

ANCIENT SUKARA NIJJARA DAM OF THE RIVER – DEDURU OYA IN SRI LANKA

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The very fascinating ancient 'Ridibendi Ella Dam', situated in the village of Ebawalapitiya of the lower region of the river Deduru Oya in Sri Lanka, could be introduced as an ancient Irrigation work, through which, more details can be obtained about the construction method of a dam, built in ancient Sri Lanka.

According to the sources, this can be identified as the Sukaranijjara dam, built by king Parakramabahu – I for diverting water to the tank of Magallewewa or Mahagallakavapi. About this dam, Messers Henry Parker and Brohier have made their reports, but no any effort taken in these reports, to identify the constructional structure of the dam. Dams, built in the River Deduru Oya as the sources say, had been ruined resulting various but about 40% of this dam, can be seen still protected. This dam had been built just across the river Dedura Oya. The mid portion of the dam has been washed out by the water but it's parts both in the right and left end are still remained.

Ruins of the portion of right end of the dam (Plan No. 1)

It seems that the remaining ruins of the right end portion are built on the natural rock plane. The method of the linking stone blocks each other for constructing the dam is clearly shown on the rock plane close to the river. Here, the stone blocks are fixed in to the cuts, made on the rock plane. These cuts are in the length of about 1.40 metres.

40% of the typical stone blocks lying on the natural rock of the lower part of the right portion, can be seen protected in their first form it self. The bottom layer of this portion is totally well protected, But the top layers are greatly changed from their initial form, resulting natural disasters such as floods, root pressure of different trees and human activities etc. Hence, only about 5% of this portion, considered as the top layer of the dam, is remained by this time.

The height of the remaining part of the top layer can be considered as it's maximum height. It is of about a 3.90 metres height above the river base. According to this the maximum height of the dam seems to be nearly 4.00 metres.

The upper and lower parts of this portion are made of well made rectangular and square shaped stone blocks, but for the mid portion, only imperfect stone blocks have been used. Mostly, there are stone blocks in various shapes spread over the layer, so as to make a levelled surface and to fill up the inter spaces, the tiny pebbles have been fixed and for some places, a strong lime plaster has been used.

When consider the ruins of upper part, there is a rock profile facing the East direction by which, one can get knowledge of making the front section (The side, facing water) of an ancient dam. This part is built by using splitted and well shaped, long stone slabs on the natural rock place, and it is placed within a large rock beside the river and a rock plane of the right direction. There are ruins of six stone layers in this place and these, the stone blocks are fixed each other, by deep cuts to prevent them moving off. The large rock mentioned above, is taken to help to build strongly the upper left end of the right portion of the dam. The cut marks and remaining plaster of this place prove that, the rock layers had been fixed, in to this rock. This method of fixing makes the strength of a dam. Besides this place, an area of about 25 square metres is covered with a layer of lime plaster composing more particles of quartz.

Ruins of the portion of left end of the dam, (Plan No. 2)

In this portion, lying on the left bank of the river Dedura Oya, there are only remains of several rock layers in it's lower side. This is also built basing a natural slopy rock plane running from left bank towards the river direction. the remaining rock layer of this portion is in a height of about 3.38 metres in comparison with the maximum height of the dam. In the down part of this portion, near by mid-river, there is a part of side bund still remained. This can be decided as the last lower limit of the dam. By the cuts of rock plane and the stone blocks, they are connected with one another. There are remains of only three stone layers to identify, but in comparision with the maximum height of the dam, it can believe that another five layers must have been had, over these layers. It is identified that mostly the lime plaster had been used to fix the stones each other in this part-specially in the places, where the stones were unable to fix with the natural rock by rock cuts. It seems clearly that, to prepare this plastering mixture, they have used not only quarts particles but also the small pebbles too. This strong plaster can be identified even now very clearly.

There is cut mark, as a single line runing ahead, in the natural rock plane of the lower end towards the left side of the river. After a 5.50 metres length from the starting point, this cut line turns in an angle of 140° , to the South West direction from the outside of the dam. This cut line is marked also on the large 4 stone blocks lying at the end of the cut line. this cut line ends near a large natural rock, close by riverbank. This clears the efforts of fixing the bund of the dam, by turning it in a

140° angle, with the natural rock of the left bank. This device helps, to stop the sliding of the dam down by the pressure of flowing water from the upper side. There are identified ruins of some another stone layers in this place.

The place where the bund of left part of the dam, had been fixed with the riverbank, is severely damaged, so that it is difficult to understand its initial structure. The special mark of this place is the bricklayer, that is lying close to the bank. This is the only place, where there is evidence, to prove that the bricks had been used to build this dam. There are eight brick layers, laid upwards, on the ground surface. This is typically constructed by using lime plaster and neatly keeping its inter-spaces. The size of a brick is 23x11x4 centimeter in the length, width and height. This bricklayer proves that it had been fixed in to the left bank. So it can be guessed that bricks had been taken in to use when joining the dam with the riverbank.

There are another trench shaped important cut marks, just below the dam in this part. They give an understanding about another constructional technique of a dam. These cuts, of about one metres distance to each other, give an understanding that there had been put up a stone layer on the ground surface. This portion is very close to the bottom of the dam and it is 3.50 metres below the maximum top height. According to this, it is clear that, by this constructional device, the dam had been given a good protection to stop the erosion, in the places where there was no any proper condition of the stone layer, to prevent the erosion by falling water from such a height.

The mid portion of the dam is completely ruined, Mr. Parker, had surveyed this place in 1873, has given in his report about these ruined parts and the destructive condition of the top stone layers. Except to this, people living near by conform that this dam was severely damaged by the floods in 1956 and 1978.

The total length of the dam is 104.15 metres but it is very difficult to get the measurement of the width but the width of the right portion is about 11.40 - 12.60 metres and in the left portion it is about 18 metres. In the left part which was not properly covered with natural rock layer, the dam could have been built in a more width.

The ancient canal related to the dam

With this Sukaraniijara, dam, there is no any ruin of a canal that was made direct from the dam or any near by place, to bring water from the dam. The reason for this is, there is no any good topographical condition to make a such canal in the both sides of this dam. Instead, as an alternative, a natural stream called Tallagalla Ela, connecting to the river Deduru Oya, just about 180 metres ahead the upper direction of the dam, has been used as the main canal. By this canal, water had been brought, up to about 856 metres length and there after turned in to Magallewewa

through another sub canal, that has been out in a lower place of it's right bank. This sub canal, at present is known as Heen Ela.

Though the ground base of this Sukaranijjara Dam is suitable for constructing a dam, both two banks of the river are in a higher elevation than the dam so that, it appears to be difficult to construct such a canal direct from the dam. Because of that, the above method had been utilized for that purpose. In comparison with the maximum height of the dam, the base of this sub canal at the point it starts from Talagalla Ela is in a depth of about 99 centimetres below the height. Hence, there is an ability to bring the water, collecting in to the dam, without any difficulty through this canal.

This is a very good example to reveal the superb technical knowledge of the ancient people in constructing the canals by studying the topographical condition of the ground.

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Plan No. 1

Surface plan of the southern section of the Sukaraniijara Anicut

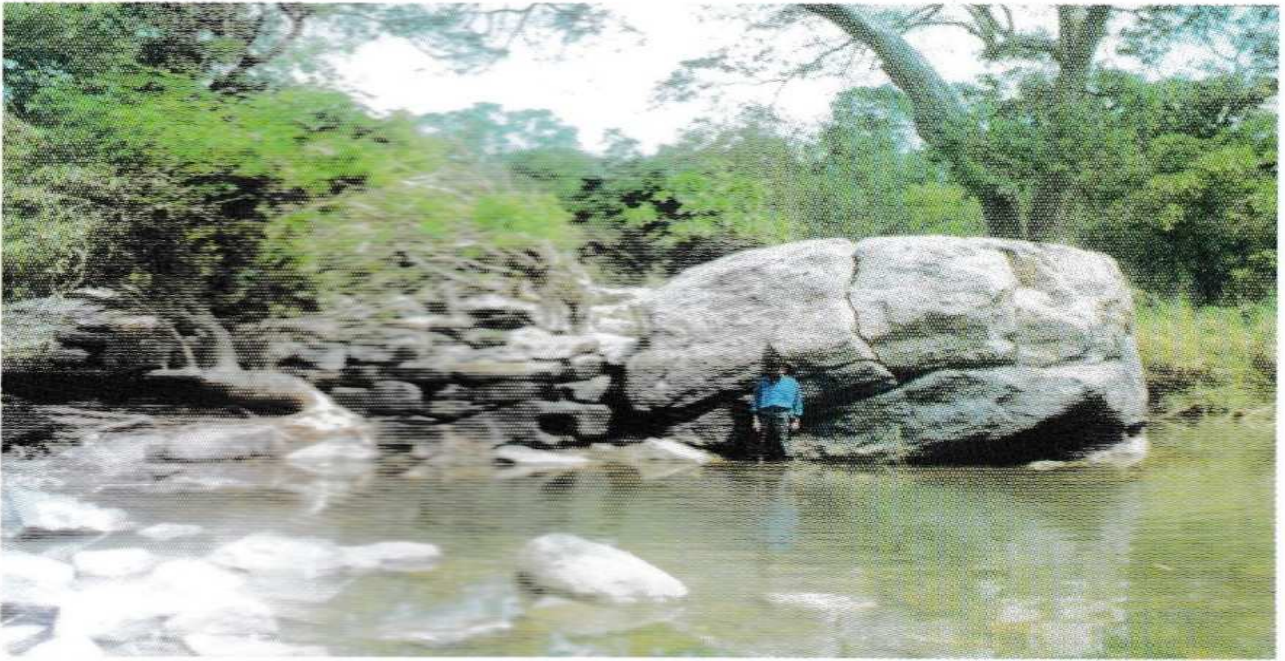
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|------------------------------|---------------------------|
| 1. Southern Section | 2. Lower Southern Section |
| 3. Cross section towards Oya | 4. Height of the Anicut |
| 5. Natural Flat Rock | 6. Southern Bank Boundary |
| 7. Damage Sections | 8. Rock |



Plan No. 2

Surface plan of the Left Section of the Sukaraniijjara Anicut

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|------------------------------------|----------------------------|
| 1. Lower end | 2. Left section- Lower end |
| 3. Left section - upper | 4. Left Bank Boundary |
| 5. Upper end | 6. Damaged section |
| 7. Damaged due to Human activities | 8. Natural Flat Rock |



Cross section towards Oya



Upper Southern section of the Anicut



Rock cut mark of the left section



Section of the Lower end of the left part



Surface of the left section – Arial view