

LACK OF ENERGY INFRASTRUCTURE AND ITS EFFECTS ON LIVING STANDARD IN UNDERDEVELOPED AREAS OF SINDH

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ABSTRACT: A relation exists among the levels of available energy supply and the standard of living of people in underdeveloped, less developed and developed areas of Sind. In this paper, the effects of inadequate energy supply on the standard of living of the people living in typical less developed and underdeveloped areas of Sind Pakistan are evaluated. The assessment takes into account the levels of subsistence of the people living in such areas and consequent implications on social, economic and cultural spheres. The subsistence levels are considered on basis of the availability of energy supplies required for potable water, food and electrical power in developed areas in comparison to underdeveloped areas, which lacks such energy supply system.

Keyword: Sustainable environment, energy scarcity, subsistence levels, socioeconomic implications.

INTRODUCTION

Disparities in the lifestyles exist in developing and underdeveloped areas. Socio-economic disparities exist in the developing and underdeveloped areas[1]. Majority of the urban areas are considered developed and receive adequate amounts of power, water and food, and the system of supply is comparatively better than the rural and slum areas [2,3,4]. An scenario analysis cum assessment can be developed to build an understanding on the socioeconomic conditions of the people living in typical developed,developing and underdeveloped areas and underline the need of initiatives, which are required to explore the avenues of sustainable development to improve the quality of life of the communities living in such areas of Pakistan [5,6].

Pakistan is a developing country. It has low energy consumption levels, a low standard of living and high population growth [7]. Low energy consumption levels are responsible for poor standard of living. In urban areas,which are developed comparatively better, the basic daily energy consumption of a low-income household is in the range of 1.16-1.33 kWh and is 0.83 kWh or less in rural underdeveloped areas [8]. Electricity is used mainly for lighting and space cooling in urban areas in comparison to underdeveloped areas where and kerosene, wood and biofuels are used for cooking and for lighting areas [9].Because of the differences in lifestyle levels of communities at and above subsistence levels, a process of movement of communities to other areas in search of these resources takes place [2,10].

MATERIALS AND METHODS

Two categories of energy consumption are described on basis of their subsistence level. In the first category, it is presumed are the underdeveloped areas that are at a subsistence level and in the other category are developing/underdeveloped

areas that are below subsistence level. The people living in the communities below subsistence level are those communities, which lack adequate amounts of electrical power, potable water and food. While people living in the communities above subsistence levels are those, which obtain adequate amounts of basic commodities such as electrical power, potable water and food. The communities below subsistence are denoted by “A” and that above subsistence are denoted by “B”, as is illustrated in Figure 1.

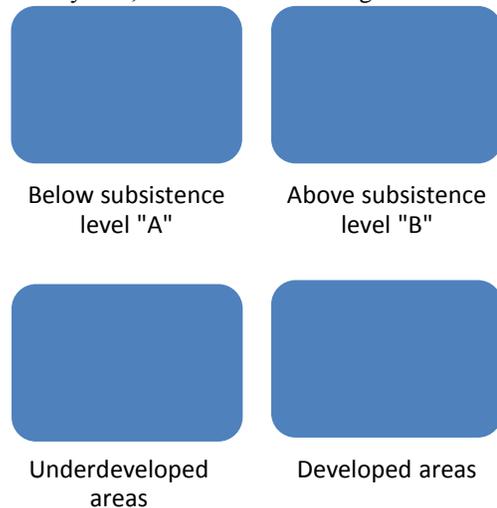


Figure 1: Illustration showing the level of subsistence in developed and underdeveloped areas.

It is presumed that in the event of lack of availability of adequate amounts of potable water and food, electrical power and natural gas these communities of below subsistence level move towards the towns, as is demonstrated in Figure 2.

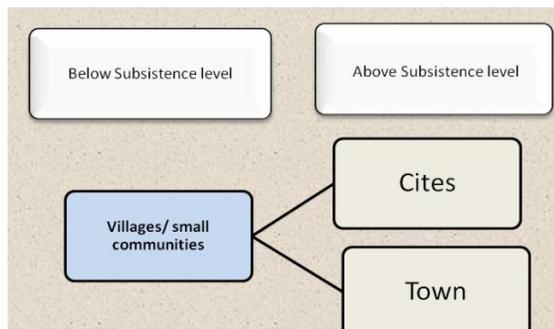


Figure 2: Illustrationshowing the movement of communities from underdeveloped to less developed and developed areas

The effects of such movements could be positive on existing energy supply infrastructure and lifestyles. However, there are negativeeffects of such movements of populations on existingenvironments, ecology, economy, society and culture because of increase in demographic, social and economic disparities. However, if subsistence products such as water, electrical power and food are provided at specified regions, it could stop the movement of these communities. Since the cities are overpopulated, the quality of life of recently moved communities is affected adversely, and these people suffer social and economic disparities. Psychological problems also emerge due to socioeconomic disparities of the existing and migrated communities. These problems are complicated in the long run.

RESULTS

Both categories of below and above subsistence level are differentiated numerically.Subsistence level values are indicated by 1 and those above subsistence are assumed 1.5 and under Subsistence is indicated as 0.5, as is illustrated in Table 1 and Figure 3.

Table 1.Energy levels of communities living below and above subsistence levels.

Categories types	Subsistence level	Above subsistence	Below subsistence level
Subsistence levels	1	1.5	0.5

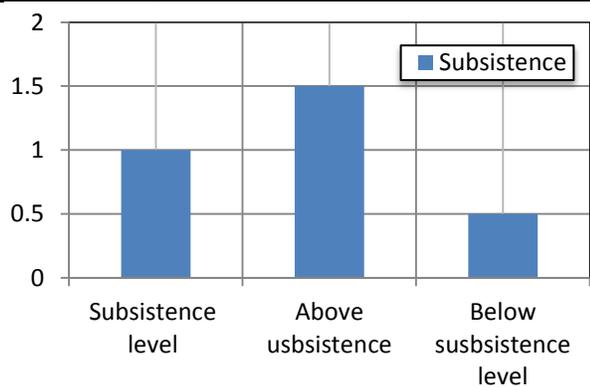


Figure 3.The above and below Subsistence levels of various categories of people

An alternative scenario can emerge on account of changing energy supplie to all these areas in order to improve energy levels altogether of all these categories. In such an event,those living in less developed areas below subsistence level are placed in energy supply level 1,less developed to 1.5 and those areas which are quite developed with energy infrastructure are placed in energy level 2, as is indicated in table 02 and Figure 04.

Table 2.Energy levels of underdeveloped, less developed and developed communities

Energy infrastructure supply areas categories	Under developed	Less developed	Developed
Energy infrastructure supply levels	1	1.5	2

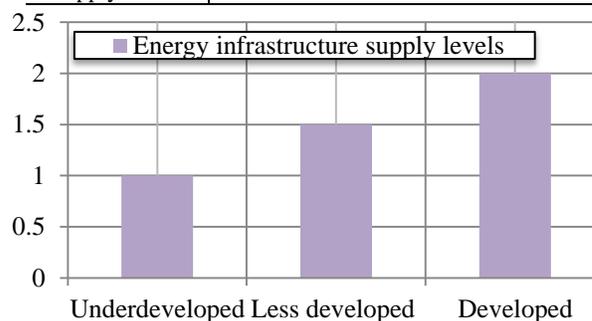


Figure 4.Energy consumption levels of underdeveloped less developed and developed areas

CONCLUSION

The assessment reveals the need for gradual development of sustainable energy infrastructure on modern approach in underdeveloped and less developed areas, so that the quality of life of communities living in such areas could be improved. Such developments could bring a positive development towards human development index and ultimately quality of life of the population living in these areas.

Majority of the population living in non urban areas,who suffer due to lack of electrical power supply,drinkable water can be benefitted from such sustainable energy enhancement programme. However,coordination, cooperation and contribution between public and private would be required at short,small and large scale for such energy generation and supply system.

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REFERENCES

- [1] McCalla, A.F. "Agriculture and Food Needs to 2025: Why We Should Be Concerned, (Consultative group on international agricultural research Sir John Crawford Memorial Lecture International Centre Week". *Washington, D.C.*, pp 1-3 (1994).
- [2] Ghaffar, M.A. "The energy supply situation in the rural sector of Pakistan and the potential of renewable energy technologies". *Renewable Energy*, **6**(8): 941-976 (1994).
- [3] Caliendo, B. and F. Biswas. "A multivariate analysis of the human development index". *Indian Journal*, pp 1-5 (2000).
- [4] Grunewald, N. "One-Quarter of World's Population Lacks Electricity Replacing wood and coal with electricity could help reduce poverty and pollution". *Scientific American*, **1**: 1-2 (2009).
- [5] Khattak, N., Hassnain, R.L., Shah, Mutlib, W.A. "Identification and Removal of Barriers for Renewable Energy Technologies in Pakistan". *IEEE-ICET*, pp 1-6 (2006).
- [6] Mirza, U., Nasir K, Harijan K, and Majeed T. "Identifying and Addressing Barriers to Renewable Energy Development in Pakistan". *Renewable and Sustainable Energy Reviews*, pp 927-931 (2009).
- [7] Ilyas, S.Z. "A Case Study to Bottle the Biogas in Cylinders as Source of Power for Rural Industries Development in Pakistan". *World Applied Science*, **1**: 127-130 (2006).
- [8] Barnes, D.F. and Floor W. "Rural energy in developing countries: A Challenge for Economic Development". *Annual Review Energy Environment*, **21**: 497-530 (1996).
- [9] Qureshi, S. "Energy, Poverty Reduction and Equitable Development in Pakistan". http://www.wilsoncenter.org/sites/default/files/Asia_FuelingtheFuture_rptmain.pdf, 57-74 (2007).
- [10] Soharwardi, M. "Migration of Cholistan people from desert areas towards irrigated areas". *International Journal of Social Sciences and Education*, **2**(3): (2001).