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The Effect of Population Density on Rural Communities of Kurdistan Region, Iraq

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The main objective of this paper is to clarify the effect of rural population density on socio-economic characteristics of the rural communities with a special focus on Shaqlaw, one of the major districts in Kurdistan, Iraq. This study try to find the particular significance of rural population density as an important variable in understanding the socioeconomic characteristics of settled rural communities, where spares and falling density here presents practical and theoretical problems for rural planners. Quantitative survey data were conducted and gathered within both high and low rural settlements within the Shaqlawa district involving samples of 330 rural households. The study reveals that rural density is found to be important descriptive variable in its own right. Examining local rural population density, we have established that it is fairly strongly associated with a large series of imperative socioeconomic indicators once analysing the survey data. Out of 20 dependent variables that have been tested (p value < 0.05); rural density was not significantly correlated only to 6 of them. In discussing these outcomes, we have established that rural population density is a very imperative variable in describing, evaluating and categorizing rural communities. In shaqlwa, the consideration we illustrate here to the significance of rural population density, as variables of planning importance in their own right is confidently opportune.

Keywords: Shaqlawa distirct, Iraqi Kurdistan, human population, density, rural community, socio-economic characteristics

Introduction

Human population density shapes a critical link between this journal's two points of reference: human populations and their environments. Performing as a major factor mediating the extent and intensity of their shared impact, density concepts have been linked to debates over the capacity of the environment to support developing world subsistence populations.

Over the last two decades, the whole world has experienced rapid changes and socio-economic transformations, which lead mostly to global resource depletion and pollution that are forcing recognition that existing patterns of development and resource use are not sustainable (Roseland, 1998). According to the World Development Report (2009), which is about geography and economic development, and focusing more on spatial variability of conditions and outcomes than economic analysis usually does, the socioeconomic transforms influenced and resulted in strict stress, mostly to remote, marginal and rural areas of the world (WDR, 2009). Though, the transformations in economic and social tradition structure of the globe lead to reduce the farmstead returns, changing in the farming area values. In addition high rates of joblessness, cause mass exodus of the productive forces and lack of balance in the demographic of rural area (Gallent et al., 2008).

A look at the various developing and developed nations worldwide will clearly show that some of the developed nations like Canada or Australia are placed at the extreme end in the list of the gross national population densities. In these countries having extremely low population rates large tracts of areas remain practically uninhabited, though observations reveal that their 'pre-urban' (urban fringes) population densities around the large urban centers are more or less similar to the other developed nations. This has led to a dense rural population in certain 'pockets' (around the metropolitan centers) within the country, presenting a host of problems, both theoretically and practically, for the rural policy makers and developers.

Besides the infrastructural and developmental problems, observations also show that a spatially constrained antithetical urbanization movement has allowed the entry of certain 'exurban' elements within the sphere of some of the rural communities, thus making it necessary that one makes a review of the entire situation from a new perspective. A closer look at the available research papers will reveal that though are some researches on the subject of urban population densities, with some papers exploring the

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falling densities in rural areas, there is a serious lack of data on the effects of the rising or falling rural population densities on the socio-economic characteristics of the rural communities.

It is obvious from the above that the demand of rural areas for socio-economic and sustainable development jointly with the need for diversification of their economic basis to meet the changes is today greater than at any time. The motive behind of this task is established on the reality that throughout the last few decades, the rural settlement in the study area has been dramatically changed. Nevertheless, at the same time there is a realization that particular parts of the rural area have been left behind in development and the authority is presently upgrading rural area in order to sustain local economies and to increase employment and growth.

Literature Review

Human population density (both urban and rural) serves as an important study tool, necessary to measure the balance between the total capacity of the physical environment necessary to support the perpetually rising global population, especially in the context of the developing or under developed nations (Nouri et. al, 2006).

The studies on population density have primarily focused on the constantly increasing human population and subsequent impact of this increase on the physical environment and the resources available (Argent, 2008). The picture of an increasing population in developing nations, inserting compelling pressure on the country's natural resources, takes a different turn in majority of the developed industrialized nations. Here, researches show that the excessive low human population densities may show detrimental effects on the support system of social communities within the modern, industrialized, capitalist societies, creating barriers in the scale economy development, restraining the division of labor, while reflecting a heavy transportation charges upon the rural and 'sparseland' populations, that decrease their chances for social interactions (Theodoropoulou & Panagiotis, 2008).

Though having a seemingly simple front, the term population density actually comprises of a complex concept, which is associated with a wide range of factors like the physical environment, humans, economy, and technology, with each factor closely linked to the other (Fonseca and Wong, 2000). Saglie (1987) in his paper delineated two major concepts within the term population density, which are: measured density (a quantifiable figure of the population units, that comprise of the individuals, families and the households, in per unit area); and perceived density (a qualitative dimension comprising of abstract concepts, like loneliness, privacy, isolation, contact potential, and crowding) (Saglie, 1987).

Human population density has always been the chief centralizing theme within geographical studies, co-relating the range and depth of the interrelationships that occur between society, individuals, and the surrounding physical environment and the nature of their mutual influence. a majority of the density related research work has centered upon the factor of measured density (ratio of people per unit area), and have explored various aspects seeking resolutions for problems related to the services provided by the State, or for planning, within rural or urban settings. Holmes (1981) in his paper conceptualized the notions of 'critical density thresholds' for specific kind of service centre oriented network, where he associates population density levels to the wider aspects of 'primary production,' and his papers on Australian population density distinguished between the 'sparselands' and the 'settled areas' (Holmes, 1981).

It is not easy to distinguish between cause and effect, while explaining the various planes of human density, and the type and depth of their relationships with different social aspects. The complex nature of population density also implicates the involvement of the socio-economic, environmental, and historical factors that help to create a specific density spectrum and kind, like, linear, clustered, or randomly distributed, in respect to any type of rural community (Argent et al. 2005).

The perceived density or the qualitative dimensions of population density are yet to be explored in details. Only a few researchers have worked in this regards, as for example, Irving and Davidson (1973) defined social density (interpersonal relationships between members of a rural community) and Tuan (1977) in his paper emphasized that the feelings of crowding or loneliness were created owing to an individual's sense of socio-economic opportunity within a particular environment. He opined that qualitative responses to the figurative human population density were adapted by two main factors, culture and the desire for a community member's self-accomplishment. Tuan (1977) gives an example of the Russian farmers residing in the Steppes. This landscape does not have much human habitation, except for few isolated farmhouses, and such isolation tends to produce a feeling of fear and despair within the local rural inhabitants. Saglie (1998) recounts his experiences of the Norwegian people living in urban settlements, and his observations show that the Norway residents displayed an antipathy towards urban form of life,

which grew from their age-old tradition of low-density settlement, thus making the Norwegians inherently prefer sparser settlements. Here, Saglie comments, "The ideal Norwegian way is to live scattered because Norwegians are 'lone wolves'…Norway has been a kingdom of small kings, with rural communities divided by topographical features" (Saglie, 1998). According to Saglie (1998), the two aspects of density (measured and perceived) portray two different conceptions of space. Measured density arises from an absolute proportion of space (Kantian theory); whereas the perceived density ensues from social relationships, is relative in nature with a relational concept of space.

Population density, best described in terms of a typical spatial aspect, reflects the way in which human species have spread out, and occupied the surface of the earth, and is an extremely important factor in the study of social and population geography. A study of the available literature on the subject, as already mentioned, however reveals that there are very few detailed studies in this line, with the majority of work conducted concerning themselves with population density only within the urban areas. For example, we find town-planning reviews based on the population density by Saglie 1998; with various other general overviews, on the subject of urban population density (Bahr et al., 1992).

As regards specific studies on the density of the rural areas, there are articles by Robinson, Lindberg, & Brinkman (1961) that explore the link between the rural farm densities and percentage of arable land, percentage of the land producing crop, percentage of rainfall, and the distance from the nearest urban centre (robinson et al., 1961). However, it was in 1967 that Berry in his research papers first undertook a systematic work to distinguish the effects on the variation of density on an overall community settlement system.

Working within the restraining framework of the inflexible concepts of the central place theory, Berry revealed in his papers that the dimensions of the rural trade areas and service centers is linked to the wider aspect of the regional population density of which it is a part. Irrespective of the population density, the rural centers are apt to form a distinct spatial pyramid. With a decrease in the population density, the place dimension at each level of the pyramid also decreases, while there is an increase in the trade area sizes that seeks to compensate partially for the decreasing population density. Subsequently owing to these shifts and transitions, the specific forms of services seen at the lowest level of the spatial pyramid under conditions of high-density rural population will move a step up to the next higher level when population density decreases (Berry, 1967).

Rural population density has a significant amount of influence over the socio-economic characteristics of rural communities, which is on one hand a persistent process occurring through a long period over the years, and on the other hand it is also ongoing process taking place at the present moment. Unlike urban size, rural density takes a direct measure of the rural community's living size and space, the habitability of the physical environment where it is located, and the potential cost of transport for service delivery and other measures of maintaining contact and personal interaction between the rural people (Smailes et al.,2002).

In Australia, researchers have shown that the besides the aforementioned factors rural density can be also co-related with 'age and maturity' of the rural community's tradition and culture, the kind of farming practice followed, size of the farms, amongst various other factors (Holmes, 1987). Rural population density also influences the markets for entrepreneurs, and the chances for earning from doing work other than farming.

Smailes, Argent and Griffin (2002) theorized an original relationship between rural density, which is an independent variable, and other characteristics of the rural communities, which are the dependent variables. The authors found positive correlation between the rural population density and the total population; the mobility rate of the community members; industrial workforce, and ratio of non-native population. Negative correlations were found with the number of people working within the primary industry, spatial area of the rural community, the masculinity proportion, and the fertility ratio. The authors additionally found in their researches conducted mainly in the Australian context that rural population density remains correlated at a significance of 0.01 levels with the aforementioned variables, along with factors like youth dependency factor, unemployment proportions, and ratio of the population below 15 years of age (Smailes et al., 2002).

Although there are a dearth of studies into the dimension of rural population density, whatever researches have been conducted into the matter, shows us that, there is a close link between the rural population density and socio-economic characteristics of rural communities and the two factors are mutually interdependent.

The Study Area

Shaqlawa is one of the Iraqi Kurdistan's region district, located in the central part of Erbil

governorate and is sub-divided into five sub-districts, namely, Harir, Basirmah, Hiran, Balisan and Salahaddin which share borders with Swran districts to the north, Suleimaniah governorate and Koey district to the east, and Dohuk governorate to the west, Dashty hawler district to the south, Figure1. Shaqlawa district has a total land area of 1787 square kilometers covering about 12% of the former Erbil governorate total land area which is about 14471 square kilometers. Farming activities take up about 52% of the total district land, while other uses are grazing 32% and forests 16% (swzan, 1999).

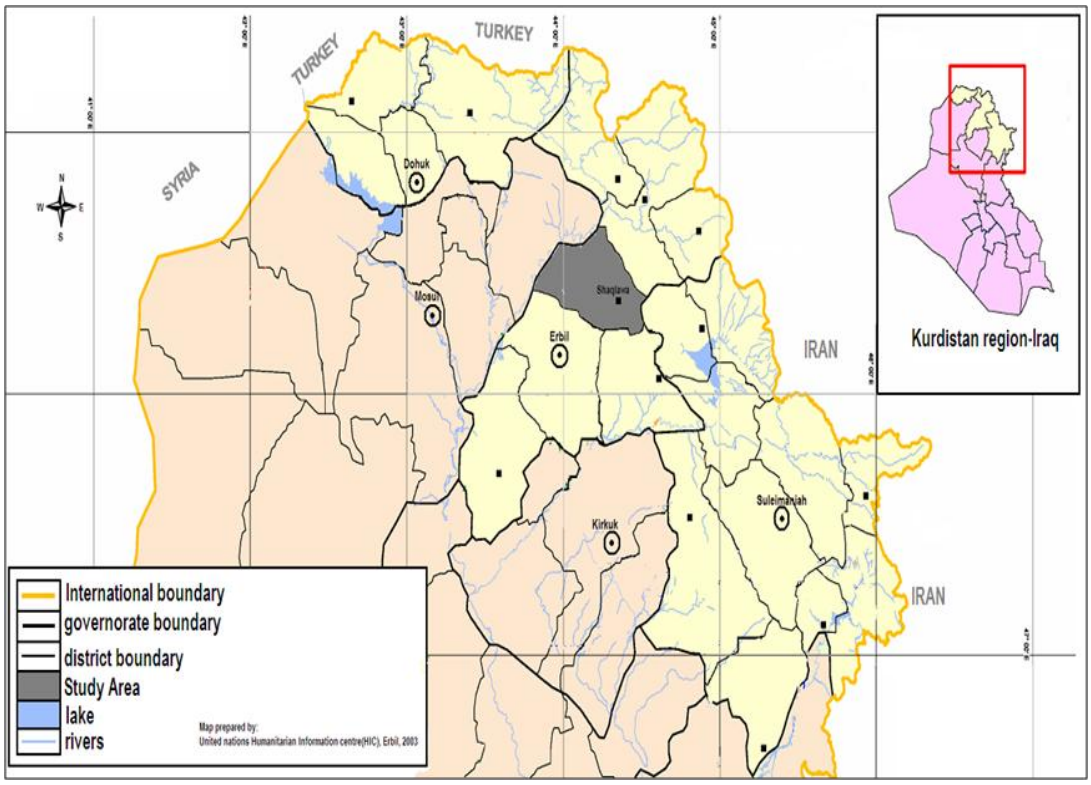

Figure1. Geographical location of Shaqlawa. Source: UN Humanitarian Information Center-HIC, Erbil (2003).

Methodology

This research examines the effect of rural population density on socio economic characteristics of rural community in Shaqlawa district. It assesses the pattern of rural population density in order to discover the driving force behind these differences from point of view spatial core and peripheral of elements this of Shaqlawa rural community. To this end purposive stratified sampling of respondents includes all households member (household head, wives, children and parent). The component of analysis for this research is the households. The analysis is illustrated by field observation of six villages namely of Amokan, Graw, Mirawa, Zyarat, Freez and Aspindara. Data sources consist of a quantitative survey made up of 330 stratified purposive sampled households - 95% confidence level- (De Vaus, 1996) presented in Table 1.

Table1. Sample size based on HH population.

Villages	HH No.	Density Person/ K.sq	Type of density	Sample size
Amokan	222	294	High	100
Graw	112	144	High	65
Mirawa	58	130	High	55
Zyarat	55	9.9	Low	55
Freez	30	7.3	Low	30
Aspindar	25	3.9	Low	25
Total	502			**330**

To ensure ethical sampling strategy, a feasible sampling plan of moderate cost, was drawn. This involves training of research assistants, identification and interaction with Mukhtar (community leaders) and NGOs agents. Some funds were set aside for tips, consent inducement cost, and participation bonus. Cash disbursement really aided the implementation of the research plan by enhancing access and saving valuable time.

The observation focused on four socioeconomic elements of rural settlements: demographic, economic, agricultural and housing character (Table 2). Rural settlement here implies first a dwelling unit for a household, and a group of dwellings forming a settlement. A plot for this research is limited to the physical boundaries of a settlement (the unit of analysis).

The researcher conducted a pilot study on the quantitative methods in order to improve on the full-scale survey. Questionnaires were tested undeclared with two volunteer respondents in each of the six settlements. The actual Data were collected during 2011 in order to logically evaluate the socioeconomic characteristics of Shaqlawa rural communities.

Results

In an attempt to fix the role of population density as the indicator of socio economic structure of the rural community, three villages were selected from two different zones. Amokan, Graw and Mirawa represented high dense villages and Zyarat, Freez and Aspindara representing low dense villages. Information were collected on various aspects, such as household size, gender, age distribution, level of education, occupation, income, expenditures, agricultural land holding, agricultural land use, livestock ownership and housing information.

The results of the descriptive statistic tests analysis of household level determinants of demographic characteristics indicated statistically no significant differences between the type of density with household size and age distribution, while the test indicated statistically significant differences between the communities in terms of male to female ratio and education level. In regard to the economic characteristics, the results of the descriptive statistic tests analysis for occupation, income and expenditures indicated statistically significant correlation between density and those variables. Based on the farm size and land type the results of the descriptive statistic tests analysis indicated statistically significant correlation. However, the test indicated statistically no significant differences between the type of density with agriculture machinery and livestock ownership. With regard to housing characteristics the results of the descriptive statistic tests analysis for housing area, material, facilities and fuel source indicated statistically significant correlation between density and those variables. While no significant correlation between the types of density and numbers of rooms in the house were found.

The study reveals that rural density is found to be important descriptive variable in its own right. Examining local rural population density, we have established that it is fairly strongly associated with a large series of imperative socioeconomic indicators once analysing the survey data. Out of 20 dependent variables that have been tested (p value < 0.05); rural density was not significantly correlated only to 6 of them. In discussing these outcomes, we have recognized that rural population density is a very imperative variable in describing, evaluating and categorizing rural communities.

The future of rural and regional development in Kurdistan is a topic of great political meaning for the government. The social cost of an economic policy that considers regional markets and service delivery only in terms of numbers and not of density may be great. In a countryside right at the sparse end of the rural population density distance, remoteness and density will continue to be imperative problems inspite of improvement in communication meanings.

Lastly, high population densities have been important drivers of technological innovations. Possibility of spawning intensive systems of large-scale irrigation and new higher-yielding crops is at easy access in denser populations. The social needs at community levels increase, which drives the populace of the area to strive more for greater production and increased facilities with available resources. Resources are found running short to meet their needs, due to increase in the density of population. Under the pressure of such energy resource shortage the society as a whole begins to think of harnessing different energy and resource manipulations. This kind of thinking leads to innovations both technologically and socially. Development stems from this thinking. Sustainable development has to be more than merely ‘protecting’ the environment; it requires economic and social change to improve human well-being while reducing the need for environmental protection. This in no way absolves individual citizen’s responsibility to preserve environmental equilibrium. However, in high dense areas this equilibrium is maintained, with much strain out of diversities in social and cultural way of life led by the concerned people. Table 2 below presents a summary of the major findings from the socio-economic survey.

Table 2. Summary of major findings from household survey.

Dependent variable	Description	Unit	Correlation sign* + Significant Not significant	Note
Demographic characteristics				
Household size	People in the household	Number		Both in HD and LD villages no variation is found
Gender	Gender of household	Dummy	+	In LD villages the masculinity ratio is higher
Age	Household age	Years		Both in HD and LD villages no difference is found
Education	Household education level	Dummy	+	In HD villages HH education level is higher
Economic characteristics				
Occupation	People formally employed	Dummy	+	HD villages correlated with high levels of occupational variety
Total Income	Household total income	ID (000)	+	HD villages associated with higher total income
Farming Income	Household income from farming	ID (000)		Both in HD and LD villages no difference is found
Other Income	Household income from other sources	ID (000)	+	HD villages linked with higher income from other source
Expenditures	Household expenditure	ID (000)	+	HD villages related with higher expenditures of households
Agricultural characteristics				
Farm size	Agriculture land Area	Donum	+	In LD villages the farm size is larger
Land use	Type of production	Donum	+	HD villages are associated with variety of crop production
Machinery	Own or not own	Dummy		Both in HD and LD villages no difference is found
Livestock	Household own or not	Dummy		Both in HD and LD villages no difference is found
Housing characteristics				
House area	Household Dwelling area	M. Square	+	In LD villages the house area is larger
House type	Construction materials	Dummy	+	HD villages are related with better construction materials
Room in house	Number of Rooms in the house	Dummy		Both in HD and LD villages no difference is found
Facilities In the house	Household having kitchen, toilet and water	Dummy	+	HD villages are associated with better house facilities
Cooking fuel	Household cooking fire	Dummy	+	HD villages is highly calculative in harnessing clean fuel resources

*Coefficient significant at the 0.05 level.
HD: High density; LD: Low density; ID: Iraqi Dinar

Conclusion

The investigation of this paper shows that it is not easy to distinguish between cause and effect, while explaining the various planes of human density, and the type and depth of their relationships with different social aspects. The complex nature of population density also implicates the involvement of the socio-economic, environmental, and historical factors that help to create a specific density spectrum and kind. As shown by the researchers the rural population density has significant effects on the main attributes of the rural communities, like the demographic and cultural composition, diversity in occupations, nature of the local industries, their demographic and ethnic composition and the relative mobility of the community member. Though one cannot deny the significance of the rural population density study, yet much remains to be done in this area. While collecting data for the literature review on this theme a dearth of information on this matter is very evident, and it singularly points out the necessity to conduct greater number of primary researches on the subject of rural population density.

From The present study it stands out clearly that rural population density is a very important factor or variable in identifying, delineating, analyzing and categorizing the rural communities. The concept of the rural population and the nature of these settlement densities are essential variables as one tries to comprehend the important factor in understanding the socio-economic, the population density and the

settlement matrix of the sparsely populated rural areas, where the thin and decreasing population densities present both theoretical and practical problems for those involved in rural planning. Rural population density has a strong influence over the socio-economic and demographic characteristics of the various non-urban communities, especially in the developed world, and forms to be a fundamental variable within the realms of planning and public policy framing. Thus, we find that study of rural population density is an essential subject in order to develop these sparsely-populated areas better.

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