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HERITAGE SCIENCE AND SOCIETY PROGRAMME

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NIAS Policy Brief

Regulation boundaries for preservation of Cultural Heritage sites

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The Issue:

Archaeological sites in India are governed by the Ancient Monuments and Archaeological Sites and Remains (AMASR) Act (1952, amended in 2010). According to the guidelines on AMASR published by Archaeological Survey of India (ASI), a site should be recommended for protection based on its *authenticity* and *integrity*. The latter is defined as “a measure of wholeness or intactness” of the site, including “all elements necessary to express its national importance from historical, artistic or archaeological points of view”. Similarly, the UNESCO’s Convention has defined that boundaries of Core and Buffer zones should include “all those areas and attributes which are a direct tangible expression of the Outstanding Universal Value of the property”, as well as “those areas which in the light of future research possibilities offer potential to contribute to and enhance such understanding”.

Field survey and onsite observations are most appropriate methods to assess *authenticity* of a site, however these methods are not adequate for assessing a site’s *integrity*. It has been observed that at many sites, several unprotected archaeological structures have been overlooked by on-

ground studies, though these structures may lie close to protected areas. Developmental activities often disintegrate and obscure the spatial associations and wholeness of the historical extent of heritage sites. In this context, the central issue is: how to identify boundaries that reflect a site’s “wholeness or intactness”. This is a necessary first step to enable effective site conservation and preservation.

The Question:

ASI is responsible for over 3,600 sites, including many of the 30 sites that are in World Heritage list and 48 in the *Tentative List* of UNESCO. Further, each State’s Department of Archaeology is typically responsible for a few hundred sites. Still many sites remain uncared for or even unidentified. We are fortunate that so much of our built heritage has survived, and some of these surviving remnants have not yet been discovered. While it may not be feasible to protect everything of historical significance, finding and documenting most of what has survived is achievable. Our interest therefore is to find and record as much of our cultural heritage as quickly as we can, so that we can make carefully considered decisions on what we must preserve.

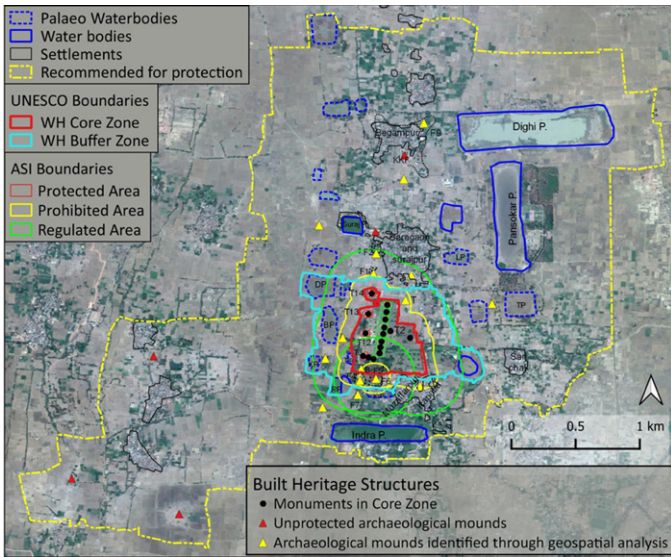


Fig.1: The archaeological landscape of Nalanda in context of the regulatory boundaries of UNESCO and ASI

Remote sensing has been extensively used to discover as well as record characteristics of archaeological sites. Thus, can remote sensing, GIS, and associated geospatial technologies be used to delineate regulation boundaries that preserve better site-integrity? Further, can these technologies be leveraged for creating a resource of historical landscapes, which can be accessed, monitored and managed by respective stakeholders?

The Findings:

The Heritage Science and Society Programme at NIAS has leveraged geospatial technologies to assess the integrity of several heritage sites, and the outcomes of our research can be effectively used for delineating regulation/protection boundaries. Selected findings from these studies are listed below:

i. **Nalanda:** One of the factors that makes Nalanda outstanding is that it was the largest and longest serving (5th century AD to 13th century AD) monastic-cum-scholastic establishment in the Indian Subcontinent. The site has been protected by ASI since the early 20th century and was inscribed as World Heritage in 2016. At its peak, the establishment accommodated thousands of scholars, and such numbers could not have been supported within the 0.23 km² area which is being protected at present. Using geospatial technologies in conjunction with historical records of Nalanda and environs, we have identified archaeological remains in a much larger 9.79 km² area (Fig.1) which probably defines the historical extent of Nalanda. Note that some of these remains lie just outside the protected area. The same is true at most other sites in India that have attained World Heritage status or are on the tentative list.

ii. **Halebidu:** Halebidu in Karnataka was the capital of the Hoysala dynasty in the twelfth century AD and possessed unique and exquisite examples of temple architecture that was typical of Hoysala style, only a few of which have survived. The site is currently on the tentative list waiting to be nominated for UNESCO’s World Heritage inscription. This capital city was surrounded by a fort wall (extent has been identified through geospatial analysis) whose perimeter is approx. 7.3 km enclosing an area of 2.9 km² surrounded by a deep and wide moat (Fig.2). The moat connected a series of tanks which indicates planning of water management of the settlement. On ground, parts of the fort wall can still be seen. As of now, only the temples fall within the Protected Area. The larger fort is an integral part of this site and may possess, among other things, sculpting workshops that have “potential to contribute to and enhance such understanding” of the tangible and intangible heritage of this magnificent site. Hence the whole of the fortified area deserves to be included within the regulatory boundaries.

iii. **Srirangapatna:** The historical fort of Srirangapatna was initially built in the 15th century AD. A few structures within the fort and three buildings along the outer wall on the north are protected monuments of ASI (Fig.3a). The Department of Archaeology, Museum and Heritage, Karnataka, protects and maintains a few other parts of the fort (for instance Fig.3b). Nevertheless, large portions of the 3-tiered fort-wall and moats are outside these boundaries, as identified using satellite imagery. For instance, see the crop mark indicating moats adjoining each tier (Fig.3d) and a circular corner feature representing the magnificent *burj* (bastion)

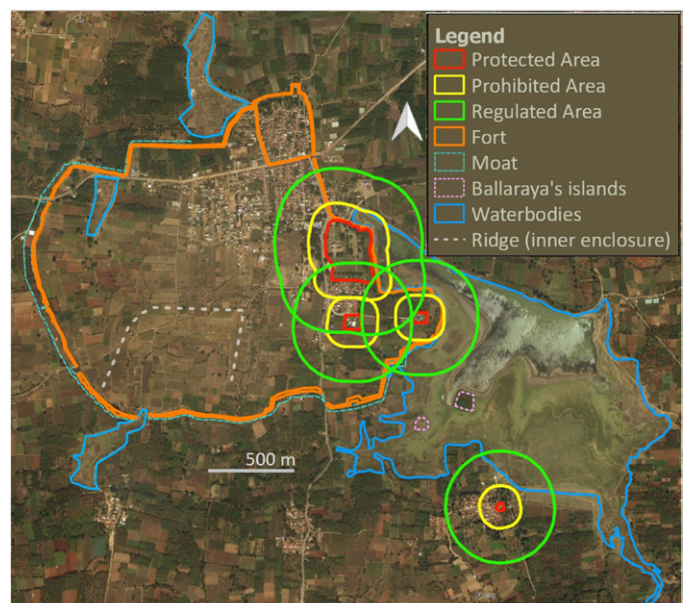


Fig.2: The archaeological landscape of Halebidu in context of the regulatory boundaries of ASI

buried under thick overgrowth. The layout has been identified based on a wooden tabletop model made in 1800 AD (Fig.3c).

Lalbagh garden palace at Srirangapatna was described as “the handsomest building” of the time by Francis Buchanan (1807), but had faded from living memory. By analysing old maps and etching together with satellite images, we can clearly identify a layout that is typical for the Persian Charbagh (four gardens) architecture, having a central structure with axial paths dividing the surrounding large square garden into four parts. Unprotected remains of the palace still exist at the site. Unprotected structures close to popular sites face elevated risk of damage, particularly as nearby development activities are likely to intensify. One of Tipu Sultan’s armouries was located very close to the railway tracks (Fig.3a). The track-doubling project caused the armoury to be relocated at significant additional expense. Therefore defining boundaries of such sites is crucial.



Fig.3: (a) Srirangapatna fort (15 Feb2005); (b) one of the parts of the fort protected by State Dept. (c) southeastern part of the wooden model of the fort (made in 1800 AD); (d) satellite image of area corresponding to (c) showing neglected outer tier and bastions of the fort (16 Feb 2020)

- iv. **Bodhgaya:** The site of Buddha’s enlightenment was inscribed as World Heritage in 2002. In Core and Buffer-1 zones, several archaeological mounds, an ancient canal, and waterbodies have been identified through geospatial analysis of a satellite image of 2003 (Fig.4). Many modern buildings have been constructed within the Buffer-1 zone as seen in an image of 2020. Hence the protection boundaries are like a double-edged sword. Once they are set, they protect the structures within while simultaneously heightening the threat to structures outside. This risk is heightened at World Heritage sites, as development projects aim to cater to the growing number of visitors.

Implications:

Preserving the relics of cultural heritage is feasible only within well-defined regulatory boundaries. These can be effectively created using geospatial data and analysis. The identified regulatory area may overlap with existing settlements, but well-preserved sites attract visitors and can become a non-perishable resource that contributes to the regional economy. Thus, even individuals whose livelihoods are impacted by the creation of Protected, Prohibited and Regulated areas have a powerful incentive to participate in the preservation of such remains and reap their share of the collective economic dividends.

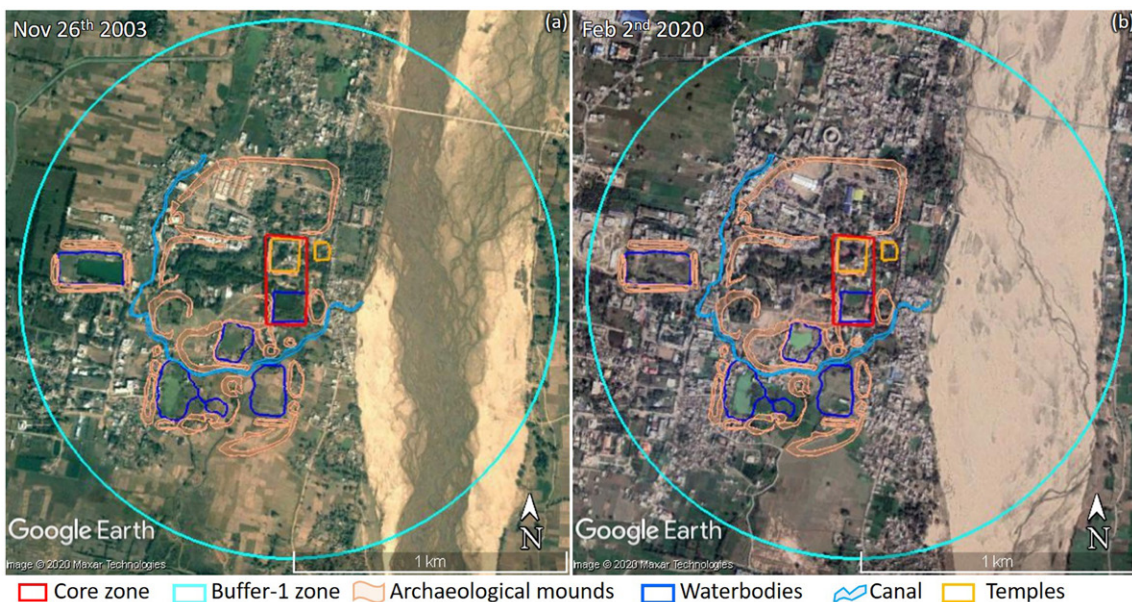


Fig.4: The property of Bodhgaya inscribed as a World Heritage site in 2002 in context of the archaeological landscape identifiable through geospatial analysis. Note the increased number of concrete structures from 2003 (left) to 2020 (right).

The Interventions:

- 1. The historical extent of a cultural heritage site based on geospatial analysis should be considered when defining regulatory and management boundaries:** A careful study of the landscape in the vicinity of a site using satellite imagery can lead to the discovery of further instances or attributes of built heritage, and the discovery of artefacts such as former water bodies, canals, and mounds associated with past human activities at the site. Such geospatial analysis must be integrated with historical spatial records such as old maps, records, paintings, and field surveys to estimate the site's historical extent. The distribution of confirmed and probable authentic remains within this extent should be considered, in addition to traditional on-site exploration and surveys, to determine the Protected Area for the site. Our findings show that many UNESCO and ASI sites are inadequately protected. It is therefore necessary to perform geospatial analysis at such sites on priority. This includes all sites inscribed as World Heritage where, sustained developments due to high tourist footfall can be expected.
- 2. A national-level geospatial database of all cultural heritage landscapes (ASI & Non-ASI sites) to be created.** Such a database would record and monitor cultural heritage resource of the country and also help create awareness about their existence. Therefore, it is imperative to develop and maintain a geospatial database that identifies cultural heritage landscapes.

This database should be regularly updated based on new research findings. The database should be publicly accessible.

- 3. Training and capacity building.** Institutions with the necessary expertise should be provided support to run training programmes for ASI, State Departments of Archaeology, and other partner institutions so that geospatial analysis of sites can be rapidly scaled up.
- 4. Create awareness among local stake holders:** The local stakeholder community should be made aware of the importance of the cultural heritage in their locality and encouraged to participate in its protection. Efforts to sensitise communities to their local cultural heritage can begin even at the school level, in line with the recommendations of the National Education Policy 2020 (4.29, p.16).

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