well Africa can address challenges related to securing land rights especially for rural communities, to prevent landlessness, which is often a cause of extreme poverty for rural Africans.

A Food and Agriculture Organisation (FAO) report notes "Given Africa's resource endowments, natural resources are at the heart of FDI flows to the continent. Increases in investment flows are directly linked to global demand for energy and commodities such as oil, gold, copper, aluminium and nickel. Growing interest in Africa's petroleum and minerals, exemplified by recent (in 2007) large-scale projects like the Chad-Cameroon Oil Development and Pipeline Project, is linked to fluctuations in global commodity prices and Western efforts to diversify supplies. The perceived availability of land in Africa has attracted the attention of governments eager to ensure security of food and fuel supplies and of investors eager to tap into global demand for food and fuel".

Yet as the evidence from the previous chapters shows, the process can be made more responsive to those who surrender land if the pricing positions can be made transparent, which would mean making it rule-based.

China

China has engineered the most extensive scale of land switch in the world in the past few decades. Unlike the cafeteria approach espoused by India, this process has been fully coercive. This has automatically restricted the role of markets in the acquisitions.

There is little, if any, evidence that the provincial or central governments undertook any measures to provide compensation at any scale that can be called remunerative to the people who were asked to move out of the land they were tilling. China's compensation

principles have unique characteristics. For example, property title exchange is a barter based compensation method that fits the ideology of a socialist country. However, other types of compensation under the current laws fall short of just terms compensation. They are designed for the convenience of the acquiring authorities rather than for adequately reimbursing dispossessed people.

The biggest problems with the current compensation principles include the non-existence of a just terms compensation principle in compensation laws, limited consequential financial loss payments, no concept of interest in land, no right to claim compensation, lack of a market value definition, non-uniform compensation standards and a lack of transparency.

Efficient use of land has emerged as a key focus area for China. There is a growing recognition within the policy circles in China that the country's new urbanisation drive should shift away from the previous reckless expansion of urban area towards efficient use of available land. China's previous urban development model was characterised by extremely inefficient land use and cheap supply of industrial land at the expense of residential land. Officials and scholars have criticised China's cheap supply of industrial land driven by the desire of local governments to attract investment.

East and South-East Asia

Study of land acquisition is a new subject. Even Asia, which one would suspect would have the most skin in the game, has not studied the subject in detail till recently. All states have used the concept of eminent domain to get land to build on. But compensation based plans to provide succour to those forced to move out have been rare.

For instance, the World Bank has begun a "Management of Land Acquisition, Resettlement and Rehabilitation (MLARR) Program in South Asia" in April 2013. These national centres are at Bangladesh, Pakistan, India and Nepal.

There are two reasons for a one-dimensional approach to land theory. First, the government in most nations has taken over land with the private sector preferring to buy the land from the state than from others. Second, since the governments have been cash strapped, they have baulked at the prospect of having to pay economic prices. Also, the underlying economic logic was one of transferring the terms of trade in favour of industry. Providing for economic pricing ran counter to this thesis. As a UN ESCAP report points out, every day in Asia, the urban population increases by about 1,40,000 people and the pace is increasing. Yet the pace of study on land alienation is still desultory.

Available literature on land surveyed by the authors accordingly does not show research on the lines conducted for this study. The same ESCAP study says about Asia "Cities have so far absorbed their growing numbers in settlements with a varying quality of living mostly located in the urban fringe. However, the shortcomings of present land management systems have gradually become obvious as the urban growth has resulted in negative impacts such as sprawling squatter settlements and traffic chaos. Although appropriate land for housing exists, sometimes in relatively central locations, it is not accessible to vast sections of society because of factors such as land speculation and lack of public investment in infrastructure and transport facilities".

The report analyses four cities in **Indonesia, Bangladesh, Malaysia** and **Sri Lanka** to bring out this aspect.

It says "Land could be expropriated in Bandung for the "well-being of the nation". Compensation for building and land was based on the market value and disputes were settled in court.

Dhaka could request the government to expropriate land should it be required for its land development programme. The land would be acquired by the Deputy Commissioner in the district. The compensation had four different components: First, the market value of the land including an additional 50%;

second, the market value for structures and buildings; third, loss of business income; and, fourth, cost of rehabilitation (investments in renovations). In the case of land expropriation in Dhaka, the land value was calculated by collecting the sale proceeds of land with similar characteristics in the vicinity during the twelve months preceding the date when the acquisition notice was publicised. The sale proceeds were collected from the local Sub-Registry Office which is responsible for the registration of land transfers.

Land could be expropriated in Hué if it was necessary for the "benefit of the country". Land expropriation and compensation had to abide by strict national regulations. There was a process whereby the Municipal Land Management Office and a contractor prepared the background material. However, the final decision on expropriation would be taken by authorities outside the municipality. Compensation was provided before the land was used for a project. Provided that the claimant had a Land Ownership Certificate, the compensation

for expropriated land would be based on two components. Compensation was provided for the market value of buildings and trees on the plot, while on the other hand, compensation for the value of the land depended on the size and location of the plot.

In Kandy, land was expropriated mainly for slum upgrading projects, provision of playgrounds and other recreational facilities and the provision of staff housing.

Makati was able to expropriate land for specific public purposes such as projects for the benefit of the landless poor. Expropriation was used only when all other methods had failed and there have only been a few cases. The municipality had to fulfil two conditions in order to take immediate possession of the land. Initially, the municipality had to provide a valid offer on the land. Thereafter, the municipality had to deposit 15% of the current land value in the tax declaration at the court. The tax declarations are managed by the Municipal Assessor. The amount which would eventually be paid was determined by the court and reflected the "fair market value" at the time of taking possession of the property.

In Penang, there were several so-called enabling acts which allowed the municipality access to land. For instance, it could request the State of Pulau Pinang to compulsorily acquire land which was necessary to "widen and improve public roads". In none of these projects was the private sector given a free hand. Moreover, the states decided the price they would pay for the land.

Conclusions

One of the most important issues in emerging markets is the timing and intensity of land development decisions and how these decisions affect property values. In these markets, newly developed office space and residential units often account for a substantial proportion of the aggregate supply of similar types of developed properties.

It has been argued that rapid land development in Asia and especially in China is to accommodate domestic economic growth and increases in international trade. The steep declines in rents and property values have surprised many developers and investors. Existing land development models, focused on the U.S. and other developed markets, cannot fully explain this negative impact on property values as the Asian markets exhibit two distinct characteristics. First, in developed markets, urban development typically takes place slowly. In Asia, high growth expectations have led to massive land development occurring within a short period of time and within a relatively small geographic region. Second, in developed countries, the land development market is more competitive with a large number of developers competing for land. In Asia, land development decisions are often made by a few developers or by a central planner. These two characteristics of Asian markets make it important to study the land development problem in Asia and other emerging markets using an equilibrium setting which takes into account the adverse impact of increased supply on rents and property values.

Acquisition of land is thus emerging as a hot issue even in sparsely populated regions. Unlike India or China, the choice is not between how to share land between agriculture and industry; instead the choice in these regions is between subsistence and large scale farming.

A series of guidelines framed by the donor countries, the United Nations and other multilateral institutions show land acquisition issues can emerge even in the absence of industrial development in a fairly big way. These include 'Voluntary Guidelines on the Responsible Tenure of Land, Fisheries and Forests' adopted under the auspices of the Food and Agricultural Organisation (FAO). Others are the World Bank's 'Draft Principles for Responsible Agricultural Investment that Respects Rights, Livelihoods and Resources'. A UN Committee on Global Food Security is also moving to develop a set of 'Principles for Responsible Agricultural Investment', which will come up for approval by October 2014.

The choices are again becoming stark. When population pressures increase, countries have to make the choice between raising productivity of sectors and shifting among sectors to provide the larger population the means to improve their life chances. This will inevitably mean shepherding the population into activities that are more productive and which will mean concomitant alienation from the land.

In densely populated areas, getting enough land to start factories (or to build the necessary infrastructure to support them) is a problem that affects

most emerging countries. It has become a major bone of contention between farmers and those who want more land for commercial and industrial development and mining projects (or the state that tries to acquire the land on behalf of the latter). In high-growth densely populated countries like China and India, this has quickly become a politically explosive issue, sometimes leading to political unrest and violence.

It has been argued that rapid land development in Asia and especially in China was aimed at accommodating domestic economic growth and increases in international trade. In Asia, land development decisions are often made by a few developers or by a central planner. These two characteristics of Asian markets make it important to study the land development problem in Asia and other emerging markets.

It would, therefore, appear that all developing countries have some laws and procedures for the public acquisition of privately owned land. But few have genuinely comprehensive laws and procedures and still fewer have institutions and trained personnel to administer the laws they possess. Those countries that have been comparatively successful in land acquisition generally have a broad variety of compulsory and non-compulsory powers at their disposal.

As a practical measure, a realistic capability to acquire land compulsorily is necessary to induce the owner of the land to negotiate in good faith. That would entail steps from having a political will, a system of participatory growth and proper valuation mechanisms to derive at a correct land price. When political will to acquire land by compulsion is lacking or if public sentiment is against public land acquisition, there tend to be outdated, ineffective acquisition laws.

08

Conclusions

Conclusions

The present law on land acquisition is an amalgam of various other predecessor plans and also a reaction of the backlash created by these plans. But it swung to one end of the pendulum and the provisions now make buying of land for projects extremely cumbersome. As industrial lobbies and others protested, several changes were proposed repeatedly but the results are still unsatisfactory to the industry. The current project emerged in this context.

The study works on the premise that:

a) A market for land can be created based on sound economic logic and valuation techniques. This is necessary and essential if India has to move on a path of manufacturing-led growth.

b) An informed land market in India can be created if its benefit accrues to all categories of land losers. It is important to remember that a person does not sell a plot of land only once in a lifetime but may wish to enter into more such transactions. However, this does not happen due to the current travails of such a deal, especially the deep fear of capital loss. As a result, large tracts of land lie disused despite their apparently high value.

c) Buyers, for instance flock to a limited pool of land in the absence of a transparent market and thereby ramp up prices creating distortions. The buyers (this includes a large range from home buyers to those who plan to set up mega industrial projects) can otherwise plan for an efficient use of the plot they wish to buy.

The research demonstrates the ways to create an effective market for land in India through the following process by means of this report. The project was conceived as a study of land records data spread over 30 years in four districts of India. The rationale for the choice of the states and the districts is explained in detail in chapter 3, and it runs the entire gamut from the ones with the most advanced economic parameters to the most backward.

The key variables impacting prices are classified into four groups. These are:

- inflation and size of holdings,
- level of industrialisation of the district
- fertility factors including irrigation, crop cycles
- distance(geographical) indicators including proximity to highway, railway lines, distance from towns, etc.

The impact of the variables or factors considered in this study varied over the decades and across districts. Some of the findings that emerge are

Impact of size of land holdings and Inflation on land prices

- The study shows that land sales in any region are mostly guided by economic and market considerations agnostic of the decade considered. There is a close correlation of land prices with variables including inflation and size of the land being sold\purchased.

Impact of fertility on land price

- Significance of fertility factors varied across districts but what was clear is its lower ranking in the relative importance of all the factors under consideration. For instance, irrigation was found to be statistically significant in Faridabad which is known to be a well irrigated district. However, the same variable was insignificant in the other districts. Explanatory power of the fertility variables was at its peak in the eighties but has been on the decline since then.

Impact of Geographical factors on land prices

- The geographical factors were seen to play a very important role and gained importance with every decade. For instance a railway link was conspicuous by its absence in the calculations a farmer would make when deciding to sell land in the 1980s. But post 2000s this is a very important variable impacting the pricing of land.
- The geographical factors were seen to affect land prices irrespective of the state of development of the districts. Where there is a difference is in the relative impact of the individual geographical factors. Proximity to the airport as a factor was much less important than proximity to a railway station, a major road or highway and the distance from the nearest district city to which land prices were seen to react sharply.
- The location of the land parcel within a municipal corporation area and the distance from the railway station turns out to be a significant factor across all districts. Distance from the nearest city in the district emerges as the next important factor.

Location vs fertility as a determinant of price and the impact on food security

- The other major change is that location factors have superseded fertility factors in deciding prices. The decline in fertility as an important factor in deciding prices implies that acquisition for industrial purposes may acquire agricultural land, no matter how fertile it is, for a lower price. This would not only lead to loss of agricultural land but provide less incentive for people to buy agricultural land for farming and poses a threat to food security in the country. Hence, this necessitates a balanced policy which neither compromises on food security nor does it make acquisition of land a harrowing experience for the industry.

Impact of Industrialisation on land prices

- Not surprisingly in a district like Mandla even now, industrial activity has less of a demonstration effect than say Ambala. In the developed district of Faridabad, investment and the number of registered Medium, Small and Micro enterprises has a sizeable effect on land prices. The impact of the proxies for industrialisation in a district for land price determination is a clear enough reason to include the same in any plan for pricing in the land markets of India.

Land Acquisition

- The study also discovered that land acquisition by government agencies is thus undervalued. The only factor that has been considered in the impact attributing to a general price rise or inflation is very limiting and that too often arbitrarily. Hence the extent of correction in our sample is less than 25 %. Worse, as the pace of industrialisation is accelerating, this could lead to potentially more political and economic disturbance.

Information Asymmetry

- One of the reasons for sellers to under quote the price of land is the extent of information asymmetry between them and the buyers. This in turn is a factor of the lack of development in the land markets. However, this asymmetry is declining over the past decade. While the structural factors are the domain of a separate study the ingredients of a pan-national pricing regime can be constructed from analysis conducted in this study.

Cost Benefit Analysis

- A proper cost benefit analysis of land prices, it goes without saying, is something that private or public sector companies are unable to carry out at present. They may even lack the tools to do so. The valuation principles which have been enumerated in chapter 5 are the basis on which the same can be constructed. The net result will allow the economy to make the most appropriate use of a scarce resource that in turn will maximise welfare.

In the course of the debate over the latest land acquisition act, The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013, opinion hardened to two opposites. This was about the definition of public purpose and the right of the individuals to challenge it. The state, some felt should have the right to define public purpose with enough latitude to acquire land for a range of activities. While this is debatable enough, at the other extreme is who and to what extent do individuals or groups have the right to challenge the notion of public purpose for a project.

Bhattacharya and Palit have noted in their paper[17] that since 1962, all amendments (actual and proposed) to the LAA including the latest Act, have tried to 'accommodate' acquisition for industry with various qualifications of 'public purpose' projects. "Indeed, even the NAC's (National Advisory Committee, 2007) recommendations, supposedly inspired by the rights-based approach, have sanctioned the state acquiring for private enterprises provided such acquisition enjoys majority support of the community".

The Act follows the NAC in principle and justifies government takeover of land for PPP and other privately owned and operated projects subject to the community's support. This has been done by raising the benchmark for acquisition through the consent of 80% of the people who would be affected by such acquisition from the NAC's suggested floor of 70% for the same purpose.

But in this respect, both the Act and the NAC mark a significant departure from the LAA (Amendment) Bill of 2009. The latter proposed acquisition for industry only after 70% of the desired land was already obtained. The state was not expected to play a role in the initial transaction and was visualised intermediating at a much more advanced stage upon a request to do so. This also meant that the LAA and its provisions would apply to only a minor part of the overall transaction.

The Act, arguably inspired by the NAC, mandates a much larger intermediation by the Government for PPP and other private projects producing public goods, by suggesting acquisition of the entire

project land subject to written consent of at least four-fifths of the original owners.

Unlike the amendment proposed in 2009, the current provisions would bring a huge swathe of land transactions under the purview of the new Act, irrespective of whether the appropriate government acquires the whole project land or a part of it, following a request from industry to do so after it has already purchased the bulk. The main implication of the greater coverage of the new law is in terms of the R&R provisions that apply to land acquired by both the government as well as by industry.

Even now that the bill has been passed in Parliament and is an act, these are not settled issues. Meanwhile there is no doubt that land is required by industries to expand and urbanisation to proceed, even where it is happening in situ. While these debates flourish, is it possible in this context to build upon the existing market for land in India and improve upon it?

This project has dwelt on this model.

17   Bhattacharya, S. and Palit, A. (2012). Journal of Emerging Knowledge on Emerging Markets, Vol. 4, No. 7.
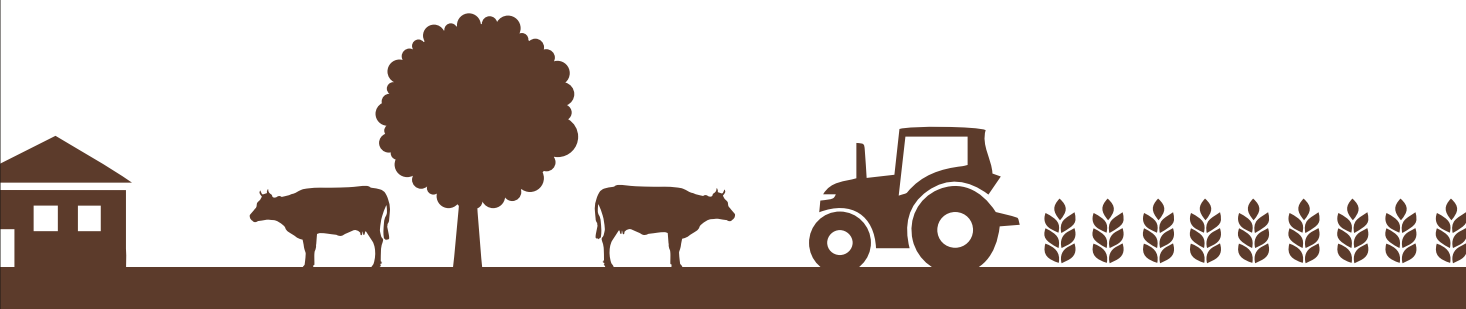
As chapter 5 demonstrates, there is a clear possibility that sale of land by anyone, if it is built upon a range of quantifiable parameters, can be efficient compared to state-level acquisitions. This is quite against the grain of established literature on the subject.

How is this possible? The model in this project is entirely empirical. It shows that between the developed urban markets like, say, Faridabad and farms in tribal districts, there is large range of intermediate land. In all these areas (if the lessons from this model are extended) price signals are more robust than they are allowed for. Land holders in so-called backward districts process complex sets of information to assess the value of their land. They assess geographical factors, a more nuanced economic logic that includes the pace of industrialisation of the district, and so on.

But the model does more. It not only examines a cross section of data from across districts, it also looks at the time series. So yesterday's Faridabad is today's Mandla. The trend in price discovery now in the latter mimics the pattern that was visible about 30 years ago in the former. As the information age expands, this difference will likely be eliminated sooner rather than later.

In the midst of these developments, one notices that it is the government that introduces distortions by insisting on a thin inflation based assessment of land valuation which then becomes the ceiling for transactions between private individuals too.

The authors have shown, especially through incorporating geographical parameters and proxy variables, that the price discovery done as per the project can be a holistic model rather than the narrow sliding calculator of inflation to value land prices.

There are admittedly lacunas in this approach. The chief among them is that future developments around a land parcel cannot often be quantified even when using models like the Lucas county models chiefly because the spatial maps of land are still in their infancy in India.

In their absence, one can only use much generalised approximations. Yet as repeatedly shown in chapter 4, this immediately improves the quality of the predicted variables compared to the approximants built on just CPI and acreage.

The state in which India finds itself now in 2013 is likely to be repeated in several countries when population pressure catches up. Globally, public purpose, as in India, is often ambiguously described. There are some countries where it is relatively clearly stated as in the Expropriations Law of Mexico, or the Land Administration Law of China (Parker and Vanka, 2008).

Since public purpose enables exercise of eminent domain, greater ambiguity facilitates more exhaustive use of the same, and works to the advantage of the state. The Indian state has been using public purpose for expropriating land for decades as was noted in chapter 2 on regulations. It was also noted there that the concept of public purpose and the absence of land titling has created a volatile cocktail that has been drawn upon by civil society. For the civil society, the instances of more and more land acquired in public interest being used for private interest is a symptom of the state being co-opted by business interests.

From the point of view of industry, the debate in India is becoming costly. Already there is enough opposition to extractive industries on environmental grounds and that of social equity. The effect of these has potentially raised the costs for the manufacturing sector considerably.

Would the present model raise costs further? As the penultimate chapter demonstrates, it will. But then so would the Act. The costs would be higher there too. The real estate industry has calculated the additional costs at 150% more than current prices while

estimates by Sanjoy Chakravorty of Temple University, USA, show "the purchase price alone will provide an income that is about 8–12 times larger than the current income from the land" (The Price of Land, S. Chakravorty, pg. 179).

The research suggests an approach which is neither government mandated nor tantamount to an auction but based on an informed understanding of the price dynamics for land. Moreover, it is not static. The LARR formula increases mechanically to the cost of land, whereas the model addressed here will

respond to the economic situation. So if the growth environment turns aggressive, the model will incorporate that bullish trend and will scale down costs when the environment turns bearish.

The important part will be to set up the coefficients smartly in this case, but one can be fairly sure that an approach that accounts for real price movement over a long period will feel acceptable in future too. This is of course an assertion that has to be validated by future developments in the field.

Appendix

Chapter-4

Table 4.3.1: Aggregate Regression Model

Coefficients:	Estimate	Std. Error	t value	Pr(>|t|)
Intercept	8.6802545	1.1118659	7.807	3.24e-12
size_acre	0.2769210	0.0391824	7.067	1.38e-10
cpi	0.0060324	0.0008125	7.424	2.29e-11
type (Residential)	−0.8540814	0.2550343	−3.349	0.0011
mc_village	0.3201264	0.1890473	1.693	0.0931
rail_dist	−0.0288193	0.0336434	−0.857	0.3935
airport_dist	0.0081174	0.0311329	0.261	0.7948
dist_district_city	0.0258480	0.0306722	0.843	0.4012

Table 4.3.2: Regression Model for Mandla district

Coefficients:	Estimate	Std. Error	t value	Pr(>|t|)
Intercept	9.765e+00	6.568e+00	1.487	0.151
size_acre	3.820e-01	2.493e-01	1.532	0.140
cpi	3.219e-03	3.371e-03	0.955	0.350
type	−8.475e-01	9.698e-01	−0.874	0.392
Irrigation	−1.303e+00	2.288e+00	−0.570	0.575
log(investment_adj)	8.276e-03	5.223e-01	0.016	0.988
num_reg_units	−1.198e-05	8.368e-03	−0.001	0.999
mc_village	1.060e+00	7.886e-01	1.344	0.193
road_dist	−1.344e-01	2.045e-01	−0.657	0.518
rail_dist	−4.306e-02	3.134e-02	−1.374	0.183
number_crop	2.509e-02	5.956e-01	0.042	0.967
tribe	−8.219e-01	1.443e+00	−0.570	0.575

Residual standard error: 1.318 on 22 degrees of freedom

Adjusted R^2 : 0.3626

F-statistic: 2.707 on 11 and 22 DF

p-value: 0.02251

Table 4.3.3: Testing for Significance of Fertility in the Three Cases Below

Variables	Model 1: Mandla		Model 2 : Singrauli		Model 3 : Faridabad	
	t-value (coefficient)	Pr(>|t|)	t-value (coefficient)	Pr(>|t|)	t-value (coefficient)	Pr(>|t|)
irrigation	−0.570 (−1.303e+00)	0.575	0.750 (0.1754170)	0.454508	0.012 (0.0013722)	0.9904
type	–	–	−0.227 (−0.0940327)	0.820485	6.739 (0.6029778)	2.82e−11
number_crop	0.042 (2.509e−02)	0.967	0.356 (0.0788725)	0.722442	–	–

Chapter5

Table 5.1: Land Cost in Singrauli District (from LAA)

S. No	Size of land (in acre)	Land cost from power project land acquisition (in Rs., for year 2011)
1	0.05	9,383
2	0.75	1,63,888.53
3	3.00	8,34,565

Note: The quality of land in the area is almost uniform and irrigation rather a rarity in the district

Table 5.2: Average Transaction Prices Based on Free Sales Corresponding to Different Land Sizes

S. No	Size in acre	Average Transaction Value (in Rupees)
1	0.01	41500
2	0.02	12000
3	0.025	100775
4	0.0275	100000
5	0.03	51900
6	0.035	45350
7	0.03648	200000
8	0.03912	40000
9	0.03936	128000
10	0.04	100000
11	0.0425	140000
12	0.04848	15000
13	0.0492	65000
14	0.05	197187.5
15	0.055	190000
16	0.0575	195500
17	0.06	69900
18	0.0624	700000

...continued

S. No	Size in acre	Average Transaction Value (in Rupees)
19	0.06336	330000
20	0.0675	93333.33
21	0.07	7000
22	0.0725	181250
23	0.075	55000

Table 5.3: Average Inflation Adjusted Transaction Prices Based on Free Sales Corresponding To Different Land Sizes

S. No	Size in acre	Average Transaction Value (in Rupees)
1	0.01	81053.57
2	0.02	128031.91
3	0.03	149962.00
4	0.04	233681.82
5	0.05	191461.54
6	0.06	208125.00
7	0.07	389428.57
8	0.08	635442.31
9	0.09	384542.86
10	0.1	37594.00
11	0.11	335645.83
12	0.12	83000.00
13	0.13	128406.25
14	0.14	283071.43
15	0.15	320928.57
16	0.16	545000.00
17	0.17	228303.57
18	0.18	80000.00
19	0.19	478500.00
20	0.2	101250.00
21	0.21	143562.50
22	0.22	46375.00
23	0.23	130912.86
24	0.24	138775.00
25	0.25	227460.00
26	0.26	215854.17
27	0.27	159597.22
28	0.28	237703.12
29	0.29	247000.00

...continued

S. No	Size in acre	Average Transaction Value (in Rupees)
30	0.3	395186.07
31	0.31	287571.43
32	0.32	55625.00
33	0.33	109500.00
34	0.34	349291.67
35	0.35	547805.56
36	0.36	210166.67
37	0.37	288750.00
38	0.38	380173.08
39	0.39	281900.00
40	0.4	215312.50

Table 5.4: Regression Model for Singrauli

Response Variable : log(transaction_value)	
Predictor Variables	Regression Coefficients
Intercept	9.8370429
size_acre	0.6781374
cpi	0.0011146
type	– 0.1708221
mc_village	0.9763247
irrigation	0.2075460
number_crops	0.0056224
rail_dist	0.0013606
airport_dist	0.0008309
dist_district_city	– 0.0001593

Regression Model for Singrauli

Log(transaction_value) = 9.8370429 + 0.6781374*size_acre + 0.0011146*cpi – 0.1708221*type
+ 0.9763247*mc_village + 0.2075460*irrigation +0.0056224*number_crops
+ 0.0013606*rail_dist + 0.0008309*airport_dist – 0.0001593*dist_district_city

where,
cpi with base 85 for 2005 = 536
type of land = non-agricultural land
mc_village = village under consideration, Muher, is within the MC area
irrigation = non-irrigated land
rail_dist = 12 km
airport_dist = 174 km
distance from district city = 17 km

Table 5.5: Comparative Prices Between Land Acquisition and Free Sales Transaction in the Singrauli District

S. No	Size of land (in acre)	Transaction Value From Our Data(Inflation Adjusted) (In Rs)	Land Cost From Govt Land Acquisitions (In Rs)	Calculated Transaction Value From The Model (In Rs)
1	0.05	20,659.45	9,383	1,09,414
2	0.75	68,436.760	1,63,888.53	1,75,886
3	4.00	2,43,478.261	8,02,933	15,93,652

Table 5.6: Regression Result for the Decade 1990-2000

Variables	Estimate	Std. Error	t value	Pr(>|t|)
Intercept	10.3417	1.1655	8.873	3.3e-16
type	0.3118	0.2123	1.469	0.1434
mc_village	–0.3347	0.1737	–1.927	0.0554
Irrigation	0.1595	1.1867	0.134	0.8932

Residuals

Min	1Q	Median	3Q	Max
–2.98900	–0.86080	0.07856	0.88975	2.73930

Table 5.7: Regression Result for the District of Faridabad

Variables	Estimate	Std. Error	t value	Pr(>|t|)
Intercept	9.513e+00	2.027e-01	46.919	< 2e-16
size_acre	-3.880e-04	4.853e-04	-0.799	0.4242
cpi	6.752e-03	2.013e-04	33.542	< 2e-16
type	5.986e-01	8.952e-02	6.687	3.95e-11
log(investment_adj)	-3.158e-10	2.308e-10	-1.368	0.1716
mc_village	-1.606e-01	1.052e-01	-1.526	0.1272
rail_dist	1.653e-01	7.890e-02	2.095	0.0365
irrigation	4.163e-04	1.138e-01	0.004	0.9971
airport_dist	2.836e-02	7.401e-02	0.383	0.7017
num_reg_units	-1.443e-03	1.673e-04	-8.623	< 2e-16
dist_district_city	-1.056e-01	7.804e-02	-1.354	0.1762

Residual standard error: 1.053 on 916 degrees of freedom

Adjusted R-squared: 0.7522
F-statistic: 282.1 on 10 and 916 DF
p-value: < 2.2e-16

Figures

Figure 1: Nominal And Inflation Adjusted Transaction Values Over Time For The District Of Faridabad

Trend of Nominal Transaction Values over time

Trend of Inflation Adjusted Transaction Values over time
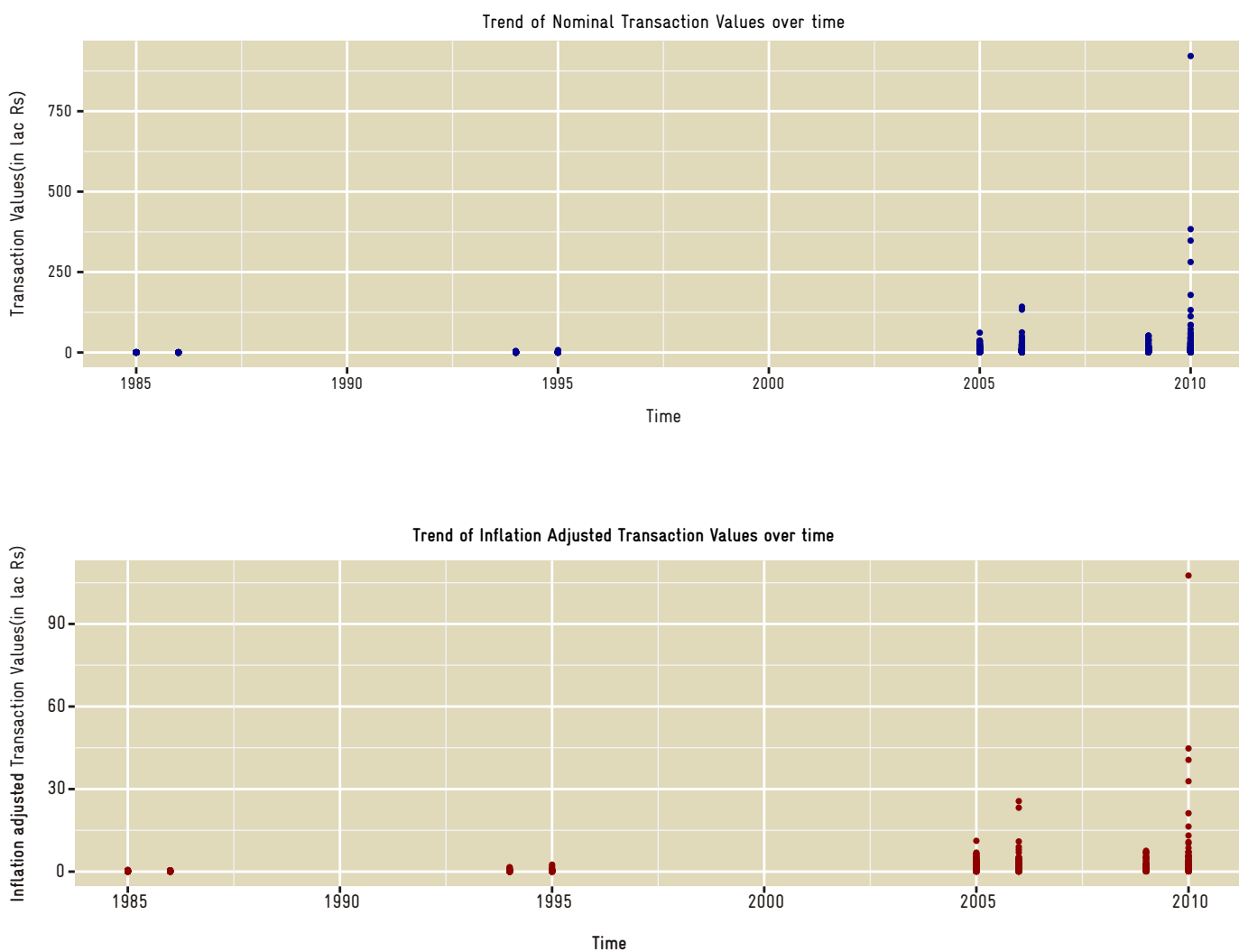
Figure 2: Log of Nominal and Inflation Adjusted Transaction Values for the particular years in our dataset for the district of Faridabad
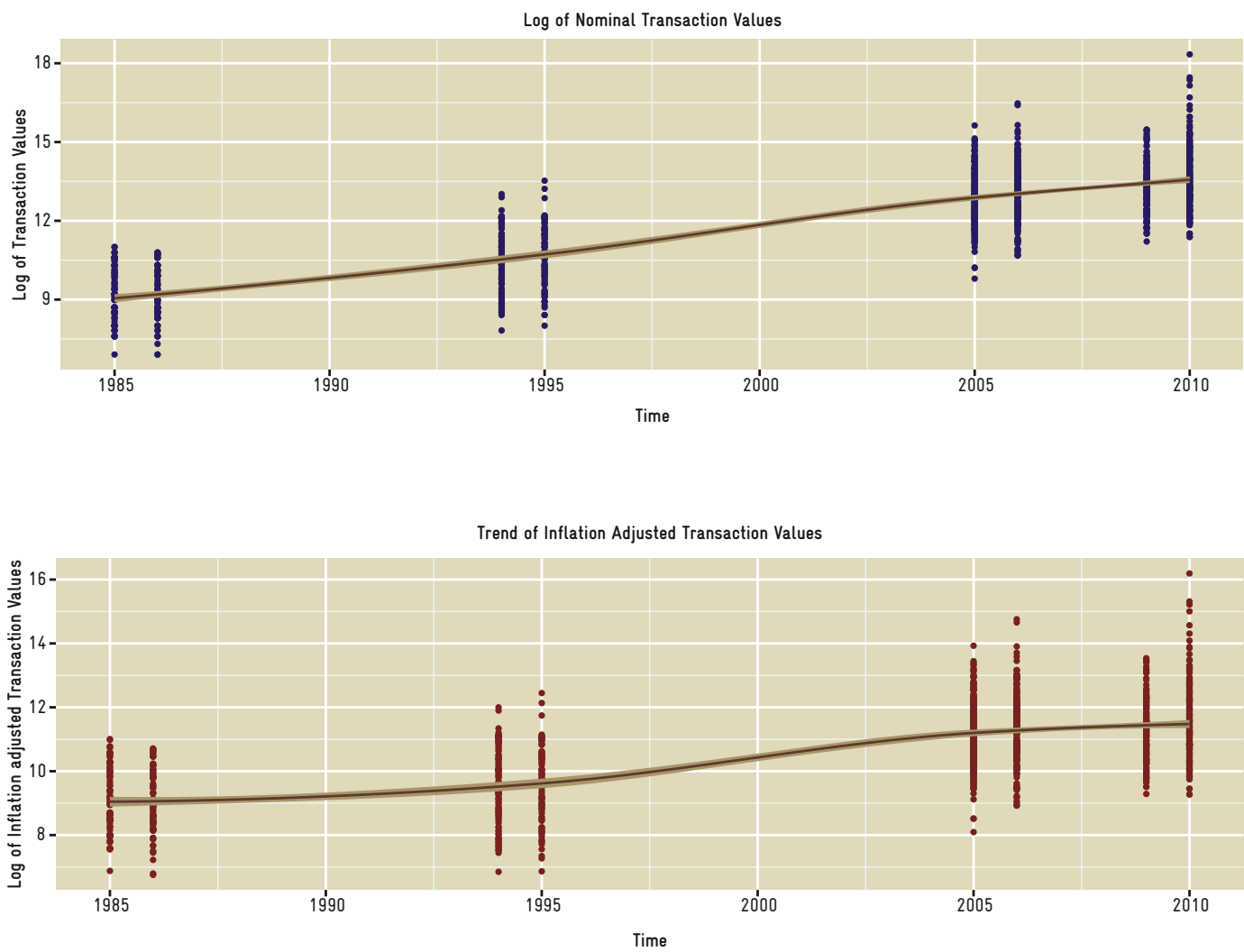
Figure 3: Log of Nominal and Inflation Adjusted Transaction Values over time for the district of Faridabad

Log of Nominal Transaction Values

Log of Inflation Adjusted Transaction Values
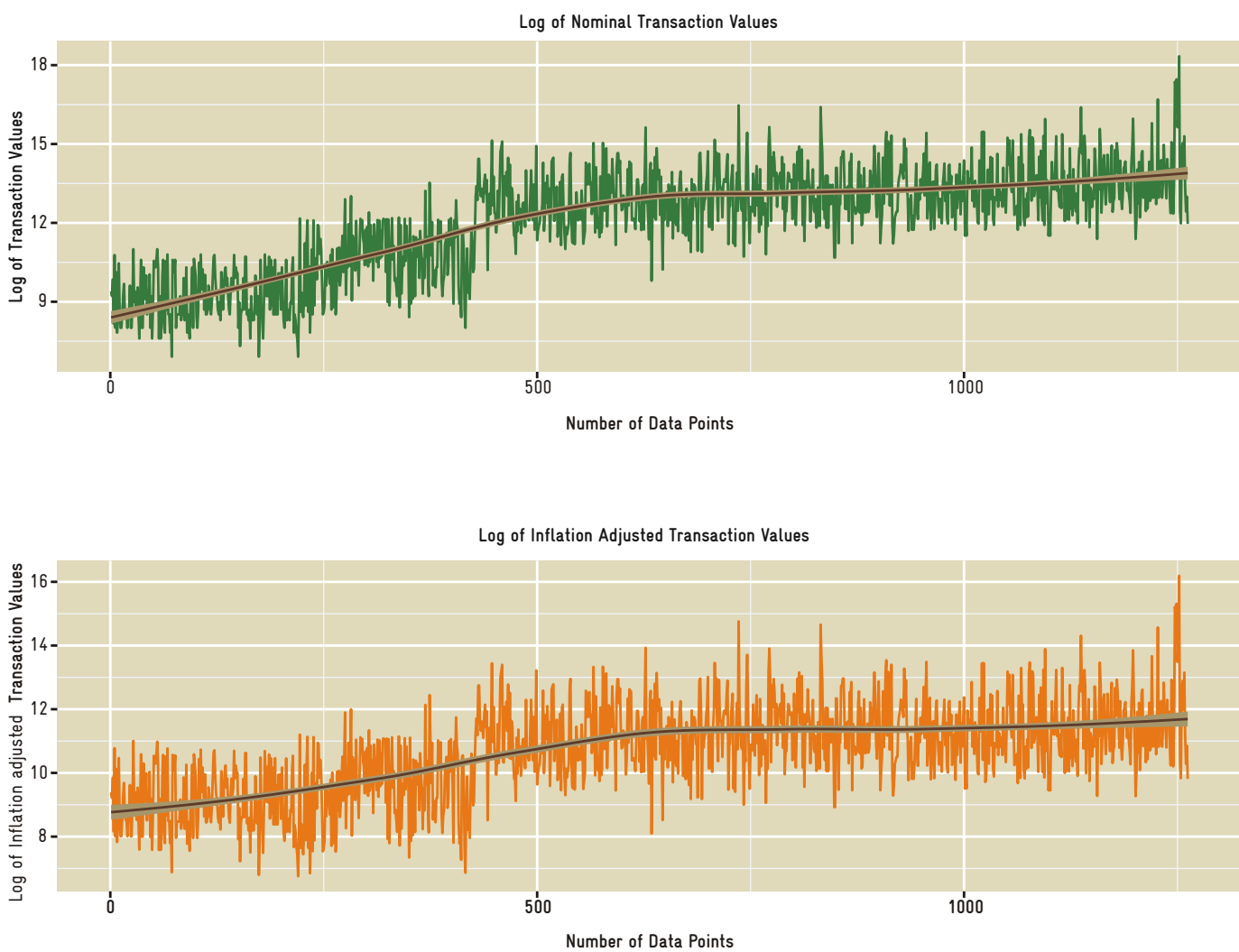
Figure 4: Transaction Values Vs the Size of land for the district of Faridabad

Transaction value Vs Size of land

Log of Transaction value Vs Size of land
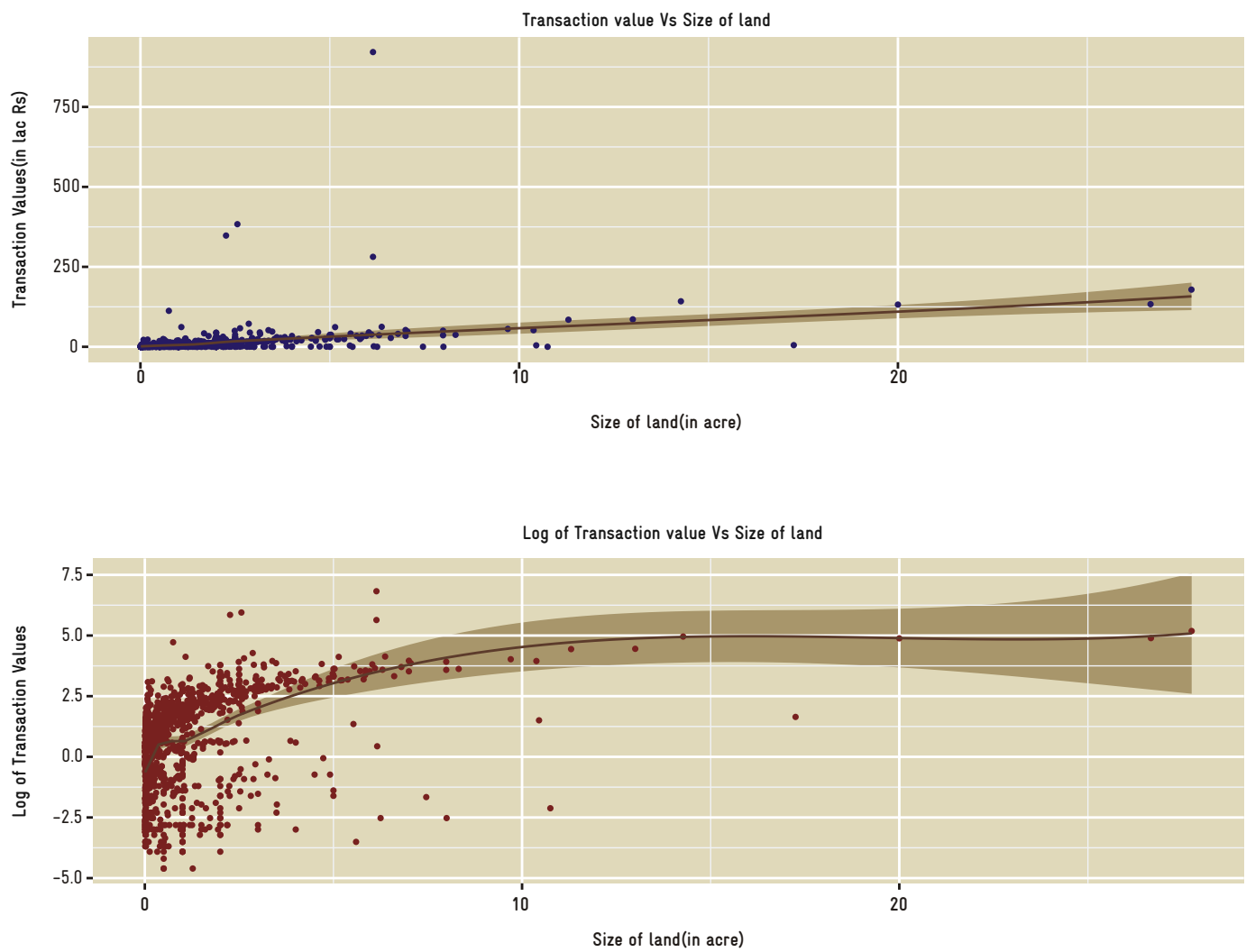
Figure 5: Average Transaction Values for land plots of 10 acre or less for the district of Faridabad

Average Transaction Values Vs Size of land in Faridabad
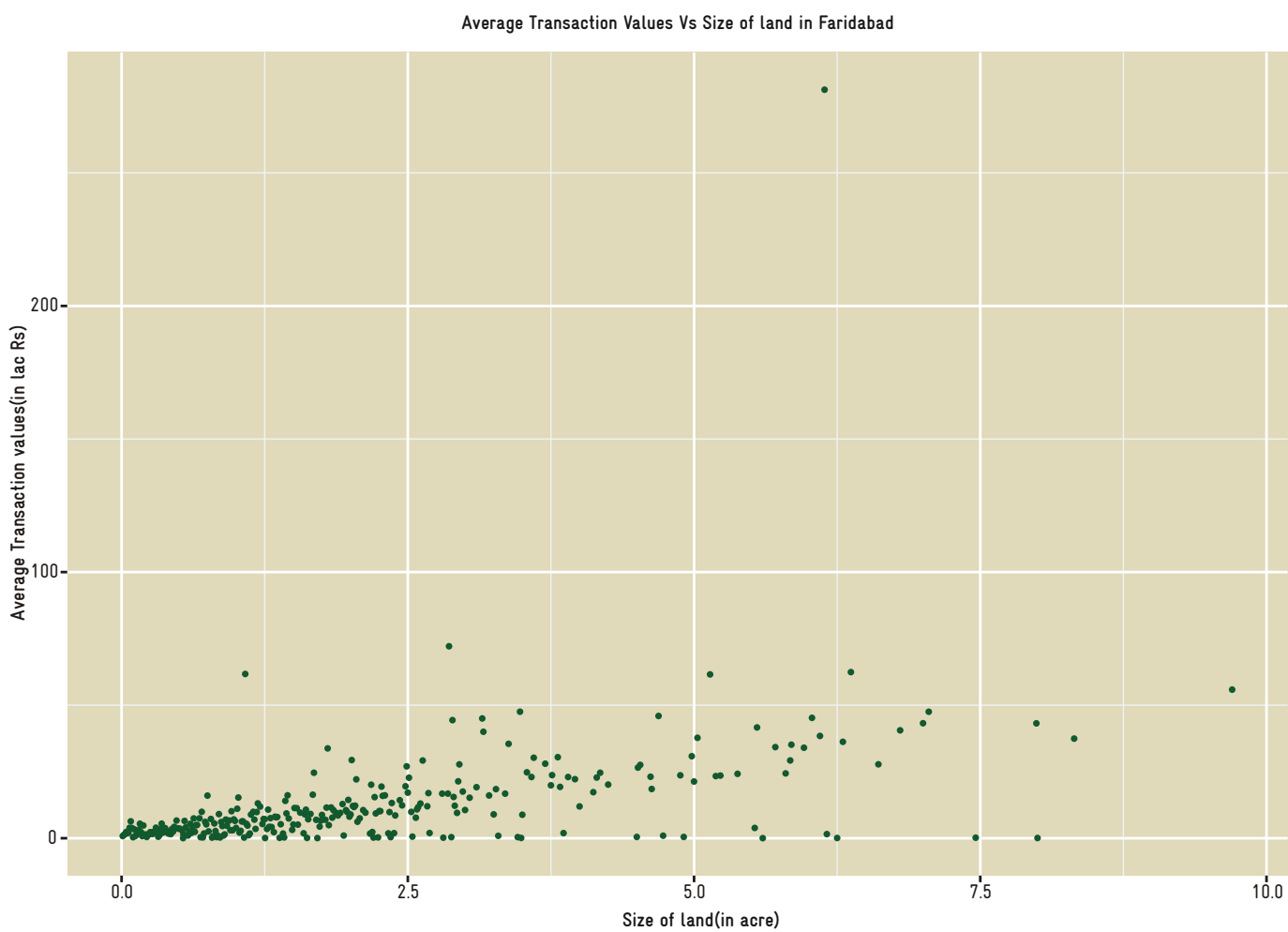
Figure 6: Scatter Plot for size (in acres) and the transaction values for all the 4 districts
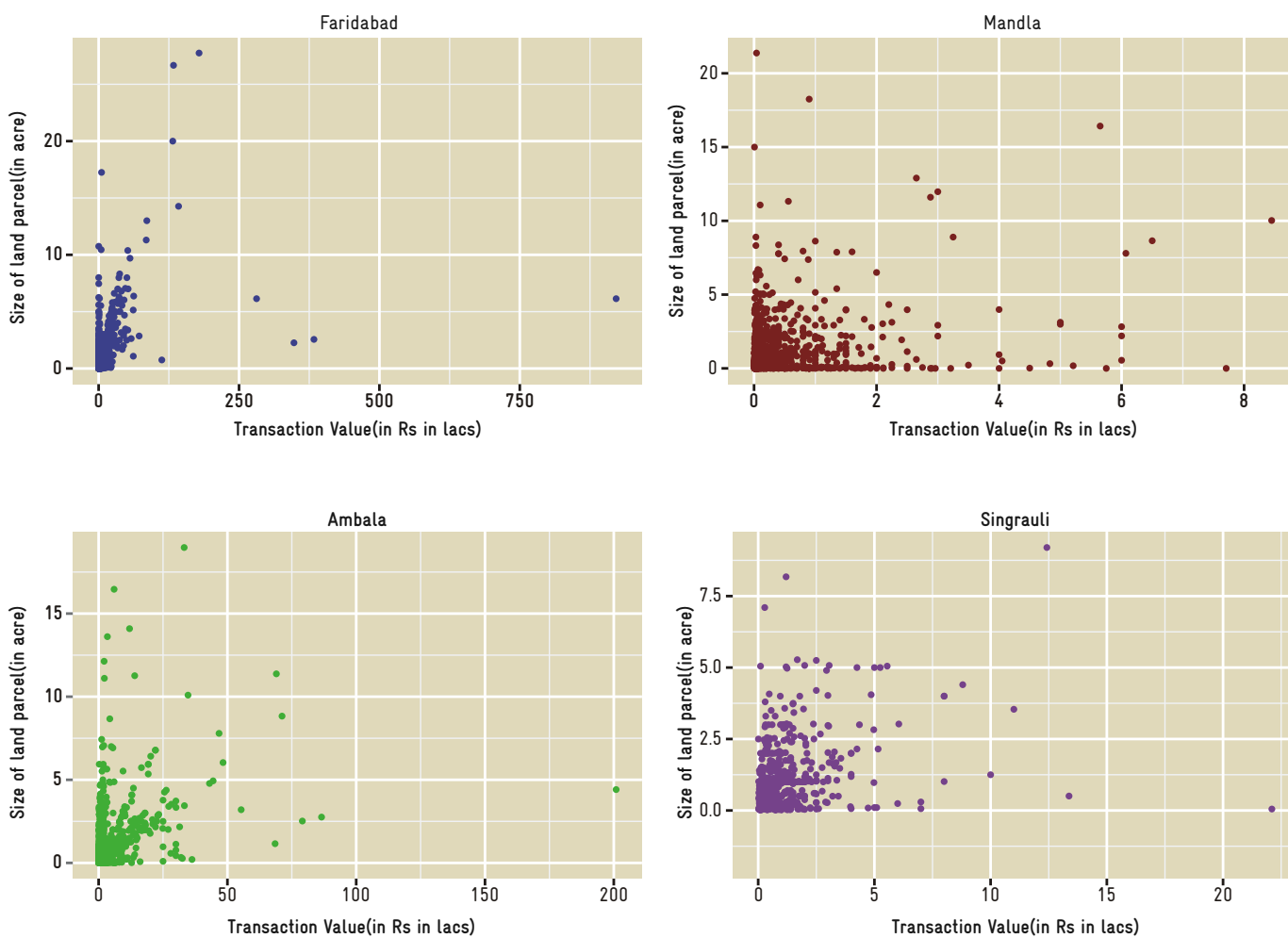
Expert Commentator Note

In the study what is not clear is the connection sought to be drawn between the two main findings, namely that locational factors are the chief determinant of land prices, and the systematic underpricing of land acquisitions by government. The study seems to suggest that land acquisition by government was under-priced because locational factors were not given due consideration as the median price of all relevant sale deeds was taken as the reference price. This however is not something I could agree with, having worked as a land acquisition officer in Kerala several years ago. Due consideration was always intended to be given to locational factors. The land acquisition officer was expected to rely most on recent sale deeds executed in areas closest to the land being acquired, and for plots comparable in size and type. Since it was usually difficult to find a suitable reference sales deed, the officer had the discretion to make a reasoned mark-up or mark-down in the reference price,

taking into account locational and plot size differences, or for any other reason considered reasonable. The final decision was always subject to judicial scrutiny. The reasons for under-pricing to my mind were two fold. First, the land acquisition officer relied on registered sale deeds, which tended to be grossly under-valued. Second, this undervaluation was used to good effect by government to keep the fiscal costs of land acquisition low. Where the cost of acquisition was to be paid by a third party, the compensation was generally more generous. The judicial process, the long delays notwithstanding, was quite severe on government for such under-pricing, and large amounts of additional compensation had to be paid subsequently by government.

– Alok Sheel
Secretary
Economic Advisory Council to the Prime Minister