ORIGINAL RESEARCH

An examination into the Socio-Archaeological activity, with respect to village tank concept, in the dry zone of Sri Lanka

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Abstract

Water had been a very close factor affecting the social life of humans from the early It has directly been responsible for starting, developing and even destroying of settlements. The cleverness, shown by historic people in irrigation methodology, has been very helpful for the civilization of the dry zone in Sri Lanka. Although many environmental factors related to the dry zone are good for civilization, water was a factor that offered a great challenge. While examining the above matters, it was found that these small tanks had started in the Proto-Historic period, where the organization of agriculture had begun in this country. It is clear that it had started using the knowledge of the natural structure of the environment which later transformed into an organized tank network gradually. Specially, the native people as well as Indian immigrants have used their experiences for this purpose. These tanks were improved gradually and it was also a main factor that indicates the start of a large scale irrigation system. Because these tanks were built from place to place covering the water flow of the tank premises, they had activated as one tank feeding another. These village tanks had acted as the main factor for the extension of settlements. Through this paper, an attempt is made to present examination on identification of the Socio-Archaeological activity regarding village tank concept relating to the dry zone in Sri Lanka.

Key Words: Socio - Archaeology, Village tanks, Settlements, Agriculture, Irrigation Society

Introduction

Water had been very close factor affecting the social life, of humans from the earliest times. It had being directly responsible for commencements, development and even for destruction of settlements. When people of ancient world moved into Agriculture, water became very close to them. The main reason for affecting to start many old civilizations nearby river valleys, was due to the usefulness of water for different needs, finally leading Agriculture. The cleverness, shown by historic people in the irrigation methodology, has been very helpful for the civilization of dry zone in Sri Lanka. Although many environmental factors in the dry zone are good for civilization, water was a factor of great challenge. To overcome this challenge early historic people and their descendents made small tanks, to collect rain water by using the natural physical

features, seen in the environment. These small tanks later developed and was a main reason for the extension of civilization in that region.

The main objective of the study was to examine the Socio-Archaeological beginning and expansion of village tanks relating to the dry zone in Sri Lanka.

Methodology

This research was done, based on the facts, received mainly by resource education and field research. Small tanks and related environment randomly, selected from selected areas of the dry zone were specially used for field study. In addition, stone inscriptions, facts considered as archaeological resources, facts shown in chronicles and the views of different researchers were used in this study.

Discussion

Water is considered and important factor that decides the prosperity of a country. As O-Hara¹ indicates, for increasing of poverty, the non availability of the water resource division has also affected. Irrigation technology is an activity, borne on the needs of the people, that improved gradually So, it is important to identify the factors that mainly impacted to build the irrigation system in the ancient society, it's gradual development and the social activities that helped developing its different parts.

While conducting Socio-Archaeological studies on the ancient periods of Sri Lanka, attention should be paid to the social expansion through different fields such as, the differences among different social groups that lived in the country in those periods, ruling organizations, social leadership, development of technology, resource usage, economic system and talents. Reason being a human society can be identified as a unit of many activities in different areas.

Early researchers, who conducted Socio-Archaeological studies in Sri Lanka, have obtained facts mainly from written resources. An example for this was the effort taken by Paranavithana² to identify the differences of ancient Sri Lankan society, using early Brahmi inscriptions. In addition. Nicholas³ has tried to explain about ancient societies, using mainly stone inscriptions and in addition chronicles. Working on such facts alone is not feasible, since many of these facts shown in Chronicles have changed over time, depending on writers will, religious matters and the political background that prevailed at the time they were written. Because some news had space to deform while coming through folklore for a long time, even the Chronicles news had problems. However the stone inscription news is contemporary and main attention had been given for the necessary matter. This belief can be verified mainly by stone inscriptions, present mainly from early Brahmi stone inscriptions to Anuradhapura last period inscriptions of Sri Lanka. Though, some imaginary news was seen in some stone inscriptions by Polonnaruwa period, these could be corrected based on other factors.

Water has been a main factor when settling human societies. Many human societies commenced as "River based civilizations". Where settlements had been made bordering rivers. Examples of such ancient river valley civilizations are Nile, Euphrates, Tigris, Huanghe, Yangtze and Indu⁴. In contrast in the old human society of Sri Lanka,

such human settlements were not borne centering a part of natural water way, named locally as river or oya. In here the settlements were near water ways and also in faraway places, spreading inland^{2,5}. Thus, water for feeding the faraway lands of the valley, was taken from the irrigation devices, based on tanks and dams. Accordingly the Sri Lankan society can be identified as "*Irrigation based civilization*". In the ancient society of Sri Lanka representing this irrigational civilization, that irrigation had been considered as a main investment and was also the main asset of the country. One example for this is the statement made by King Dhatusena, that *Kalawewa* is his only property6. In an irrigation based civilization, the specialty is the water in the natural water ways, was taken into use by using irrigation devices. Further the rain water management too, can be identified in the irrigation based civilization as many small tanks, seen in the dry and intermediate zones in Sri Lanka are as rain-water fed tanks, by collecting rain water in the rainy periods and storing it, for use in agriculture and other social needs. Hence it is very clear that the oldest examples for rain water management in the world are in the dry zone irrigation based civilization of Sri Lanka.

Entry into Irrigation Systems.

While examining the Socio-Archaeological space, which affected the progress of irrigation one could learn about the settlement, in the Proto-Historic period of this country. It is an important matter, for beginning of small village tanks of which the attention of this letter has been paid. By the Proto-Historic period, it became clear that people were moving into the areas where their needs can be fulfilled with the lowest effort. The main feature of this period was the entry by people, into an economic system with animal husbandry and limited agriculture an, not considering hunting and food collecting as their main life style. So, instead of a tiresome and monotonous living system as before, moving into a different economic system based environment had occurred in this period. According to that, people of Proto-Historic period of this country, had moved towards starting permanent settlements so as to fit their activities and to easily fulfill their needs. As the special features of settlements in this period, Megalithic burials, Black and Red ware (BRW) can be shown. The culture of Proto-Historic period, that emerged basing these feature, is known as Megalithic Black and Red ware culture.

The culture of Proto-Historic first iron period, had been activated approximately in the period of 1000-300 B.C^{7, 8,9,10}. According to Seneviratne¹¹ the Proto-Historic period had spread in the time of 900-300 B.C. According Mahavamsa, by the 6th century BC, there had been three human groups (tribes) in Sri Lanka, as Yaksha, Naga, Deva and were a group that worked in an organized system⁶. Archaeological evidence have show that, in the period of 900-600 BC, there had been in the permanent settlement society, activities such as, knowledge of iron usage, using of horses, black and red clay wear, paddy cultivation and house hold animal husbandry¹⁰. By 600-500 B.C they had gained literacy¹⁰. When these archaeological evidence are matched with the facts in Chronicles, it becomes clear that, Yaksha, Naga and Deva tribes were civilized local people who lived in the Proto-Historic period in this country. These tribes who liked agricultural and livestock activities, moved into plane lands with dry climates that were suitable for that. Settlements were established in the costal belt changing in to an economic system, based on fisheries and ocean resources. Economy built basing mineral resources and spices moved people into hilly and wet zone areas. Important evidence, about social extension during this time are Proto-Historic burials. That can be identified, in dry zone the country in places such as Maamaduwa, Tekkam,

Karambankulama, Tammennagodella, Gurugalhinna, Kalpe-Wadigawewa, Kokembe, Divulwewa, Kambewa, Maawachchagama, Sandanamkulama, Anuradhapura, Pinwewa, Ibbamkatuwa, Yatigalpoththa, Rajanganaya, Polpithigama, Siyambalegaswewa, Ridiyagama, Godavaya, Eruwewa, Kataragama, Aanakatawa, Kandalama, Rotawewa, Sigiriya, Siyambalewewa, Nelubewa, Ranchamadama, Kalawelpothana, Nilagiriya, Gurugoda^{12,13,14,15,16}.

According to the Megalithic burials' expansion, it is clear that the Proto-Historic settlements of Sri Lanka, has been established close dry zone river valleys of this country¹². This dry Zone region has a suitable soil and a dry climate for Agriculture and has the ability to successful agriculture successfully, with the artificial irrigation. This could have been the reason for this regions' rapid expansion of settlements, than in other regions of this zone. Hence, it is clear that the pioneers of irrigation in this country are the people, who lived in the Proto-Historic period in this zone. Some of Proto-Historic settlements that are related to some river valleys in the dry zone, are as follows;

- I. Yan oya valley: Gurugalhinna, Thammennagodella, Wadigawewa, Rambewa, Kokebe, Divulwewa, Siyambalewewa, Sigiriya
- II. Malwathu oya valley: Anuradhapura, Thekkam, Aluthbomuwa, Siyambalagaswewa, Eruwewa, Sandanamkulama, Maanthai, Nelubewa
- III.Kala oya valley: Karambankulama, Rajanganaya, Pomparippu, Ibbankatuwa, Aanakatawa, Yatigalpoththa, Kandalama
- IV. Deduru oya valley: Pinwewa, Polpithigama

In the Proto-Historic period, the tanks were introduced into the dry zone mainly as a solution, to provide water for agriculture. It can be assume that, the fore fathers of Proto-Historic people, who made settlements in the river valleys, had used the water, that were stored in the natural low lands like "Pathas", by using temporary bunds and canals to get for farm lands. But with the increase of population, as these irrigation methods were not sufficient, they might have collected rain water, by making small tanks using natural furrows and hillocks that were on the plain land. Constructing a soil bund to block water in the "Pathasa", could be considered as the start of a small tank.

By the time of Proto-Historic period, there was an expanding settlement system in the dry zone. This assumption could be according to the expanding system of burials. This clearly show that these settlements had been as micro settlements. In this period, while putting up micro settlements, people also had interest in the structure of the land. . There, they might have thought mostly about a suitable soil structure for agriculture and the support, that can be got from the land, for irrigation. At the start of Proto-Historic early iron period, people may have used the water, that collected in the natural Pathas Later by using soil structure, they had connected hilly places of the land, made small dams covering the low lands and built small tanks. From many places with burials, situated neighbouring dry zone land-the evidence was found about small tanks. Idammaluwa wewa close to Ibbankatuwa Megalithic burial, small tanks nearby Yapahuwa. Kondadeniya burial, tanks can be identified relating to the burials like Sandanamkulama and Siyambalagaswewa, tanks Pomparippu burial, tanks and channels seen near the Kokembe burial, the small tank nearby Thammennagodella burial and the tank nearby Wadiga wewa burial are the example for this. Once it has taken effort to examine the relationship with Pomparippu megalithic burial and it's nearby tank9.

According to legends and as seen in Chronicles by about the 6th B.C, the water collecting methods had been, established. The ponds mentioned in the Prince Wijaya and Kuweni story⁶ and the Timbiriyahanawila, mentioned in the Pandukabhaya story⁶ can be shown as examples for this. In addition to this by constructing primary stone buns across water ways crossing water ways. While observation of some stone inscriptions' found in some dams of Yan oya and Kala oya in the dry zone, one could assume that they represent the primary step of a dam.

For construction of this type of irrigation methods in the Proto-Historic period, first iron periods technical knowledge and iron tools the people had with them by that time, would have been used. It seems that steel had been used successfully for agriculture and other purposes at this time. Likewise, the metal implements like mammotys crow bars, pick axes and hammers may have been used for tanks building of tanks.

Clear differences between the end of Proto-Historic period and the start of Early Historic period are not seen. Seneviratne¹⁷ had shown that, it is another developing opportunity of the Proto-Historic culture itself. However, this time period is commonly considered as the start of organizational society in Sri Lanka. Many of early Brahmi inscriptions, from the news about early Historic period can be obtained have been found from different areas in the dry zone. These inscriptions are helpful to obtain news about social spreading at that time. The speciality, relating to these inscription is that, many matters can be obtained about names of leaders and their posts and duties of the social groups. These are not usually available through historic resources of this country.

By the time of revising the first part of "Inscription of Ceylon", 1105 early Brahmi inscriptions had been identified². Among them, there are about 1035 such stone inscriptions in the dry zone and in the neighboring areas (Table - 1).

Table 1. Distribution of Brahmi inscriptions in dry zone areas of Sri Lanka

District	Number of Early- Brahmi inscriptions	Percentage
Anuradhapura	269	24.34
Kurunegala	169	15.29
Polonnaruwa	51	4.61
Matale	60	5.42
Vavunia	53	4.79
Trincomalee Baticaloa Ampara	179	16.19
Hambantota	153	13.84
Monaragala Badulla	54	4.88
Puttalam	47	4.25
Total	1035	93.61

These stone inscriptions were distributed in some river valleys (Table 2.) . This clearly shows that by Proto-Historic period and also in the Early Historic period, the most attracting zone of this country had been the dry zone.

Table 2. Number of early -Brahmi stone inscriptions situated in the main river valleys in the dry zone

River valley	Number of early Brahmi inscriptions	Percentage
Deduru oya	103	9.52
Kala oya	123	11.13
Malwathu oya	162	14.66
Yaan oya	85	7.69
Kumbukkan oya	100	9.04
Menik ganga	83	7.51

According to these stone inscriptions it could be surmised that by the early , Historic period, the social expansion extended into the neighboring North Western, North Central and East West areas relating to the dry zone . Systematically. Also from the post names, it can be that the social establishment and grading had been systematically arranged.

Claessen¹⁸ was of the view that the establishment among social groups occurred on the economic and social matters and through that, the building of a ruling organization emerged. Examination of the social arrangement of the early Historic period of Sri Lanka, further proves this view. According to the early Brahmi writings there was an identifiable – social activity establishment. This establishment consisted of Parumaka, Gamika, Gapathi and Aya (Table 3). By the time of 3-1 B.C, the settlementation neighboring river valleys of the dry zone, had been in an upper level, can be opened through the news of table 2. Through these inscriptions, about the persons, who gave the leadership for this social activity, facts can be opened. These post names (*Parumaka*, *Gapathi*, *Gamika Batha* and *Asa*) perhaps may be of leaders who led to a settlement programme arranged on a tribal base or extension. Gunawardhana stated that, by the post names like *Gamani*, *Gapathi* and *Parumaka*, show a grading in the society of that time and through that information could be got about the social political activity at that time¹⁹.

Table 3. Percentage of early-Brahmi Inscriptions

Name of social group	Number of early-	Percentage
Parumaka	Brahmi letters 321	29,04
Gamika	86	7.78
Baratha	28	2.53
Batha	159	14.38
Asa	21	1.90

According to early - Brahmi inscriptions, the social groups named *Parumaka*, had worked, as leaders . and Seneviratne²⁰ having observed stone inscriptions stated that day lived in the areas neighbouring ancient burials. According to that, it can be guessed that the introduction of the *Parumakas* had been since Proto-Historic period itself. The Parumakas, mentioned mostly in the early-Brahmi inscriptions, were closely related to

the Megalithic burials and land settlement in Sri Lanka², and can be thought considered as the traditional leaders, who descended from the Proto-Historic native tribal people, Who lived in those regions. From the Proto-Historic period, it could be assumed that this grade name had been popular in this country and was the most used mostly used post name by 2-1 B.C in this country Sitrampalam, was of opinion that Parumakas are a group, who worked as leaders in the society at that time²¹.

Further according to stone inscriptions, *Parumakas* were not limited for one special activity in the contemporary society, and their activities had been according to the needs of society. It was a combination of social, economic, political and religious and administration activates²². Stone inscriptions showed that, in the contemporary period *Parumakas* had issued their power on every section in the society². Based on these factors, it can consider that, *Parumakas* had maintained a great part in the irrigation field of this country. Some out of them, , had worked as maintainers and also were in charge of tanks².

Table 4. Parumakas in - charge of tanks, according to early Brahmi inscriptions

Early Brahmi inscription and number*	Parumaka name
Handagala 1130	Vapi hamika Parumaka Mahavebaliya
Handagala 1132	Vapi hamika Parumaka Mahadaka
Avukana 1151	Vavi hamika Parumaka Uvajanaka
Avukana 1153	Vavi hamika Parumaka Dasakaha

^{*} Source: Inscription of Ceylon.Vol:1

According to inscriptions the metal industry had begun and later developed in the north central and north western regions. There were different people involved in this industry known as *Thopasha* or Tin workers² *Tambakara* or copper workers², *Kabara* or iron workers², *Kolagama* or *Lokurugama*² In addition to them, their had been gem workers too in these regions and would have helped in the settlement of people in this region In this situation the need of water in this zone for different fields other than agriculture, may have been a reason for the progress of irrigation.

The most important incident that happened after 6th B.C in this country was the Indian immigration into the regions where the resources were present⁶. Due to this immigration, the occasion for further the preservation of the identity of the Proto-Historic native tribes in this country may not have received attention. Owing to the social mixing between native and Indian immigrants, a most confused society emerged in Sri Lanka, and it started to show the features of a society graded as Agrarian ,Techno and Commercial.

Sri Lankan native people and the social groups who immigrated here from North India through South India and ocean zone, moved into an agro-economy, based on the structure of dry zone areas of this country. For Indian immigrants, their experiences in India would have been useful for that. Two main factors have been identified for emergence settlements in the dry zone at the beginning;

- 1. Storing rain water in a pond, made very simply and using the water, through primary channels for their needs.
- 2. Blocking the primary water ways that carry water throughout the year, by using large stones and wooden logs and taking that water into use for the needs through small canals^{23,24}.

Native people and Indian immigrants have made their settlements in groups. These houses, made mainly using wooden posts and laths were formed in a circle. Archaeological evidence for this, has been found (ASW2) by the excavations at Anuradhapura Salagahawatta²⁵. Using this type of houses even at present by some Indian people, is evidence for existence of that tradition without stoppage. So to serve a group of this type of houses, a tank with a small bund, limited for only several acres, may have been built by themselves and established below their paddy farms. Accordingly, it can be thought that the dry zone "tank" of first period had been built, centering a tank. This may be the reason, for having small tanks as village tanks.

The facts about the tanks that were built in the B.C. period are mentioned in the Chronicles. The oldest news on this is, the tank made by minister named Anuradha, while building Anuradhagama⁶. This tank was built with the knowledge gained from Indian immigrants about small irrigation methods. King Pandukabhaya built three tanks, named *Jayavapi*, *Abhayavapi* and *Gaminivapi*, while construction of Anuradhapura city⁶.

In the 3rd B.C. sub king Mahanaga constructed the tank Karachchavapi⁶. Labhiya Wasaba, who served King Dutugemunu, also had made a tank⁶. Prince Saddhatissa who ruled in the Deegavapi region built many tanks of this type for development of agriculture⁶ Hundaravapi (Sundarawewa) and Veheravapi (Viharawewa), were two tanks built by villagers⁶. Early Brahmi inscriptions provide clear evidence that the settlements were borne basing such village tanks. Examples of such are the village, Erakapi mentioned in the Nettukkanda inscription², building the village named as Lonapi, attaching "Lona vapi" mentioned in an inscription of Mihintale², "Anulapivapi" in the Handagala inscription² and "Upalavi" (Upali vavi) in an inscription of Rajagirikanda Mihintale ². Village tanks had been a very close factor for human life in ancient times and as such villages also bore the names of these village tanks²⁶.

In the early period agriculture, was done using water from the village tanks. In an inspection done in 1904 a total of 11200 village tanks of this type were found only in Anuradhapura district and Northern Province (Unpublished reports-Irrigation department). According to the data of the Department of Agrarian development, in the districts relating to dry zone, 10651 active village tanks have been identified I n recent times (Final document on village irrigation works in Sri Lanka, Department of Agrarian development - Sri Lanka). But, the data is not complete and many village tanks have been missed. According to the inspection, done using one inch map 16336 by these researchers, there are more than 2500 such unused village tanks, in the dry zone that had not been counted. Many of these tanks have been converted into paddy and coconut lands and settlement areas. So, it can be guessed that the number of village tanks that were built relating dry zone of Sri Lanka, could approximately be about 12700.

These active and missed village tanks can be shown as important evidence, about the developed social extension, relating to the dry zone in Sri Lanka. Among them, a thick village tank establishment can also be seen in the Kurunegala district where about 4192 tanks are situated (Unpublished reports-Irrigation department). In the Deduru oya valley, in the Wariyapola region, a high density of village tanks can be seen (See the 1,63360 Wariyapola map, Survey department). Belonging to the dry zone, relating he Thibolketiya region also, a great extension of the village tanks is shown (See the 1,63360 Thimbolketiya map, Survey department - See the 1,63360 Wariyapola and Thimbolketiya maps, Survey department). It shows a developing position of the rural societies of those regions.

Even though, the village tank building was done considering it as a common matter, some tanks were also made by Parumakas, who held the village leadership and were knowen as "Vapi Hamika". Examples of this are Anulapi vapi hamika Parumaka Maha vebaly, Parumaka Nakodapika vapi hamika, Kadapi vapi hamika Parumaka Uvahajanaka². In addition to this, the association of Parumakas with irrigation were shown by other ways² NO evidence is found to show that parumukas were owners of tanks but instead were those in-charge of the tanks.

By the 1st century B.C every village in the dry zone had a small tank, as seen through chronicles, stone inscriptions and archaeological resources. Two irrigation methods were found in these times such as :.

- (i) Building of Temporary dams -water being moved into channels through small damsmade of stones permanently across waterways or making dams using timber, clay or other materials.
- (ii) Built soil bunds, making their by small tanks for getting its' collected water into the farming lands below²⁷

According to that, it is clear that in this period, the Agriculture, fed on minor industries has been built relating the dry zone in Sri Lanka. Many of these irrigational creations seem to have been activated independently. However, by the start of A.D, because of social changes and through experiences, instead of village tanks, bigger tanks that can store more water and also the stone dams through which more water can be released to other areas were developed. Yet village tanks were not neglected due to this change although some village tanks would have changed into larger ones. The *Manadavapi* tank, built in the period of king Mhachulika Mahatissa (77-63 B.C) may be a such tank⁶.

Whatever the irrigation system including village tanks, they were built in this period identifying the social needs. Under the activity of *identifying the need > having a feeling > getting an example > having an induce > being in the irrigation*, the improvement of irrigation had happened, can be identified. It seems there had been social and economic development of people and participation in this tank building process. Many numbers of such small village tanks, out of large irrigation works are mentioned in the stone inscriptions up to 3^{rd} century A.D⁵.

For the perfect dry zone village society in Sri Lanka, the help obtained from the small village tanks is very great. It can be identified that these small tanks, had helped rural people in the dry zone, for a very long time. These small tanks in the dry zone completely control the collection and storage of rain water. There contribution t00 change the environmental condition in the dry zone is very great. A single large tank change the environment and similarly the small tank whish were inter connected also change the environment but in a larger large area. These were known as "Enduthu Vavu" (joined tanks). These joined each other and collected drained water from paddy fields and spill water from tanks for use again.

Some scholars opined these village tanks as "cascade system" because, these tanks were join each other in a network²⁸. Not only water springs, "Pathas" (small ponds) like natural water resources, but also permanent water ways like over flow canals (Agara), that were active only in the rainy periods in the dry zone, had been identified when making this type of tanks. All of these tanks that have been extended very clearly into the neighboring districts of *Anuradhapura*, *Kurunegala*, *Vavunia*, *Monaragala*, *Hambantota and Ampara* and a little in the other districts belonged to the dry zone, were built in the

main river valleys, sub valleys and micro valleys, present in each zone. Due to that, it can be identified that many dry zone small tanks are built, relating each land zones as joint tank networks. When compared with other regions, a big extension of these *Enduttha* tanks (joined tanks) are seen in the districts of Anuradhapura and Kurunegala²⁹. By this time, about 1661 cascade systems that were built basing village tanks of Sri Lanka have been identified and it can be identified that about more than 95% village tanks are coming under some cascade system. Of them, some tanks are activating in a small cascade system while some have been able to create larger cascades.

These small village tanks, started as a result of identifying the primary water resources in the Proto-Historic period, have gradually extended and as a result of that, it can be identified that, these small cascade tanks had provided a full time contribution for the dry zone social life. The main example for that is finding evidence, even in Anuradhapura and Polonnaru kingdoms, where large scale irrigation works started, basing large tanks and dams without destroying these small tanks.

One specialty of the tanks of cascade system is, when it goes down gradually, amplitude of the tanks become higher than the tanks situated above. This is because these collect not only over flow water of the tank above, but also additional flow water into them and this may be a reason for the largeness of below tanks. It might have been the reason for gradual largening of the tanks of cascade system, the need for storing a big density of water and protecting the strongness of the tanks. Basing thee small tank system that built connecting many such cascade systems, many villages may have been built. There are evidences that the names of those villages have been introduced basing the name of tank².

Conclusion

While examining the above matters, it is clear that these small tanks had started in the Proto-Historic period, and alone with it organize agriculture. It is also clear that, it has been started using the natural structure of the environment and later became an organized tank network, gradually. Specially, native people as well as Indian immigrants also have used their experiences for this, so that these tanks were improved gradually and it was also a main factor that indicates the start of a large scale irrigation system. Because these tanks were built from place to place, covering the water flow of the tank premises they had activated as one tank feeds another tank. It is clear by identification evidences for playing the main role to build the village in the dry zone by the first part of Anuradhapura period, these village tanks had activated as the main factor for the extension of settlements. According to that, by the end of Anuradhapura period, these tanks were able to do joint network, in the dry zonal area. As these tanks could be seen not only for the benefit of the people but also as environment friendly, it can be decided that, it is the main factor for the activating of these tanks up to now.

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References

- 1. O'Hara S., Water Management in the Southern Caucasus, and Central Asia, Drop by Drop, Open Society Institute, 2003.
- 2. Paranavitana S. *Inscription of Ceylon Vol. i. Part. i.,* Colombo: Department of Archaeology, 1970.
- 3. Nicholas CW., Historical topography of Ancient and Medieval Ceylon. *Journal of the Royal Asiatic Society (NS)* 1963; vi: Special number, Colombo.
- 4. Korovkin F., History of the ancient world, Moscow: Progress publishers, 1985.
- 5. Paranavitana S. *Inscription of Ceylon Vol. ii. Part. i.* Colombo: Department of Archaeology, 1983.
- 6. **මහාවංසය** (සිංහල), 1967, සංස්. හික්කඩුවේ ශීු සුමංගල හිමි, බටුවන්තුඩාවේ දේවරක්ෂිත පඬිතුමා, කොළඹ, රත්නාකර පොත් වෙළඳ ශාලාව.
- 7. Paranavitana, S., Archaeological investigation near Pomparippu. *Ceylon Today*. 1956; 5 (iii) 13-15.
- 8. Indrapala K., Early Tamil settlement in Ceylon. *Journal of Royal Asiatic Society*, Ceylon Branch (new series) 1969; xiii: 43-63.
- 9. Begly V., Excavation of Iron Age burials at Pomparippu 1970. Ancient Ceylon. Journal of the Archaeological Survey Department in Sri Lanka, 1981; 4.49-141.
- 10. Deraniyagala SU. b, *The Prehistory of Sri Lanka; An Ecological Perspective, Part II.* Colombo; Archaeological Survey Department,1992.
- 11. Senavirathna S., 1989, Pre State Chieftain and Servants of the State: A case study of the parumuka. *The Sri Lanka Journal of Humanities*. 1989; XV (1&2):99-131.
- 12. Senavirathna S., The archaeology of the Megalithic-Black and Red Ware complex in Sri Lanka. *Ancient Ceylon, The Journal of the Archaeological Survey Department of Sri Lanka* 1984; 5:237-307.
- 13. Somadewa R, Dissanayake R., Fernando, R., The Galpaya Survey: Results of the first field season 2006. In: Nimal De Silva, Raj Somadewa(Ed). *Occasional paper No.* 1, Colombo: PGIAR, University of Kelaniya, 2008.
- 14. වාව්වගේ, එස්., සහ විතානාච්චි, සී. ආර්., 2008, සියඹලාගස්වැව මෙගලිතික සුසාන භූමිය ආශිත මූලික ගවේශනය, *ජාතික පුරාවිදන සමුළුව*, පුරාවිදන දෙපාර්තමේන්තුව: 293-296 පිටු.
- 15. විතානාච්චි, සී. ආර්., 2009b, සන්දනම්කුලම ඉට්ටිකට්ටිය මෙගලතික සුසාන භුමිය ආශුිත මූලික ගවේෂණය, *ජාතික පුරාවිදාහ සමුළුව* , පුරාවිදාහ දෙපාර්තමේන්තුව: 1-5 පිටු.
- 16. ජයරත්න, ඩී.කේ., 2011, ශී ලංකාවේ මුල් යකඩ යුගයේ පුරාවිදාහව: ඉහළ කලවැල්ලා උල්පත සුසානය ඇසුරින්, *පුන් කළස, ජාතික පුරාවිදාහ සමුළුව*, පුරාවිදාහ දෙපාර්තමේන්තුව, 99-102 පිටු.
- 17. Senavirathna S. Peripheral regions and Marginal Communities. In: Champakalakshmi R, Gopal S.(Eds). Towards an Alternative Explanation of early Iron Age Materials and Social Formation in Sri Lanka. Tradition, Dissent and Ideology Essays in Honour of Romila Thapar, Delhi: Oxford University Press, 1996;264-312.

- 18. Claessen H J M. Skalník P., The Early State: A Structural Approach. In: Henri JM. Claessen HJM, Peter Skalnik (Eds). *The study of the state*. The Hague: Mouton publishers,1978; 533-96.
- 19. Gunawardana RALH., Social Function and political power: A case study of sate formation in Irrigation Society. In: Henri JM. Claessen and peter Skalnik (Eds). *The study of the state*, The Hague: Mouton publishers, 1981; 133-54.
- 20. සෙනෙවිරත්න, එස්., 1987, ලංකාවේ මුල් ඓතිහාසික යුගයේ ජන සම්මිශුණය පිළිබඳ ව අධායයනයක් "බරතවරු" "*යානුා* (කලාප අංක 1), පේරාදෙණිය විශ්වවිදාහලය, ලංකා සමාජ ගවේෂණ සංගමය, 67-84 පිටු.
- 21. Sithrampam SK. The title Parumaka found in Sri Lanka Brahmi Inscription: A Reappraisal, *The Sri Lanka Journal of South Asian Studies*, No. 1 New Series, 1986/1987;13-25.
- 22. Senavirathna S., Pre State Chieftain and Servants of the State: A case study of the parumuka. *The Sri Lanka Journal of Humanities*. 1989; XV(1 & 2): .99-131.
- 23. Brohier RL., Ancient Irrigation Works in Ceylon. Part i-iii. Colombo: Ministry of Mahaweli Development, 1934(1979)
- 24. නිකලස්, සී. ඩබ්ලියු., 1964:2001), ජල සම්පාදනය, *ලංකා විශ්වවිදහාලයේ ලංකා ඉතිහාසය*, කාණ්ඩය i, විදහාලංකාර විශ්වවිදහාලය, 213-217 පිටු.
- 25. Coningham RAE., Anuradhapura. The British-Sri Lanka excavations at Anuradhapura Salgaha Watta 2. Vol. i. Oxford: Hadrian Books Ltd,1999.
- 26. විතානාච්චි, සී. ආර්., 1999, පූර්ව බුාහ්මී ශිලා ලේඛන ඇසුරින් අනාවරණය වන පුරාණ ලංකාවේ ස්ථාන හා ගුාම නාම, Studies in Humanities, Journal of the Dept. of Humanities. Rajarata University of Sri Lanka, Vol. i, No. i: 89-106 පිටු.
- 27. නිකලස්, සී. ඩබ්ලිවු." 1964:2001), ජල සම්පාදනය, *ලංකා විශ්වවිදහාලයේ ලංකා ඉතිහාසය*, කාණ්ඩය i, විදහලංකාර විශ්වවිදහාලය, 213-217 පිටු.
- 28. Maddumabandara CM., Catchment Ecosystems and Village Tank Cascades. Redel Pabe, 1985.
- 29. Water sheds of Sri Lanka. Department of Agrarian Development, 2007.