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Asset Mapping for Rural Development: A Case Study for Nagondapalli Panchayat, Hosur Block

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Abstract: The Asset Directory is the comprehensive compilation of different types of assets/resources available in various parts of the country which are being created under several schemes of Government of India, States and communities by themselves to facilitate the local population. In this paper, an asset directory is prepared for the Nagondapalli panchayat of Hosur Block, Krishnagiri district. The assets are mapped using satellite images acquired from Bhuvan web portal. The asset and its details are added to GPS points acquired for each asset in Nagondapalli panchayat and the required asset maps were prepared using ArcGIS. The asset maps so prepared will be useful for the future development of the panchayat, to fulfill its demands and the needs of the community.

Keywords: Asset Directory, Panchayat, GPS, ArcGIS

I. INTRODUCTION

The Asset Directory is made on community based and village based assets in a Panchayat. The compilation and categorization of assets/resources is in reference to the Space based Information Support for Decentralized Planning (SIS-DP) Project. The assets are classified into 5 major categories, 25 subclasses, 73 asset groups and 281 assets. E-Panchayat has usually been undertaken through which good governance for development with social justice is the preparation and updating of asset register. Asset mapping provides information about the resources of a community and promotes community empowerment. Identification and mapping assets in any community may be done through a proper planning. First the asset directory and mapping guidelines given by the National Remote Sensing Centre is studied. The Asset Directory is the comprehensive compilation of different types of assets/resources available in various parts of the country which are being created under several schemes of Government of India, States and communities by themselves to facilitate the local population. Every asset type is identifiable with a unique code. A unique symbol is associated with each asset group and every category is presented in a unique color. An Android based Mobile application is also available in this portal using which the assets can be mapped.

II. STUDY AREA

The study area is Nagondapalli panchayat of Hosur Block located in the Krishnagiri district of Tamil Nadu. The latitude 13.0938995 and longitude 80.292356 are the geo-coordinate of the Nagondapalli. It is situated at a distance of 10 km from Hosur, 4 km from Mathigiri, 8 km away from sub-district headquarter Hosur and 61 km away from district headquarter Krishnagiri. As per 2009 stats, Nagondapalli village is also a gram panchayat. The total geographical area of village is 889.38 hectares. Nagondapalli has a total population of about 5,000 people. There are about 674 houses in Nagondapalli village. Mathigiri is nearest town to Nagondapalli. Location map of the study area is shown in fig 1

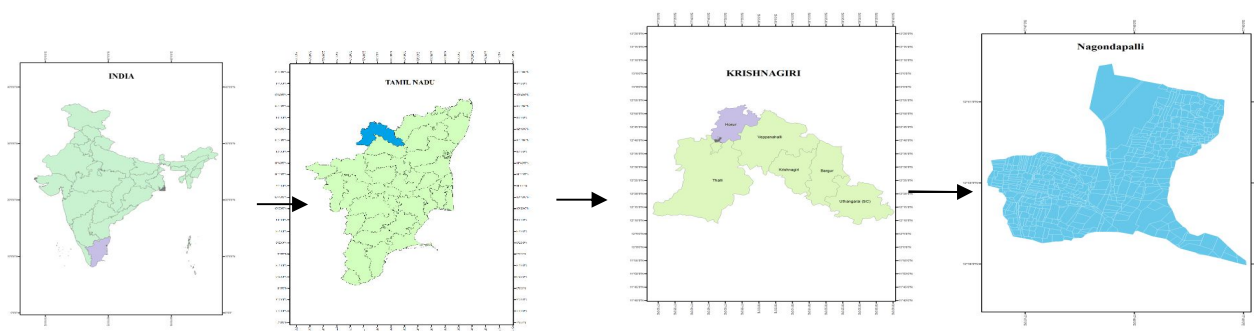


Fig 1 Study Area

III.METHODOLOGY

Asset mapping using GIS helps in the sustainable development of rural areas and for proper planning of the region. The steps which are to be carried to create an asset map are listed below:

- 1) Satellite images, cadastral maps and shape file of that village were initially collected.
- 2) The asset directory and mapping guidelines for gram panchayat given by NRSC were thoroughly studied.
- 3) The field survey was carried out using GPS and the ground control points of the assets were recorded.
- 4) Details of each asset were collected.
- 5) A directory was prepared showing the details of all the assets.
- 6) The recorded GPS points were plotted in the georeferenced satellite image using ArcGIS software.
- 7) The prepared directory/ database was linked to the plotted GPS points.
- 8) Then the asset maps were created accordingly.

Fig. 2 shows the flowchart depicting the methodology for Asset Mapping

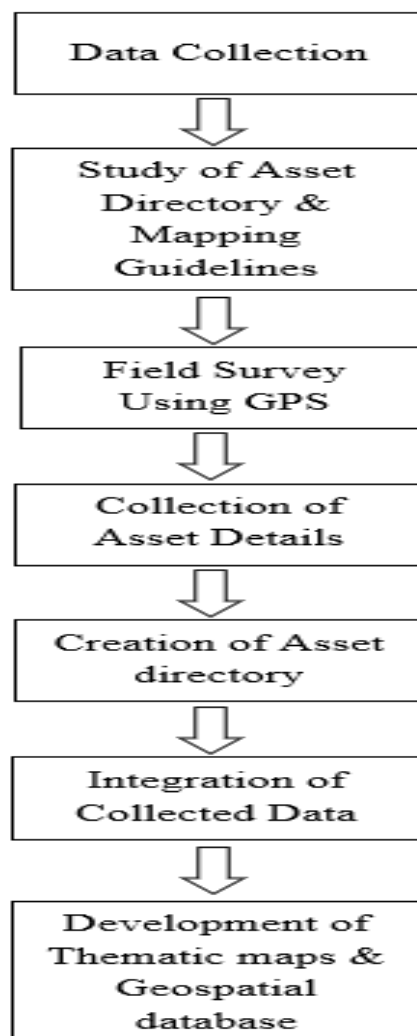


Fig. 2 Flowchart

A. Data Collection

Data collection involves collection of satellite images, cadastral maps and toposheets. Also an overview about the assets in Nagondapalli are known from the VAO Office in Nagondapalli Panchayat.

B. Study of Asset Directory and Mapping Guidelines

The asset directory and mapping guidelines provided by National Remote Sensing Centre are thoroughly studied. According to it the assets are classified into 5 major categories, 25 subclasses, 73 asset groups and 281 assets. The Asset Directory consists of 5 major categories of assets as follows:

- 1) Civic amenities/Infrastructure: 226 Assets
- 2) Governance Assets: 35 Assets
- 3) Human and Livestock Resource Assets: 2 Assets
- 4) Natural Resources Assets: 8 Assets
- 5) Productive Assets: 10 Assets

C. Field Survey

The field survey is done with the help of GPS. The GPS is taken to each asset location and the coordinates are recorded. Table I and Table II shows the coordinate details collected using GPS for the assets in Nagondapalli

Table I Gps Data Collected In Nagondapalli

S.No.	Major Category	Assets	GPS Data		
			No.	Latitude(°)	Longitude(°)
1.	Civic Amenities/Infrastructure Assets	Middle School	180	77.78549957	12.66779995
		Anganwadi	181	77.78489685	12.66889954
		Public Library	174	77.78420258	12.66539955
		Water Tank	173	77.78430176	12.66530037
		Public Distribution Shop	175	77.78410339	12.66539955
		Temple – 1	172	77.78450012	12.66520023
		Temple – 2	179	77.78510284	12.66810036
		SBI Customer Service Point	185	77.78500366	12.66779995
		Barber Shop – 1	182	77.78489685	12.66870022
		Barber Shop – 2	184	77.78479767	12.66839981
		Bus Stop	186	77.78500366	12.66800022
		Cycle Repair Shop	183	77.78489685	12.66860008
		Grocery Store – 1	185	77.78500366	12.66779995
		Grocery Store – 2	201	77.78440094	12.66699982
2.	Governance Assets	Panchayat Office	176	77.78399658	12.66539955
		VAO Office	177	77.78410339	12.66539955
		Digital Seva Common Service Centre	201	77.78440094	12.66699982
3.	Productive Assets	Poultry Farm – 1	169	77.78479767	12.6644001
		Poultry Farm – 2	170	77.78520203	12.66549969
		KSM Bright Steel Industries	171	77.78510284	12.66530037
		Paper Company	187	77.78669739	12.67140007

Table 2 Gps Data Collected In Edayanallur (Nagondapalli Panchayat)

S.No.	Major Category	Assets	GPS Data		
			No.	Latitude(°)	Longitude(°)
1.	Civic Amenities/Infrastructure Assets	Primary School	188	77.80690002	12.67940044
		Anganwadi	198	77.80570221	12.68029976
		Temple – 1	189	77.80680084	12.6796999
		Temple – 2	190	77.80660248	12.6796999
		Temple – 3	192	77.80609894	12.68000031
		Temple – 4	193	77.80599976	12.67990017
		Temple – 5	200	77.80699921	12.68039989
		Flour Mill	196	77.80690002	12.67770004
		Rice Mill	197	77.80709839	12.67800045
		Grocery Store	191	77.80660248	12.6796999
		Water Tank	199	77.8062973	12.68060017
		Public Distribution Shop	194	77.80680084	12.67889977

IV. COLLECTION OF ASSET DETAILS

The details of each asset such as ownership, quantity, area, etc. are obtained. This is done by communicating with the owner of the asset or the concerned people.

V. CREATION OF ASSET DIRECTORY

The collected details of the assets are combined, categorized and a directory is prepared. Based on the prepared directory it is found that Nagondapalli panchayat has:

- 1) Civic Amenities/ Infrastructure Assets: 26 Assets
- 2) Governance Assets: 3 Assets
- 3) Productive Assets: 4 Assets

VI. INTEGRATION OF COLLECTED DATA USING ARCGIS IMPORTING GPS POINTS

The GPS data collected from the instrument is imported into ArcGIS by the following procedures:

- 1) The Collected GPS points are converted into Shapefile point by using conversion tool in Arc toolbox.
- 2) The points are then plotted onto the map and labeled as per the GPS No.
- 3) *Linking the Asset Directory to the plotted GPS Points:* The asset directory prepared using Excel is linked to the plotted GPS points in ArcGIS.

4) *Creation of Cadastral Map*

- a) The Cadastral map is digitized over in ArcGIS.
- b) The Cadastral map is mosaicked on top of cadastral and then satellite image is snapped at the edges, to produce the satellite map of Nagondapalli.
- c) Shape file for every point is done for denoting the shape of building.
- d) The symbology for each asset is set in accordance with the asset type.
- e) The scale used here is 1:24,000 for a high resolution spatial satellite image.

Fig. 3 shows the cadastral map of Nagondapalli panchayat showing the demarcated boundaries and plots.

Fig. 4 shows the symbol given for each asset category.

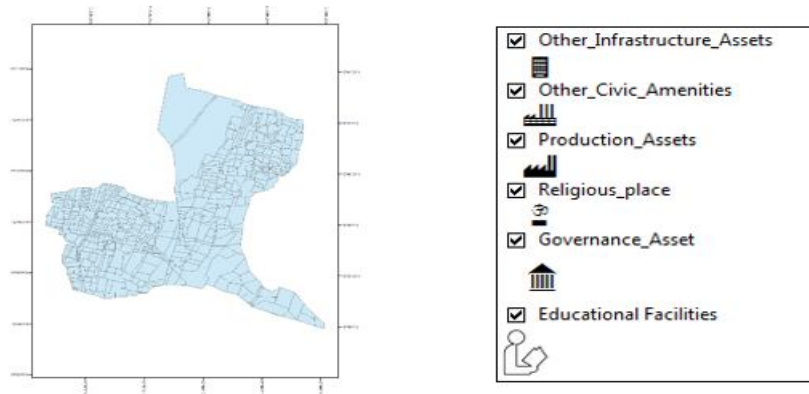


Fig. 3 Cadastral Map

Fig. 4 Assets differentiated by Symbols

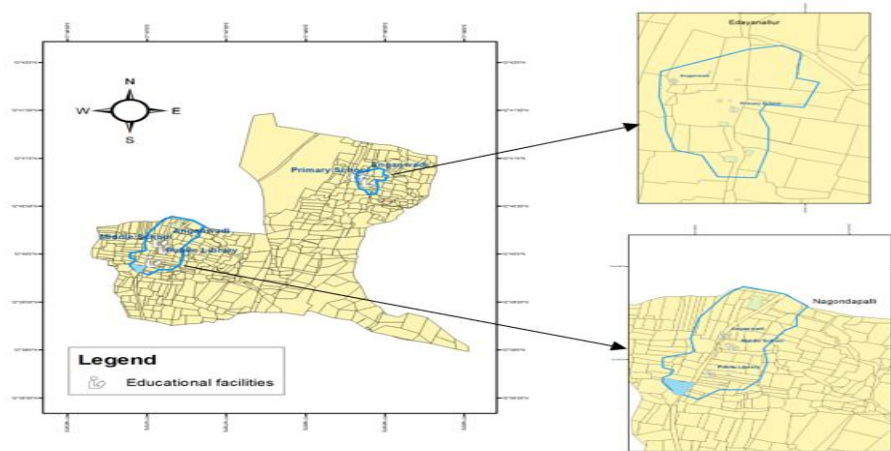
VII.RESULTS AND DISCUSSION

Asset maps are created for each asset category. These asset maps help in easily knowing a particular asset and its details.

A. Educational Assets

In our study area there are 5 educational assets. In this there are no high schools and higher secondary schools. Students need to go to nearby Mathigiri panchayat or some other place to pursue their high school and higher secondary school education.

Fig. 5 shows the asset map showing only the educational assets in Nagondapalli Panchayat. Also the attribute table giving the details of the assets is shown.



Asset *	Type	Run by	No. of students	No. of teachers	No. of rooms
Public Library	Government	1	1	1	Yes
Middle School	Co-ed	Government	B=31, G=41	6	6
Anganwadi	Co-ed	Government	B=9, G=6	1	1
Primary School	Co-ed	Government	B=13, G=17	2	4
Anganwadi	Co-ed	Government	B=13, G=12	1	1

Fig. 5 Educational Asset Map & Its Attributes

B. Governance Assets

Governance assets are those assets which are owned by the government and which performs the role of governing a particular area. There are 3 governance assets in Nagondapalli panchayat.

Fig.6 shows the governance assets which comes under Nagondapalli panchayat. The attribute table giving the details of the assets is also shown.

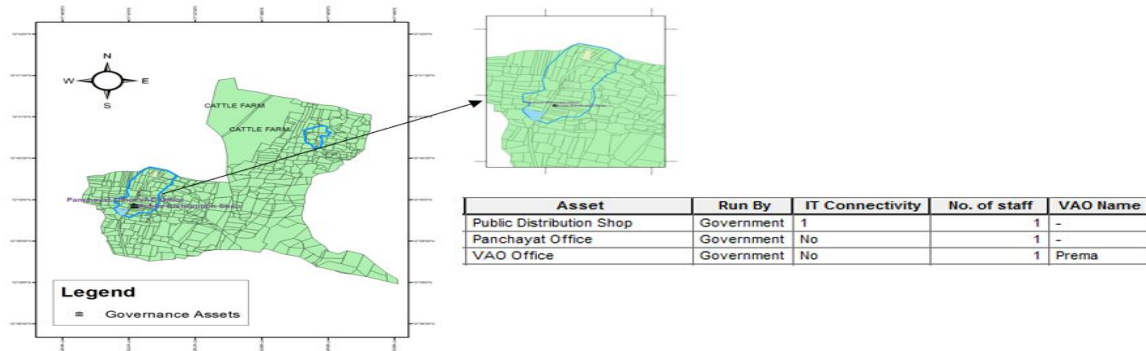


Fig. 6 Governance Asset Map & Its Attribute s

C. Productive Assets

The assets which produce something for business purposes come under productive assets. There are 5 assets in Nagondapalli which comes under this category.

Fig. 7 shows the productive assets in Nagondapalli and also the attribute table showing the details of the assets.

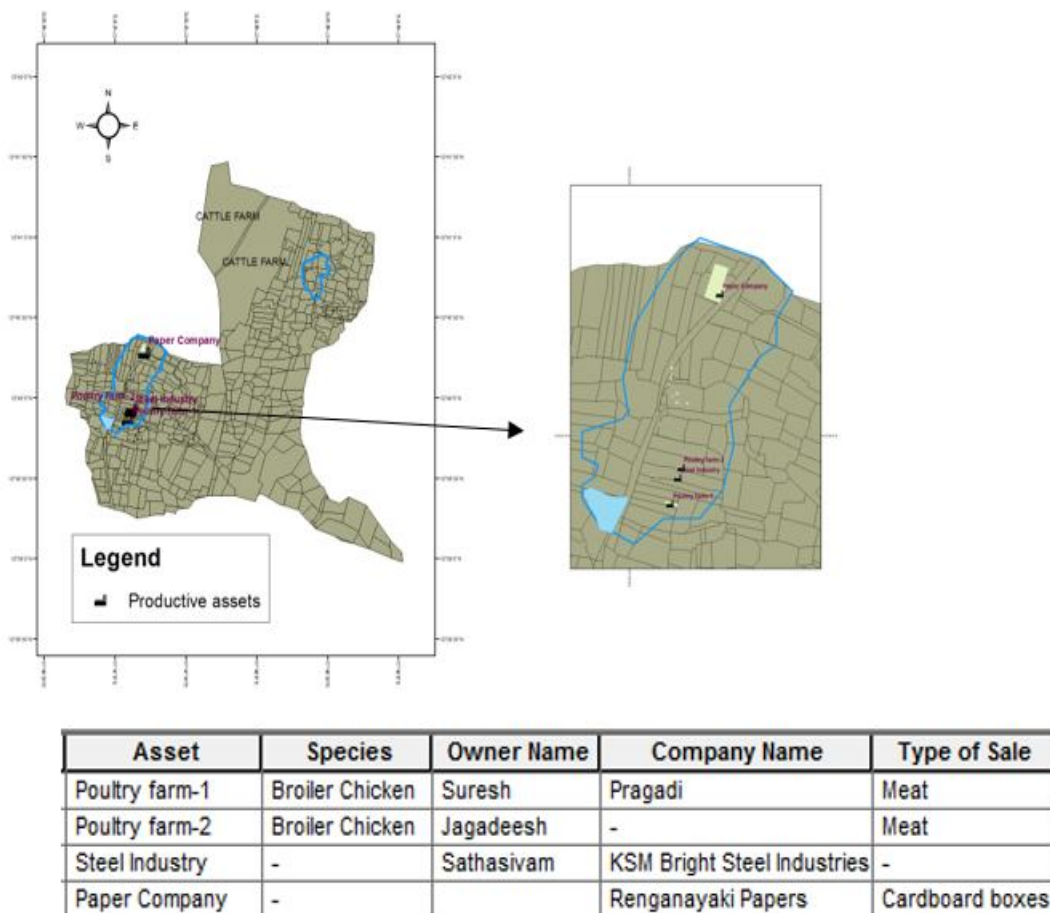


Fig. 7 Productive Asset Map & Its Attribute Table

D. Religious Assets

Assets such as temple, mosque, church, etc. come under religious assets. There are totally 7 temples in Nagondapalli panchayat.

Fig. 8 shows the religious places in Nagondapalli panchayat and its attribute table showing the names of the temple.

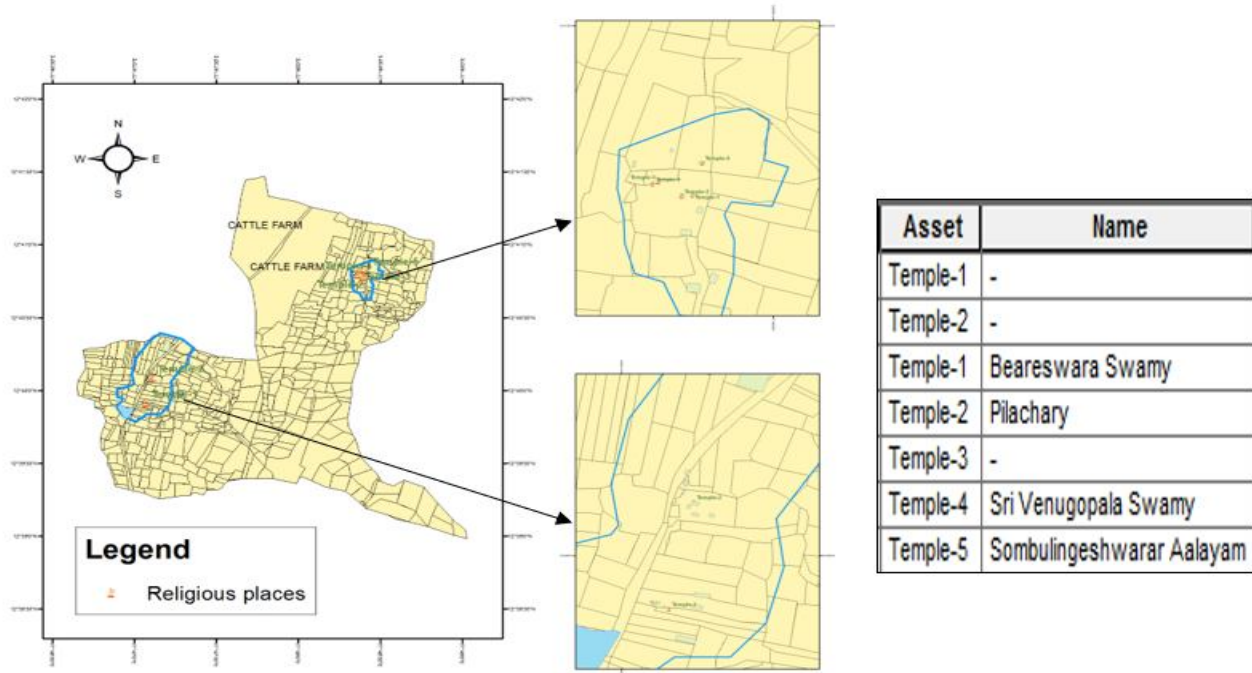


Fig. 8 Religious Asset Map & Its Attributes

E. Other Infrastructure Assets

In the study area there are 3 assets in this category namely 2 water tanks and a bus-stop.

Fig. 9 shows the other infrastructure assets in Nagondapalli and its details.

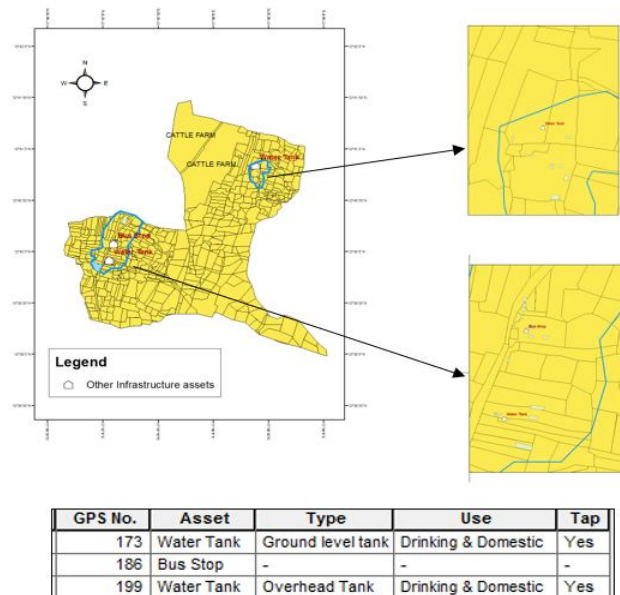


Fig. 9 Other Infrastructure Asset Map & Its Attributes

F. Other Civic Amenities

The assets such as grocery shop, public distribution shop, barber shop, etc. comes under this category.

Fig. 10 shows the other civic amenities in Nagondapalli and its details.

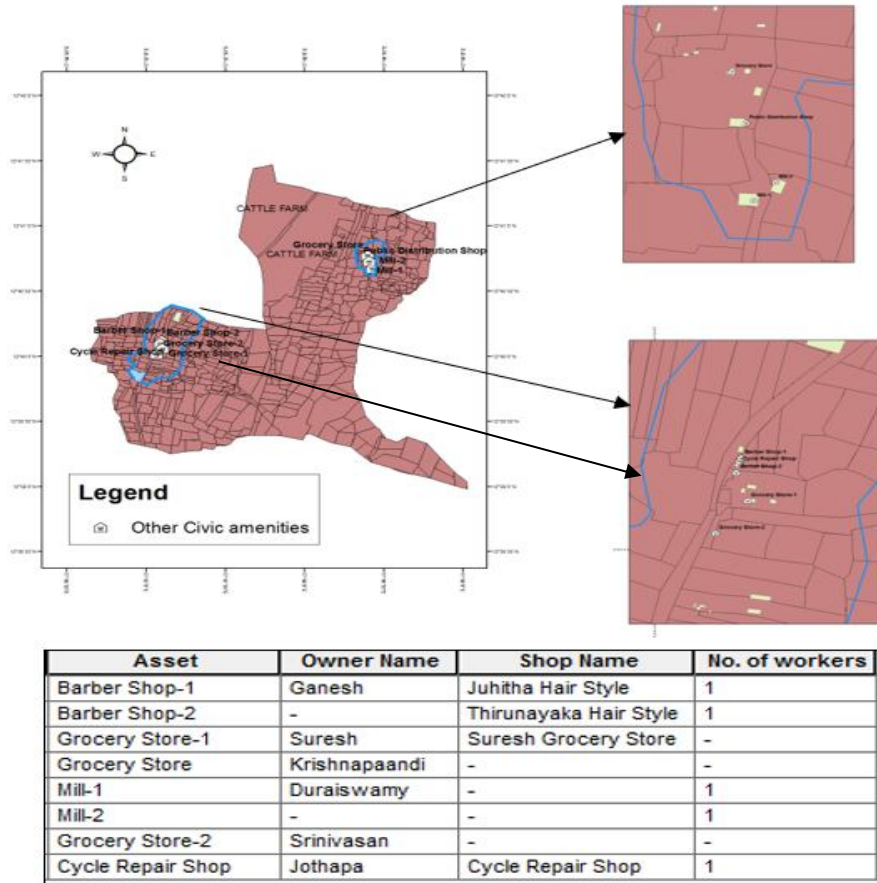


Fig. 10 Other Civic Amenities Asset Map & Its Attributes

G. Final Asset Map

The final asset map created for Nagondapalli panchayat is shown in Fig 11 and 12. 33 assets have been mapped, differentiated based on their category and their details are also added.

The assets are depicted by their individual symbols and shown in both Fig. 11 and Fig. 12.

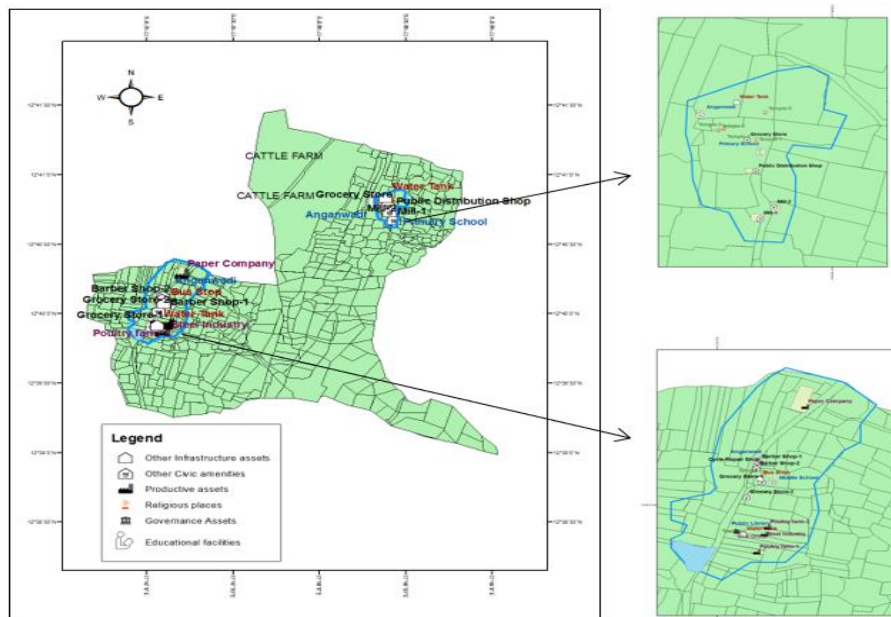


Fig. 11 Asset Map of Nagondapalli with Cadastral Background

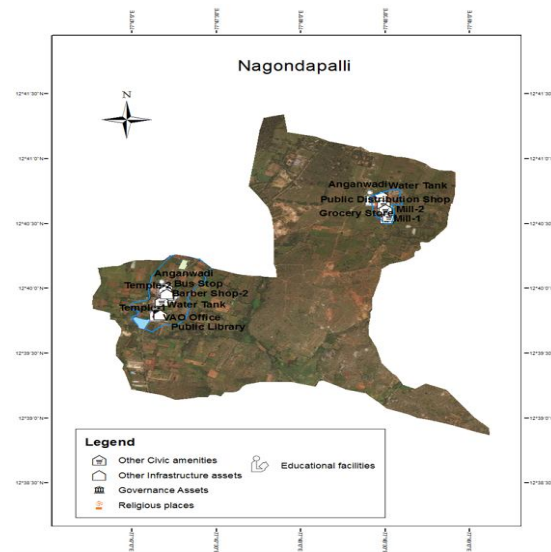


Fig. 12 Asset Map of Nagondapalli in Satellite Imagery

VIII. CONCLUSION

The final asset map for Nagondapalli panchayat has been created using ArcGIS software. This map helps in the future decision making related to further developments in that area. It also helps for the proper planning of the area when it undergoes further expansion in future avoiding the occurrence of menace in rural areas. It can be used by Revenue department, Agriculture and forestry management, Gram Panchayat development board and other various institutions. According to our analysis, the village doesn't have any health and medical facilities, sewage treatment plant and public toilets. There is an immediate need for financial institutions and Postal & telecom facilities.

IX. FUTURE ENHANCEMENT

An open source solution for the Asset Monitoring System is to be implemented, which helps us to know the status of the assets mapping process in various gram panchayat.

X. ACKNOWLEDGEMENT

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