



Status and determinants of human Development: a study of Nellore district

Dr. K. Maheswara Rao

Academic Consultant, Department of Economics, VSUPG Centre, Kavali, Nellore Dt.
A.P

The term "Human Development has come to be accepted in the development economics as an expansion of human capabilities, a widening of choices, an enhancement of freedoms and fulfillment of Human rights. Rising incomes and expanding outputs, in the human development framework, are seen as the means and not the ends of development. Higher incomes do help many people realize valuable ends and fulfill many aspirations. Income expansion matters, especially to the poor. It enables them to gain access to many goods and services, and potentially, to an improved quality of life. But higher incomes alone may not always guarantee the aspirations that people cherish and value. For example, freedom, power to make and take decisions, levels of environmental pollution, safety, Crime and free from violence, or the quality of education and healthcare. All these may not be associated with levels of income in any predictable manner. Therefore, the focus of policy cannot be based merely on the generation of more and more income. How additional income is used, and the degree to which it improves the quality of people's lives, must be given equal weight. Indeed, defining peoples well-being as the end of development and treating economic growth as a means have been central messages of the annual Human Development Reports being published since 1990. On the lines of

UNDP many organizations and individual researchers have undertaken empirical works relating to human development at international, national, state and regional levels. In this paper an attempt was made to analyse the levels of human development in Nellore district of Andhra Pradesh.

Methodology

The study is based on primary data collected from the sample of 300 households' selected using multi-stage random sampling technique in different villages of Nellore district of Andhra Pradesh. There are three Revenue divisions viz., Gudur Kavali and Nellore in Nellore District. From each Revenue division four mandals were selected using Simple Random Sampling without Replacement (SRSWOR) making the total to twelve Mandals from all the Three Revenue divisions of Nellore District. From each Mandal two villages were selected again using SRSWOR. Thirteen households were selected from the first village and 12 households were selected from the second village. Thus the total sample size was 25 households X 12 mandals = 300 households. Specially designed pre-tested interview schedules were used to elicit information from the sample households. The collected data were analysed using two-way table, human development indices using UNDP methodology. An attempt was also made to analyze the determinants of human



development using multiple regression analysis.

In order to compute the dimension index the following formula was adopted.

$$\text{Dimension Index} = \frac{\text{Actual value} - \text{minimum value}}{\text{Maximum value} - \text{minimum value}}$$

The goal posts for the present study were fixed as follows:

Goal posts for calculating the HDI

Indicator	Maximum value	Minimum value
Life expectancy at birth (years)	73	40
Adult literacy rate (%)	100	0
Combined gross enrolment ratio (%)	100	0
Per capita income (in Rs.)	48,000	11,000

In calculating the education index, the adult literacy was given 2/3 weight and combined enrollment ratio at primary, secondary and tertiary level was given 1/3 weight.

Determinants of Human Development:

The determinants of human development were analyzed using multiple regression analysis model. The model is

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + u$$

Here, Y = Human development index at the district level.

- X₁ = Caste
- X₂ = Education index
- X₃ = Per capita income
- X₄ = Proportion of people above 60

- X₅ = Household Type
- X₆ = Drinking water facility and U = random disturbance term

The variables take the following type of data:

X₁ = **Caste Group variable**

- ST = 1
- SC = 2
- BC = 3
- OC = 4

X₂ = **Education in terms of index values**

X₃ = **Per capita income in Thousand Rupees**

X₄ = **Proportion of people above 60 years in terms of pure numbers**

X₅ = **House hold type takes tree values according to quality of housing**



Table – 1: Distribution of all Households according to the level of Annual Household Income

S. No	Name of the Mandal	Income levels of the Households						Total
		Below Rs.20,000	Rs.20,000 to Rs.40,000	Rs.40,000 to Rs.60,000	Rs.60,000 to Rs.80,000	Rs.80,000 to Rs.1,00,000	Above Rs.1,00,000	
1	D.V.Satram	7	9	6	2		1	25
2	Guduru	7	5	6	2	2	3	25
3	Venkatagiri		12	8	2		3	25
4	Vakadu	14	6	2	1		2	25
5	Jaladanki	4	13	2		2	4	25
6	Udayagiri	7	14	3	1			25
7	Marripadu		9	9	3	2	2	25
8	Alluru	13	5			1	6	25
9	Rapur	17	7			1		25
10	Podalakuru	12	10	1	2			25
11	A.S.Peta	4	8	7	5	1		25
12	Nellore		3	6	8	5	3	25
	Total	85	101	50	26	14	24	300
	%	28.33	33.67	16.67	8.67	4.67	8.00	100.00

Source: Field Survey

Thus more than three-fourth of (236 or 78.7 per cent of households) were found to earning income below the level of Rs.60,000/- per annum. Only 24 households (8.00 per cent) were getting income above the level of Rs. 1,00,000/- per annum.

The disparities in the spatial and caste group wise distribution of income would be very clear when the average

levels of incomes in different mandals and among different caste groups were analyzed. The relevant information is provided in Table - 2. As could be seen from the table the average annual household income among different mandals of Nellore district varied between a low of Rs.21,625 in Rapur mandal to a high of Rs 69,576 in Jaladanki mandal. Rapur is relatively a dry mandal where there are very few



opportunities for earning income from business and agricultural activities. Hence, the average income was the lowest in the mandal. Jaladanki, though a non-delta mandal, is very close to one of the fast growing urban area viz.,

Kavali. It is also relatively more developed in terms of agriculture due to canal irrigation tjlinks to flow of irrigation water through Kavali canal from Somasila project.

Table – 2 : Distribution of Average Household Income of Different Caste-Groups in the Sample Mandals of Nellore District

S. No	Name of the Mandal	OC average Household Income	BC average Household Income	SC average Household Income	ST average Household Income	Mandal Average
1	D.V.Satram	66000	26833	44857	11000	37173
2	Guduru	49200	51800	37142	13000	37786
3	Venkatagiri	35333	56000	--	--	45667
4	Vakadu	52333	--	22018	12000	28784
5	Jaladanki	193400	37538	33700	13667	69576
6	Udayagiri	28000	28300	15000	19000	22575
7	Marripadu	69727	32000	--	30000	43909
8	Alluru	18000	74090	31692	--	41260
9	Rapur	41667	17166	15000	12667	21625
10	Podalakuru	32675	18846	--	--	25761
11	A.S.Peta	37562	42400	75000	--	51654
12	Nellore	82625	60833	75000	48667	66781
Caste-Group average		58876	40528	38823	20000	

Note: The respective caste group households were not found in the sample

Source: Field Survey

Hence the average household income is the highest in Jaladanki mandal even surpassing the district capital viz. Nellore. Households in most of the mandals had annual income ranging between Rs.37, 000/- and Rs.52, 000/-. Thus regional disparities are rampant even within a district.

The analysis of variance (ANOVA) carried out to test the significance of difference in the average incomes of households in different mandals, however, indicated that the differences were not statistically significant (Table - 3).



Table-3: ANOVA for Average Income of Households in different Mandals of Nellore District

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	10194569610	11	926779055.5	0.88001281	0.569213	2.151197
Within Groups	29487995226	28	1053142687			
Total	39682564836	39				

Source: Field Survey

The calculated 'F'-value (0.880) was less than the F-critical value of 2.1512 at 5 per cent probability level. It means that the apparent differences in the average incomes of households in different mandals might be due to fluctuations of sampling.

The disparities in average income levels are also observed among different social groups viz., OC, BC, SC and ST. The average income of OC household was Rs. 58, 876 that was nearly three times higher than that of a ST household. The average household income of a BC household was Rs. 40,528 that was more than two times higher than that of a ST household. The average income of a SC

household was Rs. 38,823 that was nearly two times higher than that of a ST household. As could be seen from the table, the average income of a ST household was realized at Rs. 20,000 per annum.

The analysis of variance carried out to test the significance difference in the average incomes of different caste-group households also indicated that the found differences were not real and statistically significant. As could be observed from Table - 4, the calculated F-value (2.7489) was less than the critical F-value (2.866) at 5 percent level of significance.

Table - 4: ANOVA for Average Income of Households among different Caste Groups

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	7396216290	3	2465405430	2.748982	0.056899	2.866265
Within Groups	32286348546	36	896843015.2			
Total	39682564836	39				

Source: Field Survey



However, the p-value, the level at which the null hypothesis (that there is no significant difference in the average incomes of different caste-group households) becomes significant was very close (0.057) to 0.05 or 5 per cent level. It means that there exist real differences among different caste-groups in the average incomes when compared to that among different mandals in Nellore district even though both are not statistically significant. It also indicates that the differences in the income levels of different caste groups households were potentially significant and that suitable measures needed to be taken to control the differences in the income levels of different caste group households.

Distribution of Individuals According to levels of education

Another important dimension of human development is literacy or educational levels. An attempt is made here to analyse the distribution of sample individuals in different mandals of Nellore district according to level of education. For the purpose of analysis, the levels of education were divided into four categories viz, primary education covering standards one to five, secondary education covering education from VI to X, 10+2 and higher education compassing graduation and post-graduation.

Table – 5 : Distribution of Individuals in different Mandals of Nellore District according to the level of Education

S. No	Name of the Mandal	Primary	Secondary	10+2	Higher	Total
1	D.V.Satram	25	24	2	5	55
2	Guduru	30	34	6	15	85
3	Venkatagiri	16	25	8	17	66
4	Vakadu	13	14	10	9	46
5	Jaladanki	33	31	5	5	74
6	Udayagiri	42	37	10	11	102
7	Marripadu	15	36	13	6	70
8	Alluru	27	16	7	20	70
9	Rapur	10	28	10	6	54
10	Podalakuru	22	19	12	9	61
11	A.S.Peta	23	22	3	4	52
12	Nellore	33	32	19	18	102
Total		289	318	105	125	837
Percentage		34.59	37.99	12.56	14.92	100

Source: Field Survey



As could be seen from Table-5, out of 837 sample individuals, 289 individuals or 34.53 per cent had only primary education. About 318 individuals accounting for about 38 per cent studied up to X class. The individuals who studied up to +2 (intermediate) constituted about 12.56 per cent. Another 125 individuals or 14.92 per cent had higher education. In short, more than one-third of total sample individuals in the district had only primary education and they together with persons who had secondary education accounted for more than three-fourths of total sample individuals. Thus intermediary and higher education still had not reached many individual in the district. An analysis higher education in different mandals indicated that urban mandals like Guduru, Venkatagiri, Allure and Nellore had more number of

individuals with higher education. Similarly, there were variations in educational levels among different caste group individuals particularly in higher education Nellore district.

Human Development Indices

The Human development index is a composite index of human development encompassing literacy and enrollment in educational institutions, life expectancy and income levels. Each of these three dimensions gets one-third weight in human development. In the present study, the Human development indices were calculated using the above methodology as adopted by the UNDP in the calculation of human development indices at the international level. The Mandal wise picture of human development in Nellore district is presented in Table-6.

Table – 6 : Mandal-wise Human Development indicators of Nellore District

S. No	Name of the Mandal	PCI Index	Edu. Index	Life. Ex. Index	HDI	Ranks
1	D.V.Satram	-0.2598	0.5886	0.727	0.3520	7
2	Guduru	-0.2971	0.7146	0.727	0.3815	4
3	Venkatagiri	-0.0814	0.6574	0.727	0.4343	3
4	Vakadu	-0.5237	0.5745	0.727	0.2593	11
5	Jaladanki	-0.1952	0.7918	0.727	0.4412	2
6	Udayagiri	-0.6040	0.8089	0.727	0.3106	9
7	Marripadu	-0.1741	0.5664	0.727	0.3731	5
8	Alluru	-0.4206	0.6875	0.727	0.3313	8
9	Rapur	-0.7236	0.7270	0.727	0.2435	12
10	Podalakuru	-0.4883	0.6668	0.727	0.3018	10
11	A.S.Peta	-0.2136	0.5994	0.727	0.3709	6
12	Nellore	-0.0658	0.8780	0.727	0.5569	1
District Average		-0.3264	0.6786	0.727	0.3597	--

Source: Field Survey

It could be seen from the table that Nellore mandal of Nellore district occupied the first rank with HDI value of

0.5369. Jaladanki mandal in Kavali Revenue Division scored the second rank with HDI value of 0.4412. Similarly



Venkatagiri mandal of Gudur revenue division occupied the third rank in the district. Thus it could be seen from the table that one mandal in each of the three revenue division occupied the first three ranks. On the other hand, in- each of the three revenue divisions, one mandal occupied the last three ranks. For instance, the Rapur mandal of the Nellore revenue division occupied the 12th rank. Similarly, the Vakadu mandal

of Gudur revenue division occupied the 11th rank and Udayagiri mandal of Kavali revenue division could get 9th rank.

Thus gross disparities were found in Human Development even within each revenue division. As Simon Kuznets pointed out, this was the essential feature of developing economies. Tracks of high human development and low human development are found within each its each revenue division.

Table – 7 : Caste-wise Human Development indicators of Nellore District

S. No	Caste	PCI Index	Edu. Index	Life. Ex. Index	HDI	Ranks
1	OC	0.2820	0.7080	0.727	0.4564	1
2	BC	-0.2822	0.7121	0.727	0.3856	2
3	SC	-0.5053	0.6419	0.727	0.2879	3
4	ST	-0.8389	0.5006	0.727	0.1296	4
District Average		-0.3264	0.6786	0.727	0.3597	

Source: Field Survey

As could be seen from the table, out of the four caste group households, OC households seemed to have obtained positive value for per capita index at 0.2820 and obtained the first rank even in human development. The BC households though obtained higher score in educational attainments (0.7121) as compared to OCs (0.7080), they could get only second rank in human development mainly due to their inability to earn higher IPSBi of income. The SC households with an income index score of -0.5053 and education index score of 0.6419, obtained HDI value of 0.2879 to be adjudged to occupy the third rank in the district. The ST households, as expected were at the bottom layer of the

human development hierarchy with a HDI score of only 0.1296. Relatively speaking, compared to ST households, OC households obtained four times higher score and SC households more than two times higher scores in human development in the district.

Perhaps the main reason for such a wide disparity in human development among different caste groups might be due to disparities in income levels. The disparities in educational attainments though present were not such glaring. How much differences in HDI were attributed to each of the determinants of human development could not be understood from the present analysis.



Hence, an attempt was made to analyse the factors determining the levels of human development in terms of multiple regression analysis fitted for households in different mandals.

Comparison of Human Development at district, State and National levels

The present study covers both rural and urban areas of Nellore District. Since the size of the urban sample was very less, no attempt was made to analyse the human development separately for urban areas. Hence, rural and urban combined analysis was carried out in the present study. A comparative analysis of human development index at district level, state level and national level (using secondary data) is presented in Table-8.

It could be seen from the table that the HDI index at the national level

averaged at 0.472. The corresponding index value for Andhra Pradesh was 0.416. These values were based on Planning Commission study on Human Development in 2001 at national level. The HDI value based on primary data in Nellore district of Andhra Pradesh averaged at 0.3597 or 0.360. The HDI value of comparable magnitude was found to certain states like Bihar (0.3880).

Thirdly, every attempt was made to elicit accurate income data from the households through checking and cross checking. In spite of this some amount of under reporting of income data might be possible. This might be another reason for low values of HDI in Nellore District as compared to at National level and State levels.

Table – 8 : Human Development index for Different States in India

S.No	Different States of India	2001 HDI Value
1	Andhra Pradesh	0.416
2	Assam	0.386
3	Bihar	0.367
4	Gujarat	0.479
5	Haryana	0.509
6	Karnataka	0.478
7	Kerala	0.638
8	Madhya Pradesh	0.394
9	Maharashtra	0.523
10	Orissa	0.404
11	Punjab	0.537
12	Rajasthan	0.424
13	Tamil Nadu	0.531
14	Uttar Pradesh	0.388
15	West Bengal	0.472
	All India	0.472

Source: Planning Commission (2002), Human Development Report: 2001, March.



Fourthly, due to problems in estimating life expectancy index at district level and also due to lack of appropriate proxy variable, the secondary information provided by the district Medical and Health Department was taken up for the study. As a result true life expectancy index could not be provided.

Determinants of Human Development in Nellore District

As noted already, an attempt was also made to analyse the determinants of human development in Nellore district using multiple regression analysis as defined already. The district level analysis provides interesting findings. Except three variables viz., proportion of people above 60 years, residential quality variable and water quality indicator variable, all other variables were statistically significant at five percent probability level.

Table – 9 : Determinants of Human Development: Nellore District

<i>Variable</i>	<i>Coefficients</i>	<i>Standard</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower</i>	
<i>Upper</i>		<i>Error</i>			<i>95%</i>	<i>95%</i>
Intercept	-0.1232	0.0337802	-3.6458	0.00032	-0.18964	-0.05667
Caste	0.0318	0.0070388	4.5164	9.1E-06	0.01794	0.045643
Education indices	0.3647	0.0251157	14.5200	2.3E-36	0.31525	0.414109
PCI in Rs.1000	0.0136	0.0007044	19.2591	5.6E-54	0.01218	0.014951
Proportion of people above 60	-0.0001	0.0005513	-0.2138	0.83087	-0.0012	0.000967
Household type	0.0134	0.0068581	1.9470	0.05249	-0.00014	0.02685
Water facility	-0.0042	0.0091595	-0.4638	0.64315	-0.02227	0.013779
<i>Regression Statistics</i>						
Multiple R	0.8813					
R.Square	0.7767					
Adjusted R Square	0.7721					
Standard Error	0.099					
Observations	300					
<i>ANOVA</i>						
		<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	
<i>Significance F</i>						
Regression	6	9.9839437	1.663990625	169.812	2.8E-92	
Residual	293	2.8711079	0.009799003			
Total	299	12.855052				

Source: Computed for the Field Data

As could be observed from Per capita income turned out to be the most significant Variable exerting positive effect on Human development in the district. The calculated t test statistic value was at very high level of 19.25 that was far higher than the critical level of 2.57 at one percent probability level. An increase of thousand rupees in per capita income has increased human

development index by 0.0136 units. The educational index representing adult literacy ratio and combined primary, secondary and territory enrollment ratio had no less significant effect on human development in the district. As could be seen from the table, a rise of educational index by one unit pushed up the human development index by 0.365 units. This variable was also statistically significant



as the calculated 't' test statistic value (14.51) was higher than the theoretical or table value (2.57) corresponding to large samples (2.58) at one per cent probability level. Caste factor also seemed to have exerted significant influence on human development in Nellore district. The increase in caste factor by one unit made the human development index to surge by 0.0318 units. Since the computed 't' value of this factor viz., 4.516 was greater than 2.58, it was inferred that the variable was significant at one percent probability level. Similarly, the quality of residential house also seemed to have influenced human development to some extent. The increase in the residential house quality by one unit increased human development index by 0.0134 units. This factor was also statistically significant. The other two factors viz., proportion of people above 60 years and drinking water quality indicator did not have statistically significant effects on human development in the district and more over they assumed negative signs.

The co-efficient of determination that provides information on the explanatory power of the variables included in the regression model was 0.78. It means 78 per cent of variation in the dependent variable was explained by the independent variables included in the model. The R^2 was also statistically significant as could be understood from the computed 'F' test statistic of 169.8 for 6, 293 degrees of freedom at one per cent probability level of Significance. This value was much above the theoretical or critical or table value at the corresponding degrees of freedom and significant level. Thus the regression model provided good fit to the data at the district level as well.

Concluding Observations

In this paper an attempt was made to analyze the level and determinants of human development. Human development was analyzed in terms of three important indicators viz., income levels, educational levels and life expectancy at birth. The analysis revealed that there were inter-mandal disparities in human development among the 12 sample mandals in Nellore district. More than that, there were also inter- caste group differences in human development among SCs, STs, BCsand OCs. The analysis of determinants of human development in terms of multiple regression analysis clearly indicated that income, educational levels and caste were the principal determinants of human development in Nellore district.

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