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**Articles**

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# Determinants of Marketed Surplus of Food Crops – A Village Level Study in the North 24 Parganas District of West Bengal

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*The aim of this paper is to investigate how different socio economic factors affect market participation and marketed surplus of food crops in some selected villages of North 24 Parganas district of West Bengal in terms of a multiple regression model and to suggest different means of increasing the marketed surplus of food crops, which may enlighten the policy makers in fine-tuning their designs and applications. A systematic, multistage stratified sampling design was adopted to conduct a survey and responses of 100 farming households were documented in terms of a pre-tested structured questionnaire designed for the purpose. The study shows that the marketed surplus of food crops by farming households in the area of study increase with the increase in education of household head, perception of farmers regarding lagged market price of the product, landholding size and access to credit; whereas it falls with the increase in household size and distance from the market. All the results are statistically significant. The 't-test' is also conducted to investigate significant difference in mean value for marketed surplus of food crops between farmers when they are divided into two groups based upon different categories defined by the explanatory variables considered in this study.*

**Keywords:** *Marketed surplus, Food crops, Survey, Multiple regression, T-test*

## I. INTRODUCTION

### Backdrop

Agriculture is the lifeline of the Indian economy which keeps the economy going and growing. Increase in marketed surplus of food crops is essential to meet the constant challenge of food and nutritional security of the burgeoning population of the nation over time, control of food prices led inflation and to increase the foreign exchange earnings from export. Moreover, increase in purchasing power of the farmers from the sale of agricultural produces is conducive to widening the home market for industrial products and it helps in reducing the rural-urban divide in the distribution of income and wealth and migration of people from the rural to the urban sector.

Marketed surplus is defined as the portion of production that actually enters the market irrespective of the farmers' requirements for family consumption, farm

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requirements, social and religious payments. It also includes the distress sales. Thus, the marketed surplus may be more, less or equal to the marketable surplus of food crops in any year (Acharya & Negi, 2012). The small and marginal farmers have very less retention capacity of what they produce and usually sell a greater proportion of their output in the market. Sometimes, due to an urgent need for cash, they are forced to engage in distress sale and at that time their marketed surplus is more than the marketable surplus. Such farmers generally buy the produce from the market in a later period to meet their requirements. Marketed surplus is less than the marketable surplus when the farmers, especially larger ones with better retention capacity, hoard some of the marketable surpluses in anticipation of fetching higher prices in the future.

**Motivation**

Agriculture remains at the heart of the rural livelihoods even though the agrarian economy of the nation has changed in many dimensions since independence. The shift from subsistence farming to commercial farming and diversification of export basket of agricultural products are some key aspects of the transformation of Indian agriculture in recent times that had a critical impact on rural livelihoods. The proportion of agricultural production that is marketed by farmers has increased significantly from about 30 per cent during the early 1950s to more than 70 per cent in recent times (Sharma & Wardhan, 2017). In this context, the marketed surplus is proportionately higher in the case of commercial crops than subsistence crops.

In order to maintain the balance between demand for and supply of food grains with the rapid increases in demand due to higher growth of population, urbanization, industrialization and overall economic development, accurate knowledge on marketed and marketable surplus is essential in the process of proper planning for the procurement, distribution, export and import of agricultural products (Malik & Singh, 1993). In this regard it is very important to analyze the factors that affect the growth of marketed surplus of agricultural produce for policy design of the government.

**Review of Literature**

Different studies have been conducted to identify the determinants of market participation and intensity of marketed surplus of agricultural produce by the farmers at different parts of the world. Tura, Goshu & Demisie (2016) studied the market options available to the teff farmers of Bacho and Dawo districts of Oromia state of Ethiopia and showed in terms of Double Hurdle model that market participation of smallholder farmers are significantly affected by access to credit, perception of farmers on lagged market price of teff, size of the family, agro-ecology, farm size and ownership of transport equipment. Another study was made by Amre Tesfaw (2013) in the upper watershed of the Blue Nile in North-Western Ethiopia for the pepper farmers and in

terms of Heckman Two stage econometric model he showed that market participation of farmers and the amount of pepper sold in the market were significantly affected by the age and educational qualification of the household head, distance from the market centre, number of oxen owned by the farmers and non-farm income of the farmers. Kraybill, Bashaasha & Betz (2012), in terms of multiple regression models have shown that production and marketed surplus of food crops in Uganda are positively affected by improved seeds, agricultural assets and technological know-how of the farmer and the availability of credit. The study of Alam & Afruz (2002) has shown that the marketed surplus of some leading crops like different varieties of rice, wheat, potato mustard and lentil in Bangladesh is positively affected by the size of land holdings of farmers as well as the market price of those crops. In the Indian context, Dharam Narain (1961) found that marketed surplus as a proportion of the value of agricultural produce declines up to 10-15 acres size of land holdings, after which it shows a steady increase. According to Mathur & Ezekiel (1961), in poor nations like India, farmers sell that amount of output which gives them the amount of money they need to satisfy their given cash needs and retain the balance of output for their self-consumption. With the rise in the price of food grains, they sell a smaller quantity of food grains to get that fixed cash needs and vice versa. Krishna (1962, 1967) put forward the case for a positive relationship between price and marketed surplus of food grains in India. The study of Chattopadhyay & Sen (1988) showed that marketed surplus of subsistence crop depends positively on the size of landholdings as well as the size of the family. Reddy (1987) carried out a study for marketed surplus of paddy by size classes in Andhra Pradesh and found a larger proportion of marketed surplus for big farmers. A similar study by Upendra (1998) in the same state had however a similar proportion of marketed surplus for all size classes. Deogharia (2017), in terms of multiple regression model as shown that vegetable marketing in some selected districts of Jharkhand is no way affected by their price level. Jadav and Leua (2011) have shown that lack of marketing intelligence, non-availability of labour for transportation and price fluctuations are the major constraints for marketing of potato for marginal and small farmers in the Anand and Kheda districts of Gujarat. Pandit, Pandey, Rana & Kumar (2015) have studied the problem of marketing of potato in the Barpeta district of Assam and concluded that lack of quality seeds, irrigation facilities, cold storage, knowledge regarding scientific potato production, fertilizer at peak time, finance, low and fluctuating market price, high cost of inputs and flood problem were the main constraints. The study of Alagh (2014) in Gujarat has identified that lack of market information and availability of proper storage facilities are the major constraints for the farmers to market their products. Sashimatsung & Giribabu (2015), in terms of their regression analysis, have shown that the marketed surplus of cabbage in Mokokchung and Wokha districts of Nagaland has a positive and significant relationship with the

size of land holdings. Vinutha (2013) has shown that the marketed surplus of potato in Hassan district of Karnataka depends positively on the number of marketing channels and the contract with the middlemen and there is no significant relationship between marketed surplus of potato and size of landholding of the farmer. Grover & Singh (2012) have shown that the marketed surplus of paddy and wheat in some districts of Punjab is positively affected by the size of operational holding, crop farming as the main occupation and educational qualification of the household head. The study of Sarkar & Roy (2013) has shown that the marketed surplus of paddy in three districts namely Burdwan, Murshidabad and Birbhum of West Bengal has a positive and significant relationship with the size of land-holdings, the average price received by the seller, access to credit and the availability of storage facility.

### Research Gap

In this backdrop, it can be mentioned that although there is a large domain of study intended to investigate the factors affecting marketed surplus of food grains in different parts of the nation and abroad, almost no study has been made yet to empirically estimate the influence the different socio economic factors on marketed surplus of food crops at the village level in the North 24 Parganas districts of West Bengal, which is one of the agriculturally rich districts of the state. The present study is an honest and dedicated effort to fill this research gap.

### Objectives

The objectives of the paper are to

- Investigate how different socio-economic factors affect market participation and the marketed surplus of food crops in some selected villages of North 24 Parganas district of West Bengal,
- Suggest different means of increasing the marketed surplus of food crops and in a way it will enlighten the policy makers in fine-tuning their designs and applications.

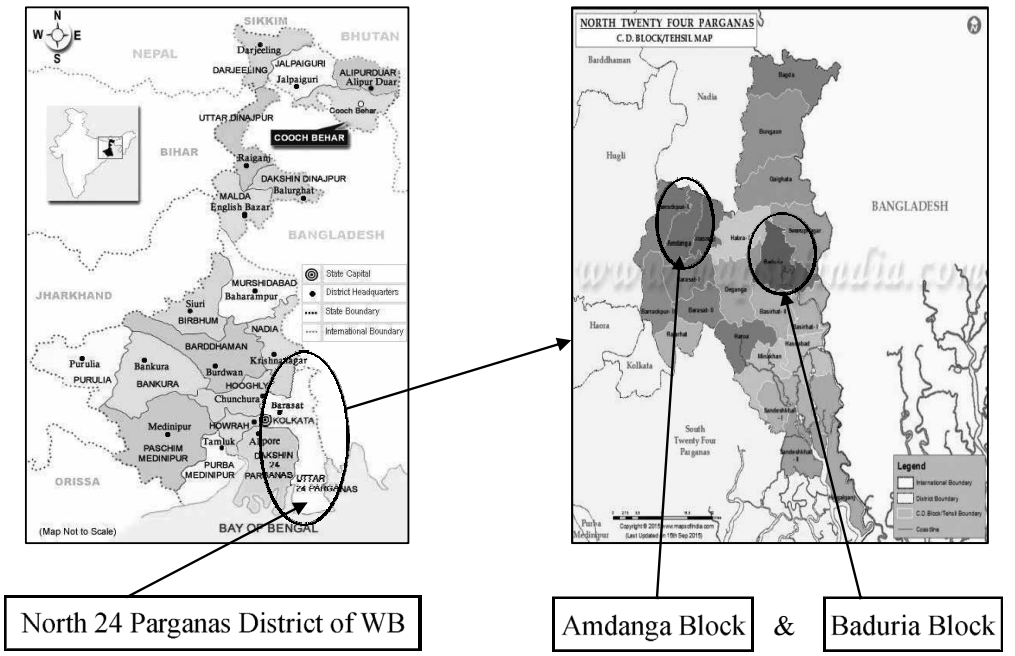
The plan of the paper is as follows – Section I introduces the paper by highlighting the motivation of the study, a brief review of literature, research gap and objectives of the study. Section II provides the sources of data and research methodology used in the study. Section III makes an empirical analysis of data, while Section IV concludes.

## II. DATA AND METHODOLOGY

### Area of Study

The study was conducted in Bodai and Mathura village of Amdanga Block and Gokna and Basudevpur village of Baduria block of North 24 Parganas district of West Bengal.

North 24 Parganas district is located in the southern side of West Bengal, which is the most populated district of the state and the second most populated district of the entire nation. According to the 2011 census, this district contains 11.05% of the population of the state and it is the third most densely populated district of the state. Geographically, the district lies at 22°71' N latitude, 88°71' E longitude and 13m altitude. The district encompasses a geographical area of 4094 sq. Km and is bounded by Nadia on North, Bangladesh (Khulna Division) on North and East, South 24 Parganas and Kolkata on South and Kolkata, Howrah and Hoogly on West. The climate of the district is tropical, like the rest of the Gangetic West Bengal. The actual rainfall in the district was 1592 mm in the year 2016-17 (District Statistical Handbook, North 24 Parganas District, Government of West Bengal, 2017).




The district ranks third in the state in literacy rate. The sex ratio of the district is 955 females for every 1000 males. The major religions in the district are Hindu (73.46%) and Muslim (25.82%). Agriculture is the backbone of the economy. According to the 2011 census, the cultivable land in the total geographical area of the district is about 67.18% and the net sown area is 60.04%. The distribution of operational land holding is bottom-heavy where small and marginal farmers dominate significantly. Major field crops of the district are rice (Aus, Aman & Boro), jute, oilseeds, wheat and potato.

Among vegetables, brinjal, cabbage, cauliflower, tomato, chilly, spinach and ladys-finger are important. Mango, banana, papaya, jackfruit and guava are the major fruits produced in the district.

**Source of Data**

Both secondary and primary data were used for this study. A formal survey was undertaken from January 2018 to March 2018, through interviews with selected farmers of the four villages under the study area using a pre-tested semi-structured questionnaire designed for the purpose. Secondary data regarding the number of farm households were selected from the sample villages belonging to different size strata from the exhaustive list of farmers available with the State Agriculture Offices in the concerned blocks and development agents at the gram panchayats.

**Sampling Design and Sample Size Determination**

A systematic, multistage stratified sampling design was adopted for the study. In the first stage, two out of twenty-two blocks of the district were selected purposively (namely, Amdanga Block and Baduria Block) based on the number of inhabitants farming households. Then in the second stage, two villages from each block were selected (namely, Bodai and Mathura village of Amdanga Block and Gokna and Basudevpur village of Baduria Block) purposively having a resemblance with the socio-economic characteristics of the selected blocks. Then in the last stage, 100 sample farmers were selected randomly based on proportional to the size of farming households in the selected villages.

**Method of Data analysis**

Collected data are analyzed in both descriptive and econometric methods. Descriptive method of data analysis refers to the use of percentages, means, t-test and Shapiro-Wilk test for normality of data. It is employed in the process of examining the characteristics of respondent farm households.

In the case of econometric analysis, a multiple linear regression model is applied to investigate the factors affecting the marketed surplus of food crops. The study tries to investigate the coefficients of the following regression equation

$$Y_i = \beta 0_{+\,i} X_i + ui$$

Where, Yi = The marketed surplus of food crops by the farm household (dependent variable)

$\beta_0$ = constant term, $\beta i$ = Co-efficient of the $i^{th}$ explanatory (independent) variable [ i = 1,2,…,7]

$X_i$ = the $i^{th}$ explanatory (independent) variable [ i = 1,2,…,7]

$u_i$ = Error term & $u_i \sim N(0, \sigma^2)$

But before going into econometric analysis the normality of the data is tested in terms of looking at the Histogram showing the frequency of the regression standardized residual as well as the probability-probability (PP) plot of regression standardized residual drawn with the help of statistical software SPSS. The problem of heteroscedasticity is checked from the scatter plot graph between regression standardized predicted value and the regression standardized residuals generated in SPSS. The problem of multicollinearity among the explanatory variables is checked in terms of the Variance Inflation Factor (VIF). The problem of autocorrelation, if any, is checked in terms of the Durbin Watson (DW) test statistic. The reliability of the model is tested in terms of Cronbach's Alpha test statistic.

## Definition of Variables used in the Study

### *Dependent Variable*

The dependent variable of the study is the amount of food crops marketed by the farming households in a year. It is a continuous variable and is measured by tons (denoted by $Y_i$)

### *Explanatory variables*

The explanatory variables which are hypothesized to affect the dependent variable are as shown in table 1

Table 1
**Summary of the Explanatory Variables Considered in the Study**

| *Name of the variable* | *Type* | *Notation* | *Measurement* | *Expected influence on marketed surplus* |
|---|---|---|---|---|
| Education of the household head | Dummy | $X_1$ | 1 = if attended any formal education, 0 = otherwise | + |
| Perception on lagged market price | Dummy | $X_2$ | 1 = if high , 0 = otherwise | + |
| Land holding size | Continuous | $X_3$ | Hectares | + |
| Household size | Discrete | $X_4$ | Number of people in household | ± |
| Access to credit | Dummy | $X_5$ | 1 = if taken loan , 0 = otherwise | + |
| Non-farm income | Dummy | $X_6$ | 1 = if Yes , 0 = otherwise | - |
| Proximity to the market | Continuous | $X_7$ | Kilometers | - |

*Note:* ± affecting either positively or negatively

*Source:* Own survey (2018)

## III. RESULTS AND DISCUSSION

### Descriptive Analysis of Data

This section of the data analysis tries to investigate whether there is any significant difference in the mean values of marketed surplus of food crops between the respondents when they are divided into two groups based on their responses relating to different explanatory variables under study. The test statistic used in the study is the Students 't-test'. The null hypothesis for such test assumes that the mean-values of marketed surplus of food crops for the two groups are equal. The alternative hypothesis should be that the mean-values of marketed surplus should be different between the two groups. The null hypothesis will be rejected when the test statistic is significant at the 5% level (or, in other words when the p-value is less than 0.05). Now, an important assumption of running a t-test is that the dependent variable (in this case, it is marketed surplus of food crops) should be approximately normally distributed for each category of independent variables. The following numerical outputs must be investigated in this regard-

- Skewness & Kurtosis z-values, (that should be somewhere in the span of -1.96 to +1.96)
- The Shapiro-Wilk test p-value, (that should be above 0.05, as the null hypothesis for this test is that the data are normally distributed).

Table 2 has described the descriptive statistics of the data. The skewness and kurtosis z-values and the Shapiro – Wilk test p-value as shown in Table 2 confirm that the dependent variable is approximately normally distributed for each category of independent variables.

Table 3 shows the 't-test' for the difference in the mean value for marketed surplus of food crops between farmers when they are divided into two groups based upon different categories defined by the independent variables in this study.

If farmer families are grouped according to the level of education achieved by the household head, then it is observed that only 52% of the household heads had formal education. The mean value of marketed surplus of food crops is higher (0.477 tons) for those who attended formal education than those who did not have any formal education (0.303 tons) and the result is significant at 1% level. This result is true as better education will provide better understanding and information about the current market situations to the farm households who have formal education relative to others (unlearned). This helps the farmers to improve their decisions about the amount of output sold in the market.

**Table 2**
**Descriptive Statistics of Data under Analysis Dependent Variable: Marketed Surplus of Food Crops**

| *Independent variable* | *No .of Hhs* | *Mean* | | *Variance* | *Skewness* | | | *Kurtosis* | | | *Nomality Test* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *Statistic* | *Std. Error* | | *Statistic* | *Std. Error* | *Z value* | *Statistic* | *Std. Error* | *Z value* | *Shapiro-Wilk statistic* | *Sig.* |
| *1. Education of Household head* | | | | | | | | | | | | |
| Attended formal education | 52 | 0.477 | 0.013 | 0.009 | 0.310 | 0.330 | 0.94 | -0.408 | 0.650 | -0.63 | 0.970 | 0.202 |
| No formal education | 48 | 0.303 | 0.015 | 0.011 | -0.101 | 0.343 | -0.29 | 0.002 | 0.674 | 0.003 | 0.969 | 0.231 |
| *2. Perception on lagged market price* | | | | | | | | | | | | |
| High | 48 | 0.479 | 0.015 | 0.012 | -0.298 | 0.343 | -0.87 | 0.257 | 0.674 | 0.381 | 0.971 | 0.287 |
| Low | 52 | 0.315 | 0.014 | 0.011 | -0.464 | 0.330 | -1.41 | -0.159 | 0.650 | -0.245 | 0.961 | 0.090 |
| *3. Land holding size* | | | | | | | | | | | | |
| Medium & Large | 21 | 0.523 | 0.022 | 0.010 | 0.094 | 0.501 | 0.19 | -1.137 | 0.972 | -1.169 | 0.955 | 0.423 |
| Small & Marginal | 79 | 0.359 | 0.013 | 0.014 | -0.276 | 0.271 | -1.02 | -0.256 | 0.535 | 0.478 | 0.975 | 0.126 |
| *4. Household size* | | | | | | | | | | | | |
| Less than or equal to 6 | 44 | 0.446 | 0.017 | 0.013 | -0.031 | 0.357 | -0.09 | 0.252 | 0.702 | 0.359 | 0.980 | 0.631 |
| More than 6 | 56 | 0.353 | 0.018 | 0.017 | 0.006 | 0.319 | 0.019 | -0.355 | 0.628 | -0.565 | 0.976 | 0.319 |
| 5. Access to credit | | | | | | | | | | | | |
| Yes | 42 | 0.492 | 0.015 | 0.009 | 0.211 | 0.365 | 0.578 | -0.862 | 0.717 | -1.202 | 0.950 | 0.066 |
| No | 58 | 0.323 | 0.014 | 0.012 | -0.371 | 0.314 | -1.182 | -0.455 | 0.618 | -0.74 | 0.968 | 0.129 |
| 6. Non-farm income | | | | | | | | | | | | |
| Yes | 46 | 0.456 | 0.017 | 0.014 | -0.136 | 0.350 | -0.39 | -0.041 | 0.688 | 0.06 | 0.967 | 0.211 |
| No | 54 | 0.340 | 0.017 | 0.015 | -0.083 | 0.325 | -0.256 | -0.15 | 0.639 | -0.234 | 0.973 | 0.270 |
| 7. Proximity to the market | | | | | | | | | | | | |
| Less than or equal to 5 Km | 68 | 0.434 | 0.014 | 0.013 | 0.311 | 0.291 | 1.069 | -0.559 | 0.574 | -0.97 | 0.976 | 0.202 |
| More than 5 Km | 32 | 0.308 | 0.024 | 0.018 | -0.055 | 0.414 | -0.133 | -1.005 | 0.809 | -1.242 | 0.947 | 0.121 |

*Source:* Author's calculation based on survey data

Similarly, if farmer families are grouped according to their perception of the lagged market price of the crop they market, then the mean value of marketed surplus is higher for those families who perceived a higher price (0.479 tons) compared to those who perceived a lower price (0.315 tons) and the result is also significant at the 1% level. Only 48% of the farming households perceived that the lagged market price for the product they cultivate is high. This result is true because when the perception of the lagged market price by the farmers is high, it motivates them to produce more and they will have surpluses to supply them in the market.

If one considers the land size distribution pattern in the area of study, then it is observed that the land distribution pattern is bottom-heavy and there is marginalization of the peasantry. This land distribution pattern resembles the land distribution pattern of the overall nation in general and that of West Bengal in particular. In the area of study, 79% of the farming households have their size of operational land holding less than or equal to 2 hectares and they can be classified as marginal and small farmers. About 14% of the farm households have landholdings of medium size (more than 2 hectares but less than or equal to 4 hectares). Only 7% of family has land size more than 4 hectares and thus they are classified as large farmers. The study shows that

the mean value of marketed surplus is higher (0.523 tons) for medium and large farm households compared to small and marginal farm households (0.359 tons) at 5% level of significance. The result is logical as larger the farm size, the larger the area allocated to the production of crops by the farmers, thereby increasing the quantity of produce available for sale.

When farming families are classified according to the household size (the number of family members), then it is observed that 56% of the farm households had the family size more than 6 members. Marketed surplus of food crops is more on average for those families having the household size less than or equal to 6 members (0.446 tons) compared to those families having more than 6 family members (0.353 tons). The result is significant at 5% level. The intuition is very clear. Larger the size of the family, more of the produced output will be used to feed the family and thus less will be marketed. Moreover, among the respondents, the majority of the farm households are small and marginal in nature. As a result, the potential for crop production is also low for these households.

Credit is important for cushioning cash-constrained farmers to be able to meet their farm activities requiring cash on time. Among the respondent farming families, 42% had access to credit from different formal or informal sources.

**Table 3:**
**'t-test' of Two Samples for the Difference of**
**Means Hypothesized Mean Difference is Equal to Zero**

| *Independent variables* | *No. of Households* | *Mean value of marketed surplus of Food crops* | *Critical 't-value' for two-tail test* | *p-value* |
|---|---|---|---|---|
| *1. Education of Household head* | | | | |
| Attended formal education | 52 | 0.477 | 1.98 | 0.000 |
| No formal education | 48 | 0.303 | | |
| *2. Perception on lagged market price* | | | | |
| High | 48 | 0.479 | 1.99 | 0.000 |
| Low | 52 | 0.315 | | |
| 3. Land holding size | | | | |
| Medium & Large | 21 | 0.523 | 2.03 | 0.031 |
| Small & Marginal | 79 | 0.359 | | |
| 4. Household size | | | | |
| Less than or equal to 6 | 44 | 0.446 | 1.99 | 0.042 |
| More than 6 | 56 | 0.353 | | |
| 5. Access to credit | | | | |
| Yes | 42 | 0.492 | 1.99 | 0.019 |
| No | 58 | 0.323 | | |
| 6. Non-farm income | | | | |
| Yes | 46 | 0.456 | 1.99 | 0.029 |
| No | 54 | 0.340 | | |
| 7. Proximity to the market | | | | |
| Less than or equal to 5 Km | 68 | 0.434 | 2.01 | 0.000 |
| More than 5 Km | 32 | 0.308 | | |

*Source:* Author's calculation based on survey data

It is observed in the study that the farming households having access to credit have marketed more of their output on average (0.491 tons) compared to those who do not have access to credit and this difference in the mean value of marketed surplus is significant at 5% level. Access to credit enables the farm household to overcome cash constraint to purchase the essential inputs for production. This not only increases output production but also increases the sale of output in the market such that farmers can earn sufficient income to repay the loan and still remain profitable.

One of the interesting features of the rural economy in India in recent times is the growth of non-farm income. Among the respondent farming families, 46% have non-farm sources of income and they work as carpenters, run small shops and also work in different construction activities in off-seasons. It is observed that marketed surplus of food crops was more on average for those families having non-farm income (0.456 tons) compared to those who had no sources of non-farm income (0.34 tons) and this difference is significant at 5% level. This result is contradictory to the hypothesis made earlier in the study. It is argued that farming families having non-farm sources of income usually devote less time for cultivation as they are engaged in different off-farm activities. This reduces the total production of the crop and also reduces the supply of output in the market. But in this case, the marketed surplus of output is more on average for those farmers having non-farm sources of income. This may be due to the fact that an important proportion of the non-farm income of these families is invested in up-gradation of farm technology and purchase of superior farm inputs, that ultimately leads to higher output production and thus increases the supply of output to be marketed.

Lastly, if the farming families are classified according to the distance of their residence from the market, then it is observed that marketed surplus of output on average is more for those where this distance is less than or equal to 5 Km. (0.434 tons) compared to others (0.308 tons) and this difference is statistically significant at the 1% level. This observation is quite obvious as lower the distance of residence of the farmers from the marketplace, lower will be the cost of transportation and this motivates the farmers to sell more in the market.

**Econometric Analysis of Data**

To initiate the econometric analysis of data in terms of a multiple regression model, at first one should check the necessary preconditions to run multiple regression. The histogram and normal probability plot of regression residuals show that residuals are approximately normally distributed. The normal P-P plot of regression standardized residuals shows that the observed points are very close to the normal diagonal line with no strong deviations. This also verifies that the residuals are normally distributed. If one

considers the scatter plots then it shows a rectangular pattern of dots, which indicates that error variances are homoscedastic. In survey-based social science research, an important aspect of data analysis is the reliability of the assessment tools to reach any conclusion. Reliability is the degree to which an assessment tool produces stable and consistent results. Cronbach's alpha is the most often used statistic for the estimate of reliability. It is a measure of internal consistency, i.e., how closely a set of items are related as a group. The general rule of thumb is that if the value of Cronbach's alpha is over 0.7 then it reflects high internal consistency. In this study, the value of Cronbach's alpha based on standardized items is 0.798, suggesting that the items (variables) have relatively high internal consistency. The Durbin- Watson test statistic in this study is 1.79, which is between the two critical values 1.5 and 2.5. So it can be assumed that there is no problem of autocorrelation in this regression data. Table 4 shows the results of multiple regression.

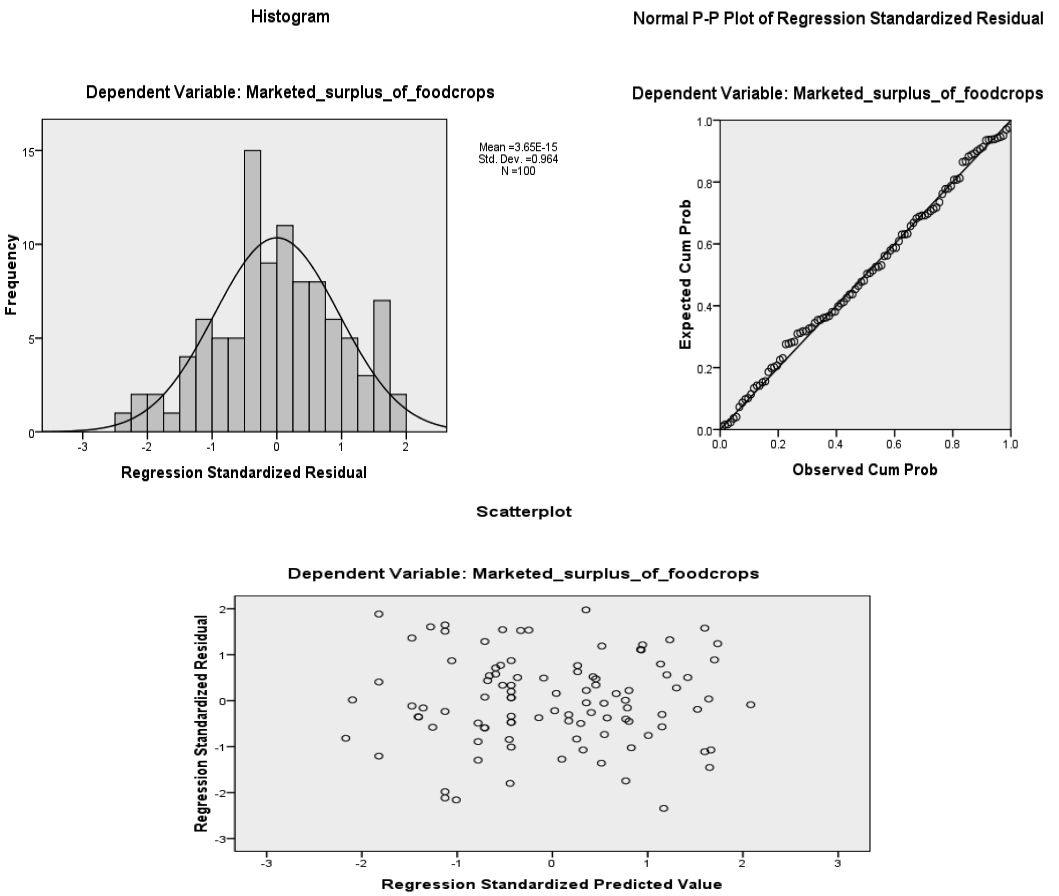


Table 4
**Regression Result**

Dependent variable : Marketed surplus of food crops (Y) No. of observations = 100
R squared = 0.71 Adjusted R squared = 0.69 Durbin- Watson statistic = 1.79
F- statistic = 31.97 Significance of F- statistic = 0.000

| *Independent variables* | *Co- efficient* | *t statistic* | *Significance* | *Collinearity statistics* | |
|---|---|---|---|---|---|
| | | | | *Tolerance* | *VIF* |
| Education of household head ($X_1$) | 0.068 | 3.12 | 0.00 | 0.50 | 1.99 |
| Perception on lagged market price ($X_2$) | 0.060 | 2.92 | 0.00 | 0.53 | 1.87 |
| Land holding size ($X_3$) | 0.013 | 1.61 | 0.10 | 0.45 | 2.21 |
| Household size ($X_{4)}$ | -0.031 | -1.67 | 0.09 | 0.65 | 1.52 |
| Access to credit ($X_5$) | 0.053 | 2.03 | 0.04 | 0.34 | 2.97 |
| Non-farm income ($X_6$) | 0.037 | 0.64 | 0.52 | 0.50 | 1.99 |
| Proximity to the market ($X_7$) | -0.039 | -6.42 | 0.00 | 0.84 | 1.19 |

*Source:* Author's Calculation by using SPSS

Before interpreting the results of multiple regression, all the hypothesized explanatory variables were checked for the existence of multicollinearity problem in terms of Variance Inflation Factor (VIF) for association among the explanatory variables. VIF assesses how much the variance of estimated regression co-efficient increases if the explanatory variables are correlated. A VIF between 5 and 10 indicates high correlation among the explanatory variables which is problematic. In statistical software like SPSS, another collinearity diagnostic is usually reported, called Tolerance. Tolerance = 1 / VIF. A small tolerance value indicates that variable under consideration is almost a perfect linear combination of the independent variables already in the equation and that it should not be added to the regression equation. The general rule of thumb is that a tolerance value less than 0.1 should be investigated further. If a low tolerance value is accompanied by large standard errors and non-significance, then multicollinearity may be an issue. As we see from the collinearity statistics in terms of VIF and Tolerance values in Table 4 for each of the explanatory variables under study that there exists no problem of multicollinearity. So the result of regression analysis can be interpreted with confidence.

Table 4 shows that the adjusted R squared value is 0.69, which indicates that all the 7 explanatory variables in the model together can explain 69% of the variation in the dependent variable (marketed surplus of food crops). The F-statistic is significant at 1% level, which indicates that the model is a good fit.

As Table 4 shows that except non-farm income, all other explanatory variables yield a statistically significant effect on the marketed surplus of food crops. Now let's try to explain how each of the explanatory variables affects the dependent variable in the model in ceteris paribus.

***Education of Household head ($X_1$)***

At first, consider the effect of education of the household head on the marketed surplus of food crops. It was assumed that producers with better education levels would have a better understanding and information about the current market situations relative to others (unlearned). The regression result reveals that the education level of the household head affects the market participation decision of farming households in a similar manner as the hypothesis. At a 1% level of significance, the education level of households influenced the marketed surplus of food crops of producers positively. More specifically, if farming households receive formal education then marketed surplus of food crops will increase by 0.068 tons. As the education level of households is improved, their attitude to adopt new technologies and to acquire market information becomes better. This would help them produce more and increases their willingness to sell. As a result, the marketed surplus of food crop rises. This result is in line with Tesfaw (2013), who showed that an increase in the level of education of the farmers increases the amount of pepper sold in the market in Ethiopia.

***Perception of the lagged market price ($X_2$)***

As it was expected, farmer's perception of the lagged market price of crop affects the amount of food crops supplied to the market positively and significantly at 1% significance level. More specifically, if farmers perceive a higher lagged market price of their crop, then marketed surplus will increase by 0.06 tons. This is because when the perception of lagged market price by farmers is high, it motivates the farmers to produce more and they will have surpluses to supply to the market. Thus, the lagged price can act as a motivation for them to supply more in the market. This is in line with Myint (2003) who observed that if prices in one year are bad, farmers will often respond by planting less in the next year. Gebreselassie and Sharp (2008) also discussed that last year prices of teff had a strong positive and highly significant effect on the probability of market participation as a seller.

***Landholding size ($X_3$)***

As hypothesized, the size of land allocated for production has influenced marketed surplus of food crops positively at a 10% level of significance. More precisely, if the size of operational land holding rises by 1 hectare, then it will lead to an increase in the marketed surplus of food crops by 0.013 tons. The explanation of the result is easy to interpret. Farmers having large landholdings, not only devotes the larger size of lands in production but also have greater economic power to employ improved seeds, irrigation facilities, fertilizers and pesticides in their production activity. In this study, most of the medium and large farmers have access to credit, which also helps them to provide the necessary financial capital to purchase and employ sophisticated

technology in production. Moreover, large farmers can undertake the risk associated with farming much better than small and marginal farmers. As a result, large farmers produce more on average than the small farmers and marketed surplus of output rises with the rise in landholding size. This is in line with the study done by Abayneh (2013) which showed a positive significant relationship between land size and extent of market participation in the Haricot bean market in Ethiopia. Olwande and Mathenge (2012) also found that the size of land cultivated has a significant and positive relationship with the extent of market participation among poor rural households in Kenya. This result is also consistent with the study of Sarkar and Roy (2013), who has shown how the marketed surplus of paddy in some districts of West Bengal is positively influenced by the size of land-holding. But this result contradicts with the findings of Binswanger and Rosenzweig (1986), who posited a negative relationship between farm size and the value of output per acre because of rising managerial inefficiency and labour cost as land size increases.

***Household size ($X_4$)***

The study shows that family size is negatively associated with the marketed surplus of food crops and the result is true at 10% level of significance. An increase in the household size by one person decreases the marketed surplus of food crops by 0.031%. This is so because the bigger family size, the more quantity of the crop will be consumed by the family, and the less will be available for sales. This finding is inconsistent with that of Gani and Adeoti (2011) who observed that family sizes have a positive relationship with the probability of market participation decision.

***Access to credit ($X_5$)***

As expected, access to credit positively and significantly influences the marketed surplus of food crops at 5% significance level. In this study, access to credit increases marketed surplus by 0.053 tons. Access to credit gives the farm households the economic power to cultivate on a large scale and enables farmers to buy farm inputs in optimum doses. This increases production and thereby marketed surplus of food crops. The result is in line with Alemayehu (2012), who has shown that access to the credit increases the amount of ginger supplied to the market. Randela et al. (2008) also found that access to credit had a positive and significant impact on producers' likelihood to participate in the cotton market in South Africa , because the availability of credit reduces the transaction costs of both input and output markets.

***Proximity to the market ($X_7$)***

As expected, proximity to the market affects the marketed surplus of food crops positively at a 1% level of significance. More specifically, if the distance of residence

of the farming household increases by 1 Km. then the marketed surplus of food crops reduces by 0.039%. Closer the farmer's residence to market, the frequency to visit to the market increases as transport cost as well as the cost of time reduces. This increases the marketed surplus of food crops. This result is consistent with the finding of soybean market participation by smallholder farmers in Zimbabwe in which distance to the market negatively influences smallholder farmers' extent of market participation (Zamasiya et al., 2014).

## IV. CONCLUSION

The study shows that the marketed surplus of food crops by farming households in the area of study rises with the education of household head, perception of farmers regarding lagged market price of the product, landholding size and access to credit, whereas it falls by the increase in household size and proximity to the market. All the results are statistically significant. Non-farm income has no statistically significant effect on the marketed surplus of output.

Based on the findings of the study the following policy recommendations can be made.

Firstly, the government should strengthen the financial capability of small and marginal farmers by providing them the scope to avail sufficient institutional sources of credit for the purpose of production. The government should also arrange seed and fertilizer subsidies to the small and marginal farmers to enhance their production, such that they can sell more in the market;

Secondly, the government should spread the necessary market information, particularly regarding the current market prices of the crops in different market centres of the district in terms of different mass media like local newspapers, radio and television sets. This will increase the awareness of the farmers regarding the sale of their products. The government should also ensure proper standardization and gradation of products sold in the market and should try to limit the activities of middlemen such that poor farmers can get a fair price for their products;

Thirdly, Infrastructural facilities should be improved, particularly the establishment of proper roads and storehouses to enhance marketed surplus of the output of the farmers;

Fourthly, the local administrative body should organize 'kisan mela' frequently which can encourage the farmers to market more of their products at reasonable prices.

Lastly, the government should also initiate different workshops with the farmers of the villages, where farmers can get information about the modern techniques of farming, proper use of fertilizer and pesticides, how and where the farmers can avail

institutional sources of credit, different information regarding the marketing of their crops in the domestic market as well as for export, about different government support programmes for the farmers, etc.

Proper policy designing will obviously create the necessary incentive and congenial climate to enhance marketed surplus of output by the farmers. Increase in marketed surplus of food crops will not only improve the standard of living of the farming community in villages but will also foster the economic growth of the nation.

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# Crime and State Level Per Capita Income: Exploring the Relationship for Indian States

Dipparna Jana*

*Concern with crime is usually justified in terms of the detrimental impact on economic activity, especially on the quality of life. The earliest economic literature on crime has followed Becker's (1968) neoclassical paradigm and thereafter numerous interpretations of the incidences of criminal behavior translated into varying and often opposing hypotheses of the relationship between crime and socio-economic conditions, demographics, criminal justice system and family structure. The present paper incorporates a few rather specific determinants of adult property crime and engages predominantly with the question of how regional prosperity affects incidences of property crime. In the previous literature, role of conviction rates, migration, police strength and prison conditions have received some attention, except that a detailed analysis of potential impact across states in India is unavailable. Our choice of variables that significantly explain the incidence of state level adult property crime can be identified as development-related and institution-related. We show that a rise in state-level prosperity (per capita income) lowers the incidence of adult property crime, but an increase in police strength could affect it adversely. The legal and policy-making institutions at the state level appear to be more potent in lowering the incidence, which has a strong impact on the development outcomes.*

**Keywords:** *Adult property crime, State per-capita income, Conviction rate, Criminal justice system*

## I. INTRODUCTION

In the substantially evolved literature on crime and prosperity, the role of individual income (or wealth) and the level of income inequality the person or group is exposed to attain considerable importance. It is generally believed and proven that income inequality is significantly responsible for the incidence of property crime in most countries. Nevertheless, many of these studies use separate income-related indicators for measuring the benefit from and the cost of criminal activities. Indeed, Eide (1994) provided a vivid categorization of the income variables that are regularly deployed to understand the pattern of crime, and these include (i) benefits of legal activities of the opportunity cost of crime, (ii) the gains from criminal activity, i.e., the pay-off from delinquency and (iii) the income differential or the Gini measure in a country or a region. At the household level, mean family income, median income, median household income, value of earnings from theft or burglary as compared to median

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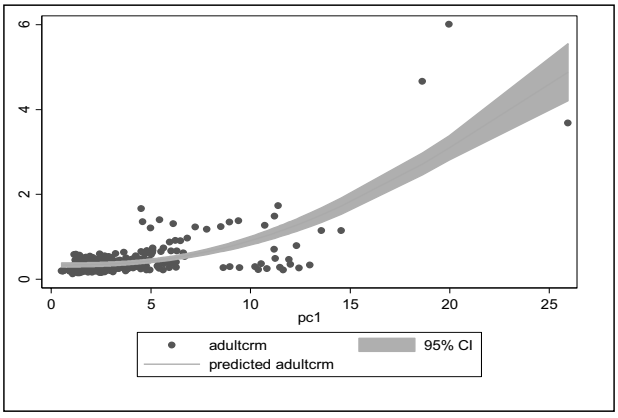
income, etc. have been given importance in trying to understand the role of income in explaining crime (starting with Becker, 1968; Car-Hill and Stern 1973; Chiu and Madden 1998; Ehrlich, 1973, 1996; Chisholm and Choe, 2005 proposing an analytical basis for income inequality and property crime, etc.). Later, a number of papers picked up various related variables to estimate if crime is sensitive to unemployment (generally, positive and significant, but small; Lin, 2008), to education (Lochner, 2004; Lochner and Moretti, 2004), to demographic changes (Entorf and Spengler, 2000), etc. Fortunately, with better availability of data on the distribution of incidences between property and physical or violent crime, the classification of variables offers useful implications for policymakers. Societal income continues to be important among such variables. For India, the role of societal income, i.e. state-level income can potentially explain the extent of property crime, particularly because per capita income at the state level tends to both converge and diverge over time. This creates space and opportunity for crime to spill over between states.

Figure 1 reports the fitted relation between adult property crime as the more prominent form among all other types of crime recorded by the National Crime Records Bureau of India and the increase in the overall per capita income. For India, some of the cases that made biggest impact are violent crimes but as these may not have clear economic motives behind them we consider it for future analysis. Presently we focus exclusively on property crime committed by adults, consisting of dacoity, preparation for dacoity, burglary, theft, robbery, etc. [1]

Figure 1
**Fitted Relation Representing the Incidences of Adult Property Crime with Respect to Per Capita Income**




*Source:* Author's representation of NCRB data (Government of India).

This is not the general picture, however, because the overall result when all states are pooled in the analysis offers a negative relation. The rise in per capita income

does not obviously explain the trend in income inequality and for a country like India where the Gini coefficient is quite high for both urban and rural areas it is unlikely that the income growth is distribution neutral or improves the state of inequality. While we shelve the consideration of income inequality[2] as an explanatory variable for extended analysis, the present paper considers a number of important determinants including police strength, expenditures on prison inmates, the rate at which arrests turn into conviction or release, the level of congestion or overcrowding in the prison, etc. affecting the incidence of crime committed by individuals in 18 major states in India between 2000 and 2016.

While we offer the detailed empirical strategy, information about the data (Section 2) econometric specification (Section 3) results (Section 4) and robustness check (Section 5) subsequently, it is useful to recount that our choice of variables has followed two distinct groupings. While income related variables typically signify the level of development for specific states and its impact on the incidence of property crime, we have also included a number of institution-related variables. It is well-known that legal institutions in poor democracies often work slowly and are subjected to various political and social influences. Consequently, the transformations of arrests into some legal verdict might be time consuming, and affecting the opportunity cost of the detainee to a considerable level. It is also possible that due to inherent weaknesses and influences, the perpetrators roam free and enjoy a considerable gap between arrests and conviction making them care much less about prompt legal action and punishment.

Does the incidence of crime rise owing to this even when the state level per capita income is rising steadily for most? This is an open empirical question. Similarly, if jails are crowded, and the government spends fairly little amount to create opportunity among the inmates for rehabilitation if punished and jailed for a reasonably long span, should it raise crime? For India, such estimates do not seem to have enriched the scope of public debates so far. We look into these aspects with contemporaneous and lagged values of institutional variables, and therefore allowing for some flow of information between current and future convicts, because in most urban spaces it would be unwise to consider that incidence of property crime as isolated and uncoordinated. These may be sporadic and not part of networks in some cases, but generally there are strong connections between groups that engage with property crime as a profession (unlike the NLYS example in Williams, 2015, where crimes committed by adolescents and then self-reporting on the gains seem more of a short-lived adventure rather than sustained professional practice). Finally, we also suggest that the relationship between police strength and reduction in crime is an open-ended question, because whether increased police deployment is a reaction to crime or crime happens despite police

deployment is unsettled for many countries (see Levitt, 2004). The aforementioned issues are investigated with the help of the panel data techniques.

## II. DATA SOURCES AND VARIABLES

Our econometric analysis focuses on the determinants of adult crime for 18 major states during the period 2001 to 2015. The dependent variable of interest is the incidences of adults committing property crime. The data collected from Crime in India published by National Crime Records Bureau (NCRB), Ministry of Home Affairs (Government of India). The database provides the figures in absolute terms for each state. In order to consider standardized figures across state, we convert the incidences of adult property crime into per capita terms by dividing them by mid-year population figures of respective states. The adult crime has been classified on the basis of the incidences reported under Indian Penal Code (IPC) where we adopted the standard NCRB definition throughout. We consider only property crime which incorporates incidences reported on theft, burglary, robbery and dacoity. We typically focus on the property offenses owing to the larger frequency associated with these at the state level, and since crime against body or physical crime is also an outcome of emotional and behavioural factor it may not be always associated with the development aspect of an economy.

Table 1

**Incidences[3] of Property Crime Committed by Adults across 18 Major States in India, 2001-2015**

| *States* | *2001* | *2015* |
|---|---|---|
| Andhra Pradesh | 24814 | 19159 |
| Assam | 9009 | 18539 |
| Bihar | 16428 | 29046 |
| Chattisgarh | 9381 | 9538 |
| Delhi | 22977 | 124776 |
| Gujarat | 22294 | 19644 |
| Haryana | 9700 | 28387 |
| Jharkhand | 6376 | 9779 |
| Karnataka | 20287 | 29008 |
| Kerala | 10608 | 8136 |
| Madhya Pradesh | 35742 | 42946 |
| Maharashtra | 57707 | 87054 |
| Odisha | 9872 | 16267 |
| Punjab | 5101 | 8065 |
| Rajasthan | 25172 | 36586 |
| Tamil Nadu | 23504 | 18183 |
| Uttar Pradesh | 40152 | 60088 |
| West Bengal | 15605 | 20964 |

*Source:* National Crime Records Bureau (Government of India, Ministry of Home Affairs)

As we can see from Table 1, except for states like Gujarat, Kerala and Tamil Nadu majority of the other states represents an enormous increase in the incidences of adults committing property crime in absolute terms. The mean for incidences of adult property crime for our sample is approximately 0.48 with a standard deviation of 0.54.

The explanatory variables in our core model are the lagged crime rate, net state domestic product per capita and its square term. All these variables are treated as endogenous in the empirical analysis. An individual's past criminal activities may affect the decision to commit crime through stigmatization and reduced moral threshold. Criminals can also "learn by doing", lowering the perceived probability of apprehension (Fajnzylber, Lederman and Loayza, 2002). Net State Domestic Product (NSDP) is taken from the Central Statistic Organization (CSO, Government of India). NSDP per capita or per capita income is constructed by dividing it by the mid-year state population as derived from Central Statistic Organization (CSO, Government of India). The mean per capita income is 3.92 with a high standard deviation of 3.4. Owing to assumed non-linear impact of per capita income on adult crime, the square of per capita income is considered as well. In Tables 2A and 2B, we show the top 5 states based on the sample of 18 states in terms of average adult crime and state specific per capita income level.

Table 2A

**Top 5 states based on average adult crime (average out of total population)**

| *State* | *Per capita Income* |
|---|---|
| Delhi | 9.29 |
| Haryana | 5.95 |
| Maharashtra | 5.54 |
| Punjab | 5.27 |
| Kerala | 5.19 |

*Source:* Author's representation based on the data collected from CSO (Government of India)

Table 2B

**Top 5 states based on per capita net state domestic product**

| *State* | *Adult Crime* |
|---|---|
| Delhi | 1.89 |
| Haryana | 0.73 |
| Chandigarh | 0.66 |
| Maharashtra | 0.65 |
| Madhya Pradesh | 0.51 |

*Source:* Author's representation based on the data collected from NCRB (Government of India)

We find that in the top 5, at least three states are common in both lists. Although this does not provide any robust support for our hypothesis, it provides some

preliminary evidence that states with relatively higher per capita income can have higher incidences of adults committing property crime as well.

As determinants of crime rates across regions or states in the Indian context we consider two factors – developmental and institutional. State specific per capita income explores the aspects of economic development and its impact on the incidences of crime. For the institutional factor we use two variables to proxy for the efficiency level of the judiciary system. First, we use the number of police personnel for each state to capture the deterrence effect. Police strength is constructed on the basis of data taken from Crime in India (NCRB) standardized in per capita terms by state specific mid-year population. The strength of the police across states increases the probability of apprehension and thus can create a negative incentive for an individual to commit crime. This variable is treated as an exogenous variable in the regression with a mean of 1.48 and standard deviation 1.23. We believe the impact to be non-linear and thus we include a square term of police per capita. Second, we use the conviction rate on the basis of the data taken from the Prison Statistics published by NCRB (Government of India). This variable reflects the rate at which an arrested individual is being exposed to the judiciary system and are subjected to some form of punishment, if needed. Conviction rate therefore reflects the transformation of arrests in to some form of legal verdict – so it is considered as an exogenous variable in the corresponding regressions. The mean of conviction rate is 10.7 with a high standard deviation of 6.3.

## III. EMPIRICAL METHODOLOGY

The empirical analyses of our paper test the interactive impact of different development and institutional factors on the incidences of adults committing property crime. We consider a sample of 18 states, over 2000 to 2016 to test the following questions –

- How does per capita net state domestic product affect incidences of adult crime across states?
- What institutional factors can affect the per capita net state domestic product and adult crime rate relationship?

We estimate the following structural form specification to answer the above specified questions.

$$\begin{aligned}\text{Adult. Crm}_{it} &= \beta_1 + \beta_2 \text{Adult. Crm}_{it-1} + \beta_3 \text{Per capita income}_{it} + \\ &\beta_4 (\text{Per capita income})_{it}^2 + \beta_5 (\text{Per c. Income} * \text{fac.})_{it} + \sum_{j=1}^{J} \alpha_j X_{jit} + \beta_6 \gamma_i + \beta_7 \theta_t + \epsilon_{it}\end{aligned} \quad (1)$$

*Adult.Crm*$_{it}$ represents adult crime per capita for state i in time period t. *Per capita income*$_{it}$ denotes the value of per capita net state domestic product for state i in time t. *(Per capita income)* $_{it}^{2}$ aims to capture the non-linear impact of the state specific per capita income on the incidences of adult crime rates. $X_{jit}$ represents the range of control

variables including per capita number of police and its square term, state specific conviction rate, per head expenditure incurred on inmate population and state specific inmate population. The subscript 'j' represents the set of control variables within one summation symbol. and stands for state fixed and time fixed effects respectively and represents the idiosyncratic error terms.

$Adult.Crm_{it-1}$ represents the lagged crime rate incorporated to measure the persistence of the dependent variable. Considering the pattern of crime rates for a given state overtime, we can test for inertia in crime rate. *Per c.Income*fac.* represents the interaction term of per capita net state domestic product and the different institutional factors that are considered in our empirical analysis affecting the state specific per capita income and the adult crime relationship.

In this paper the coefficients of interest are and . Here and measures the linear and non-linear impacts of per capita income on adult crime rates respectively. measures the indirect impact of per capita net state domestic product on adult crime rates through the channels of the institutional factor that we have considered – the state specific conviction rate. The point estimate of per capita income for conviction rate is given by. Based on whether , and are > = or < 0, and depending on the magnitude of conviction rate, will be >, = or < 0.

## IV. BENCHMARK RESULTS

We present the first set of benchmark results – fixed effect estimates in Table 3. We incorporate the main variables of interest – per capita net state domestic product and its square term. Further, we also include the array of control variables, police per capita and its square term, conviction rate, expenditure per inmate and the inmate population.

For column (1) specification, we consider all variable in contemporaneous terms relative to the dependent variable. In column (2) and (3) we drop the control variables and lag per capita income and the square term by three and five years respectively. We consider standard errors clustered by states. Year dummies included in all specifications. Here we can see per capita income and the square of per capita income are significant for all specifications. The sign of the coefficient of state-specific per capita income and the square term of it implies that per capita net state domestic product has a convex relationship with the level of incidences of adults committing property crime. As net state domestic product rises, the incidence of property crimes committed by adult declines but the rate of decline is clearly enhanced. A rise in income encourages growth of economic activity in a society creating the possibilities of attractive legal employment opportunities, thus, increasing the opportunity costs of committing property crime. Adult property crime rate decreases. But as income rises further, it also improves the wealth of other members of society for the state, which raises the size of the potential loot for crime. Thus we see the enhancing impact.

In terms of economic significance, we can evaluate the following - $\frac{\delta \text{Adult .Crm}_{it}}{\delta \text{Per c.Inc}_{it}} = \beta_3 + 2$ Estimating based on the estimates from Table 3, we can determine the threshold value of per capita income beyond which $\frac{\delta \text{Adult .Crm}_{it}}{\delta \text{Per c.Inc}_{it}}$ increases. Below the threshold, $\frac{\delta \text{Adult .Crm}_{it}}{\delta \text{Per c.Inc}_{it}}$ will decline. Based on the estimates, we find this threshold to be approximately 6.1 which, as evident from Table 2B, correspond to states like Maharashtra and Haryana. Thus, for most states in our sample, with a rise in per capita net state domestic product, we see a decline in adult crime rates. There are only few states in our sample that have an average per capita income equal or above 6.1. In column (1) specification, at the average level of income per capita, a standard deviation rise in per capita income will decrease adult crime rate by 0.31 percentage points. Per capita police strength and its square term represent a concave relation with the dependent variable, where only the square term is significant. Thus, with a rise in police strength for a state, the incidences of adults committing property crime increases and the rate of increase occurs at a dampening rate. One probable explanation being that often larger number of police force is deployed in the area with higher crime rate signifying the initial positive relation. However, over time we observe a non-linear impact where greater number of police strength do act as a deterring factor generating a negative and significant impact on the incidences of adults committing property crime.

Table 3
**Fixed Effect Specifications: Adult Crimes and State Per capita Income**

| | *(1)* | *(2)* | *(3)* |
|---|---|---|---|
| Per capita income | -0.231*** | | |
| | (0.0164) | | |
| (Per capita income)$^2$ | 0.0176*** | | |
| | (0.000880) | | |
| Police Strength | 0.0724 | 0.0230 | 0.181 |
| | (0.0794) | (0.148) | (0.179) |
| (Police Strength)$^2$ | -0.0141*** | -0.0125 | -0.0209** |
| | (0.00454) | (0.00798) | (0.00954) |
| Conviction Rate | -0.0149*** | | |
| | (0.00478) | | |
| Expenditure per Inmate | 5.26e-06*** | | |
| | (1.33e-06) | | |
| Inmate Population | 5.58e-06*** | | |
| | (1.75e-06) | | |
| Per capita income$_{t-3}$ | | -0.365*** | |
| | | (0.0511) | |
| (Per capita income)$^2_{t-3}$ | | 0.0489*** | |
| | | (0.00463) | |
| Per capita income$_{t-5}$ | | | -0.545*** |
| | | | (0.0688) |

| | (1) | (2) | (3) |
|---|---|---|---|
| $(\text{Per capita income})^2_{t-5}$ | | | 0.0861*** |
| | | | (0.00739) |
| Constant | 0.813*** | 0.962*** | 1.322*** |
| | (0.122) | (0.190) | (0.242) |
| Observations | 261 | 212 | 176 |
| R-squared | 0.795 | 0.603 | 0.671 |
| Number of States | 18 | 18 | 18 |

*Notes:* Specifications are Fixed Effect (FE) Estimates. Dependent variable is number of adults committing property crime out of total population. Per capita income stands for net state domestic product and is considered in per capita terms. (Per capita income)2 is the square of per capita income. Police Strength represents per capita police strength and (Police Strength) 2 stands for square of per capita police strength. We consider Per capita income and (Per capita income)2 lagged by three and by five periods in alternate specifications. Conviction Rate represents the state specific rate at which an arrest is converted to some form of punishment. Expenditure per Inmate represents the expenditure incurred by states for its inmate population. Inmate Population represents the total prison strength of each state. Year dummies are included in all specifications. Standard errors are clustered by states. ***, ** and * denote significance at 1%, 5%, and 10%, respectively

Conviction rate, expenditure per inmate and the inmate population all represents a significant coefficient from column (1). Considered as contemporaneous variable, if conviction rate increases it will decrease the incidence of adults committing property crime acting as another major "deterrent factor"[4].

Expenditure per inmate and the inmate population has a positive but significant coefficient. Higher expenditure incurred on the inmates does not mitigate the current incidences of crime. Expenditure per inmate can create negative impact on the incidences of crime through rehabilitation, if the criminals get extremely long sentences (Glaeser and Sacerdote, 1999). For shorter duration sentences, expenditure per inmate fails to provide adequate rehabilitating training thus reducing the substitutability of legal employment – hence creating more crimes and criminals. Finally, rising inmate population also reflects the "prison-overcrowding" scenario imparting positive impact on crime, as often harsh prison conditions increase post-release criminal activity – though not always precisely estimated (Drago, Galbiati and Vertova, 2011).

To explore the second part of the study, that is, the impact of state income on the incidences of property crime committed by the adults conditioned upon the state-specific institutional factor that can impact such incidences, we consider an interaction term. We present these results in Table 4. In column (1) of Table 4 we include the variables, conviction rate and the interaction term (Per c.Income*Con.Rate) in contemporaneous terms. Additionally, we also include the control variable per capita police strength across states.

In column (2), we lag income per capita, its square term as well as the interaction term by three years – with the idea that an extensive lag should further mitigate the problem of endogeneity. Similar to previous result in Table 3, we find that the income

per capita has a convex relationship with adult crime rates. While the coefficient of income per capita is negative and significant in both specifications, the coefficient of income per capita square is positive and significant. Thus, state specific per capita income has a dampening effect on adult crime rates with the impact enhancing at higher levels of per capita income. Similarly, we also find that police strength per capita has a concave relationship – higher police per capita raises adult property crime rates and it increases crime at a decreasing rate as the level of police per capita rises. We find the coefficient of the interaction term, (Per c.Income*Con.Rate) is negative for both specifications with strong significance level. The sign of the interaction term suggests that a higher level of conviction rate reduces the enhancing impact of per capita income on adult property crime. This makes sense as higher conviction rate is an indication of well-functioning judiciary system with better implementation of law and order in a state and, thus, it reduces incidences of adult crime. To fully delve into the inter-linkage, we need to estimate the marginal impacts - $\frac{\delta \text{Adult .Crm}_{it}}{\delta \text{Per c.Inc}_{it}}$

**Table 4**
**Fixed Effect Specifications: Adult Crimes and**
**State Per Capita Income – Incorporating Interaction Term with Conviction Rate**

| | *(1)* | *(2)* |
|---|---|---|
| Per capita income | -0.139*** | |
| | (0.0199) | |
| (Per capita income)$^2$ | 0.0150*** | |
| | (0.000938) | |
| Police Strength | 0.0804 | 0.0338 |
| | (0.0795) | (0.145) |
| (Police Strength)$^2$ | -0.0100** | -0.0132* |
| | (0.00464) | (0.00784) |
| Conviction Rate | -0.00180 | |
| | (0.00541) | |
| Per c.Income*Con.Rate | -0.00403*** | |
| | (0.000870) | |
| Per capita income$_{t-3}$ | | -0.303*** |
| | | (0.0539) |
| (Per capita income)$^2_{t-3}$ | | 0.0508*** |
| | | (0.00458) |
| Conviction Rate$_{t-3}$ | | 0.0174* |
| | | (0.00928) |
| (Per c.Income*Con.Rate)$_{t-3}$ | | -0.00744*** |
| | | (0.00234) |
| Constant | 0.717*** | 0.802*** |
| | (0.128) | (0.210) |
| Observations | 261 | 212 |
| R-squared | 0.793 | 0.623 |

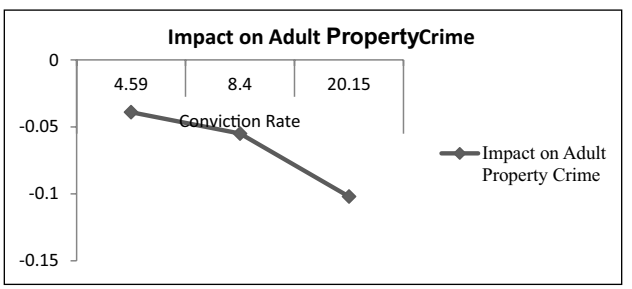
| | *(1)* | *(2)* |
|---|---|---|
| Number of States | 18 | 18 |

Notes: Specifications are Fixed Effect (FE) Estimates. Dependent variable is *number of adults committing property crime out of total population. Per capita income* stands for net state domestic product and is considered in per capita terms. $(Per\ capita\ income)^2$ is the square of per capita income. *Police Strength* represents per capita police strength and $(Police\ Strength)^2$ stands for square of per capita police strength. *Conviction Rate* represents the state specific rate at which an arrest is converted to some form of punishment. *Per c.Income*Con.Rate* is the interaction of per capita state income and conviction rate. We consider *Per capita income and* $(Per\ capita\ income)^2$ lagged three periods in alternate specifications. We do the same for the interactions as well as conviction rate. Year dummies are included in all specifications. Standard errors are clustered by states. ***, ** and * denote significance at 1%, 5%, and 10%, respectively.

In the presence of the interaction terms between two variables, say X and Y, the overall impact of X on the dependent variable can only be analysed based on the values of Y. Thus, the overall impact of NSDP per capita on adult property crime rate depends on NSDP per capita itself as well as the level of conviction rate across states. We present the marginal estimates in Figure 4.1. We estimate  for different levels of conviction rate. Following Dutta and Sobel (2016), Cooray, Dutta and Mallick (2016) and Asiedu, Jin and Nandwa (2009) we calculate the marginal impact  at the $10^{th}$, $50^{th}$ and $90^{th}$ percentile of conviction rate.[5] As stated earlier, . This implies to get a detailed sense as to how  varies over the entire sample; we need to consider not only the different values of conviction rate but also per capita income. Thus to understand the inter-linkages among adult crime rates, per capita net state domestic product and conviction rate, we not only estimate  at the $10^{th}$, $50^{th}$ and $90^{th}$ percentiles of conviction rate, but we do this for the $10^{th}$, $90^{th}$ and the mean of per capita net state domestic product as well. We present all the results in Figure 4.1. Analyzing the results present us with an interesting picture. We can conclude that crime rates vary both due to per capita net state income and the varying levels of conviction rate. We see the non-linearity in the relationship across both variables. The marginal estimates provide very interesting conclusions. Let us analyze Panel A of Figure 4.1.

Figure 4.1(A)

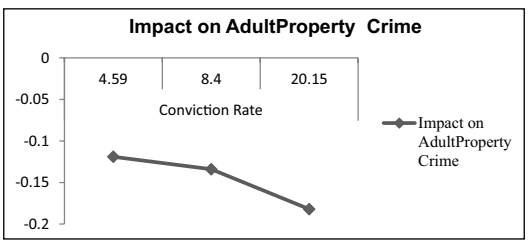
**Representation of Marginal Effect of State Per Capita Income on Adult Crime at Different Levels of Conviction Rate – at the Mean of Per Capita Income**




*Source:* Author's representation based on marginal estimates

Here we evaluate at the mean value of net state domestic product per capita. As conviction rate rises, we find that an increase in per capita net income will reduce adult crime. In the face of an improving law and order and the justice system as evident from increasing conviction rate, an increase in per capita income provides better off opportunities reducing the incidences of property crime. When conviction rate is at the 10th percentile level, a standard deviation rise in per capita net state income will reduce adult property crime by 0.136 percentage points[6]. But for a state at the 90th percentile of conviction rate, the same rise in per capita net state income reduces incidences of adults committing property crime by 2.07 percentage points. The results available in Panel B and C provide further interesting perspectives. In Panel B, the marginal estimates are calculated at the 10th percentile of per capita income. We find that for all levels of conviction rate, the impacts are stronger compared to the estimates in Panel A with a decreasing trend as conviction rate rises.

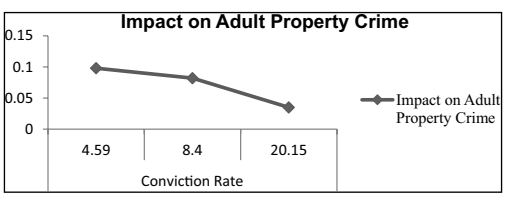
Figure 4.1(B)
**Representation of Marginal Effect of State Per Capita Income on Adult Crime at Different Levels of Conviction rate – at the 10th Percentile of Per Capita Income**




*Source:* Author's representation based on marginal estimates

Thus, for lower levels of per capita income, a rise in the same reduces adult crime much more across all levels of conviction rate, compared to higher levels of per capita income. This speaks of the non-linearity in the impact of per capita net state income on adult crime –per capita income has an enhancing impact on adult crime once it rises. In Panel C where we compute the estimates at the 90th percentile of per capita income, we find the marginal estimates to be the highest but with a decreasing impact.

Figure 4.1(C)
**Representation of Marginal Effect of State Per Capita Income on Adult Crime at Different Levels of Conviction Rate – at the 90th Percentile of Per Capita Income**




*Source:* Author's representation based on marginal estimates.

We can conclude that, states with low income per capita and high conviction rates experiences better off situation in terms of adult crime. Reiterating the points from above, when states have low income per capita, a rise in the same provide incentives and legal opportunities, thus, adults committing property crime decreases. Though it is difficult to determine the level of economic development for states based on different variables, without actually testing their impacts, but states with low income per capita but high conviction rate will be at relatively better off levels in terms of the economic development. The scenarios of high conviction rate coupled with low income per capita are indicative of improved judiciary system, thus, they are most likely to deter crime. However other state level factors will play an important role as well.

## V. ROBUSTNESS CHECK

As a starting point of an array of robustness tests, we check the results with the alternative estimator, i.e., the Difference GMM estimator. One of the foremost challenges that an empirical study with panel data can potentially face is that of presenting a clear identification strategy that can arise due to reverse causality, or omitted variable bias, or both with regard to the empirical analysis. As far as per capita state income and related variables are concerned, studies have mostly explored the impact of income inequality on crime and have concluded that income inequality does have a significant enhancing impact on crime rates (Fleisher, 1966; Mocan and Rees, 1999; Machin and Meghir, 2004, etc.). The causation identified in the literature mostly seems to be running from income inequality to committed crime and there are hardly any studies that have identified the causation to be running the other way round. While per capita state specific income and income inequality are not analogous measures, it can still be assumed that the chance of causation running from per capita state income to crime is more likely. We establish identification strategy through multiple estimation methods, our benchmark estimator being the fixed effect estimator. The alternate method via which we resolve endogeneity concerns is Dynamic Panel estimators. In recent decades, the use of dynamic panel estimators for cross country panel empirical investigation have steadily increased (see, Dutta and Mallick, 2018; Dutta and Williamson, 2016; Dutta and Sobel, 2016; Cooray, Dutta and Mallick, 2016; Asiedu and Lin, 2011; Dollar and Kray, 2002, Bond, Hoeffler and Temple, 2001 to mention a few). By allowing us the dynamic process of economic activity, dynamic panel estimators have become popular in cross country panel estimation because of being well suited to handle varied panel data challenges. Such models help us to control for unobservable heterogeneity.

It needs to be mentioned here that we consider a 2-year interval panel for all the robustness tests instead of an annual panel which we did so far. Considering the approach of Acemoglu et al. (2008), we consider a 2-year interval. There are a few

reasons for doing this. First, as they mention impact of economic policy or economic variables like per capita net state domestic product in our case may not be instantaneous and, thus, an interval panel takes that into account. Second, such interval panels mitigate serial correlation concerns. Acemoglu et al. (2008) consider a 5-year interval panel where an observation is considered every 5 years. Averaging variables also help us take into account that economic policy may not have instantaneous impact. But as the authors stress interval panel is preferable to averaging since the latter can introduce additional serial correlation[7], making inference and estimation more difficult. Finally, while the concern of instrument proliferation is more associated with System GMM estimators, Difference GMM estimators may still have some of that concern. Considering an interval panel keeps the instrument count within a check and thus, our estimates are not susceptible to being biased. The 2-year interval panel implies that an observation is considered every 2 years. A five-year interval panel is better but given our restricted sample size both in terms of N and T, we stick to a 2 year interval panel.

We present the Difference GMM estimates in Table 5. We instrument both per capita net state income and its square term. Other than instrumenting per capita state income and its square, we also lag these variables to further control for possible endogeneity. In other words, we instrument the lag of these variables. We also lag adult crime by one period to take into account possible endogeneity concerns. To briefly remind, here, lagging by one period essentially translates into a 2-year lag since we are using a 2-year interval panel. Higher levels of conviction rate in a state can lead to higher levels of adult crime.

**Table 5**
**Difference GMM Specifications: Adult Crimes and State Per Capita Income – Interaction with Conviction Rate**

| | *(1)* |
|---|---|
| Adult Crime$_{t-1}$ | 0.646*** |
| | (0.109) |
| Per capita income$_{t-1}$ | -0.0522*** |
| | (0.0160) |
| (Per capita income)$^2_{t-1}$ | 0.0104*** |
| | (0.00136) |
| Police Strength | 0.103*** |
| | (0.0732) |
| (Police Strength)$^2$ | 0.00569 |
| | (0.0119) |
| (Per c.Income*Con.Rate)$_{t-1}$ | -0.000594 |
| | (0.000930) |
| Conviction Rate$_{t-1}$ | 0.00620*** |
| | (0.00244) |
| Constant | -0.0118 |
| | (0.0620) |

| | |
|---|---|
| Observations | 54 |
| Number of States | 18 |
| Sargan Test (p-value) | 0.73 |
| Second order autocorr. Test (p value) | 0.78 |

Notes: Specifications are Difference GMM Estimates. Dependent variable is *number of adults committing property crime out of total population. Per capita income* stands for net state domestic product and is considered in per capita terms. $(Per\ capita\ income)^2$ is the square of per capita income. *Police Strength* represents per capita police strength and $(Police\ Strength)^2$ stands for square of per capita police strength. *Conviction Rate* represents the state specific rate at which an arrest is converted to some form of punishment. *Per c.Income*Con.Rate* is the interaction of per capita state income and conviction rate. Per capita Income and its square term are instrumented and lagged 1 period. Conviction Rate and the interaction term are also lagged 1 period. Standard errors are clustered by states. ***, ** and * denote significance at 1%, 5%, and 10%, respectively.

We find that the interaction term, (Per c.Income*Con.Rate), is negative and significant, reaffirming previous conclusions. As conviction rate rises signifying an improving law and order, a rise in per capita state specific income reduces adult crime rates. We find that per capita income and its square are significant and of the desired signs. We report the p values from the Sargan statistic to make sure that the generated internal instruments meet the over identification restrictions. As mentioned by Baum and Schaffer (2003), the Sargan statistic is identical to the Hansen J statistic when the efficient two-step GMM estimator is applied. We do apply the two-step GMM estimator. We also calculated the marginal estimates following the same methodology that we adopted to present the results in Figure 4.1. The marginal estimates are calculated based on column (1) estimates of Table 5. We retain the same format – Panel A reports the marginal estimates at the 50$^{th}$ percentile of per capita state income, Panel B reports the results for the 10$^{th}$ percentile of per capita state income and finally in Panel C, we report the marginal estimates for the 90$^{th}$ percentile of per capita state income. We find that our conclusions remain unchanged[8].

The magnitudes are different from Table 4 but qualitatively our conclusions are the same. At low values of per capita state income, a rise in per capita state specific has the strongest impact in declining adult property crime rates across all levels of conviction rate. Higher levels of conviction rate create better impact reflecting the efficiency level of the judiciary system, where the fear of any forms of punishment acts more as a deterring factor. For higher values of per capita state income, while a rise in the same still creates a positive effect on adult crime rate but with a dampening impact as per capita state income rises. In fact, we find that at the 90$^{th}$ percentile of per capita state income (a rich state), the impact of state specific per capita income is insignificant across the highest level of conviction rate.

Our final set of robustness tests consist of a measure of income inequality. As mentioned throughout the paper, we are unable to consider income inequality as our benchmark measure due to data constraints. From the India state briefs report

published by World Bank (2018), one that has compiled state wise data for India from census and other scattered sources, we are able to get 2 data points per state for our sample period. The 2 sample periods considered are 2005 and 2012. However, running regressions with 2 sample points per state reduces our sample considerably and render the results insignificant. So in an attempt to check results with an extended sample, we create an interpolated data set of income inequality from 2001 to 2015 by considering the two data points of 2005 and 2012. The results show that the coefficient of income inequality itself is though not significant but the sign of the coefficients are consistent[9].

## VI. CONCLUDING REMARKS

The present study offered a detailed account of the incidence of adult property crime in India as determined by state level per capita income and a number of important explanatory variables. We showed that as per capita state income increases, the incidence of property crime committed by adults' decreases – a more prosperous state or greater urbanization creating more opportunities diminishes such incidences. But interestingly, as per capita state income increases further, the negative impact of income on adult property crime diminishes.

Secondly, the study also explored the impact of state income conditioned upon other state-specific development and institutional factors that can influence such incidences. These factors include varying degrees of law and order as represented by the police strength and conviction rate implemented by the judiciary system on the criminal scenario across states. We find that given a mean value of state income, higher conviction rate diminishes the incidences of property crime. Therefore, conviction rate reflects judicial attitudes which when coupled with an expansion of policing, acts as a tough law and order stance.

### Acknowledgement

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### Notes

1. As coined by National Crime Records Bureau, the broad classifications of crimes under Indian Penal Code (IPC) consist of 11 categories – out of which the category incorporated in this paper is the crime relating to Property Offences. This comprises of dacoity, making preparation and assembly for committing dacoity, robbery, criminal trespass/burglary and theft. Violent crime includes Murder, Kidnapping and Abduction, Rape and Rioting. Revised definition of Violent Crime is made by excluding 'Preparation/Assembly for Dacoity' & including 'Grievous Hurts'. Violent Crimes in metropolitan cities is actually a new addition in 2016 (NCRB Report, 2016).
2. Income inequality as the main explanatory variable has been considered in the robustness check with an insignificant result.

3. Unit of incidence is officially reported number of adults committing property crime. The source of data is our benchmark source – National Crime Records Bureau, Ministry of Home Affairs (Government of India).
3. Though the work of Levitt (1998) suggest a conceptual difference between deterrence and incapacitation, where incapacitation suggests that an increase in the arrest rate for one crime will reduce all crime rates. Whereas deterrence predicts that an increase in the arrest rate for one crime will lead to a rise in other crimes as criminals substitute away from the first crime. Empirically, deterrence appears to be the more important factors, particularly for property crimes provided when one can identify unit level data reporting the shift of the criminals from one crime form to another. Given the data constraint in the unit level, as reported by the NCRB (Government of India) we consider the deterrence effect through conviction of criminals for one crime and its impact on all other forms of crime rates.
5. Here we calculate the threshold value of per capita net state domestic product at the $50^{th}$ percentile of conviction rate and the value of per capita net state domestic product comes to be around 6 which are almost same as before.
6. Considering the space constraint, we have not reported the tabular finding of the marginal estimates for different levels of conviction rate as well as per capita income but they are available on request.
7. We have checked for serial correlation of first order in our data and there is presence of the same. Thus, considering an interval panel is efficient.
8. Due to space constraint we do not represent the marginal estimates under GMM estimator. The results are available on requests.
9. Results are available on request.

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# An Empirical Study of Causes, Concerns and Impacts of Migration in India: A Development Perspective and Implications

Archana Sinha*

*Migration is not a new phenomenon; nor is it a failure of or a substitute for development in the present times. In normal conditions, human migration has taken place owing to the lack of social and economic opportunities at the place where one resides. Hence people start moving to those centers where they can meet their needs and overcome miseries. This empirical research study is necessitated to understand the implications of migration within country, interstate, inter-district and the social, political and economic impacts and to know how the society and state respond to the ever-growing process of migration; to understand the policies and overall preparedness of governments. The states of Chhattisgarh, Jharkhand, Madhya Pradesh and Uttar Pradesh are identified as historically migrants originating areas. The village and city with a considerable concentration of migrated population were selected within the systematic criteria through random sampling. The present study was carried out to examine the causes of migration in these four states; to find out the strata tending to migrate; to find out the impacts of migration in these four states, and to analyze opportunities for migrant workers and opportunities which exist for migrants of other states. An assessment of the impact of migration was done using the parameters that included, increase in their total monthly income, increase in the number of family assets, working hours per day, overall living conditions, and status of women. There were more options for monthly income source as well as assets after migration at the destination place. An overall 59.1 per cent of respondents revealed an improvement in their living conditions after migration. A deeper inquiry into the reasons for such a positive impact of migration on their living conditions was attributed to – savings at the destination place, improved agricultural situation at origin place, better availability of work at destination place at relatively regular basis, assured monthly income, better food and clothing at destination place, and better wages and livelihood options. In light of this, it was observed and stated by the migrants as well that economic factors are the most important ones accountable for out-migration and unemployment of the most important push factor. Changes in standard of living transpired due to higher income, expenditure and investments, new pucca houses and more possessions of assets were also reported. Above all, a higher contentment level was perceived for resource use, autonomy in decision and gain in material assets and possessions.*

**Keywords:** *Seasonal migration, Long term migration, Livelihood, MGNREGA, Agriculture*

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## I. INTRODUCTION

Caste, social networks and historical precedents play a powerful role in shaping patterns of migration. Migration for the poor is mainly circular, as despite moving temporarily to urban areas, they lack the social security which might keep them there more permanently. They are also keen to maintain a foothold in home areas during the agricultural season. This study is necessitated to understand the implications of migration within country, inter-state, inter-district and cross-border migration; the social, political and economic impacts and to know how society, political parties and state respond to the ever-growing process of migration; to understand the policies and overall preparedness of governments and to influence the stakeholders.

## II. GEOGRAPHICAL AREA

The states of Chhattisgarh, Jharkhand, Madhya Pradesh and Uttar Pradesh are identified as historically migrants originating areas. The workers from Bihar-Jharkhand migrated not only to urban centers in India but from seventeenth-century slave labour trade began from Bihar. The village and city with a considerable concentration of migrated population were selected within the systematic criteria through random sampling. The random household sampling procedure was employed for the selection of the respondent and collection of data.

## III. OBJECTIVES

The present study of causes, concerns and impacts of migration 'within', 'to' and 'from' the states of Chhattisgarh, Jharkhand, Madhya Pradesh and Uttar Pradesh involved the objectives - i) to examine the causes of migration in four states, ii) to find out the strata or the economic group/class that tend to migrate, iii) to find out the impacts of migration on social structure in four states and iv) to analyze opportunities for migrant workers and opportunities that exist for migrants of other states.

## IV. METHODOLOGY

This research study intends to work towards understanding and mapping out the broad trends in migration and livelihood and document case studies and village/area profiles. We need to understand the broad macro factors that lead to new trends and patterns of migration and changes in livelihood patterns. What livelihood opportunities are closing down and what are the new sites of work that are opening up for the states under study. The study involved desk research based on available studies and literature. Thereafter, fieldwork was conducted in selected areas and information was collected through personal interview method and discussions.

**Sample Selection**

The study was undertaken in the states of Chhattisgarh, Jharkhand, MP and UP of India. Two districts from each state and two villages per district were selected through systematic criteria - where there is a mixed population, that is, households from all social groups and where migration is more rampant. Seventy-five households from each village were selected through random sampling. The random household sampling procedure was employed for the selection of the respondent and the collection of data. In all, a sample of 1200 migrant households (300 migrant households from each state) (primary data) was investigated within a particular time frame in 2013 by the author. Accordingly, the sample was selected from low-income households and having some work engagements outside the village.

**General Features of Sample Households at Origin Place**

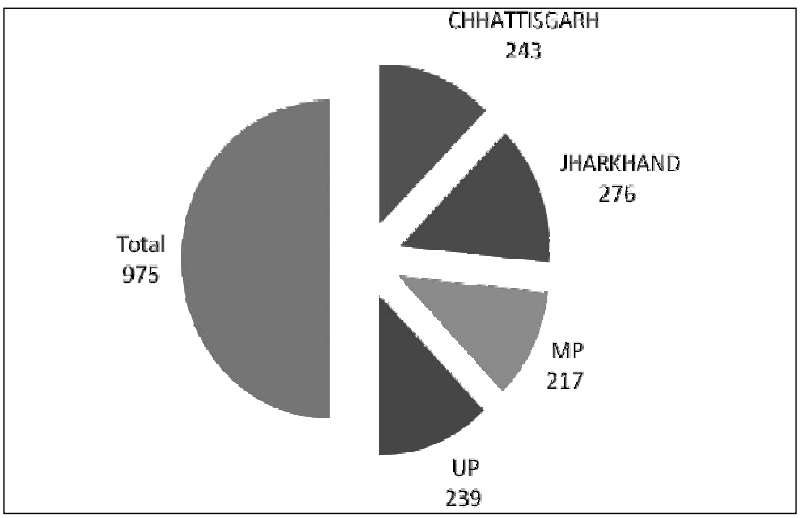
Two districts were selected under each state (CG, Jharkhand, MP, UP) randomly, and villages under each district were selected based onthe low level of development, proximity and connectivity to the main metallic road.

- In Chhattisgarh, two districts (Jashpur and Bilaspur) were selected. The two districts have two villages each (Basen and Bhursabad from Jashpur district; Beltakri and Gataura from Bilaspur district) comprising 75 households per village, making a total of 300 sample households from Chhattisgarh state.
- In Jharkhand, two districts (Gadwa and Palamu) were selected. Gadwa district has two villages each (Sondag and Mongdeh from Gadwa district; comprising of 75 households per village. While Palamu district comprising10 households from Raani ki Kala village, 10 households from Gataura village, 55 households from Seeki village, 70 households from Chiyanki village, 2 households from Matpurhi village, 2 households from Gadke village, 1 household from Mahademade village), thus making a total of 300 sample households from Jharkhand State.
- In Madhya Pradesh, two districts (Sagar and Bhopal) were selected. Each of these two districts has two villages each (Chandrapur and Hinautiya kalan from Sagar district; Padariya Kachhi and Bhadbhada from Bhopal district) comprising 75 households per village, making it a total of 300 sample households from Madhya Pradesh.
- In Uttar Pradesh, two districts (Kaushambi and Jhansi) were selected each of the two districts has two villages each (Rakswara Khas and Songhiya villages from Kaushambi district; Atariya and Kalaupura village from Jhansi district) comprising 75 households per village making a total of 300 sample households from Uttar Pradesh.

Thus a total of 1200 households (300 households each from CG, Jharkhand, MP, UP) formed the sample population for the study.

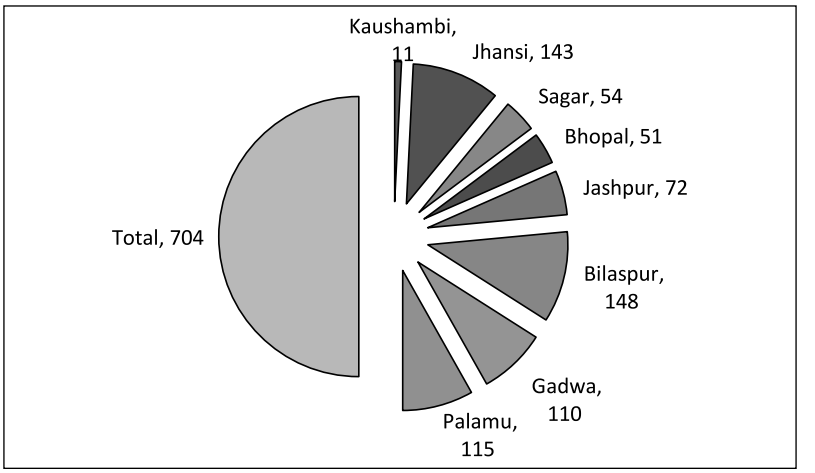
On analyzing the sample households on the basis of social groups, it was revealed that out of a total 1200 households, overall there were 468 households belonging to SC (Scheduled Caste) category, 393 belonging to Backward Caste category, 224 households belonging to ST (Scheduled Tribe) category, 68 households belonging to the General category and 47 households belonging to the Muslim category. The state-wise distribution of social groups revealed that among the SC sample, a maximum of 158 households were from Jharkhand, 110 households from Chhattisgarh, 104 households from Madhya Pradesh, and 96 households from Uttar Pradesh. Among the Backward caste group, a maximum of 153 households were from Madhya Pradesh, 136 households from Uttar Pradesh, 82 households from Chhattisgarh, 22 households were from Jharkhand. Among the ST social group, a maximum of 97 households were from Chhattisgarh, 88 households from Jharkhand, 27 households from Uttar Pradeshand merely 12 households were from Madhya Pradesh. In the Muslim social category, 23 households were from Jharkhand, 18 households from Uttar Pradesh and merely 6 households were from Chhattisgarh.

Figure 1
**Households Belonging to BPL Category**




Overall, out of 1200 households, 975 (81.3 per cent) belonged to BPL (Below Poverty Line). State-wise analysis revealed that out of 975 BPL households, a maximum of 276 households were from Jharkhand, 243 households were from Chhattisgarh, 239 households were from Uttar Pradesh, and 217 households were from Madhya Pradesh (Figure 1).

Figure 2
**Households at Origin Place who feel Compelled to Migrate**




A district-wise inquiry was done to find out whether there is any need or compulsion for these sample households to migrate from their source place. Data revealed that out of total 1200 households, 704 (58.7 per cent) expressed that they are compelled to migrate; 428 (35.6 per cent) did not feel any compulsion to migrate; while 68 (5.7 per cent) did not respond to this query.

District-wise analysis of the above revealed that out of 704 households who were compelled to migrate, 148 households were from Bilaspur district, 143 households were from Jhansi, 115 households were from Palamu, 110 households were from Gadwa, 72 households were from Jashpur, 54 households were from Sagar and 11 households were from Kaushambi district (Figure 2).

Figure 3
**Preference for Type of Migration**

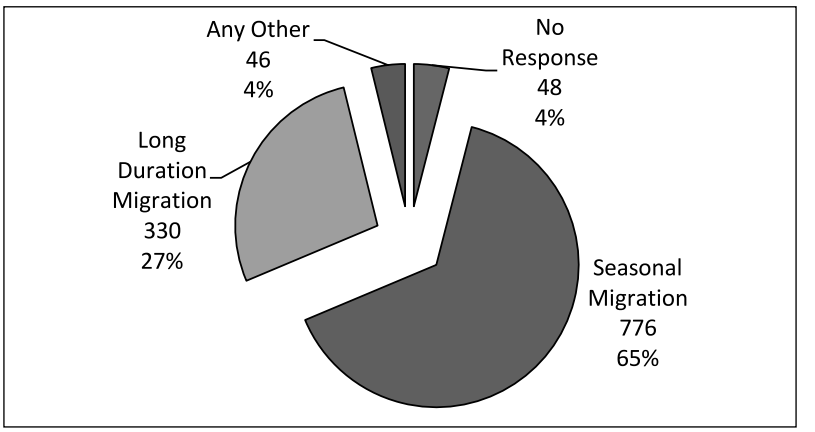


Figure 4
**Preference for Seasonal Migration**

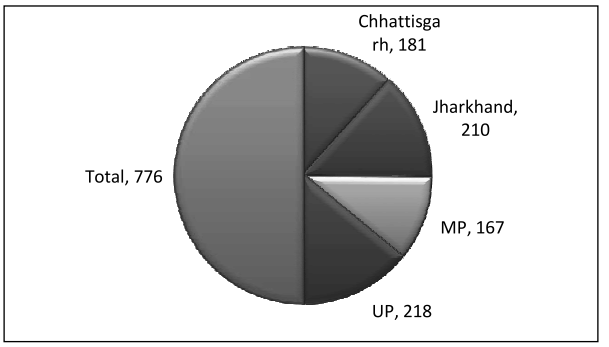
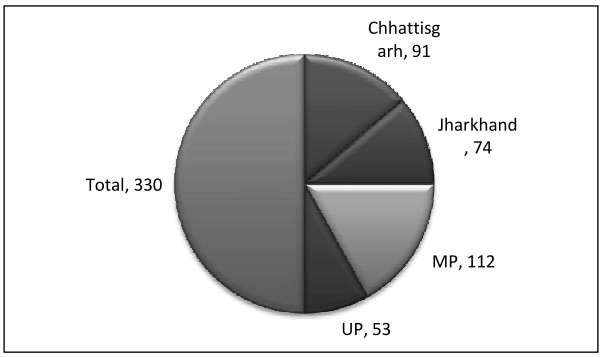



Figure 5
**Preference for Long-Term Migration**




State-wise inquiry on the preference for type of migration showed that 776 (64.7 per cent) households preferred seasonal migration and 330 (27.5 per cent) households preferred long-term duration (Figure 3). Among 776 households preferring seasonal migration, 218 households were from Uttar Pradesh, 210 households were from Jharkhand, 181 households were from Chhattisgarh and 167 households were from Madhya Pradesh (Figure 4). While among 330 households opting for long-term duration migration, 112 households were from Madhya Pradesh, 91 households were also from Chhattisgarh, 74 households were from Jharkhand and 53 households were from Uttar Pradesh (Figure 5).

District-wise analysis of the preference for seasonal migration depicted highest of 136 households in Palamu, 124 households in Sagar, 117 households in Jhansi, 101 households in Kaushambi, 95 households in Bilaspur, 86 households in Jashpur and 74 households in Gadwa district. With regards to preference for long-term migration, the highest figure was accorded to Bhopal (87 households), followed by Gadwa (66 households), Bilaspur (47 households), Jashpur (44 households), Kaushambi (35

households), Jhansi (18 households) and Palamu (8 households).

State-wise analysis was done for those households in the selected study village who do not wish to migrate to any other place. Analysis of the "reasons for no-migration" revealed that overall, a maximum of 107 households stated that they were unwilling to migrate outside their state or village for work (highest proportion in MP), followed by 88 households who stated that they are not interestedin migrating (highest proportion in MP), 87 households said that they won't migrate till they get a better livelihood opportunity (highest proportion in UP), 85 households could not reveal any particular reason for non-migration, 41 households said that there is no reason to migrate because work is available in their village/city/state (highest in MP), 27 households said that they do not migrate because there is exploitation by the employers and contractors (highest in Jharkhand), 26 households from U.P. said that they are not willing to leave their family and place, 10 households from U.P. said that they cannot leave their native place andthree households said that they have to spend a significant amount of money on commuting while one household from Chhattisgarh felt that there is no point in migrating because wherever they go their condition will remain the same.

Figure 6
**Reasons for Migration**

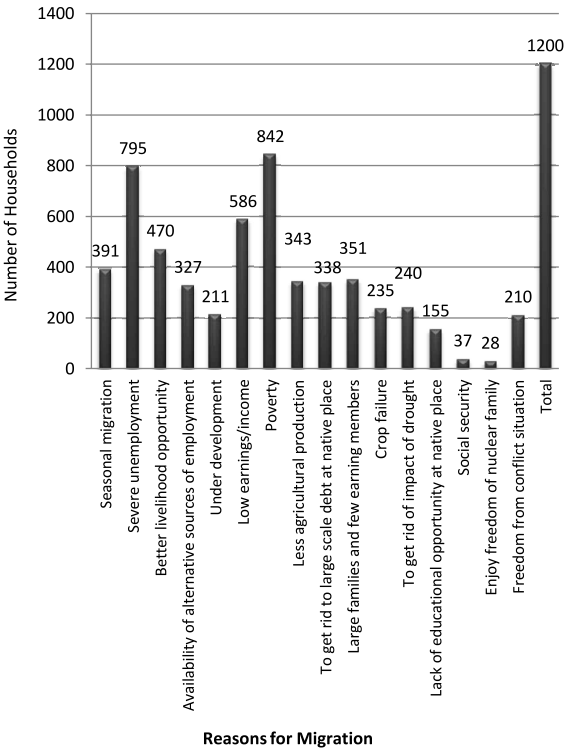
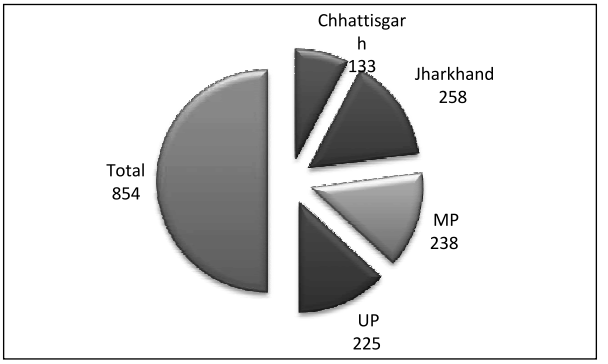


Figure 6 reveals the state-wise analysis done for those households in the selected villages who migrate outside their village. Analysis of their "reasons for migration" revealed that overall, a maximum of 842 households migrate due to poverty factor (highest proportion from Jharkhand and Uttar Pradesh); followed by 795 households due to severe unemployment (highest proportion from Jharkhand); 586 households due to low earnings(highest proportion from Uttar Pradesh); 470 households due to better livelihood opportunities (highest proportion from Uttar Pradesh); 391 households stated seasonal migration (highest proportion from Uttar Pradesh and Madhya Pradesh); 351 households migrate because of their large family size and very few earning members (highest proportion from Uttar Pradesh); 343 households migrate because there is very less agricultural production in their villages (highest proportion from Uttar Pradesh and then from Jharkhand); 338 households migrate in order to get rid of large-scale debt at their native place (highest proportion from Chhattisgarh, then Uttar Pradesh, Jharkhand and Madhya Pradesh); 327 households migrate in search of availability of alternative sources of employment (highest proportion from Uttar Pradesh); 240 households migrate in order to be rid of the impact of drought condition in village (highest proportion from Uttar Pradesh, then Jharkhand); 235 households migrate because of crop failure in their village (highest proportion from Uttar Pradesh); nearly 210 households due to status of under-development and conflict situations including caste-based conflict (highest proportion from Uttar Pradesh in both cases); 155 households migrate due to lack of educational opportunities at their native place - almost equally in all the states; 37 households migrate due to lack of social security in their village almost equally in all the states and 28 households migrate in order to enjoy the freedom to be a nuclear family.

An inquiry was made to find out the problems faced by the respondent households in agriculture. At the state level, it was depicted that a maximum of 632 households faced problems in irrigation (highest proportion of 282 households in Jharkhand, then 199 households in Uttar Pradesh, 103 households in Chhattisgarh and 48 households in Madhya Pradesh); 399 households faced problems in agriculture due to lack of fertilizers (highest proportion in Uttar Pradesh); 309 households faced problems in agriculture due to high cost of agriculture production (highest proportion in Uttar Pradesh and then in Chhattisgarh); 192 households faced problems in agriculture because there is hardly any profit in agricultural production (highest and almost equal proportion in Chhattisgarh and Jharkhand; 37 households faced problems in agriculture because farmers now are interested in shifting to non-agricultural works highest proportion in Jharkhand); 33 households faced problems in agriculture because the farmers are interested in migrating to the urban areas (highest proportion in Jharkhand); four households from Jharkhand belonging to ST category stated that insufficient rains cause problems in agriculture and one household from Uttar Pradesh belonging to Muslim category stated that being under debt leads them to problems in agriculture.

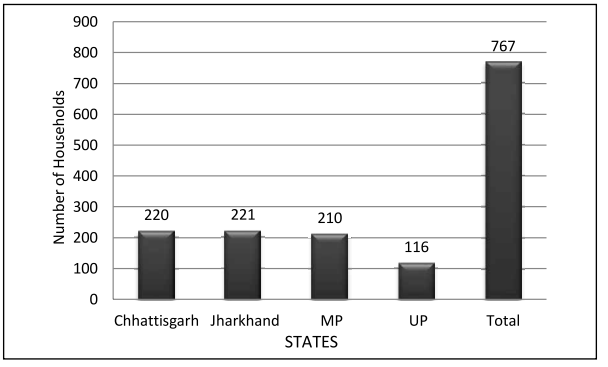
When asked whether the agricultural production is sufficient to sustain their households - at the state levelmerely 5.9 per cent (71 households out of 1200 households) said 'yes', whereas 71.2 per cent (854 households) said that it is 'not' sufficient to sustain their households (95 households – 11 per cent from Kaushambi and 130 households – 15 per cent from Jhansi in Uttar Pradesh; 107 households – 12 per cent from Sagar district and 131 households – 15 per cent from Bhopal district in Madhya Pradesh; 101 households – 12 per cent from Jashpur district and 32 households – 4 per cent from Bilaspur district in Chhattisgarh; and 142 households – 17 per cent from Gadwa district and 116 households – 14 per cent from Palamu district in Jharkhand) (Figure 7).

Figure 7
**Agricultural Production Not Sufficient to Sustain Households (State-wise number of households)**




Further, the highest proportion of households stating that agricultural production is insufficient to sustain their households were from SC group (331) followed by Backward Caste group (279), ST group (162), General group (52) and then Muslim group (30).

Figure 8
**Non-availability of any Livelihood Option in Origin Place**



State-wise analysis of prevalence of any livelihood option in the village of the respondent households show that overall 63.9 per cent per cent (767 households) stated that they had no such options (highest and equal proportion of nearly 220 from Jharkhand and Chhattisgarh; followed by 210 households from Madhya Pradesh and 116 households from Uttar Pradesh); while 20.3 per cent (243 households) stated that there are livelihood options available in their village area (highest proportion of 116 households in Uttar Pradesh, followed by 41 households in Chhattisgarh and almost equal proportion in Jharkhand and Madhya Pradesh) (Figure 8).

The available livelihood options include: works in MGNREGS, agricultural and other labour work; work in mahua shops; domestic work in other houses; work in small industry; animal husbandry and dairy; driving work, brick-kiln work; cleaning work; coal mine and construction work; work in crasher factories; fish rearing; honey-making factory; other factory work; furniture making; rickshaw pulling; making liquor from mahua; the kesar factory; collecting herbs; pottery making; stone mining; collecting wood from the jungle; selling vegetables; selling wood and herbs; tailoring work; work in coal depot; tea shops; iron factory; making brooms and baskets.

Further district-wise analysis of the availability of livelihood options in their own village area shows the highest proportion of 142 households in Gadwa district, followed by 140 households in Sagar district, 135 households in Bilaspur district, 103 households in Kaushambi district, 85 households in Jashpur district, 79 households in Palamu district, 70 households in Bhopal district and 13 households in Jhansi district.

**Conditions at Destination Place**

An enquiry was done to assess the aim of saving money at the destination place by migrants.The responses cited were as follows –family benefit; house construction; children's education; meeting family expenses; fulfilling other family requirements; unexpected expenses; agricultural development at their place of origin; repayment of debt; purchasing land; purchasing vehicle; purchasing animals at place of origin; generating income for self-employment; improving standard of life; children's marriage; treatment if sick; spending on festivals; food and clothing; bank savings; purchasing tractor; purchasing jewelry and for self-development.

An enquiry was made to find out the total number of earning members in the migrants' family, it was revealed that 285 households in Chhattisgarh had an average of two earning members per family. While Jharkhand (280 households), Madhya Pradesh (295 households), and Uttar Pradesh (295 households) had an average of single earning member per family at place of destination. 167 households in Chhattisgarh, 224 households in Jharkhand and 205 households in Uttar Pradesh had an average two earning members per family; while 201 households in Madhya Pradesh had an average of single earning member at the place of origin among the study sample (Table1).

Table 1
**Average Number of Earning Members in Case of Family at Destination Place/Origin Place**

| *State* | *Number of Earning Members in case of a family at Destination Place* | | *Number of Earning Members in case of a family at Origin Place* | |
|---|---|---|---|---|
| | *Average* | *For the no. of households* | *Average* | *For the no. of households* |
| Chhattisgarh | 2 | 285 | 2 | 167 |
| Jharkhand | 1 | 280 | 2 | 224 |
| MP | 1 | 295 | 1 | 201 |
| UP | 1 | 295 | 2 | 205 |
| Total | 1 | 1155 | 2 | 797 |

State-wise analysis about the pattern of wage payment at destination shows that in 40 migrants in Uttar Pradesh (21 in Jhansi and 19 in Kaushambi); 33 migrants in Chhattisgarh (22 in Jashpur and 11 in Bilaspur); 29 migrants in Jharkhand (28 in Palamu and 1 in Gadwa) 22 migrants in Madhya Pradesh (12 in Bhopal and 10 in Sagar) reported receiving wages on a daily basis (full or partial). While in Chhattisgarh, 180 migrants (106 in Bilaspur and 74 in Jashpur); 115 migrants in Madhya Pradesh (74 in Bhopal and 41 in Sagar); 112 migrants in Uttar Pradesh (77 in Jhansi and 35 in Kaushambi) and 71 migrants in Jharkhand (65 in Palamu and 6 in Gadwa) received wages on weekly basis (full or partial).

On the other hand, 191 migrants in Jharkhand (129 in Gadwa and 62 in Palamu); 160 migrants in Madhya Pradesh (93 in Sagar and 67 in Bhopal); 127 migrants in Uttar Pradesh (77 in Kaushambi and 50 in Jhansi) and 124 migrants in Chhattisgarh (85 in Jashpur and 39 in Bilaspur) received their wages on monthly basis.

There were various reasons cited by migrants for payment of less wages at the place of destination. These reasons included: whenever the contractor or the employer suffered any kind of monetary loss they tended to pay less wages to the workers; many times the employers were not good and honest; at times when workers could not do their full job due to their sickness, they were paid less; at times the contractor took two months' salary from the workers; the contractors deduct their commission and hence paid less wages to the workers; in some cases, the contractors were holding 10-15 days wages with themselves only and if asked, workers were denied their due share of wage money and were asked to leave work. Some migrants revealed that wage was given to the workers on the basis of their work experience; they also revealed that less wages were paid to them due to less attendance at work and due to low working hours at the work site; sometimes less attendance at worksite was due to sickness and poor health condition; due to being untrained workers, they don't get sufficient works; sometimes contractors deducted the cost of medicine from the wage payment; sometimes food and housing were provided by the contractors or employers and

their wages was paid less accordingly.It was also reported by the individual migrants that whenever they committed any mistake (for example, in brick kilns), there was a deduction in their salary by the employers; they were paid as per the number of days worked; in the verge of leaving the job they were paid less; less wages were paid to the unskilled workers; no payment was made in case the migrant workers left their work in between and left the place; in many situations, it was reported that there were many labourers working at the work site, hence payment was not done to the workers on a regular scheduled basis, they were paid whenever they had requirement for money; there was no wages for holidays; in some places, if the workers reported late for three days in a month beyond 15 minutes, then one day's salary was deducted; wages were paid as per the quantum of work. Further it was important to note that in several cases, wages were not paid in terms of money, but rather it was in terms of food grains. They were compelled to work with less wages due to under-employment and lack of opportunities available.

Table 2
**Numbers of days per month migrants manage to get work at destination (State wise)**

| Number of days per month Migrants manage to get Work at Destination | State | | | | Total |
|---|---|---|---|---|---|
| | Chhattisgarh | Jharkhand | MP | UP | |
| 10-15 days | 60 | 7 | 1 | | 68 |
| 16-20 days | 111 | 8 | 22 | 6 | 147 |
| 21-25 days | 54 | 183 | 115 | 62 | 414 |
| All 30 days | 64 | 75 | 155 | 223 | 517 |
| Households | 300 | 300 | 300 | 300 | |

Table 3
**Numbers of days per month migrants manage to get work at destination (District wise)**

| *District* | *Number of days per month migrants manage to get work at destination* | | | | *Households* |
|---|---|---|---|---|---|
| | *10-15 days* | *16-20 days* | *21-25 days* | *All 30 days* | |
| Kaushambi | | 5 | 47 | 94 | 150 |
| Jhansi | | 1 | 15 | 129 | 150 |
| Sagar | 1 | 6 | 60 | 77 | 150 |
| Bhopal | | 16 | 55 | 78 | 150 |
| Jashpur | 42 | 30 | 36 | 35 | 150 |
| Bilaspur | 18 | 81 | 18 | 29 | 150 |
| Gadwa | | 1 | 135 | 3 | 150 |
| Palamu | 7 | 7 | 48 | 72 | 150 |
| Total | 68 | 147 | 414 | 517 | |

A state-wise analysis (Table 2) on the number of days per month the migrants managed to get work at destination place shows that 60 migrants from Chhattisgarh (42 from Jashpur and 18 from Bilaspur); 7 migrants from Jharkhand (Palamu) and one

migrant from Madhya Pradesh (Sagar) managed to get work for only 10-15 days per month. On the other hand, 111 migrants from Chhattisgarh (81 from Bilaspur and 30 from Jashpur); 22 migrants from Madhya Pradesh (16 from Bhopal and 6 from Sagar); 8 migrants from Jharkhand (7 from Palamu and 1 from Gadwa); 6 migrants from Uttar Pradesh (5 Kaushambi and 1 from Jhansi) managed to get work between 16 to 20 days. 183 migrants from Jharkhand (135 from Gadwa and 48 from Palamu); 115 migrants from Madhya Pradesh (60 from Sagar and 55 from Bhopal); 62 migrants from Uttar Pradesh (47 from Kaushambi and 15 from Jhansi); 54 migrants from Chhattisgarh (36 from Jashpur and 18 from Bilaspur) reportedly managed to get work between 21 to 25 days. Lastly, 223 migrants from Uttar Pradesh (129 from Jhansi and 94 from Kaushambi); 155 migrants from Madhya Pradesh (78 from Bhopal and 77 from Sagar); 75 migrants from Jharkhand (72 from Palamu and 3 from Gadwa) and 64 migrants from Chhattisgarh (35 from Jashpur and 29 from Bilaspur) managed to get work for full 30 days in a month at their place of destination (Table 3).

## V. EFFECTS OF MIGRATION

State-wise analysis was conducted to understand the perception of the migrants and their family on the use of earned money from migration, which revealed that 21 migrants from Chhattisgarh (Jashpur), 61 from Jharkhand (56 from Gadwa, 5 from Palamu), 128 from Madhya Pradesh (71 from Sagar, 57 from Bhopal) and 154 from UP (11 from Kaushambi, 143 from Jhansi) stated that they would like to use the earned money for purchasing land in their village. While 216 migrants from CG (77 from Jashpur, 139 from Bilaspur), 201 migrants from Jharkhand (127 from Gadwa, 74 from Palamu) 10 migrants from MP (Bhopal), 171 from UP (34 from Kaushambi, 137 from Jhansi) stated that they would like to use their earned money for purpose of repayment of debt. 50 migrants from CG (11 from Jashpur, 39 from Bilaspur), 37 from Jharkhand (Palamu), 88 from MP (68 from Sagar, 20 from Bhopal), 18 from UP (16 from Kaushambi, 2 from Jhansi) revealed that they would like to use their earned income only on food expenditure. An overall of 8 migrants from MP (Bhopal) and 26 migrants from UP (Kaushambi) stated that they will use their earned money for their house construction work.

When asked whether the migrants who are still working and living at their destination place would like to live there permanently or would like to return to their village, state-wise and district-wise analysis revealed that out of 173 respondents who said they would like to live at their destination place only were 66- 38.2 per cent from CG (that is, 13 from Jashpur, 53 from Bilaspur); 1, 0.6 per cent from Jharkhand (Palamu); 99 - 57.2 per cent from MP (4 from Sagar, 95 from Bhopal); 7 - 4 per cent from UP (4 from Kaushambi, 3 from Jhansi).

Whereas, an overall of 961 respondents stated that they would like to return to their source village from their place of destination. This included 220 - 22.9 per cent from CG (125 from Jashpur, 95 from Bilaspur); 269 - 28 per cent from Jharkhand (140 from Gadwa, 129 from Palamu); 196 - 20.4 per cent from MP (143 from Sagar, 53 from Bhopal); and 276 - 28.7 per cent from UP (138 from Kaushambi, 138 from Jhansi).

An assessment of the impact of migration was done using the parameters that included increase in their total monthly income, increase in the number of family assets, working hours per day, overall living conditions and the status of women.

Before migration, the source of total monthly income was – farming work, MGNREGS works, agricultural labour work, non-agricultural labour work, tea shop, pot making, mining works, soap making, bidi making, barber work, begging, selling wine, brick kiln work, cycle repairing, daily wage work, basket making and selling, domestic work, rickshaw pulling, animal rearing, goat rearing, petty shop, carpenter, egg selling, liquor selling, milk selling, selling of mud pots, handloom working, driving, and selling of fruits and vegetables.

Sources of total monthly income after migration at destination place included – agricultural labour, driving auto-rickshaw, daily work in MGNREGS, sweeper work in college, band party, barber (salon) work, bore well, brick kiln work along with spouse, brick making, house construction work, work through contractors, factory work, company work, coolie work, teaching work, watchman work, coal mine work, house painting work, conductor work, courier work, harvesting work, work on regular monthly income, higher daily wages, cycle repairing, daily work in shops, rope making and packing, driving work, dying of threads, electrical works, factory labour, brick kiln work, furniture shop work, garage work, preparing sweets in sweet shop, hotel work, house renovation, domestic work by both husband and wife, ironing work, grocery shop work, making thatched roofs, gardener work, machine operator, work in mobile shop, *paan* shop, pipe factory work, plumber work, selling of *prasad*, printing of sarees, rickshaw pulling, basket selling, selling of mud pots, priest work, work in showrooms, salesman work, tailoring work, sweeper work, spinning machine work, trolley driving, biscuit making, balloon making, bread making, milk selling, curd selling, laundry work, truck driving, ward boy work and workingin self-employment.

Family assets before migration included – small land holdings, small agricultural lands which were lying barren and those which were mortgaged, not cultivable, where sometimes farming was not sufficient to meet livelihood needs, for house holding even for an entire year.Other assets included a hut which was *kuchha* or even semi-*pucca* house, having cultivable land under mortgage, domestic animals like cows, bulls and some of the households owned parental property that was a *pucca* house.

Family assets after migration included – land, increase in land holdings, agricultural land, new house at origin place, increase in number of domestic animals, bicycle, *pucca* house at origin place due to income from destination place, income sufficient to meet family livelihood, renovated house at village, purchase of household assets like television, motor cycle, radio, mobile phone, colour television, new plot of land, clothes, food items – in order to improve standards of living and recovery from debt crisis.

The perceptions of the respondents were recorded to understand the impact of migration on their living conditions. An overall 49 per cent (588) of respondents revealed that their living conditions had deteriorated before migration, while only 3.6 per cent (43) respondents revealed the same after the migration; only 4.3 per cent (51) respondents stated that their living conditions had shown some improvements before migration at origin place, while 59.1 per cent (709) respondents revealed an improvement in their living conditions after migration. A deeper inquiry into the reasons for such a positive impact of migration on their living conditions was attributed to – savings at the destination place, income from animal husbandry work, improved agricultural situation at origin place, better availability of work at destination place at a relatively regular basis, assured monthly income, out of a conservative mindset at destination place, better food and clothing at destination place, improved economic situation, better housing conditions, improved livelihood at destination as well as origin place, better wages, availability of better jobs and its options.

An analysis of the perception of respondents on the impact of migration on the status of women revealed that – an overall 44.4 per cent (533) of respondents stated that the status of women in the migrants' families was in a deteriorating situation before migration, while merely 3.1 per cent (37) respondents stated the same situation after migration. On the other hand, 4.8 per cent (58) respondents stated that their situation was showing some improvement before migration, while 50.9 per cent (811) respondents expressed that there was a marked improvement in the status of women after migration. Deeper analysis on the reasons for such positive impact of migration on the status of women could be attributed to their better ability to run their family, better food as living standard, improvement in their day-to-day living, better income in hand - also by saving husband's salary, by self- employment, better lifestyle for children, change in their own lifestyle as well as their in their domestic sphere, children going to school, good living, good health, good food, improved economic conditions, more avenues as income sources, increased household income, increased monthly income of husbands provides more respect for her in her own family, self-dependence, increased self-determination, increased self-reliance, self-saving by tailoring work and better social status can fulfill primary needs to a desired level, decision to stay outside village along with her husband and work at home.

An assessment of the motivation factors at the destination place were revealed as –problems of unemployment, poverty, less wages, no regular work, landlessness, and small land holdings in their village. They are able to fulfill their family needs when they migrate to destination place and there is availability of jobs and livelihood opportunities for survival and life sustenance at destination place. There are better prospects for business and self-employment and also more importance given to skill. Welfare and Government facilities are better available and there is more income and work at destination place compared to what is available at origin place. There are better prospects for children's education and urban environment is better than rural environment as it provides a good standard of living. Some also reported that payment for work is right on time. The environment in urban areas is clean and healthy and more attractive. Socially, there is a better environment and the behaviour of neighbours is also good in the urban centres. In the urban centres, there are more prospects for additional income during leisure time. There is scope of sale of herbal medicine and business of traditional items. Overall, there is better scope and availability of livelihood options.

An assessment was done to know the opinion of selected migrant household respondents about the positive impact of the change in government policies and initiative in the place of origin. It was revealed that there was implementation of adult old-age pension scheme; Mahamaya Scheme; issue of Antyodaya card; economically vulnerable to have BPL card; Mid-day Meal scheme; Janani Suraksha scheme; MGNREGS with a hike in wages and job card; Indira Awaas Scheme; Ladali Laxmi Scheme; Kisan Pension Scheme and there has been a growing realization on the importance of education and loan for small business. There has also been an improvement in lifestyle for some households.

Opinion of the selected migrant household respondents about the negative impact of the change in government policies and initiatives in the place of origin revealed thateconomically vulnerable people in the village do not have a BPL card; no employment opportunities in village; no information about MGNREGS and its provisions, the intended beneficiaries do not get benefits from the schemes like old-age pension; Indira Awaas Scheme; ration card and no voter identity card. Due to involvement of middle men in government schemes, the intended beneficiaries are unable to receive immediate benefits from these schemes. The contractors, local people, public representatives and officials join together and indulge in corrupt practices. No job and regular work is available under MGNREGS. The scheme like MGNREGS is not successful in stopping migration. The government does not encourage migration, the police officials and railway TT give trouble while people are migrating. It is important to note that the migrant respondents reported that there was no pro-poor policy, policy for scheduled caste and policy for scheduled tribe by the government.

## VI. CONCLUSION

Migration is the somewhat permanent moving away of an individual or a group or a community from one place to another. The choice to move is based on certain felt deprivations, hassle, restrictions, desires, inspiration at the place of origin. Deprivations are collectively or individually when the immediate needs are not fulfilled by the existing conditions within a community (Haq, 1974). It is assumed that when opportunities like good employment, educational and physical facilities and public amenities are little in availability, some persons move out of the place and go to a different place where they are able to find adequate facilities and opportunities to improve their living standard.

- In Chhattisgarh, out of 300 households, 132 (44 per cent) reported that people mostly migrate to different states, 122 (40.7 per cent) reported migration within the same state and 24 (8 per cent) reported migration within the same district. Generally, from the states of Bihar, Jharkhand, Orissa, U.P., M.P., Haryana, and Maharashtra (Mumbai – Ullasnagar) - people migrate to the state of Chhattisgarh. Within Chhattisgarh, people mostly migrate to Jashpur, Kashabel, Bataikela, Katra, and Rakswara and would do seasonal migration. Mainly in Chhattisgarh, people are migrating for the purpose of developing farm-based economic conditions.
- In Jharkhand, out of 300 households, 236 (78.7 per cent) reported that people mostly migrate to different states, 17 (5.7 per cent) reported migration within the same state and 7 (2.3 per cent) reported migration within the same district. From all the states in general, and particularly the states of West Bengal, Bihar, U.P., C.G., Orissa, Gaya, Gujarat, Jharkhand, Karnataka, M.P., Rajasthan, Maharashtra, Delhiand Bhursadhab - people migrate to the state of Jharkhand.
- In Madhya Pradesh, out of 300 households, 8 (2.7 per cent) reported that people mostly migrate to different states, 185 (61.7 per cent) reported migration within the same state, and 87 (29 per cent) reported migration within the same district. From all the states in general and particularly the states of Bihar, Chhattisgarh, Jharkhand, Maharashtra, U.P., West Bengal, M.P., Orissa, Haryana - people migrate to the state of Madhya Pradesh.
- In Uttar Pradesh, out of 300 households, 203 (67.7 per cent) reported that people mostly migrate to different states, 14 (4.7 per cent) reported migration within the same state and 10 (3.3 per cent) reported migration within the same district. From all the northern states in general and particularly the states of Bihar, Chhattisgarh, Jharkhand, M.P., Haryana, U.P., Maharashtra, Orissa, and Punjab - people migrate to the state of Uttar Pradesh.

– In light of this, it can be accomplished from the present study that the main causes for migration appeared to be the lack of educational and health facilities, non-availability of employment and jobs, lack of and non-availability of housing facilities, etc. Therefore, it is recommended that the central and state government should provide all these amenities, services and facilities at the access level for villagers, to discontinue the rural flow of migration and provide opportunity to the rural people by way of improving their level of living standards and quality of life.

## VII. WAY FORWARD

Migration of the husbands alone from the villages puts women in a crisis-filled state while looking after and managing the households singly handedly. These problems can be grouped as personal, emotional, managerial, social and children-related. Despite the fact that there are economic benefits of migration but they convoy with intricacies for those who are left behind, women in particular. It is therefore vital to find out determinants of migration and problems upon women and family members due to migration of husband or male member of the family. It also has repercussions not only towards the family system as a unit of society, but at the national and international level also.

Therefore, it is significant to find ways of improving implementation of the MGNREG programme. The following interventions are recommended:

There is a need for building large-scale awareness campaigns for creating MGNREGS demand. There are ways to generate large scale-awareness amongst villagers. The first is taking up village-level campaigns to educate villagers on the provisions of MGNREGS and their rights and making the Panchayats cognizant of their responsibilities. The MGNREGS campaign could be a mixed approach where, on one hand, local media could be used to make the scheme well-informed while on the other, traditional communication methods - padyatra, village level meetings, and street plays - could be used to reach the most disadvantaged sections of society.This can be done along with the support of civil society organizations working at the local grassroots level. The awareness campaigns may provide basic information about the act as well as job cardholders' rights for 100 days' employment, but also provide help and assistance in implementing their rights. Additionally, the continuing efforts of the government to announce the scheme as well to reach out to the targeted and potential households need to be extended.

Need for improved institutional capacities of the Gram Panchayat -the panchayats have been recognized as the key implementation institute for MGNREGS. A panchayat of 100 households willing to work under MGNREGS will receive the amount as wages

and material cost. It is their capacity to use this amount meaningfully by generating employment as well as creating productive assets. Further, panchayats need to maintain multiple registers in order to keep records of MGNREGS as prescribed by the government, both centre and state. So, it is important to build their capacity for record-keeping as per norms, as many panchayats still continue to use the single entry system for their accounts. In order to achieve this purpose, there is a need to invest on strengthening their perspective, knowledge and skills in the areas of development of village plans along with the participation of Gram Sabha, skills in keeping records and accounts and maintenance of created assets.

There is a need for pro-active planning for effective engagement of block and district panchayats. Roles for Zila Panchayats and Janpad Panchayats are important for MGNREGS implementation, the higher tiers of Panchayati Raj Institutions are required to be more actively involved in MGNREGS implementation from the perspective of the district level as a unit of development. These tiers of panchayats are better suited to construct mechanisms of operation and also maintenance of big assets, *and effective delivery of serv*ices. It is also required to maintain and build mechanisms for combined responsibilities of this three-tier system.

Need for mainstreaming state-level MGNREGS committees and advancing a culture of inclusiveness. Mainstreaming and inclusion of some community-based organizations, civil society representatives, district collectors, districtlevel panchayat leaders, etc., in the planning process is vital so that diverse stakeholder concerns are expressed and incorporated. A culture of *Jan Sunwai* on a regular basis should be established at the state-level as a programme in collaboration of the state with civil society, along with a MGNREGS performance note by the government, where various stakeholders, including the academia and grassroots activists present their opinions.

The ways forward presented in this part of the report are based on the emerging issues from the respondent households and other discussion and interactions at the village and state-level, during the course of data collection in the field. Hence, it is felt that the strength of engagement of civil society with the MGNREGS implementation process will provide newer challenges and alternative ways forward.

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# Seasonal Migration and Spatial Diversification in Rural Labour Market

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*Abstract: The rising employment opportunities outside agriculture has brought significant changes in the rural labour market and landless labour in particular. In this study among the landless rural labour of semi-arid region in Odisha are identified as migrant workers tends for spatial diversification, despite several state-intervention schemes such as MGNREGA work, food security public distribution system. In this backdrop, this paper has attempted to examine the underlying factors in the changing pattern of rural labour diversification. This study is depended on both primary and secondary data sources. This study collected primary data from the household survey in Odisha. The analysis of the study uses quantitative and econometrics tools such as logistic regression. Assuming improved living condition at the household level, this paper also argues that seasonal migration is a routine and inseparable livelihood strategy in the semi-arid zones of Odisha. That generates employment opportunities, meets the credit needs of poor households, and minimizes the gap between patron (landlord, moneylenders) and client (landless and marginal farmers) relationship. Unless the institutional arrangements function well, seasonal migration should be promoted as an alternative livelihoods strategy in the semi-arid zones.*

**Keywords:** *Seasonal migration, Diversification, Labour market, Poverty, Odisha*

## I. INTRODUCTION

The factors responsible for the movement of workers outside the agriculture sector are the pattern of economic growth, inter-sectoral differences in the wage rate, worker productivity, government programs, education, and sociocultural factors existing in the rural economy (Chand and Srivastav, 2014). This has serious implications for the agricultural sector. In this study the identified migrant workers among the landless rural labour of semi-arid region in Odisha[1] are seen involved in spatial diversification, despite several provisions of state-intervention schemes such as MGNREGA work, food security public distribution system. In this backdrop, it has attempted to examine the underlying factors in the changing pattern of rural labour diversification.

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The Livelihoods approach accommodates migration as an exit route to overcome shocks, vulnerability, and seasonality (Ellis and Freeman, 2005). However, in semi-arid zones, many poor households adopted seasonal migration as routine livelihoods strategy during the off-season of agriculture (Harriss-White and Garikipati, 2008). People remain unemployed after the agriculture season, and in the absence of an appropriate institutional arrangement, seasonal migration plays a vital role to provide gainful employment opportunities. Finally, income from seasonal migration meets the consumption, productive needs, and stabilizes households' economy. Deshingkar (2005) argues that the implication of seasonal migration may be positive for poverty reduction and the millennium development goals, since it involved, poor, low caste and less educated people in India in general and Odisha in particular.

Migration for livelihoods is an inevitable phenomenon in the Indian context. Two significant causes of migration especially from rural to rural and rural to urban migration are relevant. Firstly, the uneven distribution of natural resources leaves many people either landless or marginal farmers. As per the results of the National Sample Survey Office (NSSO) 49th round survey in India (NSSO, 1998), landownership has a direct relationship with migration. Households having low land holding are more likely to migrate than the households having high land holding.

In rural India, still, a large group of people depends upon agriculture as their primary source of income. In the absence of irrigation facilities, rainwater plays a crucial role in agriculture productivity and agriculture labour days. The seasonal nature of agriculture keeps many households away from their primary source of livelihood. That resulted in livelihood diversification into the off-farm sector and migration. On the other hand, regional inequalities increased. While industrialization and the green revolution concentrate in a few states like Gujarat, Punjab, Maharashtra; states like Bihar and Odisha are continuously dealing with the curse of poverty. That resulted in migration from the underdeveloped region to the developed region.

Odisha is one of the poorest states in India as compared to its neighbouring states. The Southwest region of Odisha is relatively poorer. The infamous Kalahandi, Balangir, Koraput (KBK) districts lie in this region. Seasonal Migration[2] has an added dimension in Odisha, as most of the seasonal out-migration originates from the poverty-stricken KBK districts of Odisha (Mishra 2016; Smita 2007).

While Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) promises to provide 100 days jobs to one interested member of each Below Poverty Line (BPL) family, Antodaya Anna Yojana (AAY) aims to provide 35 kilograms of rice at a minimum and affordable price. A participatory project like Western Odisha Rural Livelihoods Project (WORLP) aims to improve the livelihoods of people

through watershed development approach. Overall, the government policy response is ignoring the contribution of seasonal migration as an alternative livelihoods strategy. Consequently, seasonal migration from Nuapada, Balangir, Kalahandi and some neighbouring villages in Bargarh districts are increasing even though it is undocumented.

Assuming improved living condition at the household level, this paper has attempted to argue that seasonal migration is a routine and inseparable livelihood strategy in the semi-arid zones of Odisha that generates employment opportunities, meets the credit needs of poor households, and minimizes the gap between patron (landlord, moneylenders) and client (landless and marginal farmers) relationship. Unless the institutional arrangements function well, seasonal migration should be promoted as an alternative livelihoods strategy in the semi-arid zones.

## II. BACKGROUND AND ANALYTICAL APPROACHES

Migration is categorised into permanent or temporary in terms of its nature. The NSS 64th round survey of India (NSSO, 2010) categorised temporary migration based on the duration of staying at a particular place. Seasonal migration is temporary in nature and takes place during a particular season of the year. In semi-arid zones of the field site villages, geographical and climatic conditions influence the decision to migrate (Samal, 2006). In some cases, all the members of a household migrate temporarily or permanently. During the 64$^{th}$ round of NSS survey, it was found that the main reason behind household migration was employment-related (NSSO, 2010).

Household migration[3] is frequently taking the form in case of seasonal migration to the brick kilns because of the requirement of the condition. It operates during dry seasons of the year exactly after the agriculture season and closes before the agriculture season. Therefore, these brick kilns are successfully attracting a large group of seasonal unemployed labourers that represent the weakest section of the rural areas. A group of three labourers form a brick making unit, from the same household. According to the division of labour in the unit, the male member digs and mixes the clay and makes bricks with the frame, the female member makes clay dough, and one male or female member puts the raw bricks under the sun to dry and store them into the brick kilns later. Hence, the entire household receives a wage from the brick kilns.

Seasonal migration to the brick kilns is termed as distress migration because brick kilns industries violate all labour rights and there is a severe livelihood deficiency in the source of migration. Gupta (2003) found in his study that brick kilns violate the abolition of Bonded Labour Act as the migrants work with below minimum wage for a long hour.

**Livelihoods Approach to Seasonal Migration**

The term livelihood attempts to capture not just, what people do in order to make a living, but the resources that provide them with the capability to build a satisfactory living. They have to also manage their resources from the risk factors, the institutional and policy context that either helps or hinders them in their pursuit of a viable or improve living (Ellis, 2003). Access to resources is the precondition for rural households to adopt certain livelihood strategy or combination of livelihood strategies. Resources are broadly categorised into natural, financial, human, and social but not limited to other forms of resources people are associated with. Natural resources refer to land, water and other natural stocks. Financial resources are related to the credit needs, cash in hand, savings and other economic assets. Peoples' personal skills, physical ability of labour, education, and health are human resources. Social resources are the association, social networks, relationship, and social structure people involved with (Scoones, 1998).

While connecting seasonal migration with the livelihoods approach, there are three arguments from the livelihoods approach to migration and poverty reduction (Ellis, 2003), such as first, seasonal migration is a deliberate households' livelihood strategy. Second, seasonal migration is a social process, and it is a joint livelihood decision of migrants and non-migrants. Third, seasonal migration is a response to the problem of seasonality.

Along with the primary livelihood, seasonal migration is a central livelihood strategy adopted by many poor rural households in low-income countries. Since migration is a social process and households have its deep root in the society, it has argued that the household is the appropriate unit of analysis. One of the main criticisms towards the livelihoods approach to migration is that it is hardly applicable to the transnational form of migration and to urban households. However, the purpose of this study is concentrated in a rural area and, therefore, it is appropriately applicable to this study.

**Rural Households' Credit needs and the Role of Seasonal Migration**

The new economics of labour migration explain that migration is a response to market failure.[4] In low-income countries, credit is either absent or accessible with a high-interest rate. In that case, migration becomes 'attractive as an alternative source of capital to finance improvement in productivity and ensure stability in consumption' (Massey et. al., 1993). Ellis (2000a, 2000b) observes credit market failure as one of the key determinants of rural livelihood diversification.

Access to credit is a big problem for the poorest households, and that stimulates them to receive payment from migration. While some migrant households are

economically better, other migrant households are unable to exit from dependency and indebtedness. It is clear that the informal credit market has a strong existence in rural livelihoods. People need credit for varied reasons and indebtedness prompts them towards a change in livelihood strategy. Seasonal migration comes in the first place in semi-arid zones for poor households of Odisha. However, the extent to which seasonal migration contribute households' credit need and worthiness are not similar in all the migrant households.

**Role of Social Networks in Seasonal Migration**

The Neoclassical theory of migration argues that migration is an individual decision to gain economic benefit. The theory assumes that migrants have perfect information about the labour market in the destination. In contrast, Network theory of migration argues that the social relationship between migrants and non-migrants flow information and promote further migration. Network theory considered social capital as the third important resources in migration (Thieme, 2006).

The relationship between employers and the migrants also determines whether seasonal migration is for coping or accumulation. Deshingkar and Start (2003) study found, migrants having established a relationship with the employers migrate for accumulation. On the other hand, migrants without prior relationship struggle to cope in the destination because of the opportunistic cost.

## III. SOME FEATURES AT MACRO LEVEL DATA FROM NSSO

The share of destination states of rural out-migrants from Odisha during the year 1993, 1999-2000 and 2007-08 are placed in Table 1. The top share for destination place are Andhra Pradesh, Uttar Pradesh, West Bengal and Chhattisgarh. Even Maharashtra was a major destination place until 2000 which slid in position by 2007-08.

The seasonal migration in rural Odisha as per the results from NSSO 64$^{th}$ round data are depicted in Table 2. It shows that there are as high as around 83 per cent male who took part in the seasonal migration as against their female counterpart, which is 2.22 per cent share of migration in rural Odisha. This is the over-all situation in Odisha, where 1.32 per cent belongs to the seasonal migration in rural Odisha.

Table 1
**Top Share of Destination States of Rural Out-migrants from Odisha**

| *State* | *2007-08* | *State* | *1999-00* | *State* | *1993* |
|---|---|---|---|---|---|
| Chhattisgarh | 30.06 | West Bengal | 25.24 | West Bengal | 29.95 |
| Andhra Pradesh | 21.81 | Madhya Pradesh | 24.83 | Andhra Pradesh | 24.47 |
| Uttar Pradesh | 16.42 | Maharashtra | 14.42 | Maharashtra | 11.88 |
| West Bengal | 10.97 | Kerala | 11.23 | Uttar Pradesh | 9.80 |
| Kerala | 5.05 | Andhra Pradesh | 10.06 | Madhya Pradesh | 8.34 |

| *State* | *2007-08* | *State* | *1999-00* | *State* | *1993* |
|---|---|---|---|---|---|
| Punjab | 3.66 | Bihar | 7.35 | Bihar | 4.16 |
| Maharashtra | 2.16 | Himachal Pradesh | 1.83 | Delhi | 3.10 |
| Jharkhand | 1.55 | Uttar Pradesh | 1.68 | Tamil Nadu | 2.62 |
| Rajasthan | 1.30 | Karnataka | 1.49 | Rajasthan | 1.87 |
| Goa | 1.25 | D & N | 1.30 | Gujarat | 1.80 |
| Karnataka | 1.22 | Pondicherry | 0.24 | Punjab | 0.77 |
| Tamil Nadu | 1.19 | J & K | 0.16 | J & K | 0.43 |
| Pondicherry | 1.11 | A & Nicobar | 0.12 | Haryana | 0.21 |

*Source*: Migration in India, Computed from 49th, 55th and 64th round NSS Data

Table 2
**Seasonal Migration in Odisha (Rural)**

| *Sex* | *Migrant* | *Non-migrant* | *Total* |
|---|---|---|---|
| Male | (2.22) | (97.77) | (100) |
| | [82.55] | [48.96] | [49.41] |
| Female | (0.46) | (99.54) | (100) |
| | [17.45] | [51.04] | [50.59] |
| Total | (1.32) | (98.67) | (100) |
| | [100] | [100] | [100] |

*Note*: Figures in parentheses refer to the percentage to row totals and those in square brackets refer percentages to column totals.

*Source*: Unit-level Data, NSSO, 64th Round.

The seasonal migration in rural Odisha by household type has been figured out from the NSSO 64th round unit-level data (See Table 3). It has been observed here that among the different type of household in rural Odisha it is the agricultural labour whose percentage share is maximum, 38.09 per cent seasonal migrants, followed by other labour (28.08 per cent), and self-employed in agriculture (20.55 per cent).

Table 3
**Seasonal Migrants in Odisha, by Household Type (Rural)**

| *Household type* | *Seasonal migrants* (in per cent) |
|---|---|
| Self-employed in non-agriculture | 10.64 |
| Agricultural labour | 38.09 |
| Other labour | 28.08 |
| Self-employed in agriculture | 20.55 |
| Others | 2.64 |
| Total | 100.00 |

*Source*: Unit-level Data, NSSO, 64th Round.

To opt for seasonal migration is also greatly determined by one's educational status because the individuals with a higher educational degree have more chances to fit in better job markets. The non-literate groups (38.36 per cent) suffer and are compelled to involve in the seasonal migration; this has been supported by the data, see Table 4. Upper primary/middle and fewer degrees individuals are around 90 per cent out of total migrants and forced to or compel to prefer seasonal migration in rural Odisha.

Table 4
**Seasonal Migrants, by Educational Status (Rural)**

| *Educational status* | *Total* (in per cent) |
|---|---|
| Not literate | 38.36 |
| Literate without any schooling | 1.63 |
| Others | 0.15 |
| Below primary | 19.10 |
| Primary | 14.05 |
| Upper primary/middle | 17.77 |
| Secondary | 5.95 |
| Higher secondary | 0.84 |
| Diploma/certificate | 0.95 |
| Graduate | 1.20 |
| Post-graduate and above | 0.00 |
| Total | 100.00 |

*Source*: Unit-level Data, NSSO, 64th Round.

## IV. SOME OUTLINES ON SEASONAL MIGRATION IN ODISHA

### Interlinkage between Production-relation and Migration

#### *Migrant/Non-migrant Rural Households by Land Ownership Class*

Majority of non-migrant households belong to the landowning classes i.e. large landowning household accounts almost for 98.44 per cent leaving hardly one per cent for the commuters and there is no household migrating seasonally (See Table 5). The Irrespective of the reasons behind compelling a household to involve in migration or non-migration and small landowning classes appears similar as in case of large landowning households, the percentage of non-migrant households are significantly larger than percentage of migrant households. However, out of the total 56 landless households, 40 households are migrating seasonally to different places for their livelihood and 16 households commute daily for the same.

Table 5
**Percentage of Migrant/Non-Migrant Rural Households by Land Ownership Class, Agrarian Peasant Class, and Poor/Non-poor in Odisha**

| *Rural Households* | *Non-migrant households* | *Commutation* | *Seasonal Migration* | *Total Migration* |
|---|---|---|---|---|
| Large | 63 (98.44) | 1 (1.56) | 0 (0.00) | 1 (1.56) |
| Medium | 72 (100.00) | 0 (0.00) | 0 (0.00) | 0 (0.00) |
| Small | 69 (86.25) | 0 (0.00) | 11 (13.75) | 11 (13.75) |
| Marginal | 59 (73.75) | 8 (10.00) | 13 (16.25) | 21 (26.25) |
| Landless labour | 24 (30.00) | 16 (20.00) | 40 (50.00) | 56 (70.00) |
| Landlord | 63 (98.44) | 1 (1.56) | 0 (0.00) | 1 (1.56) |
| Rich peasant | 48 (88.89) | 0 (0.00) | 6 (11.11) | 6 (11.11) |
| Middle peasant | 53 (92.98) | 0 (0.00) | 4 (7.02) | 4 (7.02) |
| Small peasant | 44 (97.98) | 0 (0.00) | 1 (2.22) | 1 (2.22) |
| Poor peasant | 55 (72.37) | 8 (10.53) | 13 (17.11) | 21 (27.63) |
| Landless labourer | 24 (30.00) | 16 (20.00) | 40 (50.00) | 56 (70.00) |
| Exploiter | 111 (94.07) | 1 (0.85) | 6 (5.08) | 7 (5.93) |
| Self-employed | 97 (95.10) | 0 (0.00) | 5 (4.90) | 5 (4.90) |
| Exploited | 79 (50.64) | 24 (15.38) | 53 (33.97) | 77 (49.36) |
| Poor | 93 (56.36) | 21 (12.73) | 51 (30.91) | 72 (43.64) |
| Non-poor | 194 (91.94) | 4 (1.90) | 13 (6.16) | 17 (8.06) |
| All samples | 287 (76.33) | 25 (6.65) | 64 (17.02) | 89 (23.67) |

*Note:* Figures in parentheses are in per cent.

*Source*: Field Survey, 2014.

### *Migrant/Non-migrant Rural Households by Agrarian Peasant Class*

An agrarian peasant class assumes an important characteristic of the Indian village pertaining to possesses of wealth in the form of land and livestock beside the labour exploitation criterion. The same patterns exhibit out of the migrant/ non-migrants rural households by different agrarian peasant classes by different landowning classes. The landlord, rich and middle peasants are not migrating either in the form of commuting or seasonally whereas the majority of poor and landless labour are migrating seasonally and commuting.

Distribution of migrant/non-migrant out of total rural household sample in different class categories are shown in Appendix 1. The landless labourer is hardly 8 per cent of households who are not migrating anywhere.

### *Migrant/Non-migrant Rural Households by Labour Exploitation Criteria*

Out of the total 287 households, 111 non-migrants household accounts for more than 94 per cent of the exploiter category household leaving a minuscule percentage of households to prefer for migration in either form. For the self-employed category, the same picture has been seen. On the other hand, 50 per cent of the exploited household belongs to non-migrants those who are poor and landless labourer moving seasonally 33 per cent and 15 per cent for commuting.

Majority of the non-migrating households belong to exploiter and self-employed classes whereas the topmost landowner classes in the study villages have exploited 27.5 per cent of the households. Thereby most of the exploited family commute regularly on a daily basis whose percentage share is 96 per cent of the total commuters in different peasant's classes. As far as the seasonal migration is a concern, 82 per cent belongs to the same exploited groups, 8 per cent from the self-employed, and 9 per cent from the exploiter group. These self-employed and exploiter belong to decent business-related migration and for accumulative purpose and do not come under distress driven situation like the exploited peasant group.

### *Migrant/non-migrant Rural Households by Poor and Non-poor*

Those who are 56 per cent of the poor households are not migrating anywhere from the village whereas more than 91 per cent from the non-poor households prefers to not migrate. People from poor households who have to commute daily account for 12 per cent, and 30 per cent of households migrates seasonally to different places outside the village. These households fail to access the secured source of livelihoods at the place of origin or from social security schemes.

### *Job Diversification among Rural Households in Odisha*

The job diversification index (JOBDIVRS)[5] shows the extent of livelihood security in a given rural economy. The higher the values the higher the security for the household in the study area. The livelihood index for the non-migrating landless labourer is highest (4.17) as compared to the large landowner (3.37) see Table 6. As the size of the landowning class declines, the chances of diversification have seen increased. For the daily commuting household, the pattern is opposite, as the commuting landless labourer, the index is 3.75 as compared to the large landowner (4.00). In the case of the seasonal migrating household, it is the small landowner who has a secure highest index of 4.64 as compared to marginal and landless labourer classes.

Table 6
**Job diversification among Migrant/Non-migrant Households across Land Ownership Class, Agrarian Peasant Class, and Poor/Non-poor in Rural Odisha**

| *Rural Households* | *Non-migrant Households* | *Commutation* | *Seasonal Migration* | *Total Migration* |
|---|---|---|---|---|
| Large | 3.37 | 4.00 | -- | 4.00 |
| Medium | 3.40 | -- | -- | -- |
| Small | 3.71 | -- | 4.64 | 4.64 |
| Marginal | 3.85 | 4.13 | 3.92 | 4.00 |
| Landless labour | 4.17 | 3.75 | 4.03 | 3.95 |
| Landlord | 3.37 | 4.00 | -- | 4.00 |
| Rich peasant | 3.31 | -- | 3.50 | 3.50 |
| Middle peasant | 3.55 | -- | 5.50 | 5.50 |
| Small peasant | 3.84 | -- | 8.00 | 8.00 |
| Poor peasant | 3.85 | 4.13 | 3.92 | 4.00 |
| Landless labourer | 4.17 | 3.75 | 4.03 | 3.95 |
| Exploiter | 3.34 | 4.00 | 3.50 | 3.57 |
| Self-employed | 3.68 | -- | 6.00 | 6.00 |
| Exploited | 3.95 | 3.88 | 4.00 | 3.96 |
| Poor | 4.04 | 3.81 | 4.22 | 4.10 |
| Non-poor | 3.42 | 4.25 | 3.69 | 3.82 |
| All samples | 3.62 | 3.88 | 4.11 | 4.04 |

*Note:* Number of households is the same as Table 5

*Source:* Field Survey, 2014

*JOBDIVRS among migrant/non-migrant rural households by agrarian peasant class*: The landless labour who are not migrating has high livelihood index (4.17) as compared to migrant households: commuters and seasonal migrants. Among the poor peasants, the commuter has the highest (4.13) livelihood diversification index whereas for the small peasant class, it is the seasonally migrating household has the highest index of 8 unit than non-migrant households.

Those who have non-migrating exploited household has the highest score of the index as compared to exploiter and self-employed. However, for the migrating household, the reverse pattern has been seen. For the commuter, exploiter household scored highest as compared to exploited and for the seasonally migrated household, it is the self-employed category has scored high. The poor non-migrating household has higher scored for the livelihood index as compared to its counterpart commuter whereas the similar pattern has been found in case of the migrating household as compared to their counterpart non-poor households.

### *Average Land-Owning among Migrant/Non-migrant Households*

The information on average land owned (in acre) among migrant and non-migrants by land ownership classes in rural Odisha is shown in Table 7. Non-migrating household

belonging to large landowning class possess more acre of land (15.59 acre), followed by medium, small and marginal classes. Likewise, the commuters' household possesses 10 acres of land in large classes leaving a small 1.58 acre of land for the marginal classes. The household who opted for migrating seasonally, small and marginal classes possess 3.25 and 1.60 acre of land, respectively.

*Average land-owning* (in acre) *among migrant/non-migrant rural households by land ownership class*: The non-migrating landlord peasant household in rural Odisha possesses more than 15 acres of land whereas poor peasant possesses just 1.6 acres of land on an average. The patterns have not changed from the top to bottom non-migrating peasant household. The commuting households from the landlord classes possess 10 acres of land on average in rural Odisha and a poor peasant household possesses less than 2 acres of land. Again, those small peasant household migrating seasonally possesses 4 acres of land. The landlords do not migrate seasonally and the poor peasant households opt for the livelihood option in different areas outside the district or states.

Table 7
**Average Land-Owning among Migrant/Non-migrant Households across Land Ownership Class, Agrarian Peasant Class, and Poor/Non-poor in Rural Odisha (in acre)**

| *Rural Households* | *Non-migrant households* | *Commutation* | *Seasonal Migration* | *Total Migration* |
|---|---|---|---|---|
| Large | 15.59 | 10.00 | -- | 10.00 |
| Medium | 7.11 | -- | -- | -- |
| Small | 3.35 | -- | 3.25 | 3.25 |
| Marginal | 1.63 | 1.58 | 1.60 | 1.59 |
| Landless labour | 0.00 | 0.00 | 0.00 | 0.00 |
| Landlord | 15.59 | 10.00 | -- | 10.00 |
| Rich peasant | 5.30 | -- | 3.43 | 3.43 |
| Middle peasant | 5.03 | -- | 2.80 | 2.80 |
| Small peasant | 5.22 | -- | 4.00 | 4.00 |
| Poor peasant | 1.60 | 1.58 | 1.60 | 1.59 |
| Landless labourer | 0.00 | 0.00 | 0.00 | 0.00 |
| Exploiter | 11.14 | 10.00 | 3.43 | 4.37 |
| Self-employed | 5.12 | -- | 3.04 | 3.04 |
| Exploited | 1.12 | 0.52 | 0.39 | 0.43 |
| Poor | 1.81 | 0.42 | 0.54 | 0.50 |
| Non-poor | 8.52 | 3.45 | 2.25 | 2.53 |
| All samples | 6.35 | 0.90 | 0.88 | 0.89 |

*Note:* Number of households is the same as Table 5

*Source*: Field Survey, 2014

It is evident from the survey that exploiter group of household possesses around 11 acres of land on an average in rural Odisha who belongs to non-migrant households, whereas self-employed and exploited household only possess on an average 5.12 acres and 1.12 acres of land, respectively. The exploiter household possess about 10 acres

of land and commutes daily for the livelihood and security, whereas the exploited household possess about less than one acre of land. Irrespective of the reasons behind compelling a household to involve in migration or non-migration among rural households, the poor peasant and exploiter household have possessed significantly lesser amount of land-ownership than others.

Poor non-migrating household possesses only 1.82 acres of land whereas the non-poor household possesses the sizable amount of land (more than 8 acres on an average). The landowning on an acreage pattern has been the same for both the commuting and seasonally migrating household.

### *Debt-to-Asset Ratio among Migrant/Non-migrant Rural Households*

Debt-to-asset ratio for both landowning and peasants non-migrating household has declined from higher to lower classes, which implies that the debt-to-asset ratio is higher for rich landowning classes as compared to poor and landless labourer household (Refer to Table 8). The pattern is the same for peasant non-migrating household. For the commuting household the debt-to-asset ratio is higher for the landowning class and landlord peasants. Whereas the ratio is higher for marginal land owning class (0.61 per cent) and poor peasants (0.61 per cent) household migrating seasonally.

**Table 8**
**Debt-to-Asset Ratio among Migrant/Non-Migrant Households across Land Ownership Class, Agrarian Peasant Class, and Poor/Non-Poor in Rural Odisha**

| *Rural Households* | *Non-migrant households* | *Commutation* | *Seasonal Migration* | *Total Migration* | *All households* |
|---|---|---|---|---|---|
| Large | 0.62 | 0.33 | -- | 0.33 | 0.61 |
| Medium | 0.67 | -- | -- | -- | 0.67 |
| Small | 0.45 | -- | 0.21 | 0.21 | 0.42 |
| Marginal | 0.87 | 1.25 | 0.61 | 0.85 | 0.86 |
| Landless labour | 0.34 | 0.28 | 0.22 | 0.23 | 0.27 |
| Landlord | 0.62 | 0.33 | -- | 0.33 | 0.61 |
| Rich peasant | 0.53 | -- | 0.22 | 0.22 | 0.50 |
| Middle peasant | 0.69 | -- | 0.20 | 0.20 | 0.65 |
| Small peasant | 0.41 | -- | 0.21 | 0.21 | 0.41 |
| Poor peasant | 0.91 | 1.25 | 0.61 | 0.58 | 0.89 |
| Landless labourer | 0.34 | 0.28 | 0.22 | 0.23 | 0.27 |
| Exploiter | 0.58 | 0.33 | 0.22 | 0.23 | 0.56 |
| Self-employed | 0.56 | -- | 0.20 | 0.20 | 0.54 |
| Exploited | 0.74 | 0.60 | 0.31 | 0.40 | 0.57 |
| Poor | 0.63 | 0.57 | 0.29 | 0.37 | 0.52 |
| Non-poor | 0.61 | 0.71 | 0.31 | 0.41 | 0.59 |
| All households | 0.62 | 0.59 | 0.29 | 0.38 | 0.56 |

*Note:* Number of households is the same as Table 5

*Source*: Field Survey, 2014

The exploited class households incurred higher (0.74 per cent) debt-to-assets ratio than exploiter (0.58 per cent of debt-to-assets ratio). For commuter exploited household the ratio is quite high as compared to the seasonally migrated household. When it comes to commuter poor non-migrating household the ratio is 0.57 per cent and for non-poor, the ratio is 0.71 per cent whereas for the seasonally migrating household the patterns remain the same.

Meher (2002) presents about the socio-economic situation of Odisha as not only a poor state, but the State is also entrenched with the problem of regional backwardness at the intra-state level. The highland districts of western and southern Odisha have maximum numbers of ultra-poor category population. These districts namely, Bolangir, Sonepur, Nuapada, Kalahandi, Koraput, Nawarangpur, Malkangiri, Rayagada and a part of Bargarh district comprising Padmapur subdivision contiguous to Bolangir and Nuapada districts are vulnerable to recurring droughts and famine-like situation almost every year. Among the districts of southwest Odisha, except Bargarh district, the rest other eight districts of present 30 districts of the state are popularly known as the backward KBK region of Odisha named after the three old and undivided districts, Kalahandi, Bolangir and Koraput. Under the scenario of eroding natural resource base such as deforestation, land degradation, and overall socio-economic backwardness of people, the region faces the perennial problem of distress migration of poor families to developed pockets of the state and to other states of the country during the lean agricultural season.

It is understood from the field that the socio-economic dynamics of the seasonal migrants are distress in nature and the migrants are from poor families of Bolangir, Nuapada, Kalahandi and Padmapur subdivision of Bargarh districts, and have been facing exploitation in the process of finding out their sustainable ways and means of development in the region.

## V. DETERMINANTS OF MIGRATION

The determinants of these distressful and poor households persistent moving out seasonally to outside own state and /or district/village are examined at two levels: through household logistic regression and for individual migrants. The descriptions of the explanatory variables of household level regression are mentioned in the appendix section. (See Appendix 2). Household level determinants of migration based on the results of logistic regression analysis (Table 9) explained that who are more likely to participate in migration among rural household in the studied region of Odisha.

It has found out that those households who are poor are around 117 per cent more likely to participate in migration in comparison to non-poor households. Households with higher the land operated area are 63 per cent lesser probability to take participation in migration. In addition, those households in agriculturally advanced and irrigated regions villages 84 per cent lesser probability to be seen them involved in migration for their livelihood strategies. The odds ratio of other explanatory variables is not discussed here since they have not significant probability values.

Table 9
**Household-Level Logistic Regression Analysis: Who are More Likely to Participate in Migration among Rural Household in Odisha**

| *Variables* | *Odds Ratio* | *Robust Std. Err.* |
|---|---|---|
| RNFJ | 7.643 | 3.383 |
| Poor/non-poor | 2.175*** | 1.316 |
| Land-operated | 0.370*** | 0.117 |
| Education | 1.053 | 0.084 |
| Age | 0.966 | 0.025 |
| Household size | 1.019 | 0.164 |
| Caste dummy (ST/SC) | 1.701 | 0.676 |
| Membership (dummy) | 0.793 | 0.354 |
| Training (dummy) | 0.671 | 0.488 |
| Regional dummy | 0.158*** | 0.081 |
| Constant | 7.181* | 7.680 |

*Note*: *** Significant at 0.01 level, **Significant at 0.05 level, *Significant at 0.10 level
Number of Observation: 376; Wald $Chi^2$: 65.97***; Pseudo $R^2$: 0.58;
Log pseeudolikelihood: -94.07

*Source*: Own estimation using data from Field Survey, 2014.

Understanding the determinants of individual migrants is more crucial to get the better underlying dynamics of socio-economic reasons for migration in the region. The descriptions of explanatory variables that have been used for the logistic regression model of individual level has given in Appendix 3. The results in Table 10 indicates about the non-agricultural labourers are 26.9 times more likely to participate in migration as compared to those who are cultivators; agricultural labour has 6.6 times more probability than the cultivator in participating in migration; and self-employed non-farm workers have 3.02 times more chances than cultivator involved in the migration process. The higher number of household size with 2 to 4 family members are 2.27 times more likely to participate in migration as compared to the household with single member.

Table 10
**Logistic Regression Estimation Results for Determinants of Individual Migrants (Commutation and/or Seasonal Migration) in Rural Odisha**

| *Covariates in the Equation (While Dependent Variable 1= if Individual is Migrant and 0= Individual is Non-Migrant)* | *Odds Ratio* | *Robust Std. Err.* |
|---|---|---|
| Gender: Male ® | | |
| Female | 0.61*** | 0.117 |
| *Age group: Less than 19 years ®* | | |
| 20-29 years | 1.35 | 0.468 |
| 30-39 years | 1.76 | 0.677 |
| 40-49 years | 1.80 | 0.681 |
| 50 and above years | 0.46** | 0.181 |
| *Social group: Scheduled Tribes (STs) ®* | | |
| Scheduled castes (SCs) | 0.50*** | 0.121 |
| Other backward classes (OBCs) | 0.45*** | 0.109 |
| Others (General) | 0.89 | 0.441 |
| Household size: 1 person ® | | |
| 2 to 4 persons | 3.27* | 2.065 |
| 5 and above persons | 1.81 | 1.136 |
| *Education: Up to primary ®* | | |
| Illiterate | 0.96 | 0.299 |
| Middle | 0.43*** | 0.130 |
| Secondary | 0.12*** | 0.064 |
| Higher secondary | 0.29*** | 0.148 |
| Diploma, graduate, P. G. and above | 0.98 | 0.378 |
| *Principal activity status at the origin: Cultivators ®* | | |
| Agricultural labour | 7.60*** | 2.413 |
| Non-agricultural labour | 27.9*** | 12.85 |
| Self-employed non-farm | 4.02** | 2.906 |
| Regular salaried | 1.51 | 1.129 |
| Others | 0.81 | 0.298 |
| *Land possession: Landless (< 0.02 acres) ®* | | |
| Marginal (0.02 - 2.50 acres) | 0.75 | 0.187 |
| Small (2.51 - 5.00 acres) | 0.36*** | 0.110 |
| Medium and large (Greater than 5 acres) | 0.01*** | 0.007 |
| *Tenant status: Land leased-in ®* | | |
| Otherwise | 0.76 | 0.336 |
| Constant | 0.26 | 0.227 |

*Note*: *** Significant at 0.01 level, **Significant at 0.05 level, *Significant at 0.10 level
® – Reference Category; Number of Observation: 1731; Wald Chi$^2$: 265.84***; Pseudo $R^2$: 0.46; Log pseeudolikelihood: -391.13

*Source*: Own estimation using data from Field Survey.

Land possession indicates the economic power of individuals. The landless labourer is debarred from the access to land for their livelihood and is bound to depend and

accept migration practice as their strategy option for livelihood. Small land owning individuals have 64 per cent lesser chances of migration than a landless labourer; medium and large landowner are 99 per cent lesser chances to participate in migration as their job as compared to landless labour. Among the social categories, scheduled tribes are more prone to migrate out of the village, district, and state and involved in distressful environment and indecent work culture of migration. The individual belongs to the Dalit community are 50 per cent and OBCs are 55 per cent lesser likely to migrates than Scheduled Tribes. Age group 50 years and above have 54 per cent fewer chances to migrate than younger individuals of 19 years and less. Old aged individuals stay at origin and guard their grandsons and his/her family's house. Female members have 39 per cent less probability to migrate than their male counterpart.

A similar exercise has also been analysed by Mishra (2016) on Kalahandi, Nuapada and Bolangir districts and the findings of these results match with more or less similar values of the odds ratio.

## VI. Poverty Scenario

Among all the states of the Indian Union, Odisha is notoriously famous for its highest level of poverty incidence. According to NSSO data, the highland districts of western and southern are having a very high incidence of rural poverty as compared to the coastal districts. The incidence of rural poverty in the districts covered under the present study is as follows: Bolangir 66.3 per cent, Nuapada 70.1 per cent, Bargarh 61.7 per cent, and Kalahandi 70.5 per cent. In this scenario, the extent of poverty among the surveyed seasonal migrant households of Bolangir, Nuapada, Bargarh and Kalahandi districts cannot be expected to be less than the average district figure. Rather many of the sample migrant households have a more precarious living. According to the field observation, around 80 per cent of the surveyed migrant families are poor families in the village (See Appendix Table 1).

### State-Sponsored Anti-poverty Programmes

Removal of poverty through state-directed planning has always been the core objective of the Indian state, since its inception as an independent nation. After its liberation from the colonial rule, India trod the path of state-led planned economic development with a view to accelerating economic growth, to remove poverty, and to improve the standard of living of common mass. Undoubtedly, during the past seventy years or so the post-Independent India has progressed a lot in terms of modernization and advancement of economy, society, scientific education, health care measures, and the like. However, the gains in development have been mostly cornered by the richer and privileged sections of population, and regions forming the minority segment are languishing in poverty and socio-economic backwardness.

In the early era of planning in 1952, there was a Community Development Programme that aimed at agricultural growth and raising the standard of living of the poor. This was accompanied by land reform measures like the abolition of Zamindari and intermediary land tenure systems and launching of Intensive Agriculture Areas Programme (IAAP), Intensive Agriculture District Programme (IADP) and High Yielding Varieties Programme (HYVP). However, the gain accruing from all such programmes during the 1950s and 1960s through 'Green Revolution' remained mostly confined to rich and middle farmers. Followed to that during the 1970s there was an intensification of both area approach as well as beneficiary oriented programmes aiming at rural development and removal of mass poverty. These programmes such as Drought Prone Areas Programme (DPAP), Desert Development Programme (DDP), Small Farmers Development Agency (SFDA), Marginal Farmers and Agricultural Labourers (MFAL), Crash Scheme for Rural Employment (CSRE), Food for Work Programme (FWP), Minimum Needs Programme (MNP) and the like could achieve very little of the intended goals and objectives. Then during the Sixth Five Year Plan and afterwards the government launched many beneficiary oriented programmes such as Integrated Rural Development Programme (IRDP), Training of Rural Youth for Self-Employment (TRYSEM), Development of Women and Children in Rural Areas (DWCRA), Employment Assurance Scheme (EAS), Indira Awaas Yojana (IAY), MWS (Million Wells Scheme), etc. to alleviate rural poverty. Now the latest incarnation of all such programmes broadly divided into two categories such as self-employment and wage employment programmes namely Swarna Jayanti Rojgar Yojana (SJRY) and Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS). Added to all this, the state has launched many welfare programmes for the poor and weaker sections of the population such as Annapurna Antyodaya Yojana, old age pension, widow pension, etc. to subsidies the living of the poor.

Odisha has launched a populist programme to supply 25 kg of rice per month at Rs.1 per kg through Targeted Public Distribution System (TPDS) to BPL category households. Recently, with Central and State funding initiated a number of development programmes such as Revised Long Term Action Plan (RLTAP), Gopabandhu Gramin Yojana (GGY), and Biju KBK Plan. However, unfortunately, it has been revealed from the survey that many poor households in the study area do not get such benefits from the PDS shops every month. When the poor come to buy their PDS quota rice and other essential commodities like sugar, kerosene, etc. from the PDS shops, the dealers turn them away with a readymade reply that the government has not released the quota.

## VII. SUMMARY

Analysis of the reasons for migration pointed out that, seasonal migration was started in a response to insufficiency, low productive, low-labour demand in semi-arid region

agriculture and somehow it was the case too but gradually it becomes a routine and inseparable livelihood strategy. Migration at present is not just a response to shocks rather a calculated livelihood strategy in response to seasonality. While the landless households invest the earning mostly on consumption, the landowner households mostly invest in productive purposes. In both cases, there is a significant level of improvement in migrant households. Therefore, a very small amount of additional cash can support the poorest moving out of poverty (Ellis 2003). People who were working as bonded labour with few kilograms of paddy and starving a few days in a week have successfully overcome the insufficiency of food and scarcity of cash in hand. Finally, that improves the human and social capital of migrant households. Hence, seasonal migration is becoming the primary source of livelihood in place of agriculture labour work especially for the landless and marginal farmers' households.

The impact of migration on production relations has made as one of the factors for the labour shortage and/or higher wages in the agricultural labour market, mainly during transplantation, harvesting operation where major agricultural activities are not fully automated by machinery and urgently have to depend on manual labour. Seasonal migration also brings some negative consequences. Migrants experienced health problems after returned and spent a portion of their earning on treatment. The children dropout rate is increasing because migrants prefer to move with their small kids. In the community level, petty businesses are heavily influenced because of the shortage of buyers during migration seasons. Policy response needs to be addressed these negative issues along with the proper implementation of inter-state migrants workers act so that the benefits of migration will be maximised.

Through wage employment programmes the State has planned to build many rural assets and socio-economic infrastructures for the sustainable living of the rural poor besides generating adequate wage employment for them in the short run. In spite of that, the harsh form of poverty in the region has not taken its backseat. The MGNREGS that is expected to redress the acute poverty of the poor by providing a minimum 100 days of wage employment to every wage-seeker poor family in the rural area has so far failed to generate any positive impact on the region.

In this scenario, it is the least expected that programme like MGNREGS in its present form shall be able to check distress seasonal migration of poor families from the village unless it is restructured with a proper check and balance measures through public-private partnership (PPP) mode. Further, it is important to note that artificial generation of wage employment for the distressed poor families of the region cannot be sustainable in the long run without the development of local human capital and diversification of occupational skills of people for their absorption in the non-farm sector economy on a sustainable basis. It is seen that the

average size of landholding among the poor migrant families of the region owning agricultural land is only 1.66 acre and of this, more than 80 per cent of the land does not have any irrigation facility. More so, only about 55 per cent of the families own some agricultural land and 45 per cent of them are landless sustaining round the year on wage-based income.

It is not possible to prevent distress seasonal migration of the poor families without generating any alternative means of sustainable and reasonable living in the region of their inhabitation. It is seen that the majority of migrant families have developed skill in brick moulding work. Their skill is in greater demand in outside states like Andhra Pradesh, Chhattisgarh, Maharashtra, Karnataka, Goa, Uttar Pradesh, Gujarat, etc. because of the cheap price of their labour and docile behaviour. It may be noted that migration per se is not bad if it improves the income earning capacity of the poor and makes them economically empowered. However, as we find in this case the seasonal migration does not bail out the poor from their vicious circle of poverty. Rather it ruins their socio-cultural life and makes their progenies bonded to indentured wage work like their parents. Hence, in order to make seasonal migration of the poor more meaningful to improve their living in the present scenario, the policy intervention measures should aim at evolving a more formal structure of migration that would ensure social security and prevent harsh work environment in the short run. Further, for the sustainable living of the poor families in the region, it is necessary to strengthen state-run anti-poverty programmes through action-oriented intervention measures.

**Notes**

1. As per Socio-Economic Caste Census (SECC) 2011, there are 86.78 lakh rural households (87.28 per cent) in Odisha.
2. Every winter (November-December) a large group of people from Balangir district migrates to work in the brick kilns of Andhra Pradesh. They work in the destination for six-to-seven months and return before the rainy season (May-June). This form of migration is termed as seasonal migration, which is distress type in nature because it is in response to insufficiency and lack of job opportunity.
3. The NSS 64$^{th}$ round survey, the migrant household is defined as 'if the entire household, as was being enumerated had moved to the place of enumeration during the last 365 days of the survey, it was considered as migrant household'.
4. Market failure includes an absent or ineffective credit and insurance market, which stimulate households for migration to ensure sufficiency as well as insurance against risk (Taylor, 1999).
5. Livelihood diversification has measured through a more appropriate index that is job diversification (JOBDIVRS) index defined as 'number of income source categories including household work (unpaid work done by own family members) but excluding non-farm full time work plus the number of non-farm full time workers' (Kurosaki, 2002; Nayak, 2016).

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## APPENDIX

Appendix 1

**Distribution of Migrant/Non-Migrant Rural Households among Land Ownership Class, Agrarian Peasant Class, and Poor/Non-Poor in Odisha (in per cent)**

| *Rural Households* | *Non-migrant Households* | *Commutation* | *Seasonal Migration* | *Total Migration* |
|---|---|---|---|---|
| Large | 21.95 | 4.00 | 0.00 | 1.12 |
| Medium | 25.09 | 0.00 | 0.00 | 0.00 |
| Small | 24.04 | 0.00 | 17.19 | 12.36 |
| Marginal | 20.56 | 32.00 | 20.31 | 23.60 |
| Landless labour | 8.36 | 64.00 | 62.50 | 62.92 |
| Landlord | 21.95 | 4.00 | 0.00 | 1.12 |
| Rich peasant | 16.72 | 0.00 | 9.38 | 6.74 |
| Middle peasant | 18.47 | 0.00 | 6.25 | 4.49 |
| Small peasant | 15.33 | 0.00 | 1.56 | 1.12 |
| Poor peasant | 19.16 | 32.00 | 20.31 | 23.60 |
| Landless labourer | 8.36 | 64.00 | 62.50 | 62.92 |
| Exploiter | 38.68 | 4.00 | 9.38 | 7.87 |
| Self-employed | 33.80 | 0.00 | 7.81 | 5.62 |
| Exploited | 27.53 | 96.00 | 82.81 | 86.52 |
| Poor | 32.40 | 84.00 | 79.69 | 80.90 |
| Non-poor | 67.60 | 16.00 | 20.31 | 19.10 |
| All samples | 100.00 | 100.00 | 100.00 | 100.00 |

*Note:* Number of households is the same as Table 5.

*Source*: Field Survey, 2014

Appendix 2

**Description of the Variables for Household-Level Regression Models**

| *Name* | *Definition* | *Mean* | *Std. Dev.* | *Min.* | *Max.* |
|---|---|---|---|---|---|
| All households with full information (Number of Observations =376) | | | | | |
| *Dependent Variables* | | | | | |
| Commutation and Migration | Value 1 if one or two members may be head of household commuting and migrating, or 0 if not. | 0.30 | 0.45 | 0 | 1 |
| *Independent Variables* | | | | | |
| Age | Age of household-head in years | 47.03 | 13.41 | 20 | 95 |
| Education | Average years of education in a household | 4.41 | 3.30 | 0 | 27 |
| Household size | Total number of members in a household | 4.59 | 1.95 | 1 | 14 |
| Membership | Dummy=1 if a household is a member of SHG/ Co-operative/Village Committee, otherwise 0 | 0.29 | 0.45 | 0 | 1 |
| Training | Dummy=1 if a household member has received any formal training on livelihood skill development, otherwise 0. | 0.16 | 0.37 | 0 | 1 |
| Regional dummy | Dummy, whether or not the household belongs to the highly diversified district (Bargarh, the agriculturally advanced district). | 0.53 | 0.50 | 0 | 1 |
| Land-operated | Numbers of acres operated by the household | 4.85 | 4.98 | 0 | 1 |
| Caste dummy | If the household is from SC/ST, the dummy takes the value 1, or 0 otherwise | 0.52 | 0.50 | 0 | 1 |
| Village dummy | Same as regional dummy. If the household is in the developed village (Bargarh district) it takes 1 and 0 otherwise. | 0.53 | 0.50 | 0 | 1 |
| RNFJ | Dummy variable taking 1 if the household has working persons in completely non-agricultural job | 0.35 | 0.48 | 0 | 1 |
| Poor/non-poor | Based on monthly per-capita consumption expenditure, if a household is poor the dummy takes 1, otherwise 0. | 0.44 | 0.50 | 0 | 1 |

*Source*: Field Survey.

Appendix 3

**Description of the Variables for Individual-Level Regression Models**

| *Name* | *Definition* | *Mean* | *Std. Dev.* | *Min.* | *Max.* |
|---|---|---|---|---|---|
| *All individuals with full information (Number of Observations =1731)* | | | | | |
| *Dependent Variables* | | | | | |
| Migration | Binary variable taking 1 if the individual participates in seasonal migration and/or commutation, otherwise 0 | 0.15 | 0.36 | 0 | 1 |
| *Independent Variables* | | | | | |
| Gender | Male=1, Female=2 | 1.49 | 0.50 | 0 | 1 |
| Age group | Less than 19 years=1; 20-29 years=2; 30-39 years=3; 40-49 years=4; 50 and above years=5 | 2.58 | 1.48 | 1 | 5 |
| Social group | ST=1, SC=2, OBCs=3, Others=4 | 2.19 | 1.00 | 1 | 4 |
| Household size | Total number of members in a household: 1 person=1; 2-4 persons=2; 5 and above persons=3 | 2.64 | 0.50 | 1 | 3 |
| Education | Illiterate=1; Up to primary=2; Middle=3; Secondary=4; Higher secondary=5; Diploma, graduate, P.G. and above=6 | 2.51 | 1.72 | 1 | 6 |
| Principal activity status at origin | Cultivator=1; Agricultural labour=2; Non-agricultural labour=3; Self-employed non-farm=4; Regular salaried= 5; Others=6 | 3.47 | 2.32 | 1 | 6 |
| Land-possession | Landless (<0.02 acres)=1; Marginal (0.02-2.50 acres)=2; Small (2.51-5.00 acres); Medium and large (greater than 5 acres) | 2.19 | 1.16 | 1 | 4 |
| Tenant status | Land leased-in=1; Otherwise=2 | 0.04 | 0.19 | 0 | 1 |

*Source*: Field Survey.

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# Understanding and Addressing Livelihood Problem of Rag-Pickers in Surat City

Vimal Trivedi*

*Rag pickers are considered as extremely unskilled poor coming from the lowest background in social hierarchy and live either on railway platforms, footpaths, or in unhygienic shanties of disease-infested slums. The present paper has attempted to explore the various problems facing by the rag pickers. This paper is based on the empirical analysis of the study named socio-economic conditions of rag pickers in Surat city. The study was based on 152 rag pickers selected through snowball and purposive sampling from the actual operational spots like landfill site, garbage transfer station or road side while they are collecting the waste. In order to give better representation of different areas/locations, the author has selected some slum pockets also. The data analysis presented in this paper is based on the primary data collected through an interview schedule. The author also attempted to capture the insights of the situation through some case studies of child rag pickers. The study shows that 80 percent of the rag pickers are illiterate and choose this work because they have no other livelihood option to survive. The study pointed out health risk and social security is a major problem to the rag pickers. Almost 80% of the rag pickers reported that they were either sick or injured in the last one month prior to our field visit. The study revealed that rag pickers are totally dependent on the small waste dealer for their daily income. The study concludes that there is a decreasing pattern of income among the rag pickers after the implementation of door to door (d2d) garbage collection program. The finding of the study shows that almost 70% of the rag pickers have lost nearly 50% of their income after the implementation of d2d program. Almost all have reported that though "more hours are spent in the collection of waste, they earned less". During our focus group discussion with rag-pickers' families most of them reported that they spent whole day without taking meal at least once in a week prior to our field visit. The state government wants to drastically cut the number of BPL cards to give the impression that the hunger situation is improving but in the study it was found that almost 70% respondents reported that they sleep in the night without taking food at least once in a week.*

**Keywords:** *Rag pickers, Recycling, Living and working condition, MSW*

## I. INTRODUCTION

Urban poverty is inextricably linked with recycle waste (Gupta, 2001). In developing countries like India recycle waste is most easily accessible and also crucial income source for the urban unskilled poor people, who do not have any options for their livelihood. Rag pickers, mainly women and children are considered as extremely unskilled poor

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of waste economy who makes a living by moving from one street to another street to collect recycle material for salvage. They are lowest background in social hierarchy and live either on railway platforms, footpaths, or in unhygienic shanties of disease-infested slums. They work day and night to collect the recyclable materials for their livelihood. Bhide and Shekdar (1998) noted their important contribution towards society and stated that rag pickers not only help the urban local body to keep the roads and lanes free from litter but indirectly they saved the cost of transportation and disposal. One another author Gill (2010:pg 10) also stated that the rag pickers play an important role in protecting the environment by shore up inadequate local authority provision by recovering large quantities of solid waste at zero cost to the public, and reducing the burden of uncollected waste in the process. In fact both the community either ragpickers who salvage recyclable materials or itinerant waste buyers ("*Bhangarwala*") who purchase small quantities of scrap are important links in the municipal waste economy. However Bentley (1988: pg. 8) described that "the extent of the waste economy in India has yet to be adequately documented but in all cities and even in smaller towns thousands of rag pickers roam the street". An empirical evidence of the study on rag pickers in Delhi revealed that almost 17% of waste handling is done by rag pickers, who collect, segregate and transport free of cost, as part of the informal trade in scrap, saving the government Rs 8 lakhs daily (Bhide and Shekdar: 1998).The ministry of urban development launched a program in 2016 called "Swachh Bharat mission" and prepared a manual for MSW management and in that manual they pointed out that "the informal sector plays an important role in the MSWM value chain by recovering valuable material from waste. It includes both the "kabadi" system or scrap dealers and waste pickers that help reduce environmental impacts by improving resource recovery and reducing waste quantities for disposal[1].

Despite the fact that rag pickers played a very crucial role not only in waste economy, but also in clean and healthy urban and semi urban environment, however their services are not getting recognition by the local urban body and an average civic society. The municipal authorities in general treat them as if they have no legal rights to pick up waste from the roadside or landfill site. The findings of various study highlighted that harassment and eviction of the rag pickers by the municipal authorities and law enforcement agencies including police, municipal staffs is a common practise. For example Bentley (1988) and Cointreau (1987) stated that "It is well known that many people in the informal sector have to pay 'fees' to be able to continue their economic activities without harassment from police or local urban authorities". In a study carried out by the author received the same feedback where the police and the staff of civic body takes undue advantage and in many cases they ask for bribes or subject them to harassment because the arguments made by them was their mobility

in early morning in the residence areas create panic to the residents. A case study of rag picker in Delhi indicated that "to be allowed to rag picking at Connaught place they have to pay Rs. 500 each to the Police and NDMC and Rs. 300 to the local daroga (Supervisor) every month" (Langer, 2011).

The management of municipal waste has many stakeholders in its value chain. Gupta (2001) pointed out that the trend in cities in developing countries is to shift the traditional municipal responsibility to private actors without considering the host of existing stakeholders. The rag pickers, itinerant buyers, sweeper and waste dealers etc are the main actors of the informal economy prospects of municipal solid waste. However the way of functioning of other actors affects the economic prospects of waste pickers directly or indirectly. In these contexts it was reported in the national newspaper the Hindu, New Delhi, (16th August, 2012)that "due to lack of understanding of the informal recycling sector; most often, policy makers are unable to understand the critical role of various chains of informal sector, or the quantum of their work". Chintan cited the outcome of CAG report (2007) which also pointed out the issue related to the lack of recognition of the informal sector. The report stated, that 'Only 17 per cent of the sample States had recognized the role of the waste pickers.' The report further quoted "Five years on, there are new rules and new policies in place that refer to the informal sector, but their implementation remain unmonitored (The Hindu, New Delhi, 16th August, 2012).One another study Langer (2011) also pointed out that in Delhi instead of human system that would incorporate rag pickers, a clash of interest has been created. On one side five contractors are looking to maximize profits by taking over the waste business, and on another side is the question of livelihood of rag pickers, already so precarious. Obviously it is a violation of existing laws of M/H rules 2000.Despite the fact that the laws M/H rules 2000 have been frames after the Barman Committee[2] report submitted to the Supreme Court in March, 1999. The committee recommended that "for collection of recyclable waste from the doorstep, NGOs may be encouraged to organize the rag-pickers. They may allot them the work of collection of recyclable material from the doorsteps instead of picking it up from the streets, bins or dump-yard, thereby upgrading their status. This recycle waste can be collected once or twice a week according to the convenience of the households, shops or establishments". But in last one decade not a single civic body accepted the service of rag pickers in recycled waste collection program as per the M/H rules 2000. In other term waste collection program in cities and town is half-hearted attempt in the specific context of total urban management programme and the rag-pickers hardly have any direct share in entire waste collection program. Surat city **i**s not exceptional in this regards. In Surat city waste collection program called "door to door (d2d) garbage collection" implemented in 2006 which was outsourced to various agencies by municipal authority without considering the impact on the livelihood of rag pickers.

## II. BACKGROUND OF THE ISSUE

Surat Municipal Corporation (SMC) took a decision to hand over the municipal solid waste collection program d2dto seven private agencies in 2006.In other words, SMC has ruled out the participation of rag pickers in entire municipal solid waste collection program. In fact waste economy with its inherent profit motive also exploited these poor people in the name of so called efficiency in the daily waste coverage. While author[3] undertaking a study called "Midterm assessment of d2dgarbage collection program of Surat city" in 2006, the issue of social and economic conditions of rag pickers had emerged.

Garbage collection program d2d is the core activity of civic body, in the context of clean and healthy urban environment of the city. The d2d programme can be also seen as part of the larger system of solid waste management. In the MSW rules 2000 it is clearly mentioned that all municipalities have to organize house-to-house collection of municipal solid wastes. It is not only essential to comply with the norms prescribed by the Municipal Solid Wastes Rules, 2000 but it ensures the waste reduction and source segregation. The garbage collection program from the door step was adopted in the consideration that waste generator either household or shop keeper keeps two bins one for dry waste and another for wet waste, so that one can segregate the waste in wet and dry. But the finding of the study revealed that segregation was not done by household and shop keeper at source level. In most cases they throw the recyclable waste on the street or into municipal garbage containers. In these context a large section of recyclable waste is picked up by the rag pickers in very hazardous conditions and as a result they mainly child rag pickers are exposed to health risk.

## III. OBJECTIVES OF THE STUDY

Two main objectives of the study the first one was to describe the socio-economic and living conditions and health related aspects of rag pickers and second one was to examine the effect of new operationalzed d2d garbage collection system on their livelihood. In 2013 an attempt was made by the author to examine the living and working conditions of the rag pickers and the impact of d2d garbage collection program on their livelihood. The analysis presented in this paper is based on the primary data collected through an interview schedule. The author also attempted to capture the insights of the situation through some case studies of child rag pickers. As many as200 rag pickers selected through snowball and purposive samplingfrom the actualoperational area ssuch as landfill site, garbage transfer station and road side while they are collecting the waste. In order to give better representation of different areas/locations, the author selected some slum pockets also. The survey of

the study was not encourging and there were many difficulties have faced. Ninty percent of rag pickers are illiterate and also the language barriers. They either speak only "Marathi" or they are not willing to provide the information. In some cases they provides the information in half of the schedule, then refuced. Inspite of many restrains an effort has been made to collect the information from the 152 rag pickers. The pre coded schedule for data collection is framed in such a way that information could be gathered very easily. The information is obtained through a schedule by a trained team. The data is entered in SPSS data editor for analysis. Before the data analysis, the error from the data sheet is resolved by reference to the original survey data.

## IV. SURVEY RESULTS AND DISCUSSION

The outcome of the study shows that 80 percent of the rag pickers are illiterate and choose this work because they do not have any alternate options for their livelihood. Only 2.5 percent cases reported that they have studied up to tenth standard. Further 17% studied up to primary education. In the study it is observed that education is low on the list of priorities among deprived section of the society. Many respondents confessed during the informal meeting that they can't afford to educate their children. The distribution of caste shows that 98.4% are from lower strata in this informal economic activity. The outcome of the data indicated that out of 152 respondents, 123 respondents have reported their caste. Out of 123 respondents, 62.6% of belong to schedule caste, whereas 31.7% reported as belonging to schedule tribes, only 4% rag pickers were from other backward caste groups. Bentley (1988) examined the caste distribution of rag pickers in Ahmadabad and found that most of them belong to the Vankar (Weaver), Chamar and Mochi (leather worker) and Bhangin (sweeper) communities.

The survey result shows that 53 % respondents reported that their mother tongue is Marathi. Remaining cases reported Gujarati as their mother tongue. Almost 60% respondents reported that they are Hindu, whereas 33% rag pickers reported that they follow Buddhism. Interestingly less than one percent rag pickers are Muslims; however the data indicated that majority of the retailers, brokers or wholesalers of the waste are Muslim. The distribution of the respondents by family size shows that 70% respondents had their family size between four and six. The finding of the study indicates that the average family size among the family of the respondents is around six members per family. Almost 25% respondents reported their family size between 7 to 13 members. With regard to marital status the data indicated that 74% respondents were married, whereas almost 16.3% reported that they are widow. The data ravelled that 95% respondents reported that their family's main source of livelihood is rag picking. 55.4% families migrated from rural Maharashtra in search of a suitable job.

In the present study the data shows that majority of the respondents migrated mainly from the regions like Dhulia, Nanded, Nandarbar, Shirpur etc.

The outcome of the study indicates that 36% of the rag pickers said that they did not have any job at their native place and equal percent of respondents reported that they do not have land. Almost 48% respondents reported that they came to Surat with their parents. Interestingly12% respondents reported that they are brought to Surat by the brokers for rag picking work. The study also found that a small section of the respondents developed affinity with the city rather than with their native place and plan to settle permanently in the city. The study further found that almost 62% respondents reported that they retain connection with their native places. They visit their native place at least once in a year. They have voter identity cards of their respective native places with them. However 26% respondents indicated that they did not visit their native place since last many years. One respondent from Rasulabad slum told that when elections take place in Maharashtra, political leaders of the party arrange vehicles to carry them to Maharashtra so that they could vote in their constituencies. According to 57% respondents they were labourers before they migrated to Surat. 65% rag pickers reported that they do not have house at their native place. Almost 90% respondents do not own land back home.

A large number of rag pickers are living in slums whereas 6.8% were residing at public places or open spaces such as footpaths, railway station, bus stand, public parks. During the field visit, it observed that almost a hundred rag pickers families were living on the Bhatar transfer station in a very miserable condition. Some families are found in shanties created on a heap of garbage. Many families are seen on final landfill site. Some respondents reported as they are living under the bridge. Nearly 70% of the respondents of Rasulabad and Azadnagar slums have been living there for more than three decades. The data shows that about 33% respondents reported that they are living in Surat city for more than 30 years. The data shows that 66% respondents were not engaged with any other work before they choose rag picking work. Further 33.6% respondents reported that they were engaged in casual work. However as it did not give guarantee for regular income they shifted to rag picking work.

## V. EXPLOITATION FROM BROKER

Almost 48% respondents reported that they are doing collection of the recycled materials for the broker. Out of them majority have reported that the retailer exploits them in terms of less payment, and taking high interest when they borrow some loan. In our study visit we were told by many rag pickers that the retailer has a tendency to hire aged women or children rather than men for rag picking.

Table 1
**Are You Doing this Work for a Broker /Waste Dealer?**

| *Working for a Broker or Waste Dealer* | *Frequency* | *Percent* |
|---|---|---|
| No | 76 | 52.1 |
| Yes | 70 | 47.9 |
| Total | 146 | 100.0 |

*Source:* Field data

The reason behind was that they never going for confrontation with the retailer for payment and weight. About 26% respondents felt that they are getting less money when they sell to waste dealer. In fact during our field visits in many occasions it was observed that the waste dealer was manipulating the weight to retain a big profit. The rag pickers allege that they are forced to sell the recyclable materials at the rate the retailers decide with no scope to bargain. Moreover, if someone try to raise their voice against the fewer rates, the retailers' refuse to buy the material from them. In some cases waste dealers pay less amount saying the material is wet or moist (spoil due to mix with kitchen waste). In some cases they indicated that they were aware the dual price policy of brokers but they are under obligation to sell to them only because they took loan from the waste dealer. The study shows that 71% respondents took money from the waste dealer, relatives or grocery shop keeper. Out of that 71% reported cases almost 56% reported that they have taken in the form of advance from waste dealer. Almost fifty percent said that they received the advance money with 5% interest per day. The study finding shows that 54.9% of the sample rag pickers reported that they picked up 41 to 65 K.G. recyclable materials every day. The survey result also found that the weight of the recyclable material is not that much deciding factor for daily earning of the rag pickers. The waste dealer (retailer of waste) decides the rates on the basis of the type and quality of material. For instance thin plastic (carry bag known as "halka mal") does not have any value. Also wet waste receives less return generally in rainy days. The study shows that almost 90% respondents picked up thick plastic, paper and metal.

**Working Hours**

Almost 98% rag pickers said that they are doing this work throughout the year and rag picking is a full time job for them. They expressed in many informal meetings that there is no fixed hours of work. They prefer to start their work early in the morning between 6 a.m. and 7 a.m. because at that time there are more chances of the availability of recyclable materials. However they worriedly confessed that after the implementation of d2d garbage collection program, they have to work hard and start their work a little early say in the morning 5 a.m. because the staff of the d2d program also involve in the

collection and sorting of recyclable materials while collecting municipal waste from the door steps of various localities.

Table 2
**Distribution of Respondents According to the Number of Hours they Work**

| *Working Hours* | *Frequency* | *Percent* |
|---|---|---|
| <= 6 Hours | 29 | 19.3 |
| 7-10 hrs. | 118 | 78.7 |
| 11-14 hrs. | 3 | 2.0 |
| Total | 150 | 100.0 |

*Source:* Field data

As a consequence majority of the rag pickers work for 8 to 10 hours a day and some even work for more than ten hours, which is not similar to the prescribed working hours of other occupations. As far as working hours is concerned in rag-picking work there is no difference between men and women.

**Monthly Income**

The monthly income of the respondents is dependent on the sale of the recyclable material. 7% rag pickers' reported their family income as not sufficient i.e. below Rs. 1000 per month i.e. Rs. 30 per day. The data reveals that a large portion (62%) of sample rag pickers reported that their family income was between Rs. 1001 and Rs. 3000 per month (see table 3). Further 16.3% respondents reported their income between Rs. 3001 and Rs.4000 per month. The finding of the study shows that the average monthly family income of rag pickers was Rs. 2580. As far as selling of waste is concerned, two types of patterns are reported in the study. Around 31.5% rag pickers associated with the NGO; hand over their recyclable materials to a co-operative scrap shop run by women rag pickers association, while the remaining respondents sell to the waste dealer.

Table 3
**Distribution of Respondents by their Monthly Household Income**

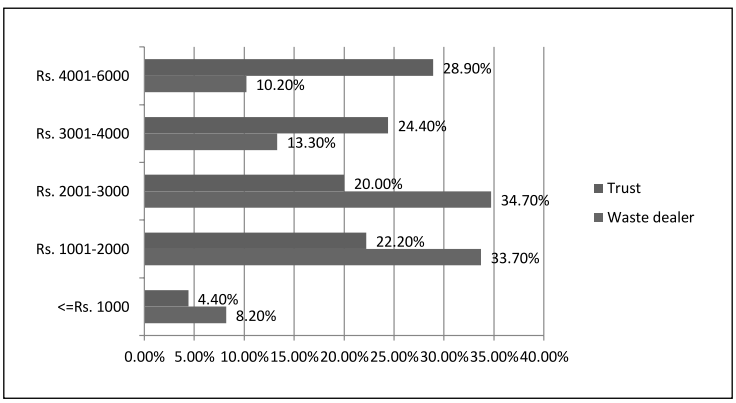
| *Monthly Income* | *Frequency* | *Percent* |
|---|---|---|
| <= Rs.1000 | 10 | 6.8 |
| 1001-2000 | 47 | 32.0 |
| 2001-3000 | 43 | 29.3 |
| 3001-4000 | 24 | 16.3 |
| 4000-6000 | 23 | 15.6 |
| Total | 147 | 100.0 |

*Source:* Field data

Comparisons of the income of these two groups reveal that the average monthly income of the respondents who sell to co-operative shop was about Rs. 3299, while those who deal with the private waste dealer were Rs. 2555. The distribution of monthly income by these two groups is shown in chart 1.Almost 70% sample rag pickers reported that the rate of the waste varies from season to season. The rate of various recyclable materials was decided by the broker or the waste dealer so chances of cheating were high said many rag pickers. There is no rate contract, so the middle men and small waste dealer earned big economic gain compared to rag pickers and itinerant buyers. However as it is an informal activity between two parties, there is no intervention from the civic body against the exploitation of this deprived section of the society. Eventually in the study it is observed that the municipal sweeper burn the waste after sweeping the roads. This practice may affect not only the environment of the city but also affect those whose livelihood depends on rag picking. The study noted that almost 30% rag pickers associated with the NGO said that the Trust and the wholesaler both decide the rates so they received fair price and they are satisfied with the help extended by the NGO. In Surat Navsarjan ensured that the rag pickers are not cheated by retailers, and they get the right price for the scrap they collect and sell.

Chart 1

**Distribution of Monthly Income by who Decides the Rate of Waste?**




*Source:* Field data

The study found that in all the sample rag picker's families, children help the elders in rag picking or in sorting out the picked material. In fact their income is dependent on the daily collection, type of the waste, and the quality of waste. Various recyclable materials are sold under different rates, which are decided by the waste dealer. Even we have observed that the rates are varying from area to area as they are decided

by the waste dealer considering the daily margin of profit. However each recyclable material has a lump sum/fixed price depending on the condition of material. For instance broken glass is Rs 7 per K.G., metal goes for Rs 15 per K.G., dry paper and thick plastic are sold at Rs 3 per K.G. However the value of both the thick plastic and paper varies depending on the season, and quality. The milk sachets, thin plastic bags popularly known as "Carry Bag" are always seen in the garbage containers with the kitchen waste or roadside in some cases. Because rag pickers generally pickup only recyclable materials like paper, thick plastic, glass, tin etc. They ignore the thin plastic bag known as "Carry bag". They said that ``Halka maal hain, bilkul nahin chalta''.

In our focus group discussion most of the rag pickers were not satisfied with their daily collection of waste and the rates of various items. It was reported that in many cases the wet waste is pay less by the broker. The study noted that each rag picker collects hardly 35 to 50 K.G. recyclable materials in a day after spending eight to ten hours. The transportation cost is also borne by the rag picker to transfer collected materials from collection point to brokers' shop. However in some cases we came to know that those who are working for the broker they can avail the transportation facility free of cost. Looking the recycle economy, the middle man or broker earns a good amount by selling recyclable materials to the wholesaler. The data shows that 78% families unable to survive on a single income and then waste picking has become a family business for them. Singh (1996) noted that because of increased economic pressure the parents are forced to put their children in this hazardous occupation without considerWing their responsibilities towards the rights of these young children. The data revealed that the daily income varies widely depending upon the location, amount of efforts put, and the type of materials they pickup etc.

The study finding indicated that 30% rag pickers collect the recyclable materials from the garbage disposal site. Remaining reported that they collect from roadside, residential areas and from the containers. The study finds that each of the rag pickers has specific areas/location for the daily collection. 88% rag pickers visit the same areas/ location to collect waste. The finding of the data shows that in the residential areas nearly 49% rag pickers are not allowed to collect recyclable materials.

Table 4
**Impact of d2d Program Implementation on their Income**

| | *Frequency* | *Percent* |
|---|---|---|
| No | 13 | 24.5 |
| Yes | 40 | 75.5 |
| Total | 53 | 100.0 |

*Source:* Field data

The study indicated that 76% rag pickers expressed loss of income after the implementation of d2d garbage collection program (table 4). The finding of the study also indicated that the staffs of d2d program do not allow the rag pickers to collect the recyclable materials in their daily collection route. The statistics show that almost 70% of the rag pickers have lost nearly 50% of their income after the implementation of d2d program.

The food security is important for everyone in the society, but the study reported that rag pickers did not get regular meal or in most cases got only one meal in a day. While discussing with them we have observed that they worked almost eight to ten hours for the collection of recyclable materials, without a regular meal. The data shows that 68.7% rag pickers do not have specific time for their meal. Almost 76% rag pickers reported that they take their meal once a day preferably during the night. Only 18.5% respondents reported that they have meals twice a day. Further, 97% respondents said that they cook the meal every day. The data shows that 94% respondents purchase grocery for meal on daily basis. Only 4% rag pickers reported that they purchase the grocery items for a week's period. However during our focus group discussion with rag-pickers' families most of them reported that they spent whole day without taking meal at least once in a week prior to our field visit.

Table 5
**Sleep in the Night without taking Food**

| | *Frequency* | *Percent* |
|---|---|---|
| No | 46 | 33.1 |
| Yes | 93 | 66.9 |
| Total | 139 | 100.0 |

*Source:* Field data

The state government wants to drastically cut the number of BPL cards to give the impression that the hunger situation is improving but in the study it was found that almost 67% respondents reported that they sleep in the night without taking food at least once in a week (table 5). Of these almost 15% were without food for two days in a week. Obviously they were asleep without taking meal during the monsoon season, because the recyclable materials like paper, plastic become wet and dirty and the broker would not give appropriate payment against the recyclable materials. Even during illness they do not earn anything hence they spend whole day without food.

**Health Aspect**

Health risk is a major problem for the rag pickers because they move around the garbage container, searching for recyclable material and come into contact with dead animals and spoiled food. The Barman committee report stated that twenty-two types

of diseases are associated with improper SWM practices. Almost 80% cases reported that they were sick or injured during the last one month prior to our field visit. The study shows that 53.8% cases reported fever. The multiple diseases reported by the respondents suggest that 41.9% of them have more than one problem like skin infection, general weakness, cough and breathing difficulty.etc. The study noted that the types of injuries reported by the rag pickers during the last one month include dog bite (22.3%) being cut by broken glass (72%), and tin while collecting waste from the containers. When asked about medical treatment received 89% rag pickers reported as having taken medical treatment. The study shows that 37.9 percent gets medical treatment from the civil hospital while half of the respondents approached private clinic/ hospitals. Another problem reported was they particularly the child rag pickers also gradually pick up a number of bad habits. In our study we have found that 15% respondents reported smoking cigarettes very often. Also the respondents reported that they the habit of chewing tobacco (58%), Gamble (4%) and regularly consuming alcohol (17%). Out of 152 interviews, we have received 143 responses on this brush with police. Of these only 4.2% cases confessed that they were arrested by the police. Almost 49% rag pickers are scared of dog bite. The result of medical expenses shows that 16.2% had medical expenses between Rs. 1500 and Rs. 4999. There are four respondents who reported medical expenses of RS 5000 and above. Almost 45% rag pickers have taken loan to meet these medical expenses from the retailers.

## VI. CASE STUDIES OF CHILD RAG PICKERS

Rag picking work is one of the most visible works in which lacs of children are engaged. In fact the child rag pickers do not contribute much as far as the responsibility of family income generating is concerned but because of poor family condition they have to engage themselves in this kind of activity. Out of ten reported case studies it was revealed that in most cases parents allow/force their children to spend time on rag picking activities like collection or sorting of waste. Almost 80% rag pickers are forced to work for their survival and remaining are influenced by peer pressure. Singh (1996) quoted that "parents themselves are the main motivators of the children to undertake rag picking work. For instance 32% of the children became motivated by their friends, 22% got motivated by neighbour and 6.7% of the child rag pickers themselves choose this occupation when they leave the school and see others working in this field".

The case study indicated that girl child rag pickers more visible in the field because of need for the social security of the girl. One of the mother of girl rag picker said that "I always bring my daughter with me at work place in view of her safety". She said further that my alcoholic husband died three years back so I am worried about my daughter. The findings of a study on the situation of girl rag pickers in Delhi (Agrawal, 1989) revealed that "Girls are allowed to go for collection of rags along

either with their mother or elder brother". A study carried out by UNICEF (2002) reported that 70% girls faced problem of eve teasing, physical abuse and sexual abuse by the watchman, guard, shop keeper, tea shop and general people etc. Soni (2009) pointed out that "The burden of household duties falls largely upon the female child". The author further noted that the "girl child labour not only deprived them of their education and recreation, but their overall development is also gets affected.

In our many informal meeting with the rag pickers we have noted that a very common instruction from the parents to their children was that "go and earn your ROTLA (one day meal)". It was told by many child rag pickers that they join in this work just because they want to help their mother in the segregation of waste so that she can cook for us. Many of the children have shown their interest in the education but as rag picking work takes much of time it becomes impossible for them to attend school on regular basis. It was observed that majority of the children start rag picking at a very young age of eight years. Looking at the age distribution the study found that almost all child rag pickers are between the age of 8 and 14 years. The information indicated that most of the children had undergone only primary education. The poor economic condition of the family and lack of interest in education lead the children to leave education.

In the study we were told by child rag pickers that generally the broker has a tendency to pay fewer amounts to the child rag pickers compared to adult rag pickers. Among ten almost fifty percent or more cases were addicted to tobacco or gutka. It was also noticed that many child rag pickers are found to have bad habits either because of the parents' habits or due to the influence of friends. The study data shows that almost all suffered from various diseases majority by fever and dehydration. As reported in the study most of the child rag pickers are prove to cuts, injuries, joint's pain, skin infections or food poisoning as they eat thrown away or leftover food. Muscular problems or body pain are reported because of long distance walks with heavy loads. The data revealed that dog bites are quite common among the child rag pickers.

## VII. CONCLUSION

The present study has highlighted the various problems facing the rag pickers. The study also discusses some insight of the living and working condition of the rag pickers. The study has pointed out that health risk and social security is a major problem to the rag pickers. Almost 80% of the rag pickers reported that they were either sick or injured in the last one month prior to our field visit. Rag pickers are totally dependent on the small waste dealer for their daily income. The study outcomes indicate that that there is a decreasing pattern of income among the rag pickers after the implementation of d2d garbage collection program. The finding of the study shows that almost 70% of

the rag pickers have lost nearly 50% of their income after the implementation of d2d program. Almost all have reported that though "more hours are spent in the collection of waste, they earned less". The local urban body (SMC) with the help of local NGOs needs to initiate some actions for the rehabilitation of these deprived sections of the society. They need to provide the medical facilities and health insurance. Educations of their children are also a problem area. In 2011 Gujarat state has accepted "Right to Education" but the study shows that the children of rag pickers are either illiterate or school drop outs. Considering the fact that the children of the rag pickers in turn become rag pickers because of lack of education so it is the responsibility of the state to take some steps to access education to their children, so that their children finds job in future instead of going in this profession. Even state can implement the scheme like Pune where many children of the rag pickers are getting education through NGO initiatives. In this context the report of DNA, June 14, 2012 highlighted that two rag pickers' children Sayali Gawre and Akshay Gaikwad scored 79% and 84% respectively in tenth class exams conducted by Maharashtra state board.

Handling the municipal waste in a more scientific manner cannot be successful without the involvement of all stakeholders such as municipal body, civic society, rag pickers, inherent buyers, NGOs, private agencies and government. To reduce and reuse waste, each one of them has to play a positive and constructive role. The municipal authority has to recognize the effort of this vulnerable group of the society and provide them with social security. SMC has to provide the space for sorting the recyclable materials and transportation facilities so that they can transport the recyclable materials directly to the recycle industry through NGOs without the middlemen. With the help of the NGOs, the corporation could spread awareness among civil society about the need for segregation of waste. SMC can also enlist the services of local NGOs for the area wise formation of cooperative societies of the rag pickers, which help them to earn a regular income every month. The concept of the cooperative society has two advantages; first there is no "middlemen" in selling the items; the society could directly deal with the recycle industry like "Navasarjan" doing in Surat. The second advantage is that the co-op society provides them identity cards so that they are no longer harassed by police or residents and also covers their health insurance. For this all rag pickers in a particular locality should be brought together by the municipal authorities, assigned areas of responsibilities and are introduced to a chain of collection of recycled materials from the door step/ shops. In this case the rag pickers could be paid a fixed monthly amount by the society and the society gets support from the waste generators like factories, shops, restaurants, individual household etc. This waste can be collected once or twice a week according to the convenience of the households, shops or establishments. The society could also extend

the program further so that the rag pickers be trained to do composting and a certain amount from the proceeds of sale of compost could be allotted to them. In conclusion, it is essential effective role played by the rag pickers in the overall municipal solid waste management, the civic body has to recognise their contribution and incorporate them in the waste collection program so that they can influence decision-makers, making sure that new policies and projects are designed in ways that protect their livelihoods.

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# Structure and Organisation of School Dental Health Service in the School Health Programme of NRHM in West Tripura District

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*School Health Programme was launched in many parts of the world with the aim of providing promotion, prevention, early diagnosis of diseases and awareness among school children. Rashtriya Bal Swasthya Karyakram (RBSK) was launched under NRHM in India to address the four 'D' s –Diseases, Deficiencies, Defects at Birth and Developmental Delays including Disabilities and Reproductive, Maternal, New-born, Child Health and Adolescent Health (RMNCH+A) (GOI,2013). Dental caries is one of the disease components among thirty diseases condition under RBSK. This paper tries to bring out the status of School Dental Health Services in the structure of School Health Services. This study uses the concept of 'power and authority' dental health services has in the given structure of School Health Services. This paper also tries to focus on the functioning of school dental health and constraints faced during the implementation of the programme. The study was qualitative in nature and done in the rural and difficult to reach areas of West Tripura District of Tripura.*

**Keywords:** *RBSK*, *NRHM*, *School health programme*, *Dental health service*, *School health service*

## I. INTRODUCTION

School Health Programme contributes to the maintenance and improvement of the health of the school-going children, which includes health services, healthful living and health education. Since the18th century, many countries of the world thought about the health of school children. In India, the first medical inspection was started in Baroda city in the year 1909 (Baru, Rama V, 2008). From 1909 AD, the school health programme has been changed several times and it has come a long way to give a new form to the programme. This new form of the school health programme was launched in the year 2013 under NRHM, named Rashtriya Bal Swasthya Karyakram (RBSK). This is a comprehensive programme which not only covers school-going children but also covers all the children from 0-18 years. This addresses four 'D's-- Diseases, Deficiencies, Defects at Birth, Developmental Delays including Disabilities. This programme also

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addresses Reproductive, Maternal, New-born child health and Adolescent Health Strategies (RMNCH+A). Outreach screening is done by the Dedicated Mobile Health Team (DMHT) from block level to Anganwadi centre (6weeks to 6 years) along with government and government-aided schools from 6-18 years of children.

Among the selected thirty disease conditions for which screening, early detection and free management are done, one is dental caries. National Health Survey 2004 shows that the prevalence of dental caries among 5-year olds is 51.9%, 53.8% in 12-year olds, and 63.1% in 15-year-old children in India. WHO (World Health Organisation) epidemiological data shows that 60% to 90% of schoolchildren suffer from dental caries in industrial countries. It is the most prevalent dental diseases in the world. Poor and disadvantaged sections of people suffer more and the burden of oral diseases is highest among them. Studies from different parts of India and the neighbouring countries show that more than 70% of school-going children suffer from dental caries (Moses et al., 2011, Grewal et al., 2009, Chaturvedi et al., 2012, Datta and Datta, 2013, Ali et al., 2012). Nutrition plays an important role in causing oral diseases (Mishu et al., 2013, Chatterjee and Bandyopadhyay, 2012, Dahiya et al., 2013, Psoter et al., 2008, Sweeney et al., 1971). Several studies conducted in different parts of India about the general health condition of children, show that nutritional deficiencies not only cause anaemia, malnourishment, Bitot's Spot and skeletal changes in children, it also causes dental diseases like late eruption of teeth, mottled enamel, dental caries etc. (S C and M R, 2009, Sudhagandhi et al., 2011, Singh and Sekhon, 2014, Kumari, 2005, Vandana and Dahiya, 2012, Kaushik et al., 2012, Singh et al., 2010, Manna et al., 2011, Bisai, et al., 2008). Dental morbid conditions can lead to systemic complications as well as psychological morbidity and low self-esteem that affect the quality of life (Sowmya et al., 2011, Sheiham, 2006). However, dental caries is a component of the school health programme, but the functioning of the School Dental Health Service is not known.

Rules and resources determine human action. Rules restrict action while resources facilitate it. Resources provide power in the structure. This study used the concept of 'power and authority' School Dental Health Services has in the given structure of School Health Services.

## II. METHODOLOGY

### Objectives

Overall objective of the study is—

To study the structure and functioning of dental health services in the school health programme in Tripura.

Specific objectives are:

– To study the Structure and Organization of the School Health Services under

NRHM in West Tripura District

– To study the functioning and constraints faced by personnel in the delivery of School Dental Health Services in the School Health Programme under NRHM in West Tripura District

The study was qualitative in nature. This study was done in the year 2014—15. A pilot study was done from 28th August 2014 to September 2014 and final data collection and fieldwork were done during November 2014 to March 2015.

**Preparation of Tools**

The interview schedule was prepared in English and translated into Bengali as the respondents were well versed in Bengali. Interviews were conducted in Bengali and were translated into English later.

**Sample Selection**

Sample selection is done purposively keeping in mind different criteria, which will help in addressing the objectives of the study. West Tripura District was the first district in Tripura, which implemented the RBSK programme.

***Selection of Blocks***

Selection of Blocks is done according to the following criteria:

– Where PHC or CHC is present and has a Dental Surgeon posted in it.
– In which Blocks School Health Programme is performed by newly recruited Dedicated Mobile Health Team
– Dental Surgeons are part of the School Health Programme as a referral unit
– Dental Surgeons previously worked in School Health Team in School Health Programme (the programme which was going on before RBSK)
– Urban area and blocks are excluded as this fall under NUHM—National Urban Health Mission

Among the nine blocks in West Tripura District, two blocks are selected.

a. Jirania
b. Mandwi/Mandai

***Selection of Schools***

Selection of schools is done according to the following criteria:

– Schools situated in poor socio-economic area of these two blocks
– Difficult to access area
– School Health Programme is implemented by a Dedicated Mobile Health Team

– Co-ed schools

Four schools; two from each block, have been selected for this study.

Respondents were personnel from the health and education department and assigned to implement the School Health Programme. The interview was conducted with the help of an interview schedule. The sample selection had been done purposively from the education and health department from the selected block level to the state level. Total sample from both education and health department were fifty-one (42 personnel from the education department and 9 personnel from the health department). Table number 1 shows the sample size.

***Sample***

**Table 1**
**Sample Size**

| | *State Level* | | *District Level* | | *Block Level* | | *Total Sample* |
|---|---|---|---|---|---|---|---|
| | *Designation* | | *Designation* | | *Designation* | | |
| Health Department | 1.<br><br>2. | M/S, NRHM, 1 no.<br>SNO, NRHM, 1 no. | 1<br>2<br><br>3<br><br><br>4 | CMO, 1 no.<br>DNO, RBSK, NRHM, 1 no.<br>M/O, (Homeopathic) RBSK, NRHM, 1 no.<br>Pharmacist, (allopathic) RBSK, NRHM, 1no. | 1.<br><br><br>2.<br><br><br>3. | Dental Surgeon, CHC, 1no.<br>Dental surgeon, PHC, 1 no.<br>Dental surgeon, PHC, 1 no. | 9 |
| Education Department | | | 1. | H/M, assigned as DNO for SHP, 1 no. | 1.<br><br>2.<br><br><br>3.<br>4.<br>5. | I/S, 1 no.<br>Teaching staff, assigned for SHP, 1 no.<br>H/M, 4Nos.<br>Teachers, 29Nos.<br>Group-D staff, 6 Nos. | 42 |

*Source:* Compiled by author

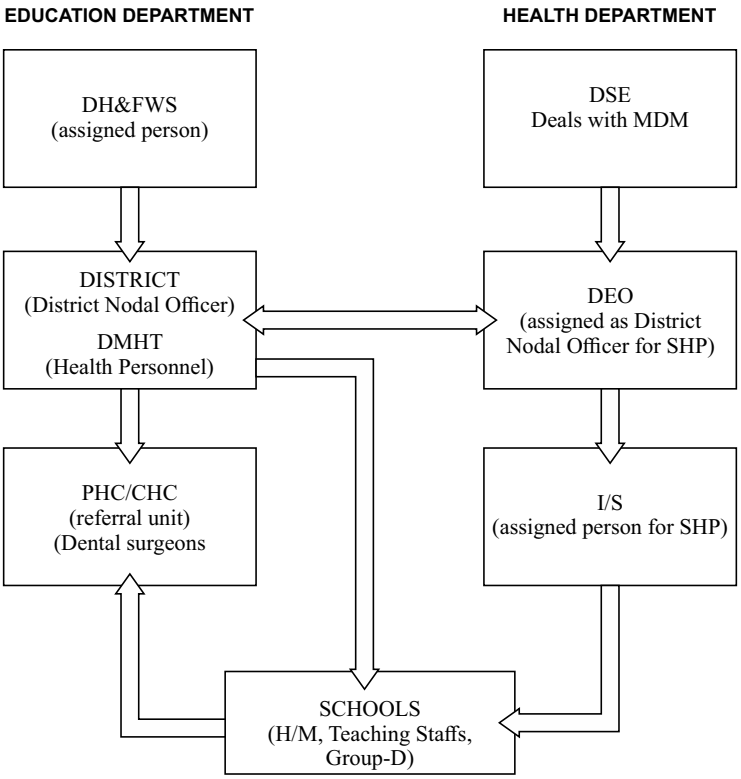
M/S- Member Secretary, CMO- Chief Medical Officer, SNO-State Nodal Officer, DNO- District Nodal Officer, RBSK- Rashtriya Bal Swasthya Karyakram, M/O-Medical Officer, CHC- Community Health Centre, PHC- Primary Health Centre, NRHM-National Rural Health Mission, SHP-School Health Programme, I/S- Inspector of School, H/M- Head Master/Head Mistress.

### Ethical Consideration

Verbal consent was taken before the interview. The interview was recorded with the consent of respondents and was not recorded for those who did not want it recorded. Their responses were written down by the researcher in the interview schedule

## III. FINDINGS AND DISCUSSION

### Structure of School Dental Health Service and Interaction of Personnel




*Source:* Interaction between health and education department, Compiled by Author

DSE-Directorate of School Education, DH&FWS- Directorate of Health &Family Welfare Society, DEO-District Education Officer, DMHT-Dedicated Mobile Health Team, I/S—Inspectorate of School, Inspector of School, PHC-Primary Health Centre, CHC-Community Health Centre, H/M- Head Master/Head Mistress, SHP-School Health Programme, MDM-Mid Day Meal.

Education and health departments are involved in the implementation of the school health programme in schools. In the preceding chart, the interaction between the two departments is shown. They interact with each other at the district level. The

education department looks after the Mid-Day Meal (MDM) Programme, Weekly Iron and Folic Acid Supplementation (WIFS) and the De-worming programme twice a year. The health department looks after the School Health Programme. District nodal officers in both the departments interact in this level as liaison officers. Education department provides a list of the schools to the health department. According to the list, the health department makes the schedule for the school health programme and conveys it to the education department. It is the duty of the district education officer to convey the message to the inspectorate of school at the block level.

Inspectorate of school conveys the message to the respective schools for the time and venue of the programme. They collect medicines from the central medicine store of the health department for the weekly Iron and Folic Acid Programme. They also collect medicines for the de-worming programme. In the School Health Programme, medicines are carried by the DMHT.

Headmaster/Headmistress of all those schools deploys teaching staffs and group–D staffs for the programme. Teachers help the health team to carry out the programme in the school.

School health team does screen and prescribes medicine to the children. Those who are in need of further intervention are referred to the nearest PHC (Primary Health Centre) or CHC (Community Health Centre) where a dental surgeon is posted.

There is no direct interaction at the higher level. Interaction is on district level between two structures and at school level when the team visits the school to carry out the programme. The school health programme is monitored by duel authority but the interaction between the actors of these two organizations of the structure is very poor. This also has been observed in the study of Despande, Baru and Nandy's work. These two departments are looking after two aspects health and nutrition –SHP and MDM separately. However, study shows that health and nutrition go hand in hand.

**Funding and Budget Allocation**

Budget allocation in school health programme: Approval of state PIP 2013-14: Tripura

Table 2
**Budget Allocations in the School Health Programme: PIP 2013-14**

| *Sl. no.* | *Budget Head* | *Unit of Measures* | *Quantity/ Target* | *Unit Cost(Rs.)* | *Budget Proposed (Rs. Lakhs)* | *Amount Approved (Rs.in lakhs)* |
|---|---|---|---|---|---|---|
| 1. | Child Health | | 5703 | 53000.00 | 97.68 | 37.82 |
| 2 | School Health Program Me | | | | | |
| 2.a | Prepare & disseminate guidelines for SHP | | 8 | 40000.00 | 3.20 | 1.40 |
| 2.b | Prepare a detailed operational plan for SHP across district (cost of plan meeting should be kept) | | | | 0.00 | 1.80 |

| Sl. no. | Budget Head | Unit of Measures | Quantity/ Target | Unit Cost(Rs.) | Budget Proposed (Rs. Lakhs) | Amount Approved (Rs.in lakhs) |
|---|---|---|---|---|---|---|
| 2.c | Mobility support | No of unit | 15 | 20000.00 | 57.94 | 22.80 |
| 2.d | Referral Support | No of DEIC | 4 | 100000 | 4.00 | 00 |
| 2.e | Other Strategies for SHP | | 67 | 222000 | 178.79 | 67.22 |
| 2.f | Tertiary Level treatment of Students | No. of Case | 48 | 200000 | 96.00 | 49.00 |
| 2.g | Specialist School Health Camp | No. of DH/SH | 4 | 2000 | .96 | 0.00 |
| 2.h | Printing of Health card and Students Health Register | No. of card and register | 1187703 card+450 register | | 36.53 | 18.72 |
| 2.i | Drugs & Supplies for SHP | | | | 256.51 | 148.72 |
| | Child Health and RBSK | | | | 915.08 | 353.43 |

*Source:* GoI: 2013-2014, page 45

PIP-Programme Implementation Plan

Budget allocation from Government of India (GOI) during the year 2013-2014, under NRHM Flexi pool was Rs55.75 crore; RCH Flexi pool was Rs 49.19 crore. Total budget allocation from GOI for different programme i.e. IDSP-Integrated Disease Surveillance Programme, NVBDCP-National Vector Borne Disease Control Programme, RNTCP-Revised National Tuberculosis Control Programme, Immunisation, NLEP-National Leprosy Eradication Programme, etc. was Rs 155.75 crores. The state share was 10% of total expenditure (GOI: 2013-2014).

In the programme implementation plan, the proposed budget for Child health and RBSK was 915.08 lakhs in the year 2013-2014, the amount approved for the said programme was 353.43 lakhs.

Table number 2 shows that budget allocation is done for school health programme but not separately for dental health. There was no budget allocation for dental health from the GOI and state. Without financial help, it is impossible for personnel to deal with dental health. There is no dental instrument in the health team, even no provision is also there. Money, which is the infrastructure for the supra-structure to function properly and keep solidarity in the system is absent here. So, what importance is dental health getting?

Code 'B' and 'Ch' schools were having annual examination at that time when the health team visited schools, so these are only reported cases as the health team could not screen all the students in the school.

From table number 3, it can be seen that reported cases and epidemiological data differ a lot. When teachers were interviewed and asked- what were the most common

diseases that students suffer from, most of them said seasonal diseases, stomach problems, headache or body ache. Very few said that the students suffer from dental diseases. Whereas, the epidemiological picture is different from the 'felt need' of the students.

Table 3
**Percentage of Dental Diseases in the Selected Schools**

| *Code of Schools* | *No. of Students Present* | *Students having Dental Diseases* | *Students having other Diseases* | *Students not Screened/not having any diseases* | *Percentage (%) of Dental Diseases* | *Percentage (%) of other Diseases* |
|---|---|---|---|---|---|---|
| Sb | 41 | 19 | 9 | 13 | 46.34% | 21.95% |
| Jb | 19 | 11 | 3 | 5 | 57.89% | 15.78% |
| B | 61 | 4 | 8 | 49 | 6.55% | 13.11% |
| Ch | 44 | 2 | 12 | 30 | 4.54% | 27.27% |

*Source:* Epidemiological data collected from the record book of DMHT and calculated and compiled by the author, 2015

Again, this epidemiological data is almost similar to the findings of National health survey done in 2004 in India, caries prevalence in that survey was that 51.9% in 5 years old children, 53.8% in 12 years old children and 63.1% in 15 years old children. However, this data did not show whether dental diseases are more prevalent than any other diseases or not.

Even studies (Moses et al., 2011, Grewal et al., 2009, Chaturvedi et al., 2012, Datta and Datta, 2013) from different regions (Uttaranchal, UP, West Bengal, Chidambaram) of the country and other south Asian countries (Pakistan, Bangladesh), show a similar prevalence of dental caries. WHO (World Health Organisation) measured 60% -90% of school going children suffer from dental caries. They also showed that poor socio-economic condition plays a role in the prevalence of dental caries.

Studies about dental caries mostly overlook the nutritional status of children. Though there are some studies (Chatterjee and Bandyopadhyay, 2012, Dahiya et al., 2013, Mishu et al., 2013, Psoter et al., 2008, Sweeney et al., 1971) that show that nutrition does have an effect on the dental health of people.

## Functioning of School Dental Health Services in Tripura

### *In the Dedicated Mobile Health Team*

Dedicated mobile health team or school health team consists of two persons; one AYUSH (Homeopathic) and a pharmacist (Allopathic), both male. There is no dental surgeon in the team. Dental problems are treated by them at the school level. Mainly they treat toothache by prescribing analgesics (painkiller) which are available in the team. Other dental problems are referred to the nearby PHC/CHC. They also give awareness about oral hygiene to children. Due to the lack of dental surgeon proper

diagnosis of the particular dental problems are difficult to do by the health team personnel. Malocclusion is often a problem that is overlooked.

There are provisions for getting a dental surgeon from the nearby PHC/CHC where school health programme is going to be implemented. However, no dental surgeon was included in the team to date. When this was inquired at the PHC, the dental surgeon said that they did not get any information and because of this, they were unable to attend the programme. The Dental surgeon even recalled one incident from another block when the team informed dental surgeon just before the date scheduled for the school health programme. As he had other engagements and OPD (Out Patient Department) duty also where many patients were given appointment that day, he could not go with the team.

***In the PHC/CHC***

Field study was done in two blocks, in one block there are two PHCs and in another block, there is one CHC. One PHC in the Mandwi/Mandai block has a separate room for dental health service. One dental surgeon from the state level is posted there. There are dental chair and provision of doing the extraction and minor surgeries, filling. If referred students come to the PHC they provide the necessary treatment to them.

The dental surgeon said that usually they get less referral from school. Only 5-10% of the referred cases come to the PHC.

Other than this, as they did not get any instruction from higher authority to stop school health programme which was ongoing before RBSK came into force, they still do that. In this case, they refer the students to the PHC five days after the school health visit, after prescribing medicines for five days. Another PHC in Mandwi/Mandai block does have a dental surgeon posted in it from state level but the PHC where he is posted does not have any infrastructure e.g. any dental chair or instruments. He shares his room along with a Homeopathic Medical Officer. In the CHC of Jirania block, a full set of infrastructures is present. Even one MPW (Multi-Purpose Worker) helps the dental surgeon during the treatment.

At the CHC level, one day a week is fixed for the school health programme. Dental surgeon and eye technician attend school health programme every week. This is independent of the existing RBSK programme, which is ongoing now. She provides only screening to school children for dental diseases and refers them to CHC.

***In District Early Intervention Centre***

RBSK in district level there should be a district-level intervention centre known as District Early Intervention Centre (DEIC). In that centre, there is a provision of posting

one dental surgeon and a dental hygienist. However, due to unavailability of land, DEIC has not been set up in Tripura until this research has been done.

**Constraints Faced to Deliver Dental Health Services in Schools**

***Health Service System Constraints***

a. Lack of human resources

*Shortage of specialist human resources:* There is no dental surgeon in the Dedicated Mobile Health Team of RBSK and the other members have expressed a need for the same. In schools, there is a number of students suffering from dental problems, as is reflected in the record books. According to the pharmacist and M/O of the team, more than 40% of the students suffer only from dental problems, particularly dental caries. Epidemiological data (table no 3) from the four schools the author visited also shows a similar trend.

As there is a high prevalence of dental diseases among students, they find it difficult to provide proper service to school children without a dental surgeon. They said, as most of the children suffer from dental problems, it is very difficult for them to tackle the situation. They can only do the screening but regarding any type of further intervention, they refer them to nearby PHC/CHC. Sometimes, if any medicines are available with the team, they prescribe analgesics for toothache. This researcher is a dental surgeon and thus was requested by the team to help in the diagnosis of various types of dental diseases students are suffering from. Most of the times stains on teeth surface and malocclusion went unnoticed by the health team personnel.

*Lack of other human resources:* In the DMHT, there were only two health personnel presents. However, in the guidelines, it is mentioned that there should be one female medical officer and one ANM. But there is no female M/O or ANM in the team.

Even this problem was echoed by teachers in the school. Girl students from rural areas feel shy to interact with male medical personnel. According to the pharmacist of the team, only two persons cannot provide better service to 100-110 students per day. There should be more personnel on the team.

b. Lack of follow up services

There is almost no follow up system. The RBSK programme is a comprehensive programme, which not only covers school children but also looks after the child from birth and maternal health along with adolescent health. So, their workload is more. The RBSK team of West Tripura district has to cover the whole district. There is no other team in the district. Whereas, in the guideline of RBSK it is

mentioned that every block must have one team. The DMHT not only visits schools but *"Anganwadi"* centres also.

There is only one team which covers 1773 *Anganwadi* centres, 290 JB (Junior Basic), 141 SB (Senior Basic), 87High, 93 H/S schools scattered in 96 revenue villages, 77 TTAADC (Tripura Tribal Area Autonomous District Council) VCs (Village Councils), 1 Municipal Corporation, 1Municipality council and 2 Nagar *Panchayats.*

From the above list, it can be seen that it is very difficult for them to cover all the schools in one year.

In Jirania block four high schools, two SB (Senior Basic) and two JB (Junior Basic) schools were covered. From Mandwi/Mandai block six high schools and one SB school were covered. These two blocks have the highest coverage among the nine blocks of West Tripura district. Most of the primary schools which are scheduled in the morning are not covered.

Letter from the School Education Department to The Mission Director, NRHM also reveals that fact. (No.F.8 (10-10)-SE/MDM/2013 dated 06/03/2014) In that letter it was said that out of 6545 schools, 1845 schools were covered and 152192 students were checked up by medical health team out of 5,57,613 students in Tripura during the last three quarters of the 2013-14 year.

c. Poor referral service

Children from the schools are referred to the referral centres i. e. PHC/CHC for further intervention. The referral is written on the slip provided by the team.

*Follow up for referral:* Whether children go to the referral centre or not is not recorded or no follow up for that is done. Dental surgeons from respective PHC/CHC said they get very less percentage of referral cases from school.

*Poor accessibility to referral centre:* Children is referred to the referral centre but how they reach to the referral centre is nobody's concern. No vehicle is provided to them. Students or guardians have to manage to go to the referral centre by themselves. As the studied area was difficult to access areas so most all of those schools have communication problems. Though the road was proper, public communication was very rare. Teachers come to the schools by their own vehicles or share vehicles with other teachers. Even hospitals are far away from the schools. The school (Ch) in the Mandwi/Mandai region is far away from the PHC in that block. One PHC which is six km away from the school does not have any infrastructure for dental treatment. Another PHC, which is more than ten km away has infrastructure for dental treatment. But there is no transport

system to reach to the PHC other than a personal vehicle or hired vehicle. The roads also are through dense forest.

Another school is closer to the PHC but it does not have proper infrastructure for dental treatment. Another PHC which has a properly functioning infrastructure for dental treatment is also far away from the school.

In Jirania block also two schools from that area have poor transport system and CHC is also far away from the schools.

*Poor socio-economic condition of the guardians of children/ inadequate affordability of dental health service:* The schools included in this study are located in the villages and guardians of those students are poor. Three schools studied have 100% tribal students. Economic profile collected from teachers of these schools shows that most of the guardians are economically poor. Mostly they are daily wage labourer or farmers having less amount of land. Some tribes practice *'jhoom'* (slash and burn) cultivation in the hill and forest. In the Jirania area, one school is situated near the brick kiln, some guardians work in that kiln.

Another school is mostly dominated by SC (Scheduled Caste) population. People of that area work as daily wage labourers at nearby NIT (National Institute of Technology) college.

As guardians are not well off it is very difficult for them to avail treatment for their wards by hiring vehicle and taking them to the referral centre. Their one day wage and then transport cost to referral centre is nothing but a luxury which they simply cannot afford.

There is no DEIC in the state so students having dental diseases are referred to nearby PHC/CHC. Even when DEIC will come up, how many will be able to go to the referral centre as DEIC will be in district or subdivision headquarter in city or town?

d. Paucity of medicine supply

Medicines, especially antibiotics, are not given adequately to the students by the school health team. Some antibiotic tablets or capsules are given to students but not the full course of antibiotics. Rest of the medicines are told to buy from the market. Whether they can buy or take a full course of medicine is not supervised. Teachers from schools also echoed the same thing.

e. Infrastructural constraints

*In the school health team:* In the school health team, there are no instruments to measure the nutritional status of children other than weighing machine. Whereas, as per the guidelines of RBSK, there should be instruments for anthropometric measurement. Other than that vision chart, appropriate calf according to the age

of children to measure B.P. (Blood Pressure) is also not available. There are no dental instruments for a check-up.

So, measuring the nutritional status of children is difficult. Whereas studies from different parts of the world show that (Mishu et al., 2013, Chatterjee and Bandyopadhyay, 2012, Dahiya et al., 2013, Psoter et al., 2008, Sweeney et al., 1971) nutritional status have an effect on the dental developmental anomaly, prevalence of dental caries, gum diseases, etc. Epidemiological data collected from DMHT of RBSK shows that the prevalence of dental caries is comparatively more than other combined diseases (other 29 diseases condition listed in RBSK list) in Tripura.

*In the referral unit:* In one PHC and in one CHC there is proper infrastructure for dental treatment. Treatments given are other than screening, extraction of teeth, minor surgery and filling of the tooth.

One PHC in Mandwi/Mandai block does not have any infrastructure. Dental surgeon shares OPD room along with the Homeopathic M/O. There is no chair, or other instruments, not even basic instrument like mouth mirror and probe, which are used for examining patients.

In one PHC, the Dental Surgeon revealed that due to no electricity in most of the rural schools, it is difficult to perform proper screening of students.

Another problem echoed by dental surgeon and teachers was the scarcity of water or difficult to access water. In Tripura, water content is high of Iron and because of that, it gives reddish stains to everything. Joint Review Commission of Sarva Siksha Abhiyan also sees water problem. They observed that scarcity of water hampered the sanitation and MDM programme and comprehensive function of schools. (SSA, 2010). In every school that this author visited, similar problems seemed to prevail.

*In the district level:* In the district office there is no almirah for the RBSK team. They keep their records and documents in other almirah allotted to the state health department. There are no computers and they have to use the state's computer for sending mail and compiling monthly reports and other related works.

f. Lack of communication among schools and I/S and health team

There is a communication gap between these sectors. In the interaction between school and I/S, schools get information from I/S which is in block level. When personnel from the block were interviewed, they said they inform schools about school health programme at least 3-4 days prior to the programme. But when H/M's of schools were interviewed, they said they do not get any information

from I/S. Only one school said they got information from I/S. In another case, pharmacist of the DMHT informed one teacher about the programme as they are known to each other. H/M of the schools said if I/S inform the schools at least seven days prior to the programme, attendance of students and guardians would have been better. Another fact worth mentioning here is that the presence of the guardians is very less.

As the health team leaves from the district CMO office, they are only vaguely aware of the location of the school. They only get the name of the school and the block in which it is situated. They are even not aware of the timings of the school sometimes.

In one incident it was found that the team was not sure about the timings of the school so they could not perform there. By the time the team reached the school by asking people about the location of the school, children had already started leaving for home after having waited for the team for a long time. H/M of that school said that as it was quite late, guardians started coming to school to inquire about their wards. Children also became tired and teachers too as they have to come from far off places early in the morning.

Teachers suggested another nearby school for the team so that their day was not completely wasted. H/M of the scheduled school arranged the programme by asking H/M of that school and the DMHT went there for conducting the programme. This school was not informed before as it was scheduled suddenly with the consent of H/M of school.

Due to poor communication with school the health team and I/S in this regard these incidents happen. What if H/M would not have agreed to give permission?

Communication gap was also observed at the district level. While providing school name from I/S to district education office they could have provided full information about the location and timings of the schools. Although, phone number of H/M is provided but many times this does not work due to network problem. This miscommunication can be prevented if MPW or ASHA (Accredited Social Health Activist) from nearby health institution or *Panchayat* can be involved in the programme.

In almost every occasion, the team had to search for the location of the schools. It has also come to notice that morning section schools, scheduled from 7.00am to 10.30am, are not covered by the team.

Even the schedule is prepared without consulting respective schools. The two schools that the author visited along with a team were having the annual examination. Because of that, only those students who had examinations, came

to the school and other students did not come as they were preparing for their next examination. Out of those who were present, not all were checked. Only those who reported their diseases to the health team were screened and treated. This is also corroborated by M/O of RBSK team and other officials involved in the school health programme.

g. Lack of co-ordination between DMHT and dental surgeon posted in the PHC/CHC:

RBSK team has a provision of taking dental surgeon and ophthalmic assistant from nearby PHC/CHC where school health programme is implemented and under whose jurisdiction the school is situated. But till (March-2015) no dental surgeons were taken along as they were not informed beforehand.

h. Vehicle problem for the dental surgeon who is/was involved in SHP:

RBSK and DMHT have their own rented vehicle that they use for the school health programme. But, when dental surgeons from PHC/CHC are asked to attend the school health programme they do not provide any vehicle. One of the dental surgeons said,

*"If they order us to go to SHP, we surely will go but who is going to provide vehicle to take us to the venue? We are not supposed to go without transport." (Dental surgeon, January 2015).*

Dental surgeons at some area take ambulance or hire vehicle for SHP till today (March-2015). In those areas RBSK and SHP is going on side by side. The higher authority has not given any order to stop SHP at those areas.

*i. Financial constraints*

Due to financial constraints and unavailability of land DEIC is not established. Human resources are also not provided for that like the teams were not provided according to the guideline of RBSK. The guidelines say that there should be at least one team in every block but only one team is provided in the West Tripura district, whereas there are nine blocks in the district. Even at the district level, due to the unavailability of con contingency funds, almirah and computer are not provided.

*ii. Ethnicity Related Problems*

This section deals with Tripura's problem of ethnic clashes resulting in insurgency and its effect on programme implementation.

Insurgency in Tripura affects the life of common people and state-run welfare programmes in villages and remote areas. Same is also echoed when the health personnel were interviewed responsible for going to the remote places and implementing school health programme in schools.

*Problem of insurgency and disruption of programme:* Insurgency problem in Tripura hampered government programmes and the lives of people of Tripura irrespective of their ethnicity. This same view was echoed by dental surgeons who are posted in PHC/ CHC. In difficult to reach areas they have to inform the local P.S. (police station) before going to the venue for the school health programme. Only when they get permission from the P.S., they can go ahead with the programme. The School health team hardly covers all the schools in one year. If one school is left or could not be covered due to some reason it is unlikely that school will be covered soon.

*Language problem:* Other than insurgency and other ethnic problems which is faced by the health personnel in delivering school dental health programme, another big hindrance is the language problem. *Kokborok* (meaning dialect of people) is the local tribal language, which is spoken by most of the tribes of Tripura.

Problem of language persists while performing different programmes in tribal majority areas. Here in school health programme also as M/O of the DMHT is Bengali speaking person and does not know *Kokborok* it was difficult for him to interact with children who are tribal and *Kokborok* speaking. Teachers help them in translating what M/O instructs to students. The pharmacist who also is from a Tripuri tribe and *Kokborok* speaking helps in this matter.

Joint review commission of *Sarva Siksha Abhiyan* also shows their concern regarding the medium of instruction and language spoken by tribal people in schools. As they have observed, more than half of the total students in several schools are tribal students and communicating with them in *Kokborok* is better than in any other language, however, the teaching content is in 'Bengali'. So, in their opinion there remain a communication gap between these two which may not be beneficial to children. (SSA, 2010).

Same concerns can be taken into consideration in case of implementing health programmes in other schools. Language, which is the medium of communication between two actors in society if not understood by another actor then system of interaction does not work. This leads to a gap in the structure in which these two actors are involved.

*iii. Other Problem*

*Fear for dental treatment among students:* Dental surgeon showed concern that students fear about dental treatment. Students assume that treatment for dental diseases means "tooth extraction" by "injection". So, when dental surgeons want to intervene, most of the students show their reluctance for screening in the oral/ dental region. They have to be motivated/encouraged to show their problems to the dental surgeon. This also hampers the delivery of treatment to students having dental diseases.

## IV. CONCLUSION

Human action is governed by rules and availability of resources. Rules restrict action, and resources facilitate it. Every human plays a role in the structure in which he belongs. Role is assigned by the structure and it is acted upon with available knowledge. Resources in the structure give the authority and power to the person who is located across different administrative levels.

In the School Health Services, two organizations act in a vertical manner having "dual authority". One deals with the WIFS (Weekly Iron & Folic acid Supplementation), MDM (Mid-Day Meal) and De-worming programme which is administered by the Ministry of School Education and another which is Ministry of Health and Family Welfare sends resourceful personnel and team once or twice in a year to look after and deal with the condition of the diseases in children. The two departments, i. e. Education and health have very weak interaction between them at the state, district and block levels. At the district level, officials meet only once in a month and next at the school level when the team visits the school. Funds allocated for School Health Programme is handled by the Health department except for MDM which is dealt with by the Education department. Within the structure itself, there is a lack of communication and coordination between the two departments at different levels.

School Dental Health Services is a small component of the School Health Service. The amount of resources allocated for a programme also determines the power and authority that it enjoys. The fund is allocated from the Reproductive and Child Health (RCH) of NRHM for School Health Programme which is again subsumed in the RBSK—Rashtriya Bal Swasthya Karyakram, which also deals with child health and maternal health. Breaking up of funds shows that there is no allocation for school dental health services. Even specialized human resources for dental health are also not available in the team except in referral level that is in PHC/CHC. In the RBSK set up of specialized service is in DEIC – District Early Intervention Centre, which is in district level. But in Tripura, no DEIC is set up till now. So, for delivering school dental health service, other health personnel are forced to also attend to dental problems and they find it difficult to deliver the services because of not having the prerequisite training. So, it is clear that dental services do not enjoy much status or power in the overall structure of School Health Services, considering that the epidemiological data shows a fairly high prevalence of dental diseases more than other diseases in children in Tripura.

The dual authority of the structure, inadequate system of interaction between two organization of the structure, vertical nature of the programme resulted in many constraints and problem in the proper and fruitful implementation of programme.

Although oral health /dental health have proven effects on the general health of people, it is not given due importance in our country. Even when there are specialized persons in some health centres, they do not have basic equipment, machinery and material. Irregular supply of electricity and inadequate water supply only worsens the already poor performance.

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# Economic Growth and Environmental Degradation: A Cross Country Analysis

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*The study attempts to analyse the impact of different economic activities on environment and test the validity of environmental Kuznets Curve(EKC) for countries with different income groups by constructing an environmental degradation index measured in terms of carbon-dioxide(CO2),methane(CH4),nitrous-oxide(N2O) and other greenhouse gases(OGHG) emissions by countries across the world. The index is used as an indicator of environmental degradation. The study also measures efficiency of the countries for attaining maximum possible output with minimum possible emission and compares it with resource efficiency. Findings reveal that higher industrial share has positive impact on greenhouse gas emission while higher agricultural share has negative impact. The study shows N-shaped nature of EKC which implies that environmental degradation increases at a decreasing rate as economic activity increases; after reaching a maximum level of emission, environmental degradation decreases with further increase in economic activities upto certain level and finally it increases at an increasing rate. In this study, efficiency scores of the countries for producing an aggregate amount of goods and services by employing their available resources reveals that although the high income group countries are more efficient in attaining economic growth than other groups, however, these nations are least efficient in sustainable growth or eco-efficiency.*

**Keywords:** *Greenhouse gas emission, Eco-efficiency, Economic growth, Environmental Kuznets Curve (EKC), Resource efficiency*

## I. INTRODUCTION

All human activities take place in the context of certain type of relationship between society and the bio-physical world. Development involves transformation of these relationships which causes depletion of natural resources and environmental degradation. Environmental degradation is the outcome of several human actions including socio-economic, institutional and technological activities. Economic and social changes such as large increase in population, rural urban migration, increase in mechanization and use of chemical fertiliser in agriculture, increase in industrial production through innovative capital intensive technologies have transformed the

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country's natural resource base both as a source of factor inputs and as a by product of pollution associated with economic activities of the country.

Exhaustible and renewable natural resources also serve as inputs for the production of many goods and services. If the composition of output and the methods of production were immutable, then damage to the environment would be inextricably linked to the scale of global economic activity (Grossman and Krueger, 1995). The continuously accelerated and unabated environmental degradation in the country is dangerous for sustainability of human development and that would affect long-term economic development. Different types of relationship exist between environmental degradation and economic growth namely; U-shape relationship (Asghari, 2012), N-shaped (Halkos, 2011), environmental Kuznets type relationship (Taskin and Zaim, 2001; Coondoo and Dinda, 2002; Dinda, 2004) etc. There also exists bi-causality relationship between environmental degradation and income (Coondoo and Dinda, 2002).

Asghari (2012) investigated the role played by different sources of growth in impacting the environmental quality of Iran by incorporating Foreign Direct Investment (FDI) and economic openness with cubic function of Gross Domestic Product (GDP). The results show that the two growth resources in Iran cause carbon-di-oxide ($CO_2$) emission to decrease in the early stages until turning point but beyond this level of income per-capita, economic growth leads to environmental degradation. He examined a U-shape relationship between environmental degradation ($CO_2$ emission) and economic growth.

Halkos (2012) examined the concept of an Environmental Kuznets Curve (EKC) hypothesis in a critical way aiming at justifying its existence as well as to propose policies compatible with sustainable development. He found existence of N-shaped income-environment relationship though the adaptation of the total N-shape income-environment relationship by policy makers may be misleading for the implications of serious policy ineffectiveness. However, Yaduma et al. (2015), explored the $CO_2$ EKC within two groups of countries based on their economic development namely, Organisation for Economic Co-operation and Development countries (OECD) and Non-OECD in six geographical areas and compared their findings. The emissions gap between OECD and Non-OECD countries is statistically significant. The disintegration further reveals that there are non-income related factors working against the Non-OECD group's greening. They cautiously concluded that there is deliberate and systematic need for lessening the amount of current $CO_2$ emissions in the Non-OECD group.

Stern (2004) presents a critical history of the EKC and proposing that indicators of environmental degradation first rise, and then fall with an increase in income per

capita. Recent evidence shows, however, that the developing countries are addressing environmental issues, sometimes by adopting developed country standards with a short time lag and sometimes by performing better than some wealthy countries. EKC results have a very flimsy statistical foundation. A new generation of decomposition and efficient frontier models can help disentangle the true relation between development and environment and it may lead to demise of classic EKC.

Economic development is concerned with sustainability which means meeting the present needs without compromising on the future needs. To ensure sustainable development of the economy, environmental degradation should be controlled for long term sustainability. Increase in the environmental degradation in the economy will move the path of sustainable development further away, while decreasing the trend of environmental degradation will move the economy closer towards it. The increasing population on the earth and transformation of the world economy from traditional to modern industrial economy has led to serious environmental concerns.

There also exists a relationship between trade and environmental conditions in the process of negotiating trade agreements (Taskin and Zaim, 2001). By using a non-parametric, non-stochastic production frontier approach, they developed an environmental efficiency index for a sample of high income and low and middle income countries and then examined the role of trade on the changes in environmental efficiency. They have also examined that the per-capita income which exhibits an environmental Kuznets type relationship; trade-related variables such as trade composition, the share of polluting exports and openness of a country are important determinants of environmental efficiency. Earlier, they developed an environmental efficiency index for the OECD countries, which allowed for temporal and cross country comparison for the period of 1980–1990 (Taskin and Zaim, 2000).

Zhang et al. (2008) have addressed the issue of eco-efficiency analysis by taking various undesirable outputs into account and developed a Data Envelopment Approach (DEA) based model by using real data from 30 provinces in China.

The previous literature available on environmental economics has attempted to analyse the extent of environmental degradation and its relation with human socio-economic variables for selected countries over the years or for a group of homogeneous set of countries. The present study attempts to analyse the relation of environmental degradation with economic growth and efficiency of the countries for producing maximum possible output by generating minimum pollution.

## II. OBJECTIVES

– To analyse the variation in pattern of environmental degradation across different income group nations

- To examine the relationship between environmental degradation and economic growth
- To measure environmental efficiency of the countries in promoting economic growth with respect to environment

## III. HYPOTHESES

There is no variation in pattern of environmental degradation across different income group nations.

- Environmental degradation is not a result of economic growth.
- Environmental efficiency does not vary across different income group.

## IV. METHODOLOGY

The study is based on secondary data sources collected from The World Bank publications[1]. At present, the World Bank (2014) has classified 214 countries into four different income groups. Around 75 nations are high income group countries out of which 31 are OECD countries and 44 are non-OECD countries, 55 countries fall in upper middle income group, 50 countries fall in lower middle income group and 34 nations are low income countries. For the 2014-15 fiscal year, low-income economies are defined as those with a GNI per capita, calculated using the World Bank Atlas method, of $1,045 or less in 2013; middle-income economies are those with a GNI per capita of more than $1,045 but less than $12,746; high-income economies are those with a GNI per capita of $12,746 or more. Lower-middle-income and upper-middle-income economies are separated at a GNI per capita of $4,125.

In order to avoid the problem of missing observation and biasness in results, 119 countries have been omitted from the sample. Only 95 countries have been selected as sample of the study based on availability of data about some crucial variables related to the study and hence, on this basis, 44 and 30 countries belonged from high from upper middle income group countries respectively. For the bottom two groups, 18 and 3 countries were selected from lower middle income and low income group respectively. The last two bottom group countries have been considered as one single group for this study.

In order to measure environmental degradation, Greenhouse gas emission is taken as the indicator of environmental quality in the study. Greenhouse gases from human activities are the most significant driver of observed climate change since the mid-20$^{th}$century. In this study, country's Gross Domestic Product (GDP) is taken as a measure of aggregate economic activities, and four major sources of air pollution viz; Carbon-di-oxide gas ($CO_2$), Methane gas ($CH_4$), Nitric Oxide gas ($NO_2$) and other greenhouse gas emissions(OGHG) (including HFC, PFC and $SF_6$) have been taken

as indicator of environmental degradation. Comparing emissions from different gases, these indicators use a concept called global warming potential to convert other gases into carbon dioxide equivalent and is measured as thousand metric tons of $CO_2$ equivalent. To construct the environmental degradation index, Principal Component Analysis (PCA) has been used by considering these four harmful GHGs.

Before using PCA, a multivariate factor analysis has been used to address the inter-relationship among the set of observed variables. The validity of factor analysis is tested using Bartlett's test and Kaiser-Meyer-Olkin (KMO) measure. Bartlett's examines whether the correlation matrix is an identity matrix, which would test the appropriateness of the factor model. KMO measure compares the value of partial correlation coefficients against the total correlation coefficients. The factors are then extracted using Principal Component method.

To compute extent of greenhouse gas emission of the countries, the factor scores ($f_{jk}$) and the corresponding weights have been used. So, a composite index was developed as weighted sum of scores, the weight being the percentage of the variations explained by the factors. If the percentage of $k^{th}$ factor is denoted by $S_k^2$, then the index for the $i^{th}$states can be calculated by using the formulae:

$$H_j = \Sigma S_k^2 f_{jk} \quad j = 1, 2 \ldots .k.$$

Greenhouse Gas Emission Index (GHGEI) of the countries is measured in terms of composite greenhouse gas emission emitted by the countries of the world. According to the value of the index, ranks have been assigned to the countries. The value of index can be negative or positive and can measure one value relative to the other. However, for comparison, this index is standardized to a scale of 0 to 1. Standardized index of the $i^{th}$state is

$$GHGEI_i = \frac{H_i - H_{min}}{H_{max} - H_{min}}$$

Where i=1,2,….8. $H_{max}$ and $H_{min}$ are the maximum and minimum values of H respectively. Based on the calculated vale of this index ranking is done for each country.

Variation in pattern of environmental degradation across different income group nations has been tested by using independent sample t test for equality of means and Levene's test for equality of variances has been applied. Then to analyse the impact of economic activities on environment, we examine the existence of EKC $GDP_{PC}$ is regressed on GHGEI upto cubic function. Further, other factors like percentage of forest area (PFA), percentage of value added to GDP by industrial sector (INDS) and that by agricultural activities (AGRI) have been incorporated to examine impact of

human activities on environment. Based on this purpose, the following regressions have been estimated.

$$GHGEI_i = \alpha + \beta_1 GDP_{PC_i} + \beta_2 GDP_{PC_i}^2 + \beta_3 GDP_{PC_i}^3 + \beta_4 PFA_i + \beta_5 INDS_i + \beta_6 AGRI_i + u_i$$

Where, i= 1,2,3,……,95. Other variables have been defined earlier, $\alpha$ and $\beta$'s are the coefficients to be estimated, $u_i$ indicates an error term which $u \sim N(0, \sigma^2)$.

The study measures Environmental efficiency or Eco-efficiency, which is an instrument of sustainability analysis, indicating how efficient the economic activity is with regard to nature's goods and services by using Data Envelopment Analysis (DEA). By definition, eco-efficiency is measured as the ratio between the (added) value of what has been produced (income, high quality goods and services, jobs, GDP etc) and the (added) environmental impact of the product or service:

$$Environmental\ Efficiency = \frac{Value\ of\ products\ or\ service\ (added)}{Environmental\ impacts\ (added)}$$

Recently, from a number of alternative measures or indicators suggested, most of them being simple indicators such as 'economic output per unit of waste' ratios approach eco-efficiency from a very limited perspective (Kuosmanen and Kortelainen, 2005). On the other hand, most eco-efficiency indicators are focused on the firms or products levels.One of the practices of measuring efficiency is measurement of technical efficiency, which is defined as the effectiveness of a producing unit with a given set of inputs used to produce an output. The level of technical efficiency of a particular producing unit is defined as the ratio of observed level of output to desirable or potential level output.

Charnes, Cooper and Rhodes (1978), extended a model that generalizes the single-input, single-output ratio measure of efficiency of a single Decision-Making Unit (DMU) in multiple inputs and outputs setting.

$$Technical\ Efficiency = \frac{\Sigma\ (Weighted\ outputs)}{\Sigma\ (Weighted\ inputs)}$$

Let there be n number of DMUs using varying amount of inputs to produce outputs. There are s number of inputs $x_i$ , i = 1...s, and m number of outputs $y_r$, r = 1...m. For each DMUj, where j = 1...,k,...n, the problem is to $Max.(h_j) = \frac{\sum_r u_{rj} y_{rj}}{\sum_i v_{ij} x_{rj}}$

Subject to for j=1,……n. $\sum_r u_{rj} y_{rj} / \sum_i v_{ij} x_{rj} \leq 1$ for j=1,……n.and $u_r v_r \geq 0$

Where, $u_{rj}$ is the weight assigned to each unit of output r from $DMU_j$ and $v_{ij}$ is the weight assigned to each unit of input i used by $DMU_j$. That is, solutions are sought to maximize the ratio of weighted output to weighted input for each DMU (the ratio of

virtual output to virtual input). By normalization, the efficiency scores range from zero to one. The same weights (virtual multipliers) that maximize $h_j$ for $DMU_j$ are applied to the inputs and outputs of all DMUs as a solution to the problem for $DMU_j$. This process is repeated for each DMU. In this study, output oriented variable returns to scale (VRS) DEA model with the help of application of multiple outputs inputs approach.

In this study, output oriented Data Envelopment Analysis (DEA) has been applied in order to maximise the ratio of economic growth per unit of environmental degradation by employing country's available resources, where GDP has been taken as good or indicator of economic activities and $CO_2$ as an agent of environmental degradation. The study estimates a production frontier which produces maximum possible amount of GDP in $ per kiloton units of $CO_2$ emission by employing labour and capital.

## V. FINDINGS

Considering the aggregate level of greenhouse gas emissions observed at present, China is polluting the most, being the most populous and fastest growing economy. Highest amount of $CO_2$, $CH_4$ and $NO_2$ is presently emitted by China, whereas USA is second in case of $CO_2$, and $NO_2$, fourth in $CH_4$ emissions and emitting highest amount of other greenhouse gases (OGHG) gases. China is the second position in case of other greenhouse gases (OGHG). India's position is third in $CO_2$ and $NO_2$ emission, seventh in OGHG emission while second in $CH_4$ emission. Major parts of $CH_4$ emissions come from agricultural sector and countries with higher dependency on agriculture are emitting more amount of $CH_4$. These three countries are from three income groups. Many developed nations are also emitting huge amount of different GHGs at a higher amount than the underdeveloped nations. In per capita terms, USA is emitting much higher amount of GHG than other populous nations whereas, New Zealand, Brunei Darussalam, Uruguay etc. are emitting a greater amount of GHGs in per capita terms than other countries.

**Table 1**
**Descriptive Statistics**

| | *Variable* | *Mean* | *Std. dev.* | *Min* | *Max* |
|---|---|---|---|---|---|
| All Countries, N=95 | $GDP_{PC}$ | 18624.42 | 20176.16 | 337.3961 | 102678.8 |
| | $CO_2$ | 313700.5 | 1036525 | 1961.85 | 8286892 |
| | CH4 | 68626.52 | 195939 | 235.4 | 1642258 |
| | $NO_2$ | 25820.53 | 70570.38 | 60.9 | 550296.8 |
| | OGHG | 10525.95 | 44370.03 | 1 | 348460 |
| | $PCCO_2$ | 6.505513 | 5.786295 | 0.074565 | 31.31974 |
| | $PCCH_4$ | 1.58473 | 1.57025 | 0.315902 | 11.1102 |
| | $PCNO_2$ | 0.58473 | 0.466738 | 0.092505 | 2.594853 |
| | PCOGHG | 0.19211 | 0.242508 | 7.57E-05 | 1.126513 |

| | *Variable* | *Mean* | *Std. dev.* | *Min* | *Max* |
|---|---|---|---|---|---|
| High Income Group Countries, N=44 | $GDP_{PC}$ | 34599.68 | 19761.63 | 10709.77 | 102678.8 |
| | $CO_2$ | 326630.9 | 856685.1 | 1961.85 | 5433057 |
| | $CH_4$ | 46284.32 | 110302.3 | 235.4 | 533546 |
| | $NO_2$ | 18100.02 | 46549.44 | 60.9 | 304082 |
| | OGHG | 15132.98 | 53382.68 | 8 | 348460 |
| | $PCCO_2$ | 10.13561 | 6.085421 | 1.970532 | 31.31974 |
| | PCCH4 | 2.022077 | 2.027139 | 0.315902 | 11.1102 |
| | $PCNO_2$ | 0.728824 | 0.576599 | 0.102756 | 2.594853 |
| | PCOGHG | 0.345159 | 0.243961 | 0.000466 | 1.126513 |
| Upper Middle Income Group Countries, N=30 | $GDP_{PC}$ | 6911.975 | 2778.562 | 4175.12 | 13559.13 |
| | $CO_2$ | 399301.6 | 1495929 | 2574.23 | 8286892 |
| | CH4 | 100718.3 | 302336.5 | 1290.6 | 1642258 |
| | $NO_2$ | 36651.07 | 104189.4 | 592.7 | 550296.8 |
| | OGHG | 10030.57 | 45292.35 | 14 | 249362 |
| | $PCCO_2$ | 4.808401 | 3.106128 | 1.499318 | 15.23927 |
| | $PCCH_4$ | 1.458685 | 1.048722 | 0.342722 | 5.26496 |
| | $PCNO_2$ | 0.529975 | 0.342224 | 0.098032 | 1.416828 |
| | PCOGHG | 0.085187 | 0.182719 | 0.001586 | 1.006386 |
| Lower and Lower Income Group Countries, N=21 | $GDP_{PC}$ | 1884.497 | 989.3825 | 337.3961 | 3444.456 |
| | $CO_2$ | 164321.1 | 438283.8 | 2027.85 | 2008823 |
| | CH4 | 69593.42 | 138202.8 | 2992.2 | 621479.7 |
| | $NO_2$ | 26524.64 | 51962.73 | 637.9 | 234135.8 |
| | OGHG | 1580.81 | 4517.408 | 1 | 20937 |
| | $PCCO_2$ | 1.324051 | 1.500532 | 0.074565 | 6.644867 |
| | $PCCH_4$ | 0.848446 | 0.380996 | 0.407739 | 1.706344 |
| | $PCNO_2$ | 0.361042 | 0.191132 | 0.092505 | 0.7109 |
| | PCOGHG | 0.024182 | 0.041766 | 7.57E-05 | 0.190653 |

*Note:* $GDP_{PC}$ is measured in $, $CO_2$, $CH_4$, $NO_2$ and OGHG are measured in matrix kilotons or thousand ton, and $PCCO_2$, $PCCH_4$, $PCNO_2$ and PCOGHG are expressed in terms of matrix tons.

*Source:* World Bank (https://data.worldbank.org retrieved on 10th September, 2014)

The Table 1 above shows that the mean value of GDP per-capita ($GDP_{PC}$) for lower middle and lower income group nations is approximately 3.67 times lower than that of upper middle income group whereas higher income group nations' $GDP_{PC}$ is almost 18 times and 5 times higher than lower income group and upper middle income group nations respectively. Maximum amount of $CO_2$, $CH_4$ and $NO_2$ is emitted by upper middle income group nations while maximum amount of OGHG is released by higher income group countries in absolute amount, while in case per-capita amount of these GH gases, highest value lies in high income group. Similar is the case of average per capita GH gases. While the average value of total $CO_2$, $CH_4$ and $NO_2$ is highest for upper middle income group nations compared to overall mean and other groups.

The pattern of overall emission for different countries, distribution of Greenhouse Gas Emission Index (GHGEI) frequency distribution with percentage is shown in Table 2.

Table 2
**Greenhouse Gas Emission Index for the countries of the world**

| *Range* | *Greenhouse Gas Emission Index* | | | |
|---|---|---|---|---|
| | *High Income Countries* | *Upper Middle Income Countries* | *Low and Lower Middle Income Countries* | *All Countries* |
| 0.0-0.1 | 0 | 10 | 17 | 27 |
| | (0.00%) | (33.33%) | (80.95%) | (28.42%) |
| 0.1-0.2 | 13 | 13 | 4 | 30 |
| | (29.55%) | (43.33%) | (19.05%) | (31.58%) |
| 0.2-0.3 | 15 | 4 | 0 | 19 |
| | (34.09%) | (13.33%) | (0.00%) | (20.00%) |
| 0.4-0.5 | 10 | 3 | 0 | 13 |
| | (22.73%) | (10.00%) | (0.00%) | (13.68%) |
| 0.5-0.6 | 2 | 0 | 0 | 2 |
| | (4.55%) | (0.00%) | (0.00%) | (2.11%) |
| 0.6-0.8 | 3 | 0 | 0 | 3 |
| | (6.82%) | (0.00%) | (0.00%) | (3.16%) |
| 0.8-1.0 | 1 | 0 | 0 | 1 |
| | (2.27%) | (0.00%) | (0.00%) | (1.05%) |
| N | 44 | 30 | 21 | 95 |
| Mean | 0.315381 | 0.15647 | 0.062542 | 0.209308 |
| Standard Deviation | 0.183308 | 0.107252 | 0.040359 | 0.173886 |
| Maximum | 1 | 0.425088 | 0.15416 | 1 |
| Minimum | 0.11228 | 0.03661 | 0 | 0 |

*Source:* World Bank's Data Bank (https://data.worldbank.org retrieved on 10th September, 2014)

Out of these 95 countries, the mean value of GHG emission index is highest for high income group countries followed by upper middle income group countries and lowest in case of lower and lower middle income group countries. Similarly, variation in the pattern of GHGEI is highest in case of high income countries and lowest for low income earning countries followed by upper middle income countries. This may be due to the fact that high income group countries are basically industrially developed and they are attaining economic growth by emitting more GHG. Considering the frequency distribution of different income group countries for different ranges of GHG emission index, it is observed that lower income group countries are emitting lesser amount of GHGs compared to the upper middle income and higher income group countries. Upper middle income group countries are emitting up to middle range of the GHG emission index, while only high income countries are emitting at extreme

high range of GHG emission index. Considering the overall situation, it is observed that all the countries are emitting GHG more or less in the same pattern only a few courtiers of upper income strata group are generating more GHG and the variation in the GHG emission is not much different (Table 2).

Table 3 shows variation in pattern of greenhouse gas emissions for different countries of the world. The results of Levene's test for equality of variances reveals that a pattern of environmental degradation exists for different income group countries. Among the four different Greenhouse gases per-capita Carbon-di-Oxide ($PCCO_2$) emission has shown most significant variation across different income group nations. Levene's statistical test for measuring equality of variances for $PCCO_2$ emission and GHGEI is significant at less than one percent level of significance for different pairs of income group countries and the variation is highest in case of the two extreme groups. The mean differences in per-capita Carbon-di-Oxide gas ($PCCO_2$), per-capita Nitric Oxide gas ($PCNO_2$), per-capita other greenhouse gas (PCOGHG)emissions and GHGEI is highest in between higher and lower income group, followed by higher and upper middle income group, while lowest being between upper middle and lower middle income group nations. But in case of per-capita Methane gas ($PCCH_4$) emission, lowest mean difference is observed in case of higher and upper middle income group countries. Hence, it is concluded that countries with higher economic attainment are generating more environmental degradation (Table 3).

**Table 3**
**Greenhouse Gas Emission across Different Income Group Countries**

| *Countries* | *Levene's Test for Equality of Variances* | | | *t-test for Equality of Means* | | | |
|---|---|---|---|---|---|---|---|
| | *Indicators* | *F* | *Sig.* | *t* | *Sig. (2-tailed)* | *Mean Differences* | *Std. Error Differences* |
| High income group- Upper middle income group countries | $PCCO_2$ | 8.439 | 0.01 | 4.939 | 0.00 | 5.3272 | 1.0785 |
| | $PCCH_4$ | 5.303 | 0.02 | 1.562 | 0.12 | 0.5633 | 0.3606 |
| | $PCNO_2$ | 3.397 | 0.07 | 1.694 | 0.09 | 0.1988 | 0.1173 |
| | PCOGHG | 4.025 | 0.05 | 5.236 | 0.00 | 0.2599 | 0.0497 |
| | GHGEI | 5.498 | 0.02 | 4.692 | 0.00 | 0.1589 | 0.0339 |
| High income group- Lower income group countries | $PCCO_2$ | 17.279 | 0.00 | 9.046 | 0.00 | 8.8116 | 0.9741 |
| | $PCCH_4$ | 11.298 | 0.00 | 3.706 | 0.00 | 1.1736 | 0.3167 |
| | $PCNO_2$ | 7.273 | 0.01 | 3.815 | 0.00 | 0.3678 | 0.0964 |
| | PCOGHG | 13.201 | 0.00 | 8.471 | 0.00 | 0.321 | 0.0379 |
| | GHGEI | 15.029 | 0.000 | 8.717 | 0.00 | 0.2528 | 0.029 |

| Countries | Levene's Test for Equality of Variances | | | t-test for Equality of Means | | | |
|---|---|---|---|---|---|---|---|
| | Indicators | F | Sig. | t | Sig. (2-tailed) | Mean Differences | Std. Error Differences |
| Upper middle income group -Lower income group countries | $PCCO_2$ | 8.131 | 0.01 | 5.32 | 0.00 | 3.4843 | 0.6548 |
| | $PCCH_4$ | 5.813 | 0.02 | 2.923 | 0.01 | 0.6102 | 0.2087 |
| | $PCNO_2$ | 3.074 | 0.09 | 2.046 | 0.05 | 0.1689 | 0.0825 |
| | PCOGHG | 2.903 | 0.09 | 1.498 | 0.14 | 0.061 | 0.0407 |
| | GHGEI | 8.024 | 0.001 | 4.375 | 0.00 | 0.0939 | 0.0215 |

*Note:* *PCCO2, PCCH4, PCNO2 and PCOGHG are expressed in terms of metric tons.*

*Source:* World Bank's Data Bank (https://data.worldbank.org retrieved on 10th September, 2014)

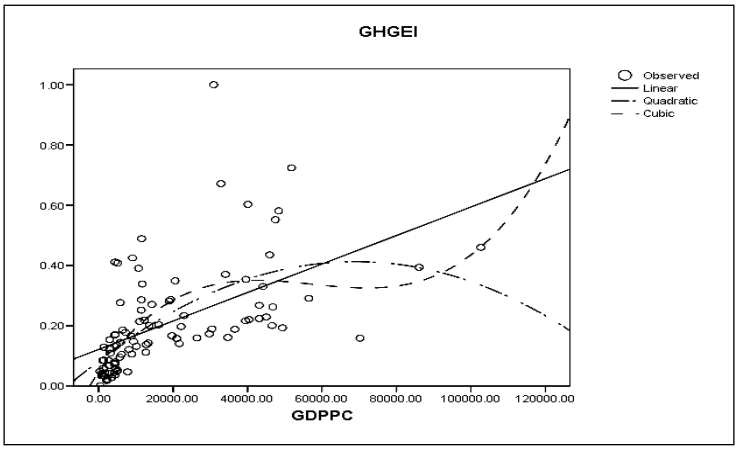
Natural progression of economic development goes from clean agricultural economy to polluting industrial economy and clean service economy. Specifically, economic development is associated with environmental pollution and there are three different effects that may explain this relationship, viz; the scale effect, the composition effect and the technical effect (Grossman and Krueger, 1995; Dinda, 2004; Everett et al. 2010; Halkos, 2012). Historically, all developed economies were originally based on agriculture, a state that produced little environmental damage. Their economies later switched to a much more environmentally damaging state that focused on industry and manufacturing. According to the EKC hypothesis, changes in evolving economies and the individual preference for environmental quality combine to determine the income threshold. However, whether an inverted 'U-shaped' curve exists or not is still a debatable issue. The correct balance between environmental protection and economic growth continues to be debated.

The coefficient of $GDP_{PC}$ across the model is positively related with GHGEI and the rate of increase in GHGEI as a result of increase in $GDP_{PC}$ is negative. This implies that environmental degradation increases at a decreasing rate with the increase in level of income and after reaching a maximum level of emission, environmental degradation decreases with increase in income and environmental degradation increases with increase in income. Figure 1 depicts relationship of $GDP_{PC}$ and environmental degradation.

From Figure1, it is clear that maximum possible observations are touched by cubic fitted curve compared to others. The threshold limit in case of quadratic function is approximately $60000, up to which a country produces at the cost of environmental quality and after which production increases at sustainable rate with a declining trend in environmental degradation. This implies that agrarian rural economies are emitting comparatively lesser GHGs with less $GDP_{PC}$, and with increase in growth with industrial development, environmental degradation increases at a higher rate and

after reaching a maximum amount of emission, growth takes place with advancement of service sector with lesser emission.

Figure 1
**Environmental Kuznets Curve**




*Source:* Authors' estimation for cross section data set of 95 countries, collected from World Bank's Data Bank

Many studies have criticised the quadratic or inverted U-shaped nature of EKC which further shows that environmental degradation increases at an increasing rate after reaching a its second optimum and it follows N-shaped nature (Lieb, 2003; Stern, 2004; Asghari, 2012). In the figure, the second optimum point where countries are moving towards unsustainable development. In case of cubic function, the second optimum thresholds limited up to approximately $80000 after which growth occurs at higher cost of environment damage which is undesirable. Since the study is cross sectional in nature, the observation above the EKC denotes those countries which are emitting more without attaining higher amount of $GDP_{PC}$.

Table 4
**Impact of Economic Activities on Environmental Degradation**

| *Variables* | *Coefficients* | *Standard Errors* | ***t** value* | ***P*>\|*t*\|** | *Standardised Coefficients* | *Goodness of Fit* |
|---|---|---|---|---|---|---|
| GDPPC | 2.11E-05 | 5.42E-06 | 3.89 | 0.00 | 2.44682 | $\mathbf{R^2}$ = 0.4488, |
| GDPPC2 | -3.87E-10 | 1.47E-10 | -2.63 | 0.01 | -3.409 | Adj. $\mathbf{R^2}$=0.4112 |
| GDPPC3 | 2.26E-15 | 1.03E-15 | 2.19 | 0.03 | 1.74759 | Number of observations |
| PFA | -0.00024 | 0.00069 | -0.34 | 0.73 | -0.0286 | = 95 |
| INDS | 0.00361 | 0.00133 | 2.72 | 0.01 | 0.24224 | $\boldsymbol{F}_{(6, 88)}$ = 11.94, |
| AGRI | 0.003357 | 0.00273 | 1.23 | 0.22 | 0.15019 | Prob. of $\boldsymbol{F}$ =0.000 |
| CONSTANT | -0.12482 | 0.08137 | -1.53 | 0.13 | | |

*Source:* Authors' estimation for cross section data set of 95 countries, collected from World Bank's Data Bank (https://data.worldbank.org retrieved on 10th September, 2014)

Table 4 shows validity of N-shaped EKC and also impact of economic activities on environmental degradation. Here, it is found that share of industrial production in GDP contributes more emission of GH gases whereas the share of agricultural production is insignificant which is likely due to the reason that in spite of generation of greater amount of methane from agricultural produce, agricultural fields are also reducing amount of $CO_2$(Table 4).

Lieb (2003) presents a thoughtful explanation for the final upturn of the extracted N-shape curve. This may be justified by the completion of the internalization of the pollution externality as well as that the abatement opportunities are exhausted. He also claims that there is a use of lower energy and thermodynamics bound material per unit of GDP at higher income level. These control methods applied in production exhibit decreasing and not anymore increasing returns to scale.

Production frontier analysis enables us to analyse the measurement of productive capacity of producing units to produce maximum possible amount output by employing minimum possible level inputs. A producing unit is said to be efficient if it produces maximum output for a given amount of inputs compared to others.

Table 5 shows efficiency of the countries in producing maximum possible output with minimum emission. Here, efficiency scores of the countries are measured for producing an aggregate amount of goods and services by employing their available resources. It reveals that although the high income group countries are more efficient in attaining economic growth than the other two groups of developing nations, however, these nations are least efficient in terms of sustainable growth or eco-efficiency, (Table 5). This is likely due to the fact that these countries are industry based nations with higher amount of capital labour ratio and enjoy economies of scale in production of goods, while generating more negative externality in the process of production of industrial output.

Table 5

**Efficiency of the Countries in Producing Maximum Possible Output with Minimum Emission**

| *Group of Countries* | *Eco-Efficiency* | | *Resource Efficiency* | |
|---|---|---|---|---|
| | *CRSTE* | *VRSTE* | *CRSTE* | *VRSTE* |
| High Income | 0.097477 | 0.35025 | 0.672545 | 0.768841 |
| Upper Middle Income | 0.083683 | 0.339342 | 0.509767 | 0.568233 |
| Lower Middle Income | 0.111103 | 0.38079 | 0.506524 | 0.59581 |
| All | 0.096663 | 0.306474 | 0.582224 | 0.667717 |

*Note:* CRSTE = technical efficiency from CRS DEA, VRSTE = technical efficiency from VRS DEA, SCALE = scale efficiency = crste / vrste

*Source:* Authors' estimation for cross section data set of 95 countries, collected from World Bank's Data Bank

## VI. CONCLUSION

Natural progression of economic development goes from clean agricultural to polluting industrial and to clean service economies. Specifically, economic development is associated with environmental pollution and there are three different effects that may explain this relationship. These are the scale effect, composition effect and technical effect (Grossman and Krueger, 1995; Dinda, 2004; Everett et al., 2010; Halkos, 2012). Hence, it can be concluded that countries with more economic attainment are generating more environmental degradation. Economic growth leads to higher pollution. This scale effect has several explanations. The demand for environmental quality is higher with higher income levels because of the potential damage irreversibility and higher demand for environmental quality requires stricter environmental regulations (Lieb, 2003). The study reveals N-shaped nature of EKC for an index of different greenhouse gases, which implies that environmental damages increases at a decreasing rate with the increase in level of economic activity; after reaching a maximum level of emission, environmental damages reduces with further increase in economic activities and finally the damage increases at an increasing rate when income increases further. Higher income group countries are more efficient for attaining higher economic growth by using available resources; whereas lower income group countries are least efficient for attaining sustainable growth.

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# Asset Management by SC Fishermen in Andhra Pradesh: A Quick Assessment

M. Srinivasa Reddy* and K. Hanumantha Rao**

*The study aims at examining the issues of selection of beneficiaries, transaction costs incurred, problems of managing the scheme, benefits realized and suggestions for better management of four selected schemes. The schemes with good sample sizes were discussed in detail and schemes with small sample sizes were presented as cases. Data were collected using a structured schedule and focused group discussions (FGDs).The coverage of beneficiaries was biased in favour of Mala and Madiga sub-castes and other sub-castes were hardly included. The costs for processing the application were about 10-20 per cent of the unit costs and this is an indication of rent-seeking behaviour of the delivery system and corruptive attitude of some of the local leaders. The schemes helped many in terms of improved social status and credit worthiness. Quite a significant proportion of households crossed the poverty line due to the schemes with a high unit cost. Resource use efficiency has been found to be good. Based on the study findings, a few measures were recommended for making the schemes vibrant.*

**Keywords:** *Welfare of SC fishers; Transaction costs; Resource use efficiency; Improved social status*

## I. INTRODUCTION

The fisheries sector is one of the fast-growing sectors having good potential for income and employment generation. But the growth has not benefitted the tiny producers in the state of Andhra Pradesh (AP) and the Agricultural Commission of Andhra Pradesh (GoAP: 2016) has highlighted the vulnerable conditions of the Scheduled Castes (SCs) and fishermen in the state. It underscored the need for revitalizing the livelihood system of these fishermen communities by intervening in the production, processing and marketing domains. The Social Welfare Department of the newly formed state of AP has been evolving several schemes under Scheduled Castes Component (SCC) to make an impact on the productivity and incomes of these vulnerable groups and

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particularly those fishermen belonging to SCs. An integrated model of development was envisaged for the empowerment of SC fishers trough introduction of modern fish culture practices, development of post-harvest infrastructure for retail fish marketing. Accordingly, the state has designed several schemes to help the SC fishermen to overcome the problems in production (supply of fish seeds, manures, nets and boats), marketing (supply of vehicles with iceboxes for hygiene, vehicles for quick transport of fish to processing units and markets) and capacity building. These interventions are expected to bring improvements in the supply chain and increase in incomes of these SC fishers besides stimulating demand for fish. It is proposed to examine the functioning of these schemes to elicit information on operational problems and perceptions of the stakeholders with a view to initiate remedial actions, if necessary, so as to ensure their success and maximize the returns on investment for improved welfare of fishers.

## II. OBJECTIVES, SAMPLING DESIGN AND APPROACH

The main objectives of the study include:

- To assess the awareness levels of beneficiaries about SC welfare schemes and the sources of information;
- To estimate the transaction costs and delays in obtaining the scheme;
- To find out the information inadequacies and main problems in managing the asset; and
- To ascertain the flow of benefits and net gains due to the scheme.

Based on the study findings, suggestions for better management of the schemes were made.

### Sampling and Approach

Five schemes with sizeable outlay were selected and these are:

Reefer Van, Seed Transport Van, Four/Three-wheelers and Two-wheelers with Icebox schemes. Based on the district wise and scheme-wise data, three districts were selected randomly and these are Srikakulam, East Godavari and Nellore. Mandals with good concentration of schemes were chosen as second-stage sampling units. The district-wise fishermen activities during 2016-17 are presented in *Annexure - 1* in the annexure. From the selected Mandals, the list of beneficiaries, scheme-wise and village-wise, was collected from the District office of the Joint Director of Fisheries (JDF). From this list, the sample villages and beneficiaries were selected. For schemes with greater coverage, a random sample of 15-20 beneficiaries were drawn. All the available units were covered whenever the coverage was small. The details of the schemes and SC beneficiaries were shown in Tables 1 to 3. The information on unit

cost, subsidy and beneficiary contribution were presented in Table 4.

A structured schedule was canvassed to all the selected beneficiaries and information was collected regarding socio-economic particulars, type of fishing activity, institutional association, awareness of the schemes under SCC, agency which helped in getting the scheme, transaction costs and delays in grounding the scheme, adequacy of assistance, source of funding, possession of skills, training imparted and its utility, information inadequacies and sources of information, the problems in management of the scheme, benefits accrued and suggestions for improvement. Focused Group Discussions (FGDs) and semi-structured interviews with Officials were held to get better insights into the gamut of activities. The data obtained from the field were analysed to examine the objectives.

Table 1
**Details of Beneficiaries: Scheme /Institution-wise**

| *Scheme* | *FCS* | *LHs* | *MMG* | *UEF* | *Total* |
|---|---|---|---|---|---|
| Four-Wheeler | 4 | 0 | 1 | 1 | 6 |
| Three- Wheeler | 16 | 0 | 0 | 2 | 18 |
| Two- Wheeler | 46 | 0 | 6 | 1 | 53 |
| Reefer Van | 1 | 0 | 0 | 0 | 1 |
| Seed Transport Van/Vehicle | 2 | 0 | 0 | 0 | 2 |
| Total | 69 | 0 | 7 | 4 | 80 |

*Note:* FCS: Fishery Cooperative Society; LHs: License Holders; MMG: Matsya Mitra Group; UEF: Un-Employed Fishers

Table 2
**Scheme-wise No. of Beneficiary Details and Coverage of Districts/Mandals under SCC**

| *District /Mandal* | *Reefer Van* | *Seed Transport Vehicle* | *Four-Wheeler* | *Three- Wheeler* | *Two- Wheeler* |
|---|---|---|---|---|---|
| *Srikakulam* | | | | | |
| Jalumuru | | | 1 (1) | | |
| Srikakulam | | 2 (2) | 2 (2) | 1 (1) | 4 (3) |
| Gara | 1 (1) | 1 (1) | 2 (2) | | 13(10) |
| Rajam | | | | 1(1) | |
| Hiramandalam | | | | | 2 (2) |
| *East Godavari* | | | | | |
| Korukonda | | | | 3 (3) | |
| Rajanagaram | | | | 1 (1) | |
| *SPS Nellore* | | | | | |
| Venkatachalam | | | | 6 (6) | 27 (5) |
| Bogolu | | | | 1 (1) | 10 (5) |
| Manubolu | | | | 11 (8) | 29 (5) |

*Note:* Figures in the parenthesis indicate the No. of Sample Beneficiaries

*Source:* District JDFs of Srikakulam, East Godavari and SPS Nellore

Table 3
**District/Scheme-wise No. of Beneficiaries Selected**

| *District* | *Reefer Van* | *Seed Transport Vehicle* | *Four- Wheeler* | *Three- Wheeler* | *Two- Wheeler* |
|---|---|---|---|---|---|
| Srikakulam | 1 | 3 | 5 | 2 | 15 |
| East Godavari | | | | 4 | |
| SPS Nellore | | | | 15 | 15 |
| Total | 1 | 3 | 5 | 21 | 30 |

*Source:* Offices of the District Joint Director Fisheries of Srikakulam, East Godavari and SPS Nellore

Table 4
**Scheme-wise Unit Cost, Subsidy and Beneficiary Contribution Details under SCC (in Rs.)**

| *Scheme/Unit* | *Total Unit Cost (in Rs.)* | *Amount of Subsidy (in Rs.)* | *%* | *Beneficiary Contribution (in Rs)* | *%* | *Beneficiary DD Charges (Rs.)* |
|---|---|---|---|---|---|---|
| Four Wheelers | 440000 | 396000 | 90 | 44000 | 10 | 500 |
| Three Wheelers | 240000 | 216000 | 90 | 24000 | 10 | 500 |
| Reefer Van | 1538142 | 1384328 | 90 | 153814 | 10 | 2000 |
| Seed Transport Vehicle | 1000000 | 900000 | 90 | 100000 | 10 | 1000 |
| Two Wheelers | 44500 | 40500 | 90 | 4000 | 10 | 25 |

*Note:* SCC: Scheduled Castes Component

*Source:* Commissioner of Fisheries, GoAP, Vijayawada.

The poverty norm of Rs 1.2 lakh per family per annum was adjusted for household size. The poverty ratios before and after the scheme were assessed by adopting the poverty line of Rs. 30,000 the income per capita per annum.

Mode of implementation is more or less the same for all schemes. The District Fisheries Office (DFO) will identify the eligible beneficiaries as per the criteria in the *Janma Bhoomi Mavooru Committee* (JBMVC) meeting. The list will be approved by the District Collector (DC). The DC will empanel the list of vehicle and other material suppliers and the rates offered by them for enabling the beneficiaries to select the suppliers as per their choice. All the aspirants of Two/Three/Four wheelers including the reefer van and seed transport van should possess a valid driving license or in the process of earning a driving license. The beneficiaries should submit details like *Aadhaar* Card Number, Bank Account Number and Mobile Number so that these will be linked to the Scheme. The vehicle shall be hypothecated to in the name of DFO for a minimum period of three years.

## III. DISCUSSION OF THE RESULTS

The main objectives of all the five schemes are to provide timely for supply of quality fingerlings and assistance to the beneficiaries in retail marketing. The specific objectives

of these schemes are: to increase the domestic production of fish; to supply fish to consumers in hygienic and fresh condition; to ensure access of poor to nutritious food; and to get higher returns to the fishers.

**Scheme A: Assistance for Retail Fish Marketing by Supply of Three Wheelers**

This scheme was given to 18 SC families in the study districts of Nellore (13), Srikakulam (2) and East Godavari (3) spread over six Mandals viz., Venkatachalam, Bogolu, Manubolu, Rajam, Srikakulam and Koru Konda. The Sub-Caste wise composition of the 18 families was as follows: 14 Malas, 3 Madigas and 1 Paidi. The socio-economic profiles of the beneficiaries are presented in Table 5.

Table 5
**Socio-economic Profiles of Beneficiaries of Three-Wheeler Scheme**

| *Parameter* | | *Mala* | *Madiga* | *Paidi* |
|---|---|---|---|---|
| Average age (years) | | 40.3 | 40.0 | 33 |
| Education of beneficiary* | | 9 | 10 | 10 |
| Highest Education of Other Adults (yrs.) | | 10 | 10 | 10 |
| Family size | | 4 | 5 | 4 |
| Average no. of workers | | 3 | 3 | 4 |
| Selection by | FCS | 11 | 3 | 1 |
| | Unemployed Fisher | 2 | - | - |
| Fishing Type | Inland Fishing | 3 | 2 | 1 |
| | Retail marketing | 10 | 1 | - |

*Note:* *mean years of schooling; yrs: Years; FCS: Fishery Cooperative Society

*Source:* Field Survey;

***Institutional Membership and Awareness***

All the beneficiaries of the Madiga community had membership in fisheries institutions as well as non-fisheries institutions. However, only one Mala beneficiary was not having membership in these two types of institutions and another one held some position in both the institutions. The interaction of Mala beneficiaries with Officials, Local Leaders and FCS might have benefitted them in having awareness about the state-funded welfare schemes for SCs both in respect of eligibility criteria and procedures to be followed; the exception being one Mala beneficiary who was ignorant of eligibility conditions. The Madigas received such information from the FCS and Friends and Relatives (F&R). The Officials were the providers of information about the schemes to the majority of the beneficiaries (54%) followed by FCSs (23%) and Local Leaders (23%). The Officials helped 58 per cent of Mala beneficiaries while FCS enabled all the Madiga beneficiaries to get the scheme. The other Mala beneficiaries got the support of local leaders in accessing the scheme. All the beneficiaries could get the scheme of their choice. There was an average delay of three months in grounding the scheme

and it was due to several factors including delay in processing applications by the department and delays in organizing the JBMVC meeting in finalizing the selection.

### *Transaction Costs*

The beneficiaries had incurred expenditure in the process of getting the scheme. These costs varied between Mala and Madiga beneficiaries and also for members within each group. The average cost towards board and lodging was Rs. 640 and for transport Rs. 318. The other costs were substantial and the average expenditure worked out to Rs. 27,000 for Mala beneficiaries and Rs. 25,000 for Madiga community.

### *Management of the Scheme*

Most of the beneficiaries had the skills to operate the auto and also fishermen. The FCS members were suppliers of seed to 69 per cent of Mala beneficiaries and one-third of Madiga beneficiaries but the quantity was reported to be inadequate. The fish feed was not supplied. As far as information on some important aspects was concerned, the status was indicated in Table 6. The dependency on friends and relatives for information relating to market demand and prices was undesirable. The Information and Communication Technology (ICT) applications proposed in the State Policy Paper (SPP) had not reached the beneficiaries despite the fact that most of them had mobiles.

Table 6
**Information Inadequacies in Managing the Scheme (%)**

| *Aspect* | *Caste* | *Sufficient* | *Inadequate* | *Not Provided* | *Source of Information* |
|---|---|---|---|---|---|
| Seed | Mala | 69 | - | 31 | Officials, FCS |
| | Madiga | 33 | - | 67 | Officials |
| Feed | Mala | - | - | 100 | |
| | Madiga | - | - | 100 | - |
| Market demand | Mala | 53.8 | 23.1 | 23.1 | Officials, FCS |
| | Madiga | - | 66.7 | 33.3 | F & R |
| Prices | Mala | 100 | - | - | F & R, FCS |
| | Madiga | 100 | - | - | F & R, FCS |
| Support services | Mala | - | 31 | 69 | F & R |
| | Madiga | - | 33 | 67 | F & R |

*Note:* FCS: Fishery Cooperative Society; F&R: Friends and Relatives

*Source:* Field Survey

The beneficiaries expressed satisfaction with the services of the Department of Fisheries (DoF). The beneficiaries depend upon different agencies in accessing information and also to deal with a variety of problems in operating the schemes. The problems encountered by them were listed in Table 7. It is evident from the table that the beneficiaries did experience problems which were less severe in nature but the support from the Department/Officials was missing and measures should be taken to

improve the situation. They had no serious problems with government agencies and banks.

Table 7
**Problems Experienced and Support of Agencies in Managing the Asset/Scheme**

| *Aspect* | *Caste* | *Occurrence (%)* | *Severity* | *Support Provided* | *Quality of Support* |
|---|---|---|---|---|---|
| Raw Material | Mala | Occ. 53.8 | LS | Local leaders | VGC |
| | Madiga | -- | -- | -- | -- |
| Service (repairs) | Mala | Occ. 100 | LS- 100 | Local leaders | VGC-61.5;VGR-38.5 |
| | Madiga | Occ. 100 | LS - 100 | Local leaders | VGC-33.3;VGR-66.7 |
| Traders | Mala | Fr-8;Occ.23 | LS | FCS | NG-100 |
| | Madiga | Occ. 33 | LS | FCS | NG-100 |

*Note:* VGC: very good but costly; VGR: very good and reasonable; NG: not good; LS: less severe; VS: very severe; Fr: frequently; Occ.: occasionally

*Source:* Field Survey

They suggested some changes in the features of the scheme and these were: syntax tank and cylinder to be given along with the three-wheeler; after the clearance of loan they should be considered for the four-wheeler scheme and pension for all fishermen above 50 years. Seven beneficiaries mentioned that they would not recommend the scheme for others since it would create more competition and reduce their earnings.

The scheme helped them in several ways and benefited them in realizing higher income. The details are provided in Tables 8 and 9. The family members were also helping them in marketing. On average, every beneficiary was covering seven other fishers in terms of collecting the fish for marketing purpose. The minimum was three and maximum coverage was 15. It was reported that they were selling fish directly as well as to traders and processors. In the busy season, all of them were marketing the fish in urban areas, and in the lean season, the activity was confined to rural and urban markets. The lean months for their activity are mainly July, August and November and their earnings were low during these months.

Table 8
**Benefits Realized by the Members Due to Scheme: Number Reporting**

| *Aspect* | *Good* | *Very Good* |
|---|---|---|
| Supply of Better Fish Seed | 4 | 14 |
| Timely Delivery | 2 | 16 |
| Fish in Hygienic Condition | 2 | 16 |
| Better Price | 2 | 16 |
| High Demand | 1 | 17 |
| More Quantity | 2 | 16 |
| More Income | 3 | 15 |

*Source:* Field Survey

Table 9
**Average Income of the Beneficiaries in the Pre and Post Scheme Periods (in Rs.)**

| *Details* | *Mala Beneficiaries* | | *Madiga Beneficiaries* | |
|---|---|---|---|---|
| | *Before* | *After* | *Before* | *After* |
| Household income | 97,462 | 1,62,692 | 1,06,667 | 2,10,000 |
| Income from fishing | 25,385 | 98,077 | 7,333 | 1,11.667 |
| Share of fishing activity in HHI (%) | 26 | 60.3 | 6.87 | 53.17 |
| Net benefit due to scheme | - | 72,692 | - | 1,04,333 |
| capital- output ratio | - | 1: 0.48 | - | 1: 0.46 |
| Poverty status (%) | 53.8 | 23.1 | 66.7 | 33.3 |
| Outstanding Debt* | NC | 84,154 | NC | 43,333 |

*Note:* HHI: household income; NC; not collected; * as on the date of survey
*Source:* Field Survey

The importance of the scheme can be gauged by the increase of its share in household income. The capital-output ratio suggests that beneficiaries were efficiently managing the asset. The other benefits realized were: transporting agricultural produce to market, bringing agricultural inputs from the market, transport of fuel, fodder and food and providing transport service to others during functions, etc. They were also working as casual labour before the scheme was given but now, they are earning more without much drudgery.

### Scheme B: Supply of Two Wheelers (Moped) With Icebox for Fish Vending and/or Shrimp Seed Transport

This scheme was given to 53 SC families in the study districts of Nellore (33) and Srikakulam (20) spread over eight Mandals viz., Hiramandalam, Jalumuru, Gara, Venkatachalam, Jaladanki, Bogolu, Kavali and Manubolu. The sub-caste wise composition of these beneficiary families is as follows: 42 Malas and 9 Madigas, one Paidi and one Relli. The socio-economic profiles of the Mala and Madiga beneficiaries were presented in Table 10.

Table 10
**Socio-Economic Profiles of Beneficiaries of Three Wheeler Scheme**

| *Parameter* | | *Mala* | *Madiga* |
|---|---|---|---|
| Average Age (years) | | 42.4 | 45.8 |
| Education* | | 7 | 4 |
| Highest Education attained by Other Adults* | | 10 | 9 |
| Family Size | | 5 | 5 |
| Average No. of Workers | | 3 | 3 |
| Selection by | FCS | 36 | 9 |
| | MMG | 6 | |
| Fishing Type | Inland Fishing | 28 | 6 |
| | Retail marketing | 14 | 3 |

*Note:* *mean years of schooling of beneficiary
*Source:* Field Survey

### *Institutional Membership and Awareness*

All the beneficiaries had membership in fisheries institutions as well as non-fisheries institutions. However, only four Mala beneficiaries held some positions in non-fisheries institutions. These associations helped them in accessing information (awareness) about the state-sponsored welfare programmes for SCs both in respect of eligibility criteria and procedures to be followed. The "Officials" was the main source of information about the schemes (60% of Malas and 89% of Madigas) followed by "Local Leaders". The Officials helped 58 per cent of Mala and 89 per cent of Madiga beneficiaries. The rest got the support of local leaders in accessing the scheme. All the beneficiaries could get the scheme of their choice. There was an average delay of three months in grounding the scheme and several factors were at play including delay in processing applications by the department and delays in organizing the JBMVC meeting in finalizing the selection.

### *Transaction Costs*

The beneficiaries had incurred expenditure to obtain the scheme. On average, the Mala members had to spend Rs.435 for board and lodging, Rs. 324 towards transport and Rs. 6344 for others (beneficiaries mentioned it as processing costs). The corresponding figures for the beneficiaries from Madiga community were respectively Rs. 378, Rs. 233 and Rs. 3922. The unit cost of the scheme was Rs.45,000. Thus, the transaction costs worked out to 15.8 per cent for Mala beneficiaries and it was about 10 per cent for their counterparts.

### *Management of the Scheme*

All the beneficiaries reported the possession of skills to manage the asset/scheme. However, the economics of the scheme was affected due to information inadequacies and problems of input supply as well as the quality of services. These details were furnished in Table 11. The information inadequacies were glaring and these had an impact on the decision making and also costs of production. Most of the beneficiaries were either satisfied or very much satisfied with the role played by the Fisheries Department (FD). However, a few suggestions were put forward for better management of the scheme and these were indicated below.

Table 11
**Information Inadequacies in Managing the Scheme – (responses in %)**

| *Aspect* | *Caste* | *Sufficient* | *Inadequate* | *Not Provided* | *Source of Information* |
|---|---|---|---|---|---|
| Seed | Mala | 28 | 37 | 35 | Officials, FCS |
| | Madiga | 33 | 22 | 44 | Officials, FCS |
| Feed | Mala | 12 | | 88 | Officials |
| | Madiga | 11 | | 89 | Officials |

| *Aspect* | *Caste* | *Sufficient* | *Inadequate* | *Not Provided* | *Source of Information* |
|---|---|---|---|---|---|
| Subsidies & Interest | Mala | 48.8 | 51.2 | | FCS, Officials |
| | Madiga | 22.2 | 77.8 | | FCS, Officials |
| Market Demand | Mala | 72 | 28 | | F&R, FCS |
| | Madiga | 22 | 78 | | FCS , F &R |
| Prices | Mala | 86 | | | Others, F&R |
| | Madiga | 56 | | | F&R, Others |
| Support Services | Mala | 23 | 62 | 14 | F&R, FCS |
| | Madiga | 33 | 55 | 12 | F&R, FCS |

*Note:* F&R: Friends and Relatives; FCS: Fishery Cooperative Society

*Source:* Field Survey

Problems were experienced by the beneficiaries in the management of the scheme and in particular service/ repairs to the vehicle (see Table 12 for details). However, these were less severe and the local leaders were able to guide them. The opinions on the quality of support received varied and the official support would have reduced the service charges besides ensuring good quality service.

Table 12
**Occurrence and Severity of Problems Encountered by the Beneficiaries**

| *Aspect* | *Caste* | *Occurrence* | *Severity* | *Support Provided* | *Quality of Support* |
|---|---|---|---|---|---|
| Raw Material | Mala | Never | - | - | - |
| | Madiga | Never | - | - | - |
| Service | Mala | 65 | LS 90; VS-10 | LL | VGC-38; VGR-48; NG-13 |
| (repairs) | Madiga | 67 | LS-90; VS-50 | LL | VGC-50, VGR-50 |
| Traders/ | Mala | 9 | LS | LL | VGR-25,NG-75 |
| Processors | Madiga | 11 | LS | LL | NG-100 |

*Note:* LS: less severe; VS: very severe; LL: local leaders; VGC: very good but costly; VGR: very good and reasonable cost; NG: not good

*Source:* Field Survey

The beneficiaries reported that they were also directly selling the fish in the urban market besides the traders. On average, each beneficiary could cater to the needs of 5.2 fishers (minimum 2 and maximum11) in marketing their produce. The earnings were lower in January, July, August and November. The beneficiaries have reported that they gained in terms of saving time and improving income. They are able to do multiple tasks such as selling dry fish, timely collection and selling of fresh fish (without much time lapse from harvesting to selling), selling fish at a better price in many places, and bringing vegetables while returning for sale in the village; thereby able to earn additional income. The vehicle is used for own purpose, attending marriages /functions, going to hospitals, transporting agricultural inputs, produce from field to home, taking and bringing back children from school.

The scheme enabled them to tap multiple benefits and the extent of benefit as perceived by them were indicated in Tables 13 and 14 which led to the enhancement of their family income besides improving their social status and credit worthiness. They were able to get hassle-free credit and were feeling financially secure. However, 11 members were unwilling to recommend the scheme to others as it would affect their market.

The decline in the share of income from fisheries had come down after getting the scheme. It was a disturbing outcome.

Table 13
**Benefits Realized by the Members due to Scheme: Number Reporting**

| *Benefits* | *Very much* | *Very Very much* |
|---|---|---|
| Supply of Better Fish Seed | 8 | 45 |
| Timely Delivery | 4 | 49 |
| Fish in Hygienic Condition | 5 | 48 |
| Better Price | 1 | 52 |
| High Demand | 4 | 49 |
| More Quantity | 4 | 49 |
| More Income | 5 | 48 |

*Source:* Field Survey

Table 14
**Average Income in the Pre and Post Scheme (in Rs.)**

| *Details* | *Mala Beneficiaries* | | *Madiga Beneficiaries* | |
|---|---|---|---|---|
| | *Before* | *After* | *Before* | *After* |
| Household Income | 83,437 | 1,18,198 | 76,556 | 99,444 |
| Income from Fishing | 38,799 | 49093 | 35889 | 40222 |
| Share of Fishing Activity in HHI (%) | 47.9 | 39.6 | 46.9 | 40.4 |
| Net benefit due to scheme | | 9294 | | 4333 |
| Poverty status (%) | 88.4 | 69.8 | 88.9 | 88.9 |
| Outstanding Debt * | | 48,837 | | 57,778 |

*Note:* *as on the date of field survey

*Source:* Field Survey

### Scheme C: distribution of "Reefer Van"

In the study area, reefer van was given in 2017 to Sri Gora Suresh, Madiga community from Chintuvalasa village in Gara Mandal of Srikakulam district. He was 49 years old and has been a member of SC FCS since 2002. He had a large family (8) with the dependency ratio of 1:1. Though a son of illiterate parents, he had 15 years of education. His wife studied up to 12$^{th}$ class and was helping in the collection, grading

and retail marketing of fish. He was working as a driver also to augment the family income prior to the distribution of the scheme. His wife was a leader of Self Help Group (SHG) and he was aware of the welfare schemes for SCs taken up under SCC. He got a scheme of his choice with the help of Departmental Officials.

His contacts and his long association helped him to get a scheme with a high unit cost. The cost of the scheme was Rs. 15.4 lakh and met his contribution of Rs.1.55 lakh (10%) by taking a loan from the bank. He also incurred an expenditure of Rs.2.04 lakh (13.3%) as a transaction cost. He was given orientation training by the officials which was found to be very useful. While the information on technical aspects has been sufficient, information inadequacies were found in regard to market demand and prices as he was dependent on friends and relatives. In the management of the scheme, he encountered problems in getting repair services though these are of less severe in nature. He received support from private agencies which he rated as good and reasonably priced. He had no problems with traders but was unhappy over the attitude of banker in providing credit services.

On the whole, he was happy with the scheme and it helped him in timely delivery of fish and prawns in hygienic conditions to urban markets and thereby fetched a better price. Before getting the scheme, he used to wait for longer hours for hired three-wheeler to take the fish to the market and this delay affected the quality (freshness and hygiene) denying him good price. He was no more dependent on the middlemen. The household income was about Rs.2.5 lakh and income from fishing was about one lakh rupees in the pre-scheme phase. The share of the fishing activity in the household income was 40 per cent. After getting the reefer van, the family was earning Rs.2.5 lakh from the scheme itself and also by using the van for non- fishery activities. The income derived from the reefer van worked out to 71 per cent of the total income of the family.

This was an indication of resource use efficiency. He was catering to the needs of 20 fishers and was selling in urban markets and mostly through direct sales. The outstanding debt of Rs.1.8 lakh was manageable since the household income was about Rs.3.5 lakh. His credit worthiness had improved and his family was enjoying a better social status. He was investing more in children's education. He was financially secure.

He was not willing to recommend the scheme for others since it would affect his earnings and livelihood opportunities. He was of the opinion that if more fishers were given the scheme, political interference might be more.

**Scheme D: Assistance for Retail Fish Marketing by the Supply of Four-wheelers with Iceboxes**

The Four-wheeler scheme was implemented during 2016-17 in Srikakulam among the sample districts and the scheme was awarded to six SC fishermen – 3 Mala and

3 Madiga beneficiaries, in the Mandals of Srikakulam, Jalumuru and Gara. Four of them were members of Fishermen Cooperative Society, one from Matsya Mitra Group (MMG) and other was Un-employed Fisher. The parents of these beneficiaries were illiterates and two of them were fishers. All the beneficiaries were literates and the mean years of schooling varied between 10 and 15 years. The average age of the beneficiary was 36.5 years. These were dealing with retail marketing of inland fish including prawns. Their main occupation was fishing but for one prior to getting the scheme. The household size varied from 3 to 7 and the number of workers was two in four households and three in the other two households. All the children of these families were attending school. The spouses of the beneficiaries were participating in the labour market while only one was in fishing activity.

All of them had membership in SHGs and fishery institutions (FCSs and MMGs). The five beneficiaries who were members of either the FCS or MMG informed that these agencies had leased in the tank for three years with formal agreements in 2017.

All the beneficiaries were aware of state schemes launched for the betterment of SC fishermen and their information sources were officials and local leaders (50:50). These agencies had adequately informed the eligibility conditions for accessing the schemes as well as the procedures to be followed for getting the scheme. The local leaders helped four of them and the other two were helped by officials to get the scheme of their choice. All of them incurred expenditure to get the scheme. The transaction costs incurred by all of them, on an average, were: board and lodging (Rs.383), transport (Rs.400) and others (Rs.75,000).The expenditure on the third component reported by beneficiaries as processing cost varied between Rs. 25,000 and Rs.100,000. It is imperative that transaction costs were very high and needed to be reduced to a minimum and more so the third component. The main reason for high transaction cost might be due to the rent-seeking behaviour of the delivery system including the political leaders.

The scheme cost was about Rs.4.4 lakh and the beneficiaries contributed 10 per cent of the scheme cost (Rs.0.44 lakh) and Rs.500 towards DD charges made along with the application. The self-contribution was met by borrowing from non-institutional sources in the case of five beneficiaries while the sixth one met this amount from his own resources. The scheme outlay was found to be sufficient for five of them and enhancement of outlay by Rs.5,000 was suggested by the sixth beneficiary. There were delays of 3 to 5 months in the grounding of the scheme and the average delay was 4.1 months. The reasons for the delay in grounding the scheme include: getting the time of MLA concerned or in-charge Minister for distribution of the assets (6), processing time by Department of Fisheries (4), interference of local leaders (3) and approval of the beneficiary list by JBMVC.

There was unmet demand for this Four-wheeler scheme since many who were desirous of the scheme were denied. The beneficiaries were selected from among the members of FCS/MMGs. The beneficiaries reported that they have the required skills to manage the scheme. For them, the source of information was mainly officials followed by FCS and occasionally local leaders helped in regard to key inputs and the details were as follows.

The beneficiaries had inadequate information regarding seed and feed. They had knowledge about the subsidies and interest rate as well as market demand and to a large extent on prices and support services. However, the information providers were friends and relatives followed by FCS. The dependency on the former on crucial information should be avoided. As far as services (repairs) and interactions with traders, half of them reported the occurrence of problems though of less severe nature. To resolve these problems, they sought the help of FCS members and private agencies. They had rated the services of the Department of Fisheries as satisfactory.

The four-wheeler helped them in transporting the fish to market in time and also in a fresh and hygienic condition which facilitated in fetching a better price and also enhanced the demand for the product. On average, the number of fishers served by the vehicle was 13.8. The local fishers had more choice in selling fish to trader or processor or direct sale. In the busy season, the local fishers were taking their product to the urban market mainly while in the lean season they were transacting in both rural and urban markets. The outcomes were encouraging and these were shown in Table 15. The fact that the scheme was given to relatively better off among SCs, the resource use efficiency was also high. Their socio-economic status had gone up and they felt financially secure and were in a position to get hassle-free loans.

Table 15
**Beneficiaries Average Income in the Pre- and Post- Scheme (in Rs.)**

| *Source/Details* | *Beneficiaries* | |
|---|---|---|
| | *Before* | *After* |
| Household Income | 1,78,333 | 2,56,667 |
| Income from Fishing | 1,08,333 | 1,75,833 |
| Share of Fishing Activity in HHI (%) | 60.7 | 68.5 |
| Net Benefit due to Scheme | - | 67,500 |
| Poverty Status | - | - |
| Outstanding Debt | - | 1,00.000 |

*Note:* Poverty line: Rs.30,000 household per capita income; HHI: Household Income

*Source:* Field Survey

**Scheme E: Seed Transport Van**

The above scheme was given to two members of FCSs in Gara and Srikakulam Mandals of Srikakulam district in 2016-17. Smt. Kantipapa Bhagyalakshmi, 45 years was from Madiga community and Sri Lingala Sriramulu, 50 years belonged to the Mala community; both were members of FCS for almost 16 years and were engaged in inland fishing as well as retail marketing. Smt. Bhagyalakhmi had a large family (6) while the family size of Sriramulu was small (4) but all of them were engaged in the labour market. The two members were aware of the state-sponsored schemes for SCs and with the help of Officials and Local Leaders could get the seed transport van. But they incurred an expenditure of over Rs.2 lakh for getting the scheme. They were given training for managing the asset which was rated to be very useful.

They were receiving adequate information on technical aspects, seed and feed, subsidies and interest, market demand and prices mainly from Officials and FCS and also from friends and relatives. This support enabled them to manage the asset well. They were very much satisfied with the guidance from the Department of Fisheries. They experienced minor problems with regard to raw material supply. The small repairs for the van were occurring occasionally and the quality of service from private agencies was good but the charges were high.

Table 16
**Household Income Particulars in the Pre-and Post- Scheme (in Rs.)**

| *Details* | *Bhagyalakshmi* | | *Sriramulu* | |
|---|---|---|---|---|
| | *Before* | *After* | *Before* | *After* |
| Household Income | 2,00,000 | 3,50,000 | 2,00,000 | 3,50,000 |
| Income from Fishing/Scheme | 1,50,000 | 3,00,000 | 1,00,000 | 1,50,000 |
| Share of fishing activity in HHI (%) | 75 | 87.5 | 50 | 42.8 |
| Net Benefits Due to Scheme | - | 1,50,000 | - | 50,000 |
| Poverty: Before Scheme | LNP | NP | NP | NP |
| Outstanding Debt* | - | 2,00,000 | - | 5,00,000 |

*Note:* LNP: Lower Non-Poor; NP: Non- Poor; * as on the date of field survey

*Source:* Field Survey

The Seed Transport Van was used to supply quality seed to the FCSs tanks and also reduced the dependency of the local fishers on the middlemen. As a result, they were benefitted in multiple ways and their income increased substantially. The income gains of the van owners were indicated in Table 16.

## IV. OTHER PROBLEMS FACED BY FISHERMAN

– While selling (as a *petty* business activity), they encounter problems from local police; lack of ID cards is posing problems in establishing proper identity, answering queries, etc.,

- Families have become insecure, in the absence of insurance, due to the death of earning member or emergency situation;
- Local leaders are interfering and depriving eligible people of getting schemes;
- Some of the Departmental Officials are bowing to political pressure; and
- It is becoming increasingly difficult to feed the family when it fails to attend to the fishing activity.

## V. OBSERVATIONS FROM FGDS AND INTERACTIONS WITH OFFICIALS AND REPRESENTATIVES OF FCSS FOR BETTER MANAGEMENT OF THE SCHEMES

- Awareness camps and training are to be organized to FCSs Members on Fishery Schemes by the Officials;
- Schemes are to be sanctioned to the eligible members based on seniority without any political interference;
- Government shall provide Health Cards, ID Cards and Insurance to Fishers;
- Quality fishing material and equipment to be distributed to all the beneficiaries;
- Service Centres are to be established for repairing Two/Three/Four Wheelers. Youth from FCS families are to be trained and involved in running these centres;
- Fingerlings Breeding Units (FBUs) are to be established in suitable places by involving FCSs, which will help in additional employment;
- Reefer Van, Seed Transport Vehicle and Four-wheeler Schemes have been benefiting only a small number of families. For benefiting more members, two-wheelers are to be provided under SCC Schemes. Such an approach will help in employment and income generation;
- Fishermen above 50 years age are not able to go for catching, and hence finding it difficult to feed the family. Pensions are to be given to such FCS fishermen; and
- During Fishing Ban Period (FBP) months, fishermen (and displaced families) are to be given Rs.4000 per month and supplied with 100 kgs of rice irrespective of the type of fishing activity (now the former is in the vogue for marine fishers).

## VI. IMPLEMENTATION CHALLENGES

### Common problems affecting the implementation of Fishery Schemes

#### *Scarcity of Staff*

At present, there are many posts lying vacant in the Fishery Department due to large scale retirement of staff, non-recruitment and consequently, the field and middle-level officials are overburdened. Frequent transfers, additional / in-charge ships, assignment

of non-fishery related works led to underutilisation of funds and non-achievement of targets as well as ineffective monitoring of the schemes' progress. The department runs the activities through contract workers i.e. Multi Purpose Fishery Assistants (MPFAs) who neither have adequate exposure to the field situation nor are they keen on continuing in this temporary job. The most affected are the Mandals where fishing is an important activity.

***Lack of Infrastructure***

To impart training to field staff and fishers, there are only two Inland Fishery Training Centres (IFTCs: in Kurnool and West Godavari districts) for the entire state. These are expected to provide training to FCSs and License Holders. Further, the District Training Centres (DTCs) and State level (SAMETI: State Agricultural Management and Extension Training Institute) unit are facing manpower problems; the classes are being organized with the help of resource persons engaged on contractual basis. There is a need to strengthen the training infrastructure and convert some of the FCSs into Training Centres for skill development and awareness building.

***Political Interference***

The field reports unambiguously reveal the increased involvement of local leaders in the identification of beneficiaries and allotment of schemes; some of the needy SC fishers were denied. The high transaction costs for various schemes raise doubts about the rent-seeking behaviour of the local elite and corruption among the bureaucracy.

***Role of Middlemen***

This is the most common problem encountered by the fishers in marketing their output. Due to information asymmetries and in a few cases due to interlocking of credit and output markets and perishability of the product, the tiny fishers have little bargaining power. As a result, the share of fisher in consumer rupee is low. Middlemen earn Rs.20-40 per kg. of fish depending upon the market conditions. The provision of Two/ Three/Four wheelers helped the fishers to sell directly in the urban market.

## VII. CONCLUSIONS AND SUGGESTIONS

The state-supported welfare schemes for SC fishers have been received well and there is unmet demand for most of the schemes. The participation of sub-caste people other than Mala and Madiga has been found to be marginal and in the sample, only a few families from *Paidi* and *Relli* sub-castes have availed of this scheme. Why the other sub-castes have not taken advantage of these welfare schemes? This issue needs to be probed.

The schemes have emerged as major source of income and not only the beneficiary but also other members are also involved in many cases gainfully. Most of the

beneficiaries could move out of poverty (poverty norm of Rs.1.2 lakh per annum per family). The state may extend the interest-free loans or loans under the interest subvention scheme.

The awareness of beneficiaries about state-supported schemes meant for SCs has been good but sizeable proportion has been ignorant of the eligibility conditions. It is disquieting that some of the SC fishers are obtaining information on these schemes from local leaders and it may lead to information inadequacies. This gap needs to be filled in by making FCSs as information dissemination centres and agencies for handholding support wherever necessary.

The transaction costs appear to be high working out to 10-20 per cent of unit cost. This indicates either the presence of middlemen or rent-seeking behaviour of the delivery system or both. The local leaders' involvement in getting the scheme to the beneficiaries may also lead to corrupt practices. These costs need to be scaled down substantially. The JBMVC is expected to bring transparency to scheme implementation but the field situation did not lend support to that view. This issue needs greater scrutiny.

The supply of quality seed and feed to the FCSs has been found to be beneficial but the beneficiaries expressed that the fingerlings of right age need to be provided to reduce mortality. Within the existing tanks, the area can be earmarked for fish breeding centres to meet the total demand for fingerlings and ensure supply of right size and age fingerlings.

The beneficiaries of vehicles have to have driving license. The aspirants can be trained under *Deen Dayal Upadhyaya Grameen Kaushalya Yojana* (DDU-GKY) or link to any other skill development programme (e.g., Rural Development and Self Employment Training Institute (RSETI) of Banks) so that they can manage the schemes or can become taxi drivers.

Information inadequacies on aspects like market demand, (virtual) prices and services including loans were reported by many beneficiaries. The state can provide such information to the fishers on their mobiles and if necessary, suitable apps may be developed. Though the state claims development of ICT applications for fishers, the field situation warns that these fishers with mobiles are to be connected and also regular updating of information is equally important. The state should promote the establishment of service centres for attending to the repairs of the vehicles at reasonable rates.

The measures for making fisheries activities more remunerative are indicated in the *Annexure-2*.

**References**

GoAP (2016), *Report of the Commission on Inclusive and Sustainable Agricultural Development of Andhra Pradesh*, Chairman: R. Radhakrishna, Centre for Economic and Social Studies, Hyderabad.

Annexure 1

**District-wise Fishermen Activities in AP: 2016-17**

| *District* | *No. of Fishermen Engaged in* | | | *Members in Fishing Community* | *Fishermen in Fishing Activity* | |
|---|---|---|---|---|---|---|
| | *Fishing Activity* | *Marketing of Fish* | *Repairing/ Mending of Nets* | | *Inland* | *Marine* |
| Srikakulam | **50208** | **25566** | **226** | **50434** | **14944** | **35264** |
| Vizianagaram | 25015 | 5685 | 2350 | 27365 | 13015 | 12000 |
| Visakhapatnam | 38582 | 13423 | 582 | 39164 | 9803 | 28779 |
| East Godavari | 70316 | 48281 | 22035 | 92351 | 22500 | **47816** |
| West Godavari | 27452 | 6354 | 755 | 28207 | 22092 | 5360 |
| Krishna | 49350 | 8400 | 4200 | 53550 | 23100 | 26250 |
| Guntur | 30635 | 1282 | 9234 | 39869 | 15390 | 15245 |
| Prakasam | 31370 | 13600 | 2240 | 33610 | 7170 | 24200 |
| S.P.S.Nellore | 65791 | 12950 | 6700 | 72491 | 17819 | **47972** |
| Y.S.R Kadapa | 1912 | 360 | 200 | 2112 | 1912 | 0 |
| Kurnool | **10590** | **3450** | **162** | **10752** | **10590** | **0** |
| Ananthapuramu | 8162 | 8162 | 12 | 8174 | 8162 | 0 |
| Chittoor | 1320 | 720 | 360 | 1680 | 1320 | 0 |
| | 410703 | 148233 | 49056 | 459759 | 167817 | 242886 |

*Source:* Commissioner of Fisheries, GoAP, Vijayawada

**Annexure 2**

Measures to promote fishing as a remunerative avocation to SC fishers are mentioned below:

1. There is ample scope to establish Fish Food Courts (FFCs), in the urban and peri-urban areas, given the high-income elasticity of fish consumption and projected high growth of state income. Training programmes have to be designed and executed accordingly;
2. Ornamental fish production holds promise in the state. The fish seed production coupled with the opening of aquarium shops in central places and near industrial establishments would provide productive employment and fetch higher income to fishers. Towards this end, market-oriented training and credit support for SC fishers are essential. Promotion of Rick Yard aquarium with a unit cost of about one lakh rupees would help unemployed youth/FCSs/MMGs to get into the rearing of ornamental fish. Exposure visits can be organized for the target group to take up this activity. The private sector can be roped under Public Private Partnership (PPP) for these purposes. These schemes can be taken up with the financial support of The National Fisheries Development Board (NFDB), *Rashtriya Krishi Vikas Yojana* (RKVY) and SCC funds;

3. Fish Processing/value addition activities such as pickles have the twin advantage of addressing the perishability issue and avoid distress sales during excess production and also ensures value addition. Dry fish plants with solar system have to be established. Besides awareness generation, training on preparation of fish-based sauces, soups etc., have to be imparted to fisherwomen/MMGs. These activities can also be taken up by FCSs through Fishers Producer Companies (FPCs) with concessional institutional finance and technical support from the professionals/ organizations; and
4. The schemes should be prepared based on area-specific approach while keeping the financial viability and administrative capability of local institutions with the consultation of stakeholders like FCSs, LHs and MMGs.

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# Impact of MNREGA on Rural Households: Selected GPs in (North) Karnataka

Pesala Peter* and I. Maruthi**

*The Government of India introduced Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in 2005. The MGNREGA provided days of employment to 67.83 crores person during 2006-07 to 2014-15 in Karnataka. The study selected three districts in north Karnataka region, and in each district three GPs; and in each GP 30 MGNREGA beneficiary households selected. Thus the total households are 90. The main findings of the study are: Firstly, nearly one third of the households earned income spent on the purchase of farm equipment, followed by health, household goods, debt repayment, education, saving and repair of the house. Secondly, nearly half of the households' family members migrated during study and the migration is very high in Handigund, out of 30 households, 29 households migrated. Thirdly; the migrated households are landless labour, marginal farmers and small farmers. Finally, 100 days is insufficient for the entire family and this is reported by 88 per cent of the migrated households. Our study suggests that the Government has to provide more than 100 work days per family/households if drought/ famine/need is required.*

**Keywords:** *MGNREGA, Focus group discussion, Migration, GPs*

## I. INTRODUCTION

The Government of India introduced Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in 2005 in India. In Karnataka state, the MGNREGA has been introduced on 2nd February 2006. The MGNREGA first introduced in Bidar, Gulbarga, Raichur, Davanagere and Chitradurga districts. According to Peter (2018a&b), the MGNREGA provided 67.83 crores person days of employment during 2006-07 to 2014-5 in Karnataka state. In the same manner, MGNREGA enhanced the livelihood in rural areas, particularly drought prone district like Karnataka. Under this scheme, most of the SC, ST, OBCs and women people participated and benefited (Peter, 2018a&b). The MGNREGA is generally implemented during the slack season of the year. During Rabi/Kharif season people in the rural areas busy with agriculture and allied activities, due to this reason, the program is implanted in the slack season of the year or summer season.

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The MGNREGA is helping in asset creation of individual households or community level. Under MGNREGA individual assets creation is taking place in the entire Karnataka state. Many places new farm ponds, dug wells, other water harvesting structure, livestock shelter construction, fish drying yards, and other assets are creating under individual asset creation. In addition to that, community level asset creations are also taking place in Karnataka state. These asset creations will provide water facilities, infrastructure facilities and other suitable facilities which will help to enhance agricultural production and productivity. This leads to increase the farmer's income in the long run. Secondly, MGNREGA is providing employment to labour through labour participating in the creation of assets. Through the MGNREGA program, rural unskilled labours get 100 man day's social security in their villages/ GP. In this paper, the study focused on individual household employment and income through MGNRGEGA. Secondly, what is the impact of MGNREGA on rural households? For this purpose, the study conducted an empirical study.

## II. METHODOLOGY

The study focused on Karnataka state, especially north Karnataka. The study selected three districts in the first stage, namely; Belagavi, Kalaburagi and Raichur. In each district one GP selected, namely; Handigund in Belagavi, Koodi in Kalaburagi and Toran Dinny in Raichur district and this is the second stage. In the third stage, each GP 30 MGNREGA beneficiary households selected. Thus the total households are 90. Here beneficiary households define two ways; the first one is whoever participated in MGNREGA labour work treated as a beneficiary household. Secondly, whoever benefited asset creation from MGNREGA treated as a beneficiary household? The study conducted Focus Group Discussion (FGD) in three GPs and visited 12 villages (Appendix1), in addition to that, applied Participated Rural Appraisal (PRA) technique. The study collected primary data from March to May 2018. The main objectives of the paper are to examine the employment and income generation through MGNREGA in selected rural households. Impact of MGNREGA, the status of rural household's migration?

## III. RESULTS AND DISCUSSION

The study selected in each GP 30 sample households. Out of 30 samples, 24 (80%) households are OBC, five (16.6%) SC households and one OC (3.3%) household selected in Handigund. In the case of Koodi, 19 OBC (63%), seven SC (23.3%), three ST (10%) and one OC (3.3%) household selected for the study. And in Toran Dinny, 18 OBC households, nine ST households and three SC household selected for the study. The total OBC households 61 (67.7%), followed by SC (16.6%), ST (13.3%) and OC (2.2%) households and details are presented in Table1.

Table 1
**Selected Sample Households in Three GPs**

| *Name of the District* | *Name of the GP* | *OC* | *OBC* | *SC* | *ST* | *Total* |
|---|---|---|---|---|---|---|
| Belagavi | Handigund | 1(3.33) | 24(80.00) | 5(16.67) | 0(0.00) | 30 |
| Kalaburagi | Koodi | 1(3.33) | 19(63.33) | 7(23.33) | 3(10.00) | 30 |
| Raichur | Toran Dinny | 0 (0.00) | 18(60.00) | 3(10.00) | 9(30.00) | 30 |
| **Total** | | 2(2.22) | 61(67.78) | 15(16.67) | 12 (13.33) | 90 |

*Source:* Primary data collected, 2018

Out of 30 households in Handigund, 17 (94.4%) OBC households are having pucca houses and six (54.4%) households are having semi-pucca houses. Four SC (36.6%) households are having semi-pucca houses and one (100%) OBC household is having Thatched/Kachcha house in the GP. In the case of Koodi, 20 (66.6%) household are having semi pucca houses, followed by Thatched/Kachcha (16.6%) and Pucca (16.6%) households. Among the semi-pucca households, 12 (60%) households belong to the OBC category, followed by SC (20%) and three (15%) households belong to ST category. In the case of Toran Dinny, 20 (66.6%) households are having semi-pucca households. Among the 20 households, 15 (75%) households belong to OBC category and four (20%) households belong to ST category. Three ST, one OBC and one SC households are having thatched/kachcha house (Table2).

Table 2
**Type of House and Selected Sample Households in GPs**

| *Name of the GP* | *Type of House* | *OC* | *OBC* | *SC* | *ST* | *Total* |
|---|---|---|---|---|---|---|
| Handigund | Thatched/Kachcha | 0(0.00) | 1(100.0) | 0(0.00) | 0(0.00) | 1 |
| | Semi-pucca | 1(9.09) | 6(54.55) | 4(36.36) | 0(0.00) | 11 |
| | Pucca | 0(0.00) | 17(94.44) | 1(5.56) | 0(0.00) | 18 |
| Total | | 1(3.33) | 24(80.00) | 5(16.67) | 0(0.00) | 30 |
| Koodi | Thatched/Kachcha | 0(0.00) | 2(40.00) | 3(60.00) | 0(0.00) | 5 |
| | Semi-pucca | 1(5.00) | 12(60.00) | 4(20.00) | 3(15.00) | 20 |
| | Pucca | 0(0.00) | 5(100.0) | 0(0.00) | 0(0.00) | 5 |
| | Total | 1(3.33) | 19(63.33) | 7(23.33) | 3(10.00) | 30 |
| Toran Dinny | Thatched/Kachcha | 0(0.00) | 1(20.00) | 1(20.00) | 3(60.00) | 5 |
| | Semi-pucca | 0(0.00) | 15(75.00) | 1(5.00) | 4 (20.00) | 20 |
| | Pucca | 0(0.00) | 2(40.00) | 1(20.00) | 2(40.00) | 5 |
| | Total | 0(0.00) | 18(60.00) | 3(10.00) | 9 (30.00) | 30 |
| Total | | 2(2.22) | 61(67.78) | 15(16.67) | 12 (13.33) | 90 |

*Source:* Primary data collected, 2018

## IV. LAND CLASSIFICATION

The study identified different farmers in the study. The study divided five types of farmers in the study. Those who do not have land are treated as landless labour. Those

who have land from 0.1 acre to 2.5 acres are considered a marginal farmer, from 2.6 acres to five acres are treated as small farmers. Whoever has land between 5.1 acres to 10 acres are treated as medium farmers. And those who have more than 10.1 acres are considered large farmers. In Handigund, 13 (43.3%) households are landless labour. Among the households, 12 (92.3%) households come under the OBC category and one household belongs to SC category. Eleven (36.6%) households come under marginal farmers, among them, six farmers belong to OBC, another four households come under SC category and one farmer belongs to OC category. If observed in Handigund, landless and marginal farmers participated more in MGNREGA work. In the case of Koodi, 20 (66.6%) households belong to small farmers, and among them 12 households belong to the OBC category, six farmers belong to SC category and two farmers belong to ST category. Seven medium and two large farmers also participated in MGNREGA work in Koodi. In Koodi, most of the small farmers participated in MGNREGA work. In the case of Toran Dinny, 15 (50%) Small farmers participated in MGNREGA and among them; OBCs (53.3%) are higher in number, followed by ST (40%). Six marginal and four landless labourers also participated in MGNREGA work in the GP and there is no large farmer in the GP (Table3).

Table 3
**Social Group and Farmer type in Selected Three GPs**

| *Name of the GP* | *Type of farmer* | *OC* | *OBC* | *SC* | *ST* | *Total* |
|---|---|---|---|---|---|---|
| Handigund | Landless labour | 0(0.00) | 12(92.31) | 1(7.69) | 0(0.00) | 13 |
| | Marginal farmers | 1(9.09) | 6(54.55) | 4(36.36) | 0(0.00) | 11 |
| | Small farmers | 0(0.00) | 4(100.00) | 0(0.00) | 0(0.00) | 4 |
| | Medium farmers | 0(0.00) | 1(100.00) | 0(0.00) | 0(0.00) | 1 |
| | Large farmers | 0(0.00) | 1(100.00) | 0(0.00) | 0(0.00) | 1 |
| | Total | 1(3.33) | 24(80.00) | 5(16.67) | 0(0.00) | 30 |
| Koodi | Marginal farmers | 0(0.00) | 0(0.00) | 1(100.00) | 0(0.00) | 1 |
| | Small farmers | 0(0.00) | 12(60.00) | 6(30.00) | 2(10.0) | 20 |
| | Medium farmers | 1(14.29) | 6(85.71) | 0(0.00) | 0(0.00) | 7 |
| | Large farmers | 0(0.00) | 1(50.00) | 0(0.00) | 1(50.00) | 2 |
| | Total | 1(3.33) | 19(63.33) | 7(23.33) | 3(10.00) | 30 |
| Toran Dinny | Landless labour | 0(0.00) | 2(50.00) | 2(50.00) | 0(0.00) | 4 |
| | Marginal farmers | 0(0.00) | 3(50.00) | 0(0.00) | 3(50.00) | 6 |
| | Small farmers | 0(0.00) | 8(53.33) | 1(6.67) | 6(40.00) | 15 |
| | Medium farmers | 0(0.00) | 5(100.00) | 0(0.00) | 0(0.00) | 5 |
| | Total | 0(0.00) | 18(60.00) | 3(10.00) | 9(30.00) | 30 |
| Total | | 2(2.22) | 61(67.78) | 15(16.67) | 12(13.33) | 90 |

*Source:* Primary data collected, 2018

## V. MALE AND FEMALE EMPLOYMENT AND INCOME

Narayanan (2008) mentioned that a positive impact on the social and economic development of rural families whoever participated in MGNREGA work. Kumar (2016) accomplished that the MGNREGA provided good employment and improved the rural livelihood of the poor people in Mysuru district in Karnataka state. In general, villagers are busy work in agriculture activities during Kharif and Rabi seasons. During summer/slack season agricultural labours are involve in MGNEREGA work. In Handigund, all beneficiary households' male members participated in MGNREGA work during 2016-17. Among the social groups, OBCs (24) participated more and generated more man days (680) and earned a total income is ₹.160480. In a similar way five SC households participated in MGNREGA work, generated 180 man days and earned income 42480. In the case of OC, only one household participated, generated man days and earned income ₹.2360. In the case of Koodi, all household participated in MGNREGA work in 2016-17 as compared to the previous two years. Among the households, OBCs man days are higher and their total income also higher as compared to other social groups. The OBC households are higher in the GP. Among the households OBC total income is₹.116584, followed by SC (₹.47200), ST (₹.14160) and OC (₹.7080) (Table4). In Toran Dinny selected households participated in MGNREGA work from 2014-15 on words. But the participation rate is gradually increased. The man days are increased from 139 days to 392 and 793 in 2014-15, 2015-16 and 2016-17 respectively. In a similar way, the total income also increased from ₹.31570, ₹.92272 and ₹.187148 in respectively. The participation of households in MGNREGA work from 2014-15 to 2016-17 gradually increased in all GPs. The generation of man days in the same mentioned years increased in all GPs. But the households' participation rate is 100 per cent in 2016-17 in Handigund and Koodi (Table4).

There is no wage discrimination between male and female in MGNREGA work. The female members' participation rate has gradually increased from 2014-15, 2015-16 and 2016-17 in Handigund. But the workdays (665) were generated more in 2016-17. In a similar way, the total income (₹.156940) is very high in 2016-17 due to number of participation generating more work days. Among the social groups, OBC, female worked days and incomes are higher and followed by SC and OCs (Table5). The Koodi female participation has increased from 2014-15 (14 households), 2015-16 (26 households) and 2016-17 (30 households). In this GP, the female generated more work days and earned income ₹.39424, ₹63428 and ₹.154816 mentioned years. Among the social groups, days are higher for OBC women and men followed by SC, ST and OC (Table5). Toran Dinny female participation is higher among the GPs and generated more worked days and earned significant income during three study years.

**Table 4**
**Male Participated in MGNREGA Work, Employment and Income in Selected GPs**

| Name of the GPs | Name of the social group | Number of households participated | | | Number of man days generated | | | Total income | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2014-15 | 2015-16 | 2016-17 | 2014-15 | 2015-16 | 2016-17 | 2014-15 | 2015-16 | 2016-17 |
| Handigund | OC | | 1 | 1 | | 5 | 10 | 0(0) | 1180 | 2360 |
| | | | | | | | | | (1180) | (2360) |
| | OBC | 1 | 10 | 24 | 3 | 24 | 680 | 660 | 5620 | 160480 |
| | | | | | | | | (660) | (562.0) | (6686.7) |
| | SC | | 3 | 5 | | 15 | 180 | 0(0) | 3540 | 42480 |
| | | | | | | | | | (1180) | (8496) |
| | Total | 1 | 14 | 30 | 3 | 44 | 870 | 660 | 10340 | 205320 |
| | | | | | | | | (660) | (738.6) | (6844) |
| Koodi | OC | | 1 | 1 | | 25 | 30 | 0(0) | 5900 | 7080 |
| | | | | | | | | | (5900) | (7080) |
| | OBC | 10 | 16 | 19 | 135 | 191 | 494 | 30240 | 45076 | 116584 |
| | | | | | | | | (3024) | (2817.3) | (6136) |
| | SC | 3 | 7 | 7 | 80 | 62 | 200 | 17920 | 14632 | 47200 |
| | | | | | | | | (5973.3) | (2090.3) | (6742.9) |
| | ST | 1 | 2 | 3 | 3 | 5 | 60 | 672 | 1156 | 14160 |
| | | | | | | | | (672) | (578) | (4720) |
| | Total | 14 | 26 | 30 | 218 | 283 | 784 | 48832 | 66764 | 185024 |
| | | | | | | | | (3488) | (2567.8) | (6167.5) |
| Toran Dinny | OBC | 13 | 16 | 17 | 119 | 216 | 468 | 26936 | 50886 | 110448 |
| | | | | | | | | (2072) | (3180.4) | (6496.9) |
| | SC | 1 | 2 | 2 | 3 | 48 | 40 | 702 | 11236 | 9440 |
| | | | | | | | | (702) | (5618) | (4720) |
| | ST | 5 | 7 | 8 | 17 | 128 | 285 | 3932 | 30150 | 67260 |
| | | | | | | | | (786.4) | (4307.1) | (8407.5) |
| | Total | 19 | 25 | 27 | 139 | 392 | 793 | 31570 | 92272 | 187148 |
| | | | | | | | | (1661.6) | (3690.9) | (6931.4) |

*Source:* Primary data collected, 2018. Figures in brackets are average income

Table 5
**Female Participated in MGNREGA Work, Employment and Income in Selected GPs**

| *Name of the GP* | *Name of the social group* | *Number of households participated* | | | *Number of man days generated* | | | *Total income* | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | *2014-15* | *2015-16* | *2016-17* | *2014-15* | *2015-16* | *2016-17* | *2014-15* | *2015-16* | *2016-17* |
| *Handigund* | *OC* | | | *1* | *1* | | *1* | *20* | *0 (0)* | *236* | *4720* |
| | | | | | | | | | | *(236)* | *(4720)* |
| | *OBC* | | *1* | *11* | *22* | *2* | *25* | *525* | *440* | *5823* | *123900* |
| | | | | | | | | | *(440)* | *(529.4)* | *(5631.8)* |
| | *SC* | | | *3* | *5* | | *6* | *120* | *0(0)* | *1416* | *28320* |
| | | | | | | | | | | *(472.0)* | *(5664.0)* |
| | *Total* | | *1* | *15* | *28* | *2* | *32* | *665* | *440* | *7475* | *156940* |
| | | | | | | | | | *(440)* | *(498.3)* | *(5605.0)* |

| Name of the GP | Name of the social group | Number of households participated | | | Number of man days generated | | | Total income | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2014-15 | 2015-16 | 2016-17 | 2014-15 | 2015-16 | 2016-17 | 2014-15 | 2015-16 | 2016-17 |
| Koodi | OC | | 1 | 1 | | 25 | 15 | 0(0) | 5900 (5900) | 3540 (3540) |
| | OBC | 10 | 16 | 19 | 138 | 180 | 421 | 30912 (3091.2) | 42480 (2655.0) | 99356 (5229.3) |
| | SC | 3 | 7 | 7 | 36 | 51 | 145 | 8064 (2688.0) | 12036 (1719.4) | 34220 (4888.6) |
| | ST | 1 | 2 | 3 | 2 | 17 | 75 | 448 (448) | 4012 (2006) | 17700 (5900) |
| | Total | 14 | 26 | 30 | 176 | 273 | 656 | 39424 (2816) | 64428 (2478) | 154816 (5160.5) |
| Toran Dinny | OBC | 13 | 17 | 18 | 146 | 174 | 380 | 32824 (2524.9) | 41044 (2414.4) | 89680 (4982.2) |
| | SC | 2 | 3 | 3 | 6 | 17 | 90 | 1404 (702.2) | 3984 (1328) | 21240 (7080) |
| | ST | 5 | 8 | 9 | 79 | 86 | 222 | 18320 (3664) | 20280 (2535) | 52392 (5821) |
| | Total | 20 | 28 | 30 | 231 | 277 | 692 | 52548 2627.4) | 65308 (2332.4) | 163312 (5443.7) |

*Source:* Primary data collected, 2018. Figures in brackets are average income.

## VI. INCOME FROM MGNREGA AND NON-MGNREGA

The study separated MGNREGA income and Non-MGNREGA income. In Koodi, seven (23%) SC households' average MGNREGA income is ₹.11631. It indicated that the SC average income is higher among the social groups. In addition to that, the (SCs) participation of MGNREGA is also higher as compared to other social groups. The minimum MGNREGA income in SC households is ₹.9,440 and the maximum is ₹.16,520 in the same community. Among the social groups, the maximum MGNREGA income is earned by one SC household. The MGNREGA high income (₹.2,15,940) is earned by OBC households, but the average income is less as compared to the SC community. Among the social groups, one OBC household's maximum income (₹.5,900) is less as compared to other social groups. The non-MGNREGA average/total income is higher in OBC households as compared to other social groups in Koodi, but the average income is lower in general category household. And the other community (OC) household also participated in MGNREGA work. The minimum income is low (₹.19,000) in ST households and the maximum income (₹.1,26,000) is higher in OBC households.

The second GP is Toran Dinny, ST (30%) households MGNGRGA average income is (₹13,295) higher than all social groups. Among the social groups, the minimum income is lower in (₹6,608) SC households and Maximum in ST (₹16,520) and OBC (₹16,520) households. And the average income is lower in SC (₹.10,227) household. The non-MGNREGA income average income is higher in OBC household (₹.75496), followed by

ST (₹.57,708) and SC (₹.17,600). The income data reveals that SCs are more vulnerable in terms of income earned very low as compared to other social groups. The non-MGNREGA minimum (₹.1,000) income is lower in SC (₹.1,000) and OBC (₹.1,000) and the maximum income earned by OBC (₹.2,02,916) household. The average income proves based on the data that most of the SCs are economically poor in the sample GPs/villages.

The MGNREGA average income (₹.14,160) is higher in SC households as compared to other households, but the households are only five. It indicated that most of the SCs participated in MGNREGA. The MGNREGA is major income source of the SC households and data reveals that their participation rate is also higher as compared to other social groups. The minimum MGNREGA income is ₹.4,720 come from OBC household and the maximum MGNREGA income come from OBC (₹.21,240) household. The non-MGNREGA income is higher in SC category (₹.48,588) due to their participation in labour activities, whereas other social groups' main activities are cultivating the land. Due to this reason, the income difference is there in the Handigund. The minimum non-MGNREGA income is lower in SC (₹.10,000), OBC (₹.10,000) and the maximum income comes from OBC (₹.1,01,760) household(Table6).

Table 6

**Total Incomes from MGNREGA and from all the Remaining Sources put Together**

| *Name of the GP* | *Social group* | *Source* | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | *MGNREGA* | | | | *Non-MGNREGA(all other sources)* | | | |
| | | *No. of household reported* | *Total** | *Min.* | *Max.* | *No. of household reported* | *Total** | *Min.* | *Max.* |
| *Koodi* | SC | 7 | 81420 | 9440 | 16520 | 7 | 438890 | 26000 | 91340 |
| | | (23.33) | (11631) | | | (23.33) | (62699) | | |
| | ST | 3 | 31860 | 7080 | 14160 | 3 | 162632 | 19000 | 113000 |
| | | (10) | (10620) | | | (10) | (54211) | | |
| | OBC | 19 | 215940 | 5900 | 14160 | 19 | 1320900 | 40900 | 126000 |
| | | (63.33) | (11365) | | | (63.33) | (69521) | | |
| | OC | 1 | 10620 | 10620 | 10620 | 1 | 55000 | 55000 | 55000 |
| | | (3.33) | (10620) | | | (3.33) | (55000) | | |
| | Total | 30 | 339840 | 5900 | 16520 | 30 | 1977422 | 19000 | 126000 |
| | | (100) | (11328) | | | (100) | (65914) | | |
| *Toran Dinny* | SC | 3 | 30680 | 6608 | 14160 | 3 | 52800 | 1000 | 50800 |
| | | (10) | (10227) | | | (10) | (17600) | | |
| | ST | 9 | 119652 | 7080 | 16520 | 9 | 519376 | 10000 | 118150 |
| | | (30) | (13295) | | | (30) | (57708) | | |
| | OBC | 18 | 200128 | 7080 | 16520 | 18 | 1358936 | 1000 | 202916 |
| | | (60) | (11118) | | | (60) | (75496) | | |
| | Total | 30 | 350460 | 6608 | 16520 | 30 | 1931112 | 1000 | 202916 |
| | | (100) | (11682) | | | (100) | (64370) | | |

| Name of the GP | Social group | Source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MGNREGA | | | | Non-MGNREGA(all other sources) | | | |
| | | No. of household reported | Total* | Min. | Max. | No. of household reported | Total* | Min. | Max. |
| Handigund | SC | 5 | 70800 | 8260 | 17700 | 5 | 242940 | 10000 | 71760 |
| | | (16.67) | (14160) | | | (17.24) | (48588) | | |
| | ST | 0(0) | 0(0) | 0 | 0 | 0(0) | 0(0) | 0 | 0 |
| | OBC | 24 | 284380 | 4720 | 21240 | 23 | 857080 | 10000 | 101760 |
| | | (80) | (11849) | | | (79.31) | (37264) | | |
| | OC | 1 | 7080 | 7080 | 7080 | 1 | 41000 | 41000 | 41000 |
| | | (3.33) | (7080) | | | (3.45) | (41000) | | |
| | Total | 30 | 362260 | 4720 | 21240 | 29 | 1141020 | 10000 | 101760 |
| | | (100) | (12075) | | | (100) | (39346) | | |

*Source:* Primary data collected, 2018. *Note: Figures in brackets are represents the average income

## VII. AMOUNT SPENT BASED ON PRIORITY

Among the three GPs, 26 per cent of the households earned income is spent on purchase of farm equipment, followed by health (25%), purchase of household goods (23%), debt repayment (9%), education (7%), saving (7%) and repair of house is two per cent. GP wise, in Handigund, sample household's first priority is given to health (27%), purchase of household goods (27%), debt repayment (27%) and savings (20%). Among the social groups, OBC households spent money on health (29%); debt repayment (29%) followed by savings (25%) and purchase of households goods (17%).

In the case of Koodi, 18 households' first priority is given to purchase of farm equipment (60%), followed by health (27%), purchase of households goods (27%) and education (3%). Among the social groups, 11 OBC households' first priority was to purchase farm equipment, followed by health (32%) and purchase of household goods (11%). Three SC households gave priority to purchase of farm equipment followed by the purchase of household goods (29%)) and education (14%) and health (14%). Toran Dinny beneficiary households spent (30%) of the households' money on the purchase of household goods, followed by health (26%), purchase of farm equipment (19%) and education (19%). Five ST households spent their MGNREGA amount for health purpose followed by education (33%) and purchase of household goods. All the social group details are presented in Table7.

Table 7
**Amount Spent and First Priority in Selected Three GPs**

| Name of the GP | Social group | *Name of the item* | | | | | | | *Total* |
|---|---|---|---|---|---|---|---|---|---|
| | | *Purchase of farm equipment* | *Health* | *Purchase of household goods* | *Debt repayment* | *Education* | *Savings* | *Repair of house* | |
| Handigund | OC | 0(0.00) | 0(0.00) | 1 (100.0) | (0.00) | 0(0.00) | 0 (0.00) | 0(0.0) | 1 |
| | OBC | 0(0.00) | 7(29.17) | 4(16.67) | 7(29.17) | 0(0.00) | 6(25.00) | 0(0.0) | 24 |
| | SC | 0(0.00) | 1(20.00) | 3(60.00) | 1(20.00) | 0(0.00) | 0(0.00) | 0(0.0) | 5 |
| | Total | 0(0.00) | 8(26.67) | 8(26.67) | 8(26.67) | 0(0.00) | 6(20.00) | 0(0.0) | 30 |
| Koodi | OC | 1(100.00) | 0 (0.00) | 0 (0.00) | 0(0.00) | 0(0.00) | 0(0.00) | 0(0.0) | 1 |
| | OBC | 11(57.89) | 6(31.58) | 2(10.53) | 0(0.00) | 0(0.00) | 0(0.00) | 0(0.0) | 19 |
| | SC | 3(42.86) | 1(14.29) | 2(28.57) | 0(0.00) | 1(14.29) | 0(0.00) | 0(0.0) | 7 |
| | ST | 3(100.0) | 0 (0.00) | 0 (0.00) | 0(0.00) | 0(0.00) | 0(0.00) | 0(0.0) | 3 |
| | Koodi | 18(60.00) | 7(23.33) | 4 (13.33) | (0.00) | 1(3.33) | 0(0.00) | 0(0.0) | 30 |
| Toran Dinny | OBC | 4(23.53) | 2(11.76) | 7 (41.18) | 0(0.00) | 2(11.76) | 0(0.00) | 2(11.7) | 17 |
| | SC | 1(100.00) | 0(0.00) | 0 (0.00) | 0(0.00) | 0(0.00) | 0(0.00) | 0(0.0) | 1 |
| | ST | 0 (0.00) | 5(55.56) | 1(11.11) | 0(0.00) | 3(33.33) | 0(0.00) | 0(0.0) | 9 |
| | Total | 5(18.52) | 7(25.93) | 8(29.63) | 0(0.00) | 5(18.52) | 0(0.00) | 2(7.41) | 27 |
| Total | | 23(26.44) | 22(25.3) | 20(22.99) | 8(9.20) | 6(6.90) | 6(6.90) | 2(2.30) | 87 |

*Source:* Primary data collected, 2018

## VIII. IMPACT OF MGNREGA ON MIGRATION

Maruthi and Pesala Peter (2018b) find that during the slack period, rural household migrated to other villages/ urban areas/ cities to get employment. The study finds that due to lack of work in villages most of the households migrated. According to Akthar and Abdu (2012), migration is the only source of rural landless labour and marginal farmers. The author finds that MGNREGA provided employment to villagers and it improved the economic status. Our empirical study results reveal that 46 per cent of the selected sample household family members migrated during our study period and the rest of the 54 per cent of the households did not migrate. The migration is very high in Handigund, followed by Toran Dinny. In Handigund out of 30 sample households, 29 households migrated during our study period. Among the migrated households, 43 per cent of them are landless labour and marginal farmers (37%) and 13 per cent of them are small farmers. Here our study results are in line with the Akthar and Abdu (2012) study. In a similar way, the second Koodi selected beneficiary households' migrated only five households. Among the social groups, three households are SCs and another two households are OBCs. In the case of third Toran Dinny, only seven households migrated. Among them, OBCs are four households and ST is three households (Table8).

Table 8
**Do You/Your Fmily Member Migrated?**

| *Name of the GP* | *Social group* | *Yes* | *No* | *Total* |
|---|---|---|---|---|
| Handigund | OC | 0 (0.00) | 1(100.00) | 1 |
| | OBC | 24(100.00) | 0(0.00) | 24 |
| | SC | 5(100.00) | 0(0.00) | 5 |
| | Total | 29(96.67) | 1(3.33) | 30 |
| Koodi | OC | 0(0.00) | 1(100.00) | 1 |
| | OBC | 2(10.53) | 17(89.47) | 19 |
| | SC | 3(42.86) | 4(57.14) | 7 |
| | ST | 0(0.00) | 3(100.00) | 3 |
| | Total | 5(16.67) | 25(83.33) | 30 |
| Toran Dinny | OBC | 4(22.22) | 14(77.78) | 18 |
| | SC | 0(0.00) | 3(100.00) | 3 |
| | ST | 3(33.33) | 6(66.67) | 9 |
| | Total | 7(23.33) | 23(76.67) | 30 |
| Total | | 41(45.56) | 49(54.44) | 90 |

*Source:* Primary data collected, 2018

## IX. REASONS FOR MIGRATION

According to Jayaraj (2013), migration helped to provide opportunities in urban areas. The results from the study reveal that a total of 41 household's family members migrated during our study period. According to migration households, the Government of India implemented the MGNREGA work in their villages, but the 100 days is insufficient for the entire family and this information was reported by 88 per cent of the households (Table9). Secondly, the nature of work under MGNREGA is lower to that of work done as a migrant worker; this was reported by 10 per cent of the households and one household reported that MGNREGA pays lower wages. The above-said reasons lead households to migrate. Based on our empirical study results, we suggest that the Government has to provide more than 100 work days per family/ households if drought/famine/need is required.

Table 9
**Reasons for Migration and Selected Three GPs**

| *Social group/ GP* | *100 days is insufficient for the entire family* | *The nature of work under MGNREGA is lower to that of work done as migrant worker* | *Lower wages under MGNREGA than a migrant workers* | *Total* |
|---|---|---|---|---|
| OC | 0(0.0) | 0(0.0) | 0(0.0) | 0 |
| OBC | 22(91.67) | 1(4.17) | 1(4.17) | 24 |

| *Social group/ GP* | *100 days is insufficient for the entire family* | *The nature of work under MGNREGA is lower to that of work done as migrant worker* | *Lower wages under MGNREGA than a migrant workers* | *Total* |
|---|---|---|---|---|
| SC | 5(100.00) | (0.00) | (0.00) | 5 |
| Handigund | 27(93.10) | 1(3.45) | 1(3.45) | 29 |
| OC | 0(0.0) | 0(0.0) | 0(0.0) | 0 |
| OBC | 2(100.00) | 0(0.00) | 0(0.00) | 2 |
| SC | 3(100.00) | 0(0.00) | 0(0.00) | 3 |
| ST | 0(0.0) | 0(0.0) | 0(0.0) | 0 |
| Koodi | 5(100.00) | 0(0.00) | 0(0.00) | 5 |
| OBC | 2(50.00) | 2(50.00) | 0(0.00) | 4 |
| SC | 0(0.0) | 0(0.0) | 0(0.0) | 0 |
| ST | 2(66.67) | 1(33.33) | 0(0.00) | 3 |
| Toran Dinny | 4(57.14) | 3(42.86) | 0(0.00) | 7 |
| Total | 36(87.80) | 4(9.76) | 1(2.44) | 41 |

*Source:* Primary data collected, 2018

## X. CONCLUSIONS

The main findings of the study are: in Handigund, 17 OBC households have pucca houses followed by semi pucca houses (20) in Koodi. In the case of Toran Dinny, 20 households have semi-pucca households. In Handigund, 13 households are landless labourers. Among the households, 12 households belong to OBC. Eleven households come under marginal farmers, among them, six farmers belong to OBC and another four households belong to SC category. In the case of Koodi, 20 households belong to small farmers. In Koodi, most of the small farmers participated in MGNREGA work. In case of Toran Dinny, 15 small farmers participated in MGNREGA and among them; OBCs (8) are higher in number. There is no large farmer in the GP. The generation of man days in the mentioned years increased in all GPs. But the households' participation is 100 per cent in 2016-17 in Handigund and Koodi. There is no wage discrimination between male and female in MGNREGA work. The female members' participation has gradually increased during 2014-15, 2015-16 and 2016-17 in Handigund. But the man days (665) were generated more in 2016-17. In a similar way, the total income (₹.1,56,940) is very high in 2016-17 due to high participation and generating more work days. Among the social groups, OBC female worked days and incomes are higher it is followed by SC and OCs.

Among the three GPs, 26 per cent of the households earned income is spent on the purchase of farm equipment, followed by health, purchase of household goods, debt repayment, education, saving and repair of the house. Our empirical study

results reveal that 46 per cent of the selected sample households' family members migrated during our study period and the rest of the 54 per cent of the households did not migrate. The migration is very high in Handigund, followed by Toran Dinny. In Handigund selected sample households, 29 households migrated during our study period. The migrated sample households, 43 per cent of them are landless labour and marginal farmers (37%) and 13 per cent of them are small farmers. The study results reveal that 100 days are insufficient for the entire family which was reported by 88 per cent of the migrated households. Secondly, the nature of work under MGNREGA is lower to that of work done as a migrant worker; this was reported by 10 per cent of the households, while one household reported that MGNREGA pays lower wages. Based on our empirical study results, we suggest the Government to provide more than 100 work days per family/households if drought/famine/need is required.

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**APPENDIX 1**

**District wise visited sample villages in Karnataka**

| *Sl.No.* | *Name of the district* | *Name of the GP* | *Name of the village* |
|---|---|---|---|
| 1 | Belagavi | Handigund | 1.Handigund |
| 2 | Kalaburagi | Koodi | 1.Handanur |
| | | | 2.Rasangi |
| | | | 3.Banmi |
| | | | 4.Kudi |
| | | | 5.Manderwad |
| | | | 6.Kobal |
| | | | 7.Hipperga |
| | | | 8.Hipperga-Kona |
| 3 | Raichur | Toran Dinny | 1.Malkapur |
| | | | 2.Toran Dinni |
| | | | 3.Goge Hebbal |
| Total | 3 districts | 3GPs | 12.villages |

*Source:* Primary data collected, 2018.

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# Current Implementation and Impacts of MGNREGS in Rural Odisha: Does this Solve the Problems of Unemployment and Migration?

M Gopinath Reddy*, Bishnu Prasad Mahapatra** and Jogindra Naik***

*The current paper reveals that the implementation of MGNREGS in many ways affected the livelihoods of the people. It has helped to provide wage employment and creation of durable assets in the rural areas of Odisha. This programme has become a main source of livelihoods for the millions of rural and tribal people. The role of PRIs as implementing institutions observed in many cases. Though MGNREGS has created ample opportunity for the poor people in the form of providing them wage employment, but failure of institutional mechanism in the process of implementation has affected the overall process of implementation.*

*After one decade of implementation of MGNREGS, still many initiatives have to be taken up for the effective implementation of this programme. The issue of institutional capacity should also be given importance in order to make it pro-people. This paper revealed that insufficiency in quantum of job, lower wage rate and delay in wage payment are major reasons for migration in search of livelihoods in the study area. Proper implementation of MGNREGS on productive rural assets would certainly help the rural people for a better livelihood.*

**Keywords:** *MGNREGS, Livelihood security, Migration, Social and resource mapping*

## I. INTRODUCTION

India's Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is considered as one of the most creative initiatives of the Government of India in the field of socio-economic development policy. The MGNREGA is aimed at poverty eradication, prevention of starvation, reducing distressed migration of the poor, use of surplus labour, creation of durable and productive assets, empowerment of social groups, and above all - empowering the disadvantaged communities in India. The MGNREGA was launched by the Government of India on 2nd February, 2006 in a large part of the country as a part of the wage employment programme. Prior to the emergence of this

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programme, a plethora of wage employment programmes were also implemented in India with the aim of addressing the unemployment in rural areas, though the issue of migration attained least priority under the implementation of these programmes.

The rationale behind the wage-oriented programmes has five basic ingredients: a) to utilise human resources more effectively and efficiently and create gainful employment for the rural poor; b) to maintain the highest feasible rate of growth; c) to make the pattern of production more labour intensive; d) to regulate technological change to ensure adequate rate of growth of employment; e) and to give guarantee of employment to the poor. Experts have recommended this strategy for poverty-alleviation on the ground that it permits self-selection of the poor and hence the leakages to the non-poor will be minimum. This is based on the understanding that there is considerable scope for targeting the poor by getting the wages at the desired level in programmes like public works. However, cross-country experiences of implementation of MGNREGA show the rampant violation of the basic provisions under this pro-poor scheme that has affected the livelihoods of many poor people. In the case of various states, in particular Odisha (the state having with more rural migration), this scheme has created little impact on addressing the issues of migration.

The emergence of MGNREGA can be considered as an important milestone on the way of providing social security and strengthening the economic productivity of the rural poor. The most novel and remarkable features of MGNREGA are: i) a legally binding response by the state to ensure right to work for poor and unemployed persons; ii) a development initiative, chipping with crucial public investments for the creation of durable assets; iii) emphasis on water conservation, drought and flood-proofing - underscoring water security for rural transformation; iv) complete ban on the use of contractors and labour displacing-machinery in executing the works; v) payment of statutory minimum wages and provide legal entitlements to labour on working hours, rest, drinking water, medical aid and crèche facilities; vi) provision for unemployment allowance to be paid to the workers in case the state is unable to provide the guaranteed days of work i.e., 100 days employment for every household in a year; vii) a heavy thrust on people's participation, decentralised process of decision-making, planning and implementation and a very minimal role for state bureaucracy; viii) ensure transparency of implementation and accountability of implementers; ix) preparation of annual report on the implementation of the programme and be made available for public scrutiny; x) monitoring of the works by Gram Sabhas by way of social audits; xi) evaluation of the assets created under the programme by technically qualified personnel; xii) strategic use of surplus labour for creation of assets for expanding labour absorption capacity; xiii) and undertake the programmes benefiting Scheduled Castes (SCs), Scheduled Tribes and women more.

The impact of MGNREGA on addressing the issues of unemployment and distress migration has become a subject of considerable debate among the scholars. It is argued that a main objective of this scheme is to reduce the distressed migration of people in the rural areas, in particular people such as the SC and ST community through providing them with wage employment. Further, creating durable assets and organizing the rural poor for this activity is believed to play a key role for providing wage employment. The studies on MGNREGS highlight that the realisation of these goals depend on several factors like i) effective preparation of plans; ii) availability of backward and forward linkages in executing the schemes; iii) adequate financial allocation and timely release of the budget; iv) use of information technology (to plan, standard procedures, arrest malpractices, reduce delay, transparency, concurrent vigilance and audit); v) support from civil society organisations; vi) active involvement of Panchayat leadership and people; vii) development of full-time professionals dedicated to MGNREGA at all levels, but most crucially at the block level, which is the cutting edge of implementation; ix) building up a cadre of fully trained "barefoot professionals" at the Gram Panchayat level for capacity building, engaging government and non-government institutions; x) setting up systems for continuous monitoring and evaluation at every stage of the programme to ensure quality; xi) evolving mechanism for ensuring transparency and accountability of the functionaries at all levels; etc. All these factors collectively contribute not only for reducing the havoc of rural unemployment but also strengthening the livelihoods of the poor in India.

**Objective of the Paper**

The broad objective of this paper is to understand the overall impact of MGNREGA in India, with a special reference to Odisha after one decade of its implementation. Further, it is intended to understand the nature and the extent of impacts it has created on strengthening the livelihoods of the rural poor and how improved livelihood conditions have also created multiple effects transforming rural areas in the states.

However, the specific objectives are as follows:

- To understand the process and status of implementation of MGNREGS in the state of Odisha while focusing on the processes and strategies taken up for addressing the issues of unemployment through the process of implementation.
- To understand the overall contribution of this scheme on creating and strengthening livelihoods of the poor people in the state
- To examine the status of assets (individual and community) being created through the process of this scheme and the nature of participation of the people for this purpose.
- To understand the impact of the MGNREGS on strengthening rural governance

through the transparency mechanisms of social audit.

– To understand the impact of the MGNREGS on migration of the poor households in the study households

## II. RESEARCH METHODOLOGY AND DATABASE

### Research Methods

The study was carried out through employing three key research methods such as: (i) Household Survey (through direct interview), (ii) Focus Group Discussion (FGD) and (iii) Social and Resource Mapping. Further, questionnaires were used for gathering data from villages, GPs and block-levels in the study area. The data base of the study was generated through employing both quantitative and the qualitative methods. 800 households from 17 districts were covered through the household survey method. Further, the qualitative aspects of implementation of MGNREGS in the state and its contribution towards improving livelihoods of people were covered through the study. The Social and Resource Maps were developed to assess the nature and qualities of the assets being created under the MGNREGS in the study area.

### Study Area

The study was carried out in Odisha, a state located in the Eastern part of India. The important factors of selecting the districts as units of study is based on its socio-economic conditions, preponderance of migrant workers and the implementation of MGNREGS in these areas.

The data collection process was based on several rounds of exploratory field visits and extensive discussions with key stakeholders; apart from the collection of data from the 800 households from 20 villages from 20 selected community development blocks (of 17 selected districts) in the state. Intensive field work was carried out from March, 2018 to May, 2018 for gathering of field-level data.

### Sampling Design

The study employed the multi-stage sampling method in selecting the regions, districts, blocks/GPs and respondents. The regions and districts from the state were selected based on two key factors i.e. (i) status of implementation of MGNREGS and (ii) status of livelihoods in the rural areas of the district. Further, other socio-economic factors such as population of SCs, STs and OBCs, and geographical areas of the districts were also taken into consideration while selecting the districts. The socio-economic status of the rural poor and their participation in the process of the implementation of MGNREGS and the socio-economic status of migrant households and their nature of participation in the process of the implementation of MGNREGS was also taken into consideration while selecting the districts. The selection of households was based on

their participation in MGNREGS. From each village, 40 households were sampled for the in-depth interview through structured questionnaires. The composition of study households in each village was 30 active participants (who worked for 30 or more days in MGNREGS) and 10 inactive/less active participants (who worked for less than 10 days or never worked in MGNREGS).

**Application of various Tools for Data Collection**

For the purpose of data collection from households, a structured questionnaire was developed focusing on the various aspects of the socio-economic conditions of the households, status of involvement in MGNREGS, wages received from MGNREGS work, difficulties in getting work and wages under MGNREGS, contribution of MGNREGS work on household income and how the MGNREGS implementation has addressed the issue of migration.

For collecting the qualitative data, FGDs were conducted using the FGD checklist. The checklist was developed incorporating various aspects of the MGNREGS and issues of livelihood, impact and other key features of MGNREGS in the study areas. Further, for conducting in-depth interviews, a separate checklist was developed while focusing on the key aspects of the research.

The PRA technique, such as Social Mapping and Resource Mapping was used for exploring the trends and pattern of migration, and trends and pattern of getting wage employment under MGNREGS. It also helped to understand the status of households in MGNREGS and migration.

**Table 1**
**Application of Various Tools for Data Collection**

| *Tools/Techniques* | *Application of the tools* | *Target Respondents* |
|---|---|---|
| Structured Questionnaire | The questionnaire was used for collection of data from the Households comprising beneficiaries and non-beneficiaries. | Household Members (Heads/ Adult Members) from the sampled households |
| FGD Checklist | The checklist was used for conducting FGDs at the village level. | Villagers, MGNREGS Workers, Women, Farmers |
| Social and Resource Mapping | The Social and Resource Mapping techniques were used for understanding the village resources. | Villagers, MGNREGS Workers, Women |
| Structured Questionnaire for Secondary Data Collection | The questionnaire was used for collecting data from GPs and Blocks regarding various domains. | Functionaries of GPs, Blocks and various Line Departments |

*Note:* The research tools described in the above table were applied during the field survey.

## III. REVIEW OF ISSUES RELATED TO MGNREGS

### Conceptual Review

The literature on the implementation of Wage Employment Programmes in India and their impact on strengthening livelihoods of the rural poor has been receiving academic importance and such a scenario has also contributed immensely towards understanding the relationship between Wage Employment Programmes and livelihoods. In the case of MGNREGS, as a Wage Employment Programme, many scholars have observed that it has great potential to address the issues of livelihoods. According to the Institute of Development Studies, United Kingdom, "A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from shocks and stresses and maintain and enhance its capabilities and assets both now and in the future, whilst not undermining the natural resource base". (Scoones, 1998, pp 5)

Further, it is also argued that MGNREGS is designed to address rural migration in India. Migration can be conceptualised as those movements that resulted in the change of the usual place of residence (UPR) of individuals (NSSO, 2010). Historically, migration is linked with various socio-economic, cultural and political factors. In the last few decades, due to lack of employment opportunities in rural areas, increasing demand for labour elsewhere in rural and urban India, and improved communication has added an impetus to the degree of rural migration in India (Dutta, 2016: 85-93). Further, in the post-independence period, the spread of the Green Revolution in agriculture since the 1960s, significant change in the labour market regime, increasing urbanisation and rapid growth of industrial and service sectors under the neo-liberal regime has contributed a lot towards the growth of outmigration in the rural areas.

### Empirical Findings of MGNREGS in India

Since the implementation of MGNREGS, many research studies have been carried out to understand various aspects of its implementation. Further, studies conducted in various states indicate that MGNREGS has reduced migration by providing work closer to home and decent working conditions (GoI, 2012:51). Distress migration has been reduced in many parts and there is livelihood diversification in rural areas (Viswanathan et.al, 2014). The findings of independent studies conducted by the Ministry of Rural Development indicate that out-migration from villages has gone down due to implementation of this scheme in various states, in particular states where migration has emerged as a major challenge for the state governments.

Many scholars have highlighted the problems associated with the wage payment mechanism under MGNREGS. It is found that in Andhra Pradesh, minimum wages were not received by the workers even for a full day's work, unemployment allowance

was observed as low as Rs.6 to Rs.13 per day for a full day's digging work. Pandey (2017:198-202) examined how MGNREGA is a beneficial and effective scheme for the development of rural India and also provides some important suggestions to make this scheme more powerful, fruitful and valuable. In this study, it has indicated that the poorest of poor were not fully able to exercise their rights under MGNREGA because of various factors. Aggarwal (2017) observed that increasing dependence on technology in the implementation of the act is creating new hurdles for wage payments.

**Empirical Findings of MGNREGS in Odisha**

In the case of Odisha, many initiatives have been taken up for the effective implementation of this scheme for the reduction of rural migration. The progress of the implementation of this scheme in the state shows many impressive outcomes. The state government has taken up serious efforts to enhance the well-being of the poor, in particular, the SC and the ST community through implementing the MGNREGA. Mobilising the rural poor under the umbrella of this scheme has been demonstrated many positive results. Since inception in 2005, the performance of MGNREGA is somewhat wavering.

It is observed through various studies that the implementation of MGNREGS in Odisha has suffered many weaknesses. Dreze (2007) looks at the corruption in the rural programme in Odisha and how this has continued in NREGS as well. Nonetheless, he believes that there is a tremendous potential of MGNREGA in survey areas. A study conducted by Biswal (2017: 84-91) found that the payment of wages has been often delayed and or the scheme and that needs to be checked. Further, awareness about the schemes like the entitlements of the participants, the process of application, demand for jobs, and compensation in case of failure on the part of the Government has to be disseminated on a priority basis.

Nayak et al (2008:39) conducted their study in 2 districts of Odisha mainly Mayurbhanj and Balasore. This study shows that the state as a whole, as well as two sample districts, is well in certain physical and financial parameters like the provision of employment to those who demand jobs and maintenance of wage and non-wage ratio. Their performance in certain physical and financial parameters likes provision of employment to those who demand jobs and maintenance of wage and non-wage ration. However, their performance in certain other important parameters like utilization of funds and creation of demand for jobs is not very encouraging. According to this report, well thought out effort is necessary to address these problems of MGNREGA in the state.

Mohanty's (2012) study entitled "Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and Tribal Livelihoods: A Case study in Sundargarh

District of Odisha", throws light on MGNREGA which is considered to be a 'Silver Bullet' for eradicating rural poverty and unemployment, by way of generating demand for productive labour force in villages. This study argues that MGNREGA provides an alternative source of livelihood which will have an impact on reducing migration, restricting child labour, alleviating poverty, and making villages self-sustaining through productive assets creation such as road construction, cleaning up of water tanks, soil and water conservation work, etc.

Smita Nayak (2013:11-24) attempts to examine the potentials and loopholes in the MGNREGA, and its impacts on tribal women in Odisha, especially in Rajgangpur Block. The involvement of tribal women in the NREGS programme in the study area was found to very marginal as compared to men. The study findings revealed that various bottlenecks such as lack of tribal women involvement at the time of planning for NREGS work, lack of awareness, lack of crèche facilities at work sites, lack of women's ownership of job cards and bank accounts, wage discrimination between men and women, harassment at the workplace and lack of appropriate gender-friendly methods of information dissemination, etc. have adversely impacted and thus questioned the efficacy of MGNREGA in enhancing the status of tribal women in the study area.

Sahoo (2013: 54-61) examined an inter-district analysis of the performance of MGNREGA in Odisha. This study observed that among 23 states, Odisha is having an index financial inclusion value of 0.2 and is at 15$^{th}$ rank. The study also highlighted some of the problems that are encountered when banks and post offices are used as means for wage payment to accelerate the speed of financial inclusion and remedial measures that can be taken to tackle these problems. Naik (2018) reveals that the performance of MGNREGA in terms of employment generation, financial performance and assets creation is found to be far better in Tamil Nadu as compared to Odisha.

Some scholars have attempted to explore the role of MGNREGS for improving the wellbeing of people. A study conducted by Parida (2015) suggests that MGNREGS has contributed enormously in creating job opportunities for the needs of people and socially backward households. The accessibility of MGNREGS prevented a huge number of distress seasonal out-migrations and brought financial autonomy for the landless poor and socially backward households through regular wage income. This helped them to overcome the hunger and debt traps and hence an improved living standard. Therefore, the Government should take proper measures to continue this programme in rural areas and allocate the resources based on demands calculation to avoid wastage of funds.

**Research Gaps**

There have been several studies that look at the implementation of the act in terms of employment created as well as issues of wages, processes of implementation and

feedback mechanism. However, only a few studies have focused on an assessment of the impact of the MGNREGA in terms of the realization of its development potential. With the overwhelming considerations of ideology and corruption at the forefront rarely have any of these studies attempted to look into the actual assets being created and their contribution towards long-term development and sustained employment generation in the villages. This study tries to bridge this lacuna by attempting to study the effectiveness of the assets created under the Act.

## IV. SOCIO-ECONOMIC PROFILE OF THE STUDY HOUSEHOLDS

This section presents the socio-economic profile of the households. The households were the final sampling unit. The total number of study households is 800. Out of these, 210 (26.95%) households belong to Schedule Castes (SCs), 298 (37.25%) households belong to Schedule Tribes (STs) and 286 (35.75%) households belong to Other Backward Castes (OBCs). 6 (0.75%) households are from General category (Table 2).

Table 2
**Distribution of Sample Households**

| *Caste Groups* | *Number of Households* | *Share to Total Study Households (in %)* |
|---|---|---|
| SC | 210 | 26.95 |
| ST | 298 | 37.25 |
| OBC | 286 | 35.75 |
| General | 6 | 0.75 |
| Total | 800 | 100 |

*Source:* Field Survey, 2018

The extent of poverty in the study area is very high. Out of 800 study households, 682 (85.25%) are Below Poverty Line (BPL) and only 54 (6.75%) households are Above Poverty Line (APL). However, in all 20 study villages, only 28 (03.5%) households possess Antyodaya Anna Yojana (AAY) cards and 24 households possess some other types of cards. Whereas 12 (1.5%) households don't have any cards.

Irrigation facility in the study area is very less. Altogether, only 51 (6.37%) households have 67.51 acres of irrigated lands. The extent of irrigated lands varies from 0.1 acres to 4.0 acres. Among social groups, only 8 (only 3.8%) SC households have 7.4 acres of irrigated lands and 31(10.40%) ST households have 44.65 acres of irrigated lands. Among OBC households, 12 (4.19%) have reported 15.1 acres of irrigated lands.

However, out of 800 study households, 561 have 902.74 acres of unirrigated lands. Out of 210 SC households, 90 have 117.23 acres of unirrigated lands. Among ST households, 241 households reported 403.22 acres of unirrigated lands. Whereas, 227 OBC households possess 375.29 acres of unirrigated lands.

## V. EMPIRICAL FINDINGS FROM FIELD

Income from agriculture, agricultural wages, non-agricultural wages and MGNREGS wages are the four major sources of income for the study households. Around three-fourths of the study households (596 out of 800 study households) have derived their income from agriculture. The aggregate income for all these 596 households is Rs.1, 00, 71,390, the average income per households being Rs. 16898. Whereas, 15 households have rented their land and have earned a sum of Rs. 1, 29,900. Agricultural wages (*Kharif, Rabi* and others) play a crucial role in income-earning of the study households. In total, 512 households have derived Rs. 3925653 from this source during 2016-17. Out of a total of 800 study households, 704 (88%) have generated Rs. 2,41,65,298 form non-agricultural wages during the same period, the average per household being Rs. 34326. Whereas, 581 (72.62%) households have earned a sum of Rs.45, 44,424 from the wage employed under MGNREGS during 2016-17, generating an average of Rs. 7822 per household.

Income from sales of forest produce and Common Property Resources (CPRs) is also crucial for the study households. In total, 109 households have earned Rs. 4,68,100 from *Tendu Patta*, 62 households have earned Rs. 1,48,800 from fruits collection and one household earned Rs.2,400 from beekeeping. Whereas, 199 households have derived a sum of Rs. 6,73,850 from the sale of other products collected from forest/CPRs. With an average income of Rs. 3386 per household.

It is revealed that 68 households have earned Rs. 5, 38,725 from sales of milk and other dairy products, 81 households have earned Rs. 5, 63,800 from sales of animals, 32 households have earned Rs. 1, 39,800 from sales of animals, 23 households have earned Rs. 13,670 from sales of eggs and 14 households have earned Rs. 93,900 from sales of other products from animal husbandry during 2016-17.

Trade/self-employment/business have contributed a sum of Rs. 9, 26,180 for 43 households during this year. The average income per household from this source of these households is Rs. 21539. Only 5 households have earned Rs. 62,200 from manufacturing (other than artisan, carpenter, plumber etc.) and 14 households have generated income of Rs.93, 900 from artisan works during this year. Whereas, the contribution from different sorts of traditional services is Rs. 2, 01,000 for 8 households.

Out of a total of 800 households, 223 have earned more than Rs. 80,000 and 221 households have earned Rs. 60,000 to Rs. 80,000 during 2016-17. Whereas, the number of households having an annual income between Rs. 40,000 to Rs. 60,000 is 214 and between Rs.20, 000 to Rs. 40,000 is 128. 13 households have earned between Rs. 10,000 to 20,000 during the same period. Only one household has an annual income of up to Rs.10, 000 during this period.

**Total Income from MGNREGS and from all the Remaining Sources**

MGNREGS has also contributed in many ways towards improving the livelihood of the people of the rural areas. Keeping this in mind, understanding the income of each household from the MGNREGS in the state was attempted. **Table 3** presents the average annual income of the study households and the contribution of MGNREGS to the annual income of these households.

Table 3
**Average Annual Income of the Study Households for the year 2016 -17 (in Rs.)**

| *Categories* | *Avg. Income from All Sources* | *Avg. Income derived from MGNREGS* | *Share of Avg. MGNREGS Income to Avg. Income from All Sources (in %)* |
|---|---|---|---|
| SC | 63437 | 8503 | 13.40 |
| ST | 65970 | 5068 | 7.68 |
| OBC | 70379 | 6571 | 9.34 |
| General | 76241 | 6907 | 9.06 |
| All | 66958 | 5972 | 8.92 |

*Source*: Field Survey, 2018

The average annual income of the study households is Rs. 66958 per household taking into account all the study households (both active and inactive/less active participants) during the year 2016-17. There is a gap among the social groups so far as the average annual income is concerned. SC households have the lowest average annual income (Rs. 63437), whereas General category households have the highest average annual income (Rs. 76241). During the same year, the average income (for all study households) derived from MGNREGS is Rs. 5681. The share of income derived from MGNREGS to the total income is highest for SC households (13.40 %) and lowest for SC households (7.68 %) (Table 3).

**Awareness of Household Members about MGNREGS**

How do people have to be aware of MGNREGS? What are the sources of their awareness? On what issues are they more aware? The study team tried to get this information by interviewing them as per the questionnaire. It was revealed that many people are aware of MGNREGS since they are involved with the implementation of this scheme. It was also observed that they have received information about MGNREGS through multiple channels (Table 4).

Table 4
**Source of Awareness about MGNREGS (provision for multiple responses)**

| *Sources of Awareness* | *Number of Households Reporting* |
|---|---|
| Radio | 28 |
| Television | 92 |
| Newspaper | 36 |
| Gram Sabha | 498 |
| GP Head/Ward Members | 616 |
| Panchayat Secretary/ Rojgar Sevak | 222 |
| Block Level Officials | 70 |
| Special Camp | 11 |
| Poster/ Wall Paintings and Public Announcement | 6 |
| Co-villagers | 379 |
| Co-workers | 284 |
| Others | 18 |

*Source*: Field Survey, 2018

It shows that respondents have received information about MGNREGS from multiple sources, mostly from PRIs, Gram Sabhas and various media platforms (both print and electronic media). It is observed from the table that the Elected Members of the GPs - Ward Members and Sarpanch have become a key source of providing information to people about MGNREGS. Further, the Gram Sabhas have also played a crucial role of creating awareness about the MGNREGS.

Table 5
**Awareness about Different Provisions under MGNREGA**

| *Items* | *Number of Households Responding* | | | | |
|---|---|---|---|---|---|
| | *SC* | *ST* | *OBC* | *General* | *Total* |
| Minimum of 100 days of employment | 191 | 280 | 247 | 6 | 724 |
| Minimum wages | 120 | 219 | 170 | 2 | 511 |
| Work to be given within 15 days | 45 | 116 | 76 | 1 | 238 |
| Unemployment allowance | 43 | 30 | 64 | 5 | 142 |
| Work to be given within 5 KMs radius, otherwise additional payment | 53 | 24 | 94 | 0 | 171 |
| One third of workers to be women | 4 | 5 | 14 | 0 | 23 |
| Four facilities at work site | 4 | 4 | 14 | 0 | 22 |
| Compensation for injury | 3 | 1 | 5 | 0 | 9 |

*Source:* Field Survey, 2018

If we see the awareness level of people on various aspects of the MGNREGS, it is revealed from Table 5 that many people are aware of 100 days wage employment provision as a key aspect of MGNREGS. Further, a sizable number of people are also aware of minimum wage provision prescribed under MGNREGS. These two important findings show the role of MGNREGS as an instrument for providing wage employment in rural areas. However, very few people are aware of work site facilities

(drinking water, shed and others) and compensatory facilities to be provided to wage labourers under this scheme. With regards to the participation of women in work, it is observed from the above that many people are not aware of this.

**Job Card and Possession of Job Card by the People**

Under the MGNREGS implementation, the role of job card has been quite significant. It is mentioned in the Act that every registered family should have a job card. It is on this basis, under the study we tried to understand the status of job card by asking a few questions to the respondents.

There are three basic features of job cards of the Households in the study area i.e. (i) Availing of job card, (ii) Period of availing job card and (iii) Possession of job card by the households. In this context, it is interesting to note here that all the 800 (100%) Sampled households have job card at the time of reporting period. It is further revealed that a majority (714 numbers) of households received the job card during years 2006-10, while 61 households had received it during years 2011-2015. Further, 24 number of households had received the job card during the 2016-18 years.

It is further reported that 689 respondents have reported that they own the job card, which makes up 86.12% of the total households. However, in some cases, the job cards of the people are being managed by others as it is found that they do not own them. Of the people, those who have not possessed job cards, a majority of people reported that their job cards are being kept by the PRIs, while some of them reported that it is with the contractors. With regards to paying money for the job cards, it is observed that 27 respondents have paid money ranging from Rs. 10 to Rs. 50 for getting their job card. This trend shows the prevalence of corruption in getting the job card.

**Application for Job by the People**

Application for jobs is an important stage of implementation of MGNREGS. It has provided the opportunity to the job card holders to formally apply for job, for getting involved in the process of implementation.

Table 6
**Application for the Job**

| *Person / place where the Households apply for the job* | *Number of Households Reporting* |
|---|---|
| GP Head | 176 |
| PS / Rojgar Sevak | 62 |
| Gram Sabha | 14 |
| GP Office | 61 |
| Block Office | 3 |
| Gets ( got) the job without application | 258 |
| First got the job then was asked to sign the application | 206 |
| Others (specify) | 20 |

*Source*: Field Survey, 2018

Table 6 presents the approach of the households seeking jobs through job applications. It is observed that 258 household members (respondents) reported that they have received wage employment without following a formal job application procedure. Further, 206 respondents reported that they have received wage employment in *post-facto* procedure, that is, they first got a job and were then asked by the authorities to sign the job application form. However, 176 persons reported that they had approached the GP head for getting jobs. While 62 households reported that they had approached the Gram Rozgar Sevak, 61 households reported that they had approached their respective GP office for getting wage employment.

**Employment and Wage**

Providing Wage Employment to the people is the ultimate goal of MGNREGS. Further, it is important to ensure that the wage payment happens in a transparent manner. Table 7 unravels the employment and wages generated under MGNREGS across social categories and overall too.

Table 7
**Average Number of Days of Employment and Average Wages Generated under MGNREGS**

| *Social Categories* | *2014-15* | | *2015-16* | | *2016-17* | | *2014-15 to 2016-17* | |
|---|---|---|---|---|---|---|---|---|
| | *Avg. no. of days of employment* | *Avg. wage derived (in Rs.)* | *Avg. no. of days of employment* | *Avg. wage derived (in Rs.)* | *Avg. no. of days of employment* | *Avg. wage derived (in Rs.)* | *Avg. no. of days of employment* | *Avg. wage derived (in Rs.)* |
| SC | 29.24 | 5004 | 33.26 | 5864 | 35.32 | 8503 | 32.61 | 6457 |
| ST | 24.96 | 4229 | 30.92 | 5341 | 28.77 | 5068 | 28.22 | 4879 |
| OBC | 24.92 | 4256 | 30.62 | 5327 | 37.59 | 6571 | 31.04 | 5384 |
| General | 19.50 | 3383 | 23.67 | 4118 | 36.00 | 6907 | 26.39 | 4803 |
| Overall | 26.03 | 4436 | 31.37 | 5464 | 33.70 | 5972 | 30.37 | 5291 |

*Source:* Field Survey, 2018

The average number of days of employment generated per household taking into account all the study households (both active and inactive/less active participants) under MGNREGS is 30.37 across three study years. Employment generation is highest for SC households (on an average 32.61 days), whereas this is lowest for General households (on an average 26.39 days). If we look at the year-wise average employment generation under the scheme, there is an increasing trend from 2014-15 to 2016-17. It is highest during 2016-17 (30.37 days) and lowest during 2014-15 (26.03 days) (Table 7).

It also revealed that there is a higher (around 44%) participation from male workers as compared to female workers during 2014-15 to 2016-17 in the study area. The employment generated under MGNREGS for male workers during all three years is 50,609 person-days, while female workers have been employed under this scheme

for only 22,267 person-days.

The average wages generated per household taking into account all the study households (both active and inactive/less active participants) under MGNREGS during 2014-15 to 2016-17 is Rs. 5291. This average wage is highest during the year 2016-17 (Rs. 5972) and lowest during the year 2014-15 (Rs. 5972). The average wages derived from MGNREGS across these three years vary among the households belong to different social categories. It is highest i.e. Rs. 6457 for SC households and lowest for General households i.e. Rs. 4803. (Table 7).

**Process of Wage Payment and other Related Issues**

With regard to wage employment, it was attempted to understand the circumstances that led to the denial of wage employment to people, despite their request, and under what scenario the implementing agencies failed to provide wage employment to the people, despite their request. Also, capturing the circumstances that led to the non-participation of people in MGNREGS work despite it being provided to them by the implementation agencies was attempted. It is observed that 41 households (5.13%) reported that they did not receive work in the time-bound period despite the demand given by them for this. Further, only 14 (1.75%) households reported that they did not participate in the work despite work offer to them by the implementation agencies.

With regards to the mode of wage payment to the workers, it is revealed that a sizable number (734) of people have received wage through Banks which is 91.75% of the total households. Only 5 numbers of households have reported about the receipt of wage payment through Post Office which is 0.63% of the total Households. However, 6% of the total household reported that they have not received Wage either through Bank or Post-office.

**Individual Assets Created and their Overall Implications**

Under the MGNREG Act, substantial attention is paid for creating durable community and individual assets through implementing various works. In the recent years, an attempt has been made to converge MGNREGS works with other works like (i) Land Development (ii) Housing under Pradhan Mantri Awas Yojana (PMAY), (iii) Individual Toilets and various other Works. Keeping this in mind, it was attempted to shed light on the nature of Individual Assets created and their overall impact on promoting the wellbeing of the beneficiaries.

It is revealed that only 130 (16.25%) households of 800 have revived assets which are individual in nature. It implies that a large chunk of households (83.75%) have not received any kind of assets under the implementation of MGNREGS. Further, with regard to the role of institution/agency that facilitated for accessing individual assets,

it was observed that Gram Panchayats have played a lead role for this purpose. Many people (48.06%) had approached to GP for getting assets. Many people have received assistance for constriction of houses under PMAY.

**Impact of Irrigation Facility Created (as Individual Assets) under MGNREGS**

The MGNREGS programme is used for the creation of durable assets, especially the creation of irrigation infrastructure. The nature of programmes attempted under the irrigation component of MGNREGS are improving the local tanks by removing silt, digging open wells and augmenting local tanks by creating embankments, etc.

In our study, only five respondents reported having paddy crop under irrigation in the pre-asset situation with an extent 3.55 acres and the total value of crop (per unit of production) was Rs.31, 450/-. Against this, the post-asset information shows that the same five respondents have raised paddy crop. But the extent has increased to 4.7 acres with the total value of crop standing at Rs.49, 500/-. Barring this incremental change, there are no benefits created under irrigation component of MGNREGS in our field survey.

**Impact of Land Development (as Individual Assets) Created under MGNREGS**

Land development activities such as bonding the agricultural land and levelling of the crop lands have been taken up to enhance land productivity in the marginal lands of SC/ST and OBCs. In our survey, households with an extent of 3.15 acres have mentioned that work has been carried out in their land resulting in a total income of Rs. 80,600/- (an increase of nearly Rs. 30,000 over the pre asset information).

**Impact of Individual Assets related to Dairy and Poultry Created under MGNREGS**

Under MGNREGS programme, some of the beneficiaries have been given cow sheds, poultry sheds that include sheep and goats. As of these facilities, the beneficiaries are expected to benefit by selling milk, eggs and meat. However, in our sample, none of the households have got these assets.

**Impact of other Individual Assets Created under MGNREGS**

An analysis of the income earned from other individual assets such as fisheries, horticultural and sericulture indicate that only one respondent under fisheries had earned Rs.8000/- per annum. With regards to horticulture, three respondents of this scheme could not earn any income as yet. However, there are beneficiaries under the sericulture programme in our sample.

**Overall Impact of MGNREGS Socio-Economic Condition of People**

MGNREGS is expected to have a positive impact on certain conditions such as house amenities (like access to in-house toilet and safe drinking water), repayment of debts, etc. The field data shows that social category wise.

The analysis of the data on impact shows that SC households having electricity facility has increased (93 households prior to the programme to 138 households after the programme). The positive effect is more in the case of ST households (79 households having electricity before the programme to 286 households at present). Some positive effect was also found in the case of OBCs regarding this facility.

Among SC households, a little over than fifty percent of them (66 respondents) have in-house toilets and only less than one fourth of them (24 respondents) have access to safe drinking water. The impact of MGNREGS on repayment of old debts of the sample households is very less. It is revealed from the primary date that only 66 households (8.25 %) were able to repay their old debt by utilising the income derived from MGNREGS. However, 68 households (8.50 %) stated that because of the MGNREGS, the chances of incurring debt for their consumption purpose have declined.

With regards to MGNREGS impact on migration among various social groups, a total of 42 households among SCs, 48 households among STs, 76 households among OBCs have reported that they still migrate. The major reasons for the continued migration among social groups are - 100 days of employment is insufficient (96 Households); lower wages under MGNREGS as compared to market wages (64 households), delay in wage payment (47 households) and job security for a long period when households migrate (41 households)

**Issues of Participation and Accountability**

Under the implementation of MGNRES, enough space has been created for people to participate in the different stages of its implementation. Powers have been devolved to GPs and Gram Sabhas for ensuring the participation of people in the process of implementation and conducting a social audit for maintaining transparency. Considering this scenario, it was attempted to understand the participation of the respondents in the process of the social audit of MGNREGS. Table 8 presents the status of participation of respondents in the social audit as per their Social Category.

Table 8
**Participation in Gram Sabha/Social Audit and in Preparation of Labour Budget**

| *Item* | *SC* | *ST* | *OBC* | *General* | *Total* |
|---|---|---|---|---|---|
| A. Gram Sabha/Social Audit | | | | | |
| Participation in GS meeting | 175 | 256 | 244 | 5 | 680 |
| Female member participation in GS meeting | 102 | 166 | 129 | 3 | 400 |
| Whether asked any question in GS meeting | 150 | 236 | 213 | 5 | 604 |
| Participation in social audit meeting | 35 | 71 | 69 | 3 | 178 |
| Family members joining SHG in the context of MGNREGS | 30 | 23 | 44 | 0 | 97 |
| Labour budget | | | | | |
| Participation in preparation of labour budget | 0 | 0 | 0 | 0 | 0 |

*Source:* Field Study, 2018

It shows that though many people have participated in Gram Sabhas and raised various questions related to implementation of MGNREGS, their participation in social audit meetings was quite low during the same period. Family members of some households (97 HHs) have also joined Self-Help Groups (SHGs) for work under MGNREGS in the study area. However, a lukewarm participation in social audit processes and labour budgeting processes has prevailed in the study area.

## VI. SUMMARY AND CONCLUSION

### Summary of Findings

This section summarises the progress of MGNREGS implementation in the state of Odisha and its overall implications on strengthening livelihoods of the people, creating durable assets and above all, addressing migration from the rural areas of the state. The average wage- earning from MGNREGS is very low. The average income per household derived by the study households (581) who participated in the programme during 2016-17 is only Rs.7822, which is only 11.52 % of average income per households from all sources of these households. Again, the participation of women is much less (around 44%) as compared to male workers.

Creation of individual livelihood assets in the rural areas is one of the major objectives of MGNREGS. But it is revealed from the study that only 130 (16.25%) households have received individual assets under MGNREGS during the period 2014-15 to 2016-17. The total number of individual assets under MGNREGS during these three years is 98, out of which 80 are for house construction (IAY/PMAY).

The lack of knowledge and low awareness about some crucial provisions of the programme could make MGNREGS less effective. The awareness among the study households about different provisions such as one-third participation from women, worksite facilities and compensation for any kind of injury during work is very less. Further, though the participation of people in Gram Sabha is quite satisfactory, their participation in the social audit is only 22.25% (even more less for women). The participation of women in SHGs in the context of MGNREGS is very negligible (only 12.12%).

It is also revealed that, insufficiency in the quantum of jobs (96 households), lower wage rate (64 households) and delay in wage payment (47 households) are major reasons for migration in search of livelihoods in the study area.

### Conclusion

This study concludes that implementation of MGNREGS in many ways affected the livelihood of people. It has helped to provide wage employment and creation of durable assets in the rural areas of Odisha. This programme has become a main source

of livelihood for millions of rural and tribal people. The role of PRIs as implementing institutions was observed in many cases. Though MGNREGS has created ample opportunities for the poor people in the form of providing them wage employment, but failure of institutional mechanism in the process of implementation has affected the overall process of implementation.

However, it is concluded that after one decade of implementation of MGNREGS, still many initiatives have to be taken up for effective implementation of this programme. The issue of institutional capacity should also be given importance in order to make it pro-people. Proper implementation of MGNREGS on productive rural assets would certainly help rural people for a better livelihood.

**Policy Recommendations**

The implementation of MGNREGS in the study districts has in many ways affected the livelihoods of people. There is no doubt that this programme helped many poor people, in particular SCs and STs, towards strengthening of livelihoods. The findings of this study from the 17 districts provided various dimensions related to the implementation of MGNREGS and its gradual progress in transforming rural areas. Considering this, it is therefore imperative to draw some lessons on the basis of findings from the field.

(a) Effective Implementation of MGNREGS: The issue of effective implementation in many ways affected the progress of this programme. Though this programme has emerged as the main work of the PRIs and line departments in the state, in many cases, gaps in implementation has created many problems for the people. Therefore, it is required to focus on effective implementation through (i) creating massive awareness programmes, (ii) improving the capacity of the PRIs and functionaries, and (iii) forging effective coordination among the various line departments.

(b) Timely Wage Payment: There should be no delay in providing wage employment to the people under this scheme. Further under MGNREGS, tribal land development should get priority. Delay in paying wages to the people should be avoided, which was suggested by many respondents.

(c) Organizing Rural Poor under MGNREGS: More attention should be given for organizing the rural poor through awareness and special works programmes/ campaign. The conventional limitation of 100 days wage employment should be reviewed, considering (i) nature of works, (ii) needs of the people and (iii) geographical location. More work should be provided where there is a genuine demand from the people.

(d) Financial Allocation and Timely Release of Funds: A key problem associated with this programme is delay in releasing funds from the centre to the state, and

from the state to the lower units of the implementing agencies. This scenario in many ways has affected the overall process of implementation and timely wage payment to workers. So, attention should be given for the timely release of funds which can address the excess delay of wage payment in many ways.

(e) *Strengthening of PRIs:* There is a need for strengthening the PRIs for effective implementation of MGNREGS. In this connection, the capacity building programme for PRIs should give more attention so that they can involve them effectively in the process of implementation. Capacity building programme on social audits should also receive importance.

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**Perspectives**

# Social Development: A Liberal Sociological Formulation

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*Taking a critical look at the existing conceptions of social development, the paper focuses on the sociological conceptualization and finds it inadequate on account of its partial premise and domineering Marxist bias. Alternatively, it advances a wider, deeper and liberal sociological formulation as enhancement of harmonious social bonds and liberal social values. The core proposition that it offers is: If economic development is about the expansion of economic capital, human development is about the enhancement of human capital, then social development is about the expansion of social capital comprising social harmony, justice, liberalism and larger good.*

**Keywords:** *Social development, Social capital, Social justice, Liberalism, Social harmony*

The concept of social development has had a chequered trajectory. It first started in sociology way back in the 1920's but soon got embroiled in a debate over whether sociologists should engage in the task of steering the course of social change. A majority of the sociologists then were opposed to the idea of sociology intervening in social affairs, thanks to the then prevailing doctrine of value-free sociology. As a result, the term, given its value load, fell in disuse in sociology for quite some time until it gained significance in development studies. However, with the loosening grip of the doctrine of value-free sociology, it has recently staged a comeback in sociology. The concept of social development has thus grown under two academic streams: development studies and sociology of development.

## I. DEVELOPMENT STUDIES

In development studies, it has grown under two major schools of thought: economic growth and human development.

Viewing development as economic growth, the former defines social development as an endeavour to promote socio-economic lot of the traditionally deprived and marginalized sections of society. This precisely is the sense in which it is used in our planning documents. At the heart of it lies the idea of delivery of developmental justice to the socio-economically deprived groups. In the Indian case, for example, such groups have been identified as the Scheduled Castes, Scheduled Tribes and Other Backward Classes.

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Disagreeing with the economic development school, the protagonists of human development contend that development is not just about economic growth: it is indeed about human well-being. Expressing his unease over the economic growth construct, Amartya Sen, for example, observes: "It is simply not adequate to take as our basic objective—just maximization of income or wealth— Development has to be more concerned with enhancing the lives we lead and the freedom we enjoy" (1999:14). In much the same vein, Mahbub ul Haq, another humanist economist, argues with evidence that economic growth by itself does not automatically lead to human well-being. Accordingly, the humanists seek to redefine development as human development with its focus on the enlargement of people's' life chances and choices. By all accounts, the rise of human development perspective signifies a paradigmatic advance as it shifts the focus of development from economy to people. In accord with its vision, it initially advanced two inter-related conceptions of social development: a) as the expansion of social services, particularly healthcare, nutrition and education for all; and, b) as the creation of a social framework conducive to individual empowerment.

More recently, it has come up with a third construct, i.e., Social Progress Index (SPI) which is largely a combination of the two. )

Figure 1
**The Social Progress Index**


https://socialprogress.in/social-progress-index/

Based on the writings of Amartya Sen, Douglas North and Joseph Stiglitz, and prepared under the guidance of Michael Porter, the index is released by the Institute for Competitiveness and the Social Progress Imperative (SPI). It comprises three dimensions: Basic Human Needs, Foundations of Well-being, and Opportunity. The dimensions and their components are reproduced in figure 2.

Figure 2
**SPI - Framework**


https://socialprogress.in/social-progress-index/

**Sociology of Development**

Moving from development studies to the sociology of development, social development acquires a systemic connotation. This is evident from the sociological formulations which largely define it as a structural transformation in an egalitarian direction. For example, Kim defines it in terms of 'structural flexibility' by which he means "the degree to which the structure of society allows the deprived and alienated majority not only to demand their just (or equal, ideally if possible) share of resources but also to actually obtain such goals" (1970:468). Similarly, Mukherji views it as a transformation of social structure from asymmetrical to symmetrical relationships as gauged by 'progressive diminution in DEO' (1989:37). DEO stands for discrimination, exploitation and oppression. In simple words, it means a progressive reduction in discrimination, exploitation and oppression. Mukherji's formulation is more sociological because he casts its net wide to encompass within it social discrimination and oppression, besides economic deprivation and exploitation.

A discerning look at the above sociological definitions reveals their underlying Marxist orientation. This is also evident from the prevailing sociological discourse at the recent seminars and conferences on social development. Important though it is, the Marxist sociological conception offers a lopsided view of social development. The reason: it is premised upon an inadequate image and a partisan interpretation of society. In order to have a viable view of social development, it may be rewarding to take a wider and deeper look at it through a liberal sociological lens. This precisely is what the paper seeks to accomplish.

To this end, the rest of the paper is organised into three sections. Section I undertakes a critical examination of the conceptions of social development derived from development studies and finds them inadequate on account of their constrained visions. Section II delivers a critique of the existing sociological formulations for their Marxist bias and eventual neglect of some of its core imperatives. Section III advances a liberal sociological formulation of social development as an enhancement of harmonious social bonds and liberal values of society.[1]

**Critique of Economic and Human Conceptions**

A closer look at the concept of social development advanced by the economic growth school reveals that it suffers from some severe limitations. Firstly, it predicates social development on economic development in a manner such that social development looks like an offshoot of economic growth. This premise is effectively refuted by the exponents of human development school who contest it on the strength of evidence. For, according to them, a nation does not have to be wealthy to provide for human freedoms that constitute the essence of social development^2.

Secondly, it envisages social development as an extension of developmental justice to the socially deprived and marginalized. Valuable though it is, however, it glosses over some of the other equally important imperatives of social development.

Thirdly, it equates economic parity with social parity. The debates on equality make it abundantly clear that equality has many forms and facets such as economic, political and social, among others. Economic equality refers to the equality of income, wealth and assets; political to equality of power; while social equality to equality of status. In simple words, social equality means equality of social position and dignity regardless of differences of race, caste, religion and gender. Social equality is thus categorically distinct from economic and political. Nothing illustrates it better than Ambedkar's perceptive writings on caste as a source of social discrimination and humiliation suffered by the lower caste people. All said and done, this version remains mired basically in economic terms. Unsurprisingly, social development has for long been viewed as a poor cousin of economic development.

Moving to the conceptions of social development envisioned by the human development school, these are laudable advances in that they signify a shift from economic towards the social sphere. Their limitation, however, is that they stop short of reaching the social plane as they stay put at the human plane. As such, they represent at best social versions of human development rather than a vision of social development per se. Take, for instance, the first conception which defines social development as a provision of social services such as healthcare and education. What else is it if not a social version of human development which means health and education status of a people?

Human development school thus renders social development as a subsidiary agency to realise its goal of human development. In effect, it views social development simply as a subset of human development. Another drawback of this conception is that it provides a one-dimensional view of social development as a provision of social services. Social services are, no doubt, a vital input for social development, but not a synonym for it. Social development is a wider category that encompasses a lot more, as we will see later. These limitations notwithstanding, many a researcher still mistake this version of human development for social development. In so doing they commit the error of equating the part with the whole.

The same holds good for the other conception which projects social development in terms of a framework for human empowerment^3. Like the former, it too goes only halfway towards social development, as it gets stuck up at the level of individual empowerment. More importantly, it leaves the idea of the above referred framework vaguely defined. According to Sen, it represents a framework around which all knowledge of the factors, instruments, conditions, agencies and the process

of development can be integrated (Singharoy 2010). However, what exactly is that framework around which all the above can be integrated is something that remains unspecified. No wonder, this conception of social development has remained oblivious in planning circles. Of the two conceptions of social development advanced by the human development school, the one based on social services has found favour with development planners.

The third conception, i.e., SPI represents a significant advance over the other two as it provides a tool to measure the progress of a society. There are, however, two problems with it. Firstly, it measures the progress of the society in terms of the performance of a society on the three identified dimensions, i.e., basic needs, well-being and opportunity. Notably, all three are the dimensions of human development more than that of social development. Obviously, it provides a partial measure of social progress. For, there are a number of other bases on which social progress needs to be gauged, including the state of social bonds, virtues and visions. Secondly, there is a crucial difference between social progress as measured by the SPI and the idea of social development. The two are not on the same page. Social development is actually about qualitative social transformation towards social harmony and liberal values, among other things, as elaborated later.

## II. CRITIQUE OF SOCIOLOGICAL CONCEPTIONS

Sociological conceptions represent a class apart as these relocate social development from the human plane to social plane. They cast it in terms of structural transformation in an egalitarian direction with a focus on the upliftment of the marginalised groups. A closer look at these conceptions reveals a clear Marxian bias, which is understandable in view of the fact that the Marxian oriented sociologists were the first to engage with the study of social development, as their liberal counterparts refrained from the same for long. Whatever it is, the Marxian strain is both a strength and a weakness of the sociological conceptions. It is a strength insofar as these conceptions converge on social justice as a fundamental imperative of social development. On the other hand, it is a weakness because it limits their vision to lose sight of the other imperatives.

A deeper probe reveals some notable limitations of the existing sociological conceptualization. One, it is premised upon a partial image of society as a hierarchical or a stratified system. This is a questionable premise as it presents an inadequate view of society. For, in actual fact, society consists as much of horizontal groups as of hierarchical^4. The horizontal groups are generally culture-bound and diverse. They, therefore, pose a different kind of challenge, i.e., a challenge of managing socio-cultural diversities which the given version is inadequate to handle.

Another serious handicap of it is its over-reliance on social justice as a sole measure of social development. Undoubtedly, socio-economic justice is a bedrock of social

development. But, the crucial question is: whether that is all to it? Given that societies are faced today not just with the challenges of long-standing social injustices but also of socio-cultural orthodoxies, social intolerance, socio-cultural conflicts and other social maladies, one wonders whether social development can be defined in terms of social justice alone. Ostensibly, there is more to social development than social justice and hence there is a need to broad-base the sociological formulation.

## III. A LIBERAL SOCIOLOGICAL FORMULATION

Moving towards a liberal sociological view, which is what the present paper seeks to advance, social development may be best defined as the enhancement of social capital comprising harmonious bonds, egalitarian justice, liberal values and larger social good. The goal of social development is not just to remove long-standing legacies of social injustice but also to promote social harmony, liberal values and the larger social causes.

### Social Justice

Social justice, by all accounts, is the primary anchor of social development. It is open to two interpretations: generic and specific. In its generic sense, it means fair and just relations between the individual and society in respect of the distribution of wealth, opportunities and privileges. In its specific sociological sense, it refers to the elimination of disparities, disabilities and discriminations.

Thus, it implies compensatory justice to the traditionally deprived, gender justice to women and the LGBTQ community, and constitutional justice to minorities. While all the forms of social justice are vital to social development, gender justice is especially so.

There are three reasons for it. One, women constitute roughly half of the human population. Two, they form the largest group among the socially deprived. Three, they remain doubly discriminated against among the deprived groups. In view of this, it is hardly surprising that gender justice has emerged as an intrinsic concern of social development, besides justice to the other deprived groups. Overall, social justice, in all its senses and forms, is so intrinsic to social development that it is unimaginable to think of the latter without it.

### Social Harmony

As important as social justice, social harmony is another imperative of social development. Since society consists of social bonds, harmonious bonds are what matter to social development. In fact, they matter at all levels of social existence: we need harmony between nature and humans, between man and woman, between individual and group, between group and group, and between a group and larger society. Lack

of it at any level is bound to affect social development in an adverse manner. Inter-group amity is what is of utmost importance for social development. A disconcerting feature of our times is the steady rise of inter-group conflicts and hostilities. This is evident from the increasing incidence of caste riots, communal conflicts, ethnic rifts and other manifestations of structural violence, including class conflicts. Needless to say, that a society fractured by such conflicts cannot be regarded as socially developed even as it may be economically or politically developed. Hence, the significance of social harmony as an imperative of social development^5.

It may be argued that a root cause of social conflicts is social injustice. And, therefore, social justice can take care of them. This is not entirely true. For, not all social conflicts are caused by socioeconomic disparities. Many of them also spring up from socio-cultural diversities. Those caused by socioeconomic disparities, as in the case of hierarchical groups, may be resolved by provisioning social justice. But, those caused by the conflict of values, as in the case of horizontal cultural groups, cannot be resolved by means of social justice. They can be tackled better by bridging the many divides that we have and forging harmonious bonds among the diverse groups.

Notably, societies today are confronted more with socio-cultural conflicts than with class conflicts. This is understandable in view of the fact that they have become more socio-culturally diverse today than ever before. As a result, management of socio-cultural diversities has emerged as a formidable challenge in many parts of the world. In view of this, social harmony gains all the greater traction as a measure of social development. Several methods and models have been devised to cope with the challenge of socio-cultural diversities: multiculturalism, cultural pluralism, melting pot, composite culture and majority uniformitarianism.

Broadly, these may be subsumed under two categories: hegemonic and harmonic. Hegemonic methods seek to forge unity from the above by means of invoking some kinds of commonalities among the diverse groups or fitting them into a uniformitarian frame. Harmonic, on the other hand, strive to promote harmony by means of building bridges of intercultural understanding and politico-economic integration allowing for the preservation of their cultural differences.

Experience the world over shows that harmonic models work better than hegemonic ones. Take, for example, the Canadian model of multiculturalism or the American model of cultural pluralism (except the Trump era): these have definitely worked better than the hegemonic models followed in India, Malaysia and several other parts of the world. One reason why the hegemonic models do not work well is that they are based on the premise of tolerance of cultural diversities. Tolerance is not a positive idea, as it implies a sullen acceptance of the differences^6. Unlike this, harmonic models are based on the idea of unreserved acceptance of, nay respect for, cultural differences. And that is the secret of their success.

**Social Liberalism**

Social liberalism is another key component. Derived from the Latin word liber, which means free, liberalism takes different connotations in different disciplines. In political philosophy, it stands for freedom of state from religion and provision of civil rights for citizens. In economics, it signifies freedom of market from state control, including liberalisation of rules of import and export. In sociology, it means freedom of the individual from social orthodoxy, including religious bigotry and community autarky. Broadly, it encompasses three aspects: provision of social freedoms to individuals, acceptance of rights of individuals over the rights of the collectivities, and acceptance of differences, diversities and dissent.

Provision of social freedoms is the first facet of social liberalism. Social freedoms include freedom of expression, of worship, of movement and of mate choice, among others. These and similar other freedoms are granted under our Constitution to liberate individuals from ages-old regressive social practices. What these freedoms call for is the openness of society to change. A question that has come up in this regard is whether these freedoms are absolute. This question gains a sharper edge with regard to the freedom of expression, in particular. There has emerged a divided opinion on it: some hold a brief for absolute freedom while others argue for 'reasonable restrictions' on it. In my view, the idea of absolute freedom is problematic. Every freedom carries with it a corresponding responsibility to respect others' right to the same freedom. As far as other 'reasonable restrictions' are concerned these should be minimal and in accord with the spirit of the Constitution. Overall, the equation is plain and simple: the greater the measure of social freedoms that a society grants to its individuals the higher is its level of social development. In short, Constitutional morality should prevail over social traditions.

The idea of the rights of individuals is a new one. Traditional societies are known to privilege the rights of the collectivities such as caste, clan and religious community over those of the individuals. It is in modern times that the doctrine of human rights has come to the fore. However, the catch in the doctrine is that it provides for the rights of collectivities too. While the latter is a welcome proposition insofar as it signifies the celebration of socio-cultural diversities, the trouble with it is that it is mistaken by the collectivities for their right to override the rights of individuals. A sterling example of it is the brutal killings of lovebirds (youths in love) who choose to defy the customary practice of sagotra vivah (marriage within own clan), under the direction of some of the Khaps (clan organization) in Haryana. And this is not a one-off instance of community swallowing the rights of individuals; it's a common occurrence. Such situations pose the problem of conflict between the rights of an individual and those of the collectivities. Social liberalism, however, stands for accommodating the rights of individuals across the board even when these are at odds with the rights of collectivities.

Social acceptance of differences, diversities and dissent is another important facet of social liberalism. Differences of orientations are a normal feature of any social formation. When these are viewed as something abnormal and treated with contempt, say, as in the case of sexual orientations of the LGBTQ community, it signals social illiberalism. In the same way, differences of beliefs and values, called cultural diversities, constitute another defining feature of present-day societies. Lack of acceptance of such diversities, for whatever reason, including religious bigotry or cultural chauvinism, is a sign of a retrograde society. It is a matter of concern that our society is currently witnessing some blatant instances of such intolerance, which is evident from the recent events of mob lynching on this count. Similarly, the difference of views and opinions, or for that matter dissent, is a normal attribute of modern democratic societies. Intolerance of dissent is, by all means, an indicator of social illiberalism. Such intolerance manifests itself in many forms such as trolls, threats, bans, censors, sedation charges and other stifling controls over intellectual freedom, including freedom of expression. We have ample evidence of it all around, India included. It certainly is a disconcerting development as muzzling dissent amounts to closing the door on alternative visions.

**Social Good**

Finally, we have the larger social good as the fourth coordinate of social development. Larger social good encompasses two things: advancement of social well-being and pursuit of noble social causes. Social well-being covers such aspects as social welfare, social security and social safeguards against maladies like drug addiction, corruption, violence, etc. On the other hand, social causes which form important parts of larger social good include environmental protection, expansion of education and promotion of civic sense, etc.

The above formulation of social development is clearly a wider and a liberal sociological formulation. It is a wider formulation as it casts its net wide beyond the given category of social justice to encompass social harmony, social liberalism and larger social good as three of its other imperatives. It is a liberal formulation because it brings to fore the importance of horizontal cultural groups as a crucial feature of society and foregrounds the imperative significance of liberal values for social development. It is essential to point out that the term liberalism is used here not in the economic sense of its equivalence with capitalism. Instead, it is used in the sociological sense to signify the liberation of the groups and individuals marginalised by capitalism, statism and patriarchy.

An observation about the significance of this formulation is in order. For long it has been held that the category of social development is relevant only to the developing

nations, as they need to pull out of their unjust traditions. Developed nations have left such traditions behind and therefore it holds no relevance for them. That seems no longer to be true, since many developed nations, particularly those where far-right political dispensations have gained power or influence, have begun to manifest signs of social regression. This is evident from such regressive trends as the rise of racial antagonism, gender prejudice, communal intolerance, erosion of liberal values and lackadaisical attitude towards environmental concerns, among other things. By all standards, all of these go against the grain of social development as defined here. Which signifies that social development is what they need to care about. That shows the universal relevance of the idea of social development as envisaged here.

In closing, it may be pertinent to address a basic issue that has come up in the contemporary discourse on social development. It is often asked: what is the basic unit of social development? Put simply, economic development has the economy as its unit of analysis, human development has human individual, what does social development have as its unit of analysis? A broad answer could be society. But that is too broad and vague since society is inclusive of the economy, individuals and much more. A precise answer, in my view, is social capital.

In brief, if economic development is about the expansion of economic capital, human development is about the enhancement of human capital, then social development is about the expansion of social capital comprising social harmony, justice, liberalism and the larger good.

**Notes**

1. This formulation is an advanced version of my view of social development as 'normative and integrative upgrading of social order' which I first propounded in my paper titled "Criteria of Social Development" published in Social Action way back in 1980.
2. This is clear from the following observation in the Human Development Report (1999): "A society does not have to be rich to be able to afford democracy. A family does not have to be wealthy to respect the rights of each member. A nation does not have to be affluent to treat women and men equally…."
3. It is true that individuals constitute the fulcrum of society. However, it is also equally true that society comprises a much larger entity than just a sum total of individuals. It consists as much of relationships, institutions, cultures and communities. In plain terms, the social sphere is arguably distinct from the individual sphere. Accordingly, social development has to be located in the social sphere rather than in the individual sphere.
4. The following observation of D'Souza is revealing in this regard: "Social relationships, in general, have two major dimensions. One of them is the hierarchical dimension of power. The other is the dimension of affiliation or the affective tie of liking and dislike or the love-hate dimension. In the hierarchical groups the dimension of affiliation is underplayed; on the other hand, there are groupings in which this dimension is predominant. By and large, the groupings

based on cultural bonds, such as ethnic, religious and racial groupings which are characterised by a strong sense of solidarity among members as well as indifference or antagonism between groups can be included in the category of affiliational groupings" (1981:21).

5. Social harmony is different from social solidarity. Social solidarity implies intra-group unity which often entails a measure of out-group hostility. Social harmony, on the other hand, is about relations of accord between two or more groups which may be otherwise diverse in language, culture or religion.
6. Several other scholars have also expressed their unease with the idea of tolerance. According to Goethe, a German writer, "To tolerate is to insult". In much the same vein, Rabinowitch, an American historian, views it as a "means for the majority to regulate the minority". For the same reason, he rejects "tolerance as a model for relations between groups". Instead, he prefers 'reciprocity' which provides for a two-way exchange of cultures.

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# Transformation of Punjab State from Water Surplus to Water Scarcity: A Book Review

**Emerging Water Insecurity in India: Lessons from an Agriculturally Advanced State by Ranjit Singh Ghuman and Rajeev Sharma, Cambridge Scholars Publishing, U.K. 2018 pp XXVI + 298, Hardcover.**

The book under review examines the emerging water insecurity situation in the country. It is achieved by investigating the present practices and ways of use of water in the agriculturally advanced state of Punjab in India. The water security in this book is viewed in the form of sustainable use of water and maintenance of its quality. Based on both secondary and primary data, a serious attempt has been made to analyse the emergence of water scarcity in the state of Punjab. The Punjab model of capitalist agricultural development has promoted use of natural resources for private profiteering sans social concern. In the process, the state became a classic case of overexploitation of water resources. This process has been facilitated by application of technology for ground water extraction and supported by policy of availability of free power for this purpose. A nexus has emerged between farmers and the state government to perpetuate the phenomenon of growing water insecurity in the region. The strong nexus has already transformed the state from being water surplus to being one of the highly water stressed states in the country.

Chapter three of the book narrates the story of transformation of the state from having abundant water to being a water stressed state. This story goes back to January 29, 1955 when the Union Irrigation Minister Mr. Gulzar Lal Nanda chaired a meeting of Irrigation Ministers of Punjab, Rajasthan, PEPSU and Jammu and Kashmir for allocation of surplus water of Ravi and Beas river. In this meeting, 15.86 MAF water of these rivers was allocated among the states of Rajasthan (8 MAF), Punjab (5.9 MAF), PEPSU (1.3 MAF) and J&K (0.65 MAF). This implies that almost half of the surplus water flowing in these rivers was allocated to Rajasthan. This reduced the capacity of the Punjab state to meet the growing needs of the state in the future. The issue of surface water got further aggravated with carving of the state of Haryana and Himachal Pradesh out of the state of East Punjab during reorganisation of the state in 1966. The control of irrigation head works was taken away from Punjab and placed with the central body named Bakhra Beas Management Board. Few years later, in 1981, an agreement was reached between the contending states keeping the limited surface water resources i.e. 2.8 MAF instead of 4.22 MAF, implying that 19.49 percent of the total surplus water of Ravi and Beas rivers. Thus, by the agreement, a major share of water was given to the non-riparian states. This led to tensions between Punjab and Haryana states and matter is now pending before the Supreme Court of India for the

final adjudication. When surface water distribution among the neighbouring states was under a dispute, there were changes taking place in the context of utilisation of ground water. In 1970-71, more than 56 percent of the net sown area was irrigated by canals through surface water and 41 percent by tube-wells. This began to change. The irrigation by canals as percentage of net sown area began to decline and it reached 28.53 in 2014-15. The irrigation intensity which was 71 in 1970-71 increased to 99 in 2014-15. This happened because of two factors:

1. limited availability of surface water through canals and
2. unrestricted use of ground water resources with free electricity to tube-wells since 1997 (pp. 79-80). The authors have provided district wise account of changing pattern of water use for agriculture which accounts for the largest number of users of water in the state.

In agriculture, there was a major shift in cropping pattern in favour of water intensive crops such as paddy. The share of paddy in Kharif crops increased from 9.62 percent in 1970-71 to 71.79 percent in 2015-16. This crop required four to five times more irrigation than wheat crop and displaced less water using crops such as oil seeds and pulses, raising the demand for water by manifolds. The book explains the emerging water insecurity situation in Punjab caused by changes in the cropping pattern dominated by paddy-wheat rotation. It elucidates that as a result of inadequate availability of surface water from the perennial rivers, farmers in the state are primarily left dependent on the ground water resources. The net sown area under canal irrigation declined from 45.47 percent in 1970-71 to 28.53 percent in 2014-15 and correspondingly the area under tube-well irrigation increased from 56.26 percent in 1970-71 to 71.47 percent in 2014-15. The availability of free electricity for tube-wells has been accompanied with liberal policy of new tube-well connections by the State Electricity Board in the past and currently by the Power Distribution Corporation Limited (PSPCL) as well as easy availability of loans from the banks. The number of tube-wells has increased from 6.10 lakh in 1980-81 to 8.95 lakh in 1996-97 to 14.19 lakh in 2015-16. As the level of rainfall in the state ranged between 672 mm to 542 mm during 1970 to 2015, the major part of the state's paddy cultivation is largely done through pumping out ground water for irrigation resulting in declining water table in the state. The authors mention that ground water experienced a minimum decline between 1996 to 2016 by 8.78 meters in Amritsar, 16.75 meters in Sangrur, 15.53 meters in Moga, 8.40 meters in Kapurthala and 7.29 meters in Mohali district. The nexus of free electricity easy tube-well connections and favourable MSP of paddy has encouraged less efficient water productivity in the state. Using data from the Commission for Agriculture Costs and Prices (CACP), authors have worked out the water efficiency gap in paddy cultivation in the state. This has been done using West

Bengal as a benchmark state with zero efficiency gap in productivity of water for the year 2013-14. The efficiency gap is highest for Punjab (51.2 percent), U.P. (42.9 percent) and Haryana (38.4 percent). It can be said that the policy framework of Punjab has contributed towards transforming the state from water surplus in 1950s and 1960s towards water deficient and finally towards water stressed state in the country. The state, by producing paddy mainly for central pool, has been exporting water to other states through rice. The export of water in this form has been 13449.2 billion litters in 1980-81, 25724.3 billion litters in 1990-91, 37038.8 billion litters in 2000-01 and 43,261.7 billion litters in 2013-14. Since the groundwater table is declining at an alarming rate, the farmers have been shifting from mono-block motors towards submersible motors. The submersible motors accounted for 56.68 percent in 2009 which increased to 72.42 percent in 2017. This not only involved huge investment by the farmers but it also increased the electricity consumption for pumping out per unit of water. The authors have supported findings of secondary data by using information collected about sources of irrigation, depth of the bore wells, days of tube-well operation during kharif and rabi crops, method of paddy sowing (pudding of fields) from 300 farmers having different size of land holdings across three agro climatic zones of the state covering 30 villages (chapter five). The field observations confirm that there is less efficient use of water in paddy cultivation. The authors mention that 88.67 percent farmers did not adopt any technique for rainwater harvesting.

The authors have done pioneering work in the area of utilisation of water by the industrial sector. Primary data was collected using sample of 50 small scale industrial units and 100 medium and large scale units. The evidence collected (chapter six) brings out that the use of water by industries differs on the basis of nature of the products and the size of industrial units studied. It is interesting to note that all the industrial units studied used only ground water resources. This adds to the already existing pressure on the water table and use of electricity in the state. The way untreated water is disposed, it generally adversely affects the quality of fresh water resources in the state. The analysis of domestic water use is based on primary data collected from 300 sampled rural households from 30 villages and 200 households from Amritsar and Sangrur cities from three agro climatic zones. In the rural areas, in addition to the domestic needs of bathing, cleaning, washing and drinking, the households used water for animals. If water for animal use is excluded, the average household requirements have been estimated at 449.29 litters per day which is almost equal to an average urban family's requirement of 449.4 litters per household. One issue common to both the rural and urban households is that the water is usually extracted from the groundwater resources using electric pumps without the households willing to pay for the user charges. This is also true for better off households who wanted to enjoy

the water facility free of charge. This becomes a major factor behind the declining capacity of local bodies to supply good quality of water in adequate quantities to the citizens in the state.

The authors hold the opinion that the awareness level of people about water scarcity and depleting ground water is an indicator of people's level of consciousness and it determines their water use habits, patterns of optimum use (chapter eight). The data brings out that awareness level of water users, in agriculture, industry and rural and urban households is quite low. There is negligible understanding about the quality of water available. The low level of education, insensitivity towards misuse of water, highly subsidised supply of water or free supply of water are the main reasons for such behaviour. Absence of any social pressure to make judicious and efficient use of water seems to be significant reasons for such behaviour. The poor governance and lack of compatible public policy are also responsible for the low level of awareness, insensitivity and non-judicious and inefficient use of water. Similar factors are responsible for lack of conservation, and non-harvesting of rainwater resources and low consumption of used water and recycling of used water.

Governance of water resources and policy responses has been discussed in chapter eight. They are built around sustainable agriculture, livelihood of resource poor farmers, agricultural labour and food security. Starting with the constitutional position that water is a state subject, the authors hold the view that it is increasingly of national concern in the context of right to water being part of fundamental right of life. The growing pressure on finite resources of water; interstate water conflicts; long term environmental, ecological and social implications of water scarcity and its equitable use and international dimensions of India's rivers are also mentioned in this context. They have referred to a model bill (revised in 1992, 1996 and 2005) forwarded by the Government of India to states in early 1970s to regulate water. The Twelfth Five Year Plan model bill for protection, conservation, management and regulation of ground water for long term sustainability of water resource has been discussed. Moving forward, direction of the Government of India to states for setting up Independent Regulatory Agencies has been cited by the authors. They have also referred to directions from the Supreme Court of India to the Government of India to set up the Central Ground Water Authority (CGWA) under the Environment Protection Act 1986 for the purpose of regulation and control of ground water development. The Court also directed CGWA to regulate indiscriminate boring of tube-wells and withdrawal of water in the country. In this light, some of the states have set up state level water regulation bodies however, authors emphasise that the state of Punjab has neither a water policy, nor a water regulatory body. At the same time, the state does not have an officially adopted agricultural policy. Although many states have formed Water

User Associations (WUAs) for managing irrigation related issues however, Punjab's performance remains very low on this covering only 2.8 percent of the net sown area. The only positive development has been the enactment of Punjab Preservation of Subsoil Water Act 2009 which banned sowing of paddy before 10th May and transplantation of paddy before 15th June. Some technologies such as laser levelling of soil, zero tillage and other water saving technologies are being promoted in the state. Similarly, micro-irrigation projects to promote water saving technologies such as underground pipes and use of sprinklers for horticulture crops are being encouraged to save water but the coverage is still very low. The authors conclude that the policy response in Punjab state is very weak from the implementation point of view. In view of comprehensive analysis of availability of water resources in the state, the authors have contributed towards implementable policy recommendations.

There are some areas which need further investigation. One issue is related to efficient use of water in the state of Punjab. Except for a brief discussion based on one of the tables derived from CACP data efficiency in different states on paddy cultivation has been presented there is no detailed discussion on this issue. Some data (Planning Commission, 2013) is also available on the efficiency of canal water in different command areas of the country. There is need to examine the way in which canal water is being used and to measure its efficiency level in the state. It is better to examine the issue of efficiency in terms of recommended level of irrigation by the Punjab State Agricultural Department and actual level of irrigation resorted to by the farmers. Our own study (Gill and Nehra, 2018) has brought out that actual number of irrigation applied by the farmers to crops exceeds the recommended level in Haryana due to availability of nearly free electricity for irrigation through tube-wells. This is equally true in Punjab. In order to work out the efficiency of water use per crop, recommendations of Punjab State Agriculture Department can be used as a measure of efficient use of water in different agro climatic zones of each region in the state. This would also expose nexus between power subsidy and inefficient use of water for irrigation.

On policy analysis, one needs to adopt political economy approach to understand the policy constraints. This can also provide a clue to non-adoption of recommendations of expert committees and suggestions of economists to shift cropping pattern in the state. There is a need to go deeper in order to examine non-acceptance of recommendations of the economists by the political class in the state. A larger issue that needs to be examined is whether any state in India can adopt its own agricultural policy different from or opposed to national priorities, in isolation. This is especially the case of crops for which Minimum Support Price (MSP) is announced by the Government of India and for which procurement mechanism is in place in the state. The wheat-paddy

rotation in Punjab ensures that the farmers not only sell crops at MSP but also result in purchase of these crops by state agencies on behalf of the Government of India. In the era of globalisation, the agricultural policies of the country are subject to scrutiny of WTO and trend of prices in the world market (WTC 1996). The policy analysis has to be holistic to understand the ground reality. All these issues have not been dealt with in a book focused on emerging water security. Although these issues impact analysis and understanding of water crisis yet they belong to different domains of agricultural economics. These issues can be undertaken by some scholars in their research in future.

The book is very strong on the empirical analysis. It contains a mine of data both from primary and secondary sources on the present status of surface and ground water resources. It provides primary data on water uses in agriculture by various classes of farmers. It provides data on meagre share of tube-wells owned by the small and marginal farmers and consequently brings out that the major share of power subsidy is cornered by medium and large farmers. The book also provides primary data on water uses by rural and urban households for domestic and related activities. It makes a pioneering contribution on water use by various size classes and category of industries. The book provides a comprehensive account of emerging water security in Punjab and it can serve as a reference book for scholars working on water in the state. It can be extremely helpful for formulation of policies for handling the emerging water crisis in the state. It is very useful and welcome addition to literature on water resources in the country. This can be useful to researchers working in the area of water scarcity and water efficiency in South Asia and also to common readers, therefore, they must read it.

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