

# HARMONIC ANALYSIS OF THE ANUAL MARCH OF RAINFALL OVER SRI LANKA

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The occurrence of rainfall has more periodic variation than other meteorological and climatological elements. For applied meteorologic and climatic studies which is ranging from flood to drought prediction, the rainfall data is very important. Understanding seasonal concentration of rainfall is an essential element for these studies. In the context already there are many investigators who have done research in various regions of the world. In this paper the harmonic analysis of the annual march of rainfall over Sri Lanka has been presented for a few selected weather observing stations.

## Data and Harmonic Analysis

In this approach it is possible to calculate and draw diagrams and charts of Harmonic Analysis, Harmonic Chart and Ratio Chart. For forty five rainfall observing stations in Sri Lanka, these have been done. But here the harmonic analysis is shown for the selected stations Jaffna, Mannar, Vavuniya, Trincomalee, Batticaloa, Anuradhapura, Kurunagela, Puttalam, Matale, Nuwara Eliya, Badulla, Galle, Ratnapura, Colombo and Tissamaharama.

The average rainfall of 1931 - 60 period has been taken to calculate the harmonic analysis.

## Studies on Seasonal concentration of rainfall

The current methods which are used

to express the seasonal concentration of precipitation appear to be fall into following broad categories. Many investigators have used Harmonic analysis to express the seasonal concentration of precipitation which based on wave amplitude and phase angle relations. This approach was first applied to climatological observations by Brookes and Carruthers in 1953. For precipitation data it is well exemplified by the work of Horn and Bryson, Who have published maps of the United States illustrating phase angle based upon precipitation distribution (1960). The same technique has been used by Chih-Pin and Wallace whose completed maps show by means of arrows, he normalized amplitude and phase angle relations. This approach was first applied to climatological observations by brookes and carruthers in 1953. For precipitation data it is well exemplified by the work of Horn and Bryson, Who have published maps of the united states illustrating phase angle based upon precipitation distribution (1960). The same technique has been used by Chih-Pin and Wallace whose completed maps show by means of arrows, he normalized amplitude and phase of the annual precipitation cycle in the northern Hemisphere (1966). "Both of thses works provide results that are useful for depicting cycles (Oliver 1980). However for duplicating these works requires a sophisticated knowledge of harmonic analysis which cannot be considered an easily - used measure

### 3. IRRIGATION AND AGRICULTURE

A. Kulam: Alamkulama, Ankuttan  
Kulama, Demala Surakkulama,  
Eppadikulama, Puliyan kulama,  
Pettikulama, Pothukkulam,  
Pukkulam, Ramankulama,  
sembukkulam, Sandanankulama,  
Senkattikulama, Senkatkulama,  
Surakkulama (Puttalam Dt.),  
Alankulama, Attikulama,  
Bambikulama, Ottukulama,  
Kurundankulama, Kuruvikkulama,  
Manakkulamagama,  
Monakkulama, Pevirikkulama,  
Porasankulama, Punnankulama  
(Kurunegala Dt.), Irradaikulama,  
Naikkulama, Marudankulama,  
Palakkulama, panaiadikkulama,  
Pulichchakulam, Chippikulama,  
Velantikkulam (Chilaw Dt.),  
Achirikkulama, Alankulama,  
Andyankulama, Attikkulam,  
Bandyankulama,  
Sirunkuttukulama, Gnanikkulama,  
Ichankulama, Karqmbankulama,  
Nochikkulama, Puliyan kulama,  
Sandananankulama,  
Iladchankulama, Ilandikkulama,  
Illuppukkulama, Irambakkulama,  
Iraniankulama, Kammalakkulama,  
Kandakkulama, Kanjanankulama,  
Karidikulama, Karambankulama,  
Karukkankulama,  
Kattamankulama, Kattankulama,  
Kawarakkulama,  
Kidawarakkulama,  
Kodarikkulama, Kochikkulama,  
Kombichankulama,  
Koppakkulama, Kottamankulama,

Kowankulama, Kulankulama,  
Kunchikkulama,  
Kurundankulama,  
Kurunchakkulama, Kuttikulama,  
Mankulama, Marakkulama,  
Navakkulama, Nellikkulama,  
Nelunkulama, Orukkumankulama,  
Pambukkulama, Palankulama,  
Palayakulama, Pallankulama,  
Pandikkulama, Pandyan kulama,  
Panikkankulama,  
Parimiyankulama, Peroyankulama,  
Pettankulama, Ponimankulama,  
Ponnarankulama, Pudukkulama,  
Sangilikkulama, Sattambikulama,  
Seepukkulama, Sembukkalam,  
Settikulama, Sinnakkulama,  
Sirukkulama, Solayankulama,  
Udayankulama,  
Vadirimunamarikkulama,  
Vendarankulama, Vanankulama,  
Vanniarkulama, Verunkulama,  
Veruppankulama, Vattankulama,  
Peikkulama (Anuradhapura and  
Polonnaruva Dts),  
Theruvakkulama (Polonnaruva  
Dt.), Watte wewa (Polonnaruva  
Dt.), Sippikkulama (Hambantota  
Dt.), Kolakkanavadi (Kulakkaddu-  
anai- vadi), (Polonnaruva).  
B. Arivi: Arivichenai (Puttalam Dt.),  
Arivi aru (AnuradhapuraDt.).  
C. Chena: (Hena). Arivichenai,  
Cettichenai, Chenaikkudiyiruppu,  
Elluchenai, Kallameduchenai,  
Karrukuchenai, Kilawamduchenai,  
Kuratihena, Maravanchenai,  
Nayakkarchnai, Puliyan chinai,  
Sandichenai (Puttalam Dt.),  
Kuratihena (Kurunegala Dt.),

Attiadimulachenai, (Anuradhapura Dt.).

D. Kinaru: Kollankinaru (Puttalam Dt.).

E. Kani: Andankani (Puttalam Dt.).

F. Cholai: Palaicholai, Vattacholai, (Puttalam Dt.).

G. Vayal: Pallikundavayal, Pulidivayal (PuttalamDt.).

H. Vaikkal: (Chilaw Dt.).

I. Patti: Manikkampattiya, Sinnivilupattiya (Polonnaruva Dt.).

J. Eri: Minneriya (Polonnaruva Dt.).

K. Pola: Karakkapola (Kurunegala Dt.).

L. Panai: Pittipanai (Negombo Dt.).

M. Veli: Puduveli (Polonnaruva Dt.).

#### 6. TREES (VIDE SUPRA: TANKS ALSO)

Vembu: Maduramdu vembu (Puttalam Dt.).

Panai: Ottapanai, Periya Panai, Sinnappanai (Puttalam Dt.), Pittipane (Negombo Dt.).

Iluppa: Illupadeniya (Chilaw Dt.).

Practically every known tree has been honoured by being used to designate tanks, chenas, etc. e.g: Alaikolaweve (Polonnaruva Dt.), Kurunjavettai (Polonnaruva Dt.), Vilankadu, Velankaduvila (Polonnaruva Dt.).

#### 7. ANIMALS AND BIRDS

A. Anai: Anaikutti (Puttalam Dt.), Anaulundawa (Polonnaruva Dt.),

Anaimaduva (Puttalam Dt.),

Anaikkuliya (Chilaw Dt.),

Anaulundawa (Chilaw Dt.),

Anaikattiya (Anuradhapura Dt.),

Singapuli, Singapuli Kande,

(Kurunegala Dt.), Kokkavillu (Puttalam Dt.).

#### 8. DEITIES PERSONS ETC.

Amman: Ammatotam (Puttalam Dt.).

Andi: Andimunai, (Puttalam Dt.),

Andigedera, Andigama (Puttalam And Kurunegala Dts.), Andigoda (Galle Dt.), (Galle Dt.), Andiambalama (Colombo Dt.).

Pandiyan: Virapandiana (Chilaw Dt.),

Pandiyankulama (Anuradhapura Dt.),

Pandyawatte (ratnapura Dt.).

Maniyar: Maniyarwatte, Maniyargama (Kegalle Dt.).

Kaliamma: Kaliammahara, (Colombo Dt.), Kalipola (Kalipola (Kurunegala Dt.).

Pullaiyar: Pullaiyaradi (Anuradhapura Dt.)

Allaperumantalawa (Puttalam Dt.).

#### 9. OLD, NEW, BIG, SMALL, GOOD, NEAR

Perum, periya: Periya Kalanchiya, Periya Kadu, Periyakulama (Anuradhapura Dt.).

Kutti: Anaikutti (Puttalam Dt.),

Adi: Erukkaladi adi, Ilandai adi, Kalladi, Manchadi, Sirambiadi, Tillaiadi (Puttalam Dt.), Pullaiyar adi:

(Anuradhapura Dt.), Sinakarukku panai (Chilaw Dt.), Sinnachariyagama (Kurunegala Dt.), Sinnaveli,

Sinnakudiyiruppu, Sinnapadu (Puttalam Dt.).

Nalla: Nallachiya, (Kurunegala Dt.),

Nallachiya, Nallapanbukkulama,

Nallamudeva (Anuradhapura Dt.)

Palaya: Palayakulama (Anuradhapura Dt.)

Pudu: Pudukkudi, Pudukkulama,

Puduveli, Pudur (Anuradhapura and Polonnaruva Dts.).

## 10. SETTLEMENT, VILLAGE, ETC.

Ambalam : Ambalam, Andiambalama (Puttalam Dt.).

Kudiyiruppu : Chenaikudiyiruppu (Puttalam Dt.).

Kudi, Kudil : Kuravankudil (Puttalam Dt.).

Kaddi : Marichukaddi (Puttalam Dt.).

Pola : Kalipola (Kurunegala Dt.),

Marapola (Colombo Dt.), Nekandapola,

Pedipola, Warakapola (Colombo Dt.),

Kotuwalpola, Muttetupola, (Ratnapura

Dt.), Weedipola (Hambantota Dt.),

Wannipola (Kandy Dt.), Irivendum pola,

Rahupola (Badulla Dt.).

Kotte : Kotte (Colombo Dt.), Kasikotte,

Wahalkotte (Kurunegala Dt.).

Ur : Kollure, Nallure (Kurunegala Dt.),

Nalluruva (Colombo Dt.), Vallindauro,

Tivumunaur, Pudur, Kollur

(Anuradhapura Dt.).

Kovil : Kovilangegammaduva (Kandy

Dt.), Kovilkare (Ratnapura Dt.),

Kovilkande (Kurunegala Dt.),

Koilandigama (Puttalam Dt.)

Madam : Nainamadama, (Chilaw Dt.)

Kade : Kochikade, Mariakkade (Colombo

Dt.).

From the foregoing it seems very likely that some time in the past the North, Central and North-Western Provinces as well as the conastal tracts as far south as Colombo were inhabited by Tamil-speaking people, as is amply demonstrated by archaeology and history. In addition, there have been also atleast small settlements elsewhere in the Island, of Tamil-speaking people. The many composite or hybrid place names and the juxta-position of Sinhala and Tamil place names indicate the peaceful co-existence of people of both language groups.