HOUSING, MATERIALS' RESOURCES & INSTITUTIONS FOR RURAL PUNJAB. A PRELIMINARY OUTLINE.

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Farokh Afshar: Massachusetts Institute of Technology
Cambridge MA USA./
30-Main Gulberg, Lahore. Pakistan.

CONTENTS:

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* For Research Project titled "Shelter & Rural Development: The Role of Shelter Technologies, Building Construction and Materials' Industries in Improving Housing and Community Buildings, and Income & Employment Generation in Small Towns & Rural Areas. A Case - Study of a Markaz/Tehsil in Rural Punjab.

Introduction

The following is atleast a consolidation of notes and thoughts arising from the preliminary stages of being in Pakistan and in the province of study. At most and perhaps less accurately described, it is the first, hazarded, approximation of what the final study will contain. As such the present report contains sections that will be the main chapters of the final study in their anticipated order. The first section defines in rough orders of magnitude the extent to which shelter is a problem worthy of attention in the rural areas. The second section describes the existing shelter technologies in rural Punjab, the province of study, including some promising shelter innovations. The third section describes the building materials resources and industries which are drawn upon in rural building construction in the Punjab. Information in these last two sections allows me to comment on some promising shelter technology alternatives and attendant materials' industries given the criteria of this study, (cost-effectiveness and rural income and employment generation). The fourth section describes the institutional structure within which rural buildings are designed and implemented and comments on the possible constraints in implementing what economically and technically may be preferred alternatives of shelter technology. The conclusion briefly draws together the preceeding points raises some methodological problems that are

anticipated and modifications of initial thoughts on how to proceed with the study.

Major omissions are firstly a too brief reference to the informal institutions that effect most rural building construction and secondly no reference to the extent to which rural building construction forms a significant (or insignificant) proportion of total rural social & economic activity in the public and private sectors.

These omissions alongwith more details and additions will emerge from the ongoing investigations.

1.0 Rural-Urban Housing Conditions

Implicit in this study is the position that rural shelter conditions constitute a problem worthy of attention. One way of underscoring this point is to compare it to the urban situation. Such a comparison reveals the following with regard to Pakistan.*

Firstly the majority of the population(71.7%) live in the rural areas - i.e. in settlements of less than 5000 population and given existing population trends, (6% decrease in rural population over the last 20 years) they will continue to do so for the foreseeable, plannable future (year 2000). Furthermore Punjab, the province under study is faithful to this aggregate figure and infact has a slightly higher rural proportion (72.5%) These percentages would increase if we consider (as this study does) settlements upto 25000 population as part of the rural sector. (See Fig.1 & 2).

Secondly, if we remove the distorting effects of settlements greater than 500,000 population (of which there are only 6 with Karachi and Lahore much the largest 5 and 3 million respectively) we find that the largest percentage of the population lived in the settlements of range 10,000 to 25,000 population, and that these settlements and those less than 5000 were growing faster than any other. (Settlements between 5000 to 10,000 grew very little (Fig.3) or even lost population-Fig.4, 1961-72)

The 1981 housing census similarly shows that 72 % of total hou units are in the rural areas, and 60% in rural Punjab alone. (Fig. 6.1)

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* The following is largely drawn from a more detailed paper written by me in Dec.'81 titled "Population Growth Rates & Housing Shortage A comparision of Rural & Urban Areas, Provinces & Settlements in Pakistan."

Furthermore, 44% of the total housing units were constructed in the last ten years. (Fig 6.2) Finally central Punjab, where the micro-region for case study is located, is the most densely populated area in Pakistan.

The above factors taken in combination indicate that the geographical focus and the settlement size range chosen for study are those where there is the most housing demand. (fig 7)

Furthermore a recent study concludes that fully 85% of the housing shortage occurs in the rural areas, and 63% in rural Punjab alone.* Housing shortage is here arrived at through identifying where the most number of units would need to be constructed if the object was simply to not expect more people to live per unit than did twenty years ago (1960) Thus in aggregate quantitative terms, most housing need is also found within the rural areas and rural Punjab in particular.

Finally, in qualitative terms housing need can also be identified as being most in the rural areas. Using the indicator of housing need that most concerns this study - durability of outer wall & roof materials - the 1981 housing census reveals that only 5% of rural houses use durable (Pucca) wall materials as opposed to 43% in urban areas. As more details emerge from this census, (in the process of being released), it is likely that more qualitative disparities between rural and urban housing conditions will be demonstrated (fig 5.1, 5.2 for more details comparing 1963, 1973 & 1977)

* Zaki, J.A.M. (1981) "Housing Conditions in Pakistan". Pakistan Development Review Vol XX # 2 (Summer 81) pp 216-246.

In sum, the significance of the above findings lies in that they indicate that the geographical focus of the study - the rural areas and rural, central Punjab in particular - and the range of settlement sizes the study is most concerned with - upto 25,000 population - are where a substantial proportion if not the most housing need and demand is being felt.

2.0 Shelter Types in Punjab & Upper Sind (Fertile Plain: canal irrigated)

Three distinct private/informal sector types of of houses can be identified in the fertile plains: (See Fig.1 and Table 1.1 to 1.4)

1) Mud/Katcha houses.
2) Katcha pucca houses.*
3) Pucca houses.

1) Mud/Katcha Houses

In the case of mud houses, the mud walls are laid in layers, with larger width at the base wich narrows down towards the top. The average thickness of walls is 15" which varies from 2 feet at the base to one foot at the top. The walls have ½" to 2" thick mud plaster mixed with straw or cowdung to increase its durability as well as aesthetics. These houses have thatched roof on wooden beams and battens which may be of irregular shape and section. The roof insulation and water-proofing is carried out with thick mud/bhoosa** layers. The floors are prepared with mud/bhoosa or mud/cowdung plaster.

Katcha houses are always single storeyed, the roof varying from 8' to 11' above floor level. A house, has 1-3 living rooms in Punjab but only one living room of varying size in Sind where separate space is also provided for quests. Cattle are provided shelter space adjacent to living rooms within the

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* Kutcha: constructed of perishable materials; mud, straw, timb
Pucca: constructed of durable materials; stone, fired brick, steel etc.

** Bhoosa = Straw.

Source : National Housing Policy Study(draft)1980, Personal Observations,

compound of the house. The size of the rooms varies from 120 to 200 sq.ft. In Sind most houses have toilets and baths inside the house whereas in Punjab most houses do not have them. In some houses a small enclosure for food grain and fodder storage is also provided. The thickness of the walls varies from 13½" to 18" and the wall height from 8' to 10'. (See Photo 2.)

2. Katcha Pucca House

The commonly preferred type of construction in fertile plains of Punjab, Sind and NWFP is the one built with sundried brick with load bearing walls. These bricks commonly known as katcha bricks are moulded in cast, with a mixture of canal-bed sand and local soil by skilled workers in bigger villages or towns. The katcha bricks are available at a low price of Rs.40-60/- per thousand. The thickness of the wall ranges from 13" to 18". In some houses, the foundation, and walls upto 2-3 feet above the floor level are built in burnt bricks with cement mortar for extra strength and to safeguard against seepage in the water logged areas. The walls are mud plastered on both sides and white washed inside. Three types of roof are generally observed in katcha brick houses:

i) Beams and battens with 'chick' or mat and mud mixed with bhoose layers on top;

ii) Beams and battens in regular sections with burnt brick tiles laid on battens. On top of the brick tiles, 4 or 5 layers of mud/bhoosa mix, each with a thickness of 1"-2" are laid for water proofing as well as heat insulation.

iii) Steel girders in I-Section with steel tiers across are laid on load bearing walls with burnt clay tiles (at times glazed) on them. Cement mortar is often used to seal the joints. On top of tiles, mud/bhoosa layers upto 4-5" thickness are laid for heat insulation. This type of roofing is particularly popular in rural Sind.

Flooring in such houses is normally of three kinds:-

i) Katcha floors as in mud houses.

ii) Brick tiles or colourful patterned floor precast cement concrete tiles laid on base course consisting of 2-3" thick sand layer or concrete aggregate.

iii) Gray or coloured cement finishing on concrete base course. In few cases terrazo flooring (Mosaic) also exists.

3) Pucca Houses

Pucca houses are very rare in small villages. However, in some bigger villages, a few pucca houses are constructed which do not vary from the usual city/town pucca houses. The basic structure is load bearing walls constructed in burnt bricks with mud mortar, with cement pointing on the exterior and cement plaster on the interior or with plaster on both sides. The thickness of the walls is usually 13" though sometimes thicker walls are also constructed. The roof is generally constructed, either with wooden beams and battens or steel girders and tiers on top of which burnt clay roof tiles are laid. In Sind, sometimes, Hala made roof tiles with glazing on the ceiling side are also used. Houses are normally single storeyed and the roof is coverted with mud layer for heat insulation. However, two storeyed houses are also not uncommon.

The older houses in lower Sind, where cool breezes from the Arabian Sea is a common feature; have wind catchers on the roof for air circulation and ventilation. In the new construction, even in the Lower Sind, wind catchers are no more common except in squatter settlements in Karachi. Provision of ventilation near the roof is common in all superior type of rural houses in Pakistan. Wooden doors are most commonly provided. Fixed precast jali windows as well as wooden windows are also common. Small niches or brackets are provided in the houses in place of cupboards.

There are two further types of Pucca houses in the formal sector:

4) Pucca Houses (Public Sector & higher quality private sector construction).

The wall structure is also load-bearing burnt bricks, however cement-sand mortar is used in place of mud mortar. The roof is always either constructed of steel girders & clay tiles or of poured reinforced concrete slab. (Photo.5)

5) Pucca Houses (Low-cost Housing 'Prototype')

Recently a low cost housing unit using concrete hollow blocks and pre-cast concrete roof beams and slabs has been developed by an independent consultancy group and used in some public-sector housing.[1] At Rs.100/sq.ft this technology is supposed to be 1/3rd cheaper than the lowest cost public sector construction of a similar quality. (see Photo 7,4.)

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1. Kibria Associates, used in Lines Areas Housing Project, Karachi.

6. Shelter Technology Innovations

Also relatively recently the Building Research Centres in Karachi and Lahore have experimented with various cost saving techniques such as cement with rice-husk bonds (Karachi) a brick specially designed to economise on the use of cement mortar (Lahore) and the use of lime-mortar. The last seems the most promising since lime can be made available cheaply in large quantities and it also has a wide range of applications both as a mortar as well as the major in gredient in lime-sand and lime-cement bricks and blocks.

3.0 Building Materials Resources & Industries for the Punjab (See Fig. 8 & Tables 2.1, 2.2 & 2.3)

3.1 Cement

Gypsum, the major input in cement is widely available and cement industries are well distributed across Pakistan. In addition to general construction works a high proportion of cement output is used in public sector buildings and most higher quality private sector construction. It is a capital intensive industry with a high foreign exchange component. Cement prices are government controlled and cement is distributed in quotas to sales depots located in most urban settlements. The controlled price has been well below the (black) market price. In the last few years however cement imports have been encourged and the controlled and market price have almost levelled (Rs.65/bag). However, imported cement is of a lower quality than the local cement requiring more careful supervision in use during construction to insure adequate structural strength. Cement output is being expanded by doubling the capacity of several plants as well as constructing new plants.

3.2 Steel

Most of the steel used in construction comes from scrap iron from shipbreaking yards near Gwadur port at the mouth of the Persian Gulf. Iron & steel works (re-rolling mills) which process this scrap iron are well distributed around the major urban centres such as Lahore. The structural strength of steel from scrap iron cannot be exactly assessed and therefore much steel construction is over designed to insure a safe load bearing capacity or cannot be depended upon for its

strength. The steel works and re-rolling mills have a high labour component. Some high quality steel is imported and used in large construction works. A highly capital intensive steel mill is coming on stream in Karachi.

3.3 Timber

Timber thatch and reed for roofing is extensively used in informal sector rural construction but hardly at all in the formal sector. (Photo This is because only low quality timber (and thatch and reed) is widely available and in expensive. This timber source is from village plantations-along water courses as well as in commonly owned village wood lots. (Shamlat) The commonly used trees are 'Keeker' and Sheesham. Four forests in central Punjab near Chichawatni, Chhanga Manga, Pirkot and Shorkot provide the timber used in the smaller towns in the area. High quality expensive timber comes from forests on the mountain slopes in North Pakistan and particular from Azad Kashmir. These are coniferou woods such as Pine and Deodar. Timber logging, sawing and distribution from the major forests are organized as a labour intensive industry under the supervision of the Forestry Department. In effect tree cuttir is difficult to regulate and in the absence of significant reforestatio programs the price of both low and high quality timber is rapidly risin However, the existance and tradition of having village wood lots as wel as river course plantations provides a basis for encouraging small scale rural based timber industries. Such industries if developed to include improved wood treatment, sawing and preparation procedures, alongwith the popularisation of improved timber roofing technologies, could offer a

much higher quality roofing to the traditional timber roof while being much lower in cost than the present cement and steel alternatives. Since neither the steel nor cement industries can meet existing demand any substitution from it to timber should not adversely effect these industries and should certainly enhance rural incomes and employment.

3.4 Kiln Fired Brick & Concrete Block

In Punjab, all building walls of pucca houses are made of fired brick. Rural Punjab has extensive clay deposits and brick kilns are widespread. These kilns are small, labour intensive industries employing from 5 to 20 persons depending on kiln size and the stage of the brick making process. The kiln workers are often the poorest, landless peasants who through borrowing as advances on their wages are often, in effect, bound to work for much of their lives to particular kiln owners. They live in makeshift shelters on the kiln land and move with the kiln as each site is exhausted of its clay deposits.(See photo 3). Since kilns can be started up with small capital assets (unlike cement and steel industries) and the major input clay continues to be widely available without need of replenishment (unlike timber) the brick industry has so far kept up with the accelerating demand and prices are relatively stable. (The expanding clay pits are also causing increasing ecological damage cutting into agricultural land as well as becoming mosquito infested ponds). However bricks continu to be too expensive for the 75% of rural houshold that live in Katcha houses. It may be desirable to popularise the use of low-cost stabilise

soil bricks or blocks using small quantities of cement or lime as stabilisers. The market for these stabilised bricks/blocks will likely be amongst the 75% in Katcha houses rather than cutting into the kiln brick market, Stabilised brick/block making plants can be started by two people with a manual ram, a wheel barrow and a shovel. Thus with demand and supply potentially elastic this could be another rural industry. Concrete blocks are the major wall construction in Sind where clay for bricks is not available and there are major cement plants Block making is therefore not alien to the country.

3.5 Building Stone

Quarry & Lime stone are a relatively small component of rural building construction costs and used only in foundation plinths in formal sector construction. Stone Quarries are located in Chiniot, Sikhanwali, Kinjana Hills near Sargodha (Oldest Quarry) and near Dera Ghazi Khan (new Quarry). Aggregate is also obtained from these areas as well as between Jhelum & Texila. Most lime stone also comes from the Jhelum-Gujranwal districts. The quarrying methods are labour intensive.

3.6 Sand & Lime

Sand is available along the banks of the major rivers as well as old river beds. Hard drift stand for high quality constructon is obtained from upriver location (for example near Haro Lawrencepur) ordinary building sand or pit sand can be obtained from along most of length of the river banks. The clay content and fines accumulates progressively downriver (for example near Multan) requireing to be washe out before use in construction. There are extensive lime deposits in

rural Punjab.

Both materials are important inputs in rural building construction whose value and use could increase if already developed innovations for low-cost building materials are popularised.

In Summary:

The potential for village based timber industries and timber roofing technologies as alternatives to cement and steel has been mentioned. Stabilised bricks and blocks as substitutes for fired bricks and lime as a substitute for cement are two other cost lowering potentials in rural building construction. Lime industries can also enhance rural incomes and employment by being rural based, requiring much less start-up capital and having virtually no foreign exchange component comparted to its substitute, cement. In so far as stabilised bricks and blocks cut into rural fired brick industries the aggregate increase in incomes and employment may be less. However it can be expected that a low-cost alternative will increase consumption rather than substitute within a fixed market. That is those who could not affored the jump in costs between an earth and fired brick building and therefore remained with the former may now enter the lower-cost brick/block and lime mortar market.

Thus at first glance the existing range of shelter technologies and building materials resources and industries offers several cost reducing, shelter quality and rural incomes and employment enhancing opportunities. It remains to be seen whether this impression

is borne out by more detailed investigation. Further more and perhaps more important, we do not as yet know whether the institutional coordination and will, exists which will be required to design and implement the necessary package of programs to put such ideas into effect. The program would need to consist atleast of r & d on low-cost shelter technologies and their popularisation, along with the promotion through credit and technical assistance, of small-scale largely decentralised materials industries such as timber, lime and stabilised brick.

4.0 Institutional-Spatial Structure for Building Construction (See Tables 1.4, 3.3, 4.1, 4.2 & Figs.7,9&10)

Not surprisingly the overwhelming majority of buildings constructed are done so with no professional assistance. Type 1 (Table 1.4) is self-help owner built, Type 2 & 3 may use individual masons/carpenters or small building contractors' assistance. Higher quality private sector construction and public sector construction will in addition to building contractors, use engineers and less often,architects for the design and construction supervision.

Most public buildings in rural areas are designed and implemented at the provincial level and below. The Planning and Development Department, Government of Punjab is supposed to oversee and coordinate the work of other departments including their building activities.

In effect three sets of public bodies are directly involved in building construction(Table 3.3).

1. The Buildings section of the Communications & Works department designs, supervises construction and maintains all buildings required by other departments such as Health and Education which do not have technical section. Thus all health buildings, (hospitals at the District & Tehsil levels, rural health centres and basic health units at Markaz and Union Council levels) are standardised designs with standardised technical specifications and construction proceedures.

Educational buildings - secondary and primary schools, are similarly standardised in design, and implemented and maintained by the Buildings Department.

2. The Departments of Housing and Physical Planning (H&PP), Local Government and Rural Development (LGRD) and Irrigation have technical sections which design and construct their departments' buildings. Of these departments, H&PP has the most extensive construction program but their projects seldom go below the Tehsil level. The other two departments are involved in building construction down to the Union Council. LGRD building activities are quite extensive including schools offices, vocational training centres etc. Irrigation department building activities are confined to maintenance of their existing buildings (field officers housing etc.) pump building and grain stores with very little new construction.

3. The Local Government at the District, Tehsil and Union Council levels also constructs and maintains buildings. They have to fund these activities through relatively meager local taxes and revenues and therefore their activities have been limited. There are plans to extend the revenue generating powers and technical capacities of the local governments which will increase their role vis a vis local building construction.

In addition to the above, building research centres at the federal and provincial levels are also supposed to assist in building construction through their r & d work. Although, as

they have developed certain cost-reducing innovations such as rice-husk cement, and soil-cement blocks these innovation have yet to be popularised. It is interesting that the one innovative attempt that is being adopted albeit to a limited extent (the low-cost housing prototype) is the work of private architects and consultants. Furthermore the consultant, Kibria, who developed the prototype, for many years headed the government's appropriate technology cell. In a recent interview with me he claimed that from within the bureaucracy he found it more difficult to introduce innovations into the market.

The House Building Finance Corporation (HBFC) is the major source of housing credit. Analysis of its activities undertaken to date point out that

1) It is grossly under-financed considering the level of finance required for housing.*
2) The bulk of its loans were made to the upper income households in the four major urban areas**
3) 41% of these loans were made in Karachi city where (by co-incidence) 41% of the total housing units financed by HBFC were constructed[1] (For the period 1973-78).

Needless to say HBFC played no role in financing housing in rural areas and it is as yet unclear what, role if any, it can play. Although the authors of the current National Housing Policy argue for

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* National Housing Policy Study (1980).

** Zaki (1981) Housing conditions in Pakistan.

1. Ahmed, Mushtaq (1982) Reported in Pakistan Times, May 8, 1982.

more funds for the corporation they are naturally an interested lobby and will meet resistance from other sectors competing for finance. Not incidentally, if an argument for simultaneously promoting rural incomes and employment can be persuasively made (thru construction & building materials industries) as this study will attempt to do, the housing finance lobby may be in a stronger position to counter the claim that it supports financing consumption rather than production. Another venue to increase housing finance to the rural sector would be to channel it through existing rural institution such as the agricultural banks and even the local government structure (by means of matching grants etc.). Further investigation may clarify if these avenues are desirable and possible to employ.

A final set of public institutions involved in rural building construction (given the approach of this study) are those concerned with the building materials industries i.e. the Industry and Mines Department, the Small Industries Corporation and Forestry Department. These departments could be central in promoting the attendant industrie required to support particular cost reducing, rural income and employment generating shelter technologies such as those that employ timber and lime. The link between these agencies and those conventionally concerned with housing has traditionally been very weak and attemting a coordinated effort either at Provincial or at the lower, for example Markaz, level may be a major problem.

Finally there are a whole set of informal institutions at the level of the small towns and rural areas through which shelter inno tions are absorbed & shelter financed and constructed. Little if any

literature is available on these institution and yet they would play perhaps the most critical role in both appreciating what needs to be done and how it may be implemented in the sphere of rural shelter. These informal institutions should be an important aspect of investigation in this study.

In Con lusion

In conclusion one can hazard the following tentative first guess regarding the results of the study based on the very preliminary information gathered to date.

Regarding the cost-effectiveness of shelter technologies: a stablised soil (using sand, lime, cement) brick or block and timber roofs may prove most suitable relative to the benefits (as assessed through some measure of durability - i.e. maintenance costs - comfort and health) and compared to other existing or possible alternative technologies. Such a technology will also stimulate the most rural income and employment being that the construction will be labour intensive (much of which would be the unskilled rural poor) and that the supporting materials industries - lime, clay bricks, timber, could also be small-scale, labour intensive and rural based.

A basic question to be confronted is that to what extent is employment generation an advantage if, as some people have suggested, given the middle-east migration, there is little unemployment in the rural areas and indeed some areas are facing labour shortages? Labour intensive construction and industries may thus be a problem rather than a solution. Further investigation will throw some light on this issue. It may be that the labour shortages are in the skilled builders' class and not amongst the unskilled, rural poor in which case the technology suggested would still be a valid preference relative to the existing alterantives of fired brick, steel and concrete.

Atleast two methodological problems may be faced in making valid cost comparisons between the various technological alternatives. Firstly labour and materials' costs may vary significantly from settlement to settlement even within the same district. A preliminary check suggests this may be so. (Fig.10) Thus the generalisability of the findings may be restricted. Secondly, regarding the analysis of technologies and materials industries which are not yet widely developed and in use (such as soil blocks, lime kilns and timber industries), one would have to use existing market prices which may be higher than if they were popularised. In the case of the latter event the resulting lowering of costs may have to be estimates open to question.

Even assuring a technical and economic case can be made for particular shelter construction methods & materials industries, their adoption will depend on their cultural and institutional acceptability. Some of the possible problems regarding institutional implementabilities have been alluded to above.

Regarding spatial dimension for the analysis, the initial thought to confine the study to the markaz level may have to be revised. A glance at the markaz boundaries suggests an arbitrary almost random division indicating that any functional links-for example between builde and his client, or materials industries, resources and their place of use - would trespass across two or more markaz lines (Fig.9). At this point it appears that the tehsil may be a

more valid basic unit of study and planning unit. From this unit one could refer down to the Markaz when considering such factors as implementation of proposed construction and upto the district level perhaps even province, when considering such factors as materials industries, their labour catchment area and market.

These are some of the possibilities and considerations that arise at this first stage of the study.

ILLUSTRATIONS:

FIG:1 PROVISIONAL POPULATION BY PROVINCES – 1981 CENSUS

Area	Population (in thousands)		Percentage change in population (1972–81)	Sex–ratio (Males per hundred Females)		Proportion 1981 Census	Density per sq. KM	Urban population as percentage of total population
	September 1972	March 1981		1972	1981			
1	2	3	4	5	6	7	8	9
Pakistan	65,309	83,782	28.28	114	111	100	105	28.28
N.W.F.P.	8,388	10,885	29.77	108	108	12.99	146	15.23
F.A.T.A.	2,491	2,175	(–)12.68	103	108	2.60	80	–
Punjab	37,610	47,116	25.28	116	111	56.24	229	27.53
Sind	14,156	18,966	33.98	115	110	22.63	134	43.37
Baluchistan	2,429	4,305	77.23	113	112	5.14	12	15.61
Islamabad	235	335	42.55	124	119	0.40	369	60.20

FIG. 3. Population, by Urban and Rural Residence and Size of Urban Locality: 1961 and 1972

Area	1961[1]			1972		
	Number	Population	Percent of total country	Number	Population	Percent of total country
Total Country	(X)	42,880,377	100.0	(X)	65,309,340	100.0
Urban areas[2]	315	9,654,572	22.5	431	16,593,651	25.4
Localities with 500,000 or more inhabitants	2	3,209,075	7.5	6	6,846,474	10.5
Localities with 100,000-500,000 inhabitants	10	2,476,492	5.8	18	2,963,533	4.5
Localities with 50,000-100,000 inhabitants	10	702,269	1.6	22	1,514,518	2.3
Localities with 25,000-50,000 inhabitants	30	1,100,441	2.6	52	1,808,656	2.8
Localities with 10,000-25,000 inhabitants	78	1,149,870	2.7	159	2,433,294	3.7
Localities with less than 10,000 inhabitants	185	1,016,425	2.4	176	1,027,176	1.6
Rural areas	(X)	33,225,805	77.5	(X)	48,715,689	74.6

[1]Excludes 97,883 non-Pakistanis.

[2]Urban areas are defined as "those having a municipal corporation, municipal committee, cantonment board, or town committee. In general, an area was designated as urban if it had a concentration of population of at least 5,000 persons in a continuous collection of houses and if the community sense was well developed and the community maintained public utilities such as roads, street lighting, a water supply, and sanitary arrangements. In special cases, a few areas that had urban characteristics but had a population of fewer than 5,000 were also treated as urban." (Latif and Sheikh, 1976, p. 137).

Source: Census data as reported in Pakistan Office of the Census Commissioner, no date b, statement 3-E; and Pakistan Census Organization, [1979], tables 2, 3, and E.

FIG. 4. RATE OF GROWTH OF URBAN POPULATION BY SIZE GROUP 1961, 1972.

Size Group	1961		1972		Growth Rate
	Total Number of Urban Areas	Total Urban Population	Total Number of Urban Areas	Total Urban Population	Percent p.a. 1961-1972
< 10,000	184	1,033,031	167	1,000,427	-0.3
10,000-24,999	86	1,289,552	152	2,308,992	5.5
25,000-49,999	31	1,139,741	52	1,818,813	4.3
50,000-99,999	12	876,113	18	1,231,306	3.1
> 100,000	11	5,275,337	21	10,185,070	6.2
Total	324	9,613,774	410	16,544,608	5.1

Source: 1) Census of Pakistan, Vol. 3, West Pakistan Population, 1961.

2) Census of Pakistan, 1972.

Fig 5·1 *Housing Units by Type of Construction, Pakistan and Provinces 1963–73*

Country/ Province	All Housing Units				Rural Housing Units				Urban Housing Units			
	Total thousand	Pucca %	Pucca-Kutcha %	Kutcha %	Total thousand	Pucca %	Pucca-Kutcha %	Kutcha %	Total thousand	Pucca %	Pucca-Kutcha %	Kutcha %
					Constructed Up to 1963							
Pakistan	7082	7.8	29.2	63.1	5261	0.8	23.4	75.8	1821	27.8	45.8	26.4
Punjab	4383	3.9	33.7	62.4	3378	0.8	25.4	73.8	1005	14.4	61.5	24.2
Sind	1456	23.1	10.4	60.5	835	0.7	10.2	89.1	621	52.7	29.2	18.0
NWFP	911	3.7	35.4	60.9	767	1.3	35.0	63.8	144	16.7	37.3	45 9
Baluchistan	332	3.3	8.0	88.7	281	0.6	5.7	93.7	51	18.1	20.7	61.1
					Constructed Up to 1973							
Pakistan	10881	9.3	27.7	63.0	8034	1.2	22.3	76.6	2847	32.0	43.1	25.0
Punjab	6744	4.8	32.8	62.5	5216	1.0	25.0	73.9	1528	17.4	59.2	23.4
Sind	2550	23.9	14.8	61.4	1489	1.0	9.2	89.9	1061	55.6	22.4	22.0
NWFP	1075	5.4	35.7	58.9	891	2.1	35.3	62.6	183	21.5	37.4	41.1
Baluchistan	512	3.5	9.3	87.2	438	1.1	7.3	91.6	75	17.8	20.8	61.4

Source: [17]. Zaki JAM. (1980)

Fig. 5·2 *Housing Units by Type of Construction, Pakistan and Provinces, 1976-1977*

Country/ Province	Percentage of total housing units by construction type		
	Pucca	Pucca-Kutcha	Kutcha
Pakistan	20.3	16.7	63.0
Rural	8.3	13.7	78.0
Urban	54.3	25.1	20.6
Punjab	31.5	17.5	51.0
Rural	8.5	16.0	75.5
Urban	67.5	19.5	13.0
Sind	31.1	22.5	46.4
Rural	3.0	8.0	89.0
Urban	48.2	31.3	20.5
NWFP	16.0	17.6	66.4
Rural	14.0	15.5	70.5
Urban	19.5	22.0	58.5
Baluchistan	15.5	17.0	67.5
Rural	–	15.0	85.0
Urban	35.4	19.4	45.2

Source: [19].

FIG 6·1 NUMBER OF HOUSING UNITS: Province, Rural-Urban. (1981 Census)

COUNTRY/ PROVINCE	TOTAL	%	% of Total.
PAKISTAN	12587648	—	—
RURAL(R)	9033475		72
URBAN(U)	3554173		28
PUNJAB	7533 326		60
R	5569956	74	44·5
U	1968 371	26	15·5
SIND	2781 873		22
R	1558 703	56	
U	1223 170	44	
NWFP	1615 616		13
R	1381 540	85·5	
U	234 076	14·5	
BALUCHISTAN	592814		4·5
R	501 231	84	
U	91 583	16	
ISLAMABAD	59 019		0·5
R	22 046	37	
U	36 973	63	

FIG 6·2. HOUSING UNITS BY CONSTRUCTION PERIOD. (1981 Census)

PERIOD Dates	Yrs.	TOTAL	%
1970-80	10	5515 357	44
1947-70	33	4,601 278	37
<1947	-	2471 013	19