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The Archaeology of Southern Sri Lanka

Introduction The archaeology of the southern and western maritime region of Sri Lanka is still a largely unexamined area. The past hundred years of archaeology in Sri Lanka has mostly been carried out in the northern peninsular where the ancient cities such as A'pura, Polonnaruva, Yapahuva, Sigiriya, are located. Sri Lankan archaeology has mostly been a narrative of the past of the Sinhalese kings and Monuments built by them. Efforts to offset this situation have been undertaken in the first phase of the SAREC supported bilateral archaeology programme. However, there have been only a few sporadic studies in the southern region since the last decades of the 19th century. A new interest in the archaeology of this region has been stirred up since the mid 60's with the works of Deraniyagala, Bandaranayake, Wijepala and Weishar and this interest has further been heightened and made socially and politically meaningful with the launching of large development projects recently in the south such as 'Southern Development Project'. in the region recently. The importance of the southern area of Sri Lanka for our knowledge of urbanism in south Asia as a

whole has been emphasised in a recent synthesis of South Asian archaeology by Coningham and Allchin 1995 pp. 170-3.

Research design Environmentally and culturally, the southern region constitutes certain specific characters in contrast to the northern peniplan. It encompasses a land area close to one fourth of the Island. The maritime belt with a large number of ports that are located and three important river basins have given a specific social, environmental and cultural character to this region. The region has also been constantly engaged in a social and political dialogue with the northern peniplane throughout history. While Anuradhapura was developed as the centre of the Sri Lankan civilisation, the southern region with its capital at Magama also developed, probably in a

trees, Tissa

similar fashion but as a separate social-political entity. Considering these aspects, the proposed research is designed to compare the southern maritime region with three regions in Sri Lanka: Anuradhapura (Malwatu and Yan Oya basins), Puttlam and Mannar (Kala Oya basin) and the Horton Plains. The city of Anuradhapura and its environs and the Puttlam and Mannar regions have already been examined and their archaeological databases are quite comprehensive.

The archaeology of the Horton Plains has also been examined and a preliminary understanding of its paleo-environment obtained under the HRAC programme. Further information on the paleo-environment of the Horton Plains will provide sufficient information to compare the differences and similarities in two different topographical and environmental areas. Explorations, surveys and excavations will be carried out in the Southern region in comparison with the other regions in order to consolidate an archaeological framework of the major regions of Sri Lanka.

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Co-operation with Sri Lankan institutions

The unit for African and Comparative Archaeology at the Department of Archaeology and Ancient History, Uppsala University first began co-operating with Sri Lankan institutions in 1994, in a bilateral SAREC supported archaeological research project which tied in with the [HRAC project](#). In 1995-1997, the [Post-Graduate Institute of Archaeological Research \(PGIAR\)](#), University of Kelaniya, Sri Lanka, participated in the joint HRAC project together with 10 countries in Africa and Europe.

The [present project](#), a co-operative effort between the PGIAR and African and Comparative Archaeology together with the Department for Quaternary Geology, Stockholm University, was instigated in 1998 and consists of [a postgraduate training programme](#) for three young Sri Lankan researchers. The Swedish component also includes [land use assessments](#) and mapping. The latest report from this project is published [here](#).

In April 1999, an application for [a three-year bilateral continuation](#) of the support was sent to SAREC. The project has been accepted and will be implemented later this year.



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PGIAR Research Team for the Archaeology of Southern Region Project

The proposed study will be carried out by the PGIAR research team comprising PGIAR's faculty and research assistants:

[T.R. Premathilake](#), M.Sc (Sri J'pura) Lecturer Palaeo Environment (Theme 1)

Arjuna Thantilage, M.Sc in Analytical Chemistry (Colombo)Lecturer Palaeo Dietary Reconstruction, Computer use in Archaeology, GIS (Theme 2)

[Raj Somadeva](#), M.Phil (PGIAR) Senior Lecturer Urbanization, Epigraphy and Archaeological theory (Theme 3)

[Gamini Adikari](#), M.A (PGIAR)Lecturer Pre-History, Stone tool technology and Osteology (Theme 3 food procurement)

Jagath Weerasinghe, MFA ; Senior Lecturer Archaeological theory and history, Materials and Technology and Art History (Theme 3)

Rose Solangaarachchi, M.A (PGIAR)Lecturer Metallurgy (Theme 3)

Priyantha Karunaratne, M.A (Arizona)Lecturer Settlement Archaeology, Proto and Early History and Field Archaeology (Theme 2)



Part of the PGIAR buildings in Colombo.

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Dissertation proposals

The present regional programme consists of three postgraduate research projects, with the addition of a fourth in the [bilateral programme](#). The outlines for the PhD dissertations can be found under the links below. The training programme works on the sandwich model, previously tested in the [Urban Origins](#) and the [HRAC](#) projects, where the student spends 6-8 weeks of every year in Sweden on intensive courses (seminars, laborative work and supervision). The remaining time is spent in the home country doing fieldwork and dissertation write-up. Communications with the supervisors via e-mail and www are frequent, with travel to the country for on-site supervision.

[A. Thantilage](#)

[R. Somadeva](#)

[T. R. Premathilake](#)

[G. Adikari](#)

Texts require [Adobe Acrobat Reader](#)

The image shows Gamini Adikari on field survey in the south-eastern coastal area of Sri Lanka.
Photo: Paul Sinclair.



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Research Themes

In line with the development from the [Human Responses Programme](#) the proposed research in Sri Lanka will focus on the examination of following broad themes:

Theme 1. Paleo environment and climate change

Here the primary focus will be on consolidating work already initiated by Premathilake on palaeo-environment, climate change, vegetation history and land use in the Horton Plains - the water shed area of Sri Lanka. The focus will be on consolidating work already initiated by the Department of Quaternary Research, Stockholm University, resulting in a MSc degree for Premathilake. The PhD research will include regional stratigraphic studies of sedimentary basins in wider valley areas with early (Mesolithic) settlement. Holocene vegetation and land use history as reflected in the valley deposits will be compared with smaller sedimentary

basins of local character. The water shed in the Horton Plains is chosen to be the key area of this research theme. Traces of early cultivation of cereals (MSc studies) will be tested and confirmed or rejected. The land use history of the area up to the present time. will be studied

Methodology

Methods include field work with corings and studies of recent vegetation, pollen and siliceous microfossils (phytoliths, diatoms), stable isotopes and mineral magnetics

Participants: T.R. Premathilake, Swedish counterparts and supervisors U. Miller and J. Risberg

Theme 2. Settlement systems and environmental change

Population growth and its impact on environment will be investigated through increase in number and changing location of settlement. Methods include testing, examination, and utilization of GIS (Geographical Information Systems) for the study of settlement patterns especially those related to urbanization and state formation in the southern region.

Work under this theme will involve the study of patterns and shifts in human settlement in relation to processes of environmental change, with a focus on selected mountain, riverine and coastal areas especially in southern Sri Lanka. A vital aspect of the programme will be to continue with the establishment of an archaeological and environmental information database using GIS applications. The GIS is co-ordinated with the systems used throughout the HRAC project, to facilitate trans-regional data communication and comparative research. This has far-reaching consequences for international scientific exchange and the sharing of archaeological information and heritage management experience. In the Sri Lankan context, as elsewhere, this will lay the basis for a National Archaeological Database. Once again, similar WWW based solutions to the Atlas of African archaeology tested in the African section of the HRAC programme will be assessed for use in Sri Lanka.

The GIS will be used for incorporating all known archaeological site data, especially from the prehistoric and proto-historic period to the 13th century. This is being compiled from existing data bases such as that maintained by the state Archaeological Department and the comprehensive map of "Ancient cities and settlements" prepared by the PGIAR for the National Atlas and updated in 1994. It will also be used for certain areas such as the Sigiriya.

The Dambulla region and the northwest and southeast coast incorporate field survey data from PGIAR research. Similarly, published, research data from other sources will also be included. Topographical, climatological and environmental coverages has already been produced in ArcInfo format. The envisaged GIS database and map server will provide a comprehensive coverage of existing archaeological information, constituting an analytical palimpsest of a kind not yet available or as far we know, envisaged anywhere else in South or

South East Asia.

Participants: A. Thantilage, R. Somadeva. Swedish counterparts P. Sinclair and M. Pyykönen.

Theme 3 Long term food procurement and resource utilization strategies:

There is a real need for a framework from the coastal areas of southern Sri Lanka to compare with other situations in the western Indian Ocean and specifically with Madagascar. The following sub themes will be the subject of individual PhD research programmes and will be implemented in the same region of southern Sri Lanka.

Specific foci include:

- Collecting of terrestrial and marine resources
- Trade, urbanisation and state formation

Work under this theme will involve the studying of subsistence strategy of the regional settlements of the arid coastal belt of southern Sri Lanka and the nutritional aspects of the communities that inhabited this region. Further, the study will also attempt to construct sequences of dating and adaptive strategies in relation to climatic variations.

For this study, GIS will be used to map the entire region, and the spread and occurrence of shell middens will be located on the regional map. The shell middens of Hambantota will be excavated to obtain food residues and human osteological materials.

Participants: Gamini Adikari, Swedish counterparts: Prof. P. Sinclair; Prof Jan Ekman (Department of Evolutionary Biology, Uppsala Univ.).



In the studies envisioned above Hambantota, Tissamaharama, Kirinda and Kataragama are taken as the main area of study for the first phase of field season. However, for 2000/01 only Kirinda and Kataragama areas will be taken into investigation and as such these two areas will form the 'core research region' of the Archaeology of Southern Region Program. This is owing to the present human resources constraints and also due to the fact that certain areas, other than Kirinda

and Kataragama of the region, are currently being investigated by the Department of

Archaeology and by a group of archaeologists from KAVA, Germany.

Photo: Paul Sinclair.

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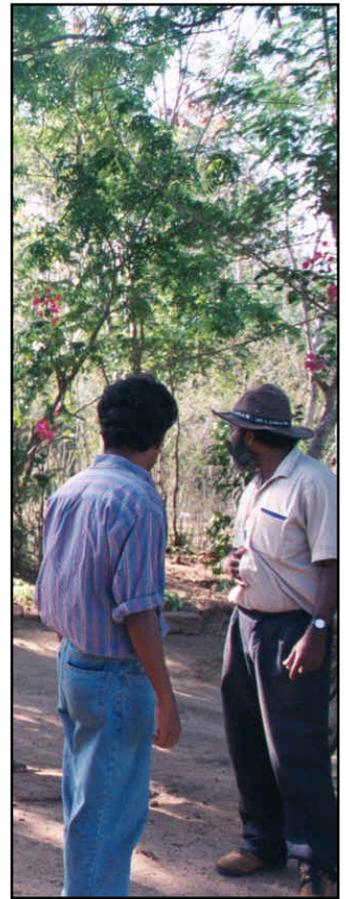
Management of the research program

The 4 Sri Lankan researchers who are involved with the PhD training projects and the three

other researchers are experienced faculty members of the [PGIAR](#). The management of the project will be handled by the researchers themselves under the financial and administrative frame of the PGIAR. Each researcher has designed her or his field work within the framework of common field program and should make arrangement for training or other required academic work pertaining to her or his research.

Training and collaboration with Swedish institutes

Several archaeologists from Swedish institutions, such as Lund University, Gothenburg University and Stockholm University have been involved in Sri Lankan archaeology through SAREC projects over the past 10 years. Their contribution towards the development of Sri Lankan archaeology and the archaeologists has been very considerable. However, for the current bilateral program it seems relevant to maintain the co-ordinating role of Uppsala University and as such PGIAR has formulated a detailed strategy of working together with the Department of Archaeology of the University of Uppsala and the Department of Quaternary Research, Stockholm University. The PGIAR researchers benefit in getting analytical and laboratory training at the above institutions. may also receive advise for their Ph.D. work. Each PhD is based on the findings from the Archaeology of the Southern Sri Lanka project.



It is planned to have only Swedish researchers in Sri Lanka who are formally involved as PhD supervisors or for training PGIAR researchers for the 2000/01 period. These include Prof. Paul Sinclair, supervisor of PGIAR researchers registered in Uppsala (Somadeva, Thantilage and Adikari), Prof. Urve Miller and Dr. Jan Risberg of the Department of Quaternary Research, Stockholm University supervising paleo-environmental work of Premathilake.

Each PGIAR researcher has submitted a request, within the budgetary frame of the project, outlining the required support and supervision.

SAREC has supported three places for PhD education in Sweden using the sandwich model. For Theme 1 of the programme T. Premathilake who has just completed his MSc in environmental studies is ready to register with The Department of Quaternary Research, Stockholm University under the supervision of Doc. J.Risberg. For Themes 2 and 3, R. Somadeva and A. Thantilage have registered at the Department of Archaeology and Ancient History, Uppsala University supervised by Prof. P.Sinclair and Doc G. Trotzig. A fourth PhD candidate G. Adikari, supported partially by the PGIAR, is working on marine resource exploitation and has submitted his research proposal here (The PGIAR will provide the funding support for the first two years of Gamini's PhD research i.e 1999 and 2000). G. Adikari will be supervised by Prof. P. Sinclair (archaeology) and for specialised biological theory and

osteological applications by Prof. Jan Ekman of the Department of Evolutionary Biology,
Uppsala University.

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Preliminary outline of Ph.D. Research Program: Arjuna Thantilage

Introduction:

In Sri Lanka we have very large collections and assemblages from excavations of copper alloy artifacts with very little knowledge about their distribution in time and space. The earliest copper alloy artifacts have been found from proto-historic contexts of Sri Lanka beginning from the First millennium BC. The major excavation at the proto-historic cemetery complex at Ibbankatuva in the northern extremity of the Central Province, in a dry zone environment led to the discovery of several copper artifacts. Sri Lankan archaeologists discovered many distinct varieties of copper alloy artifacts from the Early Historic Period (3rd century BC to 5th century AD) onwards. These include the high quality bronze sculptures of the middle historic period (6th - 13 century AD) as well as very large quantities of copper alloy vessels and other decorative items especially from the 17th to 19th centuries. The thesis work will include an investigation of the chemical and physical properties of these assemblages and an evaluation of their distribution both in space and also chronologically over 3000 years of history.

Objectives:

The main research focus of the proposed study is to work out a chronological seriation and spatio-temporal distribution patterns for the Sri Lankan metal alloys with special reference to copper alloy artifacts. This will involve building up of a GIS database for metal artifacts found throughout the country, within distinct chrono-stratigraphical horizons and extending across the entire range of pre-modern cultural contexts of the island. This information will be related to the distribution of mineral resources as well as environmental parameters.

The study aims at resolving the following research questions:

1. What is the chronological and spatial distribution of copper alloy artifacts in archaeological contexts in Sri Lanka?
2. What changes in metal extraction and processing techniques occurred through time?
3. Can the metallic composition of copper alloy and other metallic artifacts be used to establish a relative dating sequence to be used in Sri Lankan archaeology?
4. What comparisons can be made with other parts of the Indian Ocean region?

Strategy :

1. Select a sample of copper alloy artifacts from archaeological contexts which is representative of the complete copper alloy spectrum of Sri Lanka. A proper listing of the existing copper alloy objects in Sri Lanka is necessary for selecting a fair sample for the study. Compilation of this data will not pose special problems as most of the copper alloy finds have been registered by the projects and institutes responsible for their discovery. Six Cultural Triangle projects and two government departments currently maintain such records. The entire list of the assemblage will be added to the thesis as an appendix.

1.1 Selection of the sample for analysis will pay special attention to the following:

- (a) chronology (contexts radio-metrically dated from 900 BC to 1900 AD.)
- (b) geological and geographic distinctness (artifacts found from the mineral bearing areas and non-mineral bearing areas)
- (c) social distinctness (the utilitarian and ritual objects used by religious communities, secular elites and commoners)

2. Representative samples will be subjected to multidisciplinary methods of investigation such as composition and trace metal analysis, structural and metallurgical analysis (250-300 samples are scheduled to be analyzed). The main analytical method used will be the non destructive X-Ray Fluorescence (XRF). But in order to identify the techniques and the technology of extraction and casting processes, a small number of representative samples (25 samples) would be subjected to structural, metallurgical and chemical analysis methods. University of Colombo has very good energy dispersive XRF equipment which will be accessible for the major analytical work and this will save time. However for the metallurgical and structural analysis help is required from Uppsala. The XRF method requires 1000 seconds per object and processing and interpreting the XRF data takes 3hrs per object).

3. Provide a multivariate chronological seriation for Sri Lankan copper alloy metals using correspondence analysis.

4. Produce GIS coverages suitable for the spatial analysis of the distribution of the copper alloy artifacts in Sri Lanka including the information on mineral sources.

5. Compare results with those published elsewhere in the Indian Ocean region.

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Gamini Adikari



A Sri Lankan Archaeologist in the field of Prehistory (Stone Age) and Osteo - archaeology

I am Gamini Adikari, Senior Lecturer Postgraduate Institute of Archaeology (PGIAR) University of Kelaniya. At present, I work towards my PhD at the Dept. of Archaeology and Ancient History, Uppsala University under the supervision of Prof. Senake Bandaranayke (Professor of Archaeology, University of Kelaniya, Sri Lanka) and Prof. Paul Sinclair (Professor of African Archaeology Uppsala University, Sweden). I graduated (BA. special degree in Archaeology) in 1990 and completed my

master's degree (MPhil.) in 1998. I have worked as an archaeologist since 1986. After graduating, I joined the PGIAR as a research assistany in 1990. In 1992 I obtained the post of assistant lecturer in the same institute. In 1994 I became a lecturer and promoted as a senior lecturer G ii in 1998 and Unit head of the Prehistory, Palaeontology and Osteoarchaeology (PPO). During this period I have published 22 articles (in both English and Sinhalese), as well as some editorial work. I have participated in conferences, seminars, discussions and training programs both internationally and locally. I have coordinated several international and local projects in the field of Archaeology as well as postgraduate academic courses. I currently work as a visiting lecturer in the University of Kelaniya. Recently, I got three assistant director posts in two departments in Sri Lanka. One is a Central Cultural Fund (a UNESCO - Sri Lanka project), the Alhan Pariven project and the Registration of sites and monument in Matale and

Southern Sri Lanka of the Dept. of Archaeology.

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Project Description for Doctoral Work at the Department of Quaternary Research, Stockholm University by T. Rathnasiri Premathilake

Proposed project title:

Palaeoenvironment and Development of the Holocene Landscape as recorded in the Mires of Horton Plains, Sri Lanka.

Introduction

The major research project "Environmental Changes and Human Response" (ECHR) includes the mire areas in Horton Plains, archaeological sites in Sigiriya and lagoonal areas in Mundal and in Puttlam. The proposed project "Palaeoenvironment and Development of the Holocene Landscape as recorded in the Mires of Horton Plains, Sri Lanka" is a sub-project of the ECHR.

Horton Plains are situated in the Central Hill region of Sri Lanka and constitute the highest plains in the Wet Montane Zone. They are located on a high wind-swept saddle at 2100-2330 m above sea level between 6047'-6055'N and 8046'-8051'E covering an area of c.3200 ha. Climatically, the Horton Plains region is unique in the sense that all varieties of climates of the island are reproduced within a small compass, ranging from extreme wet to dry. The vegetation can be divided into two parts; upper montane rain forests and patana (montane) grasslands. The bedrock in Horton Plains mainly consists of high metamorphic rocks belonging to the charnokite- metasedimentary series. Horton Plains are characterised by a rolling landscape with mires, plains, forested hill tops, grassy slopes, precipices, brooks and waterfalls. Today it is designated as a National Park for the preservation of natural montane ecosystems and habitats.

The mires of Horton Plains have been a major focus of palynological research over the last five years. However, other palaeoenvironmental techniques, such as radiocarbon dating, phytoliths, diatoms, biogenic silica, mineral magnetic analysis and carbonised particle counts etc., are needed to evaluate these changes.

Brief research design

The floristic composition of the Horton Plains has been extensively studied since the early 1900's by scholars such as de-Rosayro and Balasubramaniam *et al.* Noone and Deraniyagala have proposed that the Horton Plains region is very productive and therefore offers the best possible conditions for pre-historic settlements. Koelmeyer has suggested that the Horton Plains vegetation can be characterised by a certain herb/tree ratio, *i.e.* the "Herbaceous Biostasy". This ratio is the result of present day climate in combination with past human activities.

There are close similarities between the upper montane forests of Nilgiris (South India) and the Horton Plains. It must be emphasised that the climate as well as the floristic composition of the Nilgiris imparts certain unique features to the montane forest of the central highland of Sri Lanka. As a result of Indo-French co-operation in the Nilgiris, climate variations were observed using the $\delta^{13}C$ values and it was concluded that climate variations could be separated into four major parts.

Palynological investigations have been conducted of this nature reserve. Neither investigations on valley bottoms, using more detailed biostratigraphical methods, nor reliable radiocarbon dating of stratigraphical guide levels have been carried out. Peat accumulation in mires of Horton Plains have produced over sixty pollen records of vegetation change, making it one of the most intensely studied high land regions in Sri Lanka. Emphasis has been placed on the past *c.*7000 years BP of palaeoenvironmental change, during which time human influence has played a varied but important role in the development of vegetation. Climatic variations range from arid to semi-arid until *c.*6000 BP. A wet period between *c.*4000 and 3000 BP marks the change of the analysed site from a meadow to a mire. Since *c.*1500 BP, deciduous and montane evergreen forest dominates.

Evidence of anthropogenic influence is strongly indicated in pollen diagrams during the period of 6700-4100 $\delta^{13}C$ years BP, *i.e.* the Neolithic. Slash and burn cultivation, forest clearance, grazing and cultivation have been identified during this period. This represents one of the most important palynological indications of forest clearance in Sri Lanka (Premathilake, M. Phil. thesis, 1997), interpreted as being due to agriculture. This work presents the initiation of palynological research at two sites in Horton Plains and attempts to define major problems facing anthropogenic studies during the Holocene palynology of the plains.

The region surrounding the Horton plains has been subject to strong anthropogenic pressure. Decades of plantations of tea estates established by the British and intensified over the years along with cypress, eucalyptus and pine. In valleys, rich in organic accumulations, vegetable crops such as potatoes, have been cultivated. It is concluded that more data on geology and soils, biology (pollen, phytoliths and diatoms) and chemistry from Horton Plains are needed to reconstruct the palaeoecological situations in Horton Plains. A major draw-back regarding the study of vegetation changes over time is the lack of a comprehensive pollen flora.

Main aims of the proposed project:

--to study pollen morphology of endemic and common taxa in the Horton Plains. It is an initiation of the production of a pollen flora covering the vegetation in Horton Plains.

--to study the effects of the Holocene climate changes on Horton Plains environment and to establish a chronological framework for these changes.

--to study in detail vegetation changes and soil development caused by climate changes.

--to study the inter-relations between natural processes and human impact, evaluate the joint effect on the environment of Horton Plains. This study is of interest for the ongoing debate in Sri Lanka about the changing pattern of prehistoric land-use and differences between the mobility pattern of prehistoric man.

Methods

The following sampling design is used to meet the research aims. In the study area, a distribution pattern of archaeological surface records (artifacts, landmarks and existing fields etc.) are considered. Known bio-stratigraphy and archaeology, and the usage of air photographs and topographical maps, are used in order to construct a model for the sampling strategy.

The stratigraphical investigations of peat accumulated in the valley bottoms are carried out using the Russian Peat corer and Jackhammer flow-thorough sampler. Suitable and representative basins are selected for detailed analytical studies of e.g. pollen, phytoliths, diatom *etc.* In the deepest part of selected basins, multiple cores are collected. Proposed methods, reasonings and possible co-operation partners are indicated in Table 1. Agro-botanical and geological surveys in the surroundings of the study areas have to be conducted. This is very useful in order to understand the contemporary situation of study area.

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Raj Somadeva

I am Delgahawatta Raj Kumar Somadeva, a senior lecturer in archaeology in the Postgraduate Institute of Archaeology, Colombo, Sri Lanka and a Ph. D. student of the Department of Archaeology and Ancient History, Uppsala University. I graduated with a BA special degree in Archaeology (Hon.) from the University of Kelanyia, Sri Lanka in 1986 and obtained an M.Phil. degree (1994) in Archaeology from the Postgraduate Institute of Archaeology, where I am currently working. Since 1989, I teach archaeology at the university and have participated in several local and international collaboration projects in Sri Lanka. My specialities in archaeology are archaeological theory,



field archaeology, social archaeology and epigraphy. I have published more than 35 articles on different topics on the archaeology of Sri Lanka and have participated in several international conferences since 1990. I research the origins of urbanism in the southern part of Sri Lanka as the subject for my doctoral degree.

Education Qualifications:

- B.A. Degree in Archaeology, Special (Honours), 1986. University of Kelaniya, Sri Lanka
- M.Phil. Degree in Archaeology 1994. Postgraduate Institute of Archaeology, University of Kelaniya
- Currently reading for PhD Degree, Uppsala University, Sweden

Current field of research: Social archaeology

Other field of interest: Archaeological Theory

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