



---

**Governmental Asset Mapping Using GIS – A Case Study of Kasaba  
Sangaon Village of Kagal Taluka, Kolhapur, Maharashtra**

---

**Kuldeep Dileep Mete, Dr. A. D. Gade, Vaishnavi S. Patil,**

**Amruta K. Hegaje, Sayali T. Murlidhar**

*Department of Geography,*

*D. R. Mane Mahavidyalaya, Kagal, Kolhapur, Maharashtra – 416216*

*Corresponding Author - Kuldeep Dileep Mete*

**DOI - 10.5281/zenodo.10906271**

---

**Abstract:**

*“Assets can be physical things like a building, a local swimming pool or a 150-year-old tree in the town square; assets can also be intangible, like the work that volunteer groups do to beautify the main street or raise funds for the food bank” (Asset Mapping a Handbook, [http://rural.gc.ca/conference/documents/mapping\\_e.phtml](http://rural.gc.ca/conference/documents/mapping_e.phtml).) The Asset-Based Community Development Institute (ABCD) considers local assets as the primary building blocks of sustainable community development (The Asset-Based Community Development Institute). For nearly three decades, Institute founders John Kretzmann and John McKnight gathered the stories of residents who built stronger neighborhoods in much the same way as the early pioneers, by focusing on their community strengths. (The Asset-Based Community Development Institute: <http://www.abcdinstitute.org/>).*

*The current research work is focused on geographical thinking. So it included the GNSS / GPS (Global Navigation Satellite System / Global Positioning System) based mapping of the “Governmental Assets”; which will be helpful for the community to access easily it. And become aware about the facilities providing by the specific asset and that can be helpful to community development. In current research work the asset locations are marked by using handheld GPS instrument. Then it cross verified using Satellite Images and Google Earth, later the georeferencing, shapefile formation and maps preparation is implemented using GIS based software.*

---

**Keywords: Asset, GNSS, GPS, Google Earth, GIS, Community asset mapping.**

---

**Introduction:**

**Background:**

An asset refers to any feature, component, resource, strength, or entity that enhances the capacity of community members to improve the safety, health, and well-being of their community (Foot &

Hopkins, 2010). Asset mapping, also known as Community asset mapping (CAM), which began with the aim to identify the prevailing communicative strengths within local communities and utilize these as prospective elements for

building healthy communities (Villanueva et al., 2016).

CAM includes the broad range of collaborative mapping processes exercised for visualizing, creating, and/or analyzing the spatial information associated with a particular community (Nelson, 2019). By using the process of CAM, one can identify, access and easily map all the individual, social, relational, physical, and economic resources that a community holdings (Naiema Taliep & Ghouwa Ismail, 2023).

Community assets can be intangible (assets that are not physical in nature, those we cannot see, feel or touch, e.g., values) or tangible (have a physical form – those we individuals can touch, see and feel, like a building) resources of a community (Cochrane et al., 2022; Cutts et al., 2016; Lazarus et al., 2017; Taliep et al., 2020).

Community mapping is a consecutive way of recognizing, visually portraying, ranking and mobilizing materialistic and unmaterialistic community assets. There are different ways of mapping community resources, including participatory community-engaged mapping, online mapping using Geographic Information Systems (GIS), compiling a capacity inventory, cultural mapping, community relationship mapping, and developing an interest checklist (Naiema Taliep & Ghouwa Ismail, 2023). Asset mapping has been used in numerous contexts with various populations, and with diverse aims. Several disciplines have used asset

mapping for research and development in a variety of areas, including education, land use, health, and crime and violence prevention (Chambers, 2006).

Weng (2016), for example, used asset mapping to determine informal and formal social support networks or service assets accessible to the Jacksonville Asian American community in Florida to obtain a more comprehensive account of help-seeking behaviour behavior in this community. In Canada, Fang et al. (2016) used this method to explore experiences of place, uncover the barriers and enablers to gaining access to the built environment, as well as to co-develop place-based solutions with service providers and older residents in a new inexpensive housing development program (Naiema Taliep & Ghouwa Ismail, 2023).

The Asset mapping approach takes benefit of a community's strengths and resources through collaborative mapping, and, thus, eases the process of uncovering solutions. CAM give inputs and promotes community engagement, participation, ownership, and sustainability (Lazarus et al., 2017). This approach not only cultivates the community building, but also it cultivates self-reliance, provides tools for teaching problem solving, and strengthens community ties (Weng, 2016).

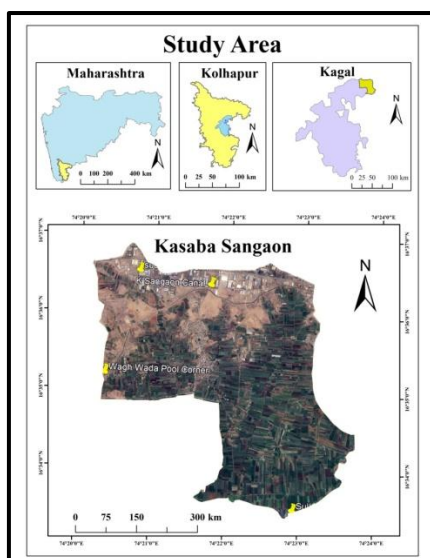
Overall the asset mapping helps to the community building, community development along with that the societal building and societal development is get put forwarded. This is only the reason behind the choice of research topic; and that is “Governmental Asset Mapping”.

The aim of the current research is to allow Map user on ArcGIS to visualize the Building or location of Assets. The current research work allows to the Map reader get visualized the Asset Building by identify feature button while reading map on ArcGIS.

### Study Area:

The study area chosen for current research work is Kasaba Sangaon. It belongs from Kagal Taluka, Kolhapur district, Maharashtra. The Kasaba Sangaon is located near to the bank of Dudhaganga river. The distance between it is near by 5 km. Its historical roots found to goes back to 1627, during Shivaji Maharaja: famous Maratha warrior's, empire. Kasaba sangaon is known as village of freedom fighters. Kasaba Sangaon has strong history of freedom fighters during pre - independence of India.

Kasaba Sangaon is a small town located south-East to Kolhapur city in Southwest Maharashtra and extended in between  $16^{\circ} 33' 30''$  N to  $16^{\circ} 37' 00''$  N and  $74^{\circ} 20' 00''$  E to  $74^{\circ} 23' 40''$  E.



Climate is a blend of coastal and inland climate of Maharashtra. The temperature has a relatively narrow range between  $12^{\circ}\text{C}$  to  $35^{\circ}\text{C}$ . Summer comparatively cooler, but much more humid, compared to neighbouring inland cities. Maximum temperatures rarely exceed  $38^{\circ}\text{C}$  and typically range between  $33$  and  $35^{\circ}\text{C}$ . Overall weather is good for farming.

Economy of the town strongly centred on agriculture. Around 70% of land is under cultivation. Sugarcane is major crop of the town. Dairy and Vegetation are constitute major share for their daily incomes as sugarcane revenue is annual basis. The village has strong economy due to its well-developed co-operative base. As most of institution are run on co-operative basis. Whether it is irrigation, finance, dairy or schools. In past few years by Kagal Five Star MIDC is developing. As MIDC's major land share is from Kasaba Sangaon town, so over the past few years' employment rate is growing in Kasaba Sangaon.

**Figure 1: Location map of study area.**

### Materials and Method:

#### Data Used:

Proposed research work utilized both the primary data and secondary data. In primary data source the GNSS / GPS based latitude and longitudes of asset location has taken by using hand held mobile based GPS system. Along with that the photographs of the buildings has captured to utilize in GIS environment.

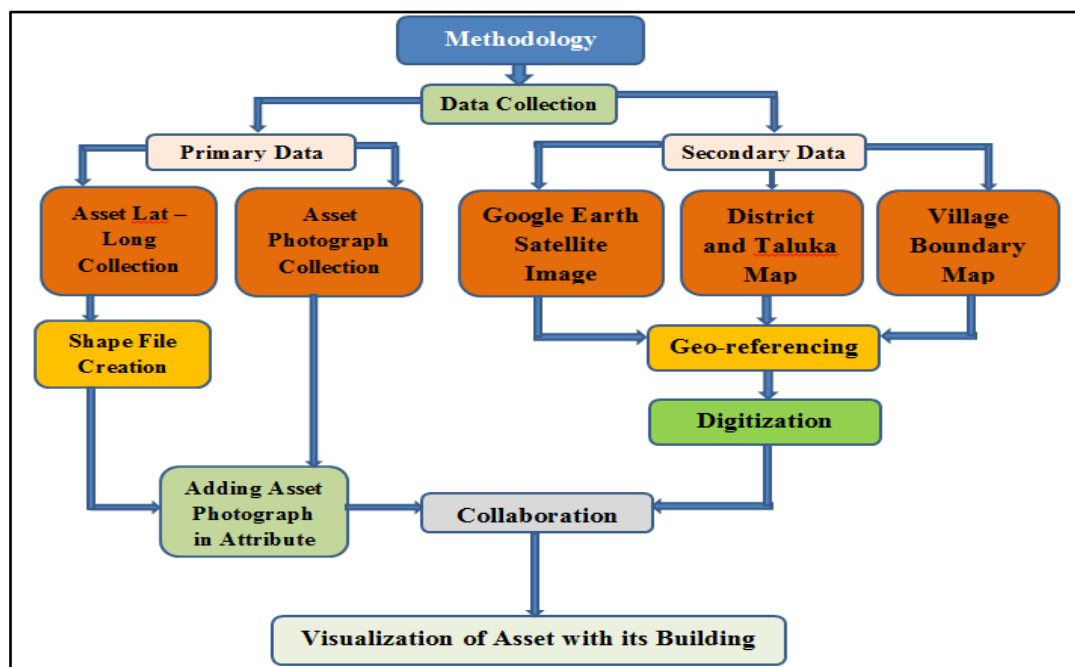
| Sr. No. | Data Used                             | Source of Data   |
|---------|---------------------------------------|--|
| 1.      | GNSS / GPS Data Collection            | GNSS / GPS Mobile Based Survey (Primary Data)                  |
| 2.      | Asset Building Photograph Capturing   | Mobile Based Photograph Capturing (Primary Data)               |
| 3.      | District Map, Taluka Map, Village Map | MRSAC<br>(Maharashtra State Remote Sensing Application Centre) |
| 4.      | Google Earth Satellite Image          | Google Earth   |

**Table 1: Database used for the research work.**

In secondary data the MRSAC published Village map downloaded from MRSAC website and it used for getting village

boundary. The Google Earth satellite Image has taken through the Google Earth.

#### Method:



**Figure 2: Method used for research work.**

The research work started with the data collection. The data collection included both primary data and secondary data. The primary data collection includes the GNSS / GPS based latitudinal and longitudinal

location information and photograph acquisition of governmental assets.

In secondary data collection the Google Earth based satellite image of study area has taken from Google Earth browser, then the District Map, Taluka

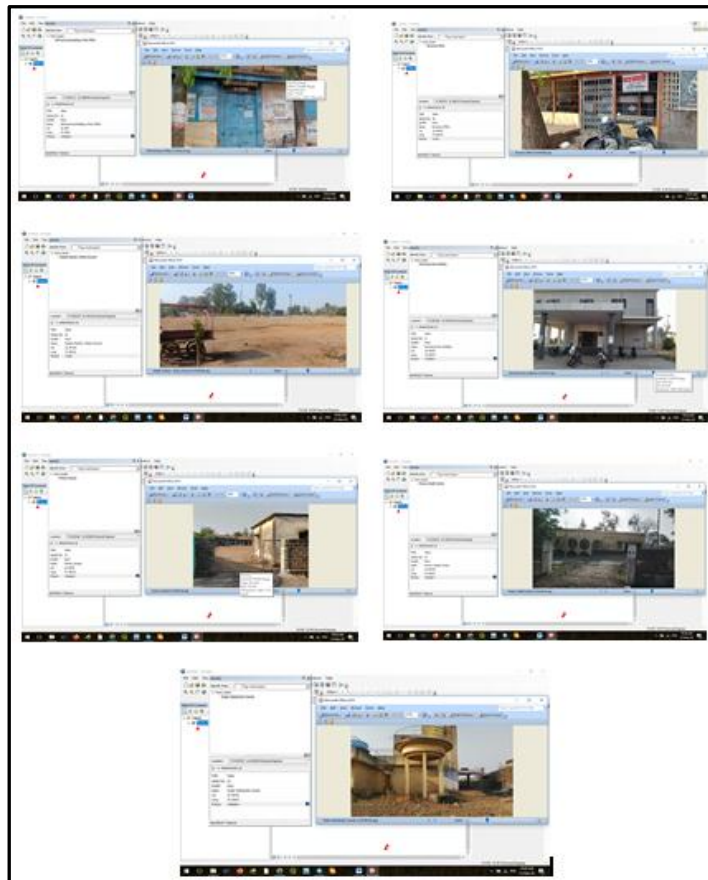
Map and Village Map are collected from MRSAC (Maharashtra State Remote Sensing Application Canter).

Later the GNSS / GPS based collected data is converted in to the location shape files. Then the photographs of the Governmental Assets are attached to the Attributes of the Assets.

There after the geo-referencing is implemented and digitization processes has done using geo-referenced maps.

### Result:

After the implementation of all methodology as per the aim of research the result is cross checked. The research fulfilled the aim. Each and every Governmental Asset building or location which is included in research is get visualized using identify tool in ArcGIS.



**Figure 3: Screen Shots of Governmental Assets attached to Shape file in ArcGIS Environment.**

### Conclusion:

In current days GIS makes various tedious geographical work much easier and it is vary mush useful in differential research work such like social, scientific and technological research work.

### Future Direction:

Governmental Asset Mapping is highly useful for the community development. In GIS as per future perspective there is huge scope to develop Web GIS based Government Asset Mapping and formation of Mobile based

Asset Mapping Application which will be tremendously useful not only for community people but also Government itself for future planning and its implementation and make the possible of community development.

### References:

1. A Practical Guide to GIS in Asset Management.  
<https://www.esri.com/content/dam/esrisites/sitecore-archive/Files/Pdfs/library/whitepapers/pdfs/a-practical-guide-to-gis-in-asset-management.pdf>
2. Asset Mapping a Handbook,  
[http://rural.gc.ca/conference/documents/mapping\\_e.phtml](http://rural.gc.ca/conference/documents/mapping_e.phtml)
3. The Asset-Based Community Development Institute:  
<http://www.abcdinstitute.org/>
4. Alevizou, G., Alexiou, K., & Zamenopoulos, T. (2016). Making sense of assets: Community asset mapping and related approaches for cultivating capacities. The Open University and AHRC.
5. Astaburuaga, J., Martin, M. E., Leszczynski, A., & Gaillard, J. C. (2022). Maps, volunteered geographic information (VGI) and the spatio-discursive construction of nature. *Digital Geography and Society*, 3, 100029. <https://doi.org/10.1016/j.diggeo.2022.100029> Received
6. Beaulieu, L. J. (2002). Mapping the Assets of Your Community: A Key Component for Building Local Capacity. Southern Rural Development Center.  
[http://srdc.msstate.edu/publications/27/227\\_asset\\_mapping.pdf](http://srdc.msstate.edu/publications/27/227_asset_mapping.pdf)
7. Bergdall, T. D. (2012). Facilitating asset based community development. In T. Timsina & D. Neupane (Eds.), *Changing lives, changing society: ICA's experience in Nepal and in the World*.
8. ICA Nepal, Kathmandu.
9. Burns, J. C., Paul, D. P., & Paz, S. R. (2012). *Participatory asset mapping: A community research lab toolkit*. Advancement Project – Healthy City
10. <https://communityscience.com/wp-content/uploads/2021/04/AssetMappingToolkit.pdf>
11. Chambers, R. (2006). Participatory mapping and geographic information systems: Whose map? Who is empowered and who is disempowered? Who gains and who loses? *The Electronic Journal of Information Systems in Developing Countries*. 25, 1e11.
12. Cochrane, J. R., Taliep, N., Lazarus, S., McGaughey, D., Christie, D., Seedat, M., Cutts, T., & Gunderson, G. (2022). “Spiritual Capacities” in Psychological Research: Confronting the Appearances. *Social and Health Sciences*,  
<https://unisapressjournals.co.za/index.php/SaHS/article/view/10423>
13. Cochrane, L., & Corbett, J. (2020). Participatory mapping. In *Handbook of communication for development and social change* (pp. 705-713). Springer, Singapore.
14. Corbett, J., Rambaldi, G., Kyem, P., Weiner, D., Olson, R., Muchemi, J., McCall, M., & Chambers, R. (2006). *Overview: Mapping for change – the emergence of a new practice*. <https://opendocs.ids.ac.uk/opendocs/bitstream/handle/20.500.12413/330/rc54.pdf?sequence=1>
15. Crozier, M. & Melchior, F. (2013). *Perspectives in Adult Education—Asset mapping: A course assignment and community assessment*. *New Horizons in Adult Education & Human Resource Development*, 25(3), 125-129.
16. Cutts, T., Olivier, J., Lazarus, S., Taliep, N., Cochrane, J. R., Seedat, M., van Reenen, R., Hendricks, C., & Carelse, H. (2016). *Community asset mapping for violence prevention: A comparison of views in Erijaville*,

- South Africa and Memphis, USA. African Safety Promotion Journal, 14(1).  
<https://www.ajol.info/index.php/asp/article/view/147998>
17. Luo, X., & Park, W. (2020). Development of a Web-Based GIS Learning Module for Community Asset Mapping to Enhance Service Learning in Social Work Education. *International Journal of Librarianship*, 5(1), 36-52.
  18. Dorling, D. (1998). Human cartography: When it is good to map. *Environment and Planning*, 30, 277-288.
  19. Edney, M. H. (2019). *Cartography: The ideal and its history*. The University of Chicago Press.
  20. Elizabeth Lightfoot, Jennifer Simmelink McCleary, and Terry Lum. (2019). Asset Mapping as a Research Tool for Community-Based Participatory Research in Social Work. *Social Work Research* Volume 38, Number 1, 2014.
  21. Fang, M. L., Woolrych, R., Sixsmith, J., Canham, S., Battersby, L., & Sixsmith, A. (2016). Place-making with older persons: Establishing sense-of-place through participatory community mapping workshops. *Social Science & Medicine*, 168, 223-229.
  22. Foot, J. & Hopkins, T, (2010). A glass half-full: How an asset-based approach can improve community health and well-being. Improvement and Development Agency (IDeA).
  23. <http://bankofideas.com.au/Download/GlassHalfFull.pdf>
  24. Gupta, A. (no date) Participatory Learning and Action – A Review. HS 318 Decentralization and Governance.  
<https://www.copasah.org/uploads/1/2/6/4/12642634/participatory-learning-and-research-a-review.pdf>
  25. Kretzmann, J. P. (2010). Asset-based strategies for building resilient communities. In J. W. Reich, A. Zautra & J. S. Hall (Eds.), *Handbook of adult resilience*. Guilford Press.
  26. Kretzmann, J. P., & McKnight, J. L. (1993). *Building communities from the inside out: A path toward finding and mobilizing a community's assets*. Institute for Policy Research.
  27. Kretzmann, J. P., & McKnight, J. L. (1997). *A guide to capacity inventories: Mobilizing the community skills of local residents*. ACTA Publications.
  28. Kretzmann, J. & McKnight, J. (2005). *Discovering community power: A guide to mobilizing local assets and your organization's capacity*. Asset-based Community Development Institute, School of Education and Social Policy; Northwestern University.
  29. Lazarus, S., Taliep, N. & Naidoo, A. (2017). Community asset mapping as a critical participatory research method. In M. Seedat, S. Suffla, & D. Christie. *Community, liberation and public engagement* (pp. 45-59). Springer.
  30. Lisho C. Mundia (2016). Participatory Mapping Approaches Aided by GIS Technology towards Sustainable Land Use Planning in Namibia. *Environment and Ecology Research* 4(6): 289-293.
  31. Marc Schlossberg, ( ). *Asset Mapping and Community Development Planning with GIS: A Look at the Heart of West Michigan United Way's Innovative Approach*.  
[https://pages.uoregon.edu/schlossb/arcpad/WUN/documents/schlossberg\\_a\\_rnova.pdf](https://pages.uoregon.edu/schlossb/arcpad/WUN/documents/schlossberg_a_rnova.pdf)
  32. Naiema Taliep & Ghouwa Ismail. (2023). *Community Mapping Method*. Springer.  
[https://link.springer.com/referenceworkentry/10.1007/978-3-030-96778-9\\_57-2](https://link.springer.com/referenceworkentry/10.1007/978-3-030-96778-9_57-2)
  33. Nelson, S. (2019). Participatory mapping for community engagement and empowerment. <https://sophia->

- [nelson.weebly.com/uploads/1/2/4/9/1/24900888/finalwriteup\\_1.pdf](https://nelson.weebly.com/uploads/1/2/4/9/1/24900888/finalwriteup_1.pdf)
34. Panek, J. (2015). How participatory mapping can drive community empowerment – a case study of Koffiekraal, South Africa. *South African Geographical Journal*, 97(1), 18-30.  
<https://doi.org/10.1080/03736245.2014.924866>
35. Rouse, M. (2019). Online mapping. <https://whatis.techtarget.com/definition/online-mapping>
36. Schiffer, E. (2007, May 1-6). Net-Map toolbox: Influence mapping of social networks. International Food Policy Research Institute. Presented at the Sunbelt Conference of the International Network of Social Network Analysis, Corfu, Greece.
37. Stuart, G. (2013). What is asset-based community development (ABCD)? Retrieved from <https://sustainingcommunity.wordpress.com/2013/08/15/what-is-abcd/>
38. Taliep, N. (2016). Process evaluation of the development of a community-based participatory intervention promoting positive masculinity and peace and safety: Addressing interpersonal violence in a Western Cape community (Unpublished doctoral dissertation). University of South Africa, Pretoria.
39. Taliep, N., Lazarus, S., Cochrane, J., Olivier, J., Bulbulia, S., Seedat, M., Swanepoel, H. & James, A. (Online, 2020). Community asset mapping as a strategy for developing an interpersonal violence prevention program. *Action Research*. <https://doi.org/10.1177/1476750319898236>
40. Taliep, N., Bulbulia, S., & Ismail, G. (2022). Using community asset mapping to foster social inclusion in developing an interpersonal violence prevention program in South Africa. In P. Liamputtong (Ed.), *Handbook of social inclusion, research and practices in health and social sciences* (pp. 1-16). New York: Springer.
41. Taliep, N., Lazarus, S., Cochrane, J., Olivier, J., Bulbulia, S., Seedat, M., Swanepoel, H. & James, A. (Online, 2020). Community asset mapping as a strategy for developing an interpersonal violence prevention program. *Action Research*. doi: 10.1177/1476750319898236
42. Vanier, D.J. (2004). Geographic information systems (GIS) as an integrated decision support tool for municipal infrastructure asset management. Une version de ce document se trouve dans :CIB 2004 Triennial Congress, Toronto, Ontario, May 2-9, 2004, pp. 1-10.
43. Villanueva, G., Broad, G. M., Gonzalez, C., Ball-Rokeach, S., & Murphy, S. T. (2016). Communication asset mapping: An ecological field application toward building healthy communities. *International Journal of Communication*, 10, 2704–2724.
44. Weng, S. S. (2016). Asset mapping for an Asian American community: Informal and formal resources for community building. *Psychosocial Intervention*, 25, 55–62.
45. Weyer, D., Bezerra, J. C., & De Vos, A. (2019). Participatory mapping in a developing country context: Lessons from South Africa. *Land*, 8(9), 134.
46. Young, R. F. (2010, March 6–9). Discursive practice in language learning and teaching. Plenary delivered at the annual meeting of the American Association for Applied Linguistics Atlanta, Georgia.