

Archaeological remains in and Around *Avati* hill

Sonia Das¹, Ekta Gupta² and M.B Rajani³

National Institute of Advanced Studies, IISc Campus, Bangaluru 560012, India.

1- sonia.civil@gmail.com, 2- ekta.geo@gmail.com, 3- mbrajani.nias@gmail.com

Introduction

Avati (*Avathi*) also known as *Ahuti* is situated at a distance of around 40 kms north of Bangalore. The village comes in *Devanhalli taluk* and is well connected to Bangalore by NH-7. This place is of historical importance as *Ranabhairegowda*, the first known chief of *Yelahanka Nadaprabhus* came from *Yenamanji Puttur* in Tamil Nadu and settled in *Avati*. Later his sons founded *Doddaballapur*, *Devanhalli* and *Chikballapur*. *Kempe Gowda 1*, the founder of Bangalore is believed to be of this clan^{1&2}. It is believed that *Avati* hill was fortified and different parts of the hill were being used as residence by the royal family³. This place has temples, which were built by the *Nadaprabhus*⁴. As there is very limited published information about this site, this paper draws information from available resources and extends the study based on satellite image interpretation and field study.

The site *Avati* is also known to have antiquity from prehistoric era. *C. Hayavadana Rao* points out 'In the valley between the *Avati* hill and *Kolugudda* are several cromlechs, each situated within a circle of rough stones, the top slab being about one foot thick and nine or ten feet square'⁵. He further goes on to say: 'It is a wonder how does gigantic slabs were got to their place'. During Arthur Cole's time (19th century) few of these cromlechs were studied by having their top slabs broken and antiquities such as pots, iron sandals, spear and bones were relocated to Bangalore⁶. *Suryanath Kamath*, in gazetteer of Bangalore rural district writes: 'In between these two tall rocks, in the plain valley, are big stone dolmens of the pre-historic era'.⁷ The Archaeological Survey of India, Bangalore Circle has reported that Neolithic celts⁸ and burial remains were found in *Avati*.

The ash pits, hero stones, ancient pottery, Neolithic celts and temples are of great archaeological importance which make *Avati* an important site for further scientific investigations.

Research focus and Objectives

The village *Avati* shares cultural association with Bangalore city as the ancestors of *Kempe Gowda*¹ settled here. In view of the recent socio-economic developments, *Avati* is now regarded important for its closeness to cosmopolitan city Bangalore, and it's International Airport, in terms of distance. The hills in and around the village are being quarried for granite. As the city grows the demand of land for housing and infrastructure is increasing posing threat of encroachment and eventual destruction of archaeological landscapes in close proximity.

In this paper we are using remote sensing with GIS to study the landscape and its change over a period of time. This study has used multispectral data to study the landscape for identifying archaeological features on and around the *Avati* hill. We have geo-tagged features of archaeological importance which include temples, tanks and prehistoric artefacts. Using geo informatics as a tool we have integrated information from historical records to come up with a site information map.

Materials and Methodology

It is more challenging to decide the extent of area to be studied at a landscape level, when an archaeological site does not have remains in the form of visible ruined monuments. The cultural remains that we see now are not just monuments but were a part of a larger settlement so there are few things that we have considered for selecting area of interest. For example: water bodies, such as wells, ponds, canals and tanks near *Avati* hill. As water is an essential requirement for sustenance, past settlements would have found ways to access water. Google earth was used to delineate the extent of the site; the boundary created was saved as Keyhole

Table 1: List of data used for the study			
Satellite/ Sensor	Spatial resolution (m)	Swath (Km)	Date
IRS-P6 LISS-4	5.8	23	26.04.09
IRS-R2 LISS-4	5.8	23	9.01.2014
CARTOSAT- 1	2.5	30	23.05.2011
GeoEye 01	0.5	15.2	7.04.2013

Table 1: Details of the satellite data acquired for the study.

Mark-up Language (KML) file which is further used in our study to acquire satellite data from NRSC and Digital Globe (Table 1). The map from Dr. S.K Aruni's book was also referred for the study⁹. The methodology followed for this study has been explained in Figure 1.

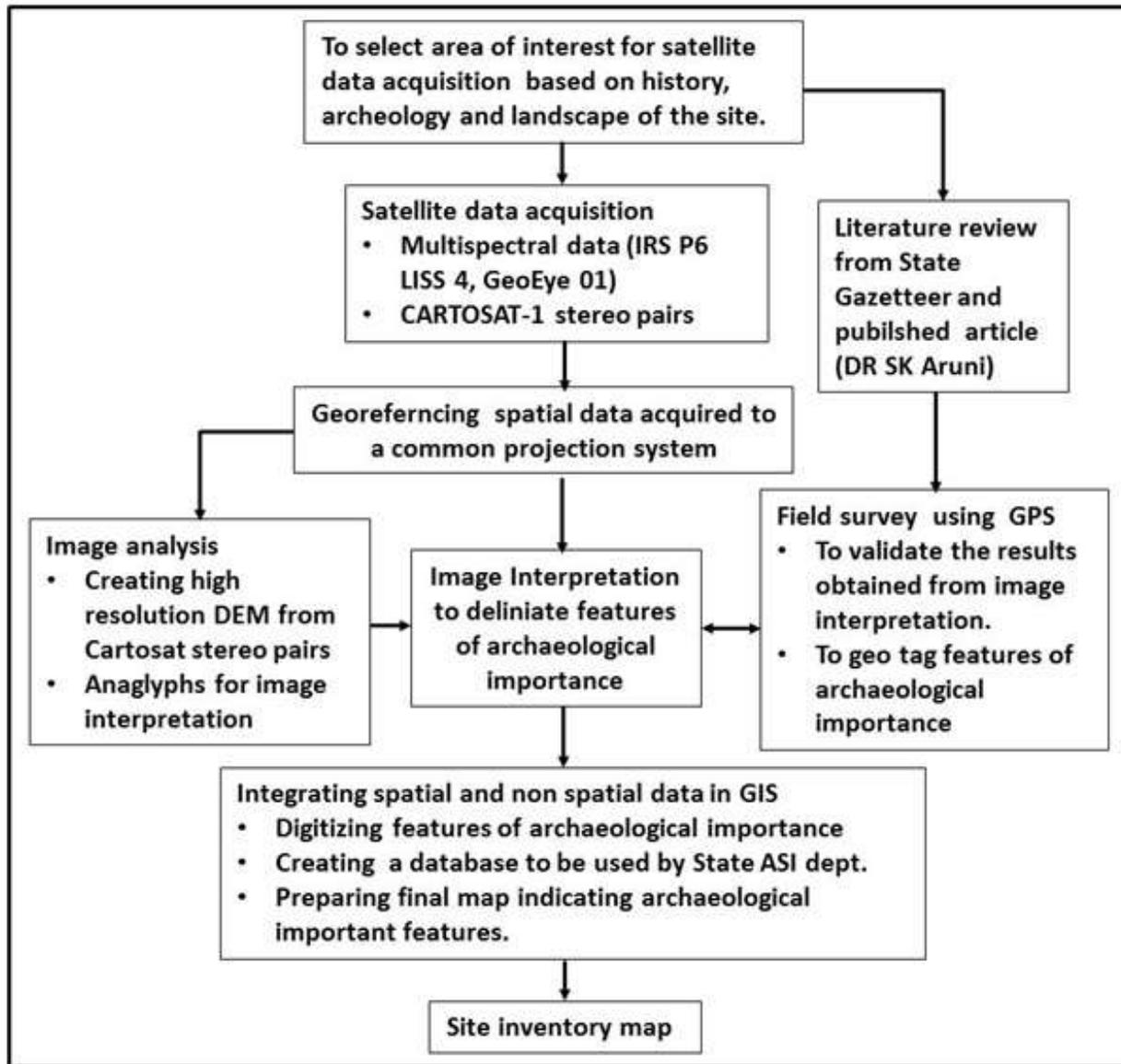


Fig. 01: Methodology Chart

Use of multispectral images for detecting moats and canals

IRS-P6 LISS 4 and Geo-eye 1 multispectral data were geo referenced using coordinates of common locations (road intersections) in QGIS software. Geo referencing is a procedure of giving geographical reference to satellite images. The use of multispectral data for detection of moats has been discussed in literature ^{10 11}. False Colour Composite (FCC) Geo Eye-01 imagery was analysed in Erdas Imagine software. Our Analysis revealed a moat and a canal connected to the site:

1. Moat: Positive crop mark (vegetation that is healthier, compared to surrounding, following shape of an archaeological ditch/moat/canal) encircling *Avati* hill was observed (Figure 2). Ground survey conducted using GPS revealed that the positive crop mark around the *Avati* Hill could be a moat surrounding the royal area, ground images from the site (Fig. 2a) shows the presence of structured boulders.
2. Canal: Curvilinear pattern of positive crop mark encircling the village was noticed (Fig. 2) which on ground survey revealed to be canal and is locally known as Raj Kalve (royal canal). Parts of the canal were found to be dysfunctional at the time of ground survey (Fig. 2b and 2c).

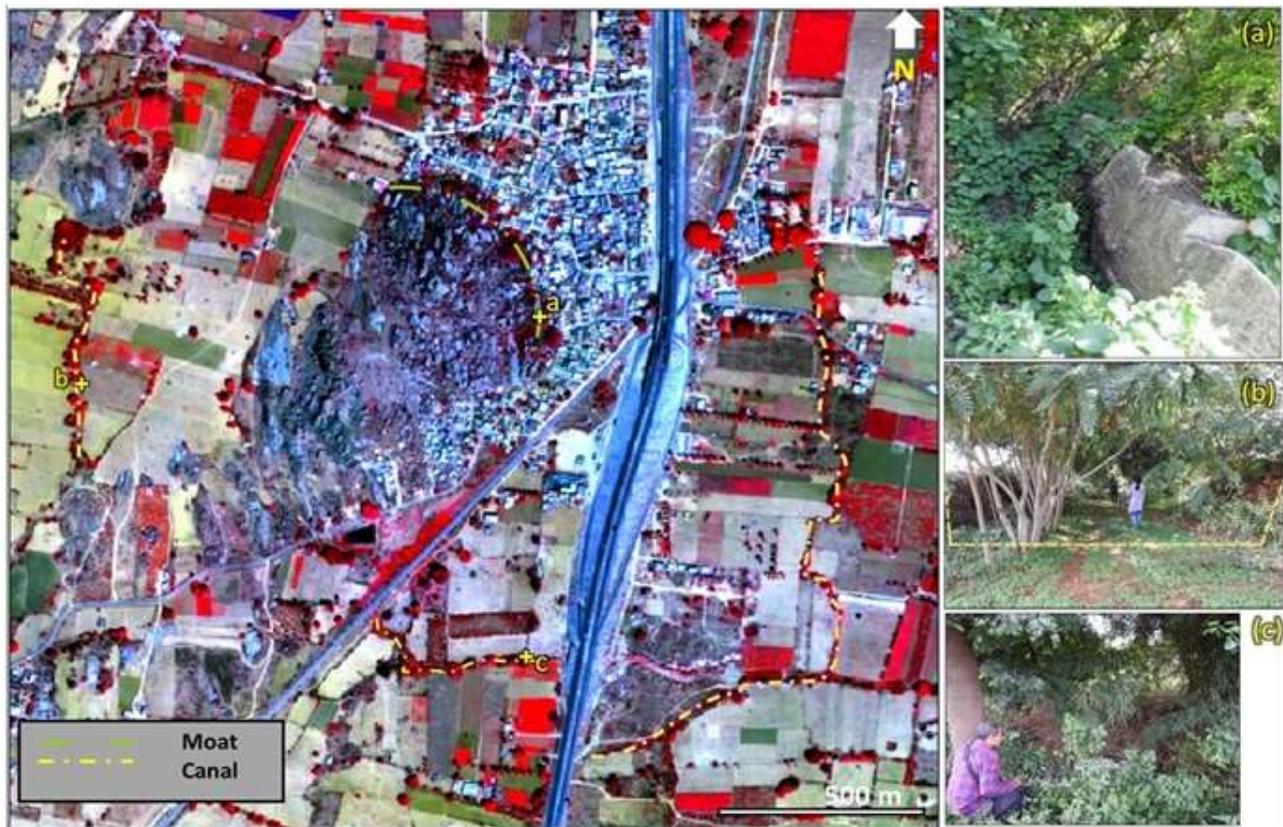


Fig.2: Pansharpened FCC image indicating crop marks with ground images marked as; (a) moat surrounding the hill; (b) canal as seen on western side of the hill; (c) canal on the south eastern side of hill.

Geo-tagging features of archaeological interest

Geo tagging features of interest becomes an important task to analyse the site in future; it also serves as a database for researchers and government body. This place has temples dedicated to *Chennakeshava* whose idol was set up by *Ranabhairgowda* and temples belongs to 16th century¹². In our work, we have geo-tagged features of interest such as temples, hero stones, Neolithic celts and locations where remains of ancient pottery were found. The geographic references of these objects

were determined in our field visit. The features of interest were geo-tagged using a hand held GPS and fed into GIS software. Road and railway network has been digitized using GIS mapping software (QGIS Desktop) to visualize the proximity of the site to present infrastructure network.

Results and Discussions

This study has found the following features as shown in Figure 3, 4a, 4b and 5 that are of archaeological interest; these can be used as pointer for further archaeological exploration:

- (i.) Based on Arthur Cole's investigation as reported in Mysore Gazetteer this study has identified area that is reported to have traces of prehistoric remains. Field survey was conducted aiming to find traces of prehistoric structures. The hero stones and probable prehistoric structures have been geo-tagged using GPS. Figure 3 shows spatial distribution of archaeological artefacts. One hero stone found amidst the fields (marked as point 4 in Figure 3) could be potential structure for study as it is an enclosure with stone slabs on three sides with one of them having inscriptions(ref Figure 4a). A detailed archaeological survey is necessary for ascertaining their condition.

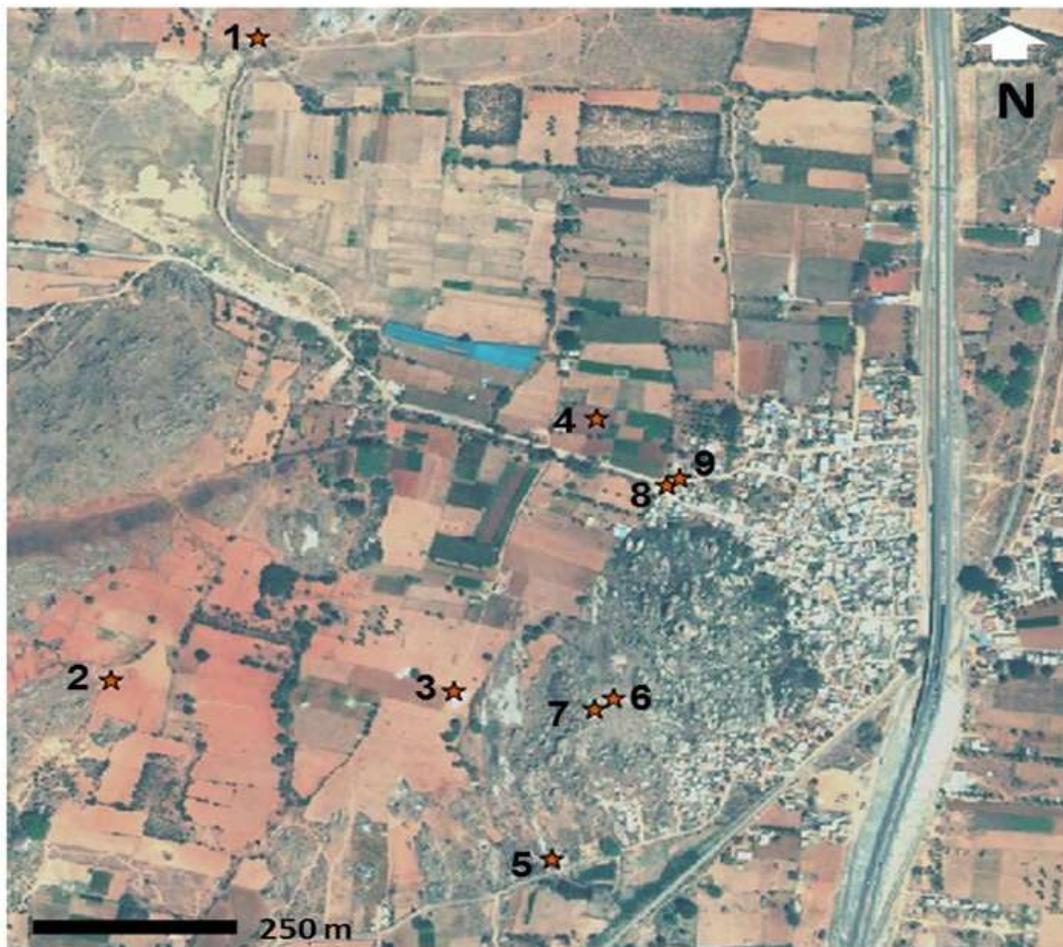


Fig. 3: Spatial distribution of archaeological artefacts in and around Avati hill (Satellite data: Geo Eye 1; imagery date 7.4.2013)



Fig. 4a: Photographs from field visit showing: 1) A large, thick horizontal stone slab, which looks like the capstone of a megalith, but considerably larger; 2) Hero stone showing a couple; 3) Slab circle megalith; 4) Hero stone with inscriptions



Fig. 4b: Photographs from field visit showing: 5) Neolithic tools found out of context; 6) Remnants of pottery found in situ; 7) Could be remnants of stone circle/cairns (megaliths); 8) Hero stone found covering drain; 9) Hero stone

(ii.)The positive crop shown surrounding the hill in Figure 2 could be a moat as the hill was once fortified. In our field visit we found a moat like depression with dressed stones on this crop mark location identified on satellite image (ref Figure 2). The hill has few boulders pointed out which were supposed to be placed where the Prabhus kept their Gods¹³. The hill has a boulder with a sculpture of female Figure known as Veer Kempamma (princess of the Prabhu family) and a part of the hill was called her *bidu* (residence) and another portion of the hill is called *Dodda bidu* (great residence) where the Prabhus had their houses¹⁴. These features are evidences of the location being Royal area. The moat detected in this study surrounds the hill and therefore would have behaved as a protective barrier for the royal area.

(iii.)In Figure 2 linear pattern of vegetation mark is seen, which on ground is a canal, supposed to have drawn water from the adjoining water body. The canal as seen in Figure 6 encircles the settlement suggesting it could have served as outer boundary. The present land use has altered the landscape. Infrastructure network (road and railway network) cuts across the area bound by canal dividing the settlement and disintegrating the archaeological landscape.

(iv.)Other existing historical features in the place that were geo-tagged are; Temples dedicated to Chennakeshava, Eshvara, Anjaneya and Timmarayaswamy temples (see Figure 5) which belong to 16-17th century¹⁵.

- A boulder in Figure 5 marked as point “k” is named as Kumbegundu by the natives; by its height it seems like it may have served as a watch tower¹⁶.
- Kannikamma’s rock as shown in Figure 5 is locally worshipped in time of droughts¹⁷.

Sites such as *Avati* comes under State Archaeological Department and often are ignored due to not being popular amongst tourist, thus they suffer from threat of encroachment under the pressure for settlement and infrastructure development. In this case the close proximity of site to NH 7 makes it even more vulnerable. The *Avati* hill should be protected, as it contains archaeological remains. Our site visit reveals that the boulders on the hill are being quarried (Figure 6b); such activities have to be prohibited if the heritage of the area is to be preserved.



Fig. 5: Avati hill and its environs ; Ground images of (1)Kumbegundu (see red arrow for reference), (2)Veer Kempamma's statue, (3)Kannikalamma's rock; (T2) Anjaneya Temple; (T3) Chennakesava Temple; (T4) Eshwara Temple; (T5) Kanika Parameshwari Temple

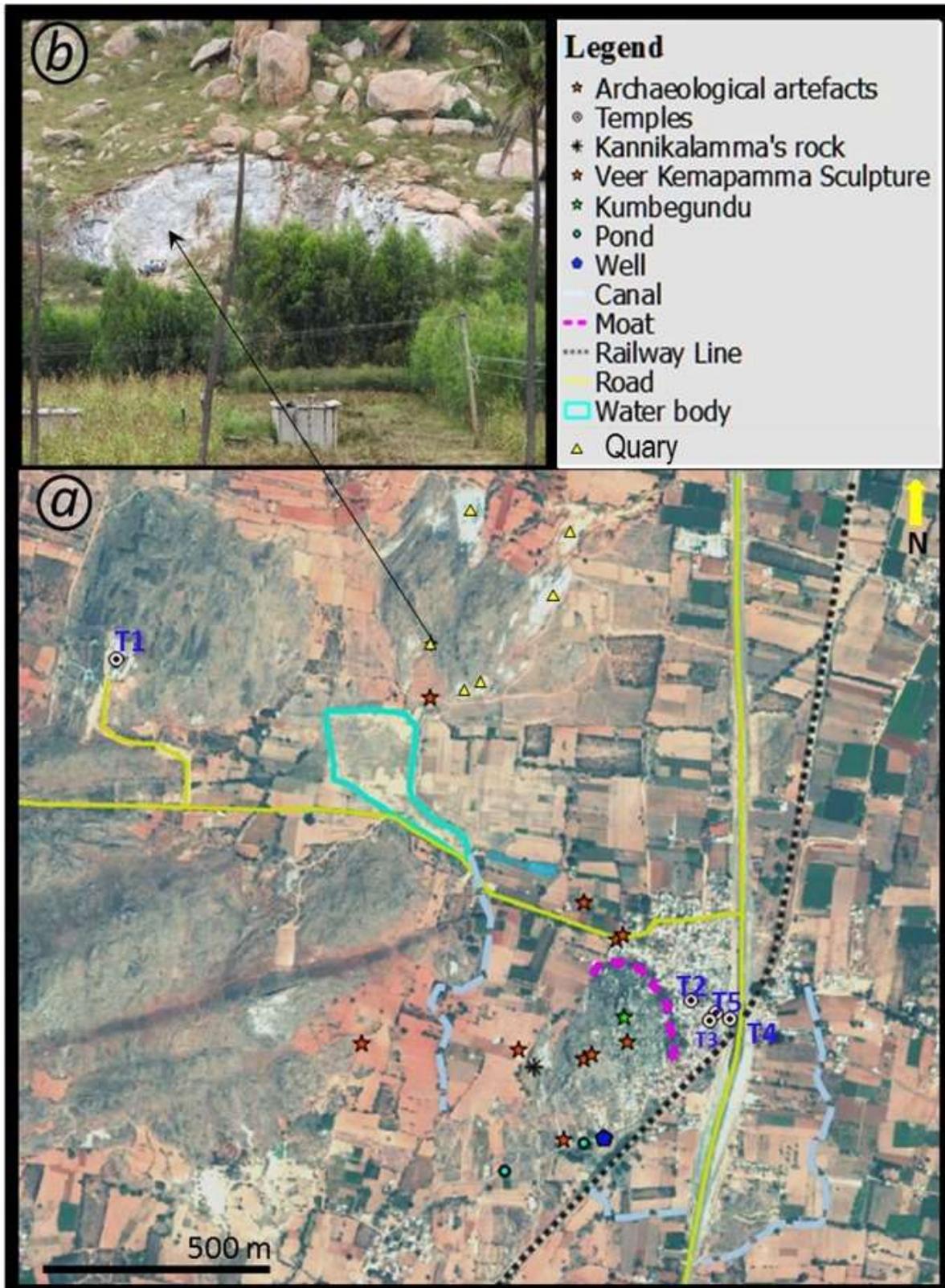


Fig. 6: (a) Final map showing distribution of archaeological artefacts, temples, water bodies, and features extracted from remote sensing (moat, canal); (b) ground image of hills being quarried.

Conclusions

This study highlights the cultural importance of *Avati* and demonstrates how geo informatics can be used to study sites which have sparse remains. The outcome of the study has led to identification of probable site having prehistoric remains which would be further analyzed by archaeologist (Figure 4). This study has also identified the probable extent of archaeological remains by locating feature on satellite imagery and also by geo tagging features through ground survey. Thus by using geo informatics we can create knowledge and awareness about location and extent of archaeological landscapes which not only helps in protecting our cultural heritage but also helps in finding appropriate solution for conflicts between infrastructure development and heritage.

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