Application of Geo-spatial Technologies for Identification & Development of Household Database for Scheduled Castes (SC's) and other backward classes (OBC's) of Sondh village in Mewat district (Haryana)

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Abstract

The paper presents detailed analysis of SONDH village in Mewat district (Haryana) by fulfilling various objectives like collecting and compiling household level data for preparation of comprehensive databases for village; utilising geo-spatial approach for building structure and land mapping; improving their socio-economic conditions by exploring possibility of using semi-automatic tools / machines to increase productivity of existing products and deriving new products at nominal prices followed by few pictures showing interaction meeting with villagers.

Key Words: *GIS; Satellite imagery; Geo-spatial approach; Land use; Attribute table.*

1. Introduction

As witnessed by last few decades, there has been an enormous growth in study of Geographical Information Systems (GIS) and its demographic entities. The condition of rural scheduled caste population in Mewat district, and particularly in Sondh village was found very bad and challenging. The villagers of Sondh were mainly Scheduled Castes (SCs) and Backward Classes (OBCs) which were economically, socially and educationally most backward lot.

Mewat district of Haryana has been identified as one of the backward and minority concentrated districts that severely lag behind in terms of socio-economic parameters of development. Its geographical map is shown in figure 1. Sondh village is a prominent village in Taoru Block &Tehsil of district Mewat. It's also a post office and

share pin code as 122105. The Census Code of the Sondh Village is 18 and Cluster of Panchayat for common service centre (CVC) Sondh includes three other villages, namely, Jalalpur Nuh, Bhango and Chahlaka. The Tomb of Hajrat Raj shah (R/A), an important personality related to establishment of Darul Uloom of Deoband, an Islamic school in India where the Deobandi Islamic movement began, is also situated in this village.

The given methodology is being followed in requisite paper as shown in figure 2. Rest of the paper is organized as follows: Section 2 fulfils objective (i) i.e. listing of household database as per Census questionnaire 2011. Section 3 presents geo-spatial approach adopted to map building and land cover use of village. It also isolates total residential households of village and individual SC's, OBC's household to obtain
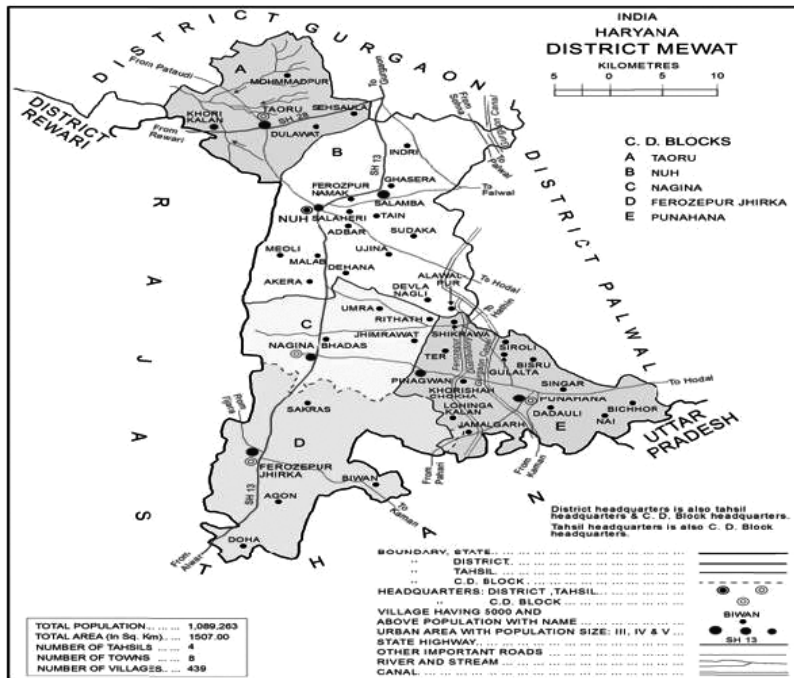
Fig. 1. Map of district Mewat (Haryana)

Fig. 2. Methodology involved

socio-economic data. It satisfies objective (ii). Now, socio-economic data obtained from section 3 is used in section 4 to assist villagers in enhancing their knowledge skills by making use of modern tools/ equipment in their profession. It fulfils objective (iii). Section 5 concludes the given paper followed by acknowledgements and references.

2. Listing Household database as per Census 2011 questionnaire

Table 1. Census Database 2011

Parameters	Data		
Name of Locality	Sondh	Taoru Block/	Mewat District
Location Code No.	18	0109	87
Area of Village in hectares	991.00	213.98	1,507.00
Population density	NA	NA	726.66
Population size	3216	NA	1089263
Sex ratio	934	NA	907
Sex ratio, 0-6 yrs	915	NA	906
Number of Households	520	21,281	160,280
Total Population (incl. Institutional & houseless population)			
Persons	3,216	144,179	1,089,263
Male	1,663	75,783	571,162
Female	1,553	68,396	518,101
Population in age group(0-6)			
Persons	647	31,948	248,128
Male	352	17,009	130,168
Female	322	14,939	117,960
Education	NA	NA	NA
Literacy rate, 7+ yrs	51.18	NA	41.76
Literates, 7+ yrs	1646	NA	454897
Condition of census houses occupied			
Households - Total	520	NA	157020
Condition of occupied census houses : Good - Households	NA	NA	55412
Condition of occupied census houses : Liveable - Households	NA	NA	88339
Condition of occupied census houses : Dilapidated - Households	NA	NA	13269
Construction material of roof			
Households - Total	520	NA	157020
Grass/Thatch/ Bamboo/ Wood/Mud/ Plastic/ Polythene etc. - Households	NA	NA	24635
Tiles - Households	NA	NA	6476

G.I./Metal/Asbestos sheets - Households	NA	NA	6046
Concrete - Households	NA	NA	10128
Any other material - Households	NA	NA	388
Construction material of wall			
Households - Total	520	NA	157020
Grass/ Thatch/ Bamboo/ Plastic/ Polythene etc. - Households	NA	NA	2592
Mud/Unburnt brick - Households	NA	NA	17952
Burnt Brick - Households	NA	NA	107473
Stone - Households	NA	NA	28013
Any other material - Households	NA	NA	990
Construction material of floor			
Households - Total	520	NA	157020
Mud - Households	NA	NA	84823
Stone - Households	NA	NA	2946
Cement - Households	NA	NA	61823
Mosaic/ Floor tiles - Households	NA	NA	2221

Any other material - Households	NA	NA	5207
Ownership status	NA	NA	
Households – Total	520	NA	157020
Ownership : Owned - Households	NA	NA	151691
Ownership : Rented - Households	NA	NA	3587
Ownership : Any other - Households	NA	NA	1742
Dwelling rooms			
Households - Total	520	NA	157020
Number of dwelling rooms: No exclusive - Households	NA	NA	4697
Number of dwelling rooms: One - Households	NA	NA	65838
Number of dwelling rooms: Two or Three - Households	NA	NA	71073
Number of dwelling rooms: Four and above - Households	NA	NA	15412

Married couples			
Scheduled Caste Population			
Persons	1,438	17.801	75,251
Male	763	9,389	39,743
Female	675	8,412	35,508
Literate			
Persons	1,646	69,938	454,897
Male	1,052	45,596	308,435
Female	594	24,342	146,462
Illiterate			
Persons	1,570	NA	NA
Male	611	NA	NA
Female	959	NA	NA
Total Workers			
Persons	889	40,318	289,964
Male	659	30,738	224,642
Female	230	9,580	65,322
Main Workers			
Persons	657	29,827	204,178
Male	565	25,086	175,670
Female	92	4,741	28,508
Cultivators			
Persons	158	11,047	81,608
Male	116	9,065	69,305
Female	42	1,982	12,303

Agricultural Labourers			
Persons	115	2,517	25,426
Male	99	2,099	20,337
Female	16	418	5,089
Household Industry Workers			
Persons	13	780	4,034
Male	9	382	2,938
Female	4	398	1,096
Other Workers			
Persons	371	15,483	93,110
Male	341	13,540	83,090
Female	30	1,943	10,020
Household Industry Workers			
Persons	9	303	1,989
Male	8	123	903
Female	1	180	1,086
Other Workers			
Persons	48	4,497	31,316
Male	31	3,015	24,432
Female	17	1,482	6,884
Non Workers			
Persons	2,327	103,861	799,299
Male	1,004	45,045	346,520
Female	1,323	58,816	452,779

Source: *Census of India 2011, Haryana, Series-07, Part XII-B, District Census Handbook, Mewat, Village and Town Wise Primary Census Abstract (PCA), Directorate of Census Operations, Haryana. "Note: NA =Not Available/could not be compiled keeling their relevance in view*.
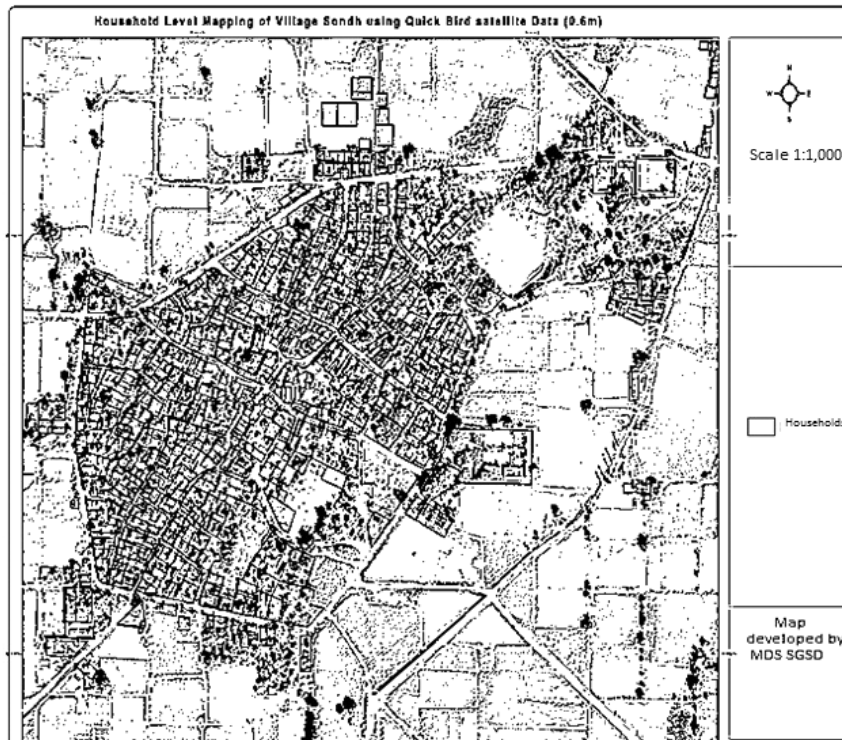
Figure 3. High Resolution Satellite Map of Building structure

3. Geo-Spatial Approach

3.1. Building structure mapping using high resolution remote sensing satellite image

All the building structures in the village were mapped using Quick Bird remote sensing satellite imagery that was of quite high resolution and digitised online as shown in figure 3.

3.2. Building use and land use mapping through ground verification by fields surveyors

All the building structures from high resolution satellite map were verified by the field investigators from the village for having each building structure identified from utilisation/ status known point of view and inputted in the map.

3.3. Attribute Table/Fusion Table Generation for identification of Occupation/ Profession of SCs & OBCs of Sondh Village

From geospatial exercise using attribute/ fusion table facility, it has been noticed/ observed that more than 100 SC & OBC families in the Sondh village are engaged a special skill, i.e. football making /stitching and need to be studied in depth.

Hence football making / stitching occupation/activity was then studied thoroughly by preparation, testing and implementation of a special questionnaire and 108 individual football making / stitching workers were interviewed by field investigators, beside general interactions in village workshops by the project investigator and team. It gave interesting results about the entire theme and basic objective of the project i.e. how S&T inputs can improve the socio-economic conditions of SCs & OBCs in the Sondh village.

4. Socio-Economic conditions of football workers and their professional upliftment avenues

This section firstly presents background of football stitching/making process by workers in Sondh village. Thereafter, answers of 108 Sondh respondents with regard to various parameters have been analysed in sub sections.

4.1. Football stitching/making by workers

In Sondh village, more than 150 football makers mainly from SC& OBC families were engaged, however some of them left this activity and now only 108 families are still actively engaged. They are taking the work activity from COSCO Football Centre existing in the village on behalf of COSCO brand by contractor.

4.2. Training Arrangement made & provided including Semi-Skilled Activity required a very light training to SC&OBC Workers

The COSCO contractor arranged the craftsmen to impart training to some SC & OBC interested workers at village Chaupal. Some interested workers undergone this simple semi-skilled training while a few learned from each other's and now started working. During the study, it was found that maximum (80%) of football makers/ stitching workers were got trained in the Sondh village itself at a commonplace, i.e. village Chaupal by the Craftsmen while a few others (20%) learnt this work from each other without attending any training class. Majority of respondents said that they received the training free of cost while a few said that were charged Rs. 100/- each by the craftsmen as shown in Figure 4.
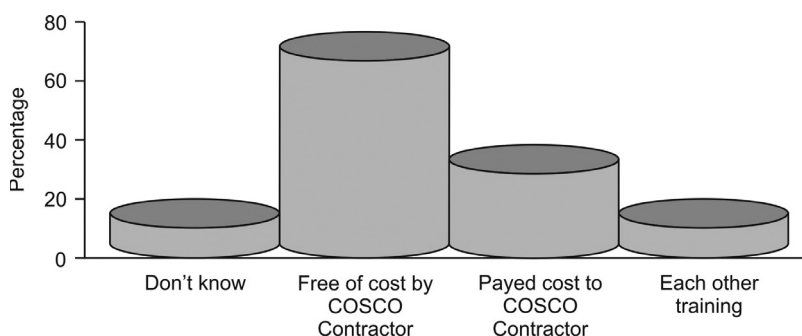

Figure 4. Percentage of Trained persons

4.3. Situational analysis of workers

Some major questions were asked from football makers/persons stitching footballs to understand their situational status and socio-economic and techno-marketing conditions, such as first time from where they came to know about football stitching, basically to know the source, and whether they are stitching footballs individually or in a group, again to know the place where the football making /stitching work carried out. In addition it was also ascertained that whether they sought any training from somewhere or not and if trained, from where and what cost etc.?

Respondent answered properly and it was found that football stitching/making work is mainly done by SC & OBC women and only a few SC & OBC males also participated in this part time activity. During the study only 23% males were found engaged in football stitching/making work while 77% were SC& OBC women in this activity as shown in Figure 5.
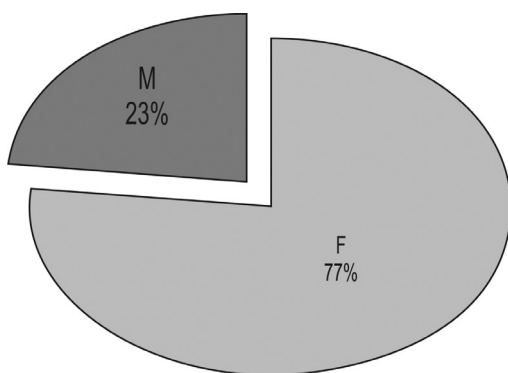
Fig. 5. Percentage ratio of workers

4.4. Traditional-modern method of football stitching/making

A majority of football stitching workers/ makers were undertaking this activity in a very traditional way by using rudimentary old tools by hands and not having any knowledge of new tools and machines. A large majority (96%) responded that they do not have any kind of knowledge about new tools and machines as depicted in Figure 6.
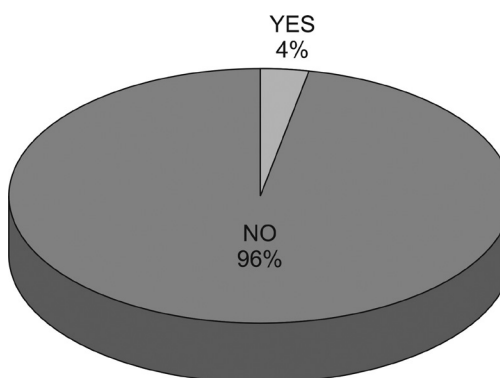

Fig. 6. Knowledge of workers about modern tools and machinery

4.5. Marketing and independent entrepreneurship ability

When the respondent asked can they do marketing of the product they make and act as an independent entrepreneur in football making/stitching. Unfortunately not even a single worker responded positively. Every one said since they are working for a contractor, we never thought to market this product and secondly neither we have knowledge of marketing nor experience, so questions of marketing& independent entrepreneurship ability have no relevance to us. When further probed if given an

opportunity to do this work at a large scale in an organized manner, will they be able to do, in that expressed their economic conditions and low level training would come in the way Statistically speaking, 98% informed that they were doing this work from their own houses, and only 2% said that do this activity from their own houses as well as from village Chaupal as shown in the figure 7.
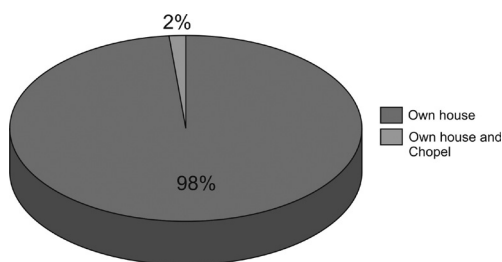
individually as well as in groups also. When asked 40% said that they stitch/make individually while 42% said that they work in groups and 18% works both individually as well as in groups too depending on situation as shown in figure 8.
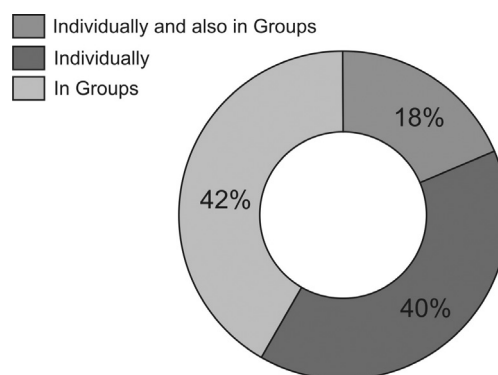

Fig. 7. Percentage of Activity/place of work

Fig. 8. Percentage ratio of "How footballs are made"?

4.6. Tools used for football making

The modern machines of different brands like Brother, Usha, Kurtzy, Singer etc. have price range from approximately Rs. 700/-to 1500/- which are not much costly, but when asked from workers whether they are economically competent enough to procure such new tools & machine for football stitching , then most of the respondents showed their inability making poor economic condition as excuse and all poor families of SCs & OBC's expressed that it would be an incentive if government would give them some kind of help in procuring these machines.

4.7. Manufacturing process of football stitching/making

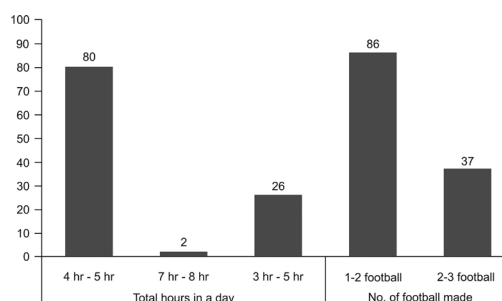These football workers stitch/make footballs individually; in groups and a few both

Fig. 9. Working hours and production

4.8. Working hours and production

As indicated in Figure 9, 80 % football makers were putting 4-5 hrs on an average in a day and 26 % workers were able to putting 3-5 hrs in a day while only 2 % workers said that they put 7-8 hrs in a day in this activity. It was also observed that 86 % workers were able to make 1-2 football in a day while only 17 % were said that they

produced 2-3 football in a day. Hence it was clear that the people were putting their extra time in this activity and producing very low through traditional means however since this activity was contributing to their livelihood.

4.9. Satisfaction level of workers in this work

An important question was asked from the SC football makers/ stitching workers whether they are satisfied with this job. The answer of majority (103) was affirmative while only 5 respondents replied negatively as shown in figure 10.
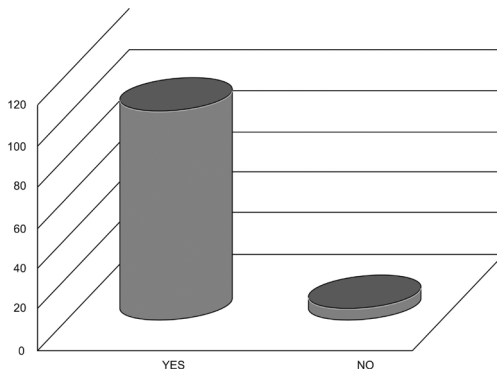
Fig. 10. "Are workers satisfied with their football stitching work"?

As far as timely payment is concerned, overwhelmingly (96%) respondents replied that they get the payment in time while only 4% replied negatively as shown in figure 11.

4.10. Online sale avenues of workers

In view of modern marketing avenues, respondents were asked whether they know the football made/stitched by them now can be sold /marketed online and further, there
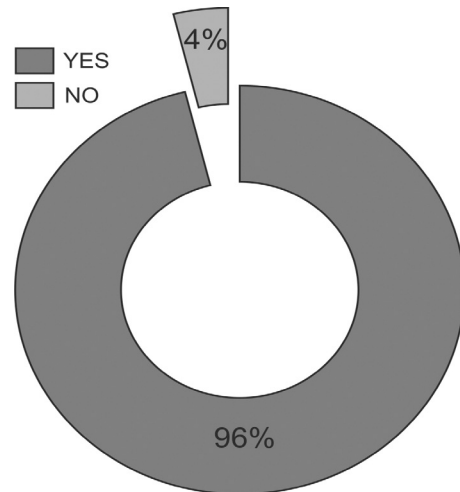

Fig. 11. "Do workers get payment on time"?

is a special opportunity just launched for Women entrepreneurs by Govt. of India namely, **'Mahila E-Haat'**-*an initiative for meeting the needs of women entrepreneurs*. Not even a single respondent responded positively and everyone showed ignorance about such an initiative.

About 79% respondents told that they heard about it when launched, while 21% showed ignorance about it as indicted in figure 12.
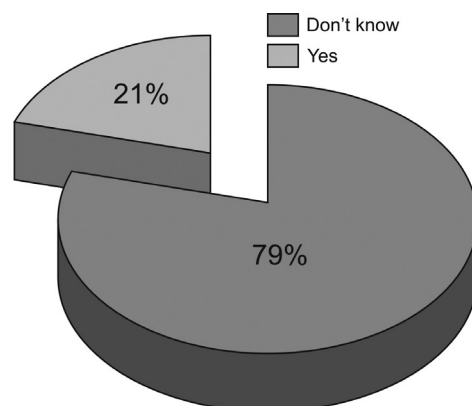

Fig. 12. "Are workers aware of Mahila-E-Haat initiative"?

5. Conclusions

A case study on one of the villages of Mewat district named Sondh has been described in following paper. Several objectives have been fulfilled like preparing of household database of village as per Census 2011. Census database 2011 acts as secondary source of data.

It is followed by adoption of geo-spatial and referencing approach in which mapping of building structure and land use of village has been shown. It also isolates total residential households of village and individual SC's, OBC's household to obtain socio-economic data. Now, socio-economic data is being used to assist villagers in enhancing their knowledge skills by making use of modern tools/equipment in their profession. It requires filling of questionnaire by 108 Sondh respondents. This is primary source of data that is being collected by field investigators especially for specific project.

Acknowledgements

References

AGUILAR-MANJARREZ, J. and ROSS, L.G., 1995, Geographical information system (GIS) environmental models for aquaculture development in Sinaloa State, Mexico. *Aquaculture International*, 3, pp. 103–115.

ANTOINE, J., FISCHER, G. and MAKOWSKI, M., 1997, Multiple criteria land use analysis. *Applied Mathematics and Computation,* 83, pp. 195–215

BOJO´RQUEZ-TAPIA, L.A., DIAZ-MONDRAGON, S. and EZCURRA, E., 2001, GIS-based approach for participatory decision making and land suitability assessment. *International Journal of Geographical Information Science*, 15, pp. 129–151

ARCTUR, D. and ZEILER, M., 2004, *Designing Geodatabases: Case Studies in GIS Data Modelling* (Redlands, CA: ESRI Press).

SEPPELT, R. and VOINOV, A., 2002, Optimization methodology for land use patterns using spatially explicit landscape models. *Ecological Modelling*, 151, pp. 125–142

Census of India 2011, Haryana, Series-07, Part XII-B, District Census Handbook, Mewat, Village and Town Wise Primary Census Abstract (PCA), Directorate of Census Operations, Haryana.

KHAN SUBHAN, Natural Resources Data management System (NRDMS) in Handbook of Libraries, Archives & Information Centres in India, Vol. 7 *Science and Technology Information Systems and Centres* (Eds.) by B.M. Gupta and S.S. Nathan, Aditya Prakashan, Delhi, pp 1-13

GAGANDEEP SINGH NARULA, SUBHAN KHAN, YOGESH, 2016 "DST's Mission Mode on Program Natural Resources Data Management System (NRDMS)", *BIJIT-BVICAM's International Journal of*

Information Technology, Jan-June 2016 Vol.8 No.1 pages 973-978 having ISSN No. 0973-5658 with impact factor 0.605, indexed with IET (UK), INSPEC

SANAY MONDAL, 2015 "Land Information System using Cadastral techniques, mining area of Raniganj, Barddhaman District, India", *International Journal of Remote Sensing Applications (IJRSA)*, Vol. 5, ISSN 2226- 4353.

LONGLEY, P.A., GOODCHILD, M.F., MAGUIRE, D.J. and RHIND, D.W., 2005, *Geographic Information Systems and Science*, Second Edition (New York: Wiley).

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