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## **DETAILS OF PUBLICATIONS IN BOOKS AND PROCEEDINGS BY FACULTY**

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# **SEMINAR PROCEEDINGS**

**International Seminar**



## **STRATEGIES FOR TOURISM PROMOTION AND MARKETING IN GLOBAL PERSPECTIVE - ISTPM 2K17 NOVEMBER 13 - 14, 2017**



**Editors**

**Dr.K.P Vinodkumar, Alikutty T.P, Dr. Shahanas Beegum.P.P**

**Department of Commerce**

**M.E.S. Mampad College (Autonomous), Mampad  
(Affiliated to University of Calicut)**

**Mampad College (PO), 676542, Malappuram, Kerala, India**

**In association with Kerala State Higher Education Council, Government of Kerala**



# **PROBLEMS AND CHALLENGES OF AYURVEDIC MEDICAL TOURISM IN THEKKADY**

**Anoop Tom Thomas**, Assistant Professor, St. Dominic's College, Kanjirapally

**Sebin Sebastian**, Assistant Professor, St. Dominic's College, Kanjirapally

## **Abstract**

*Medical tourism also called medical travel or health tourism is a term initially coined by travel agencies and the mass media to describe the rapidly-growing practice of traveling to another country to obtain health care. The reports estimate that medical tourism in India is growing by 30 per cent a year. Today, Kerala Tourism is a global super brand and is regarded as one of the destinations with the highest brand recall. The tag line 'Kerala-God's Own Country' was adopted in its tourism promotions and has become synonymous with the state. The present article studies major problems and challenges faced by Ayurvedic medical tourism in Thekkady, a prominent global medical tourism destination.*



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## **SOCIO ECONOMIC IMPACT OF PILGRIMAGE TOURISM WITH SPECIAL REFERENCE TO BHARANANGANAM**

**Prof. Joicey Jose**, Assistant Professor, Department of Commerce, St. Dominic's College  
Kanjirappally

**Prof. Deepa Tes George**, Assistant Professor, Department of Commerce, St. Dominic's  
College Kanjirappally

**Sany Emmanuel**, Assistant Professor on contract, Department of Commerce, Newman  
College Thodupuzha

### **ABSTRACT**

*Over the years tourism has grown as an industry, which is inevitable for the economic and regional development of the country. Thus tourism sector is gaining more important. At present in Kerala, one of the most prominent religious tourism destinations is Bharananganam. The objectives of the study were to identify (a) the impact of pilgrimage tourism in the growth and development of rural area (b) the economic impact of pilgrimage tourism (c) the social impact of pilgrimage tourism (d) the environmental impact of pilgrimage tourism and (e) the problems affecting socio-economic development*



Strategies for Tourism Promotion and Marketing in Global Perspective - ISTPM 2K17  
in the area of study. Simple random sampling method was used for selecting the respondent. The population of the study covers the shop keepers of Bharananganam, 60 respondents were selected for the study. The study revealed that pilgrimage tourism has a positive impact on the economic, social and environmental conditions of Bharananganam. But pilgrimage tourism has certain problems also. The study has demonstrated that the social significance of pilgrimage tourism, measured in terms of employment is very large. It has also illustrated that appropriate pilgrimage tourism-related interventions can play a role in raising the standard of living and in reducing poverty in local communities. It is often necessary, however, to develop and implement policies that take advantage of the potential benefits of pilgrimage tourism in socio-economic development. In any event, there is a strong case for considering pilgrimage tourism as an important sector in socio-economic development.

**Keywords:** Pilgrimage tourism, economic impact, social impact, environmental impact



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# Spreading Information in Complex Networks: An Overview and Some Modified Methods

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Reji Kumar Karunakaran, Shibu Manuel and  
Edamana Narayanan Satheesh

Additional information is available at the end of the chapter

<http://dx.doi.org/10.5772/intechopen.69204>

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## Abstract

The knowledge of node's ability and importance in spreading information in a complex network is important for developing efficient methods either to decelerate spreading in the case of diseases or to accelerate spreading in the case of information flow, which would benefit the whole population. Some systems are highly affected by a small fraction of influential nodes. Number of fast and efficient spreaders in a network is much less compared to the number of ordinary members. Information about the influential spreaders is significant in the planning for the control of propagation of critical pieces of information in a social or information network. Identifying important members who act as the fastest and efficient spreaders is the focal theme of a large number of research papers. Researchers have identified approximately 10 different methods for this purpose. Degree centrality, closeness centrality, betweenness centrality, k-core decomposition, mixed degree decomposition, improved k-shell decomposition, etc., are some of these methods. In this expository article, we review all previous works done in the field of identifying potential spreaders in a network.

**Keywords:** social networks, information diffusion, node centrality, m-ranking, k-shell decomposition, improved k-shell decomposition, weighted k-shell decomposition, directed networks, degree centrality, closeness centrality, betweenness centrality

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Identifying and analyzing various kinds of network have become an important theme in the frontiers of research for the past 50 years. It is an emerging area which demands research activities of interdisciplinary and collaborative nature. Network research spreads over a variety of fields such as Mathematics, Physics, Chemistry, Computer Science, Biology and Social Sciences. Recently, network research has proved its importance by establishing itself as a new





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## A Centrality Measure for Directed Networks: m-Ranking Method

Reji Kumar & Shibu Manuel

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# Centrality measure for directed graphs: An overview and a new method

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**Abstract.** Understanding importance of actors (or nodes) in complex networks is an area in social network research. Importance of nodes is interpreted in different ways in different context. If the focus of research is on the spreading of information, nodes which can spread information throughout the network in a faster pace than any other nodes is important. In the study of spread of disease or virus in a network, the nodes which are at minimum number of steps away from all other nodes are most important. Depending upon the number of direct and indirect connections that each node has in a network, its participation in the spreading varies. Indirect connections specifies the nodes that are at two steps, three steps etc., away from a node. Research for potential spreaders in undirected networks is almost saturated. But in the study of spreading of information, directed networks are more important than undirected networks. In this paper we review all important methods that are in use to identify important nodes in an undirected network. We also discuss methods which produce similar results for directed networks as well. Wherever necessary we make comparisons of the methods and point out advantages of one method over the other. Finally we propose a method that helps to rank the nodes in a directed network, which takes into account the relative importance of all nodes and directed edges in it.

**Keywords:** Social network, Information diffusion, Centrality, Degree centrality, Betweenness centrality, Directed networks, k - core decomposition, m - ranking method

## 1 Introduction

Information spreads in a society in two ways. One is the mass media such as news papers, television etc. Mass media can transfer a significant amount of

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\* Research supported by UGC, India.



# An Overview of Cardamom Economy of India & Guatemala

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**Abstract**—Being low-volume and high value commercial crops, spices are playing an important role in the agricultural economy of India. Cardamom, the queen of spices, is inching to regain its lost position in international trade fetching more value and volume in recent years. Contributing to the upswing in spices exports crossing the \$ 2 billion mark during the financial year 2011- 2012. Cardamom export registered phenomenal growth of 296 per cent in volume and 175 per cent in value as the Indian spice export for the year 2011-2012 showed an increase of nine per cent in volume and 43 per cent in rupee terms than the previous year. Till 1980's India was the main producer and exporter of the commodity. But of now Guatemala has emerged as a keen competitor to cardamom in the international spices market.

Until the mid of 1980's, India has the monopoly in cardamom trade. However, after that its exports as well as production started declining. Once the leading producer and exporter of cardamom, India now struggles to stand in the field of trade. Cardamom economy in Kerala confronted many challenges both in production and in price front. Media in the country and also the growers and traders of the crop argued that the trade liberalization policy and thereby the entrance of Guatemala, the Latin American country poses a great threat to Indian cardamom economy. So the focus of this chapter is centered on compare the features of both Indian and Guatemalan cardamom and then analyse the potential of Indian cardamom over Guatemalan cardamom.

**Index Terms**— Small cardamom, High Yielding Variety, Spices Board, Agreement on Agriculture, Sanitary and Phyto-Sanitary measures , Geographical Indications, Good Agricultural Practices, Organic cultivation.

## I. INTRODUCTION

“Elettaria cardamom maton” the scientific name of the cardamom<sup>1</sup>, is an important commercial crop of both India and Guatemala. The name cardamom is used for the herbs within the genera of the ginger family , “Elettaria”( small cardamom) and “Amomum” (large cardamom) . The aroma of cardamom had a decisive role in the search for a short ‘spice route’ to India. Small cardamom is grown mainly in hilly regions of South India. Other major producing countries are Guatemala, Tanzania, Sri Lanka, Papua New Guinea . Large cardamom, known as Nepal cardamom ,is cultivated in the sub –Himalayan state of Sikkim and West Bengal., north-eastern India. Of the two , the production of small cardamom is higher at a ratio of 3:2 as of 2006(USAID ACCESO project –Nov.2011). The world production of cardamom is estimated to be around 35,000 MT . Two thirds of the total global production is attributed to Guatemala & hence its production sets the trend for the global prices of this commodity .The major consuming countries are Saudi Arabia , India, Pakistan, United Arab Emirates Norway , Sweden, Denmark , Finland ,Germany, Russia, England,

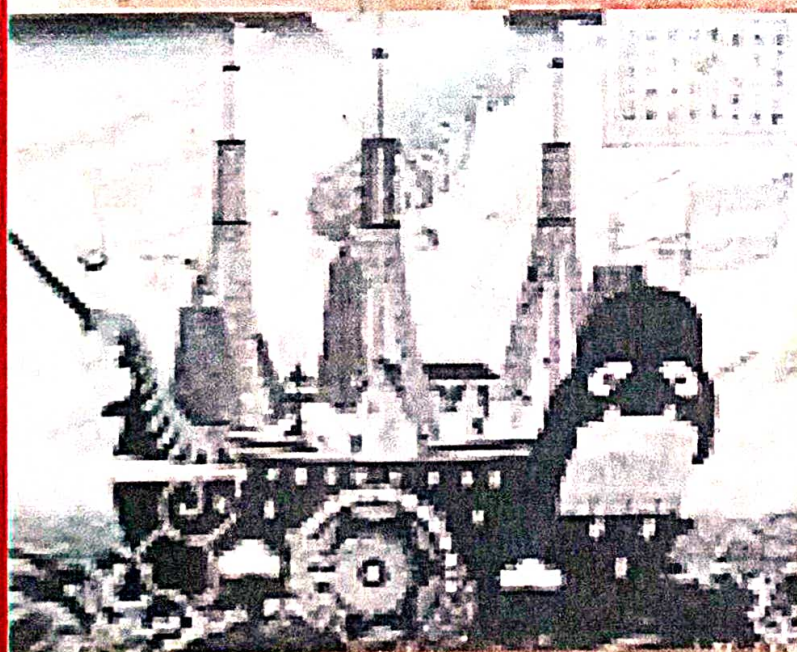
<sup>1</sup>Cardamom in this chapter exclusively refers to Small Cardamom





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# ലോകചരിത്രത്തിലെ പ്രമേയങ്ങൾ

XI



കേരള സർക്കാർ  
വിദ്യാഭ്യാസ വകുപ്പ്

തയ്യാറാക്കിയത്

സാമ്പന്ന വിദ്യാഭ്യാസ ഗവേഷണ പരിശീലന സമിതി

കേരളം 2018



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ക്ലാസ്  
XI

# ഹയർ സെക്കണ്ടറി കോഴ്സ് സ്വയംപഠന സഹായി

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## ചരിത്രം



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വിദഗ്ധർ	വിദഗ്ധർ
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വിദ്യാഭവൻ, പുജപ്പുര, തിരുവനന്തപുരം - 12

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സ്കോൾ - കേരള - 2021



ക്ലാസ്  
XII

ഹയർ സെക്കണ്ടറി കോഴ്സ്  
സ്വയംപഠന സഹായി

1

ചരിത്രം



സ്റ്റേറ്റ് കൗൺസിൽ ഫോർ ഓപ്പൺ &  
ലൈഫ്ലോംഗ് എഡ്യൂക്കേഷൻ - കേരള  
വിദ്യാഭവൻ, പുജപ്പുര, തിരുവനന്തപുരം - 12



## മൊഡ്യൂൾ തീർമ്മാണ സമിതി

### വിദഗ്ധർ

ശ്രീ. ലൂക്മാനുൽ ഹക്കീം. കെ.  
അസിസ്റ്റന്റ് പ്രൊഫസർ ഓഫ് ഹിസ്റ്ററി  
മഹാരാജാ കേരള, എറണാകുളം

### പ്രതിനിധികൾ

1. ശ്രീ. യൂസഫ് കുമാർ.എസ്.എം.  
എച്ച്.എസ്.എസ്.റ്റി.,  
ജി.എം.ബി.എച്ച്.എസ്.എസ്, ആറ്റിങ്ങൽ
2. ശ്രീ. പ്രദീപൻ.റ്റി.  
എച്ച്.എസ്.എസ്.റ്റി., ജി.എച്ച്.എസ്.എസ്.  
കല്ലാച്ചി, കോഴിക്കോട്.
3. ശ്രീ. ജ്യോതിഷ്കുമാർ. ബി.  
എച്ച്.എസ്.എസ്.റ്റി.,  
എം.ജി.എച്ച്.എസ്.എസ്, എടത്തറ
4. ശ്രീ. ഗുലാം മുഹമ്മദ്.കെ.പി.  
എച്ച്.എസ്.എസ്.റ്റി.,  
നൊച്ചാട് എച്ച്.എസ്.എസ്. നൊച്ചാട്
5. ശ്രീ. ജമൽ.കെ.  
എച്ച്.എസ്.എസ്.റ്റി.,  
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### അക്കാദമിക് കോർഡിനേറ്റർ

ശ്രീമതി. ഷീല കുമാരി. പി  
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## മൊഡ്യൂൾ വിവർത്തന സമിതി

### വിദഗ്ധർ

ശ്രീ. ബിനോ പി ജോസ്  
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കോളേജ്, കാഞ്ഞിരപ്പള്ളി, കോട്ടയം

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അസിസ്റ്റന്റ് പ്രൊഫസർ (റിട്ട.)  
സി.കെ.ജി. മോമ്മോനിയൽ ഗവ. കോളേജ്,  
പേരാമ്പ്ര, കോഴിക്കോട്

### പ്രതിനിധികൾ

1. ശ്രീ. അജു. എസ്.  
എച്ച്.എസ്.എസ്.റ്റി., ജി. എച്ച്.എസ്.എസ്.  
വെച്ചുച്ചിറ കോളനി, പത്തനംതിട്ട
2. ശ്രീ. സജീവ്.ഡി.  
എച്ച്.എസ്.എസ്.റ്റി., ജി.എം.എച്ച്.എസ്.എസ്.  
വെഞ്ഞാറമൂട്, തിരുവനന്തപുരം
3. ശ്രീ. യൂസഫ് കുമാർ.എസ്.എം.  
എച്ച്.എസ്.എസ്.റ്റി., ജി.ബി.എച്ച്.എസ്.എസ്.  
പത്തനംതിട്ട
4. ശ്രീമതി. പ്രിയങ്ക.എൻ.എസ്.  
എച്ച്.എസ്.എസ്.റ്റി., ജി.ബി.എച്ച്.എസ്.എസ്.  
വൈക്കം, കോട്ടയം

### അക്കാദമിക് അസോസിയേറ്റുമാർ

ശ്രീമതി. ലത.പി.  
അക്കാദമിക് അസോസിയേറ്റ്, സ്കോൾ കേരള  
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അക്കാദമിക് അസോസിയേറ്റ്, സ്കോൾ കേരള

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സ്കോൾ - കേരള - 2021



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ഹയർ സെക്കണ്ടറി കോഴ്സ്  
സ്വയംപഠന സഹായി

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# ചരിത്രം



സ്റ്റേറ്റ് കൗൺസിൽ ഫോർ ഓപ്പൺ &  
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## മൊഡ്യൂൾ തീർമ്മാണ സമിതി

### വിദഗ്ധർ

ശ്രീ. ലുക്മാനൂസ് ഹക്കീം. കെ.  
അസിസ്റ്റന്റ് പ്രൊഫസർ ഓഫ് ഹിസ്റ്ററി  
മഹാരാജാ കേരള, എറണാകുളം

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എച്ച്.എസ്.എസ്.റ്റി.,  
ജി.എം.ബി.എച്ച്.എസ്.എസ്, ആറ്റിങ്ങൽ
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എച്ച്.എസ്.എസ്.റ്റി.,  
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എച്ച്.എസ്.എസ്.റ്റി.,  
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### അക്കാദമിക് കോർഡിനേറ്റർ

ശ്രീമതി. ഷീല കുമാരി. പി  
കോർഡിനേറ്റർ (സബ്ജക്ട്)

## മൊഡ്യൂൾ വിവർത്തന സമിതി

### വിദഗ്ധർ

ശ്രീ. ബിനോ പി ജോസ്  
അസിസ്റ്റന്റ് പ്രൊഫസർ, സെന്റ് ഡൊമിനിക്കസ്  
കോളേജ്, കാഞ്ഞിരപ്പള്ളി, കോട്ടയം  
പ്രൊഫ. എം. ജലാലുദ്ദീൻ  
അസിസ്റ്റന്റ് പ്രൊഫസർ (റിട്ട.)  
സി.കെ.ജി. മോമ്മോരിയൽ ഗവ. കോളേജ്,  
പേരാമ്പ്ര, കോഴിക്കോട്

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1. ശ്രീ. അജു. എസ്.  
എച്ച്.എസ്.എസ്.റ്റി., ജി. എച്ച്.എസ്.എസ്.  
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എച്ച്.എസ്.എസ്.റ്റി., ജി.എം.എച്ച്.എസ്.എസ്.  
വെഞ്ഞാറമൂട്, തിരുവനന്തപുരം
3. ശ്രീ. യൂസഫ് കുമാർ.എസ്.എം.  
എച്ച്.എസ്.എസ്.റ്റി., ജി.ബി.എച്ച്.എസ്.എസ്.  
പത്തനംതിട്ട
4. ശ്രീമതി. പ്രിയങ്ക.എൻ.എസ്.  
എച്ച്.എസ്.എസ്.റ്റി., ജി.ബി.എച്ച്.എസ്.എസ്.  
വൈക്കം, കോട്ടയം

### അക്കാദമിക് അസോസിയേറ്റുമാർ

ശ്രീമതി. ലത.പി.  
അക്കാദമിക് അസോസിയേറ്റ്, സ്കോൾ കേരള  
ശ്രീമതി. ജിഷ.എസ്.  
അക്കാദമിക് അസോസിയേറ്റ്, സ്കോൾ കേരള

സ്വയംപാഠ സഹായി - 2

ചരിത്രം

ക്ലാസ്സ് XII

തയ്യാറാക്കിയത്:

സ്റ്റേറ്റ് കൗൺസിൽ ഫോർ ഓപ്പൺ & ലൈഫ്ലോംഗ് എഡ്യൂക്കേഷൻ - കേരള  
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സ്കോൾ - കേരള - 2021





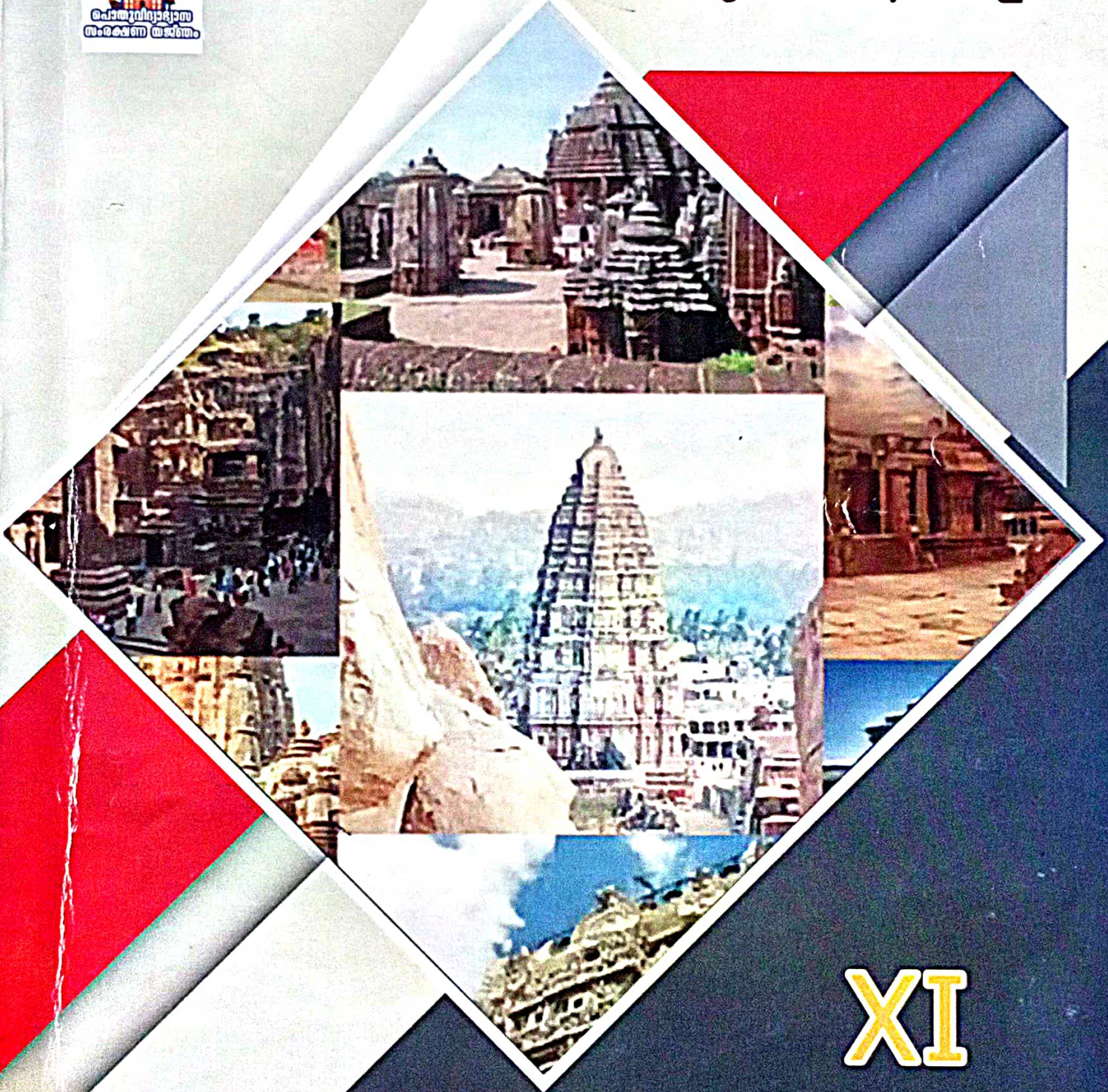
കേരള സർക്കാർ



ഐക്യവിദ്യാഭ്യാസ  
സംരക്ഷണ യജ്ഞം

# ചരിത്രം

സമഗ്ര ശിക്ഷാ, കേരളം



# XI

ഹയർ സെക്കണ്ടറി വിദ്യാഭ്യാസ വകുപ്പ്



**പഠനപിന്തുണാസാമഗ്രി നിർമ്മാണ ശില്പശാലയിൽ പങ്കെടുത്തവർ**

ശ്രീ.യുസുഫ്കുമാർ എസ്.എം, എച്ച്.എസ്.എസ്.ടി, ജി.എച്ച്.എസ്.എസ്, പകൽക്കുറി, തിരുവനന്തപുരം  
ശ്രീ.അജു എസ്. എച്ച്.എസ്.എസ്.ടി, ജി.എച്ച്.എസ്.എസ്, വെച്ചുച്ചിറ കോളനി, പത്തനംതിട്ട  
ശ്രീ.വിനോദ് എം.എം, എച്ച്.എസ്.എസ്.ടി, ജി.ജി.എച്ച്.എസ്.എസ്, മാവേലിക്കര, ആലപ്പുഴ  
ഡോ. ബി.വി നന്ദകുമാർ, എച്ച്.എസ്.എസ്.ടി, ജി.എച്ച്.എസ്.എസ്, ആര്യനാട്, തിരുവനന്തപുരം

**വിദഗ്ദ്ധൻ**

ശ്രീ.ബിനോ.പി. ജോസ്, അസിസ്റ്റന്റ് പ്രൊഫസർ,  
സെന്റ് ഡോമിനിക്കസ് കോളേജ്  
കാഞ്ഞിരപ്പള്ളി

**അക്കാദമിക് കോഡിനേഷൻ**

ഡോ.പി.പ്രമോദ് (സംസ്ഥാന പ്രോഗ്രാം ഓഫീസർ)  
ശ്രീ.എൻ.ടി.ശിവരാജൻ (സംസ്ഥാന പ്രോഗ്രാം ഓഫീസർ)

**തയ്യാറാക്കിയത്**

ജില്ലാ പ്രോജക്ട് ഓഫീസ്, കൊല്ലം  
സമഗ്ര ശിക്ഷ, കേരളം



# ഹയർ സെക്കണ്ടറി കോഴ്സ് സ്വയംപഠന സഹായി

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**ചരിത്രം**



## മൊഡ്യൂൾ നിർമ്മാണ സമിതി

### വിദഗ്ധർ

ശ്രീ. ലൂക്മാനുസ് ഹെറിംഗ്, കെ.  
അസിസ്റ്റന്റ് പ്രൊഫസർ ഓഫ് ഹിസ്റ്ററി  
മഹാരാജാ കേരള, എറണാകുളം

### പ്രതിനിധികൾ

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എച്ച് എസ് എസ്.റ്റി.,  
ജി.എം.ബി.എച്ച് എസ്.എസ്, ആറ്റിങ്ങൽ
2. ശ്രീ. അബ്ദുൽ അസീസ്. വി.പി.  
എച്ച് എസ് എസ്.റ്റി.,  
വി.പി.കെ.എം.എച്ച് എസ്.എസ്., പൂത്തൂർ,  
പള്ളിക്കൽ, മലപ്പുറം
3. ശ്രീ. പ്രദീപൻ.റ്റി.  
എച്ച് എസ്.എസ്.റ്റി., ജി.എച്ച് എസ്.എസ്.  
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4. ശ്രീ. ജോതിഷ്കുമാർ. ബി.  
എച്ച് എസ്.എസ്.റ്റി.,  
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5. ശ്രീ. ഗുലാം മുഹമ്മദ്.കെ.പി.  
എച്ച് എസ്.എസ്.റ്റി.,  
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സ്കോൾ - കേരള - 2021



**Report on**  
**ICSSR Sponsored National Seminar Titled**  
**Miscegenation and Anthrophobia in Idukki**  
**District; A Historic Discourse**

**16, 17 January, 2018**



**Organized by**  
**Department of History**  
**(Convenor & coordinator- Dr.K.A.Benny)**  
**Newman College,Thodupuzha**  
**(NAAC Accredited with 'A' grade Institution)**  
**Affiliated to Mahatma Gandhi University**  
**Kottayam,Kerala**



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## Gender Values of the Migrants and Church as a Transnational Institution

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### Introduction

The two biological categories continue to be the most important two social categories in Kerala. The male and female distinction is not so much prevalent in the socio-political fields. But the man - woman distinction is very significant. It plays a vital role in determining the functions, positions, privileges and responsibilities of every individual in the society.

The male-female distinction in society is shed to a great extent in the modern societies of Europe. The spread of modernity essentially meant a narrowing of the line between man and woman in those societies. However, the Kerala society, even after its considerable modernization, continues to be traditional on the other hand. Its religiosity and deeply rooted religious institutions which have never faced any considerable challenge in its long history could be the reason why the pre-modern continue to be very live in the modern era too.

In fact, Kerala has never experienced a drastic, sudden or complete rupture from the past. When we got modernized, we did it while keeping the pre-modern notions. When we reformed our society in the light of the modern western ideals, it was done without repudiating the sources of our traditional social order; we only reinvented our traditional sources and ideals. We repudiated the caste system, but we mostly keep the norms still in marriage. Also we never disrespected the texts that were used to sanction casteism. The reason could be the lack of development of a considerable secondary sector in the Kerala economy. Instead, we only developed a tertiary sector as result of the modernization. We thus did not want uniformities or ruptures. We could tolerate the incoherence. We could stand the diversity and internal contradictions.

Kerala continued to hold much of its traditional gender values. The division of household tasks, roles played in the community gatherings, role in finance management, dress and behavioral pattern are all still based on gender. This gendered society nurtures a gendered value system in the minds of its individuals who will find themselves in a totally different context when migrated.

The conflict is acute in the case of the migration of the couples or families from Kerala to the west in which women migrate first and then the others join. This is due to varied reasons. Several forces including the religion of the migrants play a role that somehow easily pace, neutralize or try to withhold the natural changes in the gender relations in the



migrant families. The Catholic Church, as a transnational institution, tries to keep the traditional gender values of the migrants in their immigrant life too. This attempt has several bearings on the gender relations of the migrants and sometimes on the church too.

### **Gender**

“Gender refers to the socially constructed characteristics of women and men – such as norms, roles and relationships of and between groups of women and men. It varies from society to society and can be changed. While most people are born either male or female, they are taught appropriate norms and behaviours – including how they should interact with others of the same or opposite sex within households, communities and work places. When individuals or groups do not “fit” established gender norms they often face stigma, discriminatory practices or social exclusion – all of which adversely affect health. It is important to be sensitive to different identities that do not necessarily fit into binary male or female sex categories.” This is how WHO defines gender.

The areas addressed in the definition include the following:

1. Social construction of ‘man’ – ‘woman’ images.
2. Change of gender constructs over time and space
3. Major spaces of gender differentiation - households, communities and work places
4. Social exclusion for not fitting to prescribed behaviour
5. Care for the third gender

Societies construct gender values by assigning behavioural patterns and ideals for man and woman. The gender values and gendered values are handed down the generations. Major agents of this transaction are family and religion. These values are under change within every society. They also come into conflict and drastic change when the families migrate to societies that hold different constructions. Changes are experienced mainly in three areas - households, communities and work places. And exclusion is the major strategy applied by the community to ensure gender discipline among the individuals.

### **Gender in Contemporary Kerala**

Kerala is known for its high literacy and human development index. However, the gender disparity in the state is still a major issue. Even when Keralites boast of their progress compared to the other Indian states, the state has several paradoxes and bi-standards in this regard.

Kerala governments Gender Advisor Gita Gopal observed: “...though the state was lauded the world over for its high literacy and health related issues, notions of gender equality continues to be weak. Women’s voice is weak in decision making in all areas including legislature, executive and judiciary. While the language of development in the state has been one of women empowerment, the formal and informal legal frameworks within which issues have been addressed is one of protection. The issue of protection had exacerbated gender inequalities, generated certain backlash and made more women vulnerable in economic and political dimensions. However, the state government had taken the right step in shifting from



a focus on women to one of gender equality and women's empowerment. Violence against women was increasing in Kerala. There is equal amount of violence or incidents of violence against women belonging to all religions.

Laws related to transnational migration overlook women. Active participation in the blurred boundaries of legal-illegal migratory flows.

She also said normative general perception about women who leave their families and children back home evoke a sense of "illicitness" around their work. I call this production of illicitness as moral panic." (India Today, November 13, 2015.)

One can notice a few striking contradictions in the gender values of the much celebrated Kerala society. Firstly, there are so many contradictions working in Kerala society. Secondly, even though educated and professional, Kerala women are completely adhering to the norms put forward by the patriarchal forces. "Unlike women in other states, women of Kerala are not eliminated before birth; they are given enough education, treated equally in educational institutions, but after that, their subjugation begins. Thirdly, though women are treated equally, they are also always reminded that they should not question the boundaries between public and domestic spheres. At home they are always made to remain submissive to men.

This suppression and contradiction in the lives led by a woman in the public and the private spheres is a major reason behind the deteriorating mental health of Kerala women. This deteriorating mental health further results in the increasing suicide rate of the women of Kerala." (Rigy Idiculla, in *Dominican Discern*, June 2015). In other words, the seeing freedom women achieved in the public sphere has not helped advance her liberty at home.

The religions of the state in general and the Christian church in particular, only practically emphasize the patriarchal norms. Priesthood, the religious leadership, is reserved for the male. The church bodies and for a have started implementing women reservation, women are but not generally expected to take the leading or active role except in the for a exclusively for them. The scriptures and current events are explained to teach them the necessity of women's submissiveness. These gender values are quite against those of the west and the US.

### **Migration: She Comes First**

In this context, the migration of the Syrian Christians – Syro Malabar, Syro Makankara and Orthodox sects – in large numbers pose a specific and curious typology. Here, it's the women who migrate first. Qualified nurses migrate to the west and to the US in large numbers, they get married to aspirants of migration to a developed country, take the spouse along later and then the spouse also find an employment there.

### **'Sari Visa'**

Going abroad and settling down/ getting employed in the west by marrying a Malayali girl employed there is not openly appreciated in the Kerala society. At the same time, the financial benefits and the possibilities of getting oneself employed there attract boys from



Kerala to marry girls employed/settled in the west and avail the detested 'sari visa'. Sari visa was once too detested that it was not easy for a girl employed in a foreign country to get a matrimonial alliance in Kerala. Over time, mainly because of the evident prosperity enjoyed by the sari visa holders as against their highly qualified but less employed or unemployed friends a few years after marriage has changed the picture. Now there is an ample number of applicants for sari visa. The term, however, continue to circulate, mostly with a tinge of jealousy rather than scorn.

Sari visa is practically nurse visa too. This is because most of the Keralite girls working in the west and in the US are nurses. This is especially true about the Syrian Christians. Their fortunes are so good that it is the best students of the state who opt for a nursing career in the west and the US.

### **Migration, Kerala and the Church**

Kerala nurses started working as nurses in the west by around the 1960s. The first destination of Kerala nurses in the west was probably the war-torn Germany. It was the Catholics who moved first and the destination was the church run mission hospitals of Germany. Italy was also a destination of the Kerala nurses in the 1990s. Later, Austrian Catholic Orders started recruiting from Kerala by the 1970s. The knowledge of opportunity in the west and the necessary support prior to and during the migration mainly came from the transnational ties of the Catholic Church. This historical background may explain why Malayalis and especially Christian Malayali girls constitute the largest share of emigrants to the west.

Malayalis had to look for alternative means of livelihood when population increased in the second half or the 20<sup>th</sup> century. This migration took place with the active facilitation of the Catholic Church. The Christian girls also considered a Christian country a safe and comfortable destination for migration. The church served not only as a source of information but also as a context that shaped the social essentials for an immigrant family. In Europe, as attested by the examples from Germany, the church provided a meeting point for the immigrant Malayalis. It also plaid the basic kith and kin of the immigrants with their original relatives and friends left behind in the homeland.

The role plaid by the church in facilitating and promoting migration of Christian girls to the western nations thus included the following:

- Providing information regarding possibilities and opportunities
- Training IENs, Internationally Educated Nurses
- Responding to the material conditions of the families of the believers in which there is population growth, lack of employment opportunities and poverty
- Legitimizing the nursing profession and the involvement of girls in it. Indian society in general holds the purity notion according to which the touch of the bodies of others could pollute one. This problem is acute when it is the women who touch the body of men other than those in her family. The notion is not entertained in the Christian



world, but came to influence them too in the Hindu context of the society. Thus the church sanction and promotion of the nursing profession was of much value.

- Providing a community to live in. The immigrant Christians in a European nation form associations. The Christian church, with the leadership of a full timer priest, becomes the easiest association and it serves as the basic community in which the life of the immigrant takes place.
- The stance of the Syrian Churches in general was responding to the material conditions of their believers. Thus a migratory disposition was developed among them.
- This disposition included breaking of the older norms of work and mobility. As regarding the nursing profession, the image of a polluted profession that include touching of others' body was shed. The profession gradually grew in acceptance. The nurses came to be regarded "angels on earth".
- Nursing education and migration to the west became the dream of the girls of all economic sections of the Christian families in Kerala. These were the most successful group of the girls of the state because only they were able to make the money needed as their dowry and to make a significant contribution to the financial improvement of their parental families.

### **Shifting Gender Values**

When the girls of the traditional Kerala community get employed and settled in the west with their families, the gender values they hold come under severe conflict with those of the new world. The whole context of life shifts and the gender values are affected at home, at the workplace and in the community life. There are several practical issues that lead to the shifts in the gender relations and behavioural patterns of the members of these migrant families.

- Usual pattern of family migration is the male migrates first and then the family follows; in this case, just the opposite takes place.
- The husband is both officially and practically declared a "dependent" of the wife; something unimaginable in the traditional context.
- Almost always in the early years of the immigrant life in the developed country, the husband is financially and otherwise supported by the wife.
- In many cases, even the first overseas flight of the husband is sponsored, guided and planned by the wife.
- In most cases, throughout their stay/life in the immigrated country, the wife earns more handsomely than the husband.
- The social position and financial well being of the wife are often much better than those of the husband.
- Working conditions of the wife are well defined, comfortable monitored and secure whereas the same of the husband are often under pressure, uncomfortable and lacking any security.
- Wife is, in many cases, a government employee whereas the husband is a private employee.



- Wife, even though comfortably employed, has night duties and emergencies to undertake. Her overtime work is also more rewarding than the husband's.
- For all reasons, the wife's work is more important to the family,
- Naturally, situations make the husband the first in charge of the two important family affairs: child rearing and domestic works.
- The most important agent that ensure the continuity of the gender values in family and in the husband – wife relation, the mother in law of the immigrant wife, is absent in the family of the migrants.
- Even when the presence of a member of the previous generation is required – as in case of the delivery time of the wife – the wife's mother is preferred than the husband's mother. This further avoids the chance of a disciplining period.
- Whenever it's necessary that either of the couple should avail a leave from the workplace, it looks easier, practical and profitable that the husband does it. More often, such unexpected and expected occasions rise in connection with the needs of child care. The husband becomes in-charge in such cases too.
- As a result, gender relations within the migrant family move a lot from the traditional perspective. Here, the husband and wife at least equally share the household and child rearing responsibilities.

Migration gives the girls better wealth, social acceptance, considerable chances of freedom and adventure. They come out of the traditional chains of gender notions to a great extent.

Still, the migrant women have their traditional norms well knit in their mindset. The first generation migrants are observed to comply with the traditional Kerala Christian norms of work, mobility and sexuality of women. This set of gender values includes the patriarchal norms of work division at family. Even when the work division changes towards a more egalitarian one, the conscience that *this change is accommodated due to the pressure of the situation* is strongly held both by the men and women. It is *not a Normal situation* in which such a change is accommodated, it is considered. Whenever the couple return to the homeland or whenever they are on an equally free time, the domestic work and child rearing responsibilities become primarily of women. Whatever they perform are considered not duty but magnanimity.

The migrant girls initially face the difficulty of having no community to live in. The only usual entertainments they have are the Malayalam Television Channels and company of their Malayali friends. This issue is addressed by the church by arranging a community in the migrant land. This could be in the form of a parish, a charity organization or a devotional association. There will be periodic meetings, activities and celebrations. Such platforms are the most acceptable, legitimate and safe when under the ambit of the church.

At the same time, the church plays an important role in reshaping the gender notions. This mainly manifests on occasions of community gatherings. There the church recreates the community meeting occasions at home, including the gender roles. The leadership, stage, activity and visibility all come first for men. Women often turn to be onlookers or just



participants. This, in a way, helps balancing the shifts in the gender values experienced by the men on migration. Men regain an amount of their gender prestige and position that they lost in the family through the church in the community. But, while doing so, the church is adhering to and upholding the gender values of the first generation migrants. On the other hand, the church is also entertaining gender values that are against the notions strongly and naturally held by the second generation of migrants. They, being educated in the western system, find the gender values in the church sponsored gathering odd and outdated. This could, in the long run, affect their very acceptance of the church.

### Conclusion

Christian migration from Kerala to the west and the US against the context of unemployment, underemployment and population growth started from 1960s. The majority of the initial migrants from a family are nurses. The immigrant nurses later bring their spouses and children to the immigrated world. The whole process is legitimized and supported by the Syrian Catholic churches in many ways. The migrant girls come from a society that holds traditional gender values and when faced with a totally different value system in the immigrated world, the gender relations within the family change and the husband and wife comes to share the domestic tasks and child rearing almost equally. Women enjoy several advancements as a result of the migration.

The Catholic Church assists the migrants by forming a community for the migrants to live in. There are gatherings, celebrations and regular meetings. Still the Catholic Church plays a balancing role by emphasizing on the traditional gender images, behavioural patterns and gender values. Thus, in contrast with the improved relations at home, the patriarchal male dominated community life and relations are reproduced in the west. This has made the first generation migrants to adhere to the traditional gender values to a great extent at least in the community life, if not within the household. However, the second generation of the migrants finds the gender values advocated by the church outdated and do not fixing into the life context in the immigrated world. This could in the long run, threaten the church interests because no institution can survive unless it adapts itself to the material changes of the time.

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## SOCIO - ECONOMIC IMPACT OF INTERNATIONAL MIGRATION: A CASE STUDY

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### INTRODUCTION

Migration has always been a part of human history, and it will remain so. At present, more and more people in both developing and developed countries are likely to consider migrating, either permanently or temporarily, to seek out new opportunities. Few phenomena have shaped human history as decisively as migration. Its influence is evident in our vibrant multi ethnic societies; ever present reminders of the power of the human urge to seek a better life elsewhere. Migration brings new ideas, new energy, new connections etc. Challenges and benefits - migration brings them both. But we can only hope for the former and maximize the latter, if we adopt a coherent policy response.

If access of opportunities is not equally distributed, migration may thus enhance inequality, emphasized that better-off migrants are 'pulled' towards better job prospects, while the poor are 'pushed'. We have to deal with the reality that - like almost no other issue today - migration invites controversy. In part this is because it touches upon so many aspects of modern life - economics, demographics, politics, national security, social issues, national identity, culture, language, and even religion.

The study is concerned not only with who were the movers, but why they took to the road, and what had happened to them, their families left behind, and to the sending community. It is significant that the study will point the way towards new questions and new approaches in migration studies. Thus the above mentioned characteristic features of migration pattern in Idukki district seem to be a new area in the field of studies on migration and since the study is relevant in nature.

### MIGRATION: DEFINITIONS, CONCEPTS, NUMBERS

According to Castles and Miller, "we are now living in what has been called the age of migration and it is important to understand the multifaceted consequence of global labor migration flows." Today's international migration flows in various countries of the globe did not emerge in a vacuum, of course, rather they are intimately connected to broader processes of economic integration that for the past half century have been shrinking the globe. Places that are linked to one another by flows of people, in a process that many people today refer to as globalization, in another sense migration is an increasingly central dimension of globalization.<sup>1</sup>

Migration in an extent is a tool to promote national economic development, creating programs and sometimes entire ministries to promote the export of labour and establishing mechanisms to capture remittances and channel them toward productive investment.<sup>2</sup> The worldwide advent of international migration in the late twentieth century offers many



formidable challenges. The globalization of capital and labour markets and the internationalization of production pose strong challenges to the very concept of the nation - state and the idea of national sovereignty itself.

Another basic truth is that immigration is a natural consequence of broader processes of social, political and economic integration across upheavals of market creation occur, those who adapt to changing circumstances through emigration do not scatter randomly, nor do they necessarily head for the nearest wealthy society. Rather they go places to which they are already linked economically, socially and politically.<sup>3</sup> Economic links reflects broader relations of trade and investment.

Migrants generally gain from their mobility, relative to staying home; but they could conceivably benefit even more under a reformed migration management regime.<sup>4</sup> The costs and benefits of their mobility to the societies to which they move, and which they leave behind, are more complicated still.<sup>5</sup>

At first glance migration seems a straight forward concept. People move from one place or country to another and stay there long enough to be considered migrants. The scope of the study of migration is beset by dichotomies - forced vs. voluntary, temporary vs. permanent, legal vs. illegal, internal vs. international, skilled vs. unskilled and many more.<sup>6</sup> According to the United Nations Population Division, there are 214 million international migrants in 2010, equivalent to 3 percent of the global population. This number has been growing steadily rather than exponentially: it was 175 million in 2000, 105 million in 1985, and 75 million in 1965.<sup>7</sup>

#### **MIGRATION PROCESS IN KERALA**

Indian subcontinent witnessed the emergence of a particular pattern of migration. Migrations of labor to the plantations in the tropical countries were originated in the Indian soil from the earlier decades of nineteenth century.<sup>8</sup> These migrants were unskilled agricultural workers recruited for the purpose of working in the tropical plantations. The Caribbean islands, Guiana, Natal, East Africa, Mauritius, Sri Lanka, Malaysia and Fiji were the important destinations of the migrants sent under these systems.<sup>9</sup> Migrants were recruited mainly from Eastern UP, Bihar, Orissa and the Tamil and Telugu districts of the erstwhile Madras Presidency.

New patterns of migration like the trader migration, professional migration and settler migration also emerged subsequently. A large number of migrants from India opted to settle down in the places of destination. It is estimated that as many as 2.79 million persons born in India or of Indian extraction were found to be living in foreign lands as on 1921.<sup>10</sup>

Migration has been the single most dynamic factor in the otherwise dreary development scenario of Kerala in the last quarter of the 20<sup>th</sup> century and the beginning of the 21<sup>st</sup> century. Short-term and long term international migration from a region or a country to richer countries leads to tremendous social changes at the household and community level in the sending communities. Migration to the Middle East represents a distinct type of international movement that is increasingly common and likely to dominate in the case of Kerala. It is a strictly temporary migration, with no possibility of permanent settlement for



most migrants. While some migrants to Europe, Canada and USA shows a tendency for permanently settling there. While the Muslims dominated the outflow to the Middle East, Ezhava Hindus and Syrian Christians also participated in large numbers.

Though Kerala has emerged as an important migrating state during recent years, very few Keralites seemed to have moved out of Kerala till the end of nineteenth century. However, the Keralites who were reluctant to move out of their moorings transformed themselves into a highly mobile class in India since the turn of the century. The migratory movements which started in trickles acquired the characteristics of a stream after the end of the First World War. With the oil boom in the Middle East, concomitant infrastructure boom in the countries, accompanying rapid population growth, mounting unemployment and extreme pressure on land for cultivation in, Keralites began to choose transnational migration as a viable solution to their problems. This particular flow of migration has continued since the 1970's and remains as a significant aspect of the migration profile of the state.<sup>11</sup>

The 2008 migration survey estimated that 2.2 million Keralites are at work outside the country, while the total number of Malayalees who work outside the state (outside Kerala within India) is 0.9 million.<sup>12</sup> Out of the 2.2 million emigrants from Kerala, 89 percentage live and work in the Gulf countries and most of them migrate as individuals leaving their families in Kerala.<sup>13</sup> Kerala received about 9.6 billion US Dollars as remittances equivalent to 31 percent of Kerala's state domestic product in 2008.<sup>14</sup>

#### **POSSIBLE FACTORS BEHIND MIGRATION FROM KERALA**

While no attempt is made here to provide a general theory of migration, an attempt is made to identify, what appear to be major factors behind migration from Kerala, particularly those in recent years.

One principal factor is the pressure of population on land. Kerala has the highest population density in the country (654 persons per square kilometer as against the national density of 216 in 1981). This has resulted in: (a) the lowest worker participation rate in the country (In 1981, 31% of Kerala's population was in the workforce as against the national average of 38%) and (b) the highest unemployment rate (in 1979-80, 25% of the labour force in Kerala was unemployed when the national average was 8%). On account of inadequate work opportunities and given the relatively much better developed educational infrastructure in the State, there is a greater tendency to continue as a student in Kerala than in the other States, and correspondingly, the incidence of educated unemployed in Kerala State is very much greater. Given the large pool of educated unemployed, it is only natural that a good number has tended to spill out of Kerala in search of employment.

There are thus two migrant streams in Kerala: one consisting of largely unskilled workers, almost all men migrating predominantly from rural areas to supplement family income derived from agriculture or other low productivity rural occupations; the other stream consists more of urban based, relatively better educated men and women.



## **IMPACT OF MIGRATION ON THE SOCIO-ECONOMIC STRUCTURE OF IDUKKI**

Even if there exist substantial research works and studies on international migration, most of them focus on the impact of migration on sending and receiving societies, particularly on the economic basis. The present study is a deviation from it, and focus on the socio – economic aspects of the international migration on the basis of the study of sending families and society in Idukki district, which is experiencing a lot of changes due to the migration process of her people. The study presented a detailed description on the concept, the historical background and global perspective of international migration in order to understand the impact of migration effectively.

The Paper focus on the migration patterns of a micro-region and the consequence resulting from it, so selection is made to study Idukki district which is richly populated by different religious groups. Migration and remittance flows led to the transformation of the socio-economic structure and culture of Idukki region. Migration introduced new patterns of status in the area to symbolize their changed socio-economic position within the community. Whatever the motive behind the eventual decision to migrate, the event of migration and the subsequent formation of transnational households leave an undeniable impact on the household, local economies, conventional family structures, socio-cultural perceptions of the migrants and the sending community etc. Although some characteristics of the society constrained individual responses to migration, these responses had the eventual result of reformulating the characteristic structure of the society in reverse. Thus there is a dialectical relationship between society and individual migrant behavior.

### **IMPACT ON ECONOMIC STRUCTURE**

Most important beneficial aspect of export of manpower to foreign countries is the large foreign exchange earned by the area of study through the remittances of workers to their families. Another aspect of the large scale foreign remittances is that it helped to reduce inter – regional disparities in the income distribution as the remittances are distributed more in favour of relatively backward areas.<sup>15</sup> Since bulk of the emigrants from Idukki is drawn from middle and lower middle class families and that itself from relatively backward areas, these remittances have had a leveling up effect in the distribution of income.

Many poor families thus became rich. The significant growth of newly rich people had upset the rural power – structure. In fact, one can argue that international migration has proved to be a great social equalizer. It has provided an opportunity for the economically unfortunate to enhance their economic position and through it revise the socio – economic hierarchy.<sup>16</sup> At the same time the economic position of non – migrant families does not seem to show any substantial change. As a result, the traditional social stratification between the landed class and the landless now gave way to a new social categorization that of migrants and non – migrants.

### **EFFECT ON THE WAGE RATE AND PRICE LEVEL**

Among the various impacts of foreign remittances in the region, the most commonly expressed view is that the process pushed up the wage rate and price levels. For instance, the increasing flow of construction workers to Gulf countries was followed by an increasing

demand for them in the rapidly growing construction sector within Kerala.<sup>17</sup> The sudden spurt in the demand for construction workers resulted in an abnormal increase in their wages which have also escalated to other types of workers. At the same time a good number of women workers and children from remittance receiving households in Idukki withdrew from low paid occupations resulting in a further shortage of laborers and in the increase in wages thereby.

We can also compare the lives of the wives of migrants in the contemporary period with that of the older generation in Idukki. Earlier, the women from lower middle class and poor families had to go out by necessity to work and to the market. There is no local labour (either men or women) available in Idukki and people came from non – Gulf pockets, Tamil Nadu and North – Eastern States of India for the purpose. Thus, now a days, an inward migration taking place in the labour market of Idukki. In fact, the migration affluence permitted women to conform to the demand for stricter seclusion which was seen as more honorable and therefore a privileged option.

To what extent the foreign remittances pushed up the price level in the region of study is difficult to measure as the price level is determined by the forces of supply and demand for goods in the state and in the country as a whole.

### CONSUMER CULTURE AND CONSUMERISM

The people of the district are seemed to be in the grip of a strong consumerist orientation. Changes in food habit and in clothing are visible example of consumerism, a bi-product of international migration.<sup>18</sup> Foreign goods once considered exotic and elitist, had become widespread and were deemed as necessity to maintain a basic status in society. The emigrants become accustomed to the use of many new durable consumer goods while abroad.<sup>19</sup> Most of these goods are now locally available, and the higher purchasing power of migrant households enables them to acquire these goods more frequently and effortlessly than non – migrants could.<sup>20</sup>

An interesting feature observed in this regard was that the consumption behavior in migrant households had a demonstrative – effect on other families in the District, changing their life style and habits. For instance, commodities like television, refrigerator, music system, computers, mobile phones, etc. which were considered as luxuries in the rural areas till some years ago, are now considered as necessities by one and all. There is also market craziness for acquisition of foreign made goods starting from clothes to electronic items.<sup>21</sup>

The increased consumerism provided much incentive for trade and led to an increase in the number of business establishments which are anxious to get their share in this consumer culture.<sup>22</sup> A good deal of the migrant's money was also spent on transportation; particularly on taxis, since it was considered a more decorous and prestigious way for a migrant's family to travel (as compared to walking or taking bus). This partly explains the tremendous increase in the number of commercial vehicles in the area. The number and scale of "feasts" (organized when relatives and friends visited one another) had increased a great deal after the foreign migration, which also provided business for the hotels and also hired vehicles.



### EXPENDITURE ON HEALTH CARE AND MEDICINE

Medical care had become a major item of expenditure in the area, and a remarkable change in the health consciousness is visible among migrants when compared with the non-migrants. They mainly prefer Allopathic treatment instead of Ayurvedic and Homeopathic medicines. A dutiful migrant sends his family members for regular checkups and medical treatment, as it had come to present an index of love and concern.<sup>23</sup> The migrants and their family members almost avoided public, government-run hospitals and go instead to expensive private clinics, even for relatively routine health matters.

### RELIGIOUS AND CHARITABLE ACTIVITIES

The migrants also use their remittances to flaunt their wealth and thereby secure the community's respect. A substantial proportion of the donations made by migrants were used for religious purposes which served as status enhancers. In this connection, it is relevant to note that certain organizations floated by the migrants at their places of work were instrumental in mobilizing money for cultural and charitable activities in their home villages. Members of the organizing committee of the local festivals and ceremonies depend highly on the migrants for the purpose.

### CULTURAL INTEGRATION AND ASSIMILATION AMONG MIGRANTS

As a result of migration, men and women had a greater exposure to the relative cultural isolation they had earlier. The large scale migration from the region had begun in the 1970's. The migrants had a great opportunity to meet a lot of people and make friendship with co-migrants from other parts of the state, from other states in India and also from other migrant sending nations. The overlap in the occupation of all these people, of different region, different culture, different religion and different language, resulted in their close interaction with each other, resulting in cultural assimilation among the emigrants.

### MIGRATION AND CASTE

In Idukki region, the metamorphosis of the caste system went hand in hand with substantial changes in the economic, political and social standing of the main caste groups among Hindu religion. The Namboothiris once considered being the semi-divine local rulers, had now a days, become ordinary land owners and salaried workers (though they were still treated with some awe and respect by the villagers). The Nairs had become a largely impoverished group, in the psychological and social retreat from the community that they once dominated and the Ezhavas, formerly considered as a caste group with few rights and only a little above the slave caste, had become an increasingly affluent section of society, rapidly becoming educated and socially powerful. With their numerical preponderance and economic and social power they seemed to be taking over as the local dominant Hindu caste.<sup>24</sup>

All the above mentioned transformations took place mainly due to the large scale labour migration among the Ezhavas. The process resulted in the creation of a new structure of economic opportunities in the society at large, one that reversed the pre-existed structure and allowed the 'lower castes' and classes to be the prime beneficiaries.

But in the case of Christianity, the migration increased the economic and social distance between the Syrian Christians and the Backward Class Christians (Dalit Christians) who converted from the Harijan class to Christianity. Such conversion did not bring about much expected change in their caste or social status.<sup>25</sup> The socio – cultural relationship between the two groups was similar in many respects to that between Harijans and upper caste Hindus. Many of the Dalit Christians worked as servants in the traditional land owned Christian families, which avoided close social or personal contact with them in anything other than a master – servant relationship. Despite the fact that the Dalit Christians lived in an area of very high migration rate, they were not able to participate to any significant extent in the international exodus. Although some rich Syrian Christian migrants helped their servants to migrate, this did not help them in improving their socio – economic status.

### **DE-CASTIFICATION OF MARRIAGES**

Hypergamous marriages in Idukki are typically between members of a higher and lower caste (or sub-caste) among the Hindus and it is between people of higher and lower family status or ancestry, in the case of Christians, denominations. The increase of hypergamy and hypogamy among the migrants illustrate that the traditional principles underlying marriage pattern were being changing. However, an examination of the new marriage patterns, and the conversation with the native people, seemed to indicate that it was education and the income that acquires through having educational qualifications that was mostly highly regarded.<sup>26</sup> If a boy has education, and has a highly paid job in a foreign country, that is what accounts now a days. Then no one looks at family background or caste differences.

### **CHANGES IN THE POWER STRUCTURE OF THE HOUSEHOLDS AND THE ELDERLY**

As a consequence of migration, there is a weakening of the structural authority of parents over their adult children in several families which receives foreign remittances.<sup>27</sup> Since local agriculture and labour had largely been abandoned by them, the parents gradually forced to depend financially on their migrant sons. This reverses the earlier situation in the family and strengthens the selective power of the sons over their parents. These phenomena could have the eventual consequence of undermining the basic power structure of the extended family system controlled by the elder member of the family, one of the cornerstones of social tradition in Kerala.

Another problem faced by the elderly persons in the emigrant households is said to be the loneliness.<sup>28</sup> The migrant sons/daughters live away from home with their spouses and the relatives around don't have either time or the inclination to provide them companionship. A large number of such elderly people are widows, and they were living without their lifelong companion. In such situations, there is an element of inevitability about moving to an old age home for many of the elderly population due to their loneliness. Anxiety is a problem among many of the elderly people living in the households themselves due to their loneliness.<sup>29</sup> The rate of anxiety is much higher among the elderly women than men.<sup>30</sup>



### IMPACT OF MIGRATION ON THE WOMEN LEFT BEHIND

The emigration of their husbands exposed the women who left at home to an entirely different set – up. They now had to take major responsibilities and decisions, as well as interact with the outside world which they had never done before.<sup>31</sup> The most prominent role played by wives of migrants was with regard to finance. They had to go to the bank, collect the money and spend it for different purposes – for majority of them this was a new experience. This responsibility gave the wives a certain level of economic independence and a status within the family. In turn, it enhanced their role in the family decision making and enables them to assert themselves. It made them more self – confident, a factor, which was quite evident in course of the interviews with them.<sup>32</sup> However this is not to suggest that the changes in the household roles following male emigration were easy and without any problems. This is really a testing time for many women.

### PSYCHOLOGICAL IMPACT OF MIGRATION ON THE WOMEN

The migration had a tremendous psychological impact on the migrants and their families.<sup>33</sup> A lot of women in Idukki are living apart from their husbands due to the migration of their male counterparts. The Kerala Migration Study conducted in 2008 found that wives of foreign migrants rated loneliness as the biggest problem they faced, followed by added responsibilities, adverse effect on children's education, debt incurred to finance emigration, increased anxiety about the financial gains of migration etc.<sup>34</sup>

It is clear from the observation and interviews that many migrant's wives (particularly the young wives of migrants) exhibit a characteristic set of psychosomatic disorders. These ranged from sleeplessness, chronic head ache, stomach ailments and menstrual disturbances to fainting fits and possessions. This may be an unsubstantiated claim, but the presence of this syndrome in Kerala and Pakistan had been extensively noted.<sup>35</sup>

Constant worry about the husbands welfare (particularly in the case of illegal emigrants), also a concern that the husband might divorce them or marry a second wife in the working country, demanding and unkind in – laws, disobedient children and in the case of women living independent with their children; the general stress of managing a household by themselves etc. causes for the psychological stress over the women. But we can see a number of women who seemed to be well adjusted with the migration of their husbands. In such cases, they should have considerate in – laws; they had developed strong bonds with their sister – in – laws and close friendship with women in neighboring households. There was also an indication that these wives had a close personal relationship and constant communication with their husbands.

### EFFECT OF MIGRATION ON CHILDREN

In the case of migration from Kerala, at many cases the children of the migrants have to live without the presence of one or both of their parents. Childhood and adolescence are even more challenging than usual for such children.<sup>36</sup> In the case of these children, parental remittances often contribute better investments to their education and health care needs. Despite the economic benefits to parental migration, the concomitant loss of parental care and guidance can have long lasting psychological sequelae.<sup>37</sup> Most of the children of migrant

family have the intellectual and pragmatic sense to understand the reasons for parental migration and to rationalize the separation. But that certainly does not mean that they are emotionally immune to separation and that there is no tension between their rational acceptance of migration and emotional damage it causes.

### CONCLUSION

We can summarize, migration is a major socio, economic and cultural process that has been an integral and salient feature of human history since time immemorial. It has been an important means by which human civilization has spread out, enriching cultures and generation's social, political and economic changes at the places of origin and destination. Many earlier migrations from Indian sub – continent witnessed a particular pattern of movement of labour to the plantations in the tropical countries during the earlier decades of nineteenth century. The transformation of Kerala society from an immobile class till nineteenth century to highly mobile class during the years following the First World War shows the faster adaptation of Kerala society to the labour market forces of Globalization. The remittances from international migration permeated into all walks of Kerala society, transforming the social and economic life of its inhabitants during the recent decades. The study area, Idukki witnessed its early migration at around 1930s with several villagers setting off to Singapore and Malaysia. Migrants from all religious groups in Idukki used the resources of their communities to institutionalize and facilitate international migration. Many poor families thus became rich. The significant growth of newly rich people had upset the rural power – structure. In fact, we can argue that international migration has proved to be a great social equalizer. It has provided an opportunity for the economically unfortunate to enhance their economic position and through it revise the socio – economic hierarchy. As a result, the traditional social stratification between the landed class and the landless in Idukki now gave way to a new social categorization that of migrants and non – migrants. Female migration provided the migrant women the opportunity to become the primary economy earners in their family or at least important income earners at their own right. It greatly increased their power and autonomy. In turn, the status of women was also transformed due to foreign migration. The paper arise the scope of a further detailed study on the socio – economic impact of migration in Idukki with the backing of solid data from the information collected through a detailed survey.

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<sup>20</sup> Field Work.

<sup>21</sup> Interviews.

<sup>22</sup> Interviews.

<sup>23</sup> Interviews.

<sup>24</sup> Field Work.

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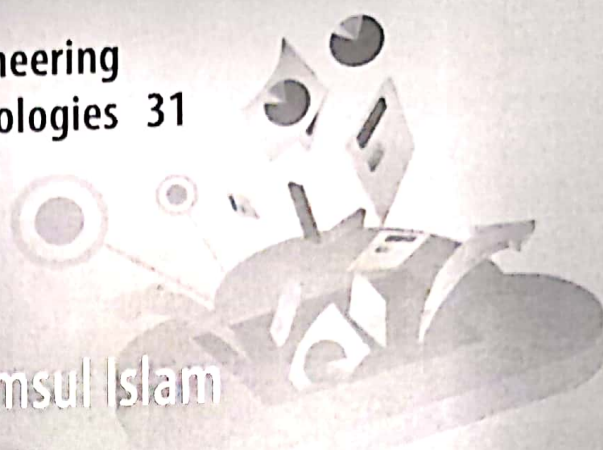
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# A Network Analysis of the Contributions of Kerala in the Field of Mathematical Research Over the Last Three Decades

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**Abstract.** In this paper we compare the performance made by higher educational institutions in Kerala (a southern state in India) in the field Mathematical research for the period from 1981 to 2015. The entire period is conveniently divided into periods of five years. We use some techniques from social network analysis to compare the performance of institutions over time. His study is based on the research papers published by the faculty of the institutions in the national and international journals which are indexed and listed by MatScinet of American Mathematical Society, which is a prominent abstracting agency in the field of Mathematics. Data available in the data base of MatScinet is used to prepare the network of collaborations of the institutions. These networks are further analyzed and compared to arrive at many valuable conclusions.

## 1 Introduction

Social network analysis is a branch of network science which deals with the dynamics of the interrelationships of a collection objects. In the context of social network analysis the term society is used in a broad sense. The word society can represent a group of individuals in the context of social sciences, a collection of web pages in the context of World Wide Web, a set of companies in the context of business, or a collection research papers in the context of research collaborations etc. But irrespective of the context the analysis of the network commonly possesses many properties. These properties come under the purview of social network analysis [17].

Social network analysis uses graph theoretic models for representing and studying the properties. Dynamic behaviour is a fundamental characteristic of social networks. Social scientists try to find relationship between the behavior of the society and the structure and topology of the underlying network. They attempt to explain some social phenomena in terms of the observable structural properties in the interconnections in the network. It is useful in many ways. If a phenomenon is associated with some structural properties in a network, one can expect the same phenomenon in some other network having same structural properties. Changes in the structure can affect the behavior of a network in many ways. Explaining the behavioral changes in terms of changes in the structure is an interesting area in the social network analysis.


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# An Approximation to m-Ranking Method in Networks

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**Abstract.** Identifying important nodes in a network is an important area of research in network science. m-ranking method is a method proposed Reji Kumar et al. [18] for ranking the nodes in a network which avoids the chance of assigning same rank for two nodes with different physical characteristics. This ranking takes into account the degree of all nodes and weights of all edges in a network. As the network becomes bigger and bigger the m-ranking method takes more and more time to complete. To overcome this difficulty in this paper we propose an approximation to this method, which simplifies the calculations without undermining the ranking outcome. We illustrate the procedure in some example networks.

**Keywords:** Social networks · Centrality measures · m-ranking method · Approximation to m-ranking method

## 1 Introduction

Identifying important nodes in a network is an active area of research. A large number of articles are available in this area in the literature of social network analysis [3, 5, 19]. Some nodes play prominent role in spreading process in a network compared to other nodes. Role of such nodes variably affects the spreading process which depends on the context. A node which is connected to a majority of nodes in a network can spread information in a faster pace than those nodes which have less connection to other nodes. In the spreading of rumor or gossip in a network the content of the information and the level of interest shown by the person who transmits etc. can also affect the spreading process [10]. In the context of spreading virus in a computer network or spreading disease in network of individuals, identifying the potential spreaders is crucial to the control of spread [3]. By removal or deactivation of potential spreaders, we can control the spread of infection in the network. In some different contexts we need to boost up the spreading. For example, marketing of a new product, spread of innovative trends and cultural diffusion in a society we treat potential spreaders in an entirely different way [3]. Due to the dynamic nature of social networks, status of nodes changes over time. Some nodes which are important in the beginning may become less important and vice versa. Nodes having high degree are known as popular nodes. Popular nodes can attract the attention of other members and consequently contact of

## Some properties of Soft Ideals in Inverse Semigroups and Soft Inverse Semigroups

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### Abstract

The concept of soft set theory is a general mathematical tool for dealing with uncertainty and vagueness. D. Molodtsov introduced the concept of soft sets, which was a new approach for modeling uncertainty. In recent years the algebraic structure of soft set theory has been studied increasingly. A soft inverse semigroup is actually a parameterized family of inverse subsemigroups. The concept of soft ideals is a more general concept than the usual concept of ideals. The aim of this paper is to introduce soft ideals of inverse semigroups and soft ideals of soft inverse semigroups together with their operations. We also investigate many properties based on that.

**Keywords:** Inverse semigroups, soft inverse semigroups, soft ideals

**AMS Classification:** 03E72, 46S40, 57N17, 06D72

### 1 Introduction

Molodtsov [14] introduced the concept of soft sets, which was a new approach for modeling uncertainty. In recent years the algebraic structure of soft set theory has been studied increasingly. Maji et al. in [12] gave a theoretical study of soft sets. In [3], Aktas and Cagman defined soft groups. The comparison between soft sets, fuzzy sets and rough sets are also established in [3]. Algebraic structures like fuzzy semigroups introduced by N. Kuroki [10] and rough semigroups introduced by



## THE COPRIME GRAPH OF A FINITE CYCLIC GROUP

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### Abstract

The interplay between group and graph have been the most famous and productive area of algebraic graph theory. In algebraic graph theory, the algebraic methods are applied to problems regarding graphs. The coprime graph  $\Gamma_G$  of a finite group  $G$  is defined as a graph whose vertex set  $V(\Gamma_G) = G$  and two vertices  $a$  and  $b$  are adjacent on  $\Gamma_G$  iff  $(|a|, |b|) = 1$ . The concept of coprime graph was introduced by M. Sattanathan and R. Kala (2009). In this paper, we discuss some properties of coprime graph of a finite cyclic group and its matrix representation.

**Keywords:** Coprime graph, Cyclic group, Adjacency matrix.

### 1. Introduction:

Graph theory is one of the leading research field in mathematics mainly because of its applications in diverse fields which include biochemistry, electrical engineering, computer science and operations research.

Groups are the main mathematical tools for studying symmetries of an object and symmetries are usually related to graph automorphisms. These both branches of mathematics are playing a vital role in modern mathematics.

Study of algebraic structure by graphs associated with them give rise to many recent and interesting results in the literature. One can associate a graph to a finite group in many different ways. The order of an element is the most basic concept of group theory. In [9], M. Sattanathan and R. Kala defined the order prime graphs of a finite groups and studied some properties of order prime graphs.



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# **determinants of Sustainability-Oriented Opportunity Identification and Entrepreneurial Intention – A Conceptual Framework**

*Reshmi Tom<sup>1</sup> & K.V Thomas<sup>2</sup>*

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## **Abstract**

Sustainability has become one of the most discussed and pressing issues today on account of the rising environmental concerns and alarming climatic changes. The United Nations have taken a pro-active step towards sustainability by framing the Sustainable Development Goals (SDG) which are to be achieved by the member countries by 2030. India with almost 18% of the world population has a prominent role to play in the SDG achievement of the globe. Sustainability is an integral part of the Indian culture which is reflected in its religious beliefs, rituals, arts and crafts, scriptures, folklore, ways of clothing, dining and housing. Indians hence have an inherent inclination towards sustainability that can be leveraged by Sustainable Entrepreneurship powered by technology thus contributing to the socio-economic development of the nation. Sustainable business models are reported to unlock economic opportunities worth US \$12 trillion every year by 2030. Sustainable Entrepreneurship contribute to the attainment of most of the SDGs specifically sustainability-oriented production, consumption, innovation, infrastructure and partnerships, generating employment opportunities, providing decent work, promoting good health, well-being and gender equality, use of clean energy, reducing inequalities and zero hunger and poverty. Sustainability (Nityam) being a fundamental feature of the Indian culture and tradition, India offers a fertile soil for sustainable entrepreneurship to sprout and grow. Sustainable Entrepreneurship (SE) starts with the identification of opportunities for sustainable entrepreneurship and advances with the development of entrepreneurial intention in SE. Hence, based on the Theory of Planned Behaviour and extending it further on the basis of review of literature to incorporate three additional variables, the study contributes a conceptual model demonstrating the factors influencing identification of opportunities and development of entrepreneurial intention in Sustainable Entrepreneurship. The empirical validation of this model will help the academia in promoting SE, the Governments in policy formulation, the corporates in framing strategies, the society in developing norms and the individuals in enhancing their skills.

**Keywords:** Sustainable Entrepreneurship, Opportunity Recognition, Entrepreneurial Intention, Theory of Planned Behaviour, Sustainable Development Goals



# പൊതിച്ചോറിന്റെ ചരിത്രം

കേരളത്തിന്റെ  
വിദ്യാഭ്യാസ ചരിത്രം

കേരള സ്കൂൾ ടീച്ചേഴ്സ് അസോസിയേഷൻ  
കെ.എസ്.ടി.എ. പ്രസിദ്ധീകരണം





# പൊതീഭച്ചാരിന്റെ ചരിത്രം

ആധുനിക കേരളത്തിന്റെ വിദ്യാഭ്യാസ ചരിത്രം

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BT-08

# ANTIMICROBIAL STUDIES ON *SESBANIA GRANDIFLORA*

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*Sesbania grandiflora* Linn belonging to the family Fabaceae is a well-recognized medicinal plant and is found to be distributed India, Srilanka and Southeast Asia. The plant is commonly known as vegetable hummingbird, katurai, agati or West Indian pea, is a small leguminous tree native to Maritime Southeast Asia and Northern Australia. It has edible flowers and leaves commonly eaten in Southeast Asia and South Asia. All parts of *Sesbania grandiflora* are utilized in the treatment of various disorders viz., bruises, catarrh, dysentery, eyes, fevers, headaches, small pox sores, sore throat, anaemia, bronchitis, nasal catarrh, inflammation, leprosy, gout and rheumatism, antiulcer, swelling and tumors. For this preliminary study, seeds were collected and evaluated the phytochemical constituents by Soxhlet extraction, GC-MS profiling and antimicrobial activity. The presence of phytochemicals was analysed using different solvents viz., petroleum ether, ethyl acetate, ethanol, methanol and water. The qualitative analysis revealed the presence of nine compounds such as alkaloids, flavonoids, phenol, quinones, saponins, steroids, proteins, tannins and terpenoids while using different extracts. A comparative antimicrobial activity of extracts was evaluated against four pathogenic strains viz., *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Klebsiella pneumoniae*. It showed that *K. pneumoniae* has the highest inhibition zone (2.8 cm) and *Staphylococcus aureus* has lowest inhibition zone (1.6 cm). While using Petroleum ether as extract, highest inhibition zone is observed in *P. aeruginosa* and *K. pneumoniae* (2.7 cm) and lowest inhibition zone in *S. aureus* (1.5 cm). The similar result was showed in ethanol and methanol extract and is 2.5 cm in *K. pneumoniae*, and 1 cm in *S. aureus*. But in water extract, highest inhibition zone was found in *S. aureus* (2 cm) and lowest in *E. coli* (0.9 cm). Among the solvents used, petroleum ether and ethyl acetate showed highest antimicrobial activity and that extracts were subjected to GC-MS analysis. The results clearly suggest that seeds of *S. grandiflora* have rich source of valuable primary and secondary metabolites exhibiting the antimicrobial activity.

**Key words:** *Sesbania grandiflora*, *E. coli*, *P. aeruginosa*, *S. aureus*, *K. pneumoniae*



BT-13

## ISOLATION AND PARTIAL PURIFICATION OF CATECHOL 2, 3 DIOXYGEANSE FROM *FUSARIUM SOLANI* – AN OIL DEGRADING FUNGUS

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Oil pollution is the resultant contamination of the environment due to the introduction of the presence of oil in excess quantities. Petroleum hydrocarbons are an important energy resource in the world, but it has become a high environmental pollution nowadays. The accumulation of hydrocarbons, especially polycyclic aromatic hydrocarbons (PAH), in the environment is a major health concern. These compounds have been shown to exhibit toxic, mutagenic, and carcinogenic effects. Microorganisms like bacteria, fungi, algae and yeasts have the ability to degrade oils in the environment. The presence of high enzymatic capacity allows microbial communities to degrade complex hydrocarbons. Catechol 2,3 dioxygenase (C2,3 O) is an enzyme involved in aromatic hydrocarbon degradation. The present study is discussing the production, purification and characterization of Catechol 2, 3 dioxygenase using *Fusarium solani*. *Fusarium solani* was collected from the GenBank of KSCSTE MBGIPS and studied the degradation activity by using different carbon sources viz., petrol, diesel, kerosene and engine oil in different concentrations (0.5%, 1%, 1.5%, 2%, 2.5%). The organism showed different degradation rates and maximum degradation was observed in medium supplemented with 0.5% diesel (4.49U/mL). The enzyme is purified using ammonium sulphate fractionation and followed by dialysis. Enzyme characterization studies also done and the results showed that enzyme is optimum at pH 7.0, temperature 65°C and 20mM substrate concentration.

**Key words:** Catechol 2,3 dioxygenase, *Fusarium solani*, oil degrading fungi, partial purification

BT-17

## PHYTOCHEMICAL SCREENING STUDIES ON *SESBANIA GRANDIFLORA*

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Phytochemicals are defined as bioactive nutrient plant chemicals in plants, that may provide desirable health benefits. *Sesbania grandiflora* is a multipurpose tree with edible flowers and is a source of one of the medicinal products. *S. grandiflora* has unique medicinal properties and used as a herbal drug for its antibiotic, anthelmintic, anti-tumor and contraceptive properties. The present study intends to provide an overview of the chemical constituents present in the crude leaf extracts of *S. grandiflora* with special emphasis on their antibacterial actions. Qualitative phytochemical screening was carried out using the crude leaf extracts in five different solvents such as water, petroleum ether, ethyl acetate, ethanol and methanol. Preliminary phytochemical analysis revealed the presence of nine compounds such as alkaloids, flavonoids, phenol, quinones, saponins, steroids, tannins, terpenoids and protein. A comparative antimicrobial activity of dried leaf extracts of *S. grandiflora* was evaluated against four pathogenic bacterial strains viz., *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Klebsiella pneumonia* by agar cup plate assay method. The leaf extracts of *S. grandiflora* were found to have high antibacterial activity. The ethanol extract of leaves showed an inhibition zone of 2.5 cm against *E. coli*, *K. pneumoniae* and *P. aeruginosa* compared to other extracts. While ethyl acetate extract of leaves showed comparatively low inhibition zone (0.2 cm) against these pathogenic strains. The study highlighted that *Sesbania grandiflora* leaves has rich source of valuable phytochemicals and antimicrobial activity.

**Keywords:** *Sesbania grandiflora*, Antimicrobial activity, Phytochemical Analysis, Agar cup method



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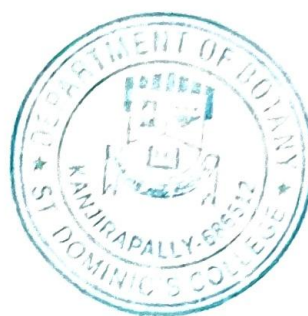
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BT-21

## BIOPROSPECTING OF *CHONDRACANTHUS* SP AND *CHAETOMORPHA* SP AS A POTENTIAL BIORESOURCE OF BIOACTIVE COMPOUNDS

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Macroalgae serve as one of the richest bioresource, consisting of numerous bioactive compounds with nutraceutical and pharmaceuticals potentials. In present scenario, the search for new bioresources with such potential is critical for addressing a variety of health-related issues. In this context, two native macroalgae *Chondracanthus* sp. and *Chaetomorpha* sp. collected from Thirumullavaram beach, Kollam, Kerala was studied. *Chondracanthus* sp. and *Chaetomorpha* sp. are two macroalgal members, which belong to the family Gigartinaceae and Cladopgoraceae, respectively. The primary objective of the present study was to biochemically characterize the biomass of these two macroalgal species. The total carbohydrate, crude protein, and phytochemical contents of dried macroalgal biomass were determined using standard methods. A solvent mixture of ethyl acetate and ethanol (6:1) was used for secondary metabolite extraction. Biochemical characterization revealed the presence of valuable carbohydrates, proteins, and secondary metabolites such alkaloids, flavanoids, phenol, tannin, saponin, terpenoid and steroid. The exact bioactive constituents of the two algal extracts were determined by GC-MS profiling and various bioactive compounds were identified. It may be noted that various bioactive compounds having nutraceutical and pharmaceutical potential from *Chondracanthus* sp. is reported for the first time. Therefore, further studies are required to standardise the bioactivity of the same.

**Key words:** Macroalgae, *Chondracanthus* sp., Nutraceutical, GC-MS

BT-23

## BIOCHEMICAL CHARACTERIZATION OF THE BIOMASS OF MICROALGA SCENEDESMUS QUADRICAUDA (TURPIN) BREÏBISSON

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Water bodies with algal blooms present an opportunity to identify algae species with rapid growth. Biochemical characterization of such rapidly growing algal biomass determines its potential as a bioresource of biofuels, nutraceuticals, or pharmaceuticals. Therefore, the primary objective was to determine the biochemical potential of the alga *Scenedesmus quadricauda* isolated from a bloomed water body. Standard methods were opted for determining the protein, carbohydrate, pigment, lipid, and antibacterial activity. The biochemical characterization of the microalga showed the presence of valuable proteins (32.00%), pigments (12.41 mg/g of chl a, 7.46 mg/g of chl b and 0.55 mg/g of total carotenoids), carbohydrate (6.025%) and lipids (14.91%) in its biomass. Moreover, the lipid profiling revealed the presence of saturated fatty acid in good proportion, which discloses the biofuel potential of the same. Similarly, the antibacterial activity of the algal extract against gram positive and gram-negative bacterial strains showed the significance of the algal biomass as a bioresource of pharmaceutically valuable compounds. Overall, the study revealed that the alga can be utilized as a good bioresources of high nutraceutical, pharmaceutical and biofuel value. However, further standardizations are required for industrial utilization of the same.

**Keywords:** *Scenedesmus quadricauda*, Algal-Protein, Algal-lipid, Nutraceuticals, biofuel, GC-MS



## BIOPROSPECTING OF *ULVA* SP. AND *SARGASSUM* SP. AS A POTENTIAL BIOSOURCE OF BIOACTIVE COMPOUNDS

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Macroalgal biomass is a natural bioresource consisting of an array of biochemicals. The habitat of macroalgal species results in the production of wide range of bioactive compounds. Bioprospecting of such macroalgal species is critical for exploring the industrial potential of the same as a bioresource for nutraceutical and pharmaceutical compounds. In this regard, the present research investigated the biochemical potential of *Sargassum* sp. and *Ulva* sp. collected from Thirumullavaram beach, Kollam, Kerala. The protein content, carbohydrate and phytochemical analysis were performed as per standard procedures. Phytochemical analysis revealed the presence of various secondary metabolites such as alkaloids, flavanoids, phenol, tannin, saponin, terpenoid and steroid in macroalgal extracts. GC-MS analysis of ethyl acetate-ethanol extract of macroalgae showed the presence of various compounds having nutraceutical and pharmaceutical value. Further studies are required to understand the cytotoxic activity of the macroalgal species.

**Key words:** Macroalgae, algal- carbohydrate, GC-MS, cytotoxicity

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## AIR QUALITY OF KOTTAYAM CITY: A MOSS BASED BIOMONITORING APPROACH

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Bryophytes are often used as the best agents for the biomonitoring of air pollution in urban agglomerations, due to their high metal accumulation capacity and structural simplicity. The present study intended to exploit the use of the epiphytic and epilithic moss community of Kottayam city as indicating agents to evaluate air quality both in the field and laboratory studies. The road from Ponthanpuzha forest to Kottayam city via Pampady, a route of 44 kms, exposed to great variation in traffic congestion and air quality, was selected for the study. The study area was divided into 3 stretches, i.e., S-I, S-II and S-III on the basis of the data available on the vehicle density of the city. Moss specimens found within 8-meter range from the selected road were collected. A total of 22 species classified among 18 genera and 15 families in 8 orders were reported from the study area. The maximum species richness (21) was recorded for S-I and minimum value (3) was noted for S-III, stretch with high traffic congestion in the study site. The finding attests to the significance of moss diversity and distribution as a *passive biomonitoring agent* for air quality. The Ecological Index (Q) was also calculated. Three acrocarpus mosses, registered with lowest Q value of 7.3 were recorded as the species with highest stress tolerance (Air). Of which, *B. coronatum* and *H. involuta*, were selected for the further analysis of atmospheric deposition of four heavy metals,  $Cd^{2+}$ ,  $Cu^{2+}$ ,  $Pb^{2+}$  and  $Zn^{2+}$  as a second level biomonitoring approach. The study also throws light on the accumulation of elements in these two species and the pattern of atmospheric heavy metal emission in different stretches of the study site.

**Keywords:** Bryophyte, Biomonitoring, Pollution indicator, Air quality, Heavy metals



# BOOK OF ABSTRACTS

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## A STUDY ON MEDICINAL PLANTS USED AS REMEDIES FOR GYNAECOLOGICAL DISORDERS BY MANNAN TRIBALS: AN ETHNOBOTANICAL APPROACH

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The wealth of traditional tribal knowledge of medicinal plants has always been a source of inspiration to search and find novel plant-based compounds that can potentially be used as remedies for various ailments. This study focuses on the effectiveness of traditional medicine used by Mannan tribals in treating gynecological disorders. Five of the most commonly used plants by the Mannan community - *Mangifera indica*, *Asparagus racemosus*, *Justicia adhatoda*, *Sida acuta* and *Centella asiatica* were chosen for phytochemical screening and antimicrobial studies. All the candidate plants showed the presence of compounds like alkaloids, phenols, tannins, etc. that throws light to their potential to be used as remedies for various gynaecological ailments. Apart from this, the antimicrobial study proved that these plants contain antimicrobial agents that can actively inhibit the growth of microbes that cause infections. In the light of the findings of the study, it is concluded that the traditional medicine of Mannan tribe is a source of remedies for many ailments, especially gynaecological disorders and can be further studied to isolate active compounds with the potential to be used as medications.

**Key words:** Ethnobotany, Mannan tribe, gynaecological disorders, antimicrobial, phytochemical analysis