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Performance Analysis of MGNREG Scheme using Classification

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Abstract: ***The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) has been implemented in Andhra Pradesh since 2006. The scheme focuses on works relating to water conservation and water harvesting, flood control, rural connectivity, repair of water bodies, drought proofing, irrigation canals and land development. There have been a number of studies that look at the implementation of the scheme in terms of employment created as well as issues of wages, processes of implementation, etc. This paper gives the analysis of the performance of MGNREG scheme in villages of Visakhapatnam district, using distance weighted k-nearest neighbor classification technique. The paper also gives the comparison of previous year statistical data provided by the government.***

Keywords: MGNREGS, Performance Analysis, Data Mining, Classification, KNN, Distance weighted KNN

1. Introduction

Majority of population in India comes under rural area. Government of India has been announcing many schemes for rural masses with the aim to bring them out of the folder of poverty. Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) is a pioneer scheme for providing minimum 100 days of job to the rural and tribal population, whose livelihood solely depends on the daily wages. Family members residing in the same village whose age is above 18 has to enroll themselves in the job card, for registering themselves in this scheme. Each micro family is provided with a unique job card. After the registration they will get work within 15 days, else unemployment allowance has to be provided [6].

2. Problem Statement

As the scheme is implemented throughout the country and as works begin everywhere, the magnitude of lives that will be touched by it will inevitably be massive. However, the actual impact of the Act on the lives and livelihoods of people is uncertain [5]. If the Government wants to know how the MGNREG scheme is implemented in particular village then the performance assessment of this scheme is done manually by State level Implementing Authority, District level Implementing Responsibility, Mandal level Supporting team, village level support. All are involved to assess the performance of the scheme in a particular village. It is very tedious and time consuming process.

3. Related Work

Many works have been carried out in previous years to study and analyze the success and failure of this scheme. Different methods has been adapted by different authors, each has its own advantages and disadvantages.

Analyzing of MGNREGA scheme is a bit tricky work, because so many factors are involved to be considered. Some of the previous works carried out are presented in this section.

1) S. Krishnan [2014][7] analyses MGNREG scheme. The study gives the report as scheme is the best India's policy and program to eradicate poverty. This is the most successful programme to eradicate poverty in India. It provides money directly in the hands of poor, especially women without any middlemen. The study also gives the analysis of women employment under the scheme.
2) Dr. Vilas M. Kadrolkar [2012][8] the study is to assess the impact of MGNREGA in Chikamagalur District. The specific objectives of the paper are to study the socio-economic background of the beneficiaries of the act, to know the perceptions of the beneficiaries about the act, to find out the gap in the implementation of the act and to offer suggestions for policy implications.
3) Dr. M. Usha Rani [2012][9] study shows that Expenditure Analysis Through Data Mining Techniques on NREGS(National Rural Employment Guarantee Scheme) Data of Andhra Pradesh. The study gives the analysis of expenditure spend by government on different districts for unskilled labor, material and contingency are collected separately from January 2010 to December 2011.

4. Performance Analysis System

The main focus of the performance analysis of system is to examine the performance of MGNREG scheme in the villages of Visakhapatnam District. The research emphasize on the comparative study of various financial years. It is useful to people who are interested to know the performance of MGNREG scheme. Here, four parameters are taken for study i.e., (1) percentage of number of household provided employment against registered, (2) number of person days, (3) percentage of work completion, (4) percentage of household working.

Objectives of the System

- To represent the variations in the above selected parameters in the duration of last four financial years
- To evaluate the performance of the MGNREG scheme village wise using distance weighted K-nearest neighbour classification.
- To derive conclusion and suggest some modifications to ensure better implementation of MGNREG scheme.

Data Collection and Period of Study

For the experimentation analysis, the data is collected from the website nrega.ap.gov.in. [1]. Present study covers the performance analysis of MGNREG scheme for four consecutive financial years. In our experimentation the data is selected from the financial year 2011-12 to 2014-15.

5. Data Interpretation of MGNREG Scheme using Graphical Representation

A. Household Registered

Each individual family who are willing to work under this scheme has to register their name and get the job card. These individual families are called as household. Figure 1 indicates the total number of household registered in the last 4 years. The number of household registered in the last four years is 474469 [1]. While analyzing the progress between the financial years 2011-2012 to 2014-2015 in Visakhapatnam district there is no change in the number of house hold registered.

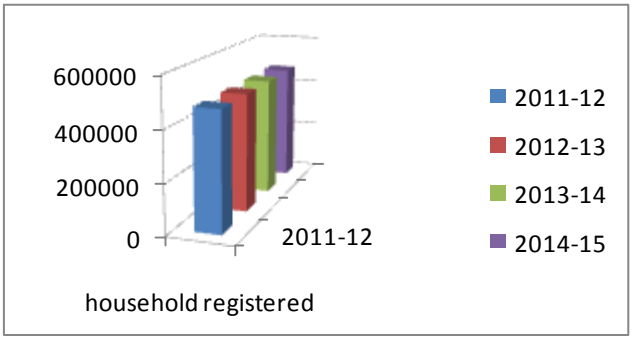

Figure 1: Graphical representation for Household Registered for last 4 years

B. Household working

Household working under this scheme keep on increasing every year. This shows that the dependence of the scheme is increasing. The total number of household working under this scheme during the financial year 2011-12 is 255606, for the year 2012-13 is 287844, for the year 2013-14 is 294630 and for the year 2014-2015 is 302794 [1]. The graph in the webpage present in the Figure 2 depicts the increase in the number of household working who are registered under the MGNREG scheme.

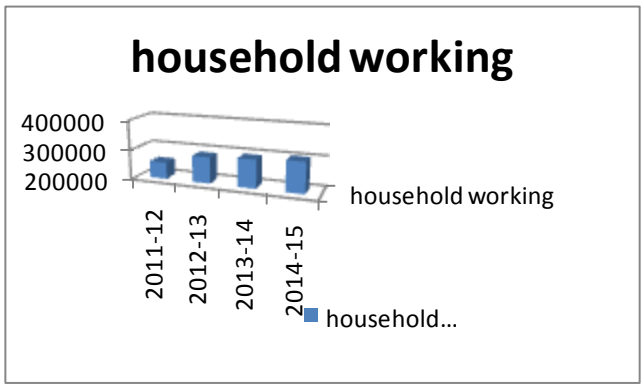

Figure 2: Graphical representation for Household working for last 4 years

C. Number of person days Generated

Person days are the total number of days, the entire people worked under this scheme. Person days generated under this scheme keep on decreasing comparing to the year 2012-13 [1]. This shows that the flaws in the implementation of this scheme. In the financial year 2011-12 the number of person days generated is 18453109 for the year 2012-13 the number of days is 19456347 for the financial year 2013-14 it comes to 18542546 and for the year 2014-2015 it is 18595801.The graph in the webpage present in the Figure 3 depicts the decrease in the number of working days generated under the MGNREG scheme comparing to the year 2012-13.

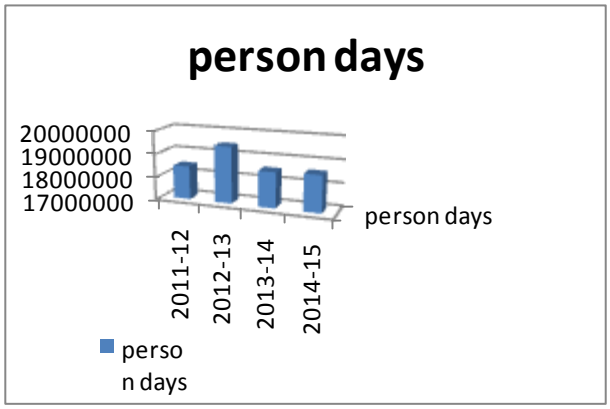

Figure 3: Graphical representation for Household total working days for last 4 years

D. Work Progress

Since inception total works sanctioned for Visakhapatnam district is 303209 [1]. The pie chart shown in the Figure 4 represents the percentage of work progress among the total works sanctioned for Visakhapatnam district. It shows that there are more works which are completed less than 25 percentage.

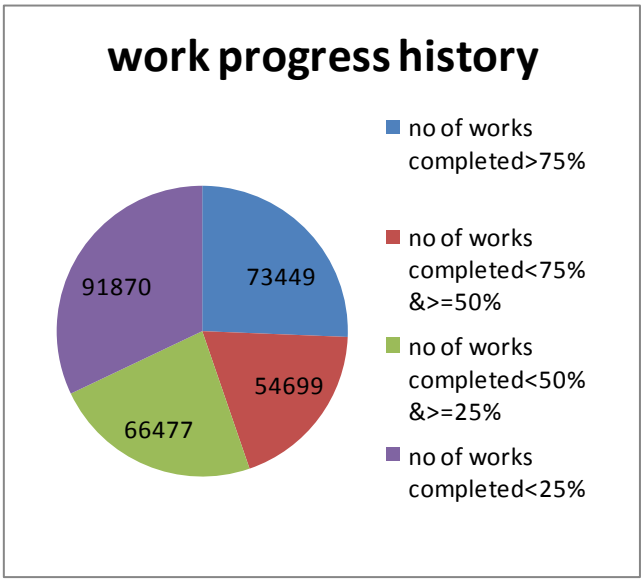

Figure 4: Graphical representation for Work Progress

6. Performance Evaluation

K-nearest neighbor algorithm (KNN) is part of supervised learning that has been used in many applications in the field of data mining, statistical pattern recognition and many others[3], [4]. KNN is a method for classifying objects based on closest training examples in the feature space. An object is classified by a majority vote of its neighbors. K is always a positive integer. The neighbors are taken from a set of objects for which the correct classification is known. It is usual to use the Euclidean distance, though other distance measures such as the Manhattan distance could in principle be used instead [2].

KNN uses simple voting method for estimating class of the test instance. It is very sensitive to unbalanced data. To improve this, an improved method is to weight vote of k nearest neighbors differently according to their distance from test instance. It is known as k-nearest neighbor with distance weighted (KNNDW) [10]. The algorithm on how to compute the Distance weighted K-nearest neighbors is as follows:

- Initialize the K (number of nearest neighbors).
- Calculate the distance between the query-instance and all the training samples. Here we used Euclidean distance metric.
- Sort the distances for all the training samples and determine the nearest neighbor based on the K-th minimum distance.
- Since this is supervised learning, get all the Categories of your training data for the sorted value which fall under K.
- The class label of selected K neighbors with maximum probability is chosen as class label of test sample. That is shown in the following equation.

$$c(x) = \arg\max \sum_{i=1}^{k} w\,(c, c(y_i))$$

Where c is the class label in the training data $c(y_i)$ is class label of the nearest neighbor y_i . w is weight assigned according to the distance

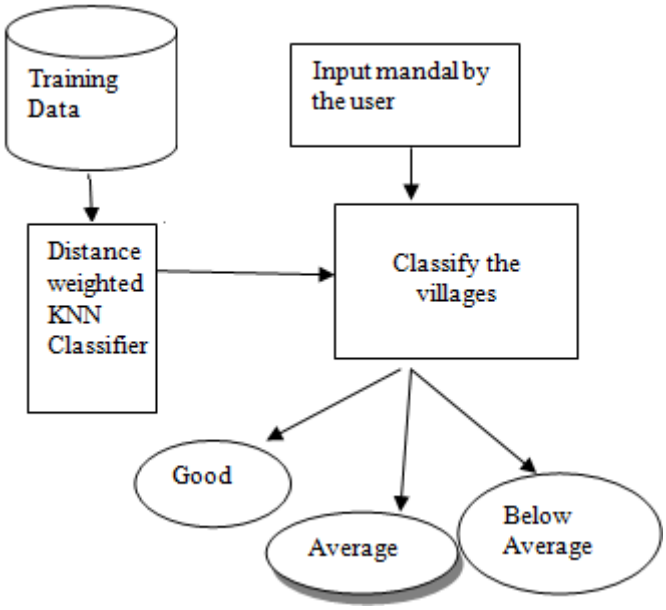

Figure 5: flow diagram for performance evaluation

The flow diagram shows that using distance weighted KNN classification the villages in the selected mandal are classified to good or average or below average based on training data. The parameters consider for Performance evaluation are:

- Percentage of household working
- Average wage
- Total expenditure spending on village
- Total working days

This analysis is done for Visakhapatnam district.

Figure 6: Select mandal name as Input

The above screen shot shows that dropdown list for selection of mandal in Visakhapatnam district. In Anandapuram mandal the villages are classified based on implementation of the Scheme is shown in the following figure.

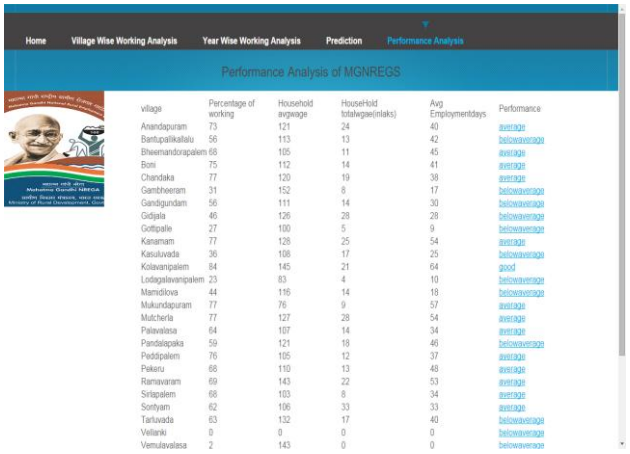

Figure 7: Result of KNNDW classification

The villages in which the performance analysis of MGNREG scheme is good are: Kanamam, Kolavanipalem, Mutcherla and Ramavaram. The villages in which the performance analysis of MGNREG scheme is average are::Anandapuram, Boni, Chandaka, Bheemandorapalem, Palavalasa, Peddipalem, Pekuru and Sirlapalem, Tarluvada. The villages in which the performance analysis of MGNREG scheme is below average are: Bantupallikallalu, ambheeram, Gandigundam, Gidijala, Gottipalle, Kasulavada, Lodagalavanipalem, Mamidilova, Mukundapuram, Sontyam, vellanki and Vemulavalasa.

7. Conclusion and Future Work

From the above analysis it is concluded that the performance of MGNREGA in Visakhapatnam is not at all satisfactory. The scheme could not ensure the 100 days job guarantee to the majority of the job card holders. By comparing the progress of last four financial year data, it can be concluded that this scheme is potentially successful only in some of villages. Many villages in Visakhapatnam district having the performance below average and not ensuring financial support for their family to improve the livelihood and the economic status of the people. This is because of failure in providing sufficient work to all the registered people. So Government should take better decision to improve the employability for villages which are having performance below average.

The future scope of this work is to carry out the performance analysis of MGNREG scheme by using other data mining techniques. The results may be more accurate.

References

[1] Information about MGNREGS from Andhra Pradesh rural development website http://nrega.ap.gov.in
[2] S. Taneja, C. Gupta, D. Gureja and K. Goyal, "K Nearest-Neighbor Techniques for Data Classification-AReview" Proc. International Conference on Computing, Informatics and Network (ICCIN-2K14), Jan. 2014, pp. 69-73.
[3] Comparative study of Naive Bayes Classifier and KNN for Tuberculosis, International Conference on Web Services Computing.
[4] Sudarshan " An Introduction to Data Mining" CSE Dept, IIT Bombay.
[5] Ravallion, Martin, 1991."Research through EGS employment: arguments, lessons, and evidence from South Asia." World Bank Research observer 6(1), 1991, pp. 153-176.
[6] MGNREGA Sameeksha An Anthology of Research Studies on the Mahatma Gandhi National Rural Employment Guarantee Act, 2005.
[7] S.Krishnan, Dr. A. Balakrishnan (2014), "MGNREGA Marching towards achieving the millennium development goals" an analysis. Journal of International Academic Research for Multidisciplinary. Volume 2, Issue 1
[8] Dr. Vilas M. Kadrolkar "An impact Assessment Study of MGNREGA in Karnataka "Department of studies and Research in Economics , Tumkur University, Tumkur.
[9] Dr. M. Usha Rani "Expenditure Analysis through Data Mining Techniques on NREGS data of Andhra Pradesh" , CSE Dept, SPMVV, Tirupati.
[10] K. G. Anil "On optimum choice of k in nearest neighbor classification", Computational Statistics and Data Analysis, 50, pp. 3113-3123, 2006.

Author Profile

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