

FLOODS, DROUGHTS AND FAMINES IN PRE-COLONIAL SRI LANKA

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The information available on the subject of floods, droughts and famines in pre-colonial Sri Lanka is meagre. Nevertheless, incidental references found in the chronicles, commentaries and literary records provide valuable information which may be useful even to a geographer or a climatologist provided that such evidence is correlated with sample surveys on soil types, pelagic sediments, lake sediments, land forms and underground water. The reconstruction of former biota can also be helpful in analysing climatic change. These surveys and reconstructions need to be conducted by multi-disciplinary teams of scholars as there is a fundamental need to fill the gap in knowledge between climatic changes over geological time scales and existing meteorological records. The earliest available meteorological records for Western Europe date only from the seventeenth century. There are reports of gauges being used for assessing climatic change in Korea as early as 1440 and in Palestine nearly 2000 years earlier but those records have not survived.¹ In Sri Lanka exact rainfall figures and records of droughts and floods are available only from 1869 onwards.² The present study is an attempt to analyse historical evidence on floods, famines and droughts in Sri Lanka during a period which is not covered either by geological time scales or meteorological records.

However, it has to be emphasised that the sources on the subject are sometimes intriguing. The chronicles, mainly the *Mahāvamsa* and the *Cūlavamsa*, which contain a continuous dynastic and religious history obviously do not refer to all instances of floods, drought and famines. For instance, the fifth century commentary - *Sammohavinodinī* refers to one of the severest droughts in the Island during the reign of Vaṭṭagamāṇi Abhaya (B. C. 89-77) but the *Mahāvamsa* is silent on this. The sixteenth century chronicle *Rājāvaliya* too contains no reference to this famine. On the other hand the *Rājāvaliya* refers to a famine and drought during the reign of Vaṭṭagamāṇi's son Coranāga³ on which the *Mahāvamsa* and the commentaries maintain silence. The chronicles and literary works also pose less serious problems when they refer to earthquakes and floods in connection with mythical or semi-mythical stories.⁴ Most of these references can be historically discounted by studying the contexts in which they appear. In boundary books and information books or the *kadaimpot* and *vittipot* written after the fourteenth century, there are references to inundation of the sea at various historical ages but these notices cannot be relied upon. For example, reference may be made to the boundary book, *Siri Laka Kaduyurupota* which mentions the inundation of the Island during the mythical King Rāvana's time.⁵ There are also references to inundations during the reigns of Paṇḍuvāsudeva and Devānampiyatissa.⁶ Considering all these omissions and rhetoric, it has to be emphasised that any reconstruction of climatic history based purely on historical records cannot claim to be either exhaustive or free from error.

As Zeper and Eaton have maintained, coastal tracts are definitely susceptible to erosion by waves approaching the coast at angles equal to or less than 45°. ⁷ Some scholars of the nineteenth century such as Charles Pridham and Sir W. Jones believed that due to erosion and irruptions of the sea Sri Lanka has been reduced considerably in historical times and was formerly of much greater extent that it is at present.⁸ Although erosion of the

coast and gradual encroachment of the sea upon the land has been going on, it is not possible to subscribe to the view that the Island was much greater in size two thousand years ago than at present. Undoubtedly sea erosion had resulted in the diminution of its size over centuries but not to the extent Pridham, Jones and other writers have imagined. According to the chronicles, a major inundation of the sea took place in the second century B. C. In the legendary story of Duṭṭhagāmaṇi, it is stated that the provincial kingdom of Kalaniya was partially inundated submerging hundreds of villages during the reign of its ruler Kalyani Tissa.⁹ This inundation is much more exaggerated in some of the boundary books written in the fourteenth century. According to them several thousands of villages and vast tracts of land were submerged as a result of the disaster.¹⁰ Yet, as occasional occurrences of hurricanes and cyclones due to climatic fluctuations are not uncommon these references cannot be totally ignored. The mesoscale disturbances that occur in ocean currents can give rise to the severest weather conditions in a region. During the short period between 1925 and 1944 forty eight cyclones have been observed in Sri Lanka.¹¹ The Bay of Bengal cyclones could be associated with gales, excessive and intensive rains, storms and surges and it may be that disturbances in the Bay of Bengal ocean currents during Kalyani Tissa's reign had resulted in large scale inundation.

Although such major sea floods are not referred to thereafter, flooding of rivers due to excessive rains certainly would not have been unknown in ancient Sri Lanka. In fact, some of the rivers have changed their courses in historical times most likely due to floods. Dennis Fernando, by examining a few aerial photographs of the Mahaveli region in the North-Central Province came across what clearly appeared to be old river courses. According to him, the Mahaveli river in particular had changed its course in the Polonnaruwa district of the dry zone. The old Buddhist temples lay beside what was obviously the old Mahaveli river bed, while there is a complete absence of temples beside the present river in the Polonnaruwa district. One of the inscriptions found near the ancient Somawati dagoba, which could be dated to a period between 100 B. C. and 100 A. D. records that "the income derived from the lands around the monastery and from the ford are to be used for the upkeep of the monastery". The dagoba is about a mile from the present course of the Mahaveli, and it is improbable that the ford was that far from the dagoba. The old course is only about 175 yards from the dagoba. This may suggest that the change of the old river course at this place had occurred after the building of the dagoba, and after the inscription was indited, i. e. within the last two thousand years.¹² In fact, constant shifting of river beds and fluctuation of river courses or drying up of river beds was not a strange phenomenon in South-Asia in the historical period¹³ and it may be surmised that apart from the Mahaveli in Sri Lanka, some other river courses too have changed from time to time due to floods.¹⁴

Because of flooding, breaching of the dams of the reservoirs, soil erosion and silting, many kings had to restore several irrigation works that were built by their predecessors. For example Parākramabāhu I (1153-86) had to restore the reservoirs known as Mahādatta, Valahassa, Kumbhīlasobbhaka, Mahādāragallaka, Pattapāsaṇa, Kana, Kaṭunnaru, Kalalahallika and Paṇḍavāpi which were restored a few decades earlier by Vijayabāhu I (1070-1111).¹⁵ Parākramabāhu also had to restore certain works such as Parakkamatalakavāpi which he himself had constructed in the earlier part of his reign.¹⁶ These are clear indications of the destructive nature of the dry zone floods.

In fact, even at present, in certain years the dry zone experiences very heavy rainfall which results in silting of canals and reservoirs and breaching of dams. For example in the floods of 1947, several hundreds of large and small canals, anicuts and reservoirs were breached causing severe destruction. The dry zone cultivator has no doubt, to reckon with the variability of rainfall which sometimes results either in drought or in floods. The failure to accept this factor may lead to many false judgements about the development of the dry zone. One or two years of heavy rainfall may so inflate the mean for a twenty year period that it gives an exaggerated impression of the rainfall that may be expected. As an illustration, the mean daily rainfall at Anuradhapura for the period 1906-1945 was 1.33" but for half the period the rainfall was less than 0.28" and in two thirds of the period it was less than the mean. A run of deficit years, i.e. years in which rainfall is less than the mean, is thus only to be expected.¹⁷ Such deficit years undoubtedly result in droughts of varying intensity.

In a discussion of natural calamities a brief reference may be made to earthslips and sliding in the mountainous region in the central hills which is an on and off occurrence to-day. There are no references to sliding or earthslips in the sources pertaining to the period under survey. In fact, much of the highland above about two thousand feet was largely unpopulated till the tenth century. During this period there are very few inscriptions which indicate human habitation in the region above two thousand feet except along the road to Adam's Peak. According to the *Culavamsa*, in the eleventh century, the Malaya country or the "mountain region" "was difficult to penetrate owing to the inaccessibility of many mountains and on account of the dangers from wild animals, shut off from intercourse with other men and passable only by forest paths offering all kinds of perils and dangers"¹⁸ However after the tenth and eleventh centuries there was greater dispersal of human settlements in the mountain region. Nevertheless, it may be assumed that during the time of the ancient Sinhala civilization the mantle of forest in the mountain region prevented heavy earthslips and sliding which are phenomena of more recent origin. Recent earthslips and sliding have been caused mainly due to large scale clearance of forest for cultivation of crops such as tea, tobacco and potato.

On the other hand, occurrences of droughts and destruction caused by them in pre-colonial Sri Lanka seem to have been more serious than at present. The first reference to a famine in the chronicles is found in connection with the legendary story of Duṭṭhagāmaṇi (B. C. 161-137).¹⁹ This famine was called *akkhakhāyika* famine which literally means the famine during which nuts called *akkha* (*Terminalia Bellerica*) were eaten. According to the commentary on the *Mahāvamsa*, the *Vamsatthappakāsinī*, it was called *akkhakhāyika* because the people used to cook tender *akkha* fruits which were not normally used as edible fruits and eat them during the famine²⁰. The commentary also refers to this famine through the term *pāsānacchātaka*²¹ and the *Thūpavamsa* refers to it as *bulu kana sāya*²². According to all the texts the famine was restricted to a particular area called *koṭṭa* in the highlands. During this period, Duṭṭhagāmaṇi, after disputes with his father was living in the region called Kottamalaya.²³ The *Thūpavamsa* refers to the region as *Kotmale*²⁴ which can be identified with the area close to Gampola known by the same name at present. The famine referred to had occurred before Duṭṭhagāmaṇi's ascent to the throne of the Rohaṇa kingdom. It has to be noted that this famine is mentioned casually in listing Duṭṭhagāmaṇi, meritorious deeds. Duṭṭhagāmaṇi is said to have sold two precious earrings to obtain food

for some monks during the famine. It may be that at the time the failure of rains had resulted in scarcity of food in some parts of the mountain region. As the communications system was very weak during this early stage of state formation, transporting grain from one area to another, particularly in the mountain region, would have been difficult when such transportation was necessary during times of crop failure and drought. The inhabitants in localities affected by such calamities would have encountered much hardship in obtaining their food requirements.

The whole island seems to have experienced a severe drought and a famine nearly half a century later during Vaṭṭagāmaṇi's reign. (B. C. 89-77). According to Buddhaghosa's commentary, *Sammohavinodinī*, the famine was so serious that as a result twenty four monks died while some others left the Island to seek refuge abroad.²⁵ The famine continued for several years and the monasteries in Anuradhapura were abandoned. On certain occasions the monks lived on the stalks of the water lily. Towards the later stages, the famine had grown so acute, that some people were forced to live on human flesh.²⁶

The Sinhala literary work *Saddarmālankāra* written in the fourteenth century, mentions this famine by using the term *bāmiṇītiya sāya*.²⁷ The *Rājāvaliya*, written in the sixteenth century, like the *Mahāvamsa*, does not refer to a famine during Vaṭṭagāmaṇi's time. Instead, the *Rājāvaliya* mentions a famine which continued for three years during the reign of Vaṭṭagāmaṇi's son Coranāga and it was also known as the *bāmiṇītiya* famine.²⁸ According to this text, the immediate cause of the famine was the destruction of temples and dagobas by Coranāga. It further explains why the famine was called the *bāmiṇītiya* famine. The king who ruled Sāgalapura in India had given orders to kill a *brahmin* by unjustly implicating him in a case of theft of a bull. The king's misdeed was due to his lust for the beautiful wife of the *brahmin*. Consequently Sāgalapura was affected by a severe famine for twelve years and his contemporary Coranāga's kingdom was affected for three years.²⁹ As this text was written during a later period greater reliance could be placed upon the ancient commentary *Sammohavinodinī* than on the *Rājāvaliya*. On the other hand, it is possible that there were two famines, one during Vaṭṭagāmaṇi's reign and the other in Coranāga's reign, the more serious being the former.

Another famine is reported to have occurred during the reign of Kuñcanāga (187-189 A.D.) approximately one hundred years after the previous one. This famine was called the *ekanālika* famine and even during the famine the king is said to have maintained without interruption an alms-giving for five hundred *bhikkhus*.³⁰ Neither the *Mahāvamsa Tika* nor any other literary text provides information as to why this famine was called *ekanālika* famine. *Nāli* was an ancient measure equivalent to four *pasata* or 'handfuls'.³¹ It is possible that the famine is called *ekanālika* because the people were reduced to depending on a very small quantity of food for their sustenance.

The next famine that finds mention in the chronicles is the one that occurred during the reign of Sirisanghabodhi (247-49). According to the *Mahāvamsa* "when the king Sanghabodhi heard that the people of the Island were suffering due to a severe drought, he meditated and performed *satyakriyā* seated on the courtyard of the Mahāthūpa or the Ruvanvali dagoba and as a result of the king's piety it began to rain thus ending the drought".³² The *Eu!*

Attanagalu Vaṃsa too refers to this famine and drought³³ and both the *Mahāvāṃsa* and the *Elu Attanagalu Vaṃsa* mention an epidemic caused by a *yakkha* known as *Raktakshī* (red-eyed demon). The symptoms of the disease were red eyes and high fever. The plague was highly contagious and fatal.³⁴ As the occurrence of eye diseases could be a result of intense heat and washing the face with polluted water, it may be that this epidemic was a result of prolonged drought and famine. Forbes is of the opinion that it was small pox which is recorded as the pestilence of the red-eyed demon³⁵ and it is likely that he is correct.

Within a hundred and twenty years after the reign of Sanghabodhi the country seems to have been again vexed by the ills of a famine and a plague during the time of Upatissa I (365–406).³⁶ The *Cūlavāṃsa* gives a vivid description of the measures that have been adopted during this famine clearly indicating that religious rituals were performed to dispel the drought. According to the chronicler “The benevolent (king)asked the bhikkhus “Did not the great sage (Buddha) when the world was visited by such evils as famine and the like, provide some kind of help for the world?” They pointed to the origin of the Gangā-rohaṇa Sutta on such an occasion.”³⁷ When he heard this he made an image wholly of goldof the Buddha laid the stone alms bowl of the master (filled) with water in the hollow of its hands and placed this figure on a great chariot. He took upon himself the duties of a moral life and made the people also do so. He instituted a great alms-giving and established security for all living creatures..... Then the *bhikkhus* (in the whole island gathered in Anuradhapura) reciting the Ratana sutta and pouring out water walked about the (main) street, not far from the royal palace in the three watches of the night. When morning dawned a great cloud poured rain on the earth.”³⁸

Another famine is reported to have occurred in the middle of the sixth century during the reign of Kittisirimegha (551–569).³⁹ This famine took place in the month of *Phussa*, i. e. December to January. From the context in which the famine is mentioned in the *Cūlavāṃsa* it can be surmised that it was not as serious as the previous famine that had occurred during the reign of Upatissa I. The village Sangilla is mentioned as an affected area but it cannot be identified with any degree of certainty. According to the chronicle the village was near Gokaṇṇa, i. e. modern Trincomalee. This area which is in the dry zone experiences north-eastern monsoon rains during December and January. By the time of Kittisirimegha’s reign an intricate irrigation system had developed on the Mahaveli basin in the dry zone, yet, failure of the rain for several years could have resulted in drought and famine.

The chronicler’s attitude towards recording famines can be understood by the reference in the text to a famine in the *Cūlavāṃsa* which is said to have taken place during Silameghavanna’s reign (619–628). According to the *Cūlavāṃsa* “during a famine the king (Silameghavanna) dispensed milk rice made with butter and syrup” to the community of *bhikkhus*.⁴⁰ In many other instances too famines are referred to in connection with praising meritorious work such as offering alms to the priesthood by a particular king. For the chroniclers the recording of meritorious deeds, particularly alms-giving to monks by kings and the nobility was probably more important than recording famines, droughts or any other natural calamities. As stated in the introductory remarks to this study as a result, some of the serious famines may never have been mentioned in the chronicles and in literature.

Irrespective of the development of an intricate irrigation system in the dry zone there had always been uncertainty of food production due to many factors among which the fluctuation of weather conditions was an important one. According to the *Sammohavinodini* a quantity of grain that could sustain twelve thousand monks for three months was always stored at the Tissamaharāma monastery and also at the Cittalapabbata monastery situated fifteen miles north-east of Tissamaharāma.⁴¹ On the one hand such storage of grain indicates that there was an excess of food during certain seasons and on the other it implies that monasteries stored grain because there was an uncertainty of food supplies in certain years. Inscriptions of the fourth century A. D. indicate that grain deposited at mercantile guilds earned annual interest as high as fifty per cent for rice and twenty five per cent for other cereals.⁴² This again indicates that irrespective of the general self-sufficiency in food in ancient Sri Lanka there was a demand for grain at various times depending on the vagaries of weather conditions. It is also worth noting that a high interest on grain was paid by mercantile guilds particularly during the period between Sirisangabodhi and Upatissa I, whose reigns were affected by famines.

For more than six hundred years between Silāmeghavanna's reign (619-628) and the reign of Parākramabāhu II (1236-70) there are no references to famines in the chronicles or in literature. Taking into account the contexts in which the famines are referred to in the texts as discussed earlier, one cannot conclude that there were no famines during this whole period. It is equally difficult to conceive of a stable rainfall pattern throughout this period. It can be surmised that at least in the Ruhūṇa region adverse weather conditions prevailed after the fifth and sixth centuries until about the tenth century. There are numerous inscriptions belonging to the early centuries of the pre-Christian and Christian eras in the Ruhūṇa region but the number of inscriptions there decreases after the fifth and sixth centuries.⁴³ This may indicate that the region was sparsely populated after the fifth and sixth centuries most likely due to the lack of sufficient water and rainfall. Although the chronicler does not refer to any famine for about six hundred years after the reign of Silāmeghavanna, certain references in inscriptions indicate that the rulers were always concerned about famines and droughts. In the tenth century Kassapa V (915-923) declared in an inscription that he dispelled the fear of famine, "by affording facilities for the cultivation of fields by invocation of Podun (god Parjanya) and Pulunda (god Agni)."⁴⁴ Mahinda IV (956-927) claimed that he repaired "the dilapidated (tanks and ponds) and by means of the water thus supplied (put an end to) scarcity of food in the Island of Sri Lanka".⁴⁵

There are no references to famines during the Polonnaruwa period but thereafter, the chronicler refers to a famine in the reign of Parākramabāhu II of Dambadeniya (1236-70) which had been caused due to a serious failure of rains.⁴⁶ According to the chronicler, owing to the severe heat all plants were burnt up. In this instance too, as during the reign of Upatissa I, religious ceremonies were performed in order to dispel the drought. The *Cūlavamsa* states that the king ordered a splendid festival to be held for the cetiyas, bodhi trees and the deities and gathered together the bhikkhu community and caused them to recite the *paritta*.⁴⁷ This emphasises the fact that the ancient Sinhalese had faith in religion for protection from such dangers as drought, flood and pestilence and as in many other medieval societies they believed that religious conduct helped them to overcome disasters.

The next recorded famine in the island was during the time of Bhuvanekabāhu I (1272–1284) and on the eve of the invasion of the Pāṇḍya King Āryacakravartin.⁴⁸ The context in which the reference is made suggests that the famine had continued for about a year but details are lacking in any text

Although natural calamities are not referred to in the texts after the reign of Bhuvanekabāhu I until the sixteenth century all the evidence points to the fact that the dry zone was depopulated after the thirteenth century.⁴⁹ By the middle of the thirteenth century, the great cities of Anuradhapura and Polonnaruwa had almost been abandoned, the Rajaraṭa kingdom had fallen and the efficiency of the major hydraulic system and thousands of small reservoirs scattered all over the dry zone had nearly come to an end. Those who remained in the dry zone had cultivated tracts under declining irrigation schemes and when the cultivation of the fields under a certain reservoir became impossible some of them must have depended on others which were functioning.⁵⁰ Yet, it is reasonable to assume that with the depopulation of the dry zone and the breakdown of the reservoir system, famine and pestilence had taken a fearful toll of life. The earliest map available of the Portuguese connection with Sri Lanka, drawn by the Spaniard Cypriano Sanchez and published by Petrus Plancius sometime before 1601, contains a note which states that the Kingdom of Yala was devastated by sickness three hundred years previously. Certain northern areas in the map are described as “*Deserto Par Doenca*” or “desert through sickness”.⁵¹ A later map which can be dated soon after 1638 with the title “*Insula Zeilan Olim Taprobana Nunc incolis*” which appears to be a Dutch edition of Plancius’ map shows a remarkable improvement in the configuration of the island but retains the original letter press. The same note appears on it regarding Yala.⁵² The conclusion which can be drawn from this is that the Portuguese and early Dutch writers knew the dry zone area to be a devastated region due to famine and pestilence.⁵³

In conclusion it may be stated that the most important lesson of the ancient historical record is that there is no such thing as a “climatic normal” in the sense that the word was used fifty or more years ago, implying that if a long enough series of observations could be collected it would produce an average condition of each element describing the climate at the observing area which would always tend to recur. Far from being the average weather climate has always changed resulting in natural calamities on a variety of different time scales. Therefore, the problem facing the researcher is to determine the extent of these changes and to unravel the different time-scales of change as far as possible from the historical record in the hope that this will provide information about the underlying mechanisms of droughts, floods, climate changes and other factors which interact to produce the complex pattern.

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