

**Estimation of the Affordability of Land for  
Housing Purposes in Lucknow City,  
Uttar Pradesh (India): 1970-1990**

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## **Introduction**

It is in the early 1990s that we come across studies on some Third World cities that have begun to address the question of land affordability for housing purposes in greater details than what have been documented in the past (Tym, 1984; Strassmann and Blunt, 1994; Ward et al, 1993).<sup>1</sup> The focus on the affordability question was partly generated by the World Bank's urban development strategy in the 1980s (Linn, 1983) and later by the mid 1980s it became more pronounced by the promotion of the World Bank's New Urban Management Policy (NUMP) (World Bank, 1989; Dowall, 1991). Some stimulus also came from urban land market and land price studies of the late 1980s and the early 1990s.<sup>2</sup> In the early 1970s, the World Bank's (1972) paper 'Urbanization Sector Working Paper' lucidly outlined urban crisis in developing countries and the important roles of self-help housing. But, as Pugh (1989) remarks, this paper remained very cautious on the discussion of land policy and it relegated it to the back-seat by placing it into the appendix of the paper. However, with the progress in time World Bank's strategy towards urban crisis in developing countries changed and in 1986 the 'New Urban Management

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<sup>1</sup> In the context of the Developed World, studies on housing affordability and/or measuring the cost of each constituent of housing have been done in the seventies (Drewett, 1973) and in the nineties too (Linneman and Mcgbolugbe, 1992; Grigsby, 1990). This paper takes a departure from studies done in the context of the Developed World and focusses only upon the Third World studies.

<sup>2</sup> See - Abdoual, 1988; Hadlad, 1982; Rose & Croix, 1989; Gilbert and Ward, 1985; Mohun & Villanizan, 1983; Dowall, 1989; TCPO: Delhi, 1984; Ward, 1989; Jones, 1991; Ward et al, 1993, Amitabh, 1994).

Programme' was started which was a ten year programme divided into two phases. During the first phase (1986-90), the objective was to develop the thinking on and techniques for the management of land, infrastructure and municipal finance. The second phase which started from 1990, and where we are now, was promotional: to develop and promote awareness levels and to develop the quality of urban research and to guide more practicable policy alternatives.<sup>3</sup> It is the first phase that encouraged researchers in the Third World to develop our understanding of segmented land and housing markets and their dynamics and behaviour in cities. This, further, questioned the availability and reliability of the information available on these aspects and that can be used in studying land and housing market conditions in the Third World (Jones and Ward, 1994; Amitabh, 1994a). In this context one of the aims was to collect information that is both analytically strong and offers some degree of comparability between different regions. It also required us to go beyond methodologies based on neoclassical principles of demand and supply (Alonso, 1964), and develop approaches that focus on the production and appropriation processes of land for housing purposes. However, the response in developing a different approach continued to be of mixed nature. For instance, Dowell (1989) adopted neo-classical approach to urban land markets in Bangkok, while others such as Ward et al., (1993), Jones (1991), Amitabh (1994) and Macoloo (1996) used political economy approach in their studies.

Although we are in the second phase of World Bank's strategy to meet urban crisis, research on various issues of the first phase is yet not over. In the similar context this paper addresses the question of land affordability for housing purposes. Having had focussed research on both some aspects of land and housing markets in general and varying trends of land price changes in different areas in the Third World in particular, it is appropriate and significant to analyse what happened to housing affordability levels, if land prices were found to be changing in both 'real' and 'nominal' terms. This is because housing consists

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<sup>3</sup> For more detailed information on the World Bank's new urban management policy (NUMP), see - Jones and Ward (1994) The World Bank's 'New' Urban Management Programme: Paradigm Shift or policy Continuity?

of different elements such as land, on-site infrastructure, the superstructure, design and management costs and interest payment on capital (Tym, 1984: 214). Broadly speaking, major inputs in housing are land and construction materials. These two inputs are the two most important elements determining the price of a housing unit.

### **Objectives:**

It is evident from the early 1990s literature that urban land prices have been increasing constantly or with fluctuations (Jones, 1991; Fitzwilliam Memorandum, 1991; Amitabh, 1994). But, it is less clear whether the land remains affordable to a household when land prices have increased. It is in this context the paper examines the question of land affordability for housing purposes in a growing metropolitan city in India - Lucknow City. In this study the estimation of affordability of land for housing purposes is based upon the changes observed in construction costs and land prices. This is an entirely different approach than what other studies adopted in the past which I shall address soon.<sup>4</sup>

The major objective of this paper is to estimate changes in construction costs in Lucknow city during 1970-1990 period and to compare the trends observed between construction costs and land prices in the city during the specified period. Finally, the paper will attempt to answer whether land remains affordable to high and middle income group households - the focus income group households in the study - in Lucknow City.<sup>5</sup>

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<sup>4</sup> The question of the affordability of land for housing purposes, in the land-price-increasing-situation, could be examined under four conditions that would allow households to adjust their need for land for housing purposes. First, if household earnings have increased in accordance with land price increases, land might remain affordable to a majority of households. Second, if construction costs have not increased in line with increases in land prices, housing might again remain affordable to a majority of households. Third, if prices in the residential rental market have not increased as fast as land prices have increased, some households will be able to find accommodation in the rented sector (even if land is itself beyond their means). Fourth, households might buy less land, in the form of smaller plots.

<sup>5</sup> It is argued that generally 'low income group' (LIG) or 'urban poor' (UP) households do not get entry into the 'urban land market' on account of their minimal paying capacity while the land market operates for those who can pay for what the market demands for. The housing needs of 'low income group' and/or 'urban poor' households fall in the purview of State Housing Schemes where they are allotted/sold built units than a vacant plot. For more details, see Amitabh, 1994.

### *Estimation of the Affordability of Land for Housing Purposes*

First of the following sections will begin with a brief introduction of Lucknow City. Second section will describe the methodology for estimating the affordability of land for housing purposes followed by a sub-section on the data, study area, assumptions and methods used in estimating construction costs and land prices in the city. Third section will analyse the estimated construction costs in the city which will be followed by a comparative analysis of the estimated construction costs and land prices in the city. In the fourth section an attempt will be made to compare construction costs, land prices and wholesale price index together. Here the aim will be to explore which of the three variables register faster average annual rate of change. Finally, the concluding section will focus upon finding a suitable answer to the question of the affordability of land in Lucknow city.

#### **Lucknow City: An Indian Metropolitan in the Making**

The case of Lucknow City in India is important because the city has experienced a massive horizontal urban expansion during the last two decades in general and during the 1980s in particular. Its Municipal Corporation limits have been extended three times so far - during 1959, 1972 and 1987 - which indicates that the city has undergone a large scale territorial expansion. This expansion has mainly occurred along five major roads that connect the city with neighbouring district headquarters. It is the 12th largest city in the country with a population of 1.64 million in 1991 and it has recorded about 63% decadal rate of population growth in the 1980s which makes Lucknow the third city in India to record such a phenomenal population growth in the 1980s. Further, In 1981, about 39% of its total population lived in 'slums' which was the second highest percentage slum population among the 1980s' twelve million-cities in India (after Kanpur). Bombay comes on the third rank.

Being the capital city of the most populated state in India - Uttar Pradesh -, Lucknow is not so much a squatter-city. It is a white-collar city on account of its dominantly administrative functions rather than industrial activities. The future growth of the city rests mainly upon administrative, educational and some industrial functions. The participation of workers in

the service sectors of Lucknow increased markedly from 1961 to 1981 than the increase noted in the secondary sector.

Not much of Lucknow city's land can be categorised as 'built-up' area, although estimates of land use vary from one to other data source. The Master Plan-2001 for Lucknow City claims that 49% of Lucknow's land was used for residential purposes in 1987 and these areas were unplanned and had high density of population. In contrast, an analysis of Landsat 5 Thematic Mapper (TM) data of February 1987 reveals that only 36% of the total land area can be categorised as 'built-up area', while 41% land remains as agricultural land. (Subudhi et al., 1990). These estimates, though variable, indicate that physical availability of land for horizontal expansion of the city is not a major problem.

The land available for housing purposes is mainly appropriated by three land delivery agents, namely, (i) the public sector (state institutions such as Lucknow Development Authority (LDA) and Uttar Pradesh Housing and Development Board (UPHDB); (ii) the private sector (individual households, property agents etc.); and (iii) the cooperative sector (cooperative housing societies). These land delivery agents appropriate land with different motives. For instance, the public sector agencies operate in the city's land market in the name of 'public purposes' that is; to safeguard the interests of 'poor people' and to check misappropriation of land by other agents of land delivery. It is expected to work as per the guidelines provided by the State government. In the private sector<sup>6</sup> land is sub-divided by individuals for needs of other individuals. Unlike the public sector, there is no organisation in this sector and it does not have the State patronage. The cooperative sector works through various cooperative housing societies which operate quite distinctly than observed in the case of other two sectors. It is hard to notice any type of organisational structure among the cooperative housing societies that operate in Lucknow city's land market.

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<sup>6</sup> In the present context the private sector does not include builders and estate developers, since these are not allowed to purchase and to sub-divide land within city limits. Instead, this group of the private sector will have to purchase land from the public sector (State agencies) for their housing schemes which must devote certain percentage (in some cases it is 40%) of their each housing development schemes to the housing needs of 'Economically Weaker Sections'.

Cooperative housing societies are supposed to be functioning on the principle of 'no profit, no loss'. However, there are not many cooperative housing societies which would meet the requirements of this principle. In most case the officials of a cooperative housing society have vested interests (such as escaping from the clutches of the Urban Land Ceiling Act, 1976) in forming the cooperative housing society and then sub-dividing the land.

### **Measurement of the Housing Affordability**

The difficulties associated with the extraction of data on construction cost variables notwithstanding, an effort to estimate construction costs with limited data is very much possible. Such an endeavour is also needed, for an analysis of changes in construction costs in Third world cities is lacking in the available literature. Drewett's (1973) analysis to determine the ratio between construction costs and other inputs of housing in England cannot fully be extended to analyse changes in the construction cost in Third World cities, as nature of the available data is remarkably different in most Third World cities. Furthermore, serious limitations of data availability and type of data collected in Third World cities require researchers to develop tools of their own rather than trying to use Eurocentric tools and techniques.

There is a major problem in examining the affordability question, as we do not have an universally accepted definition of affordability. In contrast, talk of housing affordability is plentiful, but a precise definition of housing affordability is at best ambiguous. In some cases, for instance in the US, we note that the conventional public policy indicator of housing affordability is the percentage of income spent on housing. But, researchers argue that these conventional measures of housing affordability do not control, (i) for changes in the quality of housing stock over time, (ii) for the impacts of expected appreciation on housing cost increases, (iii) cases of high price-to-income ratios of expenditure shares that result simply from changing tastes for housing amenities, etc. (Linneman and Megbolugbe, 1992: 371). Besides such problems which have been noted in academic writings, debate on affordability has also centred around what measure of income should be used. There is no

(and there can be no) general consensus on what percentage of a household's income is devoted to housing. This problem persists mainly because the income and expenditure patterns keep changing over time and they have regional variations where socio-economic groups also vary to a considerable extent.

Further, using the information available, the methods and approaches adapted to studying the segmented nature of housing and land markets are often inadequate and ill advised, and there is very little analysis of methodology in the vast literature on housing *per se*. This fact has been adequately raised and properly documented by Jones and Ward (1994) in their innovative book - 'Methodology for Land and Housing Market Analysis'. It is often commented in the context of Third World housing studies that the proportion of the household income spent on housing can be accepted as a criteria for measuring housing affordability. Faced with such comments we have to understand the limitations attached with the information on household incomes which are always difficult to ascertain, and it is usually impossible to record the information correctly. Tym (1984) rightly mentions that:

'... to establish just what level of cost for a new or improved shelter could be supported by households requires a considerable understanding and insight into the lifestyle of different income group households such as their earnings; security of the principal and secondary sources of income; their savings, and their capacity to save at all; the spending patterns of the group, and the importance, expressed as a proportion of total income, they attach to new or improved shelter provision. The actual amounts affordable are a function firstly of the amount of household or family income. Considerable care has to be taken not only to try to achieve a realistic assessment of incomes, but to make adequate allowance for the fact that, within broad socially defined categories of the "poor", there are wide differences in actual incomes, resulting in equally wide variations in ability to afford absolute amounts. As a general rule, within the lower income groups the lower the income of the household, the smaller the proportion of income that can conceivably be set aside for housing. A greater proportion has to be allowed for food and other essentials. ... Savings cannot be presumed to be available for investment in shelter; they may have been made for entirely different purposes. Savings will normally be the substitute for insurance against sickness and incapacity through old age' (Tym, 1984: 211).



To add to Tym's last point, it is possible that savings are made for housing (shelter) purposes too. But, considering the type of data, it is very difficult to separate the amounts saved for housing purposes, for the education of children and their marriage(s) and for the purchase of some luxury items such as a television set or a vehicle, etc., from the total savings amount available with a household. However, such an enterprise will be beset by data scarcity and methodological problems.<sup>7</sup> As Ward et al. (1993) remark, 'many of the methodological difficulties associated with the analysis of land prices and land price trends are compounded further, once one begins to make an accurate judgement about whether land is becoming more or less affordable over time'. Even so, there are several ways in which we might represent land prices relative to a household's ability to pay for land for housing purposes. Ward et al. (1993), while analysing land affordability for the poor in three Mexican cities, listed four ways of *representing* unit land costs relative to an assumed ability to pay: first, against the minimum wage or another standard wage line; second, against actual wages (individual and/or household) as measured by household surveys; third, against a basket of basic commodities; and/or fourth, against price rises in other arenas, for instance building materials, house-building cost indices and so on.

A comparison against the statutory minimum wage would not be feasible in the present study for three reasons. First, the present study focusses mainly upon the high and middle income group sub-divisions, given that the 'urban poor' in Lucknow city generally do not participate directly in the land markets of the city. Statutory minimum wages will not be suitable proxies for the wages of the target income groups that this paper has selected. Second, minimum wages and/or salaries in India are not regularly revised. The Pay Commission revises salaries in India every ten years, even though inflation increases 'annually'. In addition, the Government of India does have a system for upgrading salaries on an occasional basis. This is achieved by providing a 'Dearness Allowance' to employees at times when the government feels that general prices have increased, and when the natural

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<sup>7</sup>The remaining part of this notion draws heavily from Ward et al., 1993 and Amitabh, 1994.

increase in salaries is not enough to cope with a general price increase. Because as such a practice is not a regular feature in India, it hardly commends itself as a reason for using so-called minimum wages in this study.

To make any assumption about affordability in terms of household incomes also poses several difficulties. In India the income of many households depends mainly upon the number of wage earners, the amount of disposable income available, and the unaccounted wealth accumulated from inheritance and/or property transfers. It is difficult to disaggregate the contribution of these various sources to a household's income. As part of my questionnaire survey I did collect information on household incomes. But that information relates to the current income of the selected households and does not represent the purchasing power of the sampled households in years before 1990/91. In addition, it must be borne in mind that households are not always very forthcoming in reporting both their disposable income and 'unaccounted' wealth. Further, this study has noted that 86% of the sampled households (521) purchased their land by making a single payment, 12% of households paid by instalment and by lump sum, while just 2% of households purchased land by instalments only. Most households save up to buy a plot of land over a long period of time and use funds from more than one source (for example, 'household wages'). Such 'non-wage' sources will not be divulged to a researcher by many households in India.

The changing affordability of land can also be measured in terms of the changing price of a basket of basic commodities, but the feasibility of such an analysis is again constrained in several ways. In India land is not only treated as a basic commodity, but it is also used to define a person's or a household's status. This is mainly because, the concept of land ownership in India is not quite identical to the concept of land in some Western countries. Higher and middle income group household may thus have a higher propensity to invest in land than some low income groups. If this is so, the different incomes of households will be associated with different consumer investment preferences for land and for other basic commodities. It is also worth noting that the basic commodity price index in India is

prepared from a large sample of lower income group households, whereas the present study focuses mainly upon high and middle income group households.

Given all these difficulties in assessing the affordability of land, I have decided to use a fourth approach, which will make an assessment of land prices against price variations in construction costs. Using this approach, we will be exploring whether land for housing purposes remains affordable in Lucknow City's urban land market; or, whether land appears to have become expensive over time in the city. There are two reasons for making this decision. First, such an analysis will be a novel departure in the housing and land market literature so far available on Third World cities. Second, the data available on variables associated with construction costs can be accepted as a better basis for comparison than the data available for the variables that I mentioned earlier.

#### **Study Area, Data, Assumptions and the Method Used:**

##### **(I) Study Area**

In the spatial context, this paper focuses upon Lucknow city's 14 peripheral residential settlements (colonies or neighbourhoods) and their residents of which 521 households were taken as a sample for a detailed study. The purposive sampling technique was adopted to select both colonies and households. In this paper Lucknow city's construction costs and land prices will always be represented through these selected colonies and households. Having selected the households, a cross-section of the income of the selected households revealed that they mainly belonged to 'High' and 'Middle' income groups.<sup>8</sup> It was not my intention to limit myself to a particular income group household, nonetheless the income based cross-section of the selected households represented that 'low income group' (or Economically Weaker Section, or 'Urban Poor') found no place in the selection. This perhaps indicates that when we focus our attention on those who purchased a vacant plot

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<sup>8</sup> 'Middle Income Group' category represents income figures which could also be termed as 'Mixed Income Group'. But, in order to avoid confusion, here onwards we would refer to 'Middle Income Group' term only.

(without any construction on the plot) in a urban land market, economically depressed households do not emerge prominently; hence 'High' and 'Middle' income group households in Lucknow City are the focus-households in this paper.

## (II) Data

The analysis is based mainly upon one primary and two secondary sources of information.

(A) A household survey was conducted in the peripheral colonies/neighbourhoods of Lucknow city during 1990/91. The purpose of this survey was two-fold: to collect information on land prices and to enquire about details of house construction. The aim of the latter section was to extract as much information as possible on construction costs as well as to create a contextual data base on housing conditions in Lucknow City. For example, questions about the number of rooms, the size of rooms, size of other built parts of the house and construction year were specifically designed to generate hard data points. On the other hand, questions such as who built the house, the quality of housing according to the building materials used, were asked to help create a contextual background of the surveyed houses.

(B) As stated earlier, the data on land prices have been collected by the household survey, 1990/91. The sampled households were asked about the price that they paid for their plots in the year when they purchased the plot. In other words this could also be called as 'Household Paid Land Prices', but we would stick to the term 'land prices'. Further, they were asked about the size of the plot they purchased. This eased calculating land prices in Rupees per square metre.<sup>9</sup> However, for the purposes of this paper we will be using the total price paid for the plot than using prices expressed in Rupees per square metre. In so doing, we will be able to compare land prices with the construction cost, since the latter cannot be expressed in Rupees per square metre because of the constraints associated with

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<sup>9</sup> For other details see, Amitabh, 1994.

the availability of data on other input variables of the construction cost. As we proceed further, the data constraints on construction cost will be made clear.

In this paper construction costs and land prices will be expressed, first, in terms of average nominal values and then these will be converted into an index.

(C) The Public Works Department (Buildings), Uttar Pradesh (PWD) determines plinth area rate to assess the construction costs of residential and non-residential buildings. Generally speaking, a plinth area rate is the rate of the construction cost which is decided according to the costs involved in laying the foundation of a house. The PWD office revises plinth area rate when it finds that the prices for building material and labour cost have gone up. For example, the office recorded about a three-fold increase in building material and labour costs over the ten year period 1980/81 - 1990/91.<sup>10</sup> Hence, the office revised its plinth area rate in 1990-91 (see Table 1). It is difficult to predict the date of the next revision of the plinth area rate. The plinth area rate is expressed in Rupees per metre<sup>2</sup>, and is determined separately for: (i) residential buildings and; (ii) non-residential buildings. This paper takes into account the plinth area rate for residential buildings, since residential buildings are the exclusive concerns of the paper. The Plinth area rate is calculated in such a manner that it does include area covered by the walls in a house. For the purposes of this study, the plinth area rate without overhead charges has been taken into account. The houses sampled for this study have been built privately, rather than being built by a government agency (which would require overhead charges). It is thus acceptable to consider the plinth area rate without overhead charges. Residential buildings when constructed by government agencies such as PWD, U.P. Rajkiya Nirman Nigam, U.P. Housing and Development Board are divided into five categories (as shown in Table 1).

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<sup>10</sup> Information extracted from the letter of 16.9.90 issued by the Chief Engineer, PWD, U.P. to various offices. This letter also carries the plinth area rate of 1990-91. No further revision has been made in the plinth area rate till December 1995.

**Table 1 Plinth Area Rate in 1990-91 for residential areas in Uttar Pradesh (applicable for Plain-Areas only\*).**

Categories of houses	Plinth Area Rate in 1990-91 (In Rs./m <sup>2</sup> )	Overhead Charges (5%)	Total Plinth Area Rate (In Rs./m <sup>2</sup> ) (including overhead charges)
Category - 1	1238	62	1300
Category - 2 & 3	1421	71	1492
Category - 4	1557	78	1635
Category - 5	1592	80	1672

Source: Chief Engineer Office, PWD, U.P.

\* Plain Area means the areas other than those situated in the hilly region of Uttar Pradesh.

For the purposes of the determination of the plinth area rate, Categories 2 & 3 are grouped together because they hold a similar number of rooms, although they differ in respect of infrastructure availability on the plot. Hence, the categories of houses which have been considered for determining the plinth area rate are made on the basis of number of rooms in a house viz.,

Category 1	= One room house
Category 2	= Two room house
Category 3	= Three room house
Category 4	= Four and above room house.

The plinth area rate is available for only one point in time (1990-91), and thus it does not allow one to compute the construction cost for the years before and after 1990-91. In order to overcome this limitation, information on the Building Cost Index (BCI) has been taken into account. The State Planning Institute, U.P., occasionally computes the BCI on the basis of building material prices and labour charges.

### (III) Assumptions

The construction cost analysis of this paper treats Lucknow city as an entity in respect of building material prices and labour cost. To confine this analysis according to the sector of land/housing delivery agents, sampled colonies or an income based categorisation of

colonies does not seem practical. It is true that in a city there can be no sub-markets or sector based markets of building material and labour. Throughout a city building material prices and labour costs are broadly similar irrespective of the status of a house or a colony. A situation which is entirely different from urban land market conditions. Basically, what determines the construction cost is the nature and types of agents involved in the construction. For instance, if a house has been constructed by an estate developer, a building contractor or a government agency, the construction cost would vary. It is clear from Table 2 that different private sector agencies have different construction rates even at a particular point in time. Although the construction rate of the private construction agencies do not vary according to the types of house, the rates of the public sector agency - UPHDB - do vary.

**Table 2 Construction rates of private and public sector agencies in Lucknow city in 1990-91 (rate in Rs per M<sup>2</sup>)**

	CONSTRUCTION AGENCIES			
	PRIVATE			PUBLIC
	Ansal Ltd.	Unitech Ltd.	Eldeco Ltd.	UPHDB
Types of house	Aashiana wef: 13.11.90	South City wef: 20.12.90	Udyan wef: 1.1.91	wef:* 1990-91
One room house	3200	3335	2300 - 2700	1100 for EWS 1400 for LIG
Two room house	3200	3335	2300 - 2700	1200 for MIG (semi-finished SF)
Three room house	3200	3335	2300 - 2700	1200 for HIG (SF) 1300 for HIG (Dup)

Source: Unpublished data from the Uttar Pradesh Housing Development Board, 1991. Interviews conducted during 1990-91 survey.  
(Also cited in Amitabh, 1994)

Thus, an analysis of construction costs can be done according to sectors, only if the sampled houses have been built by either of these sectors. Most houses sampled in this study have not been built by a construction or building development agency (public or private). Of the total (521) sampled houses: 94.8% houses were constructed by households who hired labour and purchased building materials; 4.8% houses were constructed by building contractors while 0.4% of the houses did not respond to this question. The sampled houses which have been constructed by building contractors and those who did not respond to the question have been excluded from the following analysis. Therefore, the analysis of construction cost in Lucknow city accounts for only 495 sampled houses. To enable comparability, the calculation of land prices has also been done for the same number of houses rather than including the total sampled houses (521). Considering these constraints, this study will focus upon an estimation of construction costs in an aggregate spatial context than studying each colonies separately. Thus, in the present context the analysis of construction costs and land prices will represent peripheral areas in Lucknow city than focussing upon individual colonies separately.

#### (IV) A Method to Estimate Construction Cost

It is a fact that the sampled houses will have different number of rooms. Using the number of rooms built in each sampled houses, all the 495 sampled houses have been divided into different categories. Since we cannot categorise indefinitely, we limited the categorisation to four categories only, which followed the criteria mentioned earlier (viz., Category -1 = One Room House; Category - 2 = Two Room House, etc.).

It is also a fact that the construction cost of the ground floor of a house will be different from the construction cost of the first and following floors. Considering this characteristic, we calculated the 'Weighted Built-up-Area' for each sampled house. This has been achieved by adding up the 100% built-up area of the ground floor and only 85% built-up area of the first and successive floors together. For example, if a house had only first floor, the 'Weighted Built-up-Area' of that house would be the total built-up-area. In contrast, if a



house had three floors, we added up 100% built-up-area of the first floor and 85% built-up-area of the successive floors. Thus, in this paper, the calculated total built-up area of a house is referred to as the 'Weighted Built-up Area'.

If we multiply the Weighted Built-up Area of each sampled house which has, let us say, two rooms, with the plinth area rate of two-room houses for the year when the house was constructed, we would estimate the construction costs of that house. Unfortunately, we do not have any means to get information on the plinth area rate for each year between 1970 and 1990. Thus, we can estimate the construction cost for the year 1990, as the plinth area rate for the 1990 is available with us, while the sampled houses were built at various dates from 1970-1990.<sup>11</sup> However, we have another means through which we can use the '1990 Construction Cost' to estimate the construction cost for other required years. In so doing, we would include another variable, that is 'Building Cost Index'. We have Building Cost Index available between 1981 and 1989 (Table 3). However, this poses another problem, as we need information on Building Cost Index right from 1970 to 1990. To overcome this shortcoming, we use the 'predicted' values of the Building Cost Index. It is valid to use a regression equation for extrapolation purposes unless we have reason to suppose that the rate of change in the observed BCI is very inconsistent. It is clear from Figure 1 that a very high level of correlation ( $R^2 = 0.99$ ) over the observed period using the logarithm of the observed BCI suggests that the predicted BCI values are capable of performing the roles required of them (Amitabh, 1994).

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<sup>11</sup> The BCI and Plinth Area Rate are available according to financial years (March to March). But present study considers a year which spans from January to December. Therefore, information for a financial year has been treated as information of the year when financial year begins.

**Table 3 Extrapolation of Building Cost Index (BCI) Using Regression Equation**

Years (x)	BCI (y)*	Log y (BCI)	Predicted BCI in Log values achieved by using the regression equation**	Predicted BCI (Anti-log of y) @
1970	NA	NA	1.5639	36.35
1971	NA	NA	1.6054	40.02
1972	NA	NA	1.6468	44.06
1973	NA	NA	1.6883	48.50
1974	NA	NA	1.7297	53.39
1975	NA	NA	1.7712	58.77
1976	NA	NA	1.8127	64.69
1977	NA	NA	1.8541	71.20
1978	NA	NA	1.8956	78.36
1979	NA	NA	1.9371	86.24
1980	NA	NA	1.9785	94.90
1981	100	2.0000	2.0200	104.43
1982	116	2.0645	2.0615	114.92
1983	130	2.1139	2.1029	126.44
1984	142	2.1523	2.1444	139.12
1985	153	2.1847	2.1858	153.06
1986	169	2.2279	2.2273	168.39
1987	196	2.2923	2.2688	185.25
1988	200	2.3010	2.3102	203.78
1989	217	2.3365	2.3517	224.16
1990	NA	NA	2.3932	246.57

\*Source: State Planning Institute (Planning and Cost Management Department), Uttar Pradesh. (Also cited in Amitabh, 1994).

\*\* Predicted Log y has been calculated using the following regression equation:

$$\text{Log } y = -80.1181 + 0.0414 * x \quad (\text{R squared} = 0.99)$$

Where Log y equals the predicted BCI in Log values, and x equals the years in natural numbers. (also see - Figure 1).

NA = Not Available

@ Anti-log has been calculated using 10<sup>^</sup> of the predicted BCI Log values.

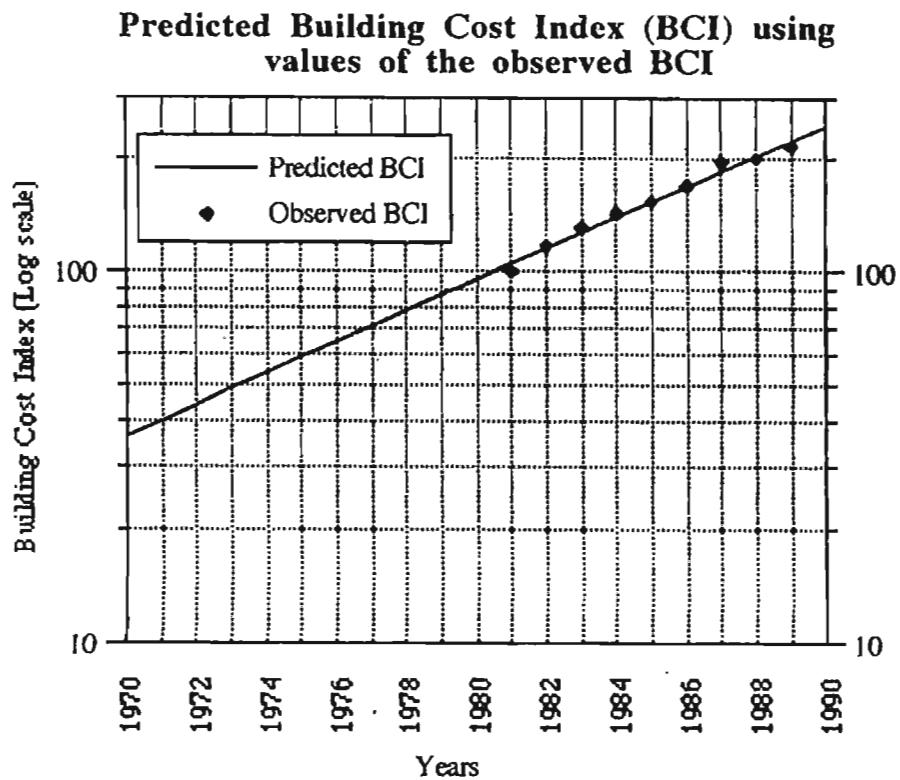


Figure 1

In order to estimate the construction cost for the year when a sampled house was constructed, first, we calculate the construction cost in 1990. For instance, the weighted built-up area of a one-room house is multiplied by the plinth area rate of the one room house i.e., plinth area rate of the Category - 1 House. Similarly, the weighted built-up area of a two room house is multiplied by the plinth area rate of the two room house i.e., plinth area rate of the Category - 2 House. For the three and four and above room houses similar methods have been adopted. The figures thus achieved for different room-houses will be the estimated construction cost of different room houses in 1990. Having done this, we estimate the construction cost of each house with different number of rooms for the year when the house was constructed. This has been achieved by using the following equation.

$$CC_i^{T-t} = (CC_i^T * PB_i^{T-t}) / PBT$$

Where:

$CC_i^{T-t}$  = Construction cost of the  $i$ th house in the year when it was constructed.

$CC_i^T$  = Construction cost of the  $i$ th house in 1990.

$PB_i^{T-t}$  = Predicted Building Cost Index of the year when  $i$ th house was constructed.

$PBT$  = Predicted Building Cost Index in 1990.

### Estimated Construction Costs in Lucknow City:

Using the data and methodology mentioned earlier, we estimated the nominal construction cost for houses with different number of rooms in peripheral areas of Lucknow city which is shown in Figure 2. This is an aggregate analysis for peripheral areas in Lucknow city. The important points that emerge from Figure 2 are as follows.

i) The trend, as shown in the Figure 2 clearly demonstrates the fact that as the size of a house increases, so does the construction cost. This observation corresponds to the reality where a house with four rooms will be more expensive to build than a house with three or two rooms. However, households might prefer to build three room houses to four or two room houses, depending upon their family requirements.

ii) Another important characteristic of Figure 2 is that generally construction costs in the peripheral areas (colonies or neighbourhoods) of Lucknow City have increased over time with some fluctuations. The degree of fluctuation for construction costs of four and above room houses is more pronounced than the three and two room houses. A possible explanation for the large fluctuation in the construction costs of four and above room houses may be due to the variation in the sample cases reported during individual years. The three room houses show a steady increase in construction cost initially which then fluctuates in the later years. The construction cost for two room houses have increased

almost steadily but since 1989 it has come down. This reflects indirectly on the fact that households in the city prefer to build more than two room houses but not more than four room houses.<sup>12</sup> Such a reflection also gets support from decline in one room and four and above room house's construction costs during the same year.

**Nominal Average Construction Costs in One to Four-Room Houses in Peripheral Colonies in Lucknow City (1970-90)**

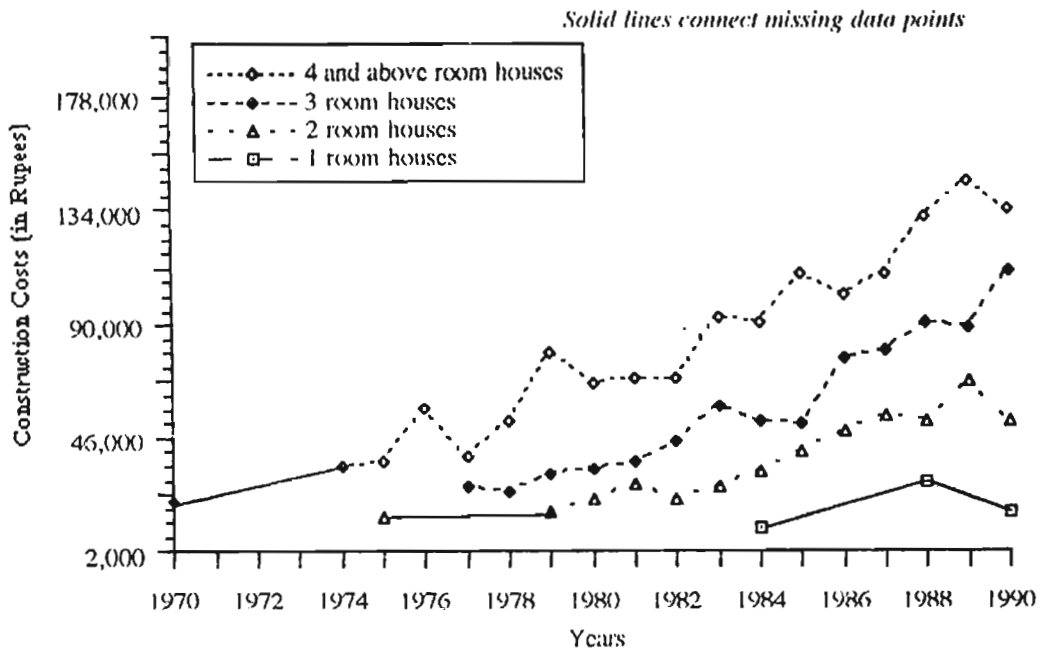


Figure 2

Another characteristic observed with the trend of changes in the construction cost is that the gap between the construction costs of two and three room houses in the city is narrow in comparison with the gap observed between the three room houses and the four and above room houses.

The last point is that the overall increasing trend in the construction cost, irrespective of the size of the houses, indicates two distinct regimes, namely 1970s and 1980s patterns. But,

<sup>12</sup> The purpose of this paper is to demonstrate construction costs trends in the City and not to attempt to explain the reasons for changes observed in the construction cost. The latter could be taken as another exercise in future research.

the 1970s pattern is relatively less inflating in nature than the patterns observed in the 1980s.

Having thus established that the construction cost in the selected colonies/neighbourhoods in Lucknow city have generally increased, the next task is to demonstrate the changes observed in land prices and construction costs for different size houses.

#### **Land Prices and Construction Costs in Lucknow City: A Comparison.**

The purpose of comparing construction costs and land prices is to explore whether land prices have increased faster than construction costs or vice-versa. Figure 3 shows the index values of construction costs and land prices for four and above room houses in peripheral colonies in Lucknow city (also see Table 4). It is clear from the figure that both variables run almost parallel to each other with some fluctuating trends till 1980. However, between 1981 and 1989, land prices of four and above room houses stay above the construction costs. But, the gap between the two variables widens considerably from 1986. This implies that during the 1980s land prices have increased faster than the construction costs of four and above room houses in peripheral areas in Lucknow city.

In contrast to the situation observed with four and above room houses, until 1987 construction costs and land prices for three room houses in the city run parallel to each other with fluctuating trends. It is since 1988 that land prices have shot up over construction costs. One of the implications of such changes is that buying land for three room houses became expensive since the mid 1980s. This period also corresponds to the trends noted for four and above room houses where we have seen a considerable increase in land prices since the mid 1980s. It is obvious that, first, land became expensive for four and above room houses since the early 1980s which must have pushed out people from buying plots for four and above room houses. Eventually, the demand increased for smaller plots, i.e., for three room houses, where again we witness a considerable increase

**Construction Cost and Land Price Index for Four and Above Room Houses in Peripheral Colonies in Lucknow City (1970-90)**

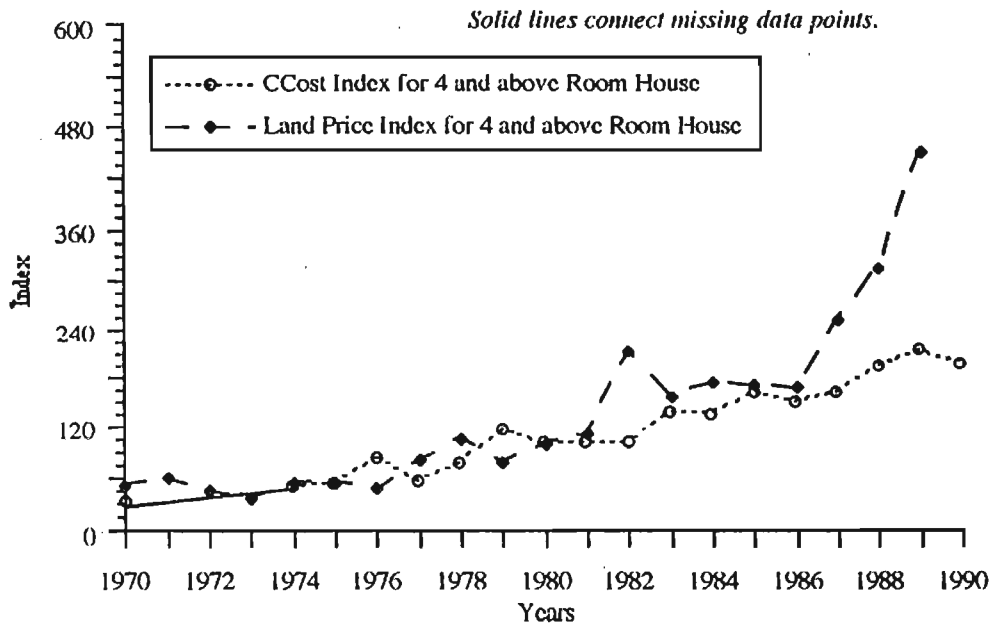


Figure 3

**Construction Cost and Land Price Index for Three Room Houses in Peripheral Colonies in Lucknow City**

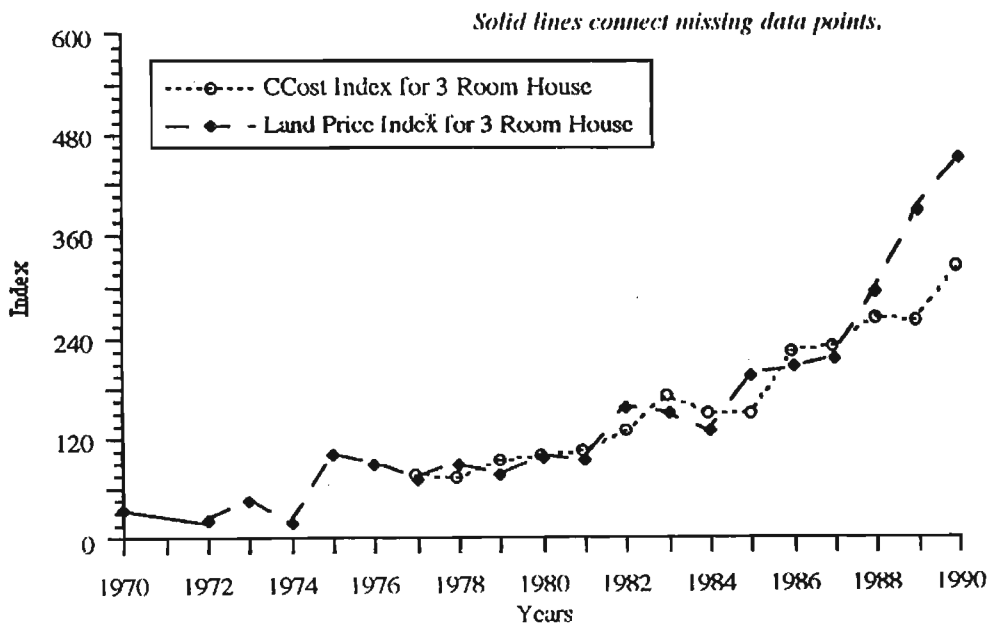


Figure 4

**Table 4 Nominal Average Construction Costs and Land Prices with Their Index Numbers  
(Base Year 1980=100) in Selected Peripheral Colonies of Lucknow City (India)**

CC = Construction costs in Rupees

LP = Land Prices in Rupees

N.O. = Number of observations used in calculating average of CC and Corresponding LP.

	4 & above room house					3 Room-house					2 Room House				
	CC	CC Index	LP	LP Index	N.O.	CC	CC Index	LP	LP Index	N.O.	CC	CC Index	LP	LP Index	N.O.
1970	21476	32	10325	53	2	na	na	5250	34		na	na	12500	156	
1971	na	na	11760	60		na	na	na	na		na	na	na	na	
1972	na	na	8908	45		na	na	3347	22		na	na	na	na	
1973	na	na	7417	38		na	na	7200	46		na	na	na	na	
1974	34848	51	11006	56	3	na	na	3000	19		na	na	na	na	
1975	36656	54	10888	55	7	na	na	16131	104		15473	71	8748	109	2
1976	57347	84	9355	48	6	na	na	14203	92		na	na	na	na	
1977	38781	57	15905	81	5	26721	78	11500	74	2	na	na	22250	278	
1978	52694	78	20912	107	9	24976	73	14075	91	3	na	na	9333	117	
1979	79668	117	15591	79	17	32408	95	12120	78	7	17025	78	7750	97	2
1980	67871	100	19628	100	15	34123	100	15498	100	8	21943	100	8000	100	5
1981	69420	102	21728	111	15	36514	107	15120	98	5	27957	127	11902	149	4
1982	69143	102	41880	213	20	44521	130	24750	160	6	22606	103	15003	188	3
1983	93529	138	30872	157	14	58754	172	23571	152	4	27161	124	16399	205	3
1984	91344	135	34104	174	30	52343	153	20294	131	16	33168	151	17372	217	10
1985	109820	162	33289	170	24	51546	151	30675	198	13	41072	187	19422	243	14
1986	101570	150	32774	167	36	77366	227	32377	209	19	48769	222	41875	523	11
1987	110200	162	49285	251	16	79982	234	34133	220	16	55017	251	24000	300	9
1988	131990	194	62032	316	13	91077	267	46100	297	12	52573	240	19040	238	10
1989	145290	214	87893	448	22	89323	262	60496	390	14	68571	312	na	na	7
1990	134120	198	na	na	6	110960	325	70000	452	3	52297	238	56000	700	3

Index = CC or LP of 'x' year divided by the CC or LP of the Base Year and then multiplied by 100.

Source: Author's survey 1990/91. na = Not available



### Construction Cost and Land Price Index for Two Room Houses in Peripheral Colonies in Lucknow City

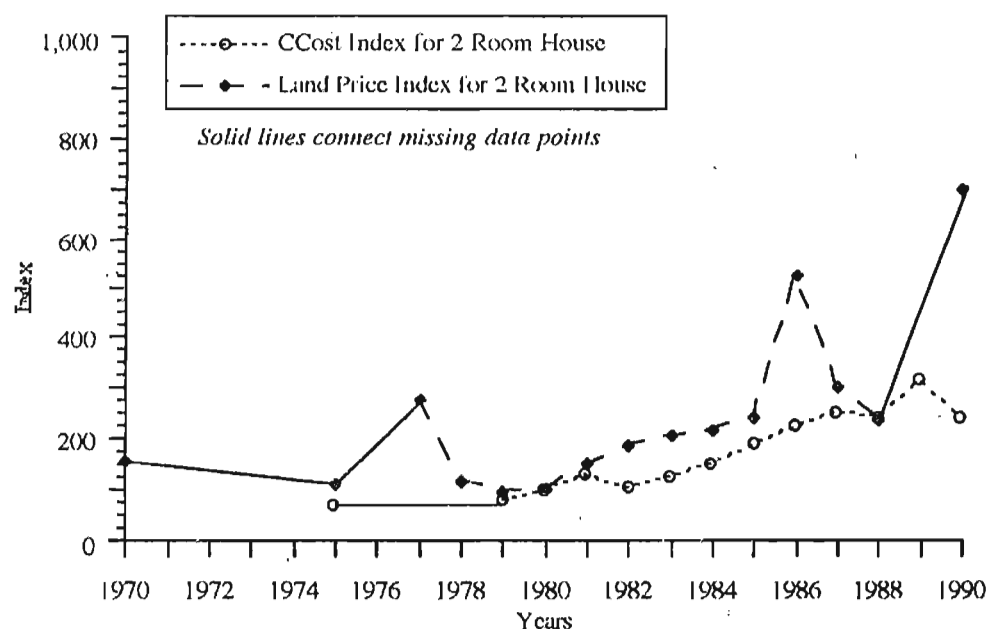


Figure 5

in land prices during the late 1980s. But this overall pressure from the people who were pushed out from buying plots for four and three room houses, eventually generated a big demand for two room houses. This is evident from Figure 5 that land prices for two room houses always exceed the construction costs.

Since we see that there has been much increase in land prices than what has been noted in the construction costs, it will be interesting to examine whether land prices and construction costs have increased faster than the increase noticed in wholesale price index in the country - an index of inflation.<sup>13</sup> Table 5 clearly demonstrates that the average annual rate of change in land prices (14.5%) for four and above room houses during 1974-1989 period is more than double, the change noted in the wholesale price index (6.5%). This situation remains

<sup>13</sup> The trend of wholesale price index in India is almost the same for U.P.; hence in the present context we decided to use Wholesale Price Index for India. Further, wholesale price index for U.P. is not available for the whole period.

almost the same in the case of three and two room houses. This leads us to comment that land has become more expensive in the city than the construction costs and the average annual rate of change in its prices is well beyond the change observed with the inflation.

**Table 5 Average Annual Rate of Change in Construction Costs, Land Prices and Wholesale Price Index for Peripheral Residential Colonies in Lucknow City**

Years	Duration	Construction Costs	Land Prices	Wholesale Price Index
Four and above room houses				
1974-1989	15 Years	10.0%	14.5%	6.5%
Three room houses				
1977-1990	14 Years	10.0%	14.0%	7.5%
Two room houses				
1975-1990	16 Years	8.0%	13.0%	6.5%

**Source: Author's calculations from the data sources mentioned in the text.**

### **Conclusions:**

Since the focus of this paper has been to estimate construction costs in a growing metropolitan city - Lucknow City - in one of the largest states (U.P.) in India, we believe that some important conclusions arise from the paper. On the issue of estimating changes in the construction cost in Lucknow City, we have demonstrated that there has been increase in the construction cost in the city during the period, 1970-1990. The analysis included various size of houses which have been categorised according to the number of rooms built in each houses. But, there are data availability problems in case of one room houses; hence the conclusion of this analysis is largely based upon houses which have 2 to 4 rooms. We noted that as the size of a house increases in Lucknow city, so does the construction cost.

But, the degree of fluctuation in the construction cost is quite distinct in four and above room houses than what we find in the case of two and three room houses. Further, it is noted that irrespective of the size of houses, the trend of changes in construction costs is less dramatic in the 1970s than what we find in the 1980s. One of the explanations for the emergence of the 1970s and the 1980s regimes in the trend is that Lucknow city has undergone a massive urban expansion phase in the 1980s. Most of today's urban housing developments on the periphery of the city came into existence during the 1980s. However, 1970s was the period when urban expansion was beginning to occur in some selected pockets on the periphery of the city.

On the issue of comparing construction costs and land prices in the city, we note that land prices have increased faster than construction costs of four and above room houses especially during the 1980s. On the contrary, in comparison with construction costs of three room houses, land prices for the similar group of houses register a sharp increase during the late 1980s. Land prices for two room houses always exceed construction costs. In addition, we find that the average annual rate of change in land prices in Lucknow city's peripheral areas has always been on the higher side when compared with the construction cost and wholesale price index. For instance, between 1974 and 1989 the average annual rate of change in land prices for four and above room houses is 14.5% while for construction costs and wholesale price index it is 10% and 6.5% respectively. One of the *indirect* implications of such changes in land prices, in contrast with construction costs, is that there has been a gradual shift in demand for houses of different sizes. Land became expensive for four and above room houses since the early 1980s and that perhaps pushed out people from buying bigger plots. This demanded some adjustments with the housing affordability levels of households which is reflected in growing preference for smaller plot sizes in the city.

Another implication of the foregoing analysis is that there are more number of people from different income groups, but mainly from high and middle income categories, willing to buy smaller plots in the city. This suggests that smaller size plots are purchased by those

households who could have purchased bigger plots, but they are not doing so because they are in an 'adjustment - situation' with their housing needs especially in the wake of increasing land prices. This signifies that even households which apparently have enough purchasing capacity to buy land find it difficult to buy bigger plots; we can imagine the pressure upon lower income group households, especially if they get access to buy land in the city. This is clearly substantiated by the fact that since this study has included only high and middle income group households in its analysis and these households are noted to be making some adjustments with the increasing land prices, the plight of 'Urban Poor' and 'Low Income Group' households can be well anticipated.

In addition to these findings, we hope that we have demonstrated the possibility of estimating construction costs and land prices in a data-constrained situation. An estimation of construction costs in most developing countries' context, especially for residential areas which are privately developed, is extremely complex because of the limited data that we can access. However, as long as we look at various attributes of housing such as land and building materials (including labour) which are produced in a concoction of social and economic variables, there is a way forward to develop further understanding of such a research issue and that is feasible under political economy approach which offers a broader perspective to understand an issue which combines social, economic and political aspects on its canvas.

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