

Indian Village evinced the ‘Nature as Medium’ of Message for Protecting a ‘Micro Eco Site’

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ABSTRACT

Arittappatti, a small village in Tamil Nadu, India, has shown the world through concerted public engagements and efforts that we can use ‘nature as a medium of message’ to protect the nature and ecology of a micro eco heritage site. The metaphorical pot-like rocky pond atop the hillock was the visual appeal of nature, and it was used to protect the site when it was about to be quarried for granites in 2011. This site is the only habitat that hosts Laggar Falcons in South India. Protecting the small ecosystem will be of huge ecological, economic, and natural importance. The article explores the visual ability of the hillock, which aids the viewers in protecting it through advocacy. The site was proposed as a Biodiversity Heritage Site in 2021 by the Tamil Nadu Biodiversity Board, and on 21st November 2022, Govt. of Tamil Nadu declared the same. The successful model of a decade of protection of a micro eco site, which is more vulnerable to developmental activities or mining. The protection mindset has been realised because of the coordinated efforts of the local public, ornithologists, nature enthusiasts, activists and scientists. As it is now protected, this is an exemplary model for the whole planet Earth to protect the micro eco sites.

Keywords: Communication, Public Engagement, Nature as Medium of Message, Environmental Communication, Science Communication, Media, Biodiversity Heritage Site

Introduction

Arittappatti is a block in the Kazhinjamalai hills that consists of seven hillocks about 250-metre-high (Elevationmap.net., 2022). During the 2-3 century CE, Jains lived in rock beds in the cave at

Arittapatti. One of the Enperunkundram (Vedachalam, V., 2000), or the “Eight Great Hillocks” surrounding Madurai, where Jains lived. The rock-cut bas relief of Jain Tirthankara and the Tamil Brahmi Scripts of 200 BC (Ekamparanatan, & Sivaprakasam, 1987) are still intact in the Arittapatti Hillocks. Arittapatti’s distinct type of land, with specific soil in marshes and “physical characteristics with hydrology and physiographic features” (USDA-NRCS, 2022) and Rare, Endangered and Threatened (RET) (Environment, Climate Change and Forest (FR.5) Department., 2022) give the Arittapatti region with 1.93 square KM, a claim of its “micro eco site” nature. Arittapatti is the only habitat in southern India for a pair of Falco Jugger, the Lagggar Falcons (Anand, 2015), which are still extant in the Indo-Malayan realm (BirdLife International, 2022) in the habitat and ecology of Savanna, Shrubland, Grassland, Artificial, Terrestrial landscape, with a decreasing trend and a status of ‘near threatened’ (IUCN Red List of Threatened Species, 2020). An independent study by Ravichandran, former vice president of the village Arittapatti, who was instrumental in forming Arittapatti Seven Hillocks Protection Council has found that over 250 bird species, 500 insect species, and 35 native fish species were recorded (Ravichandran, 2019). Arittapatti is unique because of its tropical savanna climate (Jena *et al*, 2020) in the Madurai region, as well as for the presence of prey species (Karthick, 2022) such as rock pigeons, lizards, and small mammals, all of which are necessary for the survival of Lagggar Falcons.

The Melur taluk, which includes Arittapatti village, had already lost many hillocks, including 34 water bodies (Indiankanoon, 2014). Above the Arittapatti Jain bed, the hillock has an eyebrow cut by a chisel on the rock to avoid the rainwater coming into the bed. An attempt at quarrying left a blade’s cutting mark can still be seen on the rock on top of the hillock. After this small carving sound 2000 years ago, the village never heard the sound of cutting rocks. In 2011, cutting machines were erected for granite quarrying on the Arittapatti hillock’s crest to slice out the rock into granite slabs. Assuming the importance of the hillock, the public started protesting and calling for protection. The local public protested atop the hillock by throwing away the ration cards (Dinamalar, 2011) and sought the

protection of this natural heritage site. Subsequently, based on a report of various major violations by miners, the Tamilnadu government banned granite quarrying in Madurai district in 2012 (New Indian Xpress, 2012). The public participation in Arittapatti effectively stopped quarrying efforts. However, the fear persists in the minds of the public that if the site is not protected by law, it may face the challenges of destruction at any time in the future.

Researchers observed that the keen eco-watch at Arittapatti by the local public, scientists, educators, nature and environment enthusiasts and activists was on the increasing trend to prevent any uncertainties. The eco-watch had tools of public opinions, engagements of communities, students, visits and other nature centric activities that were encouraged by enthusiasts without any gaps over the years. Ornithologists' efforts have brought this eco-watch into action.

In this research, the focus is on the perception of the public engaged in the eco-watch engagements to protect the hillock. The eco-watch also enabled the media to cover Arittapatti as a routine environmental aspect and keep the issues alive. Tamil Nadu Biodiversity Board, TNBB, Govt. of Tamil Nadu declared Arittapatti Hillock as a Biodiversity Heritage Site (BHS)⁵ in 2022. (Environment, Climate Change, Forest Deptt Notification 2022)

72 Water Bodies in Arittapatti

Unlike any other hillocks in the region, the geomorphology of Arittapatti hillocks, located around 1.93 km sq. km, has given it a treasure trove of water resources, with 72 water bodies, 200 natural springs and 3 check dams (USDA-NRCS, 2020). This is similar to a rich oasis emerging in the desert, with diverse flora and fauna. Through his keen observation for more than three decades, Ravichandran said that "if we get heavy rain for one day, we get water from the hillocks for 30 days" (Ravichandran, 2018). People became "self-reliant" (Nammazhvar, 2018) due to the abundance of water resources. The unique aspect of Arittapatti is the combination of Jain heritage and natural beauty. The public tries to understand the connection between nature and its services when they witness places of natural and heritage importance. This has also yielded public support from outside

the village. During the protest in 2011, the community understood based on their familiarity with local nature.

This paper focuses on how visual perception of nature's appeal in Arittapatti and public engagements give rise to thoughts about protecting nature. The following are the objectives of the study.

1. To assess the public perception on Arittapatti's hillock as a water pot for claiming to protect it from the vulnerabilities using the hillock as 'Medium of Message'.
2. To assess the interest of public engagement and participation in protecting Arittapatti hillock.
3. To assess the public perception of understanding of nature's elements as information capsule, and visual communicator for environmental protection.
4. To assess the public perception of the appeal of nature through Landscape Visual Perception Assessments (LVPA).
5. To propose a public engagement model for protecting nature similar to Arittapatti.

Earlier Studies

Madurai hosts eco-spots that are well connected for their nature's beauty and bounty. The lookalike of the Elephant of Yanamalai (Elephant Hillock) strongly connected with people as it was formed as a single rock and the message that quarry owners stayed away from cutting it during the massive destruction (TNN, TOI 2016). Pliny Elder (Pliny *et al*, 1855) claimed that by implementing Aristotle's division of nature, visual representations spontaneously form in nature with the same potential as a sculptor or painter; nature is not just a message but a messenger itself. The evolutionary method is based on information processing theory, in which landscape preferences are tied to the adaptive need to make sense of the environment and are additionally influenced by it (Kaplan 1973; Kaplan & Kaplan 1989; Kaplan & Saccuzzo, 2017). According to Tveit *et al.*, (Tveit *et al.*, 2018) in the European Landscape Convention, people's visual landscape perception is at the heart of promoting landscape protection, management, and planning. The subjective approaches in this study measure the public's visual perception of nature's appeal for protection. Daniel and Vining (Daniel *et al*, 1983) discussed five

techniques to evaluate the attractiveness of the visual landscape. They state that psychological and phenomenological models are the most subjective approaches for understanding landscape perception to protect and maintain the natural environment. The predictors of landscape preference, such as coherence, complexity, legibility, and mystery, for visually obtained information for understanding the function of the landscape, are very important in shaping human perceptions of that landscape (Kaplan & Kaplan 1989). The US Forest Department (Daniel *et al*, 1976), developed Scenic Beauty Estimation (SBE); this research coded landscape attributes with statistical measurements to examine public perception of nature's visual appeal and protection using regression analysis. It is still transmitted as a message for protection and conservation.

Methodology

The Researchers conducted various eco-protection participation programmes, notably with public participation in the open Eco-NEXT Media Lab in 2018. During this intensive engagement, the Arittapatti Hillocks were recognised, characterised, and proclaimed as an Eco Water Heritage Site (TNN, 2018) as a public awareness measure, and a community programme for protection organised in 2019 also reiterated the same. In 2020, the TNBB proposed designating the site as a "Biodiversity Heritage Site" (Narayani, 2020). In 2021, through a real-time online eco-media odyssey, experts at the national level met and urged again for the announcement to be made expeditiously (EVI 2021). In 2022, a programme was organised to press the urgent need for the declaration (The Hindu , 2022).

During the immersive programmes, participants asserted with wholesome public engagement for using this as a case study in the exploration of eco media and scientific temper through immersive experiences, that all of these can be put to use for supporting causes such as saving Arittapatti and protecting the life-giving nature of this eco-cultural site. Participants have also stressed that "participation in the protection of micro eco sites through eco media will aid in investigating or assessing the integrity of such ecological sites, auditing its natural resources, analysing the status of ecological balances here, investigating

using bioindicators, and arriving at measures for balancing ecological health. They have also stated that the eco-watch and real-time eco-watch, as well as unique visual pieces of evidence captured by the public in this field, can make efforts in the sense of knowledge advocacy more powerful through a common platform which may be created like UNESCO's Geoparks (Zorous, 2004).

This paper used both quantitative and qualitative methods. Department of Communication, Madurai Kamaraj University conducted seven programmes with the local community of Arittapatti, students, nature enthusiasts, ornithologists, environmental activists and scientists. Data has been collected from 2017 to 2022. A total number of 25 Landscape Visual Perception Assessment (LVPA) survey questions were designed by adapting the indicators based on the assessment of visual landscape quality, which was initially a method (LABES) (Pouya et al, 2017) by the Swiss government along with measurement of 'Scenic Beauty Estimation Model' & 'VisuLands FrameWork'. Using convenience sampling, n=224 semi-structured surveys were conducted. Five dimensions of Likert scaling were used to assess the perception of visual coherence and complexity. This method will help understand how respondents perceive the visual coherence and complexity of Arittapatti's landscape with a subjective perspective of the participants' psychophysical model, landscape psychological model, and phenomenological model. Focused group discussions and semi-structured interviews were conducted during the eco-watch to understand and protect the Arittapatti's natural, historical, cultural and social elements and protect them. These interventions are planned to examine the local people's tool of using nature as a medium of message to the various sections of visitors of Arittapatti.

Results & Analysis

For protection and creating awareness about ecological importance in Arittapatti, several programmes were conducted by the Department of Communication, Madurai Kamaraj University. To assess the perception of participants, viewshed analysis was carried out.

Quantitative Analysis: Appeal of Arittapatti's Nature

Earlier, researchers have identified that appeal by nature is crucial for the protection (Twedt et al, 2019). As Arittapatti faces several threats, the perceived appeal is essential for the protections through the public engagements. The interactions of humans and nature in detail often uncover is not merely the way nature influences and constraints human actions, but also the way that particular environments shape human intentions (Nash, 2005).

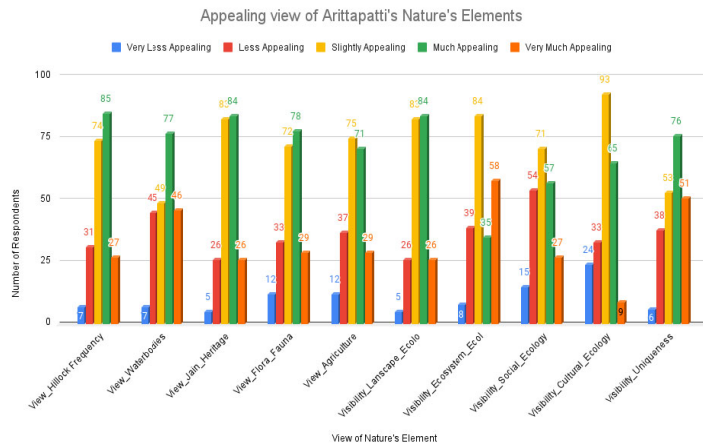


Figure 1: Frequency Statistic of Appealing View of Arittapatti's Nature's Elements

During public engagements, viewshed analysis was also performed, and LVPA surveys were conducted to identify whether they can relate the place with the nature and heritage of Arittapatti. Figure 1 shows descriptive frequency statistics obtained by measuring the perception of visual coherence and complexity of nature's agency in Arittapatti. Frequency statistics show that visual elements in nature appeal to the participants. Responses from participants suggest that the view and visibility of hillocks, waterbodies, jain heritage, flora & fauna, and agriculture are appealing from the range slightly appealing to very much appealing.

Table 1 : Regression test between public perception of understanding hillock's lake as pot vs view of waterbodies, visibility uniqueness and understanding hillock as source for waterbodies.

Variable Type	Descriptive Statistics		Pearson Correlation	Regression Model Enter			
		Mean	Pot_like_Pond	R Square	Adjusted R Square	Sig.	Coefficient Sig.
Dependent Variable	Pot_like_Pond	3.4821	1				
Predictors	View_Waterbodies	3.4911	0.856				0.008
Predictors	Visibility_Uniqueness	3.5714	0.918				0.001
Predictors	Understanding_Hillock as Source for Waterbodies	3.5938	0.864				0.001
Regression Value				0.857	0.855	0.001	

Table 1 shows the nature's appeal of the Arittapatti environment enables targeted information to positively impact people's choices. The coefficient significant of appealing view of waterbodies= 0.008, visibility of uniqueness= 0.001 and understanding hillock as source of water bodies= 0.001 influences the public perception of understanding pond in the hillock's as pot.

Table 2 : Regression test between understanding of nature's elements as information capsule & visual communicator vs view of waterbodies, view of jain heritage, view of flora and fauna and view of agriculture.

Variable Type	Descriptive Statistics		Pearson Correlation	Regression Model Enter			
		Mean	Understanding of nature's elements as information capsule & visual communicator	R Square	Adjusted R Square	Sig.	Coefficient Sig.
Dependent Variable	Understanding of nature's elements as information capsule & visual communicator	3.5536	1				
Predictors	View of Hillock	3.4196	0.808				0.046
Predictors	View of Jain Heritage	3.4464	0.944				0.01
Predictors	View of Flora and Fauna	3.3527	0.7				0.01
Predictors	View of Agriculture	3.3036	0.663				0.01
Regression Value				0.905	0.903	0.001	

Similarly, Table 2 shows the coefficient significance of view of hillock = 0.046, view of jain heritage = 0.01, view of flora and fauna = 0.01, view of agriculture = 0.01 influences public perception of understanding of nature's elements as information capsule & visual communicator.

Table 3 : Regression test between understanding of nature's elements as information capsule & visual communicator vs view of waterbodies, view of jain heritage, view of flora and fauna and view of agriculture.

Variable Type	Descriptive Statistics		Pearson Correlation	Regression Model Enter			
		Mean		R Square	Adjusted R Square	Anova Sig.	Coefficient Sig.
Dependent Variable	Nature_as_Medium_of_Message	3.7589	1				
Predictors	Waterbodies_hosting_Biodiversity	3.692	0.946	0.895	0.894	0.001	0.01
Predictors	Community_Uses_Nature_as_Medium_of_Message	3.6875	0.944	0.892	0.891	0.001	0.01
Predictors	Community_Understand_Nature_as_Medium_of_Message	3.7009	0.94	0.883	0.882	0.001	0.01

Table 3 shows public knowledge of waterbodies hosting biodiversity with public perception of understanding of nature's elements as medium of message the sig. value is 0.001 and the sig. value is 0.001 for community understanding of nature as medium of message.

Qualitative Analysis: Nature as Medium of Message

Focused group discussion shows that locals believe that their ancestors considered the barren hillocks made of rocks as the reason for water, which is normally associated with trees and forests on hills. Hence, their cultural institutional heritage is associated with nearby ponds entrusted with water-taking rituals by newlywed couples. In the case of Arittapatti, during the

protest to stop the quarrying, the metaphorical meaning of the pond was a pot.

During the public protests in 2011, this specific pond site top on the hillocks was chosen as a place for demonstration to use nature as a powerful medium for conveying their message. The shape and placement of the hillocks surrounding the pond filled with soil can be similarly imagined with a hemispheric pot. An official came to the site for talks during a protest in 2011 and wanted to view the public's claims about water resources. The officer asked the locals, "How does this water come, and where is the pump you have set?"(Ravichandran, A. (2018) , the public was stranded around allowed for inspection, and the official was then satisfied with what was shown - the perceived hemispheric pot.

The pond atop the hillock has a space for storing water. However, most days in a year, we cannot see water in the pond. Rain after summer thunderstorms during one or two days, during the monsoon failure seasons or during the end of the monsoons with very light rainy days will not fill much water on the surface other than heavy rainy days. So, most of the visitors can see the empty surface while they see the release of water from the opening of the sluice in the head under the pond. We can witness the water above the surface if the area has good rainfall. Even if water cannot be seen above the soil, seepage from the profundal zone beneath the filled soil's limnetic zone causes cascading water flow to the stream. This can be compared to a pot with a tap, which is filled with sand half level, if we pour a small amount of water that may not be visible above the sand level, but it will come through the tap if it is open. The pot can be compared with a pond, and the tap can be compared to a sluice. This is the visual interpretation of nature, where nature acted as a medium of message for protection. Hence, the virtual medium of pot was understood during the public protest.

Discussion

If the Arittapatti Hillocks had not been protected, the first thing would have been that the abundant water resource would have gone away from the vicinity. The drinking water resource named

Dharmam will go dry immediately, and subsequently, the two big tanks will also be dried as they do not have any other water linkages for receiving water, as the local people denied Periyar River Water Canal link as they do have enough water from the hillocks. And also, the agricultural lands will have an immediate impact on their yields. The feed for Laggar falcons will be in question. There are several similar hillocks around the area, but the local ecological setting of Arittapatti is quite different and unique. And now the biodiversity cannot withstand as marshlands and waterbodies go dry. And the heritage will also be lost. The local economy, biodiversity, and sustainable use of resources will also be affected. In addition, the authors have sent a policy support framework to aid in implementing Arittapatti's protected status in March 2022. Other nature enthusiasts have also engaged in evidence-based document support for declaring it a protected area .

The Arittapatti hillocks system has been acting as a medium, where the public perceives information about protection through the visual ability of its natural setting of a water pond, which releases water to the stream. The 'perceived content' of this medium is an answer to a question which is being raised to visiting individuals that: how a pond located atop a hillock has often released water to the stream even though the pond's surface is mostly empty and has no visible water. If the message was not understood, the pond might have become unprotected.

McLuhan's 'Medium of Message '(McLuhan, 1964) was conceptualised based on the medium's self-extension of information and ability to communicate messages to the public. The interaction through nature does not happen as a two-way speech conversation, but the visual appeal has a powerful meaning that can be communicated as a medium. Hence, the idea of conservation elated while this was efficiently perceived personally by enthusiasts or commoners with the social consequences. Here, the elements of nature and ecology serve as a message for conservation as they can convey the idea of conservation visually and "shapes and controls the scale and form of human association and action" (McLuhan, 1964;2). McLuhan further asserted that roads, sea routes, and rivers are "information movement" (McLuhan, 1964;3). Here the medium

was the metaphorical pot-like rocky pond atop the hillock was the visual appeal of nature which was used to protect the site. As the authorities who were in a position to understand the ecological value of the natural site, the powerful natural medium convinced them to protect it from the immediate quarrying. Even Though Govt. banned on quarrying, the granite quarries wanted to exploit it through making efforts to lift the ban.

Arittapatti 'Seven Hillocks Protection Council' formed by the local public and spearheaded by Mr. Ravichandran, acted as a conservation group and built the capacity of the local forest officials, members of Tamil Nadu Biodiversity Board (TNBB) and Media persons to take the message of protection. The content of news items on Arittapatti shows that the news given by local conservationists are predominantly published. They are the sole message channels. This site also indicates that Journalists need to acquire in-depth knowledge of environmental issues, also they must recognise the importance of urgent action against environmental degradation. For example, the ornithologist's explanation of Laggar Falcon in this area must be understood beyond the value of human-interest news by journalists.

We often identify media that mostly interacts with textual, audio, video, and other visual elements. Traditionally the, non-verbal cues, including shapes, icons, symbols and signs also communicate effectively and equally to all the modern device sticken media. In India, mountains, rivers, water, mounds, trees are seen visually and respected for their natural beauty and bounty.

The regression analysis also shows that the Arittapatti system consists of water bodies, with its unique features influencing the public perception of the hillock pond as a water pot. Also, it has proved that the view of hillock, view of jain heritage, flora & fauna present in the area and agriculture influenced the public perception of understanding of nature's elements as an information capsule & visual communicator.

As a result, the Arittapatti micro eco site has served as an example for the entire world of conservation in that the local public have been using nature as a Medium is the Message'³⁵.

The colours in particular location, for example the barren hillocks' brown, sky's blue, the vegetation's green, Springs's whitish water all give an immediate visual appeal.

The contextual ecological background and the protection measures must have been taken much earlier, if the media intervened itself. The intersection between the media and nature is a very big question here as other than the outcry of conservationists and activists, Suo Moto involvement of the media should not be very limited. This shows how media persons should also be aware on par with activists at least at local level as they can understand the ground-level situation. Stories should include stakeholder interviews and scientific data obtained from field surveys (Zazueta, 2009). Hence, media editorials need much focused efforts to bring out more issues with the help of scientists, ecologists, environmentalists, conservationists and activists. If media persons break it before activists release the news item, it is easy for activists to blow the whistle. Also this will enable more opportunities for voice outings by activists than the cryouts as they lose energy to prepare media persons for reporting.

Native eco watch with the conviction of the place should be undisturbed by damaging activities and with an eco-health objective of enough food for biodiversity through nature as a medium of expression and dissemination of information. Therefore, in the Arittapatti region, culture and science complement one another. From 21st November 2022, through a Govt. order and gazette, the Arittapatti Hillocks are protected.

In Arittapatti, nature itself was used as a medium for promoting its protection, and other forms of media, such as photography, art, audio, and video, can be used to supplement the "nature medium" later. Thereafter, the public's concerted efforts continued. Following this protest, ornithologists and nature enthusiasts realised the nature connections of this popular Jain heritage site. A banyan tree planted atop the hillock during the protest a decade ago as a protest symbol is still standing. People do have a cultural understanding of the Arittapatti hillock. According to natives' socio-scientific perspectives, culture and eco-science complement each other in the Arittapatti region. The awareness of the community and nature enthusiasts

made the Arittapatti - which was declared a Biodiversity Heritage Site by Tamil Nadu Biodiversity Board. Now the natural location is completely free from quarrying.

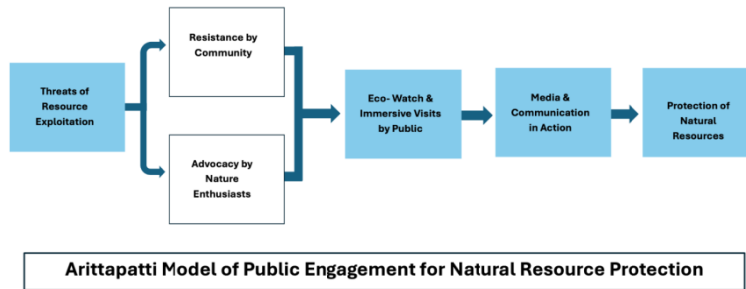


Figure 3: Arittapatti model of public engagements for natural resource protection

Figure 3 shows the model of public engagement to protect the resources of Arittapatti, primarily the threats of resource exploitation are identified which are intervened by community protest and advocacy by nature enthusiasts. To discuss and understand the Arittapatti's importance public eco-watch & immersive visits were engaged. Media and communication action is needed to bring about the policy decision to declare Arittapatti as a Biodiversity Heritage Site in 2022.

Conclusion

The model is simple to adopt and continuous with support from all sides of youth, local public, ornithologists, nature enthusiasts and the media. This has formed a strategic public science communication that proposes that small eco sites can be protected through community engagement. The Arittapatti Model of Public Engagement has been formal and informal through many engagements that are combined with cultural, spiritual, and ecological strategic communication. The continuous participation by community nature enthusiasts made the deliberations unique and alive throughout these years, which had an impact on the public mind for protection. The Arittapatti and its empowering attributes informing an unconventional genre of nature media will now ever be in the league and history of protected Indian micro eco site for its own rising through a

public conservation movement by their engaging community, ornithologists, scientists, students, and public, which could be taken for moving forward as a model to protect the micro eco sites across the world for the future generation of local public. If the villagers had not intervened, the cliffs of the hillocks would not have frequently witnessed the circling of two Laggar Falcons, and the Jains' caverns would have lost their glorious appeal and natural beauty.

Declaration of Conflicts of Interests

The authors declared no potential conflicts of interest.

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References

- 1 Anand, V. (2015, 7th June). Species Observed. Checklist S23850342. Retrieved 23rd March, 2022, from <https://ebird.org/ebird/view/checklist/S23850342>
- 2 BirdLife International. (2022). Species factsheet: Falco jugger <http://datazone.birdlife.org/species/factsheet/laggar-falcon-falco-jugger>
- 3 Daniel, T. C., & Vining, J. (1983). Methodological issues in the assessment of landscape quality. *Human Behavior & Environment: Advances in Theory & Research*, 6, 39–84.
- 4 Daniel, Terry C.; Boster, Ron S. 1976. Measuring landscape esthetics: the scenic beauty estimation method. Res. Pap. RM-RP-167. U.S. Department of Agriculture, Forest Service, Rocky Mountain Range and Experiment Station. 66 p.
- 5 Dinamalar. (2011, 20th May). கிரானைட் மலையை உடைக்க எதிர்ப்பு : மலை மீது ஏறி கிராம மக்கள் போராட்டம். Dinamalar. Retrieved 25th March, 2022, from https://www.dinamalar.com/news_detail.asp?id=243793
- 6 Ekambaranatan, & Sivaprakasam, C. K. (1987). Jaina inscriptions in Tamilnadu: A topographical list. Research Foundation for Jainology.
- 7 Elevationmap.net. (2022). Arittapatti, Madurai, India on the elevation map. topographic map of ARITTAPATTI, Madurai, India. elevationmap.net. Retrieved 25th March, 2022, from <https://elevationmap.net/arittapatti-madurai-in-1011531859>

- 8 Environment , Climate Change and Forest (FR.5) Department. (2022). Notification of Arittapatti Biodiversity Heritage Site in Madurai District Under the Biological Diversity Act, 2002. (G.O.(Ms).No.201) <http://nbaindia.org/uploaded/pdf/Notification%20of%20Arittapatti%20.pdf>
- 9 EVI. (2021). Real time eco media odyssey programme urges protection of arittapatti hillocks. Eco Vision Indica. Retrieved from <https://ecovisionindica.earth/real-time-eco-media-odyssey-programme-urges-protection-of-arittapatti-hillocks/>
- 10 Gobster, P. H. (1999). An Ecological Aesthetic for Forest Landscape Management. *Landscape Journal*, 18(1), 54–64. <http://www.jstor.org/stable/43323479>
- 11 Indiankanoon. (2014). W.P.No.20166 of 2013 & M.P.No.1 of 2013.. Retrieved 24th March, 2022, from <https://indiankanoon.org/doc/99985376/>
- 12 IUCN Red List of Threatened Species. (2020, 11th August). Laggar Falcon. IUCN Redlist Retrieved 1st February, 2022, from <https://www.iucnredlist.org/species/22696492/181452933#habitat-ecology>
- 13 JENA, S. U. R. A. J., Panda, R., Ramadas, M., Mohanty, B., Samantaray, A., & Pattanaik, S. (2020). Projecting groundwater variability in data-scarce tropical savanna region of India. <https://doi.org/10.22541/au.160071211.17794841>
- 14 Kaplan R. & Kaplan S. (1989). *The experience of nature : a psychological perspective*. Cambridge University Press.
- 15 Kaplan, R. (1973). Some Psychological Benefits of Gardening. *Environment and Behavior*, 5(2), 145-162. <https://doi.org/10.1177/001391657300500202>
- 16 Kaplan, R. M., & Saccuzzo, D. P. (2017). *Psychological Testing: Principles, Applications, and Issues*. Cengage Learning.
- 17 Karthick, V. S. (2022, 11th March). Species Observed in Arittapatti Range . Retrieved 26th March, 2022, from <https://ebird.org/targets?r1=L4030656&bmo=1&emo=12>
- 18 McLuhan, Marshall (1964). *Understanding Media: The Extensions of Man*.
- 19 McLuhan, Marshall (1964). *Understanding Media: The Extensions of Man*. p.9
- 20 McLuhan, Marshall (1964). *Understanding Media: The Extensions of Man*. p.97
- 21 Nammazhvar. (2018). Organic Agriculture Lifestyle Tamil. Self-Reliant life [0.44] YouTube. Retrieved 26th March, 2022, from https://www.youtube.com/watch?v=pBgU_c__2Fg.
- 22 Narayani, P. A. (2020, 29th December). Hillocks around Arittapatti, a home for birds.. Retrieved 18th March, 2022, from <https://www.thehindu.com/news/cities/Madurai/hillocks-around-Arirtapatti-a-home-for-birds/article33446675.ece>
- 23 Nash, L. (2005). The Agency of Nature or the Nature of Agency? *Environmental History*, 10(1), 67–69. <http://www.jstor.org/stable/3985846>
- 24 NewIndianXpress. (2012, 16th May). Stone quarrying at Arittapatti Hillock halted. *The New Indian Express*. <https://www.newindianexpress.com/>

- states/tamil-nadu/2011/may/27/stone-quarrying-at-arittapatti-hillock-halted-256866.html
- 25 Pliny, Bostock, J., & Riley, H. T. (1855). *The Natural History of Pliny*. <https://doi.org/10.5962/bhl.title.8126>
 - 26 Pouya, S., & Irani Behbahani, H. (2017). Assessment of the visual landscape quality based on the subjectivist paradigm to design the Memorial Garden. *Turkish Journal of Forestry | Türkiye Ormancılık Dergisi*, 18(3), 171–177. <https://doi.org/10.18182/tjf.294916>
 - 27 Ravichandran, A. (2018, 3rd June). Arittapatti Hillocks. Personal.
 - 28 Ravichandran, A. (2019). Arittapatti Hillocks. Personal.
 - 29 The Hindu. (2022, 13th June). Madurai Campus Connect. Retrieved from <https://www.thehindu.com/news/national/tamil-nadu/madurai-campus-connect/article65523906.ece>
 - 30 TNN , TOI. (2016). Villagers invoke faith, protest sculpture city at Yanaimalai. *The Times of India*. <https://timesofindia.indiatimes.com/city/madurai/villagers-invoke-faith-protest-sculpture-city-at-yanaimalai/articleshow/11000103.cms?frmapp=yes>
 - 31 TNN. (2018, 4th June). Mission eco-next: Eco-next lab aims to create awareness on water management: Madurai News - Times of India. *The Times of India*. Retrieved 4th June, 2018, from <https://timesofindia.indiatimes.com/city/madurai/eco-next-lab-aims-to-create-awareness-on-water-mgmt/articleshow/64441376.cms>
 - 32 Tveit, M. S., Ode Sang, Å., & Hagerhall, C. M. (2018). Scenic beauty. *Environmental Psychology*, 45–54. <https://doi.org/10.1002/9781119241072.ch5>
 - 33 Tveit, M , Å. Ode & G. Fry (2006) Key concepts in a framework for analysing visual landscape character, *Landscape Research*, 31:3, 229-255, DOI: 10.1080/01426390600783269
 - 34 Twedt, E., Rainey, R. M., & Proffitt, D. R. (2019). Beyond nature: The roles of visual appeal and individual differences in perceived restorative potential. *Journal of Environmental Psychology*, 65, 101322. <https://doi.org/10.1016/j.jenvp.2019.101322>
 - 35 USDA-NRCS. (n.d). United States Department of Agriculture. Natural Resources Conservation Service. Retrieved 21st January, 2022, from <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/range pasture/?cid=stelprdb1068392#:~:text=An%20ecological%20site%20is%20defined,management%20actions%20and%20natural%20disturbances> .
 - 36 Vedachalam, V., 2000, 'Enperumkudrankal', Sastha Publications, Madurai
 - 37 Zazueta, D. (2009, March 11). Recommendations on environmental journalism. WWF. Retrieved 17th May, 2022, from https://wwf.panda.org/wwf_news/?158643%2FRrecommendations-on-environmental-journalism
 - 38 Zouros, N. (2004). The European geoparks network - geological heritage protection and local development. *Episodes*, 27(3), 165–171. <https://doi.org/10.18814/epiugs/2004/v27i3/002>