CAN DEMOGRAPHIC PARAMETERS HELP IDENTIFY SPATIAL DEPRIVATION ?? (A STUDY IN ANDHRA PRADESH)

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1.0 Statistical Exercise to Identify Areas of Deprivation

1.1 About the Present Study :

It is a general practice, by habit or intuition, some of districts in a state are stamped as 'Backward' while some districts are felt to be "Well Developed". But if one goes into a detailed analysis at micro level, taking into consideration several indicators, all is not well even within the well-developed districts. Similarly the entire 'Backward District' is not that bad and some pockets are reasonably developed. So the misnomer of 'Enblock' backwardness of a district should be reduced, among planners, administrators or donors, of course through empirical evidence. They should concentrate in the real pockets of deprivation, irrespective of their location, either in a backward or developed district, and think of appropriate strategies, to initiate proper interventions that match the demands of the local people in order to mitigate their sufferings and ameliorate their poverty.

1.2 Objectives of this Exercise :

- To identify the backward Mandals based on level of development and geographical locations within selected districts of Andhra Pradesh, by making use of (broad based) important Development Parameters, taken together; and
- 2. to identify the priority intervention for each Mandal for immediate attention.
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The author is initially inspired by Satish B. Agnihotri's Paper on "High Female Literacy, Low Child Population", Economic and Political Weekly, 28.09.2002.

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1.3 Study Area :

The present study has explored and experimented with all possible social, economic and demographic indicators, to identify as closely as possible, the real needy/disadvantaged within the Rural Poor in six districts of Andhra Pradesh.

Three well-developed districts from three sub-regions of Andhra Pradesh are selected for this analysis. So also, three least developed districts are selected from the three subregions.

Sub Region	Backward District	Developed District
Coastal	Srikakulam	East Godavari
Rayalaseema	Anantapur	Kurnool
Telangana	Mahabubnagar	Warangal

By making use of 34 basic development indicators (Annexure I), this statistical exercise attempts to bring into light, the pockets with varying levels of human deprivation (geographical location and development parameter) in all the six districts, that deserve immediate and simultaneous development strategies.

1.4 Methodology :

The detailed data for each Mandal is collected under the following categories for the latest years available from the published documents^{*}. The analysis is expected to bring into focus the relative deprivation between Mandals (may not be the absolute deprivation, as the data is not the latest). The quantification of deprivation sets the trends or helps to guide the planner or donor in prioritising the Mandals – which one is to be taken up early and what intervention needs immediate attention in that Mandal.

For each Mandal, the data on several parameters has been collected, verified and standardised. The absolute values are converted into percentages or ratios to make them independent of the unit depending on the importance of the variable. Later they are ranked. The rank values are added across parameters for each Mandal. These cumulative (rank) values

^{*} District Census Hand Book, District Statistical Hand Books, Departmental Publications, Mandal Level Records

(hereafter referred as composite index) are arranged in ascending order. By using "Mean \pm Standard Deviation" technique, the lower values: below (mean – 2SD) are considered as underdeveloped Mandals. But experience showed that the scores do not follow normal distribution, but a skewed distribution. Hence 'Median' is considered to be a better and appropriate 'central value'. Thus the cumulative values of all Mandals, in a district, are arranged in ascending order and then divided into four quartiles. Example: If there are 40 Mandals in a district, each quartile consists of 10 Mandals.

I	Quartile	1-10 Mai	ndals -	Least developed Mandals
Ш	Quartile	11-20 Mai	ndals -	Less developed Mandals
	Quartile	21-30 Mai	ndals -	Moderatively developed Mandals
IV	Quartile	31-40 Mai	ndals -	Developed Mandals

In the order of priority, for intervention programmes, the least developed Mandals of first quartile need immediate attention.

1.5 Limitations of the Study :

The data relates to 1991 mostly and for some parameters, the data is available for 1995. As the latest data is not available, the available data is being made use of. The basic idea behind the in-depth analysis is to show the <u>relative</u> deprivation of a few Mandals within the developed districts and vice versa. The aim/objective of this analysis is to create an awareness among planners/administrators not to allot the funds as a <u>blanket</u> to the backward districts, without assessing their needs, i.e. which Mandal needs, what intervention and remedy the deprivation in that pocket, so that over a period of time, the regional imbalances can be corrected. Through this study, the Researcher wishes to urge them to look into the backward areas of the well developed districts which need their attention in getting their due share in resource allocation to prevent perpetual backwardness in some pockets. The Researcher knows that the observation made out of this micro level statistical analysis cannot be generalised but only trends can be studied, understood and appreciated, in the correct perspective (more of academic interest/angle). If some sponsorship (financial support) is available, a large-scale study, with the latest available data can be undertaken, so that generalisations can be arrived and universal application can be suggested.

1.6 (Non) Ubiquitous nature of Parameters

A close look at the individual values of parameters between the first quartile and fourth quartile in each district has revealed that in many cases there is a sharp difference. For example if we take <u>SC population and ST population</u> as indicators of backwardness, they are more in the first quartile and relatively lesser in the fourth quartile.

As generally viewed and reported in the literature, higher <u>literacy</u> means higher development. This is confirmed through higher total literacy in the fourth quartile as against the first quartile, which is true gender-wise also.

As the economically active population decides the growth and development of any area, more of <u>workers</u> means more of economic activity as well as higher incomes generated in that area. This is evident from higher percentage of total workers and more particularly the <u>female</u> <u>workers</u> in the fourth quartile. Unless the work force is made economically active in the first quartile also, they cannot achieve the minimum developmental norms. In the case of agricultural labour the reverse trend is welcome, i.e. higher percentage of agricultural labourers means lesser economic activity in that area. This is evident from the data : first quartile has recorded higher percentage of agricultural labourers while the fourth quartile recorded the lowest. Unless agricultural labourers are provided with some asset, appropriate skills and income generating activities, based on local resources and market demand, the poverty persists.

Another most important resource, the factor of production is the <u>land</u>. How it is being used is another important indicator of development. If the net area sown is higher, naturally the area is well developed, indicating job opportunities as well as food security in that region. This is obviously seen in the fourth quartile, while the net area sown is relatively less in the first quartile. The logical explanation is extended to the percentage of area under irrigation. With irrigation facility available in some areas, prosperity is obvious. In the fourth quartile the irrigated area is relatively high. Thus if the irrigation is made available to the first quartile Mandals also, the regional imbalances can be covered to a large extent.

As far as the <u>infrastructure</u> facilities are concerned, some of the central functions considered in this analysis are related to basic education, connectivity, food security and health related activities. In the presence of central functions also, the fourth quartile has invariably an edge over the first quartile. The starting point for human resource development is the

availability of "source of primary education" as well as the upper primary education. Unless these facilities are physically available in the villages, the parents cannot think of sending their children to these schools. As a basic pre-requisite, the presence of schools lead to higher education levels in the school going age children (for both boys and girls). The data has revealed lesser availability of primary schools and middle schools in the first quartile, which is obviously reflected in the lesser enrollment of girl children in the first quartile areas. Unless the children in general and the girl children in particular, are enrolled cent per cent at the primary level, no development can be attained and further sustained.

Other important <u>central functions</u> relating to the connectivity are: connection with main road and having bus stop. On these two counts also, there is a marked difference between the first quartile villages and the fourth quartile villages, indirectly indicating that connection with outside world automatically brings in development into the entire villages also. The consequences of connectivity are reflected through higher food security and higher availability of medical facilities in the region. The fourth quartile villages have registered higher presence of public distribution system and medical facilities indicating higher level of development.

Thus the detailed analysis has shown that the fourth quartile Mandals are the ideal in each district on the whole, while the first quartile Mandals need improvement in almost all the parameters studied, for identifying the deprivation. Though it would be nice and advisable to develop all the first quartile Mandals in an integrated fashion, the limiting factor would be resources available with the government and the time factor. No successive government can allot major portion of its financial resources for the development of all the parameters simultaneously. To achieve balanced regional development gradually, the important parameters that really matter for spin off development can be taken up on a priority basis.

1.7 Need for Further Study Based on the Results

In order to prevent the subjectivity in identifying the important parameters within a group that are responsible for the development or otherwise at Mandal level, **Multiple Regression Programme** (M.R.P.) has been made use of. Further as the problems of under development are area specific, the programme was run for each district separately to highlight the sub-regional problems. Similarly within a district also attempts are being made to identify the important parameters that need immediate rectification. The analysis has been done on each quartile separately. With all these precautions, the emerging conclusions are supposed to be

purely objective and based on the facts and figures collected from the authentic sources. By and large, three parameters have emerged out as responsible for the development/under development in the districts studied.

- 1. Basic <u>education</u> seems to be most important parameter that distinguishes development from under development. Within education, girls' enrollment appears to be still more important. Hence special efforts should be made to improve these two parameters in all the under developed Mandals.
- 2. Creation of employment, more particularly to women, seems to be the most important factor to decide the level of development of a region. Apart from improving the skills of people, enough of income generation activities should be planned so that, in a closed economy, the incomes can be improved.
- 3. Among the infrastructure facilities, communication facilities with bus connection, followed by a very well laid road network seem to be essential for the development of any region. By connecting as many villages as possible on to the road network, the development can be pumped in, specially in the under developed villages of the first quartile, in any district.

The above analysis has made an earnest attempt not only to identify the under developed/ backward Mandals in each district <u>geographically</u>, but the parameters that are responsible for the under development with the help of a statistical analysis. In a phased manner, if these parameters are improved (location specific and need based) the balanced regional development can be achieved over a period of time.

2.0. Testing for the suitability of two Demographic Factors to Correct Spatial Inequalities

It has been argued over the years that by educating the female member of the family, the next generation is totally safe in many aspects of the societal life. Previously it was said that an educated mother will take care of the education of her children and thus the next generation gets the benefit of their mother's care. Subsequently the planners, out of their experience, found out that if proper education is given to a woman, she will take care of the health, hygiene, and nutrition of her children. So far the concentration and focus was on the children's betterment and improvement in the areas of health and education. But of late the planners are

eyeing on the welfare of the women, as a consequence of education. Apart from educating the woman, the government exercises, for capacity building and empowerment of even rural women through DWCRA and self-help movement, have started bearing results in different walks of life. One of the important and visible affects of the women's education is that of the reduced household size, i.e. the number of living children per woman has come down. For this though not totally, a majority of the credit should be given to the education received by women.

Specially as per 2001 Census, the entire country has recorded considerably low decennial growth rate. Special menton should be made of the achievement of Andhra Pradesh, which has recorded the lowest of 13.86 per cent population growth between 1991 and 2001 compared to 24.2 per cent growth rate in the previous decade. The growth rate for the entire country during the last decade was higher at 21.34 per cent with the total population touching 102.7 crores. Among the southern states, Karnataka recorded with 17.25 per cent, while Tamil Nadu registered 11.19 per cent as against Kerala's 9.42 per cent.

Another important indicator of development is the literacy rate, which might have indirectly contributed for the low population growth (Table 1). As per 2001 Census the literacy rate in Andhra Pradesh is 61.1 per cent as against 44.1 per cent in 1991. **"This is a strong and loud message that the government efforts at total literacy are yielding results"**. Interestingly Hyderabad stands first with a literacy rate of 79.0 per cent followed by West Godavari (74.0), Krishna (69.9) and Chittoor (67.5) while Mahabubnagar is the least (45.5). It would be of interest to study the relationship between the female literacy and the growth of the population in Andhra Pradesh over the last 100 years. This relationship, with considerable time gap (decade) is definitely going to mirror the cause and effect relationship between one time female literacy and consequently the number of children in (0 - 6) age group. The literacy levels of women can be indirectly influencing the number of children – at Mandal / District / State level. Hence various combinations are analysed to study the relation between these two variables

Veer	L	iteracy Grow	Population Decadal	
rear	Total	Male	Female	Growth
1901	4.63	8.54	0.61	-
1911	5.08	9.18	0.87	12.25
1921	6.29	10.88	1.62	0.28
1931	6.82	11.76	1.77	12.94
1941	10.98	16.80	4.99	12.71
1951	15.21	22.67	7.62	14.02
1961	21.19	30.19	12.03	15.65
1971	24.57	33.18	15.75	20.90
1981	35.66	46.83	24.16	23.10
1991	44.09	55.13	32.72	24.19
2001	61.11	70.85	51.17	13.86

Table I: Growth of Literacy in Andhra Pradesh over the last 100 years

The positive effect of female literacy on fertility, child mortality and consequently on small family norm has been authoritatively dwelled by *Mari Bhat*. However the threshold levels of female literacy rates beyond which rapid decline in female fertility status is still a debatable issue. On the other extreme *Visaria Visaria* and *James* ruled out the existence of such a threshold effect (Economic and Political Weekly, 28 September 2002).

In this paper no search for a threshold effect is being made, but an attempt has been made to find out whether such correlation exists between female literacy and female fertility and relate it with the geographical (under) development of that Mandal or district in the context of Andhra Pradesh with the help of the latest 2001 Census data. The female fertility during the last decade has been substituted by the available variable called "number of children in the age group of (0 - 6) during 2001". That means the number of living children existing by 2001 have a bearing on the total female fertility during the last decade (1991-2001).

Some interesting demographic indicators are observed from 2001 Census :

- Female literacy rate in Andhra Pradesh has gone up considerably from 32.7 (1991) to 51.17 (2001)
- Total Fertility Rate (TFR) since 1981 has declined from 4.00 to 2.25 (1991). TFR for rural women decreased from 4.2 (1981) to 2.32 in 1999 as against TFR for urban women decreased from 3.0 (1981) to 2.07 in 1991.
- 3. Decline in IMR is from 86 (1981) to 66 in 1999. In the rural areas it was 93 (1981) and 75 (1999). In the urban areas it is still lower at 52 (1981) to 37 (1999).
- 4. Focussed implementation of family welfare programmes as well as total literacy campaigns appear to have greater acceptance of small family norm specially by the poor people. While a reduction in IMR may contribute to a decline in population, it is a long-term beneficial effect on the couples in the reproductive age to embrace small family norm.

Need for the Study

In our country the population boom (which has crossed 100 crores) is always coming in the way of faster development. Though Health Departments of various State Governments are doing their best in reducing population, the population growth could not be brought under control, over the last five decades (exception being 1991-2001). In addition to the use of scalpel, the long lasting social indicator : "Female Literacy" can be alternatively used as a tool to reduce population effectively.

To show the importance and inter-linkage of female literacy with the population growth, an academic exercise has been attempted for Andhra Pradesh, by taking latest secondary data from Census 2001. The data is available at the Mandal (micro) level, which is the lowest Administrative Unit.

2.1. Slum Population

The slum level analysis is expected to throw light on the most disadvantaged and marginalised population of a town or a city. Though they are part of the town, they are denied of

many civic amenities that are enjoyed by the majority of the town population. Hence being in a town they are not the town dwellers. They might be still having a tenet of their original rural characteristics where from they have migrated. Hence their behaviour pattern is expected to be somewhat different from that of the urban areas in which they are living.

In Andhra Pradesh a maximum percentage of slum population to the total population at district level is seen in Hyderabad district (16.85 per cent), followed by Ranga Reddy (15.66 per cent). Among towns Chirala Municipality has the highest proportion of slum population (98.88 per cent) followed by Kothagudem Municipality with 92.92 per cent. The highest literacy among slum population is found in Mahabubnagar (77.77 per cent) and Nalgonda (75.74 per cent). Interestingly the highest female literacy among slum population is found in West Godavari and East Godavari to the extent of 69 per cent each.

Analysis and Results

The slum population has been taken up for detailed analysis. The two variables that are taken for correlation and regression analysis are female literacy rate and percentage of (0 - 6) population from 2001 Census at each town level in the state (Table 2). There are 77 towns with slums. The overall picture has shown the female literacy to be 53.8 per cent (with a standard deviation of 6.8 per cent). Similarly the average value of (0 - 6) population is observed to be 12.4 per cent with 1.7 per cent as the standard deviation.

Sub region	Female Literacy Rate	Child Population	Correlation	
Sub-region	Mean <u>+</u> SD Mean <u>+</u> SD		Coefficient (r)	
Telangana	53.8 <u>+</u> 6.9	13.0 <u>+</u> 1.5	- 0.476	
Coastal	56.6 <u>+</u> 6.2	11.6 <u>+</u> 0.7	- 0.431	
Rayalaseema	48.1 <u>+</u> 8.0	12.9 <u>+</u> 1.0	- 0.635	
State	53.8 <u>+</u> 6.8	12.4 <u>+</u> 1.7	-0.377	

 Table 2 : Female Literacy Rate and Child Population for three Sub-Regions in

 Andhra Pradesh

The correlation coefficient between these two variables is observed to be r = -(0.377) which is statistically significant at 1 per cent level. This very clearly shows that with increasing female literacy rate there is definitely a decline in the (0 - 6) population even among the slums of

Andhra Pradesh as per 2001 Census data. In order to find out the regional differentials the same data has been analysed according to the three sub-regions of the state.

A close look at the above table indicates higher female literacy in Coastal areas followed by Telangana area and the least is observed in Rayalaseema with higher variance. By looking at the average figures of (0 - 6) child population, the inverse relationship is very obviously seen with Coastal areas recording the lowest child population of 11.6 where the female literacy is the highest (56.6). In Telangana and Rayalaseema areas the average child population is almost the same, around 13 per cent. This phenomena indicates that the lowest female literacy in Rayalaseema has resulted in relatively higher percentage of (0 - 6) child population. However in Telangana region, higher female literacy does not appear to have an immediate effect on (0 - 6) child population in that area. This has also been indirectly indicated by a relatively lesser correlation coefficient, though it is statistically significant.

Some broad conclusions on the slum population (Census of India 2001, Andhra Pradesh, Series 29, 101 p) :

- 1. The percentage of slum population to the total population in the state is 6.8 per cent.
- 2. The overall average **sex ratio** to the state and the slum population is almost the same, around 978. Similarly in the (0 6) age group also, the sex ratio among slum population is almost the same as that of the state (964).
- 3. Surprisingly the average literacy rate in the slum areas of the state is 70.70 per cent whereas it is 61.11 per cent for the state as a whole. Specially the female literacy rate in slum areas is 62.26 per cent as against 51.17 per cent in the state (lbid, 104 p).

Thus by and large the two variables in the three sub-regions appear to have been inversely related, supported by a strong statistical significance. Hence during the last decade the efforts by the government through family planning and total literacy campaigns coupled with extension and education on small family norm (preventive aspect) appear to have borne fruits in the form of reduced child population in the age group of (0 - 6).

2.2. Rural – Urban Differentials

Another analysis has been attempted to find out the urban and rural differentials within the three sub-regions of the state. In general the correlation coefficient between female literacy and (0 - 6) child population is observed to be not only negative but also statistically significant in all the cases, with varying magnitude. The mean values of the female literacy rates in the urban areas of the three sub-regions are definitely on the higher side when compared to their rural counterparts (Table 3). The trend showed Coastal areas with highest female literacy (59.6 per cent) followed by Telangana (56.9 per cent) and Rayalaseema with the lowest (53.6). However in the rural areas while the Coastal areas took the lead, it is not Telangana but Rayalaseema occupied the second position with 37.7 per cent. When it comes to (0 - 6) child population the urban areas have recorded lower values with Coastal areas recording 11.4, while the two other regions have recorded around 12.5 per cent. Definitely the rural areas in the three sub-regions have recorded relatively higher values with Telangana in the lead with 14.3 per cent, which is the highest, followed by Rayalaseema (13.2 per cent) and Coastal (12.2 per cent).

Sub-Region		n	Female Literacy Rate	Child Population	r
Coastal	Urban	79	59.6 <u>+</u> 7.0	7.0 11.4 <u>+</u> 4.0	
	Rural	423	43.6 <u>+</u> 12.1	12.2 <u>+</u> 1.4	- 0.646
Telangana	Urban	71	56.9 <u>+</u> 8.5	12.6 <u>+</u> 1.8	- 0.597
	Rural	440	31.5 <u>+</u> 7.6	14.3 <u>+</u> 1.6	- 0.463
Rayalaseema	Urban	36	53.6 <u>+</u> 10.1	12.3 + 1.2	- 0.608
	Rural	233	37.7 <u>+</u> 9.2	13.2 <u>+</u> 1.8	- 0.625

 Table 3 :
 Rural – Urban differentials in Female Literacy Rate and Child Population in Andhra Pradesh

Thus the rural urban differentials have clearly shown that in the urban areas the female literacy rate is quite high resulting in lower child population. Whereas in the rural areas there is a need to improve the female literacy rate to an extent of around 16 per cent in Coastal and Rayalaseema areas and to an extent of 25 per cent in Telangana area to bridge the gap between rural and urban segments. Then only one can expect substantial reduction in the child population. Hence as a policy measure the government should make all out efforts to achieve total female literacy at the earliest so that by 2020 as envisaged in the plan document of Andhra Pradesh, one can achieve almost unity or less than unity annual growth rate.

2.3. Sub Region Differentials

Another analysis was attempted to further test the relationship between Female Literacy Rate (FLR) and Child Population (CP) and the correlation between them. This time the three sub-regions have been split into four quartiles each, with respect to the FLR variable. Here FLR is taken as an independent variable while CP is taken as a depending variable. The simple logic behind this approach is that by improving the levels of FLR the CP may be reduced. Further this inverse relationship is quantified in terms of negative correlation coefficient, which is statistically significant also. Table 4 gives under each sub-region the bottom 25 per cent Mandals as well as the top 25 per cent Mandals with respect to FLR variable. These two figures are compared with the average of each sub-region. Further for each quartile, the respective FLRs are correlated with their CPs to know the trend, magnitude and direction of their inter relationship.

Pagion	n	Female Literacy Rate	Child Population	Correlation (r)	
Region		Mean <u>+</u> SD	Mean <u>+</u> SD	Correlation (r)	
Coastal					
Bottom 25%	105	33.78 <u>+</u> 10.49	13.45 <u>+</u> 1.64	-0.572	
Overall 50%	423	43.60 <u>+</u> 12.1	12.2 <u>+</u> 1.4	-0.646	
Top 25%	105	53.49 <u>+</u> 9.98	11.38 <u>+</u> 1.0	-0.467	
Rayalaseema					
Bottom 25%	58	29.29 <u>+</u> 7.05	14.30 <u>+</u> 2.32	-0.857	
Overall 50%	233	37.70 <u>+</u> 9.2	13.2 <u>+</u> 1.8	-0.625	
Top 25%	58	46.03 <u>+</u> 8.76	12.38 <u>+</u> 0.99	-0.496	
Telangana					
Top 25%	110	39.5 <u>+</u> 6.5	13.6 <u>+</u> 1.6	-0.237	
Overall 50%	440	31.5 <u>+</u> 7.6	14.3 <u>+</u> 1.6	-0.463	
Bottom	110	23.9 <u>+</u> 5.3	15.2 <u>+</u> 1.9	-0.323	

 Table 4 : Percentile Differentials in Female Literacy Rate and Child Population in Andhra Pradesh

In the lower quartiles there is lower Female Literacy associated with high Child Population. In the higher quartiles there is higher Female Literacy associated with low Child Population.

Coastal Area

In the Coastal area, the bottom quartile has 105 Mandals. The mean FLR is 33.8 with a Standard Deviation (SD) of 10.5. The corresponding CP is very high at 13.45 with 1.64 as SD. The correlation between FLR and CP is (-0.572) which is highly significant. On the contrary in the top quartile the FLR is 53.5 with almost the same SD as that in the bottom quartile. But the CP is recorded to be the lowest at 11.38 and also the lowest SD of 1.0. Interestingly the correlation is (-0.467) which is lesser in magnitude than in the bottom quartile which is still statistically significant. A comparison with the average value (Median value) shows that as far as FLR is concerned the bottom quartile and the top quartile figures are at equal distance from the median (by 10 points) with lower SD values. But in the case of CP the bottom quartile value is much higher than the median value while the top quartile value is not that higher than the middle value. Thus the inference is very clear that in the bottom guartile (when compared to the median) the FLR value is on the lower side whereas the CP values are on the higher side, i.e. in the Mandals where the female literacy rates are lower there higher child population values are observed. In spite of the uniform implementation of government programmes on family planning and small family norm, it is evident from the data that where female literacy is low the receiptability, acceptability and adoption of family planning methods might not be that effective. Hence the child population is relatively on higher side. In the same way in the top quartile where the FLR is the highest, the obvious is observed, i.e. lower CP values. Hence even in developed coastal areas the quartile differentials indicate direction the government has to adopt : more intensive extension and education methods on family planning in those Mandals where already the female literacy rate is low in order to achieve uniform results in all the 423 Mandals.

Rayalaseema

In Rayalaseema the median value for FLR is 37.7, which is relatively lower than that of coastal area with CP value at 13.2. The correlation coefficient is observed to be almost equal to that of the coastal area (-0.625). However in the bottom quartile the FLR is as low as 29.3 with a very high value of CP (14.3) and this is evident from the higher correlation coefficient (-0.857). In the top quartile the average FLR is 46.0 with a relatively less CP (12.38). In a backward region like Rayalaseema with relatively lower FLR the bottom quartile has been observed to have the lowest FLR and subsequently higher CP.

Telangana

In Telangana region the median value of FLR is very low (with 31.5) coupled with the higher CP of 14.3 and the correlation is also lesser in magnitude. The bottom quartile has recorded the lowest FLR (23.9) and the higher CP (15.2).

The above analysis has clearly indicated that the Government's approach in tackling the family planning has not yielded uniform results among three sub-regions. In Telangana much more concentrated efforts are needed to increase the FLR to have long lasting results on small family norm. Equal emphasis should be laid on family planning programmes in Rayalaseema to increase FLR and subsequently reduce CP. Though on the face of it, the Coastal areas are fairly better these areas also need more attention than what they are given now. Increasing FLR simultaneously reinforced with Health Department's efforts will go a long way in reducing the CP of (0 - 6) age group.

So far the discussions were around the differentials in FLR between the three subregions. But within each sub-region again the bottom quartiles need special and focussed attention to improve FLR both in the curative as well as preventive aspects. Then only the CP can be brought under control and check. *Thus the planners, administrators, policy makers and medical and health department officials should evolve spatial interventions so that each Mandal receives a treatment that it deserves / demands. Hence at the State headquarters as well as at the district headquarters, separate strategic planning methods should be evolved to solve the problem of each Mandal for a permanent and long lasting solution.* To achieve this objective, there should be constant efforts in updating data and a strict Data Base Management. This will help to know immediately the deficiency / lacuna in programme implementation and the corrective measures can be adopted without loss of time.

2.4. Performance of Low FLR Values during 1991 – in 2001

Another analysis was also attempted to find out the performance levels of the females in improving their literacy rates between 1991-2001 and it's impact on restricting their family size (inferred from the low CP values) (Table 5). The difference in literacy rates between the two years is calculated with the respective CP value of 2001 for each Mandal. The correlation is observed to be not significant and also positive. Two interpretations are possible : (1) not significant relation indicates that irrespective of the change in female literacy rate, there is no

influence on CP, and (2) the positive relation can be interpreted as for every change in the literacy rate, there is a corresponding change in CP, though at a lower level. This conclusion leads to the fact that once if FLR is low they continue to be low even after decade and hence they have no control or impact over reduced CP. Hence the government should identify these Mandals and prepare special contingency and action plans for improving the literacy levels of females on an emergency basis so that they can also restrict their child population at least by next Census in 2011.

Table 5 : Gender Differentials and Child Population between 2001 - 1991

	R	ayalaseem	a	Coastal			
	Ν	Mean	SD	Ν	Mean	SD	
Child Population	58	14.38	2.17	52	13.1	1.66	
Female Literacy Rate*	58	1.83	0.28	52	1.81	0.37	

Correlation Coefficient (r) + 0.143 N.S. + 0.123 N.S.

* Differential in FLR between 2001-1991 in those Mandals with high gender differentials

As a further exercise and logical extension of the correlation analysis, regression equations are also fitted with the available data for CP (depending) and FLR (independent). The first degree equation is in the form of

CP = A + B (FLR)

The following three equations have shown the differentials in 1991 figures, 2001 figures, and differentials between 1991 and 2001.

12.29 = 14.47 – 0.0774 FLR	- 1991 figure
12.29 = 15.57 – 0.0754 FLR	- 2001 figure
12.29 = 12.60 – 0.0196 FLR	- 2001-1991

In absolute figures, there is inverse relationship but in change (2001-1991) there is no relation.

2.5. Marginalised and Oppressed Classes

Among the 23 districts in Andhra Pradesh there are pockets where SC and ST population are in considerably higher proportion. It is of interest to study the behaviour and relation pattern of the two important variables, i.e. FLR and CP in SC districts as well as in ST districts. Khammam and Adilabad districts are identified to have high ST population, while Guntur and Nellore have high SC population.

In ST area the following observations are made.

 FLR
 CP
 r

 31.88 ± 7.44
 14.59 ± 2.04
 -0.485

The regression equation is as follows :

CP = 18.84 - 0.13 FLR

The corresponding mean values for FLR and CP for the Telangana region are 31.5 (FLR) and 14.3 (CP) very favourably agree with the mean values observed for ST population. Hence it may be concluded that the average performance of Telangana districts is no better than that of the ST population within the Telangana area. This suggests an urgent need for appropriate interventions suitable to tribal areas whereby the tribal women's literacy rates are increased substantially to reduce the family size gradually.

SC Population

In the areas where SC population is concentrated, the following values are observed.

FLR	CP	r
44.2 <u>+</u> 8.7	11.96 <u>+</u> 1.27	-0.812

These figures favourably compare with the median values of the Coastal figures mentioned earlier. As the population base is in the Coastal area, the predominance of SC population has not basically changed either in the FLR levels or CP levels. When compared to ST population, SC population have become a part of the main stream and they are also supported by good number of government schemes for their development. Notwithstanding this fact, SCs need further special attention as far as FLR is concerned and their literacy standards should touch the top values. The following regression equation gives an idea of the relationship between FLR and CP among SC population.

This equation has built in high inverse correlation between these two variables.

3.0 What the Government Plans to achieve during 10th Five Year Plan

- Reduction of poverty ratio to 20 per cent by 2007 and to 10 per cent by 2012
- Gainful employment to the addition to the labour force over the Tenth Plan Period
- Universal access to primary education by 2007
- Reduction in the decadal rate of population growth between 2001 and 2011 to 16.2 per cent
- Increase in literacy to 72 per cent by 2007 and to 80 per cent by 2012
- Reduction in infant mortality rate (IMR) to 45 per 1000 live births by 2007 and to 28 by 2012
- Reduction of maternal mortality ratio (MMR) to 20 per 1000 live births by 2007 and to 10 by 2012.
- Increase in forest and tree cover to 25 per cent by 2007 and 33 per cent by 2012
- All villages to have access to potable drinking water by 2012
- Cleaning of all major polluted rivers by 2007 and other notified stretches by 2012

In order to emphasise the importance of ensuring balanced development for all states, the Tenth Plan should include a State-wise breakdown of the broad developmental targets, including targets for growth rates and social development. These State-specific targets should take into account the potentialities and constraints present in each State and the scope for improvement in performance given these constraints. This will require careful consideration of the sectoral pattern of growth and its regional dispersion. It will also focus attention on the nature of reforms that will have to be implemented at the State level to achieve the growth targets set for the States.

3.1 Role of Government

No doubt the primary responsibility, to reduce the population growth lies with Government. There is a need for convergence of actions at all levels of Government and public sector, and with NGOs. Effective implementation of the programmes will partly satisfy the obligation of the Government. The State is also under obligation to reduce the population and thereby poverty and increase the accessibility to available resources, to the community as a

whole. The resource constraints, lack of political will should be overcome. Strict enforcement through efficient mechanism of Family Planning / Family Welfare by all citizens of the country uniformly through National Legislation, should be adhered to.

3.2 Role of Community and Civic Society

The role of Government can be at best a facilitator. There are several other factors that should work efficiently, at the same time to avoid relapse. A few important conditions are (1) political will, (2) enough of resource allocation, (3) effective implementation, (4) social mobilisation, and (5) decentralisation, to suit the local demands. Thus the community itself can lead the programmes with better accountability, transparency and participation.

3.3 Role of NGOs and International Organisations

NGOs should be involved at all stages of the programme, viz. DIME (Designing, Implementation, Monitoring, Evaluation) for better results. Monitoring mechanism should be developed in order to fulfil the obligation by the community, to limit their family size. NGOs can organise innovative programmes (suitable to the local needs / demands). NGOs can also play complimentary role, in helping Government to implement Family Planning and Literacy programmes. NGOs can involve / improve higher levels of participation of the beneficiaries in decision making and benefit - sharing in a widely decentralised process. NGOs can, if need be must, play a more crucial role in monitoring the programmes and delivery of the services.

3.4 Sustainability of the efforts

It is very important to have sustainability as an important element in reducing population growth rate. Long-term plans are to be carefully drawn and ensured of their regular implementation. Not only the latest techniques can be made use of, but at the same time, cost effectiveness should not be lost track of.

4. Conclusions & Recommendations

In these Mandals where the population has recorded relatively higher values may be taken up on priority basis and the regional backwardness can be corrected by reducing the population growth and bringing it, to the district level / regional level figure. In addition to adopting family planning methods, through concerted efforts female literacy should be enhanced – which will have a bearing on low child population, at least by next decade.

Broadly, as an example the Coastal areas, which are fairly developed have high female literacy and consequently low child population. The pockets of low development are identified with low female literacy (and high child population). The regional differences can also be corrected, over time, by adopting appropriate / suitable corrective measures (in family planning).

What should be done to achieve total female literacy in order to combat further population explosion ?

This analysis suggests as a policy measure the need for differential approach by government through literacy programmes as well as health care programmes to attack simultaneously the twin problems of female illiteracy and family planning. Ultimately the focus is on to achieve almost zero growth rate in the population (where death rate would be equal to that of birth rate). The **spatial approach** with varying concentrations on female literacy will only help to achieve alround development of female literacy to the expected target levels over a period of time. Apart from family planning methods, if women are made to understand the long lasting effect of having a small family through motivation and convincing, the results can be achieved on a sustainable basis.

To prove this point further large scale studies are needed to be taken up – with the help of Surveys and secondary data analysis over larger geographical areas (more number of States) and more number of years. By correcting one parameter, if long lasting results can be achieved it would be advisable to correct / concentrate on that aspect and correct regional imbalances.

Annexure – I

Details of Parameters Selected for Analysis

1. Demographic factors (6)

Total population, Male, Female, Sex Ratio, SC Population, ST Population

2. Literacy (4)

Total Literates, Male Literates, Female Literates, Gender Differential

3. Work Force (5)

Total Workers, Male Workers, Female Workers, Gender Differentials, Agricultural Labour

4. Land Utilisation (3)

Net Area Sown, Net Area Irrigated, Forest Cover

5. Per Capita availability of Net Area Sown (1)

6. Land Distribution (4)

Share of Marginal Farmers, Share of Small Farmers, Share of SCs and STs having land in these categories.

7. School Enrolment Particulars (3)

Enrolment of girls in Primary, Upper Primary and High School levels

8. Infrastructure availability (8)

Number of villages with Primary, Upper Primary, High Schools, Post Offices, on Main Roads, with Bus Stop. With Fair Price Shop, with Medical Facility.

Total 34 parameters

Annexure-II

Curve Fit - Telengana Rural Top 25%

Dependent		Mth	Rsq	d.f.	F	Sigf	bO	b1
CHILD POPULATION	(CP)	LIN	.056	108	6.44	.013 2	15.9007	0583
CHILD POPULATION	(CP)	LOG	.072	108	8.38		23.4762	-2.6959



Curve Fit - Telengana Rural Bottom 25%

Independent: FEMALE LITERACY RATE

Dependent	Mth	Rsq	d.f.	F	Sigf	bO	b1
CHILD POPULATION	LIN	.104	108	12.59	.001	17.9873	1159
CHILD POPULATION	LOG	.045	108	5.08	.026	19.6418	-1.4093

CP



Curve Fit - Rayalaseema Rural Top 25%

Dependent	Mth	Rsq	d.f.	F	Sigf	b0	b1
CHILD POPULATION	LIN	.247	56	18.32	.000 1	4.9833	0564
CHILD POPULATION	LOG	.256	56	19.23	.000 2	2.9039	-2.7583



Curve Fit - Rayalaseema Rural Bottom 25%

Dependent	Mth	Rsq	d.1	E. F	Sigf	b0	b1
CHILD POPULATION	LIN	.734	56	154.34	.000	22.5545	2818
CHILD POPULATION	LOG	.758	56	174.98		38.7419	-7.3110



Curve Fit - Coastal Rural Top 25%

Dependent	Mth	Rsq	d.f.	F	Sigf	b0	b1
CHILD POPULATION	LIN	.218	103	28.66	.000	13.9719	0484
CHILD POPULATION	LOG	.241	103	32.74		21.7774	-2.6243



Curve Fit - Coastal Rural Bottom 25%

Independent: FEMALE LITERACY RATE

Dependent	Mth	Rsq	d.f.	F	Sigf	bO	b1
CHILD POPULATION	LIN	.327	103	50.11	.000	16.4961	0898
CHILD POPULATION	LOG	.304	103	45.01		22.8652	-2.7112



Curve Fit - Rayalaseema Rural

Independent:	FEMALE	LITERACY	RATE					
Dependent		Mth	Rsq	d.f.	F	Sigf	b0	b1
CHILD POPUL CHILD POPUL	ATION ATION	LIN LOG	.391 .473	231 231	148.17 207.57	.000	17.9488 30.7115	1246 -4.8526



Curve Fit - Rayalaseema Urban

Independent:	FEMALE	LITERACY	RATE					
Dependent		Mth	Rsq	d.f.	F	Sigf	b0	b1
CHILD POPUI CHILD POPUI	ATION ATION	LIN LOG	.370 .332	34 34	19.97 16.87	.000	16.2385 26.0209	0740 -3.4691



Curve Fit - Telangana Rural

Independent:	FEMALE	LITERACY	RATE					
Dependent		Mth	Rsq	d.f.	F	Sigf	b0	b1
CHILD POPU CHILD POPU	LATION LATION	LIN LOG	.214 .194	438 438	119.53 105.54	.000	17.4556 23.5409	1002 -2.7043



Curve Fit - Telangana Urban

Independent:	FEMALE	LITERACY	RATE					
Dependent		Mth	Rsq	d.f.	F	Sigf	bO	b1
CHILD POPUI CHILD POPUI	LATION LATION	LIN LOG	.356 .376	68 68	37.52 41.06	.000	19.7532 37.3487	1252 -6.1366

CP 22 20 • 18 16 **י** 14 12 Observed 10 Linear 8 Logarithmic 70 20 30 40 50 60 . 80

Curve Fit - Coastal Rural

Dependent	Mth	Rsq	d.f.	F	Sigf	b0	b1
CHILD POPULATION	LIN	.417	421	301.46	.000	15.5777	0754
CHILD POPULATION	LOG	.435	421	324.13		23.7187	-3.0625



Curve Fit - Coastal Urban

Independent: FEMALE LITERACY RATE

Dependent	Mth	Rsq	d.f.	F	Sigf	b0	b1
CHILD POPULATION	LIN	.174	82	17.29	.000	21.7729	1761
CHILD POPULATION	LOG	.181	82	18.18		47.8223	-8.9662

