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FARHAT GULZAR
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RUSSIA'S TERRITORIAL EXPANSIONISM IN THE EURASIAN HEARTLAND

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Several geographers have theorized causative relationships that exist between Russia's national security considerations and regional geographic factors. These territorial relationships have been deemed to influence the national security, military power and expansion of national boundaries of Russia. This paper examines the relationships which have historically impacted Russia's foreign policy vis-a-vis her neighbors in Asia and Europe. To expand on this subject matter, two of the most popular geostrategic theories as proposed by Mackinder [1] and Spykman [2] are discussed in the light of present political ramifications in Asia and Europe.

Over the last 500 years, Russian thinking, whether Czarist or Soviet Communist, has remained quite consistent with the policy of her territorial expansion. In the past and present, Russia's primary objective has been to obtain corridors to the sea, thus providing an opportunity to compete commercially and, more importantly, militarily with the great sea powers of the world. In his "Geographical Pivot of History" and Democratic Ideals and Reality, Sir Halford John Mackinder describes Russia's role in world affairs based on its possession of the Eurasian Heartland and its desire to increase its land power and establish and develop sea power.

The dichotomy of Russian land power and world sea power, that the country has long attempted to balance, has its origins, Mackinder says, in traditional rivalries. First is the ancient East-West, Roman-Greek conflict. Mackinder affirms that "it is the Roman-Teuton who in later times embarked upon the ocean; but it was the Greco-Slav who rode over the steppes [3]." Similarly, such horse-riding peoples who dominated the Russian steppes met opposition in the form of the sea-faring Vikings, thus gripping the European population "between two pressures that of the Asiatic nomads from the East and on the other three sides that of the pirates from the sea" [4]. Thus, Russia has traditionally held power and influence only inland, while searching for opportunities to make its presence felt on the sea.

As it is Mackinder's belief that "the empire of the sea is doubt-less the empire of the world," Russian attempts to balance power throughout history have been obviously necessary [5]. Sea power can be neutralized or even defeated in two ways, according to Mackinder. First, land powers can use their strength to deny the sea powers the bases and ports necessary for a water-dominated power. A second option is to develop invincible sea strength to compliment land power [6]. Russia has attempted to narrow the advantage of sea power by following both methods. Russia, especially in recent years under the Communist regime, has taken steps to increase its land power to better confront the sea faring powers. Significant developments were first made with Joseph Stalin's implementation of the Five Year Plan in 1928. The vast supply of resources in the Heartland, especially Siberia and Central Asia, were utilized to form an industrial foundation [7]. That solid beginning in the last few decades allowed the Communist regime to become a major world producer of coal, iron ore, chromite, lead, manganese; platinum, mica, potash, steel, cement, wheat and cotton, and thus an important world power [8]. Gradually, the building of railways, roads, airports, pipelines and power lines increased the area's transportation and communication capabilities, which in turn has led to a rise in economic potential and strategic importance. The development of railways has been particularly vital as a means of "transmuting the condition of land power [9]. Not only did the train aid the transport of resources and materials, but it also provided an efficient means of quickly moving troops, as opposed to slower sea transportation. For example, during the Russo-Japanese War of 1904-05, the Russian placed "an army of more than a quarter million men 'against the Japanese in Manchuria at a distance of 4,000 miles by rail [10] an impressive achievement for the time.

While great strides have been made in furthering dominance on the land with internal developments, Russia has, for centuries, also been concerned with external development and expansion to the sea. The control of strategic waterways and expansion to the sea has been an integral part of the Russian expansionist policy ever since the establishment of the Czarist Russia 900 years ago. Numerous seas, straits, gulfs, and waterways, especially in the Middle East, which Russia covets are within striking distance of the Heartland: the Black Sea, the Caspian Sea, the Dardanelles, the Persian

Gulf, the Arabian Sea, the Bay of Bengal and the Mediterranean Sea, among the most prominent.. W.H. Parker, in his analysis of Mackinder's theories, agrees that "she (Russia) has always yearned for free access to the oceans enjoyed by other great-nations. A thousand years of Russian history can be interpreted as that of a land-locked -state struggling to break out from claustrophobic isolation [11]. "Mackinder terms Russia's lack of maritime territory and 'its desire to obtain it as a "dissatisfaction" that

"takes the form of aggression." The nation's best interests, he asserts, would be met by obtaining solid control and use of as much sea-lying land as possible [12]. In more recent years, with the onset of the nuclear arms race, the importance of strong conventional forces, particularly a dominant navy, as an alternative to nuclear weapons is evident. The fact that Russians have always faced a shortage of friendly waters in which to navigate has been a matter of serious concern to them. Strategist General Sir John Hackett notes that "her ships have no clear and easy access to the high seas, her surface and sub-surface fleets must move over tremendous distances around the 'rimlands (outerlying nations)' ...past coasts held by other powers, and her fleets must be distant, scattered and divided, with no easy means of shifting vessels from sea to sea or of reinforcing one fleet with another [13]."

Thus, Russia's historical actions and current ones by the Soviet regime have been and are filled with movements to gain areas located near waterways. By the mid-Seventeenth Century, Russia had moved some 3000 miles eastward across Siberia to the Pacific Ocean. Still, it took another century before Russia took steps to develop this Far Eastern territory. The Trans-Siberian Railway, connecting Moscow to Vladivostok, an important port on the sea of Japan acquired in 1860, was finished by the arrival of the Twentieth Century. The strategically located Port Arthur on the East China Sea was leased from China to Russia in 1898, but the Japanese shortly claimed it with a victory in the Russo-Japanese War. With the reign of Peter the Great, Russia turned its attention back toward Europe and the West. St. Petersburg, the "window on the west," was built in northern Russia at the head of the Gulf of Finland in 1702. Territory on the Baltic Sea was Peter's goal, and by his death in 1725, Russia controlled much of that sea, as well as the Gulf of Finland.

Similarly, Catherine the Great was eager for expansion, this time to the South, in the late Eighteenth Century. Eventually, under Catherine, the Russians realized a long-awaited dream with the occupation of the northern coast of the Black Sea. Control of the Black Sea would provide a route to the Mediterranean, presuming that the Ottoman

Empire would permit use of the Dardanelles, or Turkish Straits. Later, in the Twentieth Century, Russia would try to secure the Dardanelles from Turkey with the conditions of the Constantinople Agreement (1915) and the Treaty of Sevres (1920), neither of which were instituted. Another significant expansionist move was aimed at the Caspian Sea region. Early in the Nineteenth Century, the area west of the Caspian, including Georgia, was seized from Iran by Russia. In the late years of that same century, Russia again obtained lands in the Caspian area, this time to the west in Turkestan, or the Persian Khanates. Included in this region were the

important cities of Tashkent, conquered in 1864, Khiva (1873), Khokand (1876) and Samarkand (1886). This Caspian Sea territory presented Russia with a route to not only the strategic Persian Gulf, but also the Indian sub-continent.

In more recent years, the former Soviet Union has been concerned with its influence as a world power and the presence of countries in the inner and outer "crescents" that surround the Heartland. As for its role as an international power, the former Soviet Union "occupies the central strategic position ... in Europe. She can strike on all sides and be struck on all sides, save the North [14]." Mackinder contends that "if to a strong strategic position and unmatched natural resources there were to be added a large, skilled, well-equipped, and highly-organized people, the danger to world freedom would be great [15]." As it is evident that strategic location and vital resources have already been secured, the former Soviets authorities have been working on-developing their population, as Mackinder suggested.

The importance of controlling the crescent nations, while increasing the strength of the Heartland has been another Soviet concern. The Russians have been successful in more recent years with respect to the countries of the inner crescent-Germany, Austria, Turkey, India and China. In the post World War II years, the former Soviet Union spread its influence to Europe with the establishment of its communist satellites of the Eastern Block, with Poland, Czechoslovakia, Hungary, Bulgaria, East Germany, Romania and Albania, the Soviets had an important buffer zone with the West. Also, the nation's influence in China and the establishment of communism there were significant. With the Soviet presence in Afghanistan in the 1980s, it became apparent that traditional designs on the Indian sub-continent were re-emerging.

Similarly, Russian involvement in the Iran-Iraq conflict and the super power's aid to the Iraqis evidence a renewed interest in the Persian Gulf region. The former Soviet Union were also active in Egypt in the 1950s, aiding the building of the Aswan Dam. Clearly, the country's intention was also to gain influence in the country and ultimately the Suez Canal, but Soviet presence there was short-lived. The relations of the USSR with Great Britain, South Africa, Australia, the US, Canada and Japan - the countries of the outer crescent - have not been as successful for the Soviets. Intervention by the former Soviet Union in Cuba and most recently in Central America have been the only major moves against the outer crescent. Even in situations where the Russians could not gain an advantage through influence and expansion, the USSR "favored benevolent neutrality" of certain countries, preventing the US "from using territories as parts of its "perimeter of defense [16]." Thus, recent Soviet

actions, such as the invasion of Afghanistan in 1979, have been based on gaining control over the crescent nations en route to world domination.

Clearly, Mackinder's theories about Russian interests in world politics are extremely accurate. As historical evidence and current actions indicate, the Russian/Soviet designs have been concerned with increasing land power, establishing and developing sea power through expansion and controlling the crescent nations while increasing international recognition and influence.

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DISTRIBUTION OF CITIES AND CHANGE OVER-TIME: The case of Isfahan province, Iran

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INTRODUCTION

Since 1966 the Isfahan province of central of Iran has undergone rapid urbanization. This paper examines the pattern of urbanization and the degree of primacy in the province, and the distribution of urban areas from 1956 to 1986. In order to do this, the rank-size rule, Jefferson's indices, and Hoover's index are used.

DATA COLLECTION

In this study, the population size of 48 urban areas were collected from 1956-1986 from four censuses. These data were compiled from various government publications including statistical year books from 1956-1986; and from the volume of identification of Iranian urban areas [1] that was prepared in 1986 for all Urban Areas in Iran.

METHODS OF ANALYSIS

The rank-size rule is used to study the pattern of urbanization in Isfahan province and the growth of urban areas. This states that for a group of cities in a given region, the population of any individual city has a direct relation to its rank by size and to the population of the largest city. The relationship is expressed as follows:

$$PR = P1/R^q \quad (1)$$

where

P1 is the population of the largest city
PR is the population of the city of rank R
R is the rank of the city with respect to size
q is constant

When converted to logarithms, equation (1) becomes

$$\text{Log PR} = \text{Log P1-q LogR} \quad (2)$$

where the relation between rank and size is linear on a double-log scale, with a slope of $-q$. In the ideal case where $q = 1$, the rank-size rule obtains such that $R_{pr} = K = P1$, where $P1$ is the population of the largest city. It means that the second largest city is expected to be half, the fourth ranking city about one-fourth, and the hundredth ranking city one-hundredth the size of the largest city. Such relationship has been discussed by Zipf (1949) and Berry (1958). There are several approaches to the study of changes overtime. Berry, for instance, showed changes over time in the urban areas of a region, from an analysis of the shape of size distribution curves. This technique is adapted to illustrate change in the urban areas of Isfahan province. The Jefferson (1939) primacy index is used to show the degree of primacy in the province: It is measured by the ratio of the population of the largest city to the combined populations of the next three largest cities.

$$J_b = P1 / P2 + P3 + P4. \quad (3)$$

Jefferson also proposed another indicator, the ration of the largest city ($p1$) to the second largest city ($p2$)

$$J_a = P1/P2. \quad (4)$$

Hoover's index is used for the study of the concentration or deconcentration of the urban areas in Isfahan province: It gives a measure of the concentration of population of certain defined urban areas in relation to the total population. In this study the Hoover index formula is adapted to show the concentration of population in urban areas in the province and change over-time, the formula is

$$H_c = \frac{1}{2} \sum P_i a_i - a_i 100 \quad (5)$$

H_c is the Hoover's index of concentration of urban areas (c) in time (t)

$P1$ is the ratio of the urban area population to the total population

a_i is the ratio of the area of the city under consideration to the total surface of all urban areas.

n is the number of urban areas

In this formula H_c can range from 0 to 100.

This distribution of population between cities is perfectly diffused when $H_c = 0$; at the opposite end of the range the limiting case $H_c = 100$ occurs.

where the whole population is concentration one single urban area.

Urbanization in Isfahan Province

Isfahan is the second largest province to be chosen by the previous government as a "growth pole" centre for its five development plans. According to the 1986 census, its population was 3288734. Since 1966, Isfahan province has undergone rapid urbanization. As can be seen in table (1) the percentage of urban population increased from 43.90 percent in 1956 to 64.20 percent in 1986.

Table 1: Isfahan Province: Urban and Rural Population 1956-1986

Year	Total Population	Urban Population	%	Rural Population	%
1956	1,230,082	540,656	43.90	710219	57.1
1966	1,576,669	833,544	52.90	743125	47.1
1976	2,166,695	1,370,076	63.20	796619	36.8
1986	3,288,734	2,112,061	64.20	1176673	35.8

Source: Iranian statistical year books, 1956, 1966, 1976, 1986, Plan and Budget Organization, Iran

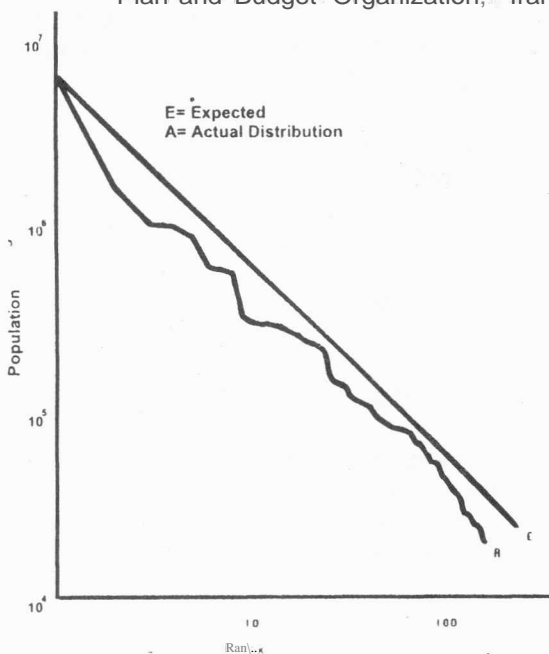


Fig.1: D: Rank-Size Distribution of Iranian Cities (1986)

To consider further the pattern of urbanization and distribution of urban areas in Isfahan province, the rank-size rule is applied to census data from 1956-1986 (Fig.1). The distribution of urban centres is distorted, indicating high primacy between the large cities such as Isfahan and the rest of urban areas in the province. Primacy increases after 1966 because of industrialization and concentration of most of the economic activities in Isfahan city. This policy had back-wash effects on the other urban areas of the province.

Figure (1)D indicates that some middle size cities have grown and adjusted more to the ideal rank-size line in 1986. This is due to the post revolutionary government policy that paid more attention to the strengthening of the middle-size cities in the province. The obvious need of developing medium and small cities becomes evident from the rank-size distribution of urban centres which indicates the need for special integration through a well-developed settlement system in the province. The development of these middle-size cities could help in reducing the problem of primacy in Isfahan province. To study the pattern of urbanization undergone by Isfahan province, the q (slope) of the line was computed. "The magnitude of this coefficient indicates the type of hierachieal structure involved" (Petsimeris,p,1986). In the situation where the value of q is higher than one it shows the existence of a primate city; therefore, when q is bigger than 1, the difference of size between urban areas is great. As can be seen in Table 2 the primacy had become more accentuated in 1986 than 1956, with a q in 1986 of -1.21.

Table 2. The Pattern of Urbunization in Isfahan Province: (1956-1986) Value of Coefficient q

Year	Slope of line	R^2	signif F
1956	-1.01	0.96	0.000
1966	-1.09	0.87	0.000
1976	-1.12	0.96	0.000
1986	-1.21	0.96	0.000

Similarly, another analysis of urban settlements systems proposed by Jefferson (1939) was calculated for Isfahan province. As indicated in Table (3), the J_a which represents the relationship between the size of the largest city (p_1) and the second largest city (p_2), increased from 5.54 to 7.21 between 1956 and 1986.

Table 3. Isfahan Province: The Evolution of Isfahan as a Primate City in the Province 1956-1986

Year	Ja	Jb
1956	5.54	2.31
1966	7.25	2.85
1976	7.79	2.93
1986	7.21	2.68

It shows the high primacy between the largest cities such as Isfahan and the rest of the urban areas. This primacy increase from 1966. This is because of industrialization policy of the government at that time which made the Isfahan province as a "growth centre". But the index decreased in 1986. This is due to the post-revolutionary government policy of decreasing the primacy by growing the middle size cities in the Isfahan province on one hand and the emigration of more than 500,000 refugees from the border of the Iran-Iraq war to this province on the other. Most of these refugees were settled in middle-sized cities by the Islamic government.. The Jb index represents the relationship between the population of the largest city (p_1) and the population of cities of 2th, 3th and 4th rank. This index also increased from 2.31 to 2.93 between 1956 and 1976, but it decreased to 2.68 in 1986. Such figures in Table 3, show that Isfahan province has wide primacy specially between the large cities such as Isfahan and the rest urban areas during the four decades. Such primacy was decreased after the revolution. This is because the post revolutionary government policy of diffusing the urbanization pattern in the province.

Hoover's index is used for the study of process of concentration or deconcentration of the system of urban settlements in Isfahan province. The index (H) is calculated for 48 urban areas in Isfahan province from 1956-1986. The results are given in Table 4. As can be seen, the concentration of population increased from 14.91 to 20.32 from 1956-1986, but the index also decreased in 1986. This decrease shows the diffusion of population over Isfahan region after 1976. This supports the previous analysis of patterns of urbanization.

Table 4:The Evolution of Concentration in Isfahan Province, Iran between 1956-1986: (Hoover's Index)

Year	H
1956	14.91
1966	20.09
1976	21.12
1986	20.32

CONCLUSION

From the analysis of the changing rank-size distribution of urban areas and of Jefferson's indices it has been shown that Isfahan province has high primacy between the largest city, Isfahan and the rest of the urban areas. Primacy increased from 1956 to 1976. This is because of the growth pole strategy of the previous government policy in the province. The analysis of concentration shows that the concentration of population of urban areas has begun to diffuse by 1986. This is due to the policy of the post-revolutionary government to strengthen the middle-size cities in the region in order to reduce primacy. This study shows that urban development policies for reducing primacy in Isfahan province to date are not enough and there is a need to encourage the urbanization of medium size cities in order to prevent rural migration and reduce the urban problems which will have to be faced more by the largest cities such as Isfahan.

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DEVELOPMENT PRESSURE AND PERIPHERAL PRIVATE HOUSING SCHEMES IN LAHORE

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Abstract: The periphery around metropolitan Lahore is under increasing pressure for development as a result of the centrifugal forces which have characterised the capitalist urbanisation process. The continuing growth of Lahore beyond the administrative boundary of the metropolis is examined in terms of housing schemes and population growth on and beyond the periphery of the urban area. The study illustrates the increasing tendency for more recent physical growth to be located away from the edge of the continuously built-up area and well outside the administrative area which bears the name of Lahore. These schemes are an important feature of the urban policy. It is now recognised, however, that the housing schemes exhibit many of the indices of social and economic factors that characterise the periphery. Recent urban policy in Lahore recognises this and proposes strategy for the peripheral housing schemes. This new urban policy relies heavily on greater involvement by the private sector operating through partnerships with the public sector. Conflict between pro-growth and anti growth interests is now endemic in many peripheral areas. A number of agents are involved in the production of the built environment in the urban periphery. The research informs, of the location and size of private housing schemes and provides guidance for decision makers charged with management of the urban periphery.

INTRODUCTION

Urban policy is primarily concerned with the construction and development of the cities periphery and the transfer of land from rural to urban uses forming an integral part of the capitalist development process. This is manifested mostly in the centrifugal diffusion of population and enterprise which has characterised Lahore. It involves development of housing schemes, the planned development of retailing and commercial areas, and the accommodation of overspill populations in new or expanded settlement areas at lower densities. The policy instruments used are a combination of controls over land development, effected through the town planning legislation, and positive measures such as the construction of

new schemes. A further integral element of the strategy of decentralisation of population from the centre of Lahore is the building of peripheral private housing schemes some of which are themselves the size of towns. While there is an explicit urban policy, the primary concern until 1970's was the difficulties experienced by large broadly defined regions. The more concentrated economic and social problems of Lahore were effectively neglected. From 1970's onwards, however, these problems came to be acknowledged. Until recently most attention was focused on the production of the built environment in the periphery with the help of relationship between major agencies involved. Two agents of prime importance in the context of the peripheral developments are the Lahore Development Authority and the Private Developers. Each pursues particular goals, the nature of which can result in conflict over the form of the built environment. The Private Housing Schemes are greater numbering 130 than the LOA schemes. The allocation of sites for private residential developments at the periphery forms a major part of both development planning and development control. The present study thus studies the Private Housing Schemes of the city's periphery.

PERIPHERAL HOUSING SCHEMES

More recently, there has been a discovery of peripheral private housing schemes. It has been recognised that many of these schemes exhibits the same economic and social characterist that previously attracted attention to the inner city. In Lahore it has been argued that housing conditions have improved greatly in certain peripheral areas and many schemes now have the local economic base service infrastructure and environmental features necessary to sustain a good quality of community life. The peripheral schemes sometimes phase problems that are both structural and locational. Structural problems includes under-investment and high levels of redundancy. Locational problems refer to the poor standards of service provisions and, more importantly, the difficulties of accessibility experienced by many of the residents. Poor provision of public transport and low rates of car ownerships increase the time and cost of travel to work and reduce the choice of availing and opportunity of owning a plot at a very low price in the peripheral housing scheme.

The urban policy proposals as laid out by the LOA are strictly applied to the approval of private schemes. The LOA, in association with the private sector local authorities and other agencies, has developed 130 schemes for physical and economic development of residential areas. The LOA plays leading role in encouraging and coordinating the various initiatives. There is both public and private-sector investment and development is interpreted in both economic and physical terms. Despite

Table 1. Finally Approved Private Housing Schemes

Sr.No.	Name of Scheme	Location (Mauza)	Total Area in Kanals	Size of Plots							Total No. Plots
				3M	5M	7M	10M	15M	1 K	2K	
1	MIS GM Riaz and Other	Niaz BeCl	29	0	0	0	0	0	13	3	16
2	Canalview Coop. H. Society	-do-	1865.00	0	0	0	113	0	848	146	1107
3	Saroba Garden	Attari Saroba	90.15	0	0	0	70	6	6	0	82
4	Akhtar Estate-I	-do-	102.00	0	0	17	60	23	13	40	153
5	Abid Town	Jobeeupra	200.15	0	0	0	0	0	136	0	136
6	Gulshan-I-Mustafa	Ajudiapur	507.00	0	61	0	179	0	114	65	419
7	Alhamra Town	Rakh Khamba	917.27	0	0	21	127	0	555	23	726
8	Nawab Town	-do-	1366.72	0	0	0	184	0	454	36	674
9	Khyaban-e-Khair ud Din	Ajudia pur	423.75	0	0	54	204	11	139	0	408
10	Arch EnClI.H. Scheme-I	Rakh Khamba	558.75	0	0	0	91	0	315	0	406
11	Ashfaq-ur-Rehman & Others	Dhana SinClhwala	78.87	0	0	0	7	0	46	0	53
12	Gulfishan Town	Shukhupura Road	1001.85	0	593	0	308	0	89	0	990
13	West Wood Colony	Niaz BeCl	663.00	0	0	0	0	0	222	81	303
14	AnClloori BaClh Scheme	Baghbanpura	111.00	183	0	49	0	0	17	0	249
15	Home Land	Rakh Khamba	370.00	0	0	0	80	0	137	40	257
16	Satellite Town	Ferozepur Road	156.40	0	101	0	120	1	50	0	272
17	Arch Engineering HJScheme-1i	Rakh Khamba	480.95	0	0	0	210	12	207	0	429
18	Dubai Town	Raiwind Road	441.43	0	186	0	73	0	4	0	263
19	Ittefaq Town	Niaz Beg	462.50	0	68	0	250	17	105	0	440
20	Alpha Avenue-I	Satto Kalla	331.70	0	0	0	68	6	169	3	246
21	Shahid Town	Ferozpur Road	247.10	0	39	49	133	0	43	4	268
22	Samam Berg Khurd	Dhana SinClhwala	52.65	0	0	0	9	1	28	0	38
23	Venus HousinCl Scheme	Attare Saroba	602.76	0	0	84	170	0	104	22	380
24	Campus View Town	JOQleenpura	1263.00	0	0	0	37	16	806	0	859
25	PIA Housing Scheme 1B II	Satto Kalla	2171.70	0	0	0	264	653	960	0	1867
26	Air lino Housing Scheme	Rakh Khamba	884.20	0	0	0	160	0	458	0	618
27	PCSIR Coop. H. Scheme	Niaz Beg	599.79	10	0	46	18	239	150	0	463
28	Judicial Coop. H. Society 1	-do-	408.40	0	47	0	155	29	136	12	379
29	Ghousia Town	Ajudipur	267.65	0	39	0	70	0	187	0	296
30	Engineers Arch H. Scheme III	Satto Kalla	389.00	0	0	0	73	41	177	0	291
31	Nasheman-I-Iqbal Coop. H. Scheme	Khamba	830.65	0	0	0	221	0	435	0	656
32	Ali Town	Riawind Road	399.20	59	63	0	28	62	154	21	387

33	Gulshan-e-Shalimar H. Scheme	Baghbanpura	177.50	8	22	119	112	0	0	0	261
34	Class IV Employees Coop. H. Scheme	Ajudiapur	62.10	0	140	0	0	0	0	0	140
35	Gosha-e-Ahbab Coop. HIS.	Niaz Beg	160.00	0	0	0	6	0	61	26	93
36	Jaffar Town, Iskat Nagar.	Rakh Khamba	122.22	0	48	0	55	0	21	0	124
37	Sunny Park	Raiwind Road	349.80	0	64	141	135	0	78	0	418
38	Saighal Estate	Niaz Beg	76.65	0	0	0	0	0	47	0	47
39	Khyaban-e-Khair-ud-Din (Ext.)	Ajudiapur	71.90	0	0	0	41	12	30	0	83
40	River View Coop H. Society	Rakh Khamba	475.30	0	24	0	16	2	260	0	302
41	SarQodha Coop. H. Society	Bhoptian	250.00	0	0	0	0	0	183	0	183
42	State Enterprises Coop. Society	Niaz Beg	1048.80	0	0	0	183	31	575	0	789
43	Aitchison College Staff CooD,Phase-1	Niaz Beg	331.55	0	16	0	0	0	203	0	219
44	General Sher Ali Khan HIS	Dhana SinQhwala	48.10	0	0	0	60	0	0	0	60
45	Farooq Avenue	Khan Singhwala	56.50	0	0	0	20	0	33	0	53
46	Ahbab Coop. H/Society	Niaz Beg	168.70	0	0	0	0	0	110	0	110
47	Khurram Town	G.T. Road	190.34	0	253	0	103	0	22	0	378
48	Agrics Town	Rakh Khamba	203.58	0	0	23	0	60	74	0	157
49	Ahmed Housing Scheme	Niaz Beg	442.00	0	19	0	191	0	177	0	387
50	Khyban-e-Zahra	Satto Kalla	66.20	0	26	0	25	0	26	0	77
51	Alia Town	BaQhbanpura	256.80	0	141	150	112	0	0	0	403
52	Zaheer-ud-Din Babar	Niaz Beg	58.55	0	0	0	19	2	8	9	38
53	Sunflower (Revised)	Niaz Beg	141.80	0	0	0	41	0	61	4	106
54	Ayubia Town	Jogeenpura	250.65	0	0	0	0	0	164	0	164
55	Lahore Chamber of Commerce	Kanjra	374.75	0	29	0	61	0	196	0	286
56	State Cement Corporation	Satto Kalla	467.13	0	0	0	43	0	118	73	234
57	PC SIR-III	Rakh Khamba	1219.40	0	59	0	280	0	703	0	1042
58	Islamia College Old Boys HJS.	Niaz Beg	352.00	0	0	0	116	0	143	0	259
59	Alpha Coop. HIS	-do-	148.00	0	0	15	52	0	61	0	128
60	Teeh Society	-do-	1076.00	0	0	0	0	0	0	440	440
61	Ajjanat Housing Scheme	Rakh Khamba	486.15	0	96	0	253	152	0	501	1002
62	Azam Garden Scheme	Niaz Beg	734.87	0	0	0	96	0	412	0	508
63	Naz Town	Sadhoke	600	184	0	0	327	0	158	0	669
64	Dilkusha Colony	Kot LakhDat	78.95	0	0	0	42	45	0	0	87
65	Sheraz H. Scheme	Begrian	546.07	122	0	115	137	0	186	0	560
66	Khyber H. Scheme	Gajju Matta	100.05	0	31	7	62	0	19	1	110
67	Sunny Park (Extn.)	Raiwind Road	120.30	0	16	0	125	0	0	0	141
68	Abdalian Society	Niaz Beg	972.55	4	18	9	95	0	446	73	645
69	Engineering Univ. E. HIS.	Satto Kalla	1547.30	0	14	0	210	0	492	200	916
70	Abuzar H. Scheme	Niaz Beg	134.35	0	78	0	102	0	10	0	190

71	Hassan Town	Mahmood Booti	259.00	a	46	a	206	a	50	a	302
72	PIA Housing Scheme Phase II	Niaz Beg	380.25	a	13	a	43	12	206	a	274
73	Samanberg	Ajudiapur	228.50	a	a	a	33	a	95	a	128
74	Awasiia Coop. H. Society	Satto Katla	265.70	a	a	a	34	a	79	33	146
75	Sultan Town	Niaz Be~	198.25	a	a	a	a	5	116	6	127
76	Nishan Colony	Kot Khawaja Saeed	486.00	a	160	88	234	14	19	a	515
77	CanalBer-HJScheme	Niaz Be~	337.05	a	4	a	115	6	36	5	166
78	Goshare Ahbab Phase 1	-do-	147.00	a	0	0	5	9	12	a	224
79	Awan Coop. HJScheme	Kharak	224.00	0	13	1	94	a	116	0	224
80	Ch.Khushi Muhammad &Other	Niaz Beg	402.70	0	0	112	120	a	111	11	354
81	Punjab Govt. E. Phase-I	Satto Katla	1860.00	0	258	0	604	a	585	92	1538
82	Wapda Employees Coop.H/S.PhasI	-do-	9109.00	0	1231	0	3090	a	2480	304	7105
83	NESPAK HJScheme	-do-	1093.00	0	14	10	81	a	250	259	614
84	Fazal Elahi Colony	-do-	159.00	0	28	21	51	a	57	0	157
85	N.F.C. H/Scheme	-do-	2047.00	0	88	0	394	a	803	210	1495
86	Scheme At Rajputan	Pindi Rajputan	66.40	0	0	0	10	a	105	0	115
87	Revenue E.Coop. H/Society	Niaz Beg	637.65	5	154	10	180	a	348	194	891
88	T & T E. Society	Bhoptian Amirpura	635.15	0	83	0	374	0	190	0	647
89	Farm H/Scheme (Green Acres)	Bhoptian Amirpura	591.60	a	0	0	a	47	29/64	16/84	92
90	Pakistan Expatriates	Sad hoke	2759.15	0	10	0	70	0	741	349	1170
91	Punjab Govt. Employees Ext.Phas 1	Satto Katla	105.26	a	8	0	59	0	16	6	89
92	PCSIR Phase II & III	Satto Katla	1261.36	0	0	0	94	a	878	0	972
93	Lahore Chamber of Commerce	Shahpur Kanjra	119.85	0	31	a	49	a	43	0	123
94	National Police Foundation (Mohafiz Town)	-do-	807.35	a	64	32	251	69	312	0	728
95	Pakistan Expatriates Phase -II	Sad hoke	2766.00	a	34	0	67	a	764	358	1223
96	Green Fort Housin- Scheme	Rakh Khamba	178.27	a	0	0	0	a	a	20/8k	20
97	Gosha-e-Ahbab Phase III	Niaz Beg	306.00	a	14	94	6	125	18	1	258
98	Gueaast Town	Harike Road	686.00	a	67	36	119	0	312	0	534
99	Account Group Officers	Sad hoke	313.16	a	0	0	0	0	93	59	152
100	Gulshan-e-Ahbab Phase-I(Shadab Colony)	Chandrai	222.70	0	53	15	92	0	62	0	202
101	Ghee Corp. of Pakistan	Ghulam Ghoswala	138.14	0	36	8	a	67	5	0	116
102	Kakezai H/Scheme	Sadhoke	249.90	0	0	0	32	a	133	4	169
103	Punjab Board of Revenue Phase-I	Dhana Sin-hwala	391.60	214	103	0	0	254	15	a	586
104	P.O. Employees H/Scheme	Ghung Pang Graian	985.80	0	13	0	144	332	213	0	702

105	Azizia Town	Khamba	201.50	0	0	107	0	0	89	6	202
106	Gulshan-e-Lahore	Khamba	380.13	0	42	0	137	0	163	0	342
107	Rail Town	Kanjra	679.10	0	73	167	339	130	0	0	709
108	Abid Farm Housing City	Ghung Pang Graian	2531.76	92/4 M	0	0	0	0	87/6k	108/8k	287
109	Women Housing Society	Chak NO.62 (Kot Jeven Mal)	271.20	0	0	0	14	0	148	3	165
110	Services Archard Homer	Mohlanwal/Marake	1723.19	0	0	0	0	0	172	413	585
111	Judicial Employees Phase-II	Niaz Beg	276.50	26/4 m	10	54/8m	91	15	0	0	196
112	Wyeth Employees Phase-II	Halloki	785.75	0	18	0	146	0	239	72	475
113	News Paper Employees	-do-	105.00	0	0	0	118	0	0	0	118
114	Revians Coop. H/Society	-do-	480.60	0	0	0	134	0	198	0	332
115	Pakistan Expatriates Coop. (H/Society (Izmir Town)	Chung Pang Graian	3528.10	0	0	0	20	0	612	616	1248
116	Army Welfare Trust Coop. HJSoc.	Rakhpur	650.00	0	0	0	0	8	299	0	307
117	Edu Park Farm H/Scheme(Revised) Chak NO.62	Kot Jeven Mall	840.60	0	0	0	0	46/4k	33/6k	32/8k	111
118	Pak Medical Coop. HIS.	Tarrogi	915.90	0	0	0	0	0	298	121	419
119	The Greater Lahore Coop. HIS.	Tarrogi Janjatay	3296.80	0	0	0	0	0	1125	417	1542
120	Public Health Engg. Emp. Coop. Boptian HIS.	Bhoptian	743.00	0	104	0	171	0	255	37	567
121	Abid City-I	Pak Khambal Khamba	1314.39	0	0	0	0	0	243	320	563
122	Khayyam Minicity Ph-I	Dinanath	205.89	0	86	1	0	174	0	0	261
123	E.M.E. Coop. HIS Society	Kanjra Mussala, Rakh Khamba Shahpura, Khanpur Khaliq Abad	4460.00	900	47	0	80	0	1951	190	3168
124	Agrics Town EIS Ph-III	Rakh Khamba	104.85	0	0	0	19	4	41	0	64
125	Gulshan-e-Ahbab HIS Ph-III	Shadab Colony Chandrai	564.10	0	153	0	317	0	183	3	656
126	Hamid Park HIS Scheme	Chak Mouzang	268.10	0	0	0	139	0	83	22	244
127	Overseas Labistan Foundation HIS	Amir pura Khamba	2335.90	0	48	43/8m	298	0	999	147/6k	1535
128	Campus Colony	Mohammad Sultanabad	213.90	Old scheme Transparency is not in record							
129	Samanzar HIS	Ajudiapur	118.00	-do-							
130	Rehmanabad HIS Scheme	Ajudiapur	148.50	-do-							

the greater promotion of private interests in the most recent urban - policy initiatives in Lahore, it has still faced criticism for not going far enough. Since 1981 the pace of built-up area and population growth on the periphery has been increasing dramatically. This has partly resulted from the natural and immigrant population growth of Lahore and increase in the demand for new houses elsewhere to accommodate population from inner city movement. One means by which these demands could be met is by outwards extensions to the existing continuously built-up area. Between 1970's to 1993 nearly 89801 canals of additional land was developed, chiefly for residential purposes (Table 1) [1]. These residential schemes are located between the Ferozepur road in the East to the Bund road and U.B.D. canal in the west, and from the south of Model Town to far beyond the south of the Lahore Corporation boundaries (Fig.1).

Over the last thirty years Lahore has grown physically well beyond its administrative and conceptual limits encompassing within it a large number of villages especially to its south. The conversion of rural land to urban use increased in the 1970's with the cost of land close to the urban margin being of higher land value than the land at distance in the outer periphery.

Lahore is paying a high price for its rapid economic and resulting physical expansion into the periphery. From 1970's onward private landlords recognised an opportunity to supply houses to the cities rapidly expanding population. To tackle the problem of inadequate housing and to provide the city with the modern infrastructure, development of peripheral schemes was the order of the day. This development programme had a marked effect on the overall condition of the cities houses.

Location fifteen to twenty miles from the metropolitan centre suffers from a number of disadvantages. The cost of land will be less, but other development costs will be greater. Raw land costs are actually only a small proportion of total development costs; the construction, marketing, and various overhead costs are greater in peripheral areas. Rate of development of a new scheme is also slower in the periphery, which increases the holding costs and the risks.

When financial considerations have not dictated a peripheral location, why have been new schemes located so far from urban centres? The main reason seems to be that large scale land acquisition near the city is difficult because of the probability of serious hold outs: Firstly land owners who will not sell because they have their own development plans, and Secondly land owners who demand unreasonable prices. Close to the urban area land owners have every reason to be optimistic about development in the near future; the chances for large schemes

development are therefore better only if some distance from the metropolice.

Private housing schemes in the adjacent areas of Lahore from parts of the continuously built-up urban sprawl of the city or are purely sub urban in character have closer affinities with Lahore than with any other main town in the surrounding area.

PATTERNS OF PRIVATE HOUSING SCHEMES

Private housing schemes in Lahore emphasized to alleviate over crowding in the conjusted parts. Changes in the wake private housing schemes affect the largest sections of the population, either directly or indirectly. Over the last decade, an ever increasing proportion of the population has been drawn into the ambit of private housing schemes which is gradually being established as a dominant way of life, with its attendants life style and socio-economic characteristics. Not-with-standing the variations from scheme to scheme in the socio-economic status of the residents, the private housing schemes are being widely recognised.

When population densities in the schemes are compared with more conjusted parts of the city from most residents have moved, private housing schemes represent generally an improvement. With due regard to modern town planning principles and the promotion of a gracious living environment, residential uses in the private housing schemes occupy, on the average, only 50% of the total land. The other half of the land is devoted to roads, schools, landscaping and other auxiliary services.

One of the clearer changes attributable to the construction of private housing schemes is the massive distribution of population in the varying sizes of the schemes (Fig.1). The largest number of schemes are those covering an area of less than 200 kanals. In the periphery intra-urban population shifts an internal rural-urban migration is the main cause of the growth of these innumerable private schemes. The large private schemes with an area above 1000 kanals are fewer in number and are located mostly in the outer periphery between the Lahore By-Pass and the Multan Riawind Link road. One of the reason being the availability of vast expenses of land away from the built environment. Some of the large schemes are namely Engineering University Employees Co-operative Housing Society, Naz Town, Lahore Chamber of Commerce, Abid Farm Housing City, E.M.E. Co-operative Housing Society Rehmanabad Housing Scheme and Khayarn Mini City.

According to the calculated figures (Table 1.) the private housin9 scheme occupy 89801 kanals. Total number of plots are 62057. The largest

number of plots are of 10 marla size numbering 15256 and the least number of 46 plots of 4 kanals each. The large number of 10 marlas plot show that this is a reasonable size on which one can afford to built.. The other size of plots preferred is the two kanals plot numbering 5975. The WAPOA Employees Co-operative Housing Scheme Phase I, consists of the greatest number of 3090 plots measuring 10 marlas (Table 1).

The pattern of residential location is not simply a uni-directional exodus from the core area. Rather the location process generates a complicated pattern of intricate linkages and interlocking relationships between the various areas and the schemes.

Not only does Fig. 1 show the distribution and size of private housing schemes, it explicitly show relationship other components of the urban ecology. In spatial terms, private housing schemes have carved out substantial areas out of the traditional urban structure and can be seen to approximate an axial pattern of development in the south of the metropolice between U.B.O. canal and Ferozepur road.

CONCLUSION

The land around Lahore is under increasing pressure for development as a result of the centrifugal forces in the urbanisation process. The process of peripheral expansion has been a characteristic of the city since 1970's but has gained momentum during the 1980's. The combined impact of various push factors and policy initiative since 1980 has been to afford greater weight to the views and interests of private housing scheme developers, albeit within the framework of urban policy. Two features are characteristic of the present urban policy initiatives. Firstly, policy measures of the peripheral housing schemes are under increased control of L.O.A. which is the principle vehicle of such policy. Secondly, the influence of private sector has greatly increased. This reflects the philosophy and belief that the LOA itself is inefficient in terms of the allocation of resources and to much LOA intervention in economic activity stifles enterprise, discourages innovation and removes incentives. Equally inefficient development authorities imposes costs and delays on private housing schemes. Peripheral housing schemes state a variety of social, economic, housing and environmental objectives. Run-down areas should be improved in appearance through the clearing of derelict land and better transport facilities should be provided.

The greater involvement of private sector investment has resulted in a level of development than had previously been achieved under public sector programmes. In the private schemes, each area has its own problems, and so tailor-made local programmes and objectives are

required for each place. The community looks to the LDA and in due course private housing schemes makers, to play a leading role in developing the initiatives in partnership with the private sector, the local authorities and other public bodies and the community itself. The private sector has a crucial role to play both in making additional resources available, and in helping people to escape from housing shortage. Therefore the allocation of sites for peripheral private housing developments forms an important part of both development planning and development control..

REFERENCES

1. Figures in Table 1 have been calculated from the data obtained from the Lahore Development Authority..
2. Similar number of schemes on the map means that the scheme has a number of phases.

ESTIMATION OF MEAN AGE AT MARRIAGE IN PAKISTAN USING HAJNAL METHOD

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ABSTRACT: One of the most significant demographic aspects of a marriage is the age of the bride and groom. Keeping in view the importance of this variable, the present research has been carried out. In this paper Hajnal technique has been applied to the PDS data to estimate the average age at marriage for both the sexes in Pakistan pertaining to the years 1984 to 1987. A comparison has also been made with the previous studies since 1951 to monitor the past trends in this regard.

The average age at marriage for males and females in Pakistan for the years 1984 to 1987 is 25.09, 25.11, 25.31 and 25.02 years for males and 20.33, 20.53, 20.83, and 20.65 years for females in the respective years. The present study shows a very slight change since 1981 but a very profound change has been noticed since 1951 (Table 1). The average age at marriage has increased about 4 years for males and about 5 years for females during the period 1951 to 1987.

INTRODUCTION

The population of Pakistan is growing at an extremely rapid rate of around 2.6 percent per annum. The total population of the country according to the 1981 census was 84.25 million, which rose to 130.58 million according to the population census of 1998. This high rate of population increase is the result of rapid decline in the mortality as well as high birth rate. Fertility is the main determinant of population growth. High levels of fertility are responsible for the growth of population everywhere in the world as well as in Pakistan. Total fertility rate (TFR) is the average number of children a woman will bear assuming that current age-specific birth rates will remain constant throughout her childbearing years. Depending upon mortality levels a TFR of 2.1 to 2.5 is considered a

"replacement" level. At this level a population will cease to grow. The TFR in Pakistan in 1987 was 6.6 while it was 6.2 for Bangladesh, 4.3 for India, 4.2 for Indonesia, 3.9 for Malaysia and 3.7 for Sri Lanka of the same years. The average TFR for all developing countries was 4.2. This reveals that the high TFR contributes to the high growth rate in Pakistan [1].

The change in the population size due to births is considered as a function of the broader process of one generation reproducing another. Marriages and divorces directly measure the fertility levels and trends of a society. One of the most important demographic aspects of a marriage is age of the bride and groom. Age at marriage is closely related to fertility (especially the size of completed family), the duration of married life, period of cohabitation and the stability of marriage. Age at marriage is inversely related to fertility so long as marriage occurs within the childbearing period and not before it. Thus age at marriage is the only factor, which regulates the potential reproductive span of women. Coale and Tye, using the stable population technique have demonstrated that in general fertility declines with an increased age at marriage, which infact means, the shortening of the average marital life span [2].

The age at marriage also affects the length of the reproductive period and hence the birth rate. Therefore the higher the age at marriage, the lower the period exposed to the risk of being pregnant.. This is more true in the societies like ours where the use of contraceptives is not common. Similarly fertility is also a function of life expectancy of both male and female. Although this factor is becoming less important with the rapidly rising life expectancy in developing countries like Pakistan. Size of the family is also dependant upon the age at marriage. Mainly socio-economic rather than the biological factors determine the differences in average family size among present day population. Generally the family size is larger in rural societies than in the urban. They are also of greater size in less developed societies than in the advanced because the tendency to marry in early ages is more pronounced in the less developed realm. Similarly age at marriage controlling the size of the families is one of the social factors. Therefore, the average age at marriage is an indicator to the total fertility rate keeping all other factors constant..

In the present research the average age at marriage for males and females for the years 1984 to 1987 have been computed by using Hajnal method. The proportion of the singles with total population in each group for males and females has also been calculated. The statistics used in this research are taken from The Pakistan Demographic Surveys for the years 1984, 1985, 1986 and 1987. (Annex.1).

HAJNAL METHOD

This method estimates mean age at marriage by transforming the data on marital status by age into an estimate of the number of years lived by a cohort of males or females before first marriage. Age at marriage is then the total number of years lived single by a generation from birth to the age 50 and dividing the total by the number who have been removed by marriage from a no mortality cohort. The average number of single years lived is also the average age at first marriage and is described as the singulate mean age at marriage.

The formula used for deriving the mean age at marriage from proportions single for Pakistan is:

$$X = d + \frac{\sum_{x=d}^D I_s x - (0 - d)SD}{1 - S_D}$$

Or

$$X = d + \frac{\sum_{x=d}^D I_n x^n - (0 - d)SD}{1 - S_D}$$

Where

- X = Mean age at marriage.
- S_x = Ratio of never married persons to the total population at exact age X
- d = Assumed minimum age at marriage
- D = Assumed maximum age at marriage
- S₀ = Proportion single at exact age D.

Hajnal method, originally designed for use with grouped data called for using the simple average of the proportion single in the age groups 45-49 and 50-54 to estimate S₀.

As the population is given in five years age groups, S₀ was estimated by taking average and is equal to:

$$5^s 45 + 5^s 50$$

LIMITATIONS OF HAJNAL METHOD

In this method, it is assumed that cross-sectional marital status data in a census or survey is the representative of the marital experience of a cohort passing through life with no mortality and no migration. If the age at marriage is changing as in Pakistan the method originally given by Hajnal requires some modification. Because of the change in the marriage rates, the proportion single in a census or survey cannot be used to represent the performance of a cohort over time.

The ages are given in quinquennial groups; it is risky to make an assumption that the average number of persons marries at the middle age of the group. The assumption of linearity does not hold when most of the persons marry in the early part of the age group. Thus there will be an over estimate of the age at marriage. This limitation can be overcome if the age distribution is given in single years of age and is without misreporting. However in case of Pakistan, where age misreporting is very frequent and the age distribution is only available in five years groups, this formula gives satisfactory results.

CONCLUSION

The average age at marriage in Pakistan for both males and females has shown no profound change during the study period. It has increased very slightly since 1981, showing an increase from 25.23 years in 1981, to 25.97 years in 1985 for males and then a slight decrease in 1986 and 1987 while for females it has increased from 20.33 years in 1981 to 20.83 in 1987. But this increase is negligible. Thus it can be concluded that the average age at marriage has practically remained constant since 1981.

Comparing the results of this study with the previous studies there is an increase in the age at marriage since 1951, especially in case of females (Table 1). Sadiq in his study has calculated the age at marriage from the census data 1961 by using the Hajnal method and has calculated 23.50 years mean age at marriage for males and 17.60 years for females [3]. In another study Alam estimated from the PGE age-sex distribution that the average age at marriage in 1964 for males and females in Pakistan was 24.70 and 19.10 years respectively [4]. Similarly in a study by Afzal and Iftikhar, net nuptiality tables for males and females in Pakistan has been constructed on the basis of the PGE mortality rate for 1962-65 and the proportions of singles from 1965 PGE population distribution by age and sex suggests that the average age at marriage is 25.20 years for males and 19.30 years for females [5]. Further it has been calculated that the

difference in the age at marriage for males and females is about 6 years, the males marry about 6 years later than the females.

The changes in the Marriage Law 1961 and socioeconomic development had a combined effect on rising the age at marriage for females in Pakistan. The decline in the Crude Birth Rate from 50 to 43 per 1000 is also the effect of age at marriage as there is no meaningful increase in the contraceptive use. It is demonstrated that women who married late (at age 21 or later) have achieved, on the average only half the fertility levels of those who married at age 16 or earlier. Further, marriage is responsible for migration of females. The lower the age at marriage the earlier the migration of women from their father's home to the inlaws. Women are also likely to migrate along with their husbands whenever they change their place of employment..

The delay in the marriage is likely due to the education and employment. Highly educated girls and boys marry late because they marry after the completion of their education. The dowry system may also increase the age at marriage to some extent.. The poor parents have to save throughout their lifetime for the marriages of their daughters and thus delay in the marriage.

Table 1. Mean Age at Marriage by Sex in Pakistan, 1951 to 1987

Years	Mean Age at Marriage	
	Male	Female
1951	22.00	16.00
1961	23.50	17.60
1964	24.70	19.10
1965	25.20	19.30
1981	25.23	20.33
1984	25.09	20.33
1985	25.11	20.53
1986	25.31	20.83
1987	25.02	20.65

Source: [3],[4],[5]and Computed from the PDS 1984 to 1987,Using Hajnal method.

ANNEXURE 1

Total and Never Married Population by Age and Sex in Pakistan 1984 to 1987

AGE YEARS	TOTAL								NEVER MARRIED							
	1984		1985		1986		1987		1984		1985		1986		1987	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
10	9667	8686	10045	8659	10378	8970	5295813	4569847	9644	8619	10004	8576	10355	8900	5283342	4538729
15	7664	6920	7726	7067	7778	7040	3908787	3641637	7222	4950	7272	5198	7387	5309	3698424	2735585
20	5849	5763	5964	5973	6145	6137	3121983	3138158	3806	1498	3905	1595	4171	1771	2058845	832533
25	4827	4906	4862	4999	5108	5197	2526796	2627185	1412	364	1468	379	1552	378	706429	190788
30	3566	3663	3673	3758	3927	4058	1940525	2076039	377	95	395	116	455	116	203966	41734
35	3405	3528	3496	3573	3693	3614	1748819	1865159	177	56	162	58	180	55	81364	25225
40	2996	2799	2979	2983	3128	3011	1587315	1584061	106	36	108	38	98	43	50711	18507
45	2752	2557	2891	2774	2996	2896	1516414	1448634	60	28	63	13	71	15	27197	11581
50	2351	2143	2524	2150	2603	2180	1282100	1155089	40	10	50	13	51	13	29610	6175

M = Male F = Female

Source: Pakistan Demographic Surveys, 1984 To 1987

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URBAN SYSTEM IN IRAN

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Abstract: This paper has examined the urban systems of Iran over the three last decades. The study found that the Iranian urban areas have high primacy and such primacy is very high between Tehran metropolitan and the rest of the urban areas in the country. Also, The Islamic Government's decentralization policies has been explained. Finally, a number of conclusion have been provided.

INTRODUCTION

The main purpose of this paper is to explain the nature of the evolution of Iranian cities system over time. Iranian cities range in size from Tehran, with approximately 6 million inhabitants in 1986, to settlements defined as urban, with less than 5000 inhabitants. The rank-size distribution is a regular one (Fig.1). In this paper the dimensions of the cities system in Iran is explained and the Islamic Government urban development policies will be explained and finally it provides a number of suggestions.

THE DIMENSIONS OF THE CITY SYSTEM IN IRAN

In order to show the changing of Urban systems in Iran, the number of cities with different size and the percentage of their population has been shown in Table 1 for the 1956-1986 period. As shown in this table, the number of urban areas with less than 5000 inhabitants has increased while the percentage of their population has decreased between the 1956-1986 period. The number of urban areas with population between 5000 to 10000 has increase while the perc.entase of their population has decreased. In general, the number of urban areas with population between 50000 has increased. On the other side, the number of the most urban areas with more than 500000 inhabitants have increased. This indicates that the large cities increase rapidly. Tehran, which has more than 6 million population, has more than 22 percent of the whole population of the country. This shows that Iran has primacy and such primacy is high between Tehran and the rest of the country.

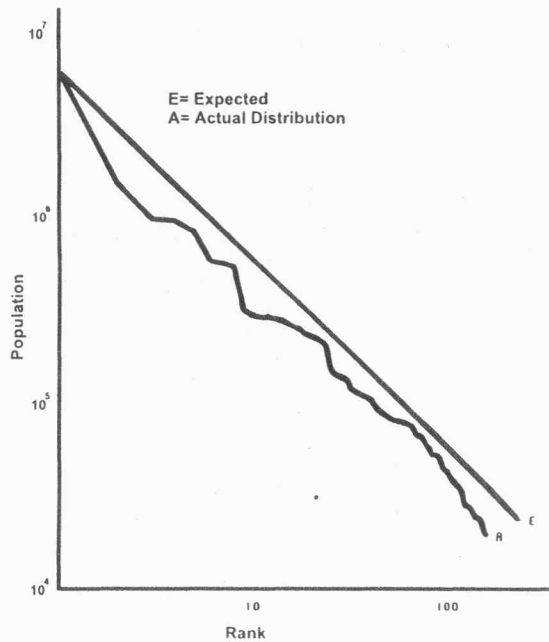


Fig.1: Rank-size distribution for Iran (1986)

Table 1. Number of cities in different size groups

Size group (OOOs)										
Less than 5			5-		10-		25-		50-	
Date	No	00	No	%	No	%	No	%	No	00
1956	13	0.8	90	10.4	56	14.6	22	12.8	9	10.6
1966	15	0.5	119	8.2	72	11.3	30	11.2	15	10.9
1976	5	0.9	163	7.1	108	10.3	47	10.4	21	9.7
1986	84	1	113	3.1	145	8.5	67	8.6	46	11.8
100			250-		500-		1000-		1500-	
Date	No	00	No	%	No	00	No	%	No	00
1956	6	16.6	2	9.1	-	-	-	-	1	25.1
1966	8	11.9	5	18.2	-	-	-	-	1	27.8
1976	14	12.9	4	8.5	3	12.3	3	12.3	1	28.6
1986	25	14.0	8	8.3	6	16.7	6	16.7	1	22.5

Source: PBO, 1986

In this table there are interesting figures. Between 1956-1986 the urban areas with more than one million population have increased very rapidly and in 1986 there are six urban areas with more than one million population which has 16.7 percentage of the whole of the Iranian population. There is only one city, Tehran, with more than 1.5 million inhabitants and has more than 22 percentage of the whole country's population. As shown in this table, the population of Tehran's metropolitan has declined from 28.6 to 22.5 percentage of the whole population. The rate of growth of Tehran's metropolitan for the last three decades are 5.7, 5.2, 2.9 percent per years respectively. It is interesting to say that the growth rate of Tehran city has declined between 1986-91. This is due to the fact that the Islamic Government has decentralization policies for large cities, particularly for the Tehran metropolitan area. In the following section, the Islamic Government decentralization policies, which effect the urban systems in Iran, will be explained.

ISLAMIC GOVERNMENT URBAN DEVELOPMENT POLICIES

As Richardson (1981) has pointed out the national urban development strategy has an important effect on urbanization and urban systems of the Third World countries. The Islamic Government has policies of decentralization of large cities, particularly the Tehran metropolitan area. The new development planning follow the "bottom up" strategies. The flow of information and project proposals starts at the small level of urban areas and then go through the district, county and provincial levels.

The provincial planning analyze the information and proposals and finally prepare a provincial plan (Amirahmadi, 1986). The major Islamic Urban Development Policies are as follows:

1. Locating areas of futures growth for existing cities and locating areas for suburb development.. Locating areas for new cities or towns establishment. .
2. Establishing policies for population settlement and population settlement systems calculate the size of the cities, define the settlement hierachies in terms of urban services.
3. Determine the regulations and policies for building and land uses throughout the country.

At the national level the Islamic Government makes arrangement for spatial planning for land use and urban development.. The government evaluates the facilities and resources in urban and rural areas of the country and finds areas of futures growth for existing cities and new town establishment.. The Islamic Government then identifies the industrial and agricultural poles and tourism and services centres.

Finally creating, organizing, and cooperating between public and private sectors. At regional level the Islamic Government create master plans or comprehensive plans for the cities. At local level the Islamic Government create guidance plans for small cities which have a municipality. All of the master plans and guide plans for small cities and guide plan for rural areas are prepared by private sectors. The master plan and guide plan for small cities and rural areas will be approved by the Supreme Committee of Ministry of Housing and Urban Development. Such urban development policies controlled the growth of population of Tehran metropolitan and has change the urban systems of the country.

CONCLUSION

Iranian urban system has high primacy and such primacy is very high between Tehran metropolitan and the rest of the urban areas in the country. This study has shown that the growth of population of Tehran metropolitan has decreased after the Islamic revolution. This is due to the fact that Islamic Government had decentralization policies for urban development. It is worth noting that the Islamic Government has paid more attention to small cities and rural areas and has placed emphasis on prompting economic growth with social equity. Such policies have absorbed urban population and relieved population pressure on large cities such as the Tehran metropolitan area.

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ECOLOGICAL DETERMINANTS IN SEMITIC TRADITION AND ISLAMIC RELIGIOUS THOUGHT

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Religion as a system of faith and worship has long been a subject of systematic investigation and research. A wealth of information is available on the content and philosophy of religions. The purpose of this paper is not to delve any further into the spiritual and philosophical aspects of a religious system. In author's judgment, a religious system is an expression of faith and worship which is embodied in the institutionalized sacred beliefs, observances and social practices [1]. It is believed that these behavioral and attitudinal aspects in a religious community evolve as a result of the changing interaction between man and his physical environment. Viewed in this perspective, a geographic interpretation is made of the relationship between the ecology of an area and its socio-religious structure. The term ecology [2], as employed in this paper, means the study of the role of man, both as a symbiotic component and disruptive agency, with a special focus on man's interaction to his earth environment. A retrospective study of the semitic religious tradition provides an appreciation of the relationship between man's beliefs and his ecological context. It is pointed out that the religious systems of Mainland Arabia, whether believed to have evolved through evolutionary process or divine intervention, reflect an intimate ecological association between the semitic man and his Arabian environment.

The paper is confined to the study of three great religions - Judaism, Christianity and Islam. The objective of the study is to examine the ecological relationships between the semitic man and his desert environment and their bearings on the philosophical content of these religions. The study demonstrates that many of the religious attitudes and ritual observances in these religions have come down from the early semitic tradition. It is believed that these religious attitudes and practices were an outgrowth of the ecological interaction between the nomadic people and the desert environment. However, the ecological relationship between man and nature is a continuing process and thus religious change will tend to occur as the ecological context changes. Following this

hypothesis, the author examines some of the philosophical and ritualistic variations that developed in Judaism and Christianity when they moved to the Hellenized and progressive Europe. An examination of Islamic philosophy and Islam's rapid expansion into South and Southeast Asia shows some of the religious repercussions this religion is experiencing in the present ecological setting.

GEOGRAPHIC MATRIX OF THE SEMITIC RELIGIONS

It is a matter of geographic significance that all three religions, Judaism, (Christianity and Islam - should have originated in the same regional context and among the same people. The question arises: it a historical accident or was it a part of an ecological process? If one accepts that Judaism, Christianity and Islam have originated from one common ecological base then one must find the reasons which have contributed to philosophical differences between these religions. A closer examination of the geographic make-up of the Arabian Peninsula would show that this area is made up of two distinct types of environments. First, there is the desert which occupies the inner core of Arabia. All through history, this desert interior has served as the heartland of the semitic race. Second, there is the area which surrounds the desert and is interspersed with pockets of great agricultural prosperity, such as the Euphrates-Tigris Valley, the Jordan Valley, and the Mediterranean constlands. It was the ecological interaction between these two areas of Araibai that set the stage for the development of great semitic civilizations and the first monotheistic religion. The mere realization that events of such global divisions should have occurred in this one small area of the world arouses great intellectual curiosity.

The close proximity of the two unlike ecological environments, the desert interior with its nomadic way of life and the fertile agricultural rimland with its sedentary society, proved to be an explosive combination. To the deprived but brave nomads, the nearby presence of the well-watered and agriculturally prosperous areas became the inviting target for invasion. Thus the stage was set for prolonged hostilities between the Bedoin (nomad) and the Fellah (peasant). As history has repeated many times, the restless, untamed and daring shepherds have appeared from the desert interior to encroach upon the territory of the more fortunate sedentary populations. This historic confrontation between the bedoins and the fellahin frequently led to the rise and fall of the Middle Eastern civilizations, a subject which has been discussed in great depth by the 14th century Arab historian Ibn Khaldun in his voluminous work "Muqqadima" [3]. The sedentary population in the riverine lands were prosperous but timid, civilized but physically soft.. On the other hand, the inner desert of Arabia served as the ecological niche for the restless and rootless nomadic

people who were associated with the nomadic way of life in a precarious desert environment. In the words of Ellen Semple, the Arabian desert was an environment where "the only change is eternal restlessness. While the people move progress stands still" [4]. Thus, pastoralists, with the ubiquitous need to move with his flocks and the martial spirit he acquired from his hostile surroundings, were equipped to play the role of world's great conquerors.

ECOLOGICAL CONTEXT AND RELIGIOUS CONTENT

It is believed that the first religious systems in the Middle East developed after the early semitic society made a transition from the hunting-gathering activities to domestication of animals. The pastoral way of life that evolved allowed the pastoralists to abandon the time-wasting chase of animals and devote the saved time to other pursuits of life. The semitic man, being a pastoralist, could now have time to reflect and ponder over the mysteries of nature and his own destiny. It was in this ecological milieu that the semitic society was able to establish the first basis of a moral code and religious order which mirrored man's view of his role on this earth and his relationship to God. In his own peculiar way and unlike his other contemporaries in Egypt, India and China, the semitic man soon visualized his role as that of a servant of a transcendent deity. He saw himself as the vicegerent of God on earth who was to carry out the divine mission. He thought that reality was dual in nature, involving man and his environment on the one hand and the God on the other. The man and Milieu was perceived as material, temporary and always changing.

The semitic belief in one God developed from an ecological need to bring rational order to a socially heterogeneous society. Overwhelmed by the dry, featureless and monotonous environment, the early semitic seers and sages were inclined to believe in the unity of nature at first. In time, however, as the nomads outgrew their primitive fetish and nature worship, they must have turned eventually towards monotheistic persuasions [6]. It is true that initially other gods were conceived but they were not held to be self-existent and autonomous in nature. In fact, they were associated with sane natural elements or earthly creatures and were always treated as subservient to God's command. This kind of semitic association of gods with one true God was always functional and never total. The concept of one God was held as the Ultimate reality, non-material, eternal and immutable [7].

Coming from the Babylonian world, the Hebrew people must have retained the semitic religious tradition based on legal and moral laws. The image of one God as a transcendent power was an outgrowth of the early

Mesopotamian religious thought. It is quite conceivable that the Jewish religious outlook transformed when the Israelites took Canaan and Phoenicia. The inter-association between the relatively simple and less urbane Hebrews and the highly sophisticated Canaanites and Phoenicians initiated a process of religious symbiosis between the two societies [8]. This process must have continued when the Hebrews settled in Egypt and were exposed to the values of an even more sophisticated and well organized religious structure. Despite this intermingling, the essence of the Jewish monotheism was still embodied in the Hebrew scriptures which viewed God as the Creator, source of all power, the Compassionate Source of all love and all ideals [9].

The early teachings of Jesus were a reaction to the political and social circumstances prevailing in Judea and Samaria at the time. The religious career of Jesus was associated with the Jewish community of Palestine and his views and beliefs were part of the Pharisaic-Essenic thought [10]. Although Christianity started out as an off-shoot of Judaism, it developed into a "movement" against the religious views held by the Jewish sects, particularly the Pharisees. In due course, the newly emerging Christian community began to consider itself as the true Israel, the ultimate Kingdom of God. Jesus' view that Abraham's monotheistic religion was for mankind and must be of universalizing nature was a major philosophical departure from Judaic ethno-centric outlook.

After the resurrection of Jesus, the active engagement of the twelve apostles in the missionary activities brought Christianity into the Hellenized Middle East and Europe. So, the teachings of Jesus, which started as a local protest in Jerusalem, became the source of a global movement. Thus, the twelve apostles, fired by the newly developed universal spirit, were able to lay the foundations of early Christianity in Phoenicia, Egypt, Syria, Cyprus, Turkey, Greece and Italy. It was in these Hellenized non-Jewish parts of the Middle East and Europe that the Jewish Christianity evolved into Christianity. The newly activated interaction between the Christian and Hellenistic viewpoints in the new ecological setting set up the stage for the development of an independent Christian religious tradition.

One fundamental change in the Hellenized version of Christianity was related to the very personality of Jesus himself. According to the earlier Jewish Christian tradition, Jesus was claimed to be the "Messiah," the son of man, "a claim vehemently denied by the Pharisaic leaders in Jerusalem. Later on, however, the Pauline Christianity, as it was introduced in the Hellenized centers of Damascus, Antioch and Rome, the messianic "son of man" became, in Hellenistic terms, the lord and Son of God [11]. Thus, the idea of Trinity, as it became the central theme of Roman

Christianity, formed the basis of fundamental disagreement between the Jewish and Christian theologians.

AGRICULTURAL SEASONS AND RELIGIOUS OBSERVANCES

The organization of the Jewish religious calendar is another interesting form of the religious observance and its relationship to the local ecological conditions. An examination of the Jewish calendar would show that the Jewish holy days and ritualized traditions closely synchronized with the Mediterranean seasonal regimes. In many instances, religious festivals were so arranged that they related to dry-farming of winter grains, fruit cultivation and animal raising in the Mediterranean climes. Thus the autumnal Jewish holy days, such as Rosh Hashanah, Yom Kippur and Sukkoth, were observed to celebrate the new agricultural year. The religious days, like the Passover [12], which coincided with the harvest time, and Shabbouth were celebrated in Spring and late Spring before the onset of the long, hot and dry summer of the Mediterranean environment.

The agricultural festivals gained religious importance when they were made to correspond with the important events in Jewish history. It was Moses, as indicated in the "Torah" who combined the seasonally associated holy days with the important historical events [13]. Thus, the Passover was observed to commemorate the Exodus; Shabbouth was now the remembrance of the Covenant at Sinai; Sukkoth came to mark the wanderings of Israelites; and the Sabbath was to observe freedom of Jews from Egyptian bondage. It is significant to note that this inter-association of seasonal festivals with the Jewish religious history may have proved to be an inadvertent driving force behind the intensification of the ethno-centric tendencies in Jewish religious tradition.

Christianity adopted some important changes in its religious calendar when it expanded into Europe. In response to the European ecological contingencies, Christianity discarded many of its older customs while adopting some of the local pagan rituals. The attitudinal change toward the observance of the Passover in the Roman Christianity is a good example of this change process. The Passover in the western world was now called the Easter and had little to do with the ecological or religious content of the Jewish Christianity. In fact, the Easter was observed as a seasonal festival which celebrated the onset of spring season at the end of long and severe European winter. The festival was a continuation of the local pagan tradition which had developed around the goddess of the season, called Easter or Ostara [14].

Another significant change in the Christian calendar involved the determination and observance of Jesus' birthday. It is a curious fact that the birthday of Christ was never celebrated in Jewish Christianity until its coming to Hellenized Europe. The observance of Christmas, or Yule, in Europe was to adapt the Christian calendar to some of the rituals prevalent in pagan Europe. What is of interest here is the fact that Jesus' birthday began to be celebrated in winter, while it is now agreed that Christ was born in summer [15]. The reason for observing Christ's birthday on 25th December was because it coincided with the winter Solstice. According to European pagan tradition it was during this month that the Sun God, Sol Invictus, was born [16].

The introduction of Christmas in Europe was proper in that it echoed the sentiments and beliefs of the local Christian community. The observance of Christmas, however, created an ecological incongruity for other parts of the Christian world. The inhabitants of the Middle Eastern and Tropical countries, for instance, could hardly relate to Christmas rejoicing and festivities amidst wintry, snow-bound surroundings, with Santa Claus at the center of stage. Later on, when the Christian communities settled in South America, Australia and South Africa, the observance of Christmas again posed some curious adjustment problems. While sweltering in the hot December sun of the Southern Hemisphere, an Australian or an Argentinian could hardly relate to white Christmas and the ubiquitous Santa Claus, with the same spirit and conviction as displayed by Christians in the northern mid-latitudes.

Islam was the first religion in the world which managed to disassociate its religious observances from the ecological bonds. The Islamic calendar, unlike the Christian, was organized on the basis of the duration of lunar rather than solar months. It is true that the Jewish, Hindu and Buddhist calendars also followed the lunar months [17]. But all three of them made the necessary adjustments in the lunar year so that it would correspond to the seasons of the solar year [18]. According to the Quran, it was forbidden to make any changes in the lunar calendar. The Islamic religious calendar, therefore, allowed the religious observances to slide through all seasons during a year [19]. The observance of Islamic holy days and months, therefore, did not involve any permanent association with any seasonal regime.

In following the lunar calendar, Islam liberated itself from ecological determinism and ethno-centric tendencies that characterized earlier Semitic religions. The observance of religious customs and rituals, free from ecological constraints, enabled Islam to restore and revitalize Abrahamic monotheism for all mankind. The new Islamic faith, by adopting lunar calendar, based its ritual and devotional practices in accord with the

relationship between man and his one God, rather than between man and his ecological circumstances which were temporal, varying from season to season and place to place.

SEMITIC TRADITION AND ISLAMIC THOUGHT

The development of Judaism and Christianity out of the womb of Semitic tradition must have been a matter of common knowledge to the Arabs [20]. Being a nation of merchants and travellers from ancient times, the Arabs were in active contact with the Mesopotamian and Jewish cultures. The great market centers, like Mecca and Medina, lay on the major trade routes leading to Babylon in the north and Jerusalem in the northwest. Thus, the Semitic people of the Arabian heartland were destined to perform a task of unique importance. Being actively engaged in trade and commerce, they remained fully aware of the religious developments taking place around them. It is quite conceivable that the Arab scribes and religious authorities had their own interpretation of the legends of Mesopotamia and the revelations of the Semitic prophets. The fact that the first house of God, the Kaaba in Mecca, was built by Prophet Abraham himself, furnishes the indisputable evidence that the Arabs had deep religious involvement in the monotheistic tradition of Abraham, Noah, Moses and Jesus. It is evident that religious history of Arabia has undergone an evolutionary developmental process which provided Arabs a collective consciousness and perception about developments in religious thought.

Al Faruqi, in his study of Islamic history, makes a critical observation regarding the role Arabs have played in restoring Judaic-Christian thought to the original Abrahamic tradition. He argues that Islamic thought has evolved from the Semitic religious history through the *hanifiyyah*, or the tradition of the *hanifs* [21]. The local tradition amply indicates that the *hanifs* were from pure Arab descent and adhered to neither Judaism nor Christianity as prevalent in the Jewish and Hellenized parts of Arabia. However, they professed faith in the teachings of Abraham, Noah and the early prophets of the semitic people and were strictly monotheistic in outlook. The role of *hanifs*, in the history of Arabia, has been to preserve and perpetuate the original Abrahamic tradition through the hanifiyyah school of thought. The philosophical collaboration between the *hanifs* of Arabia and the Jewish and Christian *hanepai* [22] (the deviants), which was certain to have taken place, readied the Arabs for reorientation and recrystallization of the semitic faith.

Philosophically, Islam was a continuation of the early semitic tradition and a reinterpretation of Judaic and Christian schools of thought.

It accepted the Mesopotamian concept that reality is dual, made up of one God who is transcendent and the natural environment in which man operates as vicegerent of God. Man's purpose of existence, according to the Islamic viewpoint, was the fulfillment of the divine mission on this earth. The interpretation of the teachings of the semitic prophets constituted the fundamental basis of the Islamic religious thought. The continued reverence of the Holy Kaaba in Mecca, the holiest place in the Islamic world, became a feature of distinction in Islamic faith. However, the Muslims rejected the Arab associationism of God with other deities, thereby destroying all the idols of worship housed in the Kaaba. Islam also abolished priesthood and sacrament, rededicating the Kaaba to the one and only one God. The doctrine of intercession or mediation with God was also rejected in Islam, which emphasized direct and personal communion with Him.

Islam, convinced by the historical precedents, assigned elect status to the Arabic language so that the Quran, the holy book of Islam, will always be learnt and studied in Arabic. The assigning of this special status to Arabic was really to preempt the danger of misunderstanding or misinterpretation of the contents of the religious book. In the case of a universalizing religion like Islam, which envisaged to cross cultural and linguistic boundaries, such a threat was to be reckoned with. No wonder that Islam, through its fourteen centuries of history, has offered only one version of Quran and in one language.

ISLAM IN ASIAN REALM

When Islam expanded into India and Southeast Asia as a universalizing system, it had to contend with ecological circumstances associated with tropical environment. Humid tropical climate expanses of fertile agricultural lands had led to the formation of pluralistic societies divided by animistic-ethnic religions, tribalism, racialism and nationalism. In the process of expansion and assimilation, the Islamic spirit of universality had to reconcile with the prevailing cultural and religious diversity. Islam's attempt to bring about a symbiosis between the elements of particularity in Asia and elements of universality in Islamic philosophy has been summed up by Cragg in the following words:

"The Arabic scripture has a humanity to educate. The Arab messenger is sent, via his twin cities, to the entire earth. The rule of Islam kept his lineage but enclosed a far diversity of language, land and life. His native tongue remains peculiarly related to the word from heaven, but addresses every speech. Revelation is, at once, untranslatable and missionary, uniquely the Arabs" but inclusively everybody's [23]".

Islam's expansion into Asia, therefore, was to establish a society with common belief in the concept of one God, one Quran and one *umma*. Thus Islam was introduced as a total and unified way of life, both in religious and secular terms. The religion and state were considered interdependent and interassociated. If politics in a country were secular in nature, it was not considered truly a Muslim nation. It is, therefore, not surprising that Islamic nations in Asia have always opposed the forces of secularism and nationalism. The ongoing struggle between the Islamic polity and philosophy, on the one hand, and the forces of secularism and modernism, on the other, has become one of the most serious political developments in Muslim Asia.

The acceptance and the continued popularity of Islam in the Asian countries was due to the absence of elaborate clerical hierarchy and its down-to-earth simplicity. Most great religions lost faith of their supporters because their religious establishment and priestly order became target of criticism for the unavoidable gap that developed between preaching and actual practice. Islam has no church or priesthood and is, therefore, above reproach and criticism. In fact, ulema in Asia like the priests in Christianity, have performed well for Islam. They were often not well-educated, always narrow-minded but seldom dishonest or corrupt. It is through their efforts that Islam in Asia has remained internally cohesive and strong.

Islam has demonstrated a great deal of adaptability and flexibility toward local ecological associations and religious attitudes. On surface, Islam would appear to be a rigid and orthodox system which would discourage any change or reform in its philosophy. But that is not what actually happened when Islam expanded from Arab to non-Arab environments. Islam has a long history of tolerance and assimilation of local conditions and ritual observances as long as they did not conflict with the fundamental Islamic Precepts.

The presentation of rigid Islamic doctrines in a flexible fashion was made possible by the special role of the Islamic missionaries in India and Southeast Asia. The Muslim missionaries were not the doctrinaire Ulema but Islam's holy men who belonged to mystical and semi-secret brotherhoods, known as *tarikas* [24]. The mystic holy men, with their particular *tarikas*, were instrumental in grafting the strictly monotheistic and rigid Islam into the non-Arab non-desert environment of tropical Asia. The co-existence of the ulema, who were established religio-legal scholars, and the mystic holy men along with their *tarikas* has been one of the great paradoxes of Islam.

The Muslim holy men in many instances were Sufi mystics who were in spiritual contact with the ordinary believers through their own *tarikas*. The school of thought they represented formed the basis of popular Islam which often condoned the widespread and quite un-Islamic cult of saints (pirs) and the veneration of their tombs. It may be pointed out that saint worship was not part of the religious life in a *tarika* but was an outgrowth of the local pagan and Hindu tradition. The reason for *tarikas* success lay in the fact that the Sufis or saints were not the orthodox and rigid ulema. They preached Islam on a personal rather than institutional basis and promoted it on the basis of personal example and effort. Because of the individual involvement, in many instances, they could tolerate variations in social attitudes and religious observance in certain culture area. Undoubtedly, it was because of the secret mystic brother-hoods (*tarikas*) with their lay followers that allowed the continued success of popular Islam in Asia for eight centuries.

ISLAM IN MODERNIZING PAKISTAN AND INDONESIA

It is an ecological reality that the modern forces of secularism, urbanization and industrialization are rapidly changing the material and the spiritual values of the Muslim society. The onslaught of the secular and modern trends in the Islamic countries is tending to loosen the grip of Islam on its followers. However, still the vast majority of the rural population, which comprises over 70 percent in most Muslim countries, and the lower middle class in the rapidly growing cities are among the most devout followers of Islam. Even the clerks, small businessman and shop-keepers, who are moderately educated, demonstrate elements of traditionalism with some inclination toward reform in the partially urbanized societies of Pakistan and Indonesia. Recent developments in Pakistan, where Islamic Revolution is underway, and in Indonesia, with its ongoing struggle against secularism and modernism, point up the fact that Islam is alive and kicking. In the following, an examination is made of the impact of the forces of secularization and modernization on the Islamic polity and social life in Pakistan and Indonesia.

ISLAMIC REVIVAL IN PAKISTAN

Insofar as Islam's meeting the challenge of secularization and modernization is concerned it seems that it has yet to find an answer which is not repugnant to fundamental Islam. Bold efforts have been made during the 19th and particularly the 20th centuries to address Islam to modern socio-political needs by Muslim thinkers and philosophers. Among these, the names of personalities like Al-Afghani, Abduh, Rida and Mohammad Iqbal are worthy of mention. The intellectual impact of these thinkers on the Muslims of the Indo-Pakistan sub-continent was profound and immediate.

It is a well-known fact that the volunteers who participated in the War of Independence in India (1857) side by side with the Indian mutineers were of Wahhabi sect inspired by Arabia. Subsequently, the wahabis and other ulema combined their religious forces and continued their struggle against the British in the north and in Bengal during the latter part of the 19th century. These resistance forces were inspired by the religious leaders as a form of Jihad or a holy war against the British usurpers. In 1912, a surge of pan-Islamic movement, then called Khilafat Movement, developed in reaction to the defeat of Turkey in the Balkan wars and the loss of Libya to the Italian colonialists. The ulema, at the time, declared Jihad again but the movement failed due to the strong opposition by the British Indian government. One indirect effect of the Khilafat movement was that it consolidated the Indian Muslim community behind new political and religious leadership. One can also argue that it was Khilafat movement that finally led to the idea of a separate state for the Indian Muslims, which became a political reality in 1947 when Pakistan became an independent Islamic state.

The establishment of Pakistan was a political accomplishment achieved to fulfill a Muslim dream of establishing an Islamic state based on the Quranic precepts and Sharia. At the time of its independence, Pakistan became the largest and the youngest Muslim nation in the Islamic world. Lying between the desert-inspired and orthodox Islam of the Middle East and the liberalizing and secularizing Islam of Southeast Asia, Pakistan occupied a geographic position of unique importance. In the technological sense, Pakistan also was more modernized and technologically more advanced than either of her two flanks of the Islamic world. The political paradox that this new nation faced was how to formulate its national policy that will be in keeping with the Islamic ideology and at the same time will allow Pakistan to economically and socially move forward. The ulema have always advocated a national policy that will preserve traditional Islam and direct itself toward consolidating the umma (World Muslim Community). Even Dr. Iqbal, the progressive thinker and the originator of the idea of Pakistan, severely criticised the westernizing and secularizing trends in British India. He believed that the materialistically and politically inspired secular and modern forces tend to dehumanize and paralyze the human and religious spirit [25]. However, being a constructionist, Iqbal has, emphatically and repeatedly, said that "Islam must be rethought in modern terms [26].

The political and religious change that Pakistan has undergone during the past forty years typify the conflict between the forces of modernization and traditional Islam. Pakistan came into being as an Islamic state with the support of the masses who were ardent Muslims and wanted

to see Pakistan become an Islamic state as an integral part of the Muslim umma. From the very beginning and to the present day this has been the dream of all Pakistanis and remains to be the very *raison d'être* of Pakistan. However, this dream was not going to be realized soon as the Pakistani leadership had other ideas. The political elite, which was westernized and secular in outlook, began to run Pakistan as a nation state. From the Islamic point of view, western form of nationalism was to be condemned as it was against the precepts of Islam. In the eyes of Islam, the forces of tribalism, ethnocentrism, nepotism and nationalism worked against the fundamental concept of Islamic solidarity. Since Pakistan, like many other Muslim nations, won independence after a long nationalist struggle, it seems ironical that Islam has such intense opposition to nationalism [27].

The nationalist movement in British India for a homeland for the Muslims grew out of religious reasons. It was believed by the Muslims that only in a free country can there be religious freedom and self-respect.. President Ayub asserted this feeling in the constitution of Pakistan saying that in Pakistani society national territorialism has no place, yet those living in an area are responsible for its defence, security and development [28]. Thus the national struggle in Islam, though against something and therefore negative, was undertaken to promote the Islamic concept of one God. This may be described as negative nationalism as opposed to positive nationalism to which Islam is vehemently opposed. The latter is the type which divides mankind into smaller, mutually antagonistic units. This form of nationalism runs against the concept of oneness and universality of mankind that the Holy Quran speaks of [29].

What happened in the first thirty years of Pakistan, amply demonstrates that the political leadership of this country has failed to establish Pakistan as an Islamic state. It appears that the Muslim leaders were able to achieve Pakistan as a political reality but once independent they fell into disarray. The pressures of secularizing and modernizing forces, on the one hand, and conservative and revivalist tendencies, on the other, were too much for the political elite to handle. This inherent duality in the body politics of Pakistan threw the nation into utter confusion. The endless confrontation between the professional politicians, who were essentially secular, westernized and often un-Islamic, and the men of religion - the ulema and the Sufi-mystic cults with their *tarikas*. These thirty years were a period during which Pakistan experienced repeated falls of governments only to be followed by the military regimes, and still in 1970 there was no indication that an Islamic state was in the offing. It was in this political context that the confused leadership of Pakistan held its first general elections in 1970. The political and emotional cost of this election was too great as it led to the break-up of Pakistan. The forces of nationalism erupted in East Pakistan and after a brief civil war in 1971, East

Pakistan became Bangladesh, the land of the Bengalis.

The debacle of Bangladesh shocked the Muslim world into disbelief. Here was a nation which was established to become an Islamic state, to follow the precepts of Islam as part of the umma. The victimization of this state by the forces of nationalism was a political reality that Islamic world was not ready to accept. Pakistan's break-up had demonstrated that the link of Islam had not proved to be strong enough to hold an Islamic state together against the pulls of regionalism and nationalism. The traumatic shock that the population of Pakistan suffered put the religious leadership of this country on the defence. Despite these developments, the newly elected political body under the leadership of Bhutto still continued to exploit the sentiments of Pakistanis. Except for some superficial religious reforms that were recommended, the Bhutto government maintained its secular and modernistic outlook. In the Constitution of 1970, it was pointed out that the Islamic obligation of zakat (alms) and the elimination of riba (usury) would be implemented in due course. It was declared in the Constitution that teaching of Arabic and Islamiyat (religious teaching) would be encouraged. However, this kind of Islamic revival, coming from a western-educated and liberal politician smelled foul to the ulema and other religious groups. They feared that the quasi-Islamic constitution of Bhutto might ultimately go for secularism. As internal religious revival and social unrest intensified in Pakistan, it became more and more difficult for the government to keep law and order. Ironically, it was once again after the general elections, which were held in 1977, that the people of Pakistan took to the streets charging the government for rigging the elections, corruption, nepotism and criminal conduct. In utter desperation and increasing hypocrisy, Bhutto turned toward exploitation of religion. In May 1977, two months before he was overthrown by General Zia-ul-Haq, Bhutto tried his last card and legislated prohibition of gambling and drinking. Also, Friday instead of Sunday was declared weekly holiday. But these religious reforms did not work as they came too late and the Pakistani people would not take this hypocrisy any longer.

Now that General Zia has been at the helm of the government for over 6 years one should briefly examine the nature of his governance. Initially, it seemed that Zia too, like his predecessors, was engaged in the political theatrics and zealous oratory to ride out the Islamic storm raised by the ulema and their supporters [30]. Soon after he took over, Zia decreed amputation as the punishment for theft and public flogging for other immoral offences in the tradition of Sharia. But the legislative changes he made in 1979 tend to dispel these suspicions that Zia too was misusing Islamic injunctions to gain political power.

According to the 1979 reforms, Zia government has legislated all of the canonical punishments for crimes like theft, adultery, drinking and bearing false witness. The government has also established the supremacy of the Sharia law over the existing civil legal system. As for the elimination of *riba*, initial investigative research has been conducted and new measures have been undertaken through the offices of the National Investment Trust and the Investment Corporation of Pakistan to establish interest-free banking in the country. Regarding levying of *zakat*, one of the pillars of Islam, detailed and comprehensive national plan was prepared to collect the *zakat* and for the utilization of the collected funds. In 1980, the government of Pakistan starts to collect *zakat* from the Pakistani Muslims, in keeping with specification of Sharia. In June 1984, the Zia government made the announcement that beginning next year all the banks in Pakistan, including foreign institutions will stop paying interest to depositors in keeping with the Islamic law [31].

ISLAM IN MODERN INDONESIA

Islam's emergence in Indonesia and its role in the social, political and economic life of this nation is a subject which has attracted very little attention. It seems ironical when one realizes that Indonesia today is the largest Muslim nation in the world and is posed to play a decisive role in the future of emergent Islam. The general impression one has of Indonesia is that it is some sort of a "backwater" of the Islamic world and that not much is happening in the placed life of this nation. Quite contrary to this, much has happened in Indonesia since the turn of the 20th century which has prompted vigorous intellectual debate between the conservative and progressive politico-religious groups. The consequences of this on-going dialogue between different ideological groups will help ascertain the role of Islam in the rapidly developing and transforming Indonesia.

Indonesia to-day has a population of over 146 million which is estimated to rise to a total of over 160 million by the year 1985. Of this total, about 90 percent are Muslim, 9 percent Christian, the remaining are either Hindu, Buddhist or Amimsts [32]. The size of this Muslim nation can be better appreciated when one realizes that Indonesia's population alone exceeds the population of all Middle Eastern countries put together. Another geographic fact that staggers the imagination is that this country is made up of 13,700 islands, where more than 200 languages and dialects are spoken. This situation poses not only serious administrative problems but sets back government's effort at consolidation and integration of this scattered nation. The question that arises is: what role Islam can play in welding this nation together as one community so it can be ready to do the task of national development and reconstruction? Another related question is: in what way the ecological circumstances in this diverse and rapidly

contributory factors to these flexible and progressive tendencies.

The first organization that started the reformist activities in Indonesia was the Muhammadiyah. Founded in 1912 at Jogjakarta by Dahlan, this institution became one of the most important progressive Muslim action group. One important feature of this social organization was that it was urban-based and offered reformist outlook [36]. Another significant aspect of this organization was its association with a women organization, called Aisjijah, which was trying to improve the social status of women in the Indonesian society. Both Noer and Hansen in their studies point out that influence of the Al-Azhar University at Cairo was the primary reason behind the reformist and modernist outlook in the Muhammadiyah organization. They observe that during the 1930's Al-Azhar's influence on the Muhammadiyah progressively grew which fused more liberal and modernist thinking into the Indonesian religious thought [37].

Nahdat-al-Ulama (NU) was another religious organization that was founded in 1926 to promote traditional and orthodox Islamic thought. Initially, this organization was formed as a protest against Turkey's decision to abolish the Caliphate. However, it soon became involved in the missionary work and other charitable causes. Its major objective was to strengthen unity among the ulema and other religious organizations. The size of this organization grew rapidly and in 1942 NU already had 120 branches all over Indonesia.

The ideological struggle between the NU and the Muhammadiyah fits classically into the ecological context of Indonesia. It is interesting to find geographic perimeters of the two organizations were associated with the socio-economic configuration of the Indonesian society. While the NU was mainly confined to the countryside and adhered strictly to the Sharia, the Muhammadiyah was associated mainly with the urban areas and offered a modernist and reformist outlook. Thus the organizational set up of the two parties reflected close association between conservatism and ruralism, on the one hand, and between progressive modernism and urbanism, on the other.

The third major political party, Masjumi, was established in 1945 by the Japanese occupation regime to serve as a coordinating body between the NU and Muhammadiyah. Its membership and leadership was drawn from both NU and Muhammadiyah. After the Japanese left, Masjumi played an important role in Indonesia's struggle for independence. Under the dynamic leadership of Natsir, in the tradition of Abduh, Masjumi became a party of the "religious socialists" who worked toward establishing an Islamic state in Indonesia. With the massive support it enjoyed, Masjumi and NU grew into a major political force in the country. In 1950, Masjumi

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and NU controlled 40 percent of the Indonesian electorate.

Both Masjumi and NU tried hard to persuade President Sukarno to have declared an Islamic state. Again, these two Parties with the support of Muhammadiyah argued with Sukarno for years to delete the term nationalism from the constitution but did not succeed. Masjumi became more vocal and restive on these two points and was finally banned by Sukarno in 1960. The political and social unrest that ensued inevitably led to Sukarno's downfall. In 1965, the army took over and the situation was brought under control. General Suharto, who led the takeover by the army, won elections four times as the President of Indonesia. In 1971, under orders from Suharto, all the religious parties were forced to merge into one body called United Development Party. To the surprise of the army, UDP won 39 percent of the votes and defeated the army's party in Jakarta. The election results amply showed the political strength of Islam in Indonesia was intact and growing.

Today, Indonesia has reached a stage where the political leadership of this nation just reconcile with the strength of Islam in the country. The riots and unrest that were witnessed after the 1982 elections show the frustrations and hostilities that the nation has built up against the government for being unresponsive to its aspirations. Increasingly, the religious parties are making demands for the establishment of an Islamic state. This renewed vitality in Islam combined with its popular appeal is bringing about a rapid expansion of this faith throughout this country. However, the fact still remains that this nation has not yet come to grips with Islam's fundamental and puritanical stand on contemporary problems. The events of the post-Independence period indicate that the Indonesian government has failed to fully appreciate the religious feelings of the Indonesian people and have ducked the problem of finding a proper place for Islam in the Indonesian society. The example of what has happened in Pakistan and Iran has come to be something the reform-oriented Indonesians would like to avoid. It is evident from the pronouncements of the religious leaders that there is need for an Islamic state. What is not clear relates to the nature and content of the Islamic state. The controversy that the Pakistani and Irani brand of Islamic state has generated has given second thoughts to even the traditionalists in Indonesia. The reformists are of the opinion that one does not have to go back to early Islamic tradition to find answers to the contemporary problems, as Iran and Pakistan are trying to do. They want to establish an Islamic state which will preserve the basic Quranic content and Hadith but will allow, through *ijtihad*, reinterpretation of Sharia, if found necessary. It seems that the inbred pragmatism and flexibility in the Indonesian people might prevail in forming an Islamic state workable and relevant to the

needs of the modern world.

CONCLUDING REMARKS

The history of semitic religions, as indicated in this paper, demonstrates that a religious system, however and wherever conceived, is an outgrowth of the ecological associations between man and his natural environment. As man moved through space and time, these ecological associations were modified and the content of a religious system changed accordingly. The discussion of Judaic and Christian tradition shows some of the ecologically derived changes that took place in these two religions. However, in the case of Islamic philosophy, it is noted that in pursuit of strict monotheism, this religion has taken a unique position. Realizing that ecological associations invariably lead to worship of nature rather than God, this religion has attacked the roots of the polytheistic tendencies. The adoption of lunar calendar in place of the solar one was to break the ecological bond with nature and thereby minimize the possibilities for nature worship. Other ways by which Islam discouraged pluralistic tendencies in religious thinking was recognizing unity in other things, the concept of God, for instance, was equated with one Quran, one language and one umma to emphasize the unity of God. It may be argued that the idea of an Islamic state being a symbiosis of religion and state was also to strengthen faith in one God.

Islam's rigidity and orthodoxy was also to preserve the faith in one God and his religion. This puritannical and traditional spirit in Islam is now confronted with forces of secularism, nationalism, materialism and modernism. Since all of these forces tend to relate to diversification, decentralization and pluralism, the orthodox Islam has stood against them. This is why the traditional thinkers in the Islamic world are against these elements of modernization. The return to the traditional Islam within the context of an Islamic state, is to get away from these divisive and shrik forces. The recent history of Pakistan is an example of this retreat to fundamental Islam under an Islamic state to purify the monotheistic Islam. What kind of Islamic philosophy is going to develop in the Indonesian setting and what kind of Islamic state it is going to become, if it ever does, are some of the questions modern Islam is facing.

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- students of botany to describe the interaction of plants with other organisms, and with their environs. Over recent years, this term has been used by social scientists and geographers to study large-scale regional ecological systems and global interactions and relationships. For more details: Andrew P. Vayda and R.A. Rapaport, "Ecology, Cultural and Noncultural," *Human Ecology* (N. Scituate, Mass., Duxbury Press, 1976), pp. 1-24.
3. In Ibn Khaldun's view, the historical role of the Beduins (nomads) and the Fellahin (peasants) has always been that of the conquerors and the conquered. The successive conquests of the sedentary civilizations of Mesopotamia, Persia and Egypt by the desert nomads has been a repetitive historical process. This repetitive pattern, in Ibn Khaldun's estimation, set the stage for a perennial territorial contest between the pastoralist and sedentary societies of the Middle East. He argued that the pastoral tribes, with their simple but hard life style, a strong sense of tribal loyalty and great hunger for land, were well-equipped to overpower the easygoing, socially disintegrated and timid sedentary peoples. With this historical pride and sense of superiority, the nomadic groups in due course of time developed a demeaning and contemptuous attitude toward the sedentary populations, treated as slaves to the land. For details, C. Issawi, *A Philosophy of History* (London: John. Murray, 1955), Chapter VI, pp. 99-130
 4. Ellen Semple, (1911), *Influences of Geographic Environment* (New York: Henry Holt and Company, p.483.
 5. The view that ecological relationships between man and his environment are of deterministic nature has been stretched by some geographers to unrealistic limits. To ascribe a deterministic role to natural environment is not only fallacious but demeaning to man, the vicegerent of God on earth.
 6. Ellen Semple, *op. cit.*, P. 512.
 7. Ismail R. Al-Faruqi, "The Ancient Near East," in *Historical Atlas of the Religions of the World*, eds. Ismail R. Al-Faruqi and David Sopher (New York: MacMillan Publishing Co., Inc.)
 8. The incorporation of the fertility rites in Judaism, for example, was a borrowing from the Canaanite-Phoenician tradition which had ritualized the gods of fertility and life. This is confirmed in Deuteronomy (28:47) where it says 'the rites of fertility were an abomination, but the Lord loves his earthly life of men and women, and He desires to be served in joy and with a good heart.' From: Jacob A. Agus, "Judaism" in *Historical Atlas of the Religions of the world* eds Ismail R. Al-Faruqi and David Sopher (New York: PUBLISHING Co., Inc., 1974), p.139.
 9. *Ibid*, p. 140.

10. Jacob A. Agus, *op.cit.*, p.149. Gerard Sloyan, however, argues that Jesus represented the Galilean Judaism and was a teacher in the Pharisaic tradition. See: Gerard Sloyan, "Christianity," in *Historical Atlas of the Religions of the world*, eds. Ismail R. Al-Faruqi and David Sopher (New York: Macmillan Publishing Co., Inc., 1974), p. 203.
11. Jacob A. Agus, *op. cit.*, p.149.
12. David E. Sopher, *op. cit.*, p.19.
13. Jacob A. Agus, *op. cit.*, p.141.
14. David E. Sopher, *op. cit.*, p.21.
15. *Ibid.*, p. 21.
16. E. O. James, (1961), *Seasonal Feasts and Festivals* (New York; Barnes and Noble, Inc., p.229.
17. *Ibid.*, p. 22.
18. In the case of a solar year, twelve months take a total of 365,4days, while in a lunar year twelve months take only 354 days, a yearly difference of 21,4days.
19. David E. Sopher, *op. cit.*, p.22.
20. Ismail R. Al-Faruqi, "Islam", eds. Ismail R. Al-Faruqi and David Sopher (New York: MacMillan Publishing Co., Inc.), p.237.
21. In the Arabic language, hanif means: the one inclined to right opinion, orthodox, firm in faith, sound and well balanced, true. In the opinion of Yusuf Ali, an eminent authority on Islam, 'true' sum up most of the other shades. From: Yusuf Ali, trans., *The Holy Quran*, English translation (Beirut: Dar Al-Arabia Publishing Co.,1968), p.55.
22. In addition of the Arabic word "*hanif*", meanings of which have been discussed earlier, there is the Aramaic/Syrian expression "*hanepaP*" which literally means "deviant" or "rejected". In the pre-Islamic times the word *hanepai* was used for those peoples in the eyes of Hebrew authorities, deviated from the orthodox Ezraic ethnocentric philosophy and thus were rejected. See: Ismail R. Al-Faruqi, "Islam," in *Historical Atlas of the Religions of the world*, eds. Ismail R. Al-Faruqi and David Sopher, p.237.
23. Kenneth Cragg, *The House of Islam* (Belmont, California: Dickenson Publishing Company, Inc., 1969), p. 87.
24. The Qadri order, founded in Bagdad in the 12th century, was the first tarika in Islam. Other tarikas were developed in every succeeding century with an explosion of mystic orders during the 18th and 19th centuries. The rule of the Qadri, Naqshbandi, the Chishti and the Suhrawardy in the Islamic society of South Asia and Southeast Asia has been of great religious significance.
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26. G. H. Hansen, (1979), *Militant Islam* (N. York: Harper and Row Publishers, p.94.
27. Even Dr. Iqbal, reformer and constructionist by outlook, was fiercely opposed to the idea of nationalism, as viewed in the western world.
28. Mohammad Ayub Khan (1967), *Friends Not Masters* (OUP, New York, p.197.
29. See the Holy Quran, sura 34, verse 28; 36, 70; 61, 9.
30. Pakistan masses were suspicious of Zia's intentions because of the circumstances he was in. Zia was under great pressure from overseas and without Pakistan to stay the execution of Bhutto. The reforms should appear to have been implemented to placate the national religious protest and to consolidate his political authority in the country.
31. From, *Eastern Times*, a weekly paper published from New York, vol.1, no. 23, June 16, 1984.
32. *Europa Yearbook*, (1983), (London: Europa Publications, Ltd., 1983), vol.2, p. 536.
33. Fazlur Rahman, *op.cit.*, p.46.
34. *Ibid*, p. 44.
35. Malaysia may be an exception, but in that country liberal and secular tendencies are more related to demographic characteristics rather than the ecological context. In Malaysia about 43 percent of the total population is non-Malay and non-muslim.
36. Deliar Noer (1973), *The Modernist Muslim Movement in Indonesia*, Kuala Lumpur: Oxford University Press, p.74
37. *Ibid.*, pp. 296-299.

THE DEVELOPMENT OF JEDDAH: A STUDY IN URBAN GEOGRAPHY

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Abstract: The historical city of Jeddah was a small village living on fishing by the Red sea coast and an important caravan station since the time people came to visit the holy Haram. Like many other major cities Jeddah developed at a communication node. A city port of great age is a gateway to the holy Makkah for people coming from North South and West..

The modern history of Jeddah is closely linked with the exploitation of oil fields in the latter half of the 14th century. There has been a dramatic increase in both the physical growth of the built-up area and the population. Today Jeddah is the largest city of the region. It has a large seaport handling import and exports of goods the world over. Industrialization has been one of the most important process for economic development. Jeddah has developed into an integrated city and represents the most important link in economic relationship between the region and the world at large. Its importance as an urban center and its role as "Growth Pole" will be intensified as petro-chemical and non-petroleum industries develop.

The name Jeddah, 'Grandmother', and the legendary tomb of Eve are indicative of ancient character of the city. Record settlement in Jeddah began about 2500 years ago with the Kodah tribe; it was the grazing land for Kodah the nineteenth grandfather of the Prophet (P.B.U.H.) it was a small humble village living on fishing by the Red sea coast and it was the one of important caravan stations, since early time for the people coming to visit the Holy Haram. This was followed by tribes of Persians origin who developed it and encircled it with a wall of Kashu blocks of manqabi stone (Coral limestone cut from its shores and dug around it reservoirs to store the rain - water precipitating on the mountains to its east, led by oq'uoms to collect into the reservoirs for storage, then was carried on animal backs into the town within the wall.. To the east of the town the road to Makkah facilitated trade to the hinterland. The subsequent town development took place on the raised mound of former settlements.

There appeared in Jeddah, an architecture of its own, depending on

local raw materials and the humane requirements of its inhabitants; merchants and fishermen. The seasons of prosperity in Jeddah came firstly with the seasonal winds driving the boats from the shores of India carrying its produce, to be temporarily stored in Jeddah until the windy season is over before being transported to the opposite coast of the Red sea prior to their export to Mediterranean shores, or else be carried by caravans through the tracks to the Levant (AS'SHAM) markets north. The second season of prosperity came with the arrival of the groups of pilgrims to the Holy Haram. Jeddah is the gateway for Makkah Al-Mokarramah for those coming from the south, the west and the north. This role as an entrepot center was strengthened by the pilgrims carrying food and goods during their visit to the holy cities.

GEOPHYSICAL

The western region is physically non-homogeneous, lying across three of the major north-south physiographic divisions of the Kingdom; the coastal plain or tihama, the escarpment and the basalt hills of the Hejaz mountains, and the interior plateau. The topographic divisions have played a major part in influencing the development of Jeddah, not only directly, a barrier to communications, but indirectly, through the influence which topography and geology exert on climate, ground water storage and flows, surface flows, and agriculture.

The city of Jeddah is located on the Red sea coast of Saudi Arabia on a 12 kilometer wide coastal plain or tihama at a point where prehistoric river courses, formed at a time when the sea level was much lower than the present, providing access through the fringing coral reefs to the area. It is backed to the east by foothill outliers of the Saudi Arabia massif, opposite a break in these foothills which provides access from Makkah and the Hejaz hinterland. Thus Jeddah like many other major cities, developed at a naturally defined communications node that is at the conjunction of sea borne traffic through the gap in the reefs, eastward land traffic through the pass in the hills to Makkah and its routes to the Arabian hinterland, and then northwards via the tihama and the Badr gap to Madinah, and beyond. The effect of this conjunction is as important today as in the past, with the level tihama providing the only suitable site for the region's airport, and the surface transport routes still being influenced by physiographic restraints.

COMPONENTS OF GROWTH

The environment of old Jeddah was like that of all the cities during that era pure and clean; planned by its inhabitants for their comfort in dwelling, trade and performance of their religious rites. Its lanes were always half shady because of the rawashins that cover the face of houses

receiving the breeze resulting from its multiple directions and to overcome the high humidity characterizing the climate. For many centuries, Jeddah thrived within its wall with an almost steady population ranging between 10,000 - 25,000 persons increasing during the prosperous seasons only to return to the normal figure at their end.

Jeddah a city port of great age: the gateway to Holy Makkah and western Arabia, "Bride of the Red sea", confined for several centuries by its desert hinterland and an uncertain water supply within massive walls of bleached coral, doubled in size between 1974 and 1980. The town 17th and 18th century writers observed had changed little in plan and form since the medieval period, in which the physical geography of the site was a dominating feature.

A generation earlier the walls were torn down, with them Jeddah's old identity, as a town began to advance across sand, silt marsh and coral reef into a sprawling modern city. It is still growing as Saudi Arabians pour in from the hinterland to settle in modern homes, and as foreigners take up temporary residence to play their part in the country's dynamic growth. Jeddah today is thus a city of striking variety; seascape and cityscape, the ancient amid the modern, the elegant amid the garish, a city of alleys and boulevards, of an aspect some times utilitarian and some times aesthetic. The city is situated about half way along the Red sea's eastern coast. Jeddah owes its existence to the presence of a gap in the triple line of coral reefs fringing the Red sea shore and to another gap in the Great Arabian Massif barrier which allowed communications via the Wadi Fatima inland to Makkah.

The Persian poet Khusrow visited the town in 1950 and left the first written account. He describes the thriving place: "Jeddah is a great city surrounded by a strong wall, with a population of some five thousand males. The bazaars are fine There are no trees or any vegetation at all, but all that is necessary for life is brought in from surrounding villages.

The opening of the Suez canal in 1869 proved a boom for Jeddah and by the turn of the century, its merchants of Hadrani, Japanese or Indian origin were handling a regular volume of commerce with other Arabian ports, Indies, Egypt, Africa, and even Liverpool and Marseilles.

In 1910 the port of Jeddah's export trade was only worth 65,000 mostly in the hides and skins that are still Saudi Arabian's second largest export. But imports partly financed by the spending of pilgrims, were as high as 1,750,000. A portion this was for transit, but the largest items were grain and rice to feed the pilgrims and to meet the growing demand of the interior.

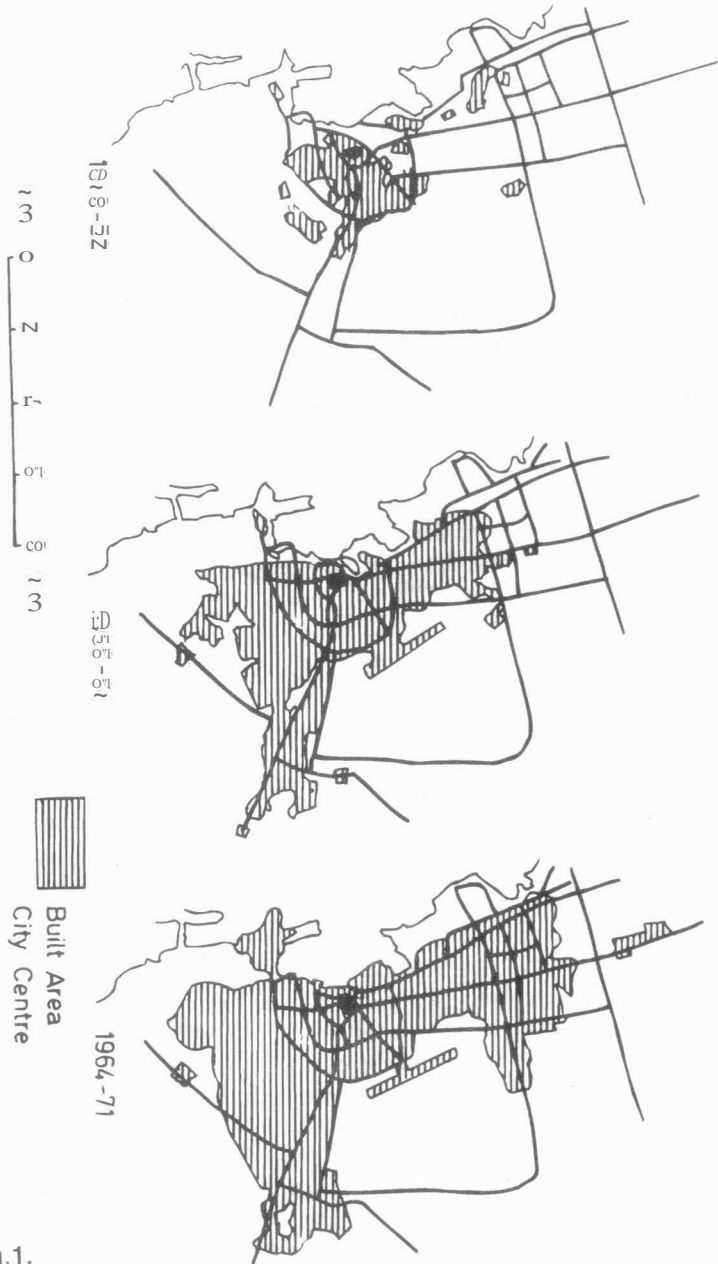
The Saudis had control of the farms and wells of Wadi Fatima and the whole of the hinterland was behind them. After a siege in which old men in Jeddah today remember the poor begging for water, the town surrendered on December 23, 1925. The modern history of Jeddah begins from that day. At the center of the town's life was the customs Quay, where lighters and sawbucks off loaded goods from the freighters in the bay. Just inland was the main street of the town and behind it a maze of alleys that formed the Suq.

In 1938 oil began to flow in the Eastern province and Jeddah's days as a walled city were numbered. Immediately after the second world war, the effects began to be felt. The walls were demolished, but at least the water problem receded with the piping of three million gallons a day from wells fifty miles to the south in Wadi Fatima.

Confined to the east by the basalt hills and wadis of the Hejaz range, and to the south by salt marshes ablaze with flamingoes, the city broke out north wards in a rash of haphazard building along the Madina Road. Some order was restored with the growing experience of the municipality in the 1960's but the early pattern was repeated in aggravated form with the quadrupling of oil prices in 1973-74.

The modern history of Jeddah is closely linked to the exportations of the east coast oil fields in the latter half of the first oil booms, from the end of the second world war up to 1376 AH, the city experienced rapid urban expansion. The growth of Jeddah then proceeded at a more controlled pace. However the increase in the price of oil during 1393/94 AH (1973-74) had an immense impact on Saudi Arabia as the world's major oil exporter. Jeddah also shared in this second oil related boom, which transformed the parameters of socio-economic planning for the city and rendered obsolete all prior projections of population and income growth.

An indication of the rapidity of recent growth can be obtained by reference to the extension of urban boundaries since 1948-1952 (Fig.1). In the master plan of 1393 AH (1973) the built up area was calculated at approximately 4,777 hectares giving a population density of approximately 85 persons per hectare. The built up area indicated by the land use survey of 1398 AH (1978) is approximately 16,800 hectares, giving a population density of approximately 54 persons per hectare. The total area surveyed for the purposes of the socio-economic survey 1398 AH (1978) was approximately 470 square kilometers. There has been a dramatic increase in both the physical growth of the built up area and in the population.



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Fig.1.

Some moderation in growth is expected in the next few years, albeit from extremely high levels; but Jeddah is likely to continue in its position as one of the fastest growing metropolitan areas in the world.

POPULATION

In 1398 AH (1978), the population of Jeddah was estimated at 916,000 of which 484,000 were foreign immigrants [1] This was one third of the total population of Saudi Arabia. This very high proportion of non Saudi nationals has principally resulted from the high labor demands generated by the National Development Plan. It is clear that the future population growth is very dependent on the rate of government investment and the consequent number of jobs that need to be filled to effect that investment in facilities and services. Jeddah with a current population of over one million in 1400 AH(1980), is forecast to grow to 1.6 million by 1410 AH (1990) and 2.25 million by 1420 AH(2000). Employment is expected to increase from 282,000 in 1398 AH(1978), to 640,000 in 1410 AH(1990) and 900,000 in 1420 AH(2000). [2]

Jeddah is the largest city in the region, followed by the holy cities of Makkah and Madina, and the towns of Taif and Yanbu. In 1394 AH, the population in the region exceeded two million persons. This was over one third of the total population of Saudi Arabia. The huge demand for consumer goods, food, construction materials and technical and administrative services for the increasing population has given tremendous impetus to the physical and economical development of the city of Jeddah.

However, because of the repeated rise in private income and government budget and also the continued increase in the number of pilgrims all previous norms calculated for the growth of the city were surpassed which in turn led to a multiple directional expansion in the boundaries of the city, both vertically and horizontally. To cope with this unprecedented increase in population every Jeddah family was tempted to see itself as a property developer, with ninety percent of Jeddah land in private hands, the power of the city was limited. Acceptable land use practices became almost impossible to enforce, while construction was often of poor quality. Some of the finest old buildings in Jeddah disappeared as the old town nearest the sea was redeveloped.

Housing in Jeddah has developed at all levels of quality, from the shanties of the low-income immigrants, to palaces. Generally houses are distributed by type with good quality villas and apartments tending to be located along the Madina road axis, and, to a limited extent, along the Makkah road axis, Middle income houses are to be found in the older

expansion areas of Kandra and Baghdadia. Low income houses are found in the old city, in the southern districts of Saleel, Quarantina etc, and around the old villages such as Rowans, Onaclish and Bani Malik, although these villages have now been developed by modern, high quality housing. The existing acts to constrain housing development to the east of the city, although this constraint will disappear if the airport closes when the International Airport opens. Scattered developments in the outer areas are by passing vacant sites nearer to the center, creating a need for a more extensive servicing infrastructure than would be generated by more compact development.

COMMERCE

The wholesale activities are scattered, but with a tendency to concentrate near the sea port, and along the Makkah and Madina Roads, wholesaling in the Makkah Road and seaport areas is well established; where as the Madina Road areas, (north of Palestine square) is a recent development and is expanding vigorously.

Jeddah also represents a major market for agricultural products, drawing its supplies of fresh fruits, vegetables, and animal fodder from a radius of upto 500 kilometers. As the city grows, so will the need of primary produce from the regions agricultural areas thus bringing beneficial and stimulating effects on the economy of the rural areas and villages within the region.

Retail activities have followed the traditional pattern of small local shops for day to-day needs. The city center markets for durable and specially goods. However there is a trend towards the establishment of durable goods outlets in the suburban areas, located on the main traffic routes, especially for those goods which require large display areas, such as furniture and electrical goods. This trend is encouraged by the availability of suitable sites and improved access for car using customers. There is also an increase in the number of super markets, catering largely for the high income non-Saudi population. However, there is no evidence yet that this has had an appreciable impact on the shopping patterns of the Saudi population.

The rapid expansion of commercial activity in Jeddah has not been matched by the provision of purpose- built office accommodation in the traditional commercial areas. This has resulted in the increased demand for office space being met by the utilization of residential units for this purpose, both within the central area, and in the suburbs. The move to the suburbs has been encouraged by the ready availability of vacant premises, and by the problems of congestion within the city center. This is further

evidenced by the recent growth of suburban purpose-built office premises.

Thus, the commercial land use pattern is one of increasing dispersion of relatively small shops away from the congested city center. Small shopping centers, with a supermarket as the principal terminal are beginning to appear, but Jeddah has yet to see development as a major regional center. Development primarily along major arterials can be expected to continue as Jeddah develops in response to the outward dispersion of residential population and as congestion within the city center increases.

Industrialization is one of the most important processes for economic development which mobilized an ever increasing sector of the national resources to build an economic infrastructure that is characterized by an upto date technological standard and variability and include a group of basic transformation industries.

Based on the results of studies on the direction of the prevailing trends in Jeddah and the nature of its land its topography and remoteness from the residential area, a large area has been devoted in the south of the city as an industrial zone, the power supply to which was provided by the increased supply of electricity a by product of desalination processes to 840 mega watts.

Since Jeddah was in the past and in fact still as the most important center for the delivery of commodities, pilgrims, visitors and those performing minor pilgrimage to the Kingdom; the port of Jeddah has much enlarged and developed into an integrated city in its own merits working 24 hours daily as it represents the most important link in economic relationships between the region and the world at large. Thus, due to the use of modern technologies in loading and unloading and in receiving frozen goods with their cold storage etc., and quays to handle livestock; the waiting period for ships at anchor was reduced to zero. Jeddah Islamic port is even considered one of the largest in the whole world for handling livestock.

INDUSTRY

Jeddah is not a heavy industrial center, mainly due to lack of available raw materials. The only primary industry which it possesses are the oil refinery, in the south, and the cement factory to the north of the city. Secondary Industry covers a wide range of products including truck assembly, food processing, light metal work, building products, and traditional crafts such as jewelry making. Small craft industries tend to congregate usually in the older, poorer parts [4] of the town, such as BAB

MEKKAH, and SABEEL. Larger factories have in the past located on the Makkah and Madinah roads, although the ministry of industry now encourage the location of new plant in the industrial estate to the south of the city. This policy has met with some success and a major extension to the estate is now under construction. Service industries, by their nature, tend to be widespread for the convenience of their customers. Small repair shops usually are found in the low income areas where accommodation is cheaper. The areas such as Bani Malik, Rowans, and Sabeel have a high incidence of such establishments.

Other social and economical factors have increased the health, education and transport facilities with the growing demand of the growing population. The process of industrial development in the Kingdom effectively began with the creation of Petromin in 1962. Petromin is a general petroleum and minerals organization which is responsible for the administration and coordination of manufacturing activities that utilize hydrocarbon resources. Because of Petromin's existence, government involvement in the hydrocarbon sector of manufacturing industry is much greater than in general manufacturing activity.

Most of the industries which are being developed in the Kingdom (with the exception of the hydrocarbon related industries) are concerned with transportation of both local and imported raw materials into goods for the domestic market.

As the major part of this market is in the existing urban centers, the pattern of industrial development can be expected to largely reinforce the existing settlement pattern. This trend will be reinforced by three other factors. First, the public utilities (particularly water and electricity) required for industrial development are more readily available in the main urban centres, and this existing situation is being reinforced by the extensions improvements to the existing utility networks. Thus although it is true that utilities are being introduced to the more remote parts of the kingdom in accordance with the Plan's aim to distribute the benefits of development equitably, the level of supplies necessary to support extensive industrial development will continue to be found only in the major centers for some time to come. Secondly, the major supplies of labor which are necessary to support the development of an industrial base exist only in the major centers of population. Third, the dependence on imported materials (although being reduced in some areas by the development of local resources-cement is the most notable example) provide considerable advantages for industrial development to the Kingdom's major parts and the urban centers close to them.

However, the government has taken at least one major policy

decision that will counteract these trends and have a direct and significant effect on the settlement pattern- the decision to establish massive new industrial dues at Jubail and Yanbu.

TABLE 1 Kingdom of Saudi Arabia Settlement Population Projections

Western Region		1394 AH	1400 AH	1410 AH	1420 AH
a)Regional Population		2463.00 (100.0%)	3229.7 (100.0)	3880.3 (10.0)	6240.8 (100.0)
b)Settlement Population	High	1349.4 (54.8%)	2040.0 (63.2)	2614.6 (67.4)	5611.5 (89.9)
	Low	-	1658.5 (51.4)	1971.0 (50.8)	3222.7 (53.2)
1. Jeddah	High	562.5 (22.8%)	928.8 (28.8)	1130.1 (29.1)	2035.2 (32.6)
	Low	-	711.8 (22.0)	866.0 (22.3)	1559.6 (25.0)
2.Makkah	High	-	537.6 (16.6)	726.3 (18.7)	1790.5 (28.7)
	Medium	374.7 (15.2%)	467.3 (14.5)	560.4 (14.4)	966.5 (15.5)
	Low	-	452.7 (14.0)	529.9 (13.7)	849.9 (13.6)
3. Taif	High	-	276.5 (8.6)	346.2 (8.9)	676.7 (10.1)
	Medium	211.1 (8.6%)	252.9 (7.8)	293.2 (7.6)	456.8 (7.3)
	Low	-	247.7 (8.2)	283.0 (7.3)	422.0 (6.8)
4. Madina	High	181.0 (7.3%)	264.0 (8.2)	361.7 (9.3)	930.0 (14.9)
	Low	-	218.6 (6.8)	255.9 (6.6)	410.4 (6.6)
5. Yanbu	High	-	33.1 (1.6)	50.3 (1.3)	175.8 (2.8)
	Low	20.1 (0.8%)	27.7 (0.9)	36.2 (0.9)	80.8 (1.3)

The second industrial development area is in the Western Region, with Jeddah as its commercial and industrial center. Jeddah is already one of the most important urban centers in the Kingdom, and its role as

"Growth Pole" will be further intensified as its port continues to be improved, and as large scale petrochemical industries (based on the piped transfer of oil from the Eastern Region) and other non petroleum industries are developed.

RESIDENCE

Likewise all other cities in the Kingdom of Saudi Arabia, it witnessed its real development since 1366 H = 1947 G when the late H.M King Abdul Aziz ordered water resources of Wadi Fatima thus solving its permanent problems viz, the scarcity of drinking water.

The city grew enormously in the directions North, South and East on Makkah Road. That was the period of growth when the activities and Zeal of its inhabitants relied on coping and stimulating architectural designs and models that mostly disagreed with the general eco-system of the city and the prevailing social traditions with the arrival of large numbers of expatriate labor force to help in development and contemporisation plans.

Almost 20 years ago the city of Jeddah witnessed preliminary attempts to apply modern systems for water and sewerage services and road improvements. After the Jeddah wall was demolished, the barrier against the expansion of the city and increase in its population was finally pulled down and this encouraged every muslim to come to work and reside in it especially professionals, craftsmen and technical expertise. A population, urban, industrial and professional outburst took place which was supported by the connection of water from Al-Aziziyah spring to the city.

With all the facilities made available, a large number of houses were built to accommodate the pilgrims to the Holy Haram and the expatriate labor force arriving to participate in the fulfillment of the ambitious development plans. The result was thus random growth and the appearance of types, models and designs of architecture reflecting different and alien cultures and civilizations that totally disagree with the local tradition. The cavities were large and the glass were unfit for this hot sunny environment that was the first stage up till 1381 AH = 1961 G which represents the beginning of modern planning of the city.

Building cities is not merely the establishment of road net works, utilities and public service as well as estate land projects, hut is in addition, a comprehensive cultural process of certain dimensions and components that should be realized right from the start with all its particulars fully controlled. Therefore, the new housing projects and public buildings were

planned so as to respond to all the cultural criteria of building Islamic cities as regards the structure of planning, the architectural design and the social structure of those areas.

The most important and basic principle in that respect was to spread out on the periphery of the city and build external and circulating roads so as to push the newly urbanized regions a far from the crowded center of the old city. The first integrated Master Plan of the city was published in 1396H = 1976 G including the main road's network, the height of the buildings reflecting the population density, land use; gardens, car parks, government buildings, housing projects, business and commercial projects etc. Cities are in need of open spaces because of their large area extensive urbanization and large population. The need progressively increases with the increase and large increase in city limits, number of buildings and population growth (Fig.2).

The choice of varying combinations of Arabic calligraphy as shown in some verses of the Quran and its distribution in the central area of the old city together with some formations of old local and Arab utensils and equipment was made on purpose to draw the viewer's attention to this magnificent lasting artistic heritage where the composition preserves the meaning, value, indication and different types and species of fish opposite the old piece for the coast guards. Similarly the boats of fishermen were erected with few poems on Jeddah in the area where their huts once stood in the Boat's Square at Al-Hamra. Other examples such as the Fist opposite H.R.H. Prince Naif, Minister of Interior's Palace and the Eye opposite the Ophthalmic Hospital..

It is worth mentioning that the modern Master Plan for greater Jeddah in the year 1410 H = 1990 G reaches an area of 1215 km of which the urbanized area is only 472 km the total accomplished area of which at present is only 310 km. With the increase in population the urban area per capita increases from 180 m to 350 m where as the under developed area of "White land" decreases from a total of 1047km to 743 km.

The Table 2 shows the various aspects of land use at present and in future up to the year 1410H = 1990 G. It is thus clear that the development of Jeddah and the extent to which they meet the people's needs are the only real face of civilization of the city and its progress since they are the practical applications of giving of the present era towards the fulfillment of a happy and easy life for the society and people. The growth and development of the city was accompanied hand in hand with a similar development in the various sectors that are the education, health and social affairs.

GROWTH OF JEDDAH

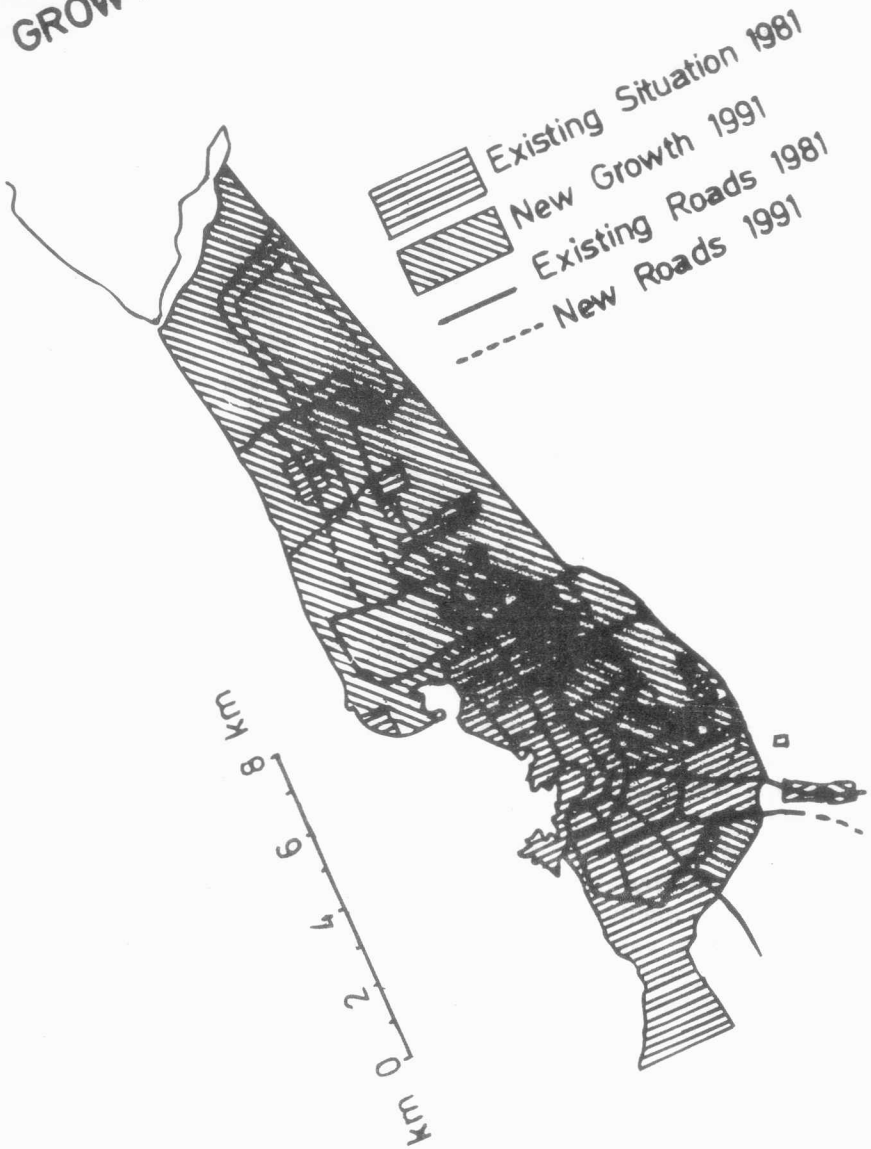


Fig.2: Reproduced from Jeddah a changing Eco-system, Municipality of Jeddah Research Department Publication No.4

In spite of this rather outstandingly rapid growth of Jeddah reaching approximately 400 fold its original area in the last decade an unprecedented event in any other city in the world either in the development of nondeveloped countries, yet the municipality of Jeddah was always conscious of preserving the old city during all phases of progress. In this- respect it was not only a question of preservation but in addition a harmonious mixture with modernization and availment of modern utilities in order to grant the city a special flavour unrivaled by any other city or port in the Arabian World.

Table 2: Land Use By Sector in Jeddah

Land Uses	Area in Km/Available.. 1389 AH.	(%) used	Expect 1410 AH	(%) Used
1. Housing	40.1	23.8	190	40.2
2. Commercial	3.4	2.02	10	2.12
3. Industrial	5.0	2.98	40	8.47
4. Government	9.1	5.42	47	9.96
5. Facilities	2.5	1.49	4	0.85
6. Open space	1.4	0.84	16	3.39
7. Road & communication	102.5	61.0	150	31.7
8. Public utilities	4.0	2.38	15	3.18
Development Land	168	13.8	472	38.8
Undeveloped Land	1047	86.1	743	61.1
Total Area	1215	100	215	100

The central part of the city still houses several good examples of old buildings that are architectural and historical value. They are frequent in groups nearby each other separated by the narrow and winding lanes permeating through out the old city. The careful study of Jeddah aiming at re planning the old city in order to preserve and restore those buildings that represent any architectural and historical value has been carried out by the municipality of Jeddah. Plans have been carried out for the development of various nearby villages and small towns In the vicinity of Jeddah in order to transform them into fully independent suburbs or satellite cities thus restricting the unnecessary frequent travel to the city itself leading to congestion in its center (OLD CITY).

COMMUNICATION

As regard facilitating communication inside the city and outside it, a net work of major and subsidiary roads have been built that are of

sufficient width and design to cope with the ever increasing traffic density and the pressure of the large number of vehicles using it. Here once more, the direction of the prevalent winds over Jeddah and the geographic position of the city, extending along the sea coast were taken; into consideration in the design of the road net work. Thus, instead of having semi circular roads as was the case in the old city which was necessitated by the need to discharge the storm water to the sea, the net work of roads in the new city was designed to run in a North/South direction parallel to the sea coast with interesting connections from east to west to ease the pressure on the central (Old Jeddah) and to avoid congestion and traffic jams in that historic part. Moreover several bridges and fly over to ensure smooth flow of traffic have been built..

In the nine years following 1971, the number of cars in the city multiplied about twenty times, and with them the parking problems and traffic congestion where the radial streets of the old town met the grid pattern of the north. It was a challenge confronted by the radical introduction of single direction traffic, the building of major peripheral arteries including between the city and the sea the provision of extensive parking areas, and the vigorous activity of traffic police. It can be called that 30 years ago Saudi Arabia had an almost completely traditional and self-contained economy and was to a large extent, because of its great size and poor communications, isolated and compartmentalized. The tremendous progress that has been made over the last few decades can be readily identified, as can the important role played by Jeddah in this progress.

As regard the telephone services Jeddah had no more than 50 telephone lines operated manually uptill 1376H = 1956 G when the first automatic service was installed. Today it has a net work that covers all the urbanized area of the city.

RECREATION

Jeddah extends for about 80 km along the Red sea coast. Its sea front is divided into 3 zones included in the integrated series of recreational projects of the city which are being carried out at the moment; these are the Southern sea front (Corniche), the Northern sea front (Corniche) and Sharm Obhur.

The modern city planners are paying great attention towards greening and designing the expressways and streets, establishing multiple designed gardens and parks planted with different plants. These places are indispensable for children to spend their energy in playing games and recreation. With the increasing availability of water the grasses and shrubs

that can tolerate saline soil and little water are on the increase. None of the parks, or even the wholesale rating of industry of the town, will do as much for the city in terms of fresh air the Corniche project. Aware that, at least until 1990's nearly half of the population will be children, the city has taken over twenty miles of coastline solely for the purpose of providing recreation. From the obhur Greek some fifteen miles to the north as far south as pass Al-Aswad, twenty beyond the city, all but those areas occupied by the port, the refinery or other installations are given over to recreation either organized into water spots at the Northern lagoon or simply for picnicking. The first part of the northern section was complete by 1980, and on holidays, the promenades are full of families and children. It is this grand imaginative gesture of road, promenade, parking areas, trees, and monument that has brought back the sea decisively into the heart of the city.

CONCLUSION

The rapid growth and development of Jeddah is *the result* of an increase in the number of inhabitants. The number of population up to 1367 H (1947) was always less than 30,000 persons rising inevitably during the Hajj and Umrli minor pilgrimage. When Jeddah was exposed to the outside world after its wall was demolished, the growth rate was rather normal yet population almost doubled in the following 30 years to reach 381,000 people in 1391. H(1971). However, with increase in oil prices and the great demand of foreign labor to carry out the development. . plans, the population of Jeddah increased greatly during the last decade. Jeddah is the largest city in the region, followed by the holy city of Makkah and Madina, the town of Taif and Yanbu. In 1394 H, the population in the region exceeded two million persons. This was over one third of the total population of Saudi Arabia. Since 1993 AH the huge demand for commercial construction, technical and administrative services has given a tremendous impetus to the development of Jeddah. This impectus is accentuated by the modern road net work radiating from Jeddah. The improvement in the communication net work has enhanced city's importance as a trading, banking, commercial and administrative center. The new airport and extension to the sea port assures Jeddah's role as the Western gate way to the Kingdom for trade, goods, visitors and Hajjies.

Great attention is being given to:

1. Modernize Jeddah and extend it parallel to the sea coast.
2. New residential areas are planned North and South of the city providing integrated services and connected with the Old city by a network of longitudinal roads perpendicular to the old city. At the point of intersection, bridges and flyovers are built to avoid traffic jams.
3. Increasing the number of gardens and green spaces in the old and new districts as well establishing a green belt bordering Jeddah from the East.
4. Considering the areas of Obhur creek (Sham) as a recreational area in the service of the inhabitants of Jeddah.
5. Moving the old Airport to the North East of Grater Jeddah.
6. Establishing and preparing the coast-line (Sea front of Corniche) as a fa~ade of Jeddah overlooking the sea, North and South of the city.
7. Defining areas of land-use for the various economic, urban and industrial activities in the south, in the north, along the coast-line and to the east along Makkah Road.
8. Changing the fa~ade of the houses according to the direction of the prevailing wind and facing the sea, coupled with height restrictions in relation to road width so as to cater for anticipated future needs with the growth in population and the increased number of cars using these roads.
9. Preserving the Old (Historic) City and connecting it to the New city through a network of roads and services.
10. Beautifying the city in an integrated plan with the groups of artistic and cultural works.

In functional terms Jeddah's potential lies in:

1. Its significance as the major sea port both for the region and the country; (e.g. some 80% of food stuffs consumed in the Kingdom arrive through as an international Airport) comparable only to Riyadh nationally.
2. Its major trading importance, requiring provision for storage and movements of goods, and also tertiary financial and other services, for national distribution.
3. Its importance as a major regional administrative and service center, taking advantage of its attractive maritime location for business conference center facilities.
4. Its importance as an industrial center, resulting from its maritime location and immediate market access to a Western Region population of (currently) 3 million.

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APPRAISING SOLAR ENERGY POTENTIALS OF NORTHERN NIGERIA IMPLICATIONS FOR ALTERNATIVE FUEL RESOURCES

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Abstract: Few months back, the northern part of Nigeria has been mostly affected with the problems of fossil fuel shortage. This has led to several unfold hardship on the inhabitants of the area despite the abundance solar energy received. This paper tries to review this untapped source of energy, its distribution, uses and further uses it could be put in this problems prone region of Nigeria. The unstable nature coupled with everyday increment in the price of this natural resource both in the distribution and availability led to this study so as to look for an alternative.

It is recommended in the paper that a detailed study and implementation of how solar energy can be used to propel engines be done by the Federal Ministry of Science and Technology without much delay. Until this is done, some area (if not all) of Nigeria is vulnerable to unexpected shortage of crude oil. Gainsaying apart, in not too far distant, environmental resources of which oil is one of them and most useful to man, will be exhausted.

Key words: Solar energy, Resources, Northern Nigeria, Fossil Fuel.

INTRODUCTION

Without wishing to raise an alarm, it is becoming increasingly evident that the environmental resource of the world can be exhausted (Oguntoyinbo, 1976). This situation appears more imminent in view of recent events in Nigeria especially in the northern part of the country. The reason for this is that the resource, especially the fossil fuels of petrol or gas and its other associated components, are not being replenished at a comparable rate of extraction and uses. Thus with increase in number of population daily, increase in number of vehicles (Tokunbos, etc.) and industrialisation, one can reach a conclusion that energies derive from sources like oil, coal, gas etc. will one day finish. Between February and August 1993 and February to October 1994, the scarcity of fuel for vehicles nearly turned the 'Giant of Africa' to a mere geographical expression. Life nearly become standstill and socio-economic activities were paralysed. All

because of too much dependence on oil as the most important sources of energy for our daily use. The local inhabitants turned to the use of firewoods, dry cowdung and saw-dust as sources of energy. With these occurrences, one may assert that soonest, the dependence of oil will soon become a thing of the past for it has been found out that the reserves, with time may be inadequate for man's use. Thus it is pertinent to look for other cheap, source of energy that is available locally. Industrialisation and urbanisation has led to the clearance of woods in the forests and the scattered trees and shrubs of the savannah were not spared too (Ojo, 1970). Also, the lands are cleared to make way for agriculture and the rate of re-forestation programme embarked on by the government does not tally with the rate of deforestation. Thus the aim is totally defeated and the source of energy is grossly inadequate though very cheap. The other source of energy that is common is the nuclear energy. Some countries have embarked on the project but their numbers are too insignificant compared with those without the project (Oliver, 1973; Taylor, 1974; Oguntoyinbo, 1976). It is even expensive to make and its exploitation demands a sophisticated level of technology. Countries in the tropic especially Nigeria cannot afford to embark on such now when the daily fall in naira value in the world market is enormous. Other sources like the Hydroelectric power (HEP) or Geothermal energy are available. The only problem facing HEP is the limitation in the elaborate usability of the energy unlike the fossil fuel energy. The energy from the sun otherwise called the solar energy is the only option that can save the situation. Solar energy is the energy derive from the sun in form of electro-magnetic waves (Bary et al., 1978). It accounts for about 99.9% of the energy used up by man for various processes within the atmosphere [6] (Mather, 1974). It is got steadily and thus can be talked of in terms of solar constant. This solar constant is the amount of energy received per unit area of surface held at right angle to the sun's rays (Sellers, 1965; Ayoade, 1988). This constant is about 2cal (8,38J) per min per cm² (Smith, 1975). This value is equivalent to 2 langleys (Bary et al., 1978; Hobbs, 1988). Solar energy is poorly utilized. Solar energy has since been harnessed for the powering of the artificial satellite system. The technology for measuring solar energy radiation started around 1890 when Pavolsk developed his first measuring device. (Oguntoyinbo, 1976). As at 1980, there are about 32 stations globally (Oladipo, 1993), but now, there are more than 3,000 observatory centres in the world. In northern Nigeria alone, we have more than 20 observatory centres. Some of these centres are at Othman Dan Fodio University, Sokoto; Solar energy village, Birnin Kebbi; University of Maiduguri; solar energy centre Federal Polytechnic, Bida; National Water Resources Kaduna; Bayero University Kano to mention but a few (Fig.1). They are more numerous in the northern part than in the south due to differences in the vegetational cover. Despite its long history, only a few studies have examined solar energy as a resource that can be alternatively used or in

replacement for other sources of energy in Nigeria. The only one known was by Oguntoyinbo (1976) and it was focused on sub-saharan Africa. The paper highlighted the usefulness of solar energy to various sphere of man's endeavour but not to powering of man's vehicles and machines. Thus the aim of this paper is to look at solar energy as potential alternative technological resources for fossil fuel used in propelling vehicular engines especially in a region blessed with abundant sun-shine hours per day. This will help to alleviate the socio-economic problems that used to plague the country (especially northern Nigeria) whenever there is fuel shortage. The objective however is to highlight the fact that solar energy got cheaply and abundantly in this region can serve as a resource to the inhabitants like it is so in America, Germany, Ireland etc. So in this paper, solar energy is viewed as an environmental resource.

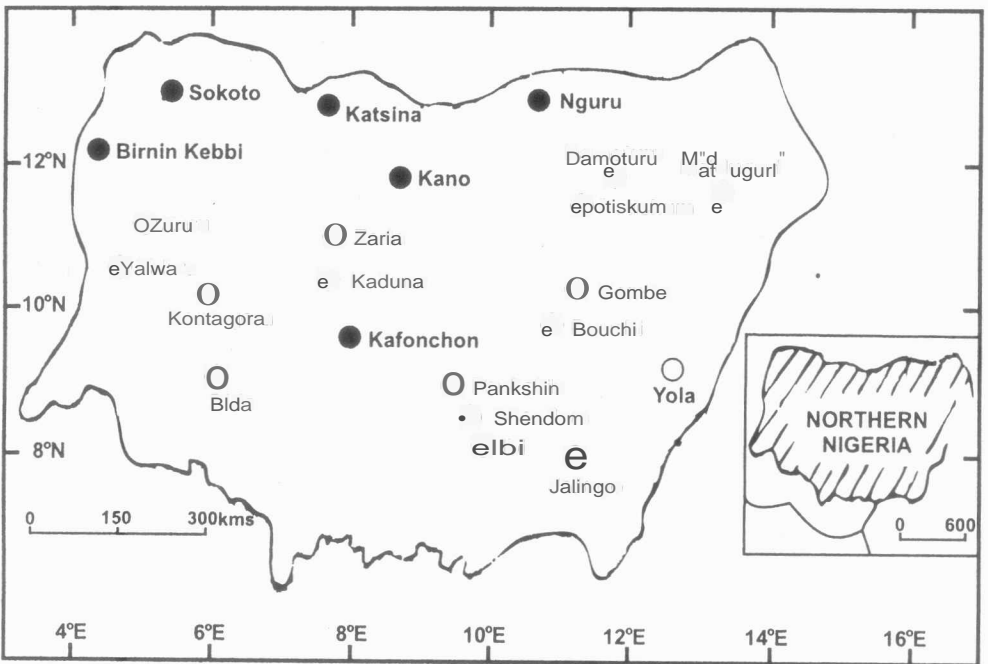


Fig.1. ●Centres used in the study, ○ other centers, source–Fieldwork 1994

DATA AND METHOD OF ANALYSIS

The study area is the northern Nigeria (Fig.1). Northern Nigeria covers 450,851 Km² and lies within latitude 12°27'N to 14°N and Longitude 2°44'E and 14°42'E (Kowal et al., 1972; Oladipo, 1993). The greater part of the region forms an undulating plain found between a general height varying from 454.5 - 697m above the sea level. This plain is surrounded by a small plateau that rises to an altitude of about 1818m east of Jos. The southern boundary of area lies some 240-256km from the atlantic coast that is demarcated roughly by the lowlands of the Niger - Benue Valley. (Kowal et al., 1972). North of Niger and Benue rivers the region rises irregularly to rolling plains called the "high plains". It occupies about 70% of the surface area of the country and can be referred to as the transitional zone between the southern humid area and the sahara desert to the north. The region is open and virtually treeless to the north but with grasses and scattered trees to the southern end. The region is an agrarian one with a long dry season and short wet season (see Oladipo, 1993). It receives sunshine constantly. The basic research weather element-sunshine hours used for this study is got from the Nigerian meteorological service in Lagos. This organisation uses standard instruments and routine for recording weather data. Data on Longitudes, Latitudes and the heights of towns used were also obtained though recorded in imperial units. These were converted to the new metric system. Data on sunshine hours were obtained for 15 selected centres unrandomly. The reason for this is that centres with solar energy gadgets were used and these were not randomly distributed in the region. The effect of cloud cover over the region on the amount and distribution and assimilation of incoming radiation and on the microclimate is noticed. Clouds greatly modify the pattern of radiation over the study area.

The average annual sunshine hours/day are reduced to about 11.2 at Lat.8°N and to about 11.8 hours per day at Lat. 13°N. A period of 20 years data on daily sunshine hours was obtained and analysed for each centre (Table 1). The mean sunshine hours is then calculated and the analysis shows some useful results. In West Africa, mean sunshine hours increase roughly from about 1600 hrs/annum on the coast to about 4000 hrs/annum or more at the northern edge into the Sahara (Oguntoyinbo, 1976). Table 1, shows clearly that this statement is true. In all the 15 centres used for the study, the minimum mean sunshine hours/annum of about 4032 hours is got at Kafanchan with its location towards the southern edge of the Plateau region. The highest amount of 4320 mean sunshine hours/annum occurred at Katsina Lat. 13°01' the most northerly town in northern Nigeria. The months of December to February are be devilled by the cold, hazy harmattan weather that normally reaches the peak at this time in the region.

Table 1: Mean Sunshine Hours / Month at .15 Selected Centres in Northern Nigeria 1974-1993

Towns/Cities	Lat. o	Long /	Altitudes Meters	Jan	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total		
Bauchi	10	17	09	49	606	340	310	370	361	370	350	362	340	330	340	360	340	4173
Birnin Kebbi	12	28	04	11	242	341	346	372	360	372	340	341	347	360	341	360	352	4232
Oamaturu	11	45	11	57	455	330	336	371	358	370	360	370	364	338	368	366	341	4272
Ibi	08	11	09	45	110	321	340	350	337	340	340	335	340	350	340	360	365	4118
Jalingo	08	36	11	20	349	330	308	338	343	358	361	343	320	330	350	358	343	4104
Kaduna	10	36	07	27	641	310	280	351	360	372	360	341	310	330	362	360	332	4078
Kafanchan	09	36	08	18	758	301	305	322	340	371	361	340	351	340	330	361	341	4032
Kana	12	03	08	32	469	320	328	370	362	374	368	352	351	340	360	364	350	4229
Katsina	13	01	07	41	514	346	340	370	362	372	361	372	360	365	372	360	340	4320
Maiduguri	11	51	13	05	352	342	336	370	360	374	360	370	351	350	370	362	343	4288
Nguru	12	53	10	28	341	340	330	374	368	363	364	360	351	340	368	365	367	4310
Potiskum	11	42	11	62	412	307	333	371	354	371	360	365	330	330	358	359	338	4186
Shendam	08	54	09	28	167	322	310	338	345	370	360	340	345	330	352	361	342	4115
Sokoto	13	01	05	15	349	340	338	374	360	370	361	360	351	362	360	359	352	4267
Yelwa	10	33	04	45	242	320	318	372	361	371	360	372	340	341	343	360	340	4198

Source: Nigerian Meteorological Services, Lagos, 1994.

This tends to reduce insolation and at times can be as effective as cutting off sun rays and subsequently, lower sunshine hours/days. Same goes for the months of July to October when the region will be experiencing torrential rain-fall. It must be noted that days with completely clear skies free of dusts are rare during the dry season. Notwithstanding, the amount of insolation received at both unfavourable seasons is enough to power all vehicles that are available on roads at these periods. From the table, no centre receives less than 4000 sunshine hours/annum and this is an enormous energy that can be tapped and used all the year round. A solar energy powered vehicle, of the size of a Peugeot car, cannot use more than one-third of this amount the year round (Tholstrup et al., 1983).

With the above analysis (Table 1) it can be rightly said that northern Nigeria can generate enough solar energy that can be used to power automobiles if the technology is developed. For example in Australia, Tholstrup et al (1983) developed a solar energy powered vehicle named "The Quiet Achiever". The vehicle about 125kg was a simple one and can conveniently carry 5 passengers including the driver. It has a tubular steel frame, fiberglass body that can withstand harsh tropical weather with bicycle racing tyres and brakes. On its roof is attached solar panels with 720 solar cells collecting fuel (solar energy) from the sun to power it. This is known as the principle of energy roof and has been used extensively in developed countries for many things. Other accessories are batteries that are charged using the solar energy, electric motor and a double chain drive. In Australia, the sun has been used to power the vehicle over 4,130kms (Tholstrup et al., 1983). Though the speed of the vehicle is low (about 25km/hr) with time and improved technology, more development will take place. This is how the modern day automobiles started too. This type of vehicle can be made purposely to be used in this part of the world with abundant sunshine. This will help to alleviate the socio-economic and other psychological problems that fuels' shortage used to caused. This will also aid development and boost the economy. It will also reduce tension and the importance attached to oil and the industry. Such solar power vehicles can be used during the day time when there is sun while the fossil fuel types be used in the dark. The manufacturing of such vehicles will also generated more funds through the payment of tax by the company responsible for such and also, aid employment opportunities for the job seekers. It can lead to competition between the manufacturers of other vehicles and the solar energy one. This is a healthy rivalry in that the cost of other vehicles may be forced to drop in that the new vehicle will reduce the number of customers patronising them.

CONCLUSION

The economic development of Nigeria depends on the proper use of natural resources with the help of modern science and technology (Kowal, et al., 1972). This study has justified the above statement made decades ago. The resources derived from climate are unlimited and must be developed to save mankind's problem.

The above shows that with improvement in technology, the abundant sunshine in northern Nigeria can be harnessed and used to power cars, lorries, turbines etc. in addition to its present uses (Oguntoyinbo, 1976). Solar energy has the sole advantage of not being owned and cannot finish unlike fuels (Hobbs, 1980b; Maunder, 1970). It is clean renewable, occurs cheaply and abundantly (Ojo, 1970). Third World Country like Australia has used this energy successfully to do this. The energy has also for long been used for powering artificial satellites in space as found in USA, for generating heat e.g., Germany and USA and for powering clocks as found in Dublin, Ireland. So if done in Nigeria, it will only improve the population's welfare. From the study, there is no season that enough sunshine hours needed will not be available. It must be noted that only air and sunshine can remain for ever and so, emphasis should be shifted on the proper use of solar energy to power vehicles. Thus developing such in these 'sunshine states' will be an asset. The geographical location, size and shape of the region is an asset for this type of a resource. It will also save the country from the regular occurrence of fuel shortage problems. Not until this is done, the country is postponing her evil days for recent occurrences have warned us enough that the days of oil industry in Nigeria are numbered. The aim of this study is to provide easily accessible data with a quantitative description of solar energy from the sun to replace fossil fuel energy in future. Therefore, it is suggested that the awareness this paper is highlighting be addressed and considered before it is too late in this country Nigeria. Such an approach bears promise of substantial socio-economic growth of the region and other sunshine countries. It is hoped that it will provide awareness and information for our planners and the population for proper future use. This will aim not only to spread out the sources of revenue income so as to lessen pressure on oil sector, it will also ensure adequate, cheap and reliable fuel and power supply for domestic uses.

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THE EXTENT OF DIGITAL PREFERENCE IN AGE REPORTING, PUNJAB - PAKISTAN

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INTRODUCTION

A Census Report is the basic source of population data in Pakistan which is used for many purposes. Many studies and future planning rely on it. Thus the significance of its accuracy can not be ignored. Pakistan stands amongst the developing countries and like many other developing countries of the world age distribution available from decennial population census and sample surveys have shown substantial distortions and irregularities. Many of these irregularities and distortions are due to coverage errors and mis-reporting of ages. The errors in the reporting of age have been examined more intensively than the reporting errors of any other question in the census.

The ages of some individuals included in the census may not have been reported, or may have been reported erroneously by the respondents, may be erroneously estimated by the enumerator. Most of the people do not know their correct ages. As a result they tend to report their ages either in round numbers or instead ask the enumerator to write down whatever age they think proper. Some of the more common reasons for age mis-statement include the omission of young infants, the rounding off due to lack of knowledge of exact age, the changing of age for reasons of schooling, voting, marriage, entitlement to age pension etc. The phenomenon of reporting ages in round numbers is usually called "digital preference". As a result of this single year age distribution shows distinct peak and troughs at ages ending with certain digits [1].

BACKGROUND

As discussed in the preceding section that the age data available from decennial population census and sample surveys have shown substantial distortions and irregularities since the first census in Pakistan after Independence. Age reporting in the 1951 census was considered highly unreliable and due unmanageable discrepancies the data were,

rather published in broad age groups such as 0-9, 10-39, 40-50 and 60 and over. Though the 1961 census is considered to have produced better results than the previous one. In the 1961 census the ages were reported in single years upto the age 9, in conventional five years age groups from 10 to 59 and 10 years age groups from 60 to 99 and in 100 years and above.

Karim and Alam compared the age reporting patterns of female population in the PGE (1963-65) and the PGS (1968-69 and 1971) and assess their possible effect on the estimation of TFR and ASFR, concluded that 'for societies like Pakistan where apparently little importance is attached to recording correct ages, there exists a definite pattern of age misreporting' [2].

Similarly these irregularities have been reported by many others like Hashmi, Krotki, Robinson et al., Yusuf, Zelnik [2] and Mian [3]. They have calculated that the major reasons of age misreporting could be the coverage and response problems faced during the collection of age data, mainly under-enumeration of females and erroneous reporting. Keeping in view the facts narrated above an attempt has been made to find out the patterns of digital preference, a common indicator of age misreporting, for the Punjab and Pakistan using 1981 census data.

METHODOLOGY

Although there are many measures available with the help of which one can study the extent of digital preference. Here Myer's "Blended Method" has been used. He introduced this method to avoid the bias in other indices which describe that the number ending at "0" would normally be larger than the following numbers ending at "1" to "9" because of the effect of mortality. This index reflects preferences or dislikeness for each of the ten digits, from "0" to "9" [4]. This method involves calculating a "blended population" of final digits in which if the population number decreases linearly with age, the expectation is that, in the absence of any digital preference about 10% of the population will have reported ages ending in digit 0, 10% ages ending in digit 1, and so on. Any deviation, from the expected 10% for each terminal digit are added (irrespective of sign) to arrive at the Myer's index. Following are the steps for calculation:

- 1) To derive the blended population, the age range has to be decided. In this study 10 to 69 years age range has been taken. The chosen age range has been divided into two partly overlapping sub-ranges with a time lag of 10 years. Here the sub-ranges are 10 to 69 and 20 to 69. Population totals are taken ending in each digit over the whole range with the lower limit of the range (e.g. 10, 20, 30, 60; 11, 21, 31 61).

Table 1. Calculation of Preference Indexes for Terminal Digits by Myer's Blended Method, for Pakistan's Total, Urban and Rural Population

Terminal Digit	Age Group 10-69			Age Group 20-69			Blended Population 4+7	%	Deviation from 10%	
	Sum	Co-efficient	Product 2+3	Sum	Co-efficient	Product 5+6				
	1	2	3	4	5	6				7
J	0	16286876	1	16286876	12963912	9	116675208	132962084	30.03	20.03
		4571196		4571196	3694723		33252507	37823703	28.25	18.25
		11715680		11715680	9269189		83422701	95138381	30.81	20.81
IJ	1	2263204	2	4526408	1017994	8	8143952	12670360	2.86	-7.14
		765449		1530898	351189		2809512	4340410	3.24	-6.76
		1497755		2995510	666805		5334440	8329950	2.70	-7.30
IJ	2	6232077	3	18696231	3284216	7	22989512	41685743	9.42	-0.58
		1866801		5600403	1060350		7422450	13022853	9.73	-0.27
		4365276		13095828	2223866		15567062	28662890	9.28	-0.72
IJ	3	2869508	4	11478032	1437324	6	8623944	20101976	4.54	-5.56
		914668		3658672	460747		2764482	6423154	4.80	-5.20
		1954840		7819360	976577		5859462	13678822	4.43	-5.57
IJ	4	3043499	5	15217495	1188670	5	5943350	21160845	4.78	-5.22
		977235		4886175	408882		2044410	6930585	5.18	-4.82
		2064264		10321320	777788		3888940	14210260	4.60	-5.40
IJ	5	11582525	6	69495150	9849046	4	39396184	108891334	24.59	14.59
		3403519		20421114	2878996		11515984	31937098	23.85	13.85
		8179006		49074036	6970050		27880200	76954236	24.92	14.92
IJ	6	3355794	7	23490558	1442925	3	4328775	27819333	6.28	-3.72
		1071998		7503986	472261		1416783	8920769	6.66	-3.34
		2283794		15986558	970662		2911986	18898544	6.12	-3.88
IJ	7	1908285	8	15266280	1016241	2	2032482	17298762	3.91	-6.09
		660514		5284112	320347		640694	5924806	4.42	-5.58
		1247771		9982168	695894		1391788	11373956	3.68	-6.32
IJ	8	5050681	9	45456129	2530669	1	2530669	47986798	10.84	0.84
		1494895		13454055	708079		708079	14162134	10.57	0.57
		3554786		31993074	1822590		1822590	33815864	10.96	0.96
IJ	9	1215948	10	12159480	511265	0	Zero	12159480	2.75	-7.25
		442534		4425340	153558		Zero	4425340	3.0	-6.70
		773416		7734160	357709		Zero	7734160	2.50	-7.50
IJ	T	Total						442736715		70.92
		Urban						133910852		65.34
		Rural						308796863		73.38

Source: Computed from Population Census Data, 1981

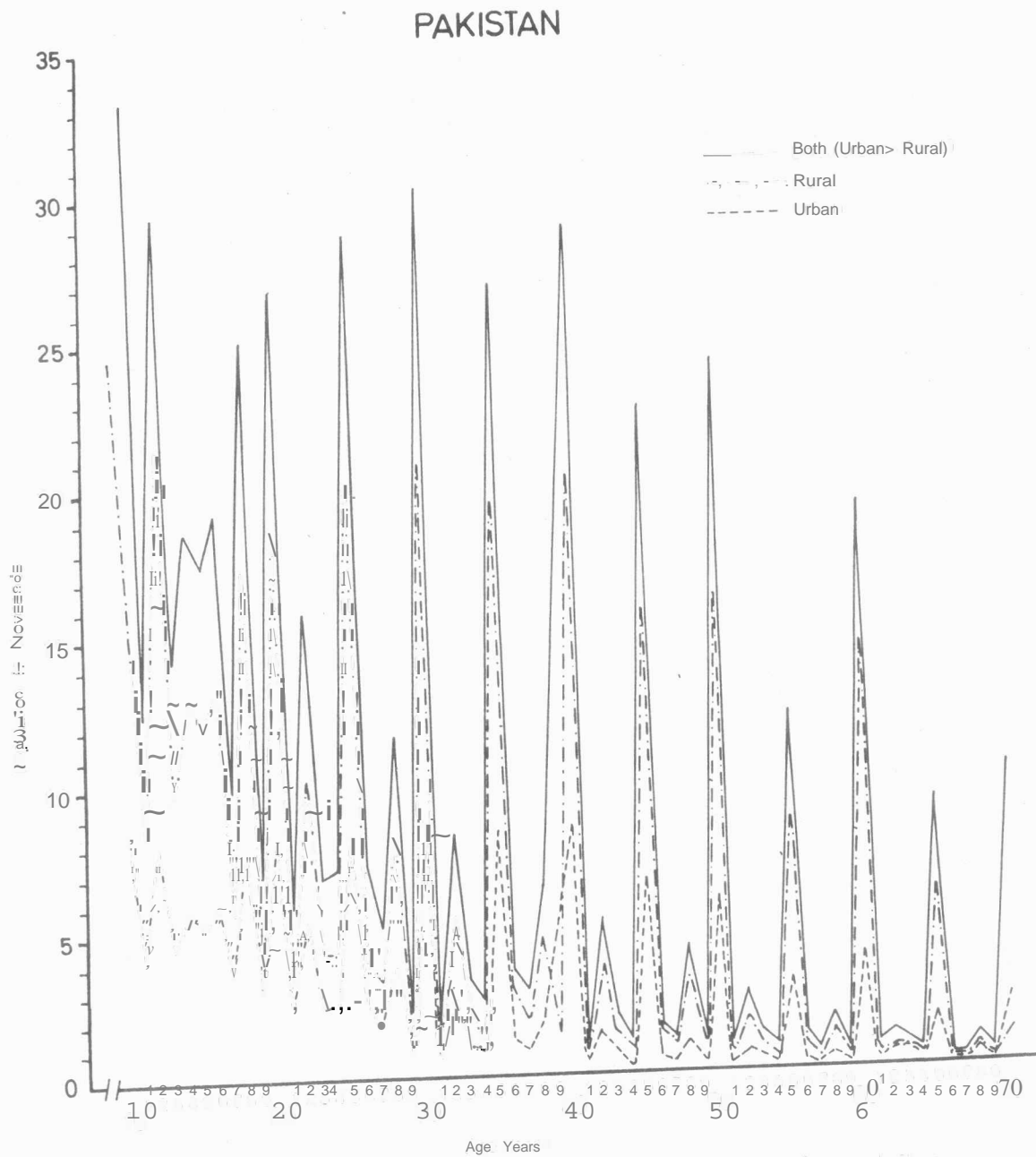


Fig.1: Single year age distribution by Total, Urban and Rural population for the Pakistan

TABLE 2. Calculation of Preference Indexes for Terminal Digits by Myer's Blended Method, for Punjab's Total, Urban and Rural Population

	Terminal DiCjit	Age Group 10-69			Age Group 20-69			Blended Population 4+7	%	Deviation from 10%
		Sum	Co-efficient	Product 2+3	Sum	Co-efficient	Product 5+6			
	1	2	3	4	5	6	7	8	9	10
J R	0	9351073	1	9351073	7508328	9	67574952	76926025	29.81	19.81
		2463993		2463993	1986540		17878860	20342853	27.96	17.96
		68870180		6887080	5521788		49696092	56583172	30.53	20.53
J R	1	1278513	2	2557026	558528	8	4468224	7025250	2.72	-7.28
		415818		831636	184891		1479128	2310764	3.18	-6.82
		862695		1725390	373637		2989096	4714486	2.54	-7.46
T U R	2	3672616	3	11017848	1969740	7	13786180	24806028	9.61	-0.39
		1030699		3092097	582243		4075701	7167798	9.85	-0.15
		2641917		7925751	1387497		9712479	17638230	9.52	-0.48
J R	3	1668480	4	6673920	828075	6	4968450	1164237	4.51	-5.49
		510103		2040412	252924		1517544	3557956	4.89	-5.11
		1158377		4633508	575151		3450906	8084414	4.36	-5.64
J R	4	1795479	5	8977395	681018	5	3405090	12382485	4.80	-5.20
		544996		2724980	221754		1108770	3833750	5.27	-4.73
		1250483		6252415	459264		2296320	8548735	4.61	-5.39
T U R	5	6803304	6	40819824	5810930	4	23243720	64063544	24.82	14.82
		1847995		11087978	1558474		6233896	17321866	23.81	13.81
		4955309		29731854	4252456		17009824	46741678	25.22	15.22
J R	6	2015706	7	141099420	844156	3	2532468	16642410	6.45	-3.55
		6011111		4207777	260249		780747	4988524	6.86	-3.14
		-14595		9902165	583907		1751721	11653886	6.29	3.71
J R	7	1107769	8	8862152	574566	2	1149132	10011284	3.88	-6.12
		360097		2880876	345676		3226452	4.44	-5.56	
		747672		5981376	803456		6784832	3.66	-6.34	
J R	8	2915839	9	26242551	1390371	1	1390371	27632922	10.71	0.71
		808114		7273026	377124		377124	7650150	10.52	0.52
		2107725		18969525	1013247		1013247	19982772	10.78	0.78
J R	9	6955037	10	6955010	279798	Zero	Zero	6955010	2.69	-7.31
		234453		2344530	80654		Zero	23445130	3.22	-6.78
		461048		4610480	199144		Zero	4610480	2.49	-7.51
T U R	T	Both sexes						258087328		70.68
		Urban						72744643		64.58
		Rural						185342685		73.06

Source: Computed from Population Census Data, 1981

PUNJAB

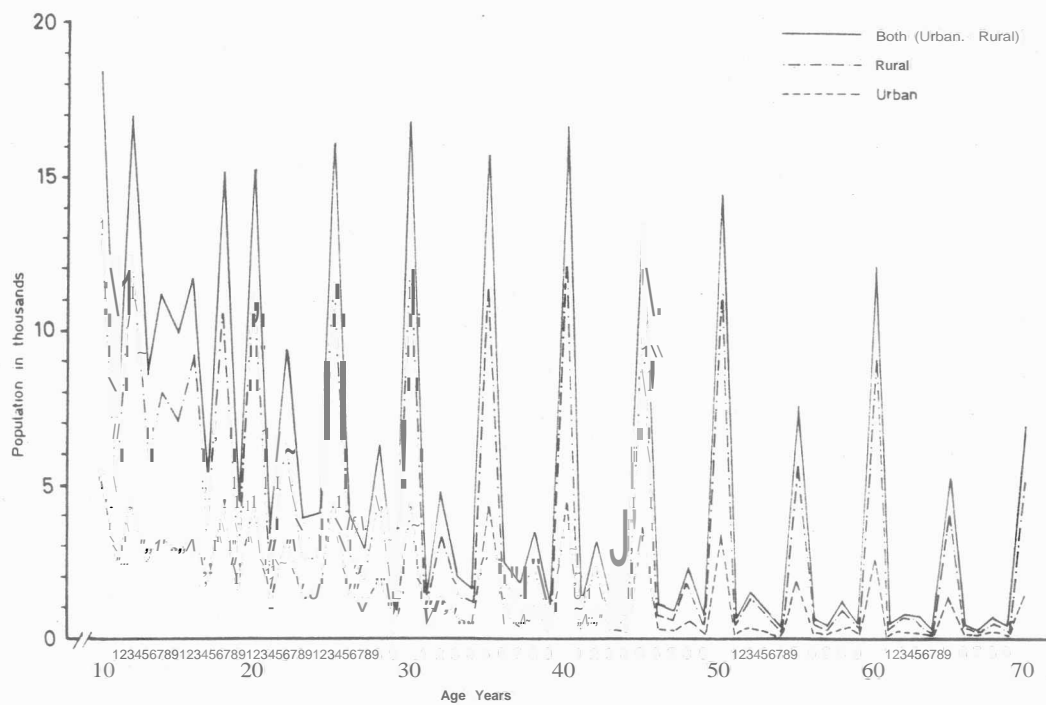


Fig.2: Single year age distribution by Total, Urban and Rural population for the Punjab

- 2) Calculated the sum excluding the first population combined in step 1. (e.g. 20, 30, 40.....60; 21,31,41,.....61).
- 3) Weighted the sums in step 1 and 2 and multiplying by the coefficients and added the result to obtain a blended population weight 1 and 9 has been used for digit "0" while 2 and 8 for the digit "1" and so on.
- 4) The distribution in step 3 has been converted into percents.
- 5) A deviation from 10.00 of each percent in step 4 has been taken.

This gives the extent of concentration on or evidence of a particular digit.

Table 1 and 2 show the age distribution by Total, Urban and Rural population for Pakistan and Punjab for 1981 Census. The illustrative computation of Myer's Index for Pakistan and Punjab's Total, Urban and Rural population is given in Fig.1 and 2 respectively.

CONCLUSION

The percentage of the blended population for each digit is given in Table 1 and 2 which shows that the digit "0" and "5" account for more than 50% of the total blended population with digit "0", "5" and "8" together account for more than 65% of total blended population.

It is apparent from the tables that the data is heaping up at digit "0" followed by "5" and then on "8". Theoretically the index can vary between 0 to 180 [5] while the range of indexes given in Table 1 and 2 is 64.58 for Punjab's urban population to 73.38 for Pakistan's rural population. The index is high for rural population and comparatively low for the urban population both for Pakistan and Punjab. Urbanization and education might have lower the index. In such fluctuations in numbers due to the digital preference it is necessary to correct the raw data in some way. It is better to use the data in age groups rather than the single year age data. Otherwise graphical or mechanical methods of smoothing should be adopted.

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THE URBAN FRINGE OF LAHORE CITY

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Abstract: The present research is concerned with an enquiry into the structure of the Urban Fringe of Lahore. The growth of the Urban Fringe does not occur in isolation, however, and it is therefore necessary to outline the spatial relationships and processes through which development takes place.

In order to examine the factors affecting Urban Fringe growth the functions of the Fringe have been considered. The growth and expansion of the city and the various functions of the Urban Fringe are related to a number of spatial and social forces. This has automatically invited here, a detailed investigation of a fundamental yet long neglected urban phenomenon, namely, the development and functions in the Urban Fringe.

INTRODUCTION

This study [1] demonstrates that the analysis of spatial variations in the amount of the functional activity in Lahore may be used as a trustworthy index for more or less clear delineation of the Urban Fringe. The impact of the functions on structure and evolution of the Urban Fringe, from a variety of standpoints, have been reviewed. The growing concentrations of certain functions in the Urban Fringe with new facilities and requirements, is affecting the surrounding country-side, and finally it is being integrated with the city in such a way that both have become inter-dependent. It is this phenomenon which has enlarged the Urban Fringe and has, as a consequence, not only accelerated multilateral functional activity and development, but an increasing proportion of the population is being drawn into its ambit, giving it the specific character of both the supplier and receiver, and an area genetically and functionally integrated to the city; boundaries of which are constantly shifting outwardly.

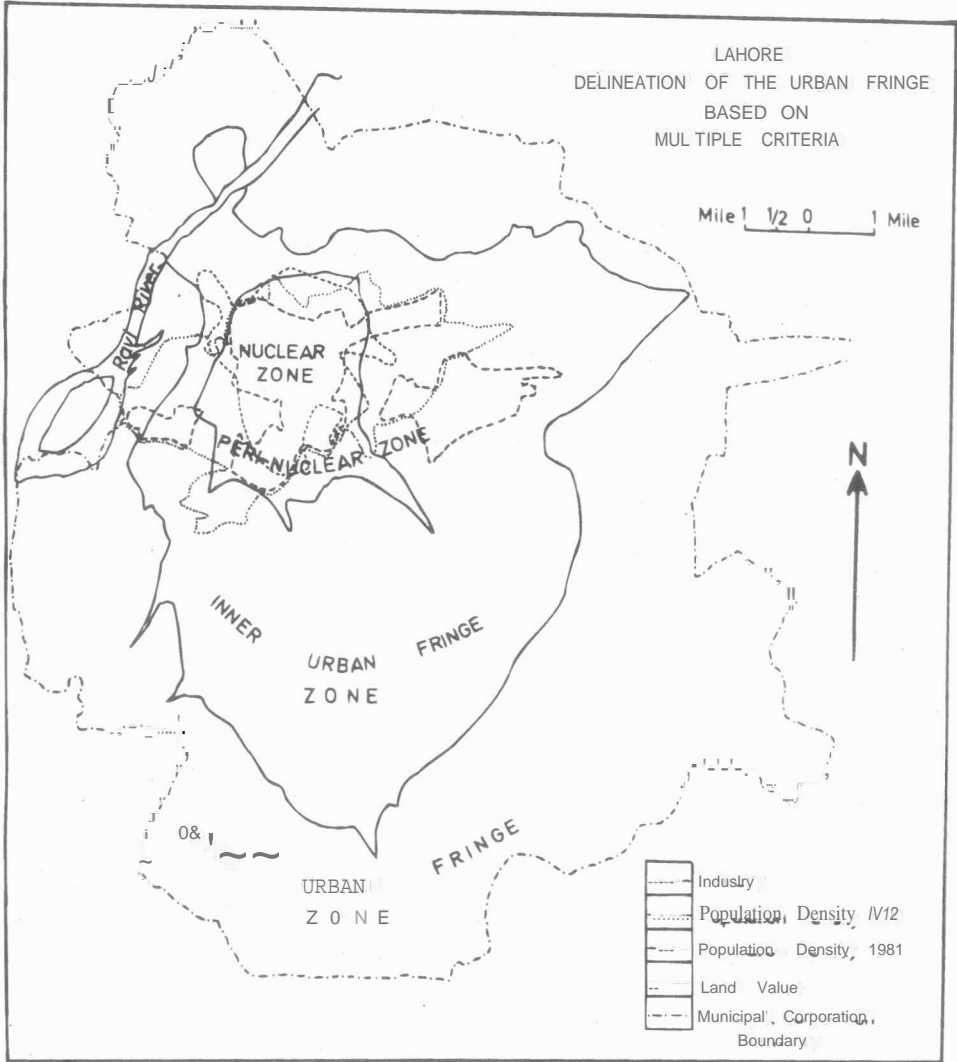


Fig.1: Lahore Delineation of the Urban Fringe based on Multiple Criteria

THE URBAN FRINGE

The growth of the Urban Fringe is an extremely interesting phenomenon, and many factors have combined to bring about its present degree of urbanization, and its spectacular concentrations of functions and their respective influence zones. The functions that have been taken into consideration are residence, industry, commerce, transport, education, health and recreation. The approach to the problem has been made by studying the areal expansion, population and land values, that makes possible through a review of the historical and geographical study, to establish a rationale for the demarcation of the Urban Fringe within the context of which various functions have been studied. It is sought to explain how it is possible for the population to move outwards presenting patterns of spatial variability with the 'growth of population'. Study of land values provides a tentative delineation of the Urban Fringe in the city. Such a study is of particular concern because it has applications to many problems in the location of functions dealt with in this study.

As there is no hard and fast boundary of the Urban Fringe, it is necessary to map and demarcate it through geographic relationships of population, land-values and influence zones of several important functions.

A marked difference in the distributional characteristics of urban population and functions found in areas of non-urban land use, helps to draw boundaries of the Urban Fringe itself and of its two principal zones (Fig.1). Mapping of four characteristics-populations density, land values, residential density and industry, and then super imposing these maps has helped in delineation of the two Urban Fringe zones; the Inner Urban Fringe and the outer Urban Fringe Zones. Each Zone presents suitability factors for the location of particular functions. The Urban Fringe thus emerging, is an extensive area taking into consideration the large population of the city and the functions carried on in well located areas. The extent of the Inner and the Outer Urban Fringe Zones vary in width in different directions but the greatest widths are found towards the south, that is comparatively undergoing tremendous development..

CHARACTERISTICS

The main characteristics of the Urban Fringe are:

1. In order to foster its own growth, the Urban Fringe is continually absorbing every new device its population is learning, and its expansion is absorbing rural land at an accelerating rate. For the Urban Fringe, the study of the areal growth of the city has been particularly rewarding. This has been made possible by a series of maps showing

the extent of the city at various periods. The growth of the city of Lahore has been resulting in a continual shifting of the Urban Fringe boundaries. Waves of migration gathered strength and developed particular areas from 1940's onwards. The examination of the patterns of change in respect of area expansion shows that the growth has been most towards the south and is likely to follow the same trend in future.

2. Population distribution in the Urban Fringe has closely paralleled population growth, but there is a tendency for the Urban Fringe population to concentrate more in the Inner Urban Fringe Zone. Accessibility combined with amenity endowment, is the key factor in presenting the pattern of Urban Fringe population distribution. Population in the Inner Urban Fringe Zone is dense and goes on decreasing with distance outwards to the Outer Urban Fringe Zone. Pattern of population distribution in the Inner Urban Fringe Zone, shows relatively greater amount of continuity and cohesion, with only a few and rather small areas lying still unfilled, in marked contrast with the Outer Urban Fringe Zone where population density is low, distribution pattern is patchy, with larger clusters concentrating close to the major arteries.
3. Land Values, an index of great significance, grade consistently downwards from the inner city towards the Urban Fringe. But on either sides of the through-fares land values fall off sharply. They have helped to provide a good delineation of the Inner and the Outer Urban Fringe Zones. Isoval of Rupees 25,00,000/Kanal draws the boundary between the Peri-nuclear Zone and the Inner Urban Fringe Zone, and the Isoval of Rupees 400,000/Kanal between the Inner Urban Fringe Zone and the Outer Urban Fringe Zone.
4. Greater part of the area of Urban Fringe is devoted to residential function. Density of housing tends to decrease with distance towards the Outer Urban Fringe Zone. The Inner Urban Fringe Zone houses have an open character and show more of associated yard space around dwellings than the Outer Urban Fringe Zone. High income people reside in the Inner Urban Fringe Zone while the Outer Urban Fringe Zone has small low-income group houses. In the Fringe Zone secondary commercial areas and ribbons of commercial-development along important arteries interrupt the expansion of residences, and so, too, do industrial areas and areas of other land uses. Moreover, the patterns of structures reveal that the oldest and the newest residential buildings are segregated in certain parts of the Urban Fringe in which rapid residential expansion is taking place.

5. Industry, like other functions, is experiencing rapid growth in the Urban Fringe. From the analysis of statistical data presented on different maps for different industry groups, it is clear that industries have tended to be localized in distinctive areas controlled by different combination of factors. Industries are concentrated in nodes, ribbons, belts and areas along major arterial lines. Though land value factor is the dominant determinant, some other factors have also favoured Urban Fringe location for industries such as: (a) lower taxes, (b) availability of cheap labor, (c) availability of large plots for larger new plants, (d) large basic processing industry units, create a great deal of noise and pollution and are to be segregated from residential area. Hence location away from residential areas in the Outer Urban Fringe Zone is preferred by larger units. Location along major arteries has been due to easy transportation of raw materials to the units and of finished products away from it to the markets. In the Inner Urban Fringe Zone the size of industrial units is relatively small, in the Outer Urban Fringe Zone mostly large.
6. Commerce, though occupies a relatively small segment of the Urban Fringe is an important function. With the commercial core of the city lying at some distance, the Urban Fringe commercial patterns show their peculiar characteristics. These are (i) patterns of planned shopping centres and (ii) arterial commercial extensions (both mainly for retail trade) that mark the Inner Urban Fringe Zone. Changing commercial influence has had a positive impact upon value and nature of commerce with distance outwards to the Outer Urban Fringe Zone.
7. Without expansion and improvement of transportation, the functional differentiation in areas of specialized land uses could not have occurred, neither would the different areas be connected goods and people be brought together. Bus traffic play an important role in the mass movement of people in the study area, with greater frequency in the Inner Urban Fringe Zone. Education, health and recreation facilities are concentrated mostly in the Inner Urban Fringe Zone in have been identified relating to the size and extent of the Urban Fringe that have been significant in explaining variations in its growth rates. The Urban Fringe, therefore, is the result of economic activity and growth impulses from the city centre. A basically different set of functions has been most conducive to viability inside the Urban Fringe, as opposed to the inner city.

With population and functions concentrating in the Urban Fringe, it is opting for new technologies and younger industries. The Urban Fringe as a whole is experiencing accelerated growth by the provision of abundant land, attractive living environment and host of other functions.

However, the effect of accessibility to the Urban Fringe growth is remarkable. Also, the evidence suggests that the growing Urban Fringe has had a significant spread effect upon its surrounding green belt.

Location of functions along major arteries has had a positive influence upon the growth of the Urban Fringe, with the interstitial areas being gradually filled in. The Inner Urban Fringe Zone is experiencing a dramatic acceleration of growth rates, whereas the Outer Zone is having a gradual growth impact. The most important element of the Urban Fringe is sectorial affinity, because growth is generally towards the south along two main axes, namely, the Ferozepur Road and Multan Road.

CONCLUSION

The present analysis has shown that the Urban Fringe has (i) regular patterns of functions in the Inner Urban Fringe Zone and the Outer Urban Fringe Zone, and (ii) the growth of the Urban Fringe is transmitted to the surrounding territory in the time-space-continuum.

Examination of the trends for future growth is probably the most promising avenue of further research. These trends constitute the key factor in shaping patterns of functional concentration, which in turn effect the Urban Fringe boundaries. Exhaustive and detailed information on the functions of the Urban Fringe is required to predict its future shifting of boundaries and changing of the functions which would be an important next step in the evolution of this subject.

Since a large portion of Urban Fringe Growth has been, and will increasingly be, directed to areas falling outside the present Urban Fringe, patterns of growth need to be given greater attention in this zone. A beneficial approach would be to study the changing nature of functions such as has been attempted in this research, so that future trends could be studied. The influence of accessibility, of functions, of the populations, and so forth, should be explored for future extension of the future Urban Fringe.

It is expected that the future growth will follow the present growth axes. The south and the southwest is expected to undergo maximum accelerated growth, while the east will have slow growth due to the proximity of the political boundary. Expansion of the city towards the north has been checked by the River Ravi, but with the building of the new Ravi bridge, Shahdara, which at one time lay outside the municipal limits of Lahore, has been growing and has eventually formed a part of the city. It is believed that if another bridge over the river is constructed, accessibility

will be enhanced and growth of the Fringe in the northward direction will also be accelerated.

The practical utility of the present enquiry is immense. It provides the essential framework for the future urban development of Lahore, as it not only delineates the Inner Urban Fringe Zone and Outer Urban Fringe Zone but also records their relative dynamisms.

REFERENCES

- 1 This paper is based on information collected by visits to the Urban Fringe Sites around Lahore, an officially published statistics used to prepare maps of population, residence, industry, transport, education, health and recreation. Land value maps were made with the help of published data from Lahore Development Authority and unpublished data collected by means of interviews with property dealers. These pas were then super imposed to delineate the Urban Fringe.



DR. eoL. (RETO.) K.U. KURESHY
(A Prominent Geographer),
1921 - 2000

PROF. DR. eoL. . (RETD.) K.U. KURESHY
(A Prominent Geographer)
1921 - 2000

Dr. Col. (Retd.) Khalilullah Kureshy, a brilliant geographer of international repute and an eminent educationist, died in Lahore on June 7, 2000 at the age of 79. Prof. Kureshy was born on January 21, 1921 in village Khurja (Bulandshahr, India). He received his early education in his home town and after passing the Matriculation Examination, he went to Aligarh Muslim University from where he graduated with Honours in 1941 and M.A. Geography in 1942. He was double Ph.D. first of which was awarded by University of the Punjab in 1955 and the second was obtained from London School of Economics in 1957. He was Merit Scholarship Holder during College and University Education.

Dr. Kureshy started his career as Geography Teacher, University of the Punjab in 1947, and over long years of service had acquired highly diversified experience in teaching, research and administration. He had a flair for public speaking which, along with high scholarly attainments, had been an asset in projecting him as a renowned teacher. Some of his academic contribution to the discipline are as under:

1. Ph.D. Theses:
 - i) Pakistan: A Geo-military Study, 1955
 - ii) Urban Development in West Pakistan, 1957
2. Pakistan Studies: Geography of Pakistan (A best seller book on the subject of Pakistan Studies)
3. Geography of Pakistan, Oxford University Press, 1977
4. Wall Map of Pakistan (Co-editor), Collins-Longman, Glasgow and Wajidalis, Lahore
5. Ferozsons Atlas for Pakistan (Co-editor), Collins Longman, Glasgow
6. Revised the book "A Geography of Pakistan" by Prof. K.S. Ahmad (1971 edition) Oxford University Press
7. One Chapter contributed in the publication, Pakistan - Past and Present: Stacey International, London
8. Over 20 research papers published in various national and foreign technical journals
9. Editor, Pakistan Geographical Review: 1966 to 1982
10. Author of several Text Books written in Urdu
11. Three Articles published in Encyclopedia Britannica viz; Pakistan-Physical, Punjab Province and Lahore City

Apart from his internationally recognized intellectual status, he was an exceptionally successful administrator in his capacity as:

- i) Officiating Vice Chancellor, Punjab University (on several occasions)
- ii) Director of Studies, Pakistan Military Academy, Kakul
- iii) Professor and Chairman, Punjab University, Department of Geography
- iv) Visiting Professor, Carleton University, Ottawa, Canada and
- v) Dean of Faculty of Education and Director, Punjab University Institute of Education & Research.

He enjoyed the unique distinction of having served as Director of the prestigious educational institutions, both Military and Civil. He was appointed Professor Emeritus in Punjab University, Department of Geography in January 1983, after his retirement as Dean of the Faculty of Education and Director I.E.R., University of the Punjab, Lahore.

Dr. Kureshy was an outstanding teacher of geography. He was also very affectionate to his students and tried to help them in every possible manners. In his death the geographer's community, not only in Pakistan but in the Islamic World, has lost an eminent scholar in the subject, a capable, devoted geographer as well as an active research worker of high calibre. His services in the cause of higher education in geography in this country have made him a man of beloved memory. I pray to Allah to grant him eternal peace and Janat-ul-Firdous (Aameen).

SAFDAR ALI SHIRAZI

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