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TERRAIN ANALYSIS OF GADWAL FORT

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For present paper we have used Google earth, golden surfer 8 for preparing 3d map of the fort .in this first stage we have prepared girds for taking elevation of the fort. For making girds we have taken the ohp sheet and on the sheet we made the girds with measurement of 1:2 cm. The choice of the gird measurement is based on standard protocol of digital cartography as it is of intersecting length of map. This therefore gives more accuracy than latitude and longitude.

OHP sheet with grids we spread on the computer monitor. Two sheet of ohp with grid will be suitable for taking elevations from *Google earth*. After preparing gird on ohp sheet and spreading these sheets on the monitor we have started Google earth. It has number of distinctive views and the grid can give the exact elevation in meters. Therefore the exact point, points, points of departure, points of sudden can be easily pinpointed. And find out the site with the help of elevations. After finding the fort in Google earth we have zoomed the image to a maximum extent and started to take the elevation of the each grid made on the ohp sheet. After collecting the elevations of the fort on the sheet we have prepared with three rows on is x, y, and z.

After collecting elevation of each gird we again enter the elevations of the fort in to excel sheet in the *M.S Office*. After entering the values of the fort elevation saved it on the computer .now we come to other software called golden software surfer8. The software has many functions that render image into 3d in multiple formats. These formats after rendering image in 3D enable to have output in diverse forms including color, top setting etc. but we have used only 3d elevation. This is significant because this software enable final out put made available in 3D format on 2D paper. This is a special program for preparing 3D images, contour and other images for analytical study of the structure. Firstly we have to prepare the gird in this software.

For making the gird in this software we have to uphold the excel sheet of elevations in to this software. After uploading excel sheet in to this program it will prepare the grid with the elevations of fort, taken from Google earth. After preparing grid in this software we have come to the final stage of the 3D image of fort. The excel sheet values are available in x ,y and z with value assigned in each table the generation of final image cross checked in this values on the excel sheet. The excel sheet also contains the full value of image, that is taken has grid.

Then we have uploaded the gird prepared in *golden surfer8*. After uploading the grid in to the 3d image option it will generate the 3D image of fort, now we can see the fort image in the 3D form. The output in 3d is available for the hole image, in other words the golden surfer has converted the uploaded values of x, y and z. therefore any deviation in the image protrosum of peak or new structure that is observable in comparison to the photograph of same place or the image on the Google earth can be easily restricted. This method is to find out any massive escalation in the z value by few hundred that is hexametrical to the range of value and therefore suddenly escalated and slumps a cross examination of the z value that are in elevation format would express this program again the z value can be re enter by verifying human error. Additionally in case of non resolution of doubt the z value as parameter for locating the specific point and elevation. Thus any error or margin of error can be easily reduced by cross check observation and rectified.

In this 3D form we can see the fort from various sides for analysis. Image of the fort, terrain, structure or natural formation can e also be generated individually as latched on to studying the facets in detail. This exercise is done by feeding only range of values that correspond to particular location, for example the structure encompass a small are can be standard in isolation by generating grid of the same , using the values corresponding to the location on the terrain . Therefore, parcial image also can generate which therefore help us reposition the image and also elements certain structure by chronologically re creating the fortification. To arrive at this point one has to identify later additions like new structures and generated the image using the process mentioned earlier i.e. taking elevations on the x, y and z feeding the value and generating grid and finding image.

This is the process used for preparing the 3D image of fort. The digital recombination and presenting also help us to study structure against the natural terrain and contour. Therefore the structure can be rotated, reversed, bent at various angles and sides to understand the different perspectives that the fortified structure offers for analysis. Thus, diverse perceptions can be correlated with theoretical advances that are based on logical assertions of the defined values and this is correlated with both primary and secondary sources. The narrative element, while taking on multifarious perspectives informed by approaches based on methodology can be read in single narrative by the image. Thus, within and perspective based on the contemporary literature just appose with military history can be also be read with ecological approach and aspect of political history like diverse forms of patronage.

This is very useful for the extensive study and analysis of various aspects of the defense structures in the medieval period and also to show in what way the rulers of medieval Andhra used the natural terrain for defence purpose. This methodology was used in the study for generating maps on which the interpretations are based and is a pioneering approach adopted for the study of forts of Andhradesa.

Gadwal Fort

The samsthanam of Gadwal is situated in the Raichur doab, surrounded by the princes of the Nizam in to the north i.e. the river Krishna and Amarachitra Samsthanam, the territories of the nawab of Kurnool in the south: Raichur provinces in the west and the river Krishna and Jataprolu Samsthanam in the east, and the region gradually merges into the Raichur Doab, the Gadwal Samsthanam consisted of 173 villages covering 817 sq miles[1].

The ancestors of the Gadwal Samsthanam were born during the times of the Kakatiyas in the provinces of Raichur Doab, i.e teeg and Dharus. They started their carres as the renters of villages called Nadagouds. The office of the Nadagoud seems to have its origin in the kalyani Chalukyas period. The Nadu denotes a province and the goud means its head. His chief duty was to make the inhabitants of the village cultivate the lands. Thus he is primarily a renter of the village, and also acts under the capacity of munsif, in keeping the law and order in the village. Gona Budda Reddy, one of the feudatories of the Kakatiyas seems to be the founder of his family, after the death of Budda Reedy his son Timma Reddy became the *ndagoud* of Ieejmd Dharus. During the times of Basi Reddy, the grandson of Budda reddy the sultans of Bijapur and Golconda attacked the doab region which was under the rajas of Vijayanagara. This Basi Reddy deserted leej and Dharus and fled away[2].

The Kurnool reign which was on the right bank of the river Tunga bhadra,. Basi Reddy had seven sons and a daughter. While staying at Kurnool the Khiladar (keeper of the fort), a Muslim tried to molest the daughter of Basi Reddy. Then her brothers killed the Khilladas and his followers and again fled leej and Dharus provinces.Yedi Reddy, the eldest of the seven sons of Basi Reddy by serving under the sultans of Bijapur acquired back their Nadageredship alongwith Cuddapah, Gurram Konda. Gandikota and Penugonda leaj and Dharas territories were shared by the first four sons and the rest three sons gained the Nadageredship of Cuddapah,Gurramkonda, Gandikota and penugonda[3].

But these later three sons continue as *nadagouds* for a long time in the above said regions, since the local power group was very strong. But the first four sons who shared leej and dharu, by Kinship ties became a strong local power group and extended their way even over their neighboring territories. Sons of Basi Reddy, yedi Reddy made his head quarter at Dharus, yella Reddy at Rajali, Savi Reddy at Mandladinna and Rmi Reddy at Boravilla.[4] they all spread to north, south and east of leej proper. Later through matrimonial alliances, the other places of doab region also came under their influence[4].

The fort shows on architecture with constant repairs of the ramparts indicating that it was in continuous usage at all periods of time. This continuity is seen in the fort that the gadwal samasthanam with its power base. Gadwal was existed prior to the Nizams and also continued later outliving them.

Gadwal fort is one of the forts that uses a natural terrain to very high advantage as seen in the circular construction of the wall. The whole fortified area i.e. surrounded by bastions includes the royal residence and other structures. The clever use of location at the upper most edge which is a flat table land has given Gadwal a prominence that is not afforded in many other forts.

One of the striking features of the bastions according to first hand observations is the prevalence of mud architecture it is amazing to note that the mud has sustained for a very long period and is also adapted itself by lending to the extension where mortar is used on top of the mud to provide for the fortification. The height of the bastions also suggests the ambit of the reach of cannons which is confirmed by the observations on the placing of the cannons. In such a situation the area own stream could be easily controlled by the fort. As the settlement below is flourishing the architecture indicates that there as more of a peaceful period rarely punctuate by violence since large scale alterations in both the ton and the fort is not observed. It also correlates with the vernacular ideas of architecture in mediaeval Andhradesa.

In popularly known as Gadwal the fort is identified with the suffix of *kota* and the town with the suffix of pets giving the twin symbolism of *kota* and *peta* which is a common feature of most of the south Indian forts that are close to habitational settlements and not purely military or administrative centers like forts of Golconda, Bidar and Bijapur. This feature of the *kota* and *peta* existing as a continuum is one of the marked features the Samsthanam architecture and a prominent marker of the politico economic process whereby the landed elite who control the surplus also maintain the military power but are connected to the process of production as managers of production directly and not as absentee landlords of sub-in feudatories. The sub-in feudation was a feature of most of the imperial powers like the Vijayanagara and the Deccani Sultanates who considered the Samsthanams as their sub-in feudatories. One of the important aspects of this architecture that is linked to the political process is that these Samsthanams or local polities where not fully absorbed into the imperial polities. As such, they did not reproduce the imperial ideology in terms of architecture by maintaining a homogeneity in planning that marked the imperial structures like Golconda, Bhongir, Devarkonda, Balakonda etc. rather the prime ambit of these structures was local and therefore the architecture of the Samsthanams varied vastly and as such they can be called as sub-imperial.

The lack of stones of good quality coupled with the political culture that did not foresee many threats let to the continuation of large scale use of mud and minimal fortification as there was no palpable threat from the imperial patrons, i.e. Golkonda state. The use of newer techniques like mortar and cannons required large investment and were not adopted wholesale by these small polities and therefore the strategic positioning of cannons at the bastions at elevated heights points to the need to minimize the usage of equipment.

Fig No. 1: Gadwal fort[5]

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