DETERMINANTS OF RURAL TO URBAN MIGRATION AND ENVIRONMENTAL PROBLEMS

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Abstract: This paper explores the factors contributing to the migration process in India. 4560 randomly selected migrants and their families were interviewed at destination using closed and open-ended questionnaires. The resulting data provided descriptive and analytical statistics. Logistic Regression analysis shows that migration is influenced by both "push" and "pull" factors, such as employment problems, extreme poverty, natural disasters and wage rate and higher income probability, better facilities, joining relatives /families. A factor analysis showed similar determinants. Reducing disparities between rural and urban areas should receive urgent attention to stabilize the migration process in India. The study also reveals that migrant households live in unhygienic water and air pollution especially at community levels. The results show the importance of behavioral risk factors in re-enforcing deficiencies in environmental services to determine diarrhea / dysentery morbidity, malaria, jaundice and respiratory diseases. The study established that relation between income, household environment and health. It analysis the living conditions, health and quality of life of poor migrants. It is evident from the study that slum dwellers are deprived on account of each and every environmental and social parameter. More efforts should be made to understand the dynamics of poor urban environments including health effects of exposures linked with poor household environments in slums of Bangalore metropolitan city.

Keywords: Poverty, Push Pull factors, Migration, Diseases, Regression analysis

I. INTRODUCTION

Enga oore vandaichi rumba naal adichi (Tamil), Mana ooru vadalesi chala kala ayindhi (Telugu), Namma halli bitti thumba deena aaythu (Kannada) mean that I left my village long ago is a common response by migrants to the question, When did you come to the city?. Investment in economic growth has been biased towards the capital-intensive urban centers, despite the fact that 80% of Indians reside in the rural areas. The poor from the rural areas have no other option but to seek a livelihood in the urban centers. The rural- urban imbalance in development provides an explanation for the unprecedented growth of urban centers and slums [1, 2]. Population explosion is one of the most threatening issues facing contemporary India particularly by the Indian cities. One of the most important reasons for population explosion in the cities of India is the large scale rural to urban migration and rapid urbanization [3].

Bangalore has grown to become the fifth largest urban center in India and accounts for 33.98 percent of the urban population in Karnataka. Bangalore, the capital of the southern state of Karnataka is one of India's fastest growing cities. Its extraordinary transformation since the early 1990's from a sleepy and leafy green city into a global technology center known as the "Silicon Valley of India" brought with migration from neighboring states of Andhra Pradesh, Tamil Nadu and Kerala. Among the districts, Bangalore rural and urban district have the highest share of inter state migrants. Border districts like Bellary, Bidar, Bijapur, Haveri, Kodagu, Koppala and Kolar also have high proportions of migrants from other states [4]. The pattern and trend of urban population in Bangalore during 1901 to 2001 shows that from 14.5 in 1911 to 50% in 2001. The area of Bangalore is a conurbation of 439 square kilometers and the "green belt" of 839 square kilometers [5].

Bangalore has grown within a planning framework that is ill-equipped to respond to the explosive

change. Rapid growth has taken its toll and many of the negative effects of urbanization, pollution, inadequate infrastructure and loss of the open space. In particular this growth has had a major impact on the environment that is environmental degradation and formation of slums [6]. While Bangalore has relatively few slums compared to India's major cities, the numbers are relative. Approximately 15 to 20 percent of metro Bangalore's residents are slum dwellers, compared to more than 30 percent in Kolkata and Mumbai. As a result of this, great threat of health and environmental degradation. The main objective of this research paper is to study the reasons of migration for rural to urban area and its impact on environment and health.

II. MATERIALS AND METHODOLOGY

The study has been carried out with the help of the collection of both primary and secondary data. The primary survey is mainly composed of observation and interview through questionnaire method. Twelve (12) main questions are considered which include particulars of household, housing details, demographic characteristics study, reason of migration, utility services, health and medical facilities, market and recreation facilities, disposal of garbage and sullage, solid waste, drainage system and latrine facility and space index [7, 8]. Since there are 473 slums (Declared Slum in 204) in Bangalore metropolitan city [9]. It is very difficult to interview all the households and conduct socio- economic survey to collect information for all slums. For study purpose, the city has been spatially stratified into three ecological zones (core, intermediary and periphery) on the basis of population density characteristics. Data was drawn with the help of a questionnaire from the survey of 4560 households selected from 42 slums from core, 43 from intermediary and 35 slums from periphery of Bangalore metropolitan city (Table 1). The questionnaire used in the interview was developed with the help of questionnaire of similar studies conducted by the Stockholm Environment Institute (SEI, 1993, 1994 and 1995) and Aligarh Environment Study Project (AESP, 1994, 1995) consisting of all those person who occupy a housing unit correctly, put their feet under one table or otherwise join together in an arrangement to provide, food, clothing, shelter and other basic residential necessities. Each household has a head of the family, a house, pucca, kutcha and semi kutcha. Out of 45600 households of slums of Bangalore agglomeration, 4560 (10%) were sampled for this study. There were 36,480 persons living in these 4560 sampled households with an average of 8 persons comprising of a household. Fieldwork was carried out during the period-from April to October 2006. The spatial distribution of sample slums as shown in figure 1.

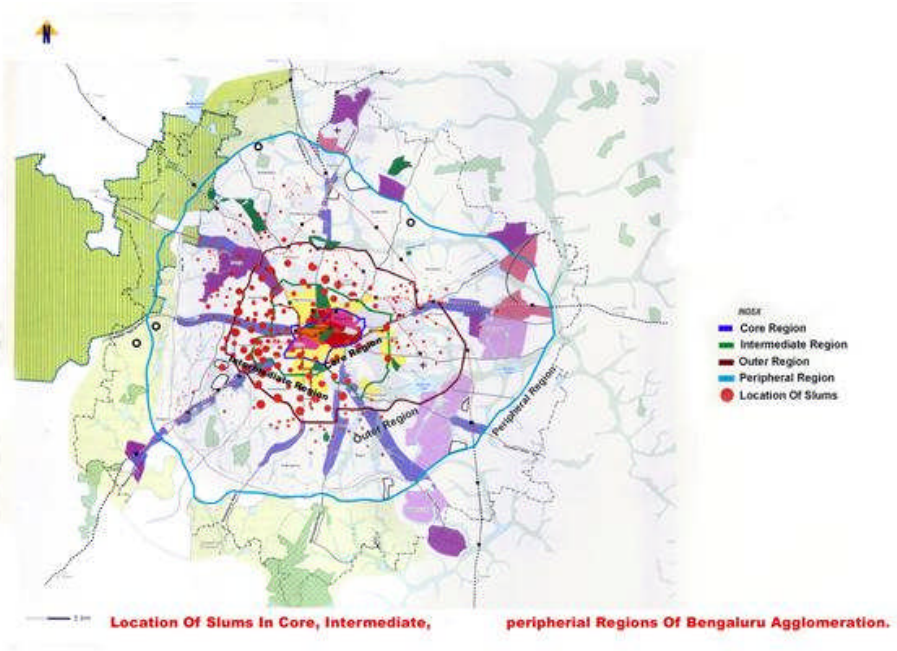

Figure-1: Spatial distribution of sample in slums in Bangalore

III. Results and Discussions

3.1 Potential determinants

The determinants of migration from rural to urban areas are characterized by two major categories; one is 'pull' and other is 'push'. The cumulative percentage of the variances of these factors is 96.84 (Table 2 and 3). This implies that the determinants could reasonably be sufficient to explain migrants. Push factors alone have accounted for approximately two thirds of the total variances. Push factors explaining 88.99 percentage of the total variance mean it is the powerful factor in determining migration especially poverty. Migrants living in sub human conditions gradually become permanent parasites in urban areas. The study established that poverty, Employment problem, Natural disasters and Wage rate has been main push factors for the migrants.

Table.1: Three ecological zones with respect sample slums

Bangalore	Core	Intermediary	Periphery	Total
Size of the sample Households	928	1531	2101	4560
Number of Sample slums	42	43	35	120

Table2: Push factors contributing rural to urban migration

Variable	Number of House Holds				
	Core	Intermediary	Periphery	Total	Percentage
F1: Finance problem	33	78	82	193	4.75
F2: Employment problem	165	266	354	785	19.35
F3: Future of children	6	18	23	47	1.16
F4: Extreme poverty	316	510	727	1553	38.27
F5: Land problems	63	91	129	283	6.97
F8: Natural disasters	141	227	341	709	17.47
F9: Government facilities	5	9	9	23	0.57
F11: Wage rate	95	162	208	465	11.46
			Total	**4058**	**88.99**

Source: Based on field survey 2006

Table 3: Pull factors contributing rural to urban migration

Variable	Number of House Holds				
	Core	Intermediary	Periphery	Total	Percentage
F18: Higher Income probability	5	6	9	20	0.43
F19: Better facilities	48	63	92	203	4.36
F20: Joining relatives /families	4	4	16	24	0.52
F21: Positive Information on the city	5	10	5	20	0.43
			Total	**267**	**5.74**

Source: Based on field survey 2006

Pull factors account for 5.74 % of the total variances and positively correlated with variables F18 higher income probability, F19: better facilities, F20: joining relatives /families, F21: Positive Information on the city. Variables with high factors loadings denote the influential determinants of migration. The study established that better facilities available in urban areas to pull the rural poor people to migrate.

3.2 The logistic regression analysis for rural to urban migration:

Principal component analysis allows a researcher to reduce a large set of initial indicator variables to smaller and more manageable set of derived indicators without making the likely unwarranted assumptions that all initial indicator variables are equally important. Determinants with comparatively higher frequencies were included in this model. The following determinants are highly correlated with the dependent variables "migration" and help minimize the number of factors that show potential determinants. Factors entered into the final model are F2: employment problem (0.0000); F4: extreme poverty (.0000); F8: natural disasters (0.0000); F11wage rate (0.0001 in the Table 4. The variables with a correlation coefficient smaller were removed from the model to maximize the relation between the determinants (independent variables) and migration (dependent variable).

Table 4: Logistic Regression analysis for rural to urban migration

Variable	B	S.E	Wald	Sig	Exp(B)
F2: Employment problem	3.2400	.6674	23.5709	0.0000	25.5338
F4: Extreme poverty	3.0646	.6433	22.6913	0.0000	21.4257
F8: Natural disasters	3.4263	.7067	23.5097	0.0000	30.7632
F11: Wage rate	2.7326	.7007	15.2098	0.0001	15.3727

Source: computed from survey data 2006

The significance value < 0.1 shows the usefulness of this model in analyzing the determinants that influence the migration process potentially and hence, the rural to urban migration is explained four factors namely employment problems, extreme poverty, natural disasters and wage rate.

Factors analysis was done in order to identify the determinants of variations among the push factor over city zones and results are tabulated in the Table 5. In the first component of core zone, employment problem, natural disasters are main determinants for rural to urban migration, followed by the poverty, land problems and wage rate. Similarly intermediary zone, poverty is the main determinant, followed by remaining factors. Further in the periphery zone is also found that future of children is the main determinant followed by natural disaster, employment problems and poverty. For pooled data of Bangalore metropolitan city concerned, natural disaster, and extreme poverty and land problems are major determinants followed by remaining determinants such as employment problems, wage rate and future of children.

Table 5: Push factors contributing rural to urban migration
ROTATED COMPONENT MATRIX

Variable	Factors loadings							
	Core		Intermediary		periphery		Total	
F1: Finance problem	.753	.399	.811	-2.054E-02	.750	5.380E-02	.786	.102
F2: Employment problem	.950	.245	.966.	.169	.774	.475	.889	.288
F3: Future of children	.605	.640	.849	.203	.943	5.184E-02	.842	6.713 E-02
F4: Extreme poverty	.945	.242	.970	.147	.775	.479	.899	.263
F5: Land problems	.948	.212	.965	.129	.758	.484	.893	.260
F8: Natural disasters	.950	.243	.967	.128	.780	.462	.905	.243
F9: Government facilities	.715	-.321	-	-	-	-	-	-
F11: Wage rate	.944	.260	.883	.106	.772	.475	.857	.340
F12: Literacy rate	-	-	-	-	-	-	.630	-6.945E-02

Extraction Methods: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization
Sources: computed from survey data 2006

Further in order to identify the determinants of variations among the pull factor over city zones and results are tabulated in the Table 6. In the fist component of core zone, a better facility in urban areas is major determinant of rural to urban migration, followed by remaining factors. Similarly in intermediary zone, joining relatives/ families is the main source followed by remaining. In the periphery zone positive information on the city is the main reason of rural to urban migration. For pooled data of Bangalore metropolitan city concerned, better facilities, are the major source of migration, followed by positive information on the city and joining relatives.

Table 6: Pull Factors contributing rural to urban migration
ROTATED COMPONENT MATRIX

Variable	Factors loadings							
	Core		Intermediary		Periphery		Total	
F18: Higher Income probability	.629	.134	.634	-.465	-	-	-	-
F19: Better facilities	.923	.126	.929	.106	.727	.505	.866	.237
F20: Joining relatives /families	.903	.227	.944	-1.243E-02	.777	.401	.824	.214
F21: Positive Information on the city	.889	.118	.885	.209	.923	.188	.861	.114

Extraction Methods: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization
Sources: computed from survey data 2006

1.3 Household environmental conditions in slums of Bangalore Metropolitan City.

The most pressing environmental health problems today, in terms of disease, illness, disabilities and even death are associated with poor households and communities in the developing countries like India. Slums of the developing world, inadequate shelter, over crowding, lack of adequate safe drinking water and sanitation, contaminated food, solid waste and indoor pollution are by far the greatest environmental threats to human health. These conditions are often compounded by poor nutrition and lack of education, which make people more vulnerable to and less able to cope with environmental threats [10]. Data was collected through field survey and to study the relationship between incomes, household environment and health

In order to find the association between income and household environmental condition, the variables are shown in the Table 7. The chi-square analysis was done and presented in the Table 8. The results indicate that income and household environmental conditions are significant at 1%. This proves the poverty is the greatest factor for degradation of environment because there is close relationship between income and various environmental conditions. This study attributes that slum dwellers in Bangalore facing problems of lack of basic amenities.

Table7: Association between income and household environmental conditions in slum areas of Bangalore metropolitan city.

Sl. No.	Variables	x^2	Coefficient of Contiguity
1	Status of the house	68.17*	0.1213
2	House type	267.81*	0.2365
3	The floor area of the house	267.308*	0.2353
4	The total number of rooms in the house	547.407*	0.3273
5	Average area of the rooms	345.903*	0.2655
6	The floor space per person in sleeping rooms	1964.88*	0.5487
7	Ventilation condition in the house	685.72*	0.3615
8	Bathroom and toilet facility in the house	2091.49*	0.5607
9	Type of latrine used	2561.58*	0.5997
10	The mode of disposal of fecal matter from manual latrines	66.27*	0.1196
11	Source of water supply	2091.49*	0.5607
12	State of water supply	125.931*	0.1639
13	Quality of water supply in	2091*	0.5607
15	Amount of water supply	364.78*	0.2721
16	Mode of water storage in the house	185.55*	0.1975
17	The drainage around the house	1894*	0.5417
18	Type of drainage around the house	2049*	0.5568
19	Water logging around the house	2565*	0.6000
20	Water logged	958.36*	0.4167
21	The mode of storage of household waste	2155*	0.5665
22	Mode of disposal of household waste	1271.71*	0.4669
23	The garbage collection	45.18*	0.0990
24	The frequency of garbage collection	191*	0.2005
25	Presence of insects and scavengers in the house	802*	0.3867
26	Distribution of the use of fly doors and windows	408.25*	0.2866
27	Place of cooking food in slums	2555*	0.5992
28	The place of cooking food	3008*	0.6304
29	The indoor smoking	1294*	0.4701
30	Outside smoke coming inside the house	820*	0.3904
31	Exit capacity of indoor smoke	228*	0.2182

Source: Based on field survey 2006

* Chi Square significant at 1% level.

3.4 Relationship between income, household environment and health

Up to one-fifth of the total disease burden in developing countries may be associated with environmental risk factors. While the disease burden in poor countries is about twice that of richer countries, the disease burden from environmental risk is 10 times greater than in developing countries. Poor people who are living in slums are most affected by environmental conditions such as unsafe drinking water, poor air quality, bad sanitation and solid waste and indoor air pollution [11].

Multiple regression models were used to assess the water supply; sanitation and house hold characteristics associated with diseases like dysentery, jaundice, malaria and respiratory disease for other diseases. Multi regression models were used to find out contributing variables to the diseases in slums of the Bangalore metropolitan city and results are presented in the Table no 9. It is found that Municipal collection of fecal matter and storage of water in open containers are the variables considered were found significant. Further the co efficient of determination, R^2 shows that there is 92.9% variation in diseases dysentery is explained by the independent variables. Where as in case of jaundice, using water from sources and the storage of water in open container contributing more significantly and value of R^2 is found to be 85.6 %. In case of the disease malaria, all variables considered in the model are contributing significantly and value of R^2 is 87.6 %. The study indicates that improper sanitation leads to causes of malaria. The slum dweller are suffering from respiratory diseases (R^2=96.7 %) mainly due to use of wood dung fuel, kerosene and improper ventilation in the house. The household environments i.e. the housing conditions, municipal collection of fecal matter and storage of water in open containers, drainage, solid waste and indoor are pollution creates the greatest and the most immediate influence on the lives of the residents.

The study established that house hold environmental in the slum areas related health problems like dysentery, jaundice, malaria and respiratory diseases. The most severe household environmental problems and health effects are faced by the poor i.e. the lower income households.

Table 8: Multiple Regression models explaining contributing variables to the variable disease in slums of Bangalore Agglomeration (pooled data)

Variable	Coefficient	t	R^2
Dysentery	.0.207 (0.105)	---	0.929
No Latrines	-0.013(0.042)	-0.310	
Municipal collection of fecal matter	0.819 (0.033)	24.859**	
Disposal of fecal matter in Garbage	-0.050(0.029)	-1.761	
Unsatisfactory water quality	-0.001(0.037)	-0.034	
Storage of water in open containers	0.407 (0.043)	9.503 **	
Jaundice	0.593(0.093)	-----	0.856
Using water from sources	0.434 (0.025)	17.453**	
Unsatisfactory water quantity	0.039(0.027)	1.469	
Storage of water in open container	0.363 (0.032)	11.209**	
Malaria	0.480(0.094)	---	
Open drainage	0.257 (0.077)	-0.593	0.876
Water logging problems	0.659(0.127)	3.353**	
Water logging problem and rain water logging	0.306(0.053)	5.775**	
Presence of household pests	0.265(0.046)	5.707**	
No use of fly doors and windows in the house	0.047(0.025)	1.850	
No use of preventive measures from mosquitoes	-.0.0690.028)	-2.435*	
Respiratory diseases			
Space per person in sleeping (less than 10 sift)	0.329(0.075)	---	
No proper ventilation in the house	0.085(0.073)	1.157	
Place of cooking meal in verandah / multi purpose hall	0.395(0.085)	4.661**	
Main cooking fuel used	-0.050(0.060)	-0.827	0.967
Out door smoke coming in the house			
Cigarette / bidi smoking inside the house	0.339(0.065)	5.241**	
No outlet of indoor smoke	-0.275 (0.081)	3.385*	
	0.143(0.084)	1.698	
	-0.224(0.070)	-3.207*	

Source: computed from survey data 2006

Figures in the parenthesis indicates the S.E

* 5% level of Significance

** 1% level of Significance

This analysis is that poverty is the greatest polluter. This was our basic hypothesis. There is a close relationship between income household environment and health. The lower the income, the poorer the household environmental conditions and higher are the occurrence of environment related diseases like diarrhea/dysentery, malaria, jaundice, typhoid etc.

IV. CONCLUSIONS AND RECOMMENDATIONS

Multivariate logistic regression analysis suggested that employment problem; extreme poverty, natural disasters and wage rate determined significantly the factors contributing the rural to urban migration. Poverty, job searching and family influence are the main push factors for out migration, while better opportunity, prior migrants and availability of job are the main pull factors behind migration. This study may help the planners and social scientists for implementing and extending the rural development programmes, as it gives an overview of the people involved in rural out-migration process and also identifies the root causes of migration at individual and household level.

The study has amply demonstrated some of the salient environmental problems facing households in slums of the city. A household environmental problem is closely interrelated and affects mainly less income households. Due to inadequate access to environmental health facilities in addition to overcrowding at sanitation facilities and hygiene, children of poor households face the greatest obstacles to optimum health. It is evident that the major obstacle to achieve a sound environmental health in slums of Bangalore metropolitan city is poverty. That is poverty is great polluter.

Need to change Development Policies:
It is necessary to reduce the socio economic differentiation that under present conditions is still growing at quite a considerable rate between urban and rural dwellers and between rich and poor. Emphasis needs to be given to rural development so as to reduce and discourage rural-urban migration. Emphasis also needs to be given towards the development of small cities. The development in rural and urban should not be competing for limited resources but rather should be considered as complementary process where the benefits of development will support each other in a balance manner.

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