POLICYMAKING AND IMPLEMENTATION FOR SUSTAINABAILITY: A CASE STUDY OF KOCHI

Reg. No:	Name of the student
AB21SOC004 :	Annie Thomas
AB21SOC008 :	Honey K Prahalad
AB21SOC009 :	Indulakshmi EA
AB21SOC014 :	Akansha Menon
AB21SOC023 :	Nandhana PS
AB21SOC028 :	Rajasree L
AB21SOC041 :	Chris Maria Anil
AB21SOC050 :	Lakshmi K
AB21SOC052 :	Manjima P

DEPARTMENT OF SOCIOLOGY AND CENTRE FOR RESEARCH

ST. TERESA'S COLLEGE (AUTONOMOUS), ERNAKULAM

MARCH 2024

POLICYMAKING AND IMPLEMENTATION FOR SUSTAINABILITY: A CASE STUDY OF KOCHI

Thesis submitted to St. Teresa's College (Autonomous), Ernakulam in fulfillment of the requirements for the award of the degree of **Bachelor of Arts in Sociology**

Reg. No: Name of the student

AB21SOC004 : Annie Thomas

AB21SOC008 : Honey K Prahalad

AB21SOC009 : Indulakshmi EA

AB21SOC014 : Akansha Menon

AB21SOC023 : Nandhana PS

AB21SOC028 : Rajasree L

AB21SOC041 : Chris Maria Anil

AB21SOC050 : Lakshmi K

AB21SOC052 : Manjima P

Under the Supervision of

DR. LINDA THERESE LUIZ

Assistant Professor

Department of Sociology

St. Teresa's College, Ernakulam

DR Linda Therese Luiz
Staff Supervisor

DEPT. OF SOCIOLOGY ERNAKULAM ST. TERESA'S COLLEGE

Dr. Lebia Gladis N.P. CSST
Head of the Department

MARCH 2024

CERTIFICATE

We certify that the thesis entitled **"Policymaking And Implementation For Sustainability: A Case Study Of Kochi"** is a record of bonafide research work carried out by **Annie Thomas, Honey K Prahalad, Indulakshmi EA, Akansha Menon, Nandhana PS, Rajasree L, Chris Maria Anil, Lakshmi K, Manjima P**, under my guidance and supervision. The thesis is worth submitting in fulfillment of the requirements for the award of the degree of Bachelor of Arts in Sociology.

DR. Linda Therese Luiz

Assistant Professor

Department of Sociology

St. Teresa's College, Ernakulam

Ernakulam

March 2024

DECLARATION

We **Annie Thomas, Honey K Prahalad, Indulakshmi EA, Akansha Menon, Nandhana PS, Rajasree L, Chris Maria Anil, Lakshmi K, Manjima P,** hereby declare that the thesis entitled **"Policymaking And Implementation For Sustainability: A Case Study Of Kochi"** is a bonafide record of independent research work carried out by us under the supervision and guidance of DR. Linda Therese Luiz. We further declare that this thesis has not been previously submitted for the award of any degree, diploma, associateship or other similar title.

Ernakulam

March 2024

Name and signature of the student

Annie Thomas

Honey K Prahalad

Indulakshmi EA

Akansha Menon

Nandhana PS

Rajasree L

Chris Maria Anil

Lakshmi K

Manjima P

ACKNOWLEDGEMENT

"Gratitude is the best attitude'. It is really a magnanimous gesture to acknowledge the services and thank everyone who has helped us in this study. First of all we thank God Almighty for showering his choicest blessings on me through various process of this thesis.We sincerely express our gratitude to the Principal Dr. Alphonsa Vijaya Joseph for her valuable support throughout the research.We acknowledge with deep gratitude the guidance of Dr.Lebia Gladis N P, Head of the Department of sociology, and all the staff members of the Department, for their help and encouragement all through this research.We are extremely grateful to Dr. Linda Therese Luiz our research guide whose constant guidance and overall direction which made the completion of this thesis possible. We also thank the librarians who have helped us in one way or other. We would also like to express our gratitude to the councillors, Ex- Mayors, EDRAAC, and C- HED, without whom the study could not be conducted successfully. In the task of preparation of this dissertation we had a great support from Smt. Hema Prahlad, we acknowledge our sincere thanks to her at this moment. We also take this opportunity to thank our parents and friends for their support and encouragement during the course of this study.

Annie Thomas

Honey K Prahalad

Indulakshmi E A

Akansha Menon

Nandhana P S

Rajasree L

Chris Maria Anil

Lakshmi K

Manjima P

CONTENTS

SL NO	TITLE	PAGE NO
1.	INTRODUCTION	3 -14
2.	REVIEW OF LITERATURE.	15 - 24
3.	METHODOLOGY	25 - 34
4.	DATA ANALYSIS	35 - 43
5.	FINDINGS AND CONCLUSION	44 - 50
6.	COMPARISON BETWEEN STOCKHOLM AND KOCHI	51 - 55
7.	REFERENCE	55 - 56
8.	APPENDIX.	57 - 59

CHAPTER I

INTRODUCTION

"*We do not inherit the earth from our ancestor: we borrow it from our children."*

-Native American Proverb.

In 1987, the United Nations Brundtland Commission defined sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs." According to John Ehrenfeld, sustainability is defined as "the possibility that human and other forms of life on earth will flourish forever." According to Francios-Henry Pinault "sustainable development is a fundamental break that's going to reshuffle the entire deck. There are companies today that are going to dominate in future simply because they understand that." According to Shrivastava (1995 a, p.955) describes sustainability as offering the potential for reducing the long term risks associated with resource depletion, fluctuations in energy costs, product liabilities, pollution and waste management. According to Amartya Sen , Nobel laureate in Economic Sciences defines "sustainable development is about enlarging people's choices. It is not only about rasing incomes but also about ensuring that people have the capability to lead lives they value." The national environmental policy act of 1969 defines sustainability "to create and maintain conditions under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic and other requirements of present and future generations."

According to John B Cobb Jr, "sustainability and the liberal arts" Conference, 1998, "historically, the term sustainable arose among those with environmental concerns, and most of the literature and assessment instruments reflects this emphasis. However, it is increasingly recognized that sustainability cannot be achieved without addressing social justice issues. There can be no sustainable communities and institutions without social justice. So too is humane consideration toward the whole community of life an essential part of true sustainability. An academic institution committed to sustainability should help students understand the roots of todays injustices and motivate them to see justice and humaneness in full integration with understanding the roots of environmental degradation and modeling environmentally sustainable practices".

According to the charter of UCLA sustainability committee sustainability is defined as the integration of environmental health , social equity and economic vitality in order to create

thriving , healthy , diverse and resilient communities for this generation and generations to come. The practice of sustainability recognizes how these issues are interconnected and requires a system approach and an acknowledgement of complexity.

SUSTAINABILITY- ETYMOLOGY

The term sustainability finds its root in the latin word “sustinere” which is a compound of “sus-,” a variant of “sub-” meaning “under”, and “tenere”, which translates to “keep”. This etymology reflects the essence of sustainability, as it implies the idea of supporting or upholding something overtime, ensuring its continuity and endurance.

HISTORY OF SUSTAINABILITY

The term ‘Sustainability’ was first found in the 1650s and was presented in the German word of “Nachhaltigkeit”. During that time research gave importance to preserving soils which could support the sustainability of wood supplies. It has been said that sustainability gained less importance during the Industrial Revolution because during this time people were in a capitalist mindset of mass production with more profit. Hence, people were unaware of the destruction that they caused to the environment at the same time.

After the Industrial Revolution living conditions of people increased which led to an increase in population because there were not enough resources to meet the needs of these people and this was warned by Thomas Malthus in 1798, he predicted that population growth would always surpass the food supply.

After that, the negative environmental impacts caused by humans during the 19th century like the 1952 air pollution incident in London that killed 12,000 people has increased the research into a wider angle. A book named Silent Spring published by Rachel Carson in 1962 reveals how the use of chemicals is harmful to wildlife and humanity, and this led to mass movements and protests, banning some poisonous chemicals.

The initial concept of sustainable development was introduced in 1972 which was adopted as a vision for interconnecting social, economic and environmental issues. In 1987 the world commission on environment and development held a meeting in which the concept of sustainability was put forward in the Brundtland report called “our common future”. This report

defined what is sustainable development and gave us a clear idea of the concept. This is what marks the beginning of a very important journey towards addressing various issues such as climate change, biodiversity and their protection and ultimately led to many organizations working for the same cause. While the ever present challenge of poverty reduction still haunts us the world goes through more difficulties such as energy and food crises, global recession and climate change which leads us to the concept of sustainability. No country or nation can achieve sustainability alone, it includes all the efforts of businesses, governments and civil society organizations to achieve this goal of sustainable development. There have been 4 mega environmental mega conferences named United Nations conference on human environment (1972) commonly known as Stockholm conference, UN conference on environment and development(UNCED) 1992 also called as Rio conference or Earth summit, UN general assembly special session on sustainable development in New York (Earth summit II) and World summit on Sustainable development in 2002 in Johannesburg.

SUSTAINABILITY IN GLOBAL LEVEL

Sustainability or sustainable development is broader concept which needs the efforts of all countries and people around the world working towards it. For us to achieve sustainability the entire globe should work as one therefore we have many organizations working to achieve sustainability at a global level.

ORGANISATION WORKING TO ACHIEVE SUSTAINABLE DEVELOPMENT:-

UNITED NATIONS:- The UN is an important organization working towards achieving sustainable development. It focuses on many aspects such as climate change , biodiversity loss and protection, energy crises, poverty, environmental degradation etc. It hosts conferences and meetings where many nations come up with several ideas and agreements to be enforced and followed by its affiliated members.

WORLD BANK:- The world Bank is an organization that extends financial help to various nations and organizations for its needs. It works to achieve sustainable development by providing the countries and organizations like UN with financial and technical assistance for projects focused on sustainability.

WORLD WILDLIFE FUND:- world wildlife fund is a Swiss based international non governmental organizations founded in 1961 for wilderness preservation and environment protection. Its funds are used for the preservation of biodiversity, environment, protection of wildlife, and sustainable use of resources. They also address climate change issues such as climate change, pollution, land degradation, deforestation etc.

GREENPEACE:- Greenpeace is an independent global campaign network founded in Canada in 1971 by a group on environmental activists. It states its goal as to “ensure the ability of the earth to nurture life in all its diversity”. It’s campaigns focuses on global issues such as climate change, overfishing, deforestation and anti nuclear issues etc. It does not accept any kind of funds from the governments or political parties and rely on the funding provided by individual supporters and founding organizations.

CONSERVATION INTERNATIONAL:- Conservation International is a non-profit organization founded in Virginia, USA in 1987 with the aim of protecting nature and benefit the lives of people. The foundation of CI is “science, partnership and field demonstration.” The organization consists of scientists, policy makers and various environment conservationists in nearly 30 countries.

THE INTERNATIONAL UNION FOR CONSERVATION OF NATURE:-

The International Union for Conservation of Nature is an international organization founded in 1985 working for the protection of natural resources and sustainable use of resources with an aim to protect life on the planet. It is involved in research, data collection and its analysis, research projects, advocacy and education. IUCN's mission is to "influence, encourage and assist societies throughout the world to conserve nature and to ensure that any use of natural resources is equitable and ecologically sustainable".

EARTH JUSTICE:- Earth Justice is a non- profit organization based on Unites States founded in 1971 dedicated to litigating environmental issues. The legal service that they provide is entirely free for their clients. It focuses on preservation of the ecosystem from climate change and fossil fuels exploitation. It also works towards providing incentives for using renewable resources and provides protection against pollution and toxic chemicals.

GLOBAL GREEN GROWTH INSTITUTE:- The Global Green Growth Institute is an intergovernmental organization established in Seoul, South Korea. Founded in 2010, it is dedicated to promote green growth, which integrates economic growth with environmental sustainability. It provides technical support, opportunities for research and collaboration with many stakeholders for promoting green growth. It also affiliates with United Nation member states to promote its initiatives.

SUSTAINABILITY IN INDIA

The main system of United Nations created 26 organizations to serve India. The whole team of United Nations aimed to give guidance and support for India. The United Nations aimed to work for the development of India. It gives a strategic support which aims to end poverty and inequality, to promote sustainable development and to attain SDG goals. Similar to other countries, the framework of sustainable development in India works same as the UNSDF(United nation sustainable development framework).The strategies of UNSDF is followed by the other countries to attain the sustainable goals of United nations is also made practical in India for its development. The UNSDF is a partnership framework between the government of India and the United Nations. The NITI Aayog provides an overall coordination for the development of this framework.

The India is successful for determining the sustainable development goals. In the UN sustainable development summit conducted in 2015, The Prime minister Narendra Modi noted "sustainable development of one- sixth of humanity will be of great consequence to the world and our beautiful planet. It will be a world of fewer challenges and greater hope and more confident of its success". The NITI Aayog as well as other think tanks helps to co-ordinate the sustainable development goals. The state governments also helped to bring out sustainable development goals for the progress of India. So the United Nations sustainable goal is helped and supported by the NITI Aayog, Union Ministry and the state government. The main focus of them in sustainable development goal is to ensure no poverty , zero hunger, good health and well being , quality education, gender equality, clean water and sanitation, affordable and clean energy, decent work and economic growth, industry innovation and infrastructure, to reduce inequalities, to create sustainable cities and communities , responsible consumption and production, climate action ,life on land, peace justice and strong institution, life below water and partnership for the

world. There are 17 goals that is mentioned in India's sustainable development goals. Sustainability is practiced in India with these 17 sustainable development goals and 169 targets which is provided by the United Nations under the 2030 agenda. ‘Leave no one behind’ is the main motto of this agenda which means 'principles of universality'. This means that development needs to be implemented in all dimensions. It also ensures the participation of all people including the marginalized groups.

ORGANIZATIONS WORKING FOR SUSTAINABILITY IN INDIA

CSTEP - Centre for Study of Science Technology and Policy.

The main subject areas they focus are climate change and energy, sustainability and environment .It is one of the think tanks that make policies and innovative ideas using science and technology for sustainable, secure and inclusive society.

CENTRE FOR ENVIRONMENT DEVELOPMENT (CED)

CED is government organization that mainly focus on the fields of environmental and development and it also solid waste and waste water management.

CEE- CENTRE FOR ENVIRONMENT EDUCATION

It is an NGO which established in 1984 by the ministry of environment and forest , government of India. It mainly focuses on how the role of education can play in sustainable development

CSER- CENTRE FOR SOCIAL AND ENVIRONMENTAL RESEARCH

It was organized in the year 2008 and it mainly contributes for better sustainable and environmental buildings.

CSIR - NEERI

It’s a government organization that mainly focus on the risk assessment, environmental health and water , solid and hazardous waste management.

DA-DEVELOPMENT ALTERNATIVES

It is an NGO that mainly focus on sustainable livelihoods, protection of natural ecosystems , waste management and poverty eradication.

KOCHI : A DETAILED OVERVIEW

At the December 2000 U.S. Agency for International Development (USAID) sponsored national conference in Hyderabad on climate change and urban development, participants agreed that a prototype evaluation of the effects of climate change on an Indian city would be very helpful. Because of its reputation as a city that frequently leads the way in introducing novel issues and solutions, Cochin was asked to be a partner in this prototype city. It is also thought to be a well-managed city and is engaged in several large infrastructure improvement projects where investments may be adversely impacted by climate change.

If someone choose an Indian city that is not expected to suffer greatly from climate change, that city might be Kochi.

Environmental Setting:

A major international harbor, rivers, canals, and other bodies of water connect the low-lying islands, peninsulas, and other parts of the mainland that make up the lovely coastal city of Cochin in the Indian state of Kerala. The city is elevated on average by 1.5 meters. More "backwaters" can be found in the interior; they are frequently more pristine and appealing to tourists but are also being affected by urban development. The Western Ghat mountain range, which forms Kerala's boundary, rises higher in the interior. Along with the export of fibers and other valuable items from coconuts, Cochin's rise as a port was primarily fueled by exports of spices, nuts, and other things like rubber from hill plantations.

With two monsoon seasons per year, none as strong as the main summer monsoon on India's east coast and neither historically linked to catastrophic floods or other storm damage, the region is warm and humid. The months of June through August see the Southwest Monsoon, which brings the most rain to the region, and September through December sees the Northeast Monsoon. Approximately two thirds of the 3000 mm of yearly precipitation are produced by the Southwest Monsoon.

One of six rivers that empties into the backwaters of Cochin is the Periyar River, which opens up to the Arabian Sea at the northernmost point of the Cochin shoreline. In the middle of the urban area is the Cochin 7 entrance canal.

At the December 2000 U.S. Agency for International Development (USAID) sponsored national conference in Hyderabad on climate change and urban development, participants agreed that a prototype evaluation of the effects of climate change on an Indian city would be very helpful. Because of its reputation as a city that frequently leads the way in introducing novel issues and solutions, Cochin was asked to be a partner in this prototype city. It is also thought to be a well-managed city and is engaged in several large infrastructure improvement projects where investments may be adversely impacted by climate change.

If someone choose an Indian city that is not expected to suffer greatly from climate change, that city might be Kochi.

Environmental Setting:

A major international harbor, rivers, canals, and other bodies of water connect the low-lying islands, peninsulas, and other parts of the mainland that make up the lovely coastal city of Cochin in the Indian state of Kerala. The city is elevated on average by 1.5 meters. More "backwaters" can be found in the interior; they are frequently more pristine and appealing to tourists but are also being affected by urban development. The Western Ghat mountain range, which forms Kerala's boundary, rises higher in the interior. Along with the export of fibers and other valuable items from coconuts, Cochin's rise as a port was primarily fueled by exports of spices, nuts, and other things like rubber from hill plantations.

With two monsoon seasons per year, none as strong as the main summer monsoon on India's east coast and neither historically linked to catastrophic floods or other storm damage, the region is warm and humid. The months of June through August see the Southwest Monsoon, which brings the most rain to the region, and September through December sees the Northeast Monsoon. Approximately two thirds of the 3000 mm of yearly precipitation are produced by the Southwest Monsoon.

One of six rivers that empties into the backwaters of Cochin is the Periyar River, which opens up to the Arabian Sea at the northernmost point of the Cochin shoreline. In the middle of the urban area is the Cochin 7 entrance canal.

Midway in the metropolitan area lies the entrance channel to Cochin, which is dredged continuously.

About 10 million cubic meters of sediment are dredged annually from Cochin port area and dumped offshore or deposited as landfill for shoreline developments. The tidal flux in Cochin's coastal waters is about one meter, with tidal flows complicated by a complex topography.

POPULATION

According to the census of 2001 (provisional), the total population of Cochin corporation is 5,96,473, which represents a very small rate of growth over the preceding ten years. The population of the metropolitan area (the area included within the Greater Cochin Development Authority: GCDA), was 1,652,871 in 1991 . Official 2001 figures are not yet available, but they are estimated to be about 2 million, a faster rate of population growth than for the central city (and faster than the state's relatively slow-growth ten-year average growth of 12%). Within the GCDA area, an additional 300–400,000 "floating" individuals commute daily into Cochin from outlying areas for employment.

ORGANIZATION AND GOVERNANCE

The Corporation of Cochin, which is divided into 66 divisions, is in charge of democratically governing the city of Cochin. A governing body composed of the divisions' elected council members is led by the mayor, who is chosen by this body. The Corporation has five zonal offices at Edappally, Fort Cochin, Mattanchery, Palluruthy, and Vytilla. It also has standing committees for finance, development, welfare, health and education, public works, tourism planning and heritage, and taxation. In addition to waste management, drainage and canal systems, sewage

treatment, health, birth and death registration, and part of education, the Corporation is in charge of local government operations.

The Greater Cochin Development Authority (GCDA) is responsible for coordinating development within the broader metropolitan area. The city of Cochin, ten municipalities, fifteen blocks, and six other local governmental entities are all included in this broader area. The Goshree Islands Development Authority, which is in charge of development planning for 27 islands northwest of the city of Cochin, including the development of a major capital improvement project that calls for the construction of three bridges and a world-class container shipping terminal, the Indian Navy's South India headquarters, and other institutions and authorities are also located within the metropolitan area. The Cochin Port Trust manages the region's commercial waterways and port facilities.

Land Use in Kochi: The Cochin Corporation's land area is estimated by the GCDA to be 78% residential, with the remaining 9% going toward transportation and communication, 3% going toward commercial establishments, 3% going toward industry, 6% going toward public and semi-public institutions, and 1% going toward open space. When the mixing of residential and business land uses is taken into account, most observers would estimate that the commercial land usage is higher than this.

SUSTAINABILITY IN KOCHI

Kochi is a densely populated city in India’s south-western state of Kerala, has made commendable progress in sustainability in recent years. Kochi is transforming into a model for sustainable urban development. The city’s commitment to sustainable transportation is evident in initiatives such as the Kochi Metro, an efficient and eco-friendly public transportation system. This not only reduces traffic congestion but also minimizes carbon emissions, contributing to a cleaner urban environment. To facilitate more sustainable transportation, electric rickshaws and bicycles are promoted as eco-conscious modes of transportation. Kochi’s emphasis on green spaces and ecological preservation further shows it’s commitment towards sustainability. The city has numerous parks, waterfronts and ecosystems that not only enhance the quality of life of but also form an important bubble for the urban ecosystem. In the waste management area,

Kochi has implemented innovative practices including energy waste management and recycling. These efforts are in line with the principles of the circular economy, which aims to reduce waste and encourage resource efficiency. Additionally, the city has identified environmentally friendly practices in its hospitality industry. Solar-powered lighting, water heating systems, and other energy-efficient technologies are increasingly becoming most features in the hospitality sector, showcasing Kochi's dedication to reducing its carbon footprint. Many hotels and businesses are adopting sustainable practices, incorporating energy efficient technology and promoting responsible tourism. These initiatives focus on reducing single-use plastics and promoting proper waste disposal. Some establishments have also incorporated eco-friendly architecture and landscaping, having modern comforts with environmentally conscious designs. This not only attracts eco-friendly tourists but also sets a model for sustainable business practices. Kochi's commitment to renewable energy is reflected in the increased use of solar panels. Kochi airport CIAL is the world's first airport fully run by solar energy with the commissioning of the plant. The plant comprises 46,150 solar panels laid across 18 ha (45 acres) near the international cargo complex, and was installed by the German-based Bosch. Solar panel rooftops, contribute significantly to the city's energy needs and reducing it's dependence on traditional energy sources.

In conclusion, Kochi's journey towards sustainability is a dynamic approach incorporating urban planning, transportation, waste management, and renewable energy adoption. As the city continues to progress, its loyalty & determination to these sustainable practices make Kochi a promising example for other urban cities seeking a harmonious balance between urban development and sustainability.

Kochi Municipal Corporation is the civic body governing the city of Kochi in Kerala. It was established in 1967 and plays a vital role in local administration and urban development of the city. The corporation is responsible for providing essential services like water supply, waste management, and public health. It is headed by a mayor and consists of elected councilors representing different wards. Kochi Municipal Corporation also looks after the infrastructure and community welfare of the city.

CHAPTER II

REVIEW OF LITERATURE

According to “The new Kerala Model:Lessons for Sustainable Development “ authored by Rene Veron,University of Cambridge and Keele University,United Kingdom,The new “Kerala model of development” which focuses explicitly on reconciliation of social, productive and environmental objectives at the local level, and tries to develop synergies between civil society, local governmental bodies and the state government has won wide international attention for its achievements in regard to social development and, to a certain extent, environmental sustainability.The new kerala model of development is portrayed as something that holds important lessons for participatory , community-based Sustainable Development around the world. Kerala's remarkable development over the past four decades has been largely due to public action, state interventions, and popular movements, despite low per capita income and stagnant economic growth rates. Kerala’s environmental sustainability is a key characteristic, but studies often overemphasize its low resource consumption, low population growth, and moderate industrial pollution. The state government, NGOs, and popular movements' recent policies are more important than environmental sustainability.

In a report titled “Possible Vulnerabilities of Cochin, India, to Climate Change Impacts and Response Strategies to Increase Resilience” prepared by Oak Ridge National Laboratory along with Cochin University of Science of Technology (dated June 2003) elaborates the waste management issue of Kochi Municipal Corporation. According to this report, Cochin, a city in India, faces severe challenges in waste management due to a lack of proper disposal infrastructure. The Corporation generates 350-400 million tonnes of solid waste daily, with households and small shops contributing 67%, markets 10%, hospitals 10%, and hotels and restaurants 13%. The waste is collected by container lorries and tillers and deposited on municipal land. On average, 50-60% of the waste is removed by the Corporation. Uncollected wastes cause unsightly and unhygienic streets, canals, and grounds, attracting flies and rodents, promoting disease spread, and discouraging tourist interest. Climate change, increased rainfall variability, and rising water levels are expected to further exacerbate these issues. Currently, sanitary waste disposal is limited to about 20% of the Corporation.

According to Kerala Sustainable Urban Development Project Report (2005) prepared by Asian Development Bank and Kerala State Government, Kochi faces several issues affecting urban development, including informal development in fringe areas, lack of affordable housing, poor management of water bodies and tanks, lack of coordination in planning, land reclamation and

construction, and transportation issues. Areas like Kalamassery, Thrikkakara, Eloor, Tripoonithura, and Maradu are under pressure due to urban growth, lack of infrastructure and development control. The urban poor struggle to find affordable housing due to high land costs, leads to slum growth. Groundwater exploitation should be effectively monitored and controlled for future use. Lack of coordination in planning and land reclamation and construction also hinders the city's economic growth. The city's transportation system is hampered by poor alignment, uncontrolled ribbon development, and bottlenecks created by narrow bridges and railway crossings.

In a study done by Vigya Sharma named “planning for holistic sustainability: a study of the process in Kerala (India) and Sweden” (September 2008). This study has brought together the findings to evaluate the process in both Kerala and Sweden to achieve sustainability. It have also examined the effectiveness of contemporary plans in achieving sustainability. They suggest that both regions have weak mechanisms of governance which have been a barrier in the effective implementation of the sustainability policy. The thesis also speaks about the absence of a comprehensive evaluation process which not only impedes the efficiency of current and future plans but also the accountability and transparency in the various stages of planning process. By studying both the regions the thesis have argued that the process of operationalizing sustainability does not only involve understanding what sustainability is but also the concept that how it may be achieved in diverse socio-economical, political, cultural and environmental settings. The thesis have come to the conclusion that operationalizing sustainability requires both active peoples participation and a socio-economic empowerment where people may demand and support innovative public policies.

In a study conducted by Sajjan Choudhary titled “a research on sustainable development in India” (July 2019). He concludes that here is a huge gap between the literature on sustainable development in India and the practices of sustainable development in India. He quoted that “Out of 17 SDGs, the SDGs of gender equality, reduction in inequality, peace and justice, partnerships to achieve goals, decent work and economic system, industry, innovation and infrastructure, sustainable cities and communities, responsible consumption and production are the least researched areas.”He found out through his studies that these areas have the potential to be tackled upon and to do further research but these areas have still not been tapped and there is scope for researchers to conduct more research and suggest solutions to the problems identified.

In this way we can close the gap between the theory and the practices for sustainable development in India.

In a study conducted by Noushad K and Vasil Vafeeque (July 2015) about the sustainable development in kerala and its environmental challenges they talk about the development induced displacements, the rights of such displaced communities and the impact on them. They assess how Kerala's development plans and policies are leading to the displacement of communities and how there is a need for more inclusive plans and development that benefits all. The study concluded that in Kerala development projects will continue in the years to come but it is the responsibility of the government to see that affected people are benefited directly and sustainably from the project instead of just forcing them of their land.

Srikumar Chattopadhyay (2022) studied " Kerala's Journey Towards Sustainability: The Challenges Ahead". In particular, Kerala's resilience in the face of climate change emergencies is crucial to attaining sustainability. The performance of Kerala in relation to the Sustainable Development Goals, its Human Development Initiatives, and the Spatial Gap in Social Development are all examined in this article. Along with discussing environmental change in Kerala, it also suggests a social-ecological paradigm for sustainability and resilience building. A new planning procedure emphasizingdecentralization and local culture, history, resources, and people has been implemented by the PPC experiment in Kerala. By encouraging confidence in participation in plan formulation and technical inputs, the PPC has engaged thousands of activists and volunteers. In order to assess and enhance development programs, the Volunteer Technical Corps (VTC) was established, bringing together social capital and technical specialists. In addition, the experiment has produced long-term advantages by establishing a democratic forum for socio-technical discussions and ground-level development decisions. Kerala has a long history of advancing health and education, and it has built social resilience via investments in human development. Reforms to the land have facilitated access to resources and assisted in removing cultural obstacles. By implementing Panchayat Raj Acts and administrative changes, the state is dedicated to decentralization. Early investments in the development of human capital have aided in economic expansion. Due to its importation of the majority of its commodities from other states, Kerala has developed into a consumer state that promotes privatization and consumerism. Nonetheless, obstacles consist of differences within states, deteriorating

environmental conditions, limited financial resources, and the state's departure from social service industries. These problems have also been made worse by globalization. Kerala can use affirmative action for human development as a starting point and expand on it by using a social-ecological system approach to spatial planning

Kannan Ramaraj(2015) in the article titled " Impacts of Sustainable Cultural Tourism in Fortkochi Kerala". The main objective of the study is to highlight and assess the impacts of Sustainable cultural tourism in Fortkochi. The article has a very narrow scope only one kerala tourist destination has been the subject of the investigator's study. The paper was written with narrative description and real data arranged logically. To guarantee the validity of data, triangulation is used. A group of forty individuals was gathered, comprising tourists, locals, tour guides, and government representatives. The viewpoints on Sustainable Cultural Tourism were measured using a scale known as the "Cultural Tourism Attraction Scale," which was standardised by the researcher. The Cultural Tourism Attractions Scale has a Cronbach's Alpha Coefficient of 0.884, indicating its dependability. Providing the data that shows Fort Kochi's impact from sustainable cultural tourism attractions is very high and continuously stable.

Athira Ravi (2017) conducted a study on Ecological footprint analysis for a sustainable solid waste management in Kochi city Kerala. The research aims to study and explore the tool Ecological footprint analysis and to suggest a solution to the solid waste management issues in the residential areas of Kochi city through Ecological footprint analysis. Over the course of three consecutive years, 2007–2009, Kochi City's ecological footprint was estimated and examined. Sustainability difficulties were discovered, and steps were taken to lessen the city's ecological footprint. The research focuses on a complete analysis of the solid waste management industry in Kochi City, and the major SWM concerns. Since residential areas produce the majority of the city's solid wastes, the idea of waste footprint, a subset of ecological footprint, is used to evaluate the effects of waste generation there. To analyse and calculate the city's waste footprint, participatory research was done over the course of four consecutive years (2010-2013). The residential regions of the Kochi Corporation and the surrounding areas were used to choose representative random samples of families in order to analyse the waste footprint of the city.

Manoj P K and Vidya Viswanath (2015) conducted a study on Ecotourism and sustainable development in kerala : some empirical evidence. This paper aims to provide a brief overview of the state of global tourism today and its broad trends and patterns, with particular attention to the increasingly important concept of ecotourism; To conduct an overall study of Indian tourism and its issues and future prospects and have a thorough analysis of Kerala tourism, highlighting its key characteristics, advantages, and disadvantages; and, finally, recommend environmentally friendly strategies for the state's sustainable tourism development. The study takes into account a number of pertinent international and Indian experiences, the environmental problems associated with tourism that are becoming more and more pressing, and most importantly, the unique socioeconomic, geographic, and other characteristics unique to Kerala tourism. Recently, the development of tourism in India and Kerala has also increased. Although tourism has great potential to contribute to the rapid economic development of India, especially in a resourceful state like Kerala, it can be recognised that the sustainability aspect of tourism is often not sufficiently taken into account when planning government tourism policies. translation causes an excessive load on nature beyond its carrying capacity, which negatively affects its ecological balance. In addition, there are often cases where the interests of tourists are protected solely for the purpose of maximising tourism income, regardless of the consequences for the local population. All this indicates that there is a growing need to embrace ecotourism in its true letter and spirit, not just in the sense of following rules or standards. This in turn requires the joint action of all parties to develop sustainable tourism. Given the government's resource constraints in developing countries such as India, the involvement of the private sector seems inevitable, underscoring the need for a public-private partnership approach to holistic, integrated and sustainable tourism development. In particular, the full potential of tourism in India in general and Kerala in particular is still unexploited, although there have been favourable developments in recent years.

Paulose N. Kuriakose and Sowmia Philip in their article “City profile: Kochi, city region – Planning measures to make Kochi smart and creative”. Kochi is a flexible city. It has it’s own history, ethnicity, diversity etc. It is one of the 100 Indian cities selected to be converted into a smart city. The current estimate population of Kochi city is 853,000. We can see a drastic increase in the population and this demands the importance to ensure the quality of the city

infrastructure. Kochi is developed as a commercial hub of Kerala because of political and administration policies taken by the princely states on the Malabar Coast. The growing trade and administration policies attracted other countries to port to Muziris (it was the major ancient port city of Cheras). The characteristics or the qualities that create a smart city is different for different cities. It is based on many factors like the willingness of the people of that cities to accept the change or development, the resources available on that city etc. Smart city does not focus on a single aspect. Inorder to fulfill the needs of the people they aim on the total development of the entire city. As per the Draft Master Plan for KCR the total population of region will be 2.27 million by the year 2031.

M.K. Rafeeque, M. Rameshan, M.K. Sreeraj in their article "Measuring the vulnerability of coastal ecosystems in a densely populated west coast landscape, India: a remote sensing perspective". The study examines the species composition and geospatial distribution of coastal ecosystems in the southwest coast of India, including mangroves, mudflats, and backwaters. The Kerala coast, with its densely populated rural-urban agglomerated coastal plains, is a key area for conservation. The study identifies 10 exclusive mangrove species in the area, with mangrove coverage in Alappuzha district and 0.48 and 0.40 km2 respectively. The study suggests that sustainable management plans like the Coastal Regulation Zone Notification of India can help conserve mangroves and their associated ecosystems.

The study examined the taxonomic and trophic responses of marine nematodes to polybrominated diphenyl ether (BDE-47) in a Bizerte lagoon community. Four concentrations of BDE-47 were applied, and responses were determined 30 days after exposure. Species abundance and univariate indices were significantly affected in all treated microcosms. The control microcosm was dominated by microvores, while the highest concentration of BDE-47 led to resistant trophic groups.

Supriya Mathew , Stefan Truck, Ann Henderson-Sellers in their case study "Kochi, India case study of climate adaptation to floods: Ranking local government investment options". Climate adaptation is a local government and community responsibility, but lacks guidance for decision-making. This paper presents a framework for prioritizing local adaptation options, incorporating non-economic dimensions and community priorities. The framework uses local knowledge to address data gaps and uncertainty related to extreme events. Risk evaluation and reduction

should be contextualized based on resources, community requirements, planning periods, and expert knowledge. The IPCC warns of increased extreme events due to climate change, but current projections struggle with local decision-making due to limited skill at local scales, causing severe economic, environmental, and social damage. The framework for prioritizing adaptation options uses a block diagram, focusing on three main tasks: risk identification, risk evaluation, and risk reduction.

The Hindu newspaper report 2023: Kochi Corporation to get German support for the sustainable development projects. According to this news report its being said that The Federal Ministry For Economics cooperation &Development Germany has offered support for sustainable development projects in kochi corporation. A delegation from the Ministry held discussion with the civic authorities. Mullassery Canal rejuvenation &cycle with kochi are some of the projects which has been implemented in the city with the support of Ministry. According to mayor Anil Kumar KFW Development Bank of Germany has supported the corporation for canal renovation projects &water metro projects. Women's safety is also one of the priority area of the corporation and the civic body sought the support of Germany for projects in the sector. Sheeba lal ,chairperson of the welfare standing committee of the corporation & representatives of the centre for Heritage, Environment & Development of the corporation & civic officials participated in the discussion. The German delegation has toured the city in cycles, electric auto rickshaw, kochi metro and in water metro. They also visited St Teresa's college and had interacted with women entrepreneurs of Kudumbasree.

Report of Bhoomitrasena club St Teresa's college 2022-23. According to the report the club had some major projects for conserving our environment by associating with Kochi corporation, suchitwa Mission etc. One of the major project was You-kan HEAL Kochi which promote green protocol among students to promote eco friendly alternative & to reduce the use of single use plastics which enters to the environment & backwaters . Global waste Expo a expo on waste management and technology named GEX Kerala-23 was conducted in marine drive and 50 students from our college volunteered it . A summer internships was conducted for the students ,where the interns had conducted a door to door survey to find out how people used to manage their waste.

Kochi Eco-challenge which aims at the restoration of the local ecosystem through collective action of youth. Beach cleaning with DOECC under India G20 presidency was another project , Green protocol was another initiative introduced by BMC to ensures Green practices are followed by the daily events in the college ,recycle drives were conducted by BMC in college in association with some departments and an upcycling workshops were conducted for making paper bags in the college and more than that many field works were also conducted by BMC in areas like mangalavanam, puthuvype Beach etc .

The quest of environment sustainability in educational institutions(2018) put forward by Nand Kumar and Aswani Kumar -Assistant professor , Department of architecture MNIT JaipurSuni Sharma- PhD scholar department of architecture MNIT Jaipur. The unsustainable and inappropriate implementation of land use planning has been evolving decades ago. But lately various declaration were implemented regarding the environment sustainability and energy consumption. This work mainly focus one the sustainability in educational institutions and universities . Educational institutions is responsible to educate young about the sustainability, for this sustainable measures should be primarily taken in the institution itself.Several declaration were put forward for this, namely Halifax declaration,Stockhomedeclaration,Rio earth summit,Tbilisi Declaration, Kyoto declaration ,Swansea Declaration, Tallories declaration and so on .All these declaration stated about the green University and limited energy consumption. It was also practiced in India in Delhi University,IITs etc.

T A Ameerudheen published an article on December 1, 2021, titled "Kerala’s fight against climate change reaches global forum, 18 sustainable projects hog limelight." The article discusses Kerala's efforts in climate change mitigation, gaining attention at the recent climate change conference in Glasgow. Facilitated by the environmental organization Thanal, Kerala presented 18 sustainable projects in a document titled ‘Climate Action in Kerala - examples of good practices.’ Covering nine sectors, including energy, transportation, agriculture, and health, the document highlights Kerala's comprehensive approach to climate resilience. The state's bottom-up approach, led by sub-national governments, sets it apart globally. Projects like the floating solar power plant in Banasura Sagar dam and the carbon-neutral program in Meenangadi gram panchayat showcase Kerala's dedication to sustainable development. The document's

potential for replication in other regions has garnered international attention, solidifying Kerala's leadership role among Indian states in the battle against climate change.

Bejal on 22nd February 2024, published a study titled "What makes Kerala one of the most eco-friendly states." The article explores Kerala's eco-friendly initiatives and sustainable practices, positioning it as a leading destination for environmentally conscious tourism. The government's proactive stance is evident through the 'Responsible Tourism Mission' established in 2017, emphasizing economic, social, and environmental considerations. Notable initiatives include the International Coir Museum, showcasing innovative use of coconut shells, contributing to cultural preservation and community empowerment. Kerala's Cochin International Airport, as the world's first solar-powered airport, reflects the state's commitment to sustainable energy practices. Eco-friendly hotels and lodges in Kerala, often in pristine locations, prioritize community engagement, local employment, and conservation efforts.

Times of India on August 10, 2021, published an article titled "Housing Project For P&T Colony Gathers Pace."" The article discusses the progress and challenges of the LIFE Mission housing project in Mundamveli, initiated by the Greater Cochin Development Authority (GCDA) to rehabilitate P&T Colony residents. Despite delays due to COVID and rain, the project is at the final stage of piling works, with construction set to begin soon. To accommodate the setbacks, GCDA extended the deadline to November 18. The use of prefabricated construction aims to compensate for lost time, managed by the Thrissur District Labour Contract Cooperative Society. The housing project aims to build 86 apartments, benefitting 82 individuals, with funding from Life Mission, Pradhan Mantri Awaz Yojana (Urban) scheme, and potential CSR funds. Challenges include delayed technical sanction and initial fund shortages, emphasizing the initiative's importance in addressing living challenges for P&T Colony residents and fostering community well-being.

CHAPTER III

METHODOLOGY

Research simply means search for facts answered to questions and solutions to problems. It's a purposive investigation and organised inquiry. It seeks to find explanations to unexplained phenomenon to clarify the doubtful propositions and to correct the misconceived facts. So this study mainly focuses on policies and implementation for sustainability in kochi. The primary data has been collected from key officials like ex mayors , councillors, representatives of civil society, CPPR and head of C-Hed. The purpose of the study is to assess sustainability in Kochi municipal corporation in the light SDG#11

Title of the study

Policy making and implementation for sustainability : A case study of Kochi

Statement of the problem

In this paper we are focusing on SDG #11 including pollution and waste management, land use planning, disaster management, protection of natural and cultural heritage, sanitation and the role of NGOs which place a crucial role in bringing about Sustainable practices. The study focuses on the policies , projects, actions regarding Sustainability made by the kochi municipal corporation along with our suggestions for effective output. The need for sustainable development arises from the growing challenges posed by environmental degradation, resource depletion, climate change and social inequalities. By embracing sustainable practices, we can ensure the well-being of current and future generations to protect ecosystems, maintain economic stability and promote social equality.

Objectives of the study

<u>General objective:</u>

The overall aim of the study is to analyse the policies and implementation for sustainable practices in Kochi municipal corporation.

Specific objectives;

1. To measure the level of awareness regarding sustainable practices among elected members, officials and key decision-makers of Kochi Municipal Corporation.

2. To understand the key policies formed for sustainability in Kochi Municipal Corporation in the light of SDG #11

3. To assess the role of non governmental agencies and civil society organisations in aiding policymaking in the area of sustainability in Kochi

4. To assess the role of selected non governmental agencies and civil society organisations in the implementation of sustainable practices in Kochi Municipal Corporation

5. To compare the sustainable practices in Kochi with that of Stockholm in Sweden

6. To provide suggestions for policymaking and implementation to achieve SDG#11 in Kochi.

Identification of variables

Dependent variable- level of awareness regarding Sustainability and Sustainable policies

Independent variables- party affiliation, position held, age, Education, budget

Clarification of concepts

1.Sustainability :

Theoretical definition

According to Brundtland report " Sustainable development is the development that meets the needs of the present without sacrificing the ability of the future generations to meet their own needs" (UN 1987)

Operational definition

For the purpose of this study, sustainability will be defined in terms of SDG#11 including: land-use planning (11.3), protection of natural and cultural heritage (11.4), disaster management and disaster risk reduction (11.5 and 11.A), pollution and waste management (11.6), provision of green and public spaces, particularly for women, children, older persons and PWD (11.7).

2. Sustainable practices :

Theoretical definition

Sustainable practices refer to actions and behaviours that aim to meet the needs of the present without compromising the ability of future generations to meet their own needs.

Operational definition

Sustainable practices like segregation of waste, using of cloth bags and effective land use planning etc which is being promoted by Kochi municipal corporation.

3. Sustainable policies

Theoretical definition

Sustainable policies are governmental or organisational guidelines and regulations designed to promote and support sustainable practices.

Operational definition

The various policies, implementation and level of awareness regarding Sustainability in Kochi Municipal Corporation.

4. Master plan

Theoretical definition

A master plan is a comprehensive and strategic document that outlines long-term goals, objectives, and guidelines for the development and growth of a particular area, such as a city, region, or organisation.

Operational definition

A panoramic and complete document containing the long term and short term plans and goals for the development of Kochi city.

5. Waste management

Theoretical definition

Waste management refers to the systematic handling, treatment, and disposal of waste materials in a manner that minimises environmental pollution, conserves resources, and protects public health.

Operational definition

Waste management is the process of proper segregation, processing and management of waste in kochi.

6. Disaster management

Theoretical definition

Disaster management refers to the systematic process of planning, organising, coordinating, and implementing measures to prevent, mitigate, prepare for, respond to, and recover from disasters.

Operational definition

Disaster management involves the operations and handling of frequent disasters that hit cochin city.

7. Land use planning

Theoretical definition

Land use planning is a systematic process that involves the analysis, assessment, and regulation of the allocation, utilisation, and development of land resources within a specific area.

Operational definition

Land use planning involves the issuing and allotment of the available lands for various purposes and its judicious usage by the kochi municipal corporation.

8. Civil society

Theoretical definition

Civil society refers to the aggregate of non-governmental organisations (NGOs), community groups, advocacy organisations, voluntary associations, and citizen initiatives that operate independently of the government and the private sector.

Operational definition

Civil society organisations include the organisations such as EDRAAC, kudumbashree working in alliance with the corporation for effective implementation of its policies.

9. Cultural heritage

Theoretical definition

Cultural heritage refers to the tangible and intangible manifestations of human creativity, knowledge, beliefs, traditions, and practices that are inherited from past generations and are considered valuable and worthy of preservation.

Operational definition

Protection and promotion of sustainability of cultural heritage in kochi

10. Sustainable tourism

Theoretical definition

Sustainable tourism refers to tourism practices that minimise negative environmental, social, and cultural impacts while maximising benefits for local communities, economies, and the environment.

Operational definition

Sustainable tourism involves sustainable tourism practices and policies that increase tourism in kochi municipal corporation

11. Budget

Theoretical definition

A budget is a financial plan that outlines expected income and expenditures over a specific period, typically a fiscal year. It serves as a tool for allocating resources and managing financial activities effectively.

Operational definition

Budget is a document containing the revenues and expenditures of kochi municipal corporation in each financial year.

12. Hospitality

Theoretical definition

Hospitality refers to the provision of services and amenities to guests or visitors in a welcoming, friendly, and manner. It encompasses a wide range of industries and establishments, including hotels, restaurants, resorts, cruise lines, event venues, and tourism destinations.

Operational definition

Hospitality industry refers to hotels, restaurants, cafes, working within the areas of jurisdiction of KMC. We analyse how these industries deal with the produced waste.

Research Design

Descriptive research design is employed in this study

Universe

Universe of the study are councillors, mayors, various committee heads of kochi municipal corporation in the present and previous terms, representatives of civil society organisations.

Sample

Sample consists of 25 respondents which includes ex mayor's, councillors, chairpersons of developing committee of KMC and representatives of civil society such as EDRAAC, CPPR and head of C-Hed .

Tool for Data Colllection

Interview schedule has been used as tool for data collection

Primary observations have been used for comparison between Stockholm and kochi

Sampling technique

Simple random sampling is the sampling technique used in this study

Data Collection

Data collection was done from January 9 to February 15

The respondents were from KMC, CPPR, C-HED and other civil societies .The primary data is collected using interview schedule and the secondary data was collected by referring books, journals, research papers budget of KMC and also depended upon interest for further information.

Data Analysis

The primary data collected using the interview schedule was analysed through content analysis method

Limitations of the Study

1. The researcher found it difficult to get permission for data collection from authorities

2. as the number of sample population was not adequate it was difficult to draw generalisations from the collected facts

3. Lack of knowledge and awareness among the respondents

4. Since our respondents were key officials there was difficulty in finding respondents.

5. Many councillors were accessible but some were very evasive.

6. Answers to the questions were not direct

7. Receiving diplomatic answers from the respondents

Plan of the Study

The first chapter being an introductory one, we use a preface to the study. It gives a clear information about sustainability as a concept and about sustainability in kochi and general concept about sustainability.

The second chapter consists of review of literature, it includes some of previous studies related to the topic.

The third chapter includes the methodology adopted in the study .it deals with the objectives, concepts, variables, universe, the method of sampling, tools used for data collection and limitation of the study.

The fourth chapter consists of objective wise analysis and interpretation of data regarding the policy making and implementation of sustainability in KMC.

The fifth chapter consists of findings and conclusions from the data analysis and interpretation made. Suggestions and recommendations are also included for efficient policy making & better implementation of sustainability in KMC.

The sixth chapter consists the of the comparison study between Stockholm in Sweden and Kochi which is based on primary observations.

CHAPTER IV

DATA ANALYSIS

In this data analysis we aim to explore the level of awareness of key stakeholders, elected members and official decision makers and the process of policymaking and implementation for sustainability in Kochi Municipal Corporation. We also aim to analyse the role of civil society and non-governmental organisations for implementation of sustainable practices in Kochi Municipal Corporation. Through this data analysis we target to provide actionable recommendations, suggestions for policymaking and implementation to achieve SDG 11 in Kochi.

For any proper policymaking and implementation it is important to have a defined plan which is why our first objective was to find out if Kochi Municipal Corporation had any Master plan and if there is, whether this Master plan incorporates sustainability aspect into it. According to the official website of C-HED, Kochi Municipal Corporation assigned C-HED to organise entire process of preparation of master plan for Cochin city. The city's master plan was crafted with a foresight extending 20 years ahead to the year 2026. To get more insights we started by questioning the key stakeholders of Kochi Municipal Corporation. Some officials responded that there is a master plan for Kochi and it has included sustainability aspect in it and some had said it does not, but we also got few contradicting responses that a master plan does not exist in Kochi Municipal Corporation. This shows the lack of awareness among the key decision makers. To gain more knowledge about the making of the master plan we interviewed representatives of civil society organizations like EDRAAC and think tanks like CPPR (CENTRE FOR PUBLIC POLICY AND RESEARCH) for understanding their involvement. They had the view that their involvement while planning and making decisions is very less. They feel that their involvement should be more so that Kochi Municipal Corporation can benefit from their views ad suggestions while making plans and for their effective implementation. They also had the view that there is no adequate representation of such civil bodies and those people who should be involved in the process are being left out. They are of the view that people who are interested and want to Actively participate in the process are not being involved and they are being unheard.

After analysing about the master plan, we took different components of Kochi Municipal Corporation in accordance with SDG 11 and our objectives to understand about the level of sustainability in the operations of Kochi Municipal Corporation. First such component that we looked into was about land use planning. While analysing the data received we could find mixed responses. Some of the respondents said that there is land use planning but the aspect of sustainability is questionable. One of our respondents pointed out that Kochi is not a planned city. The concept of land use planning and sustainable development came to the forefront recently and in this situation because of the population density it is difficult to implement land use planning as the possibility of demolition or construction is very minimal in a metropolitan city. He quoted that "fortunately or unfortunately construction means commission."

One of the three basic needs that is required for basic survival is shelter. Housing is a very important component of SDG11 and to ensure the development of sustainable cities and communities we looked at 2 important policies i.e. LIFE mission implemented by the state government and Pradhan Mantri Aavas Yojana (PMAY) implemented by the central government.

Life mission (Livelihood Inclusion and Financial Empowerment) aims to provide safe and dignified houses to all the landless and homeless in Kerala within the next 5 years to enable them to earn their livelihood, to participate in social processes with dignity and to concentrate the benefit of all social welfare schemes including financial services. The beneficiaries of the scheme are the homeless with land, the homeless without land, those with incomplete or uninhabitable housing, and those with temporary housing in the outlying coastal or plantation areas. Pradhan Mantri Aavas Yojana-(PMAY) is a mission implemented by the ministry of housing and urban affairs to provide affordable housing to all eligible beneficiaries across urban and rural areas in India. The scheme aims to address the housing needs of economically weaker sections (EWS), low-income groups (LIG), and middle-income groups (MIG). Kochi Municipal Corporation has combined both of these programmes to provide land and shelter to the needy. Most of the respondents were positive about the implementation of these programmes. Though few feedbacks that we got were problems regarding lack of continuous funding of the houses, lack of cooperation from the people to move to a new place etc. As part of the housing

programmes we also enquired about the problem of Slums and their management which is a major problem in metropolitan cities.

As part of slum management, most of our respondents talked about Rajiv Awas Yojana (RAY) which was launched by the central government of India in 2009 to provide affordable housing facilities and rehabilitate slums from urban areas. One of our respondent's gave an example of Thuruthy colony which is a settlement of poor people living in close proximity to Fort Kochi & Mattancherry. 200 families from this colony has been rehabilitated with the support of RAY program with the help of GCDA (Greater Cochin Development Authority). Some other colonies like Santhom colony, Kammatipadam colony, P&T colony were also rehabilitated the same way. One of the key respondents also mentioned that Kochi Municipal Corporation has a vision to rehabilitate 398 families into 2 blocks by December 2024.

One of our objectives was to analyse the role of non-governmental organisations in the implementation of sustainable practices of Kochi Municipal Corporation. Most of the respondents were of the opinion that the potential of NGOs aren't being fully tapped. While some of the respondents said that NGOs are actively participating in the policy making process. As the potential of the NGOs are also untapped there is a suggestion among the respondents that retired expertise should also be tapped well in the policy making.

Our next focus was to understand the role of educational institutions in the implementation of sustainable practices. Kochi Municipal Corporation has the most number of campuses in Kerala. One of the key respondents said that youth is the easiest crowd to be moulded. This implies that the youth's potential is not being used to the fullest. It is the youth that is going to live in the city so when a city planning is done youth must be incorporated in the planning process. Kochi Municipal Corporation is trying to increase the participation of educational institutions through programs like a You-KAN heal Kochi. You-KAN heal Kochi stands for Youth of Kochi All for Nature. Kochi Municipal Corporation, GIZ, C-HED and St. Teresa's College together initiated a project in alignment with the LIFE project of Govt. of India, which aims at mobilizing youth for reduction of single use plastics and promotion of sustainable practices/eco-friendly alternatives. One of the key respondents said that You-KAN heal is a project that holds much potential but it

is in it's infancy stage & Kochi Municipal Corporation is attempting to incorporate more workings in the project so that it's effective implementation can be ensured.

For making any policies and their effective implementation the involvement of the residence is very important. In Kochi we have a residence association called EDRAAC (Ernakulam District Residence Association Apex Council). When we asked regarding the implementation of the sustainable policies, the president of the council had the response that involvement of EDRAAC in the policy making process is very less. He also said that the representation of EDRAAC is absent in the discussions and meetings of Council hall. EDRAAC is the part of Residence Welfare Association of India and this association mandates the management of the 3 major components – waste management, rain water management, solar energy which is not being given focus by Kochi Municipal Corporation. Majority of the decisions are taken by top officials & key holders such as collector, GCDA chairman, mayor, municipal chairman etc. He has given the view that there is no proper representation of public in the decision making process of Kochi Municipal Corporation and that there is time lag in the implementation of policies. He quoted that " vision as well as mission should be there" which is lacking in Kochi Municipal Corporation.

The Kudumbasree project of the Kerala Government aims at women empowerment and poverty eradication. The word Kudumbashree means 'Prosperity of the family'. Most of our respondents identify Kudumbashree as a useful medium for ensuring grassroot level participation. They also said that Kudumbasree plays vital role in data collection as a part of Life Mission, RAY Project etc. Their opinions are also considered in the policy making stage and Kudumbasree representatives attend the official meetings of Kochi Municipal Corporation. However they are also of the view that in the recent times Kudumbashree and its working has been limited to certain activities like lending loan conducting food fests, and making crafts.

CPPR (Centre for Public Policy and Research) is a think tank formed for the making of policies. CPPR has collaborated with KMC in few of its projects such as for implementing Street Vendor's Act 2014.Through our interactions with the representatives of CPPR, we came to

understand that they were included in the policy making process at later stage. This created several difficulties in the implementation stage. The key respondents is of the view that Kochi Municipal Corporation fails to make use of such think tanks and NGOs .Their potential to give effective solutions goes untapped.

Culture and heritage are important in sustainability as they connect people to their past, foster a sense of identity and belonging, and inspire conservation of natural resources, promoting long-term environmental and social resilience. C-Hed (Centre for Heritage, Environment and Development) is a think tank for Kochi Municipal Corporation. The job of C-Hed is to introduce good practices, new knowledge and innovation related to sustainable development in Kochi Municipal Corporation. The President of C-Hed identifies circular economy as vital for implementing sustainable practices. C- HED gives a lot of importance for nature based solutions in promoting sustainability. Mangalavanam is a biodiversity hotspot in the heart of the city. It is a restricted zone that comes under the control of forest department. This places limitations on C-hed for the implementation of polices in this area. However they indulge in formulating guidelines and specifications for its conservation. However in the case of FortKochi beach there are several agencies assigned for its conservation. From the collected data we could understand that there are several policies, collaborations from international entities as well as adequate funds flowing in. However the main road block is that our system should be more dynamic. Right now we are in a transitional phase moving from a conventional system which still exerts a lot of influence on us.

An estuary which is an integral part of any ecosystem is very much sensitive in nature. Therefore it is important to have policies that aim at estuary protection. But the sad reality is that most of our respondents especially councillors have very little awareness regarding this. However from the data received we could see that the KMC has taken steps for estuary protection. Kmc through C-HED has submitted a major proposal to the United Nations Environment Program stating detail guidelines for the conservative of Vembanad, which is the second biggest Ramsar site in India.

Sustainable tourism promotes responsible travel practices that minimize negative environmental, cultural, and social impacts while maximizing benefits to local communities and preserving natural resources for future generations. According to one of our respondent's sustainable

tourism is Kochi's biggest hope and scope as Kochi attracts a lot of people due to cultural & natural diversity. To promote sustainability in tourism that level of infrastructure should be developed. On of the respondent's pointed out about the recent incident where a group of Russians did a took it upon themselves to tackle the mounting garbage problem at Fort Kochi beach, exposing a contrast between Kerala tourism's depiction of pristine beauty and the grim reality on the ground.

Another major industry that we focused on is the hospitality sector & how they contribute to sustainability. The hospitality sector is one of the major contributors to waste production. Some of the respondents mentioned that there are many rules and regulations for waste control and management but they're are being violated. They were of the view that there should be strict orders & monitoring of these services for effective implementation of the policies. The implementation of laws related to waste management in such sectors is very low compared to other sectors. The hospitality sectors are also facing many difficulties in the implementation of policies due to basic level production of plastic. They pointed out that production of plastic should be stopped in order to minimise the usage of plastic.

As well all know, Kerala has recently been hit by disasters like multiple Floods, Covid-19 pandemic etc. Disaster management is of paramount importance for its role in saving lives, reducing suffering, and protecting property and infrastructure. Through effective preparedness, response, and recovery strategies, it ensures the continuity of essential services, prevents disruption of daily life, and builds resilience in communities to withstand future disasters. Additionally, disaster management efforts play a crucial role in minimizing economic impacts, supporting stability, and fostering international cooperation for global security. By focusing on these objectives, disaster management not only mitigates the immediate effects of disasters but also contributes to the well-being and safety of individuals, communities, and nations worldwide.

However while analysing the acquired data we could find that the efforts of Kochi Municipal Corporation in formulating policies for disaster management is very low. There are very limited policies that aims at preventing or minimising the impact of the future disasters. Similarly the policies that aim to build resilience towards disasters is also very less. Planning for disaster is

also absent. For instance Kerala Water Authority is doing very less for the proper water management which can prevent drought like situations. As one of our key respondents rightly said, if proper planning exists we will be able to foresee a drought that can happen in the future. This lack of planning put great risk over our lives as it becomes impossible to face a disaster for which we are not prepared for.

For flood control also the Kochi Municipal Corporation has policies like 'Operation Breakthrough' but the gaps in its implementation as well as it's ineffectiveness to prepare us for a future flood makes the efficacy of this policy questionable. Kochi faces flood related issues very frequently due to which clearing & cleaning of the drainage system becomes very important for flood control. When we analysed Kochi Municipal Corporations budget documents, we found out that most of the funds have been allotted for flood control. Most of the respondents had the view that cleaning the drainage system is done very efficiently. There are suction tools specifically purchased for clearing the drainage system. Workers should be trained to use such new mechanisms & and tools in an effective manner. Authorities should also put more sincere efforts in using the new mechanisms & tools as well in implementing the new policies.

Waste management involves the collection, transportation, processing, recycling, and disposal of waste materials in a way that is environmentally friendly, socially responsible, and economically viable. It encompasses various strategies such as reducing, reusing, and recycling waste to minimize its impact on the environment and human health. Efficient waste management practices are essential for sustainable development and preserving natural resources. Recently Kochi has gone through a big disaster also know as the Brahamapuram incident. In March 2023, the massive fire breakout at Brahmapuram landfill turned out to be a major point of concern among people. The Brahmapuram plant is polluting the two rivers, Kadambrayar and Chithrapuzha, as the rivers flow through this region. According to the Times of India, "the efforts to put out the fire at the solid waste treatment plant premises at Brahmapuram cost the government exchequer Rs 1.14 crore. The state disaster management wing has released the amount to pay various agencies which bore the cost during the fire outbreak." In the light of this incident certain new provisions have been brought with regard to waste management by KMC. These provisions are to segregate the solid & food waste. Haritha karma Sena workers will collect the plastic waste once a week & residents who can dispose food waste by their own are

advised to do so by themselves. Kochi Municipal Corporation now focuses policies of source reduction of the waste. One of our respondent's has also mentioned an act called the Travancore-Cochin Literary, Scientific and Charitable Society's regulation act 1955 which mentions that flats should have a proper waste management provisions which is necessary for them to get a permit. But this act is not being implemented properly. Asking about the gaps in the implementation of waste management policies one of our key respondents pointed out the following- due to floating population even if the public gets training about the waste management practices, their corporation is very limited. There is no proper mechanism to dispose plastic & thermocol. Source reduction is also failing to produce results as it was started in a later of waste management. There is no proper monitoring regarding dumping of waste. Lack of employees in Kochi Municipal Corporation also affects the planning & implementation. Failure of effective use of machinery and equipments designed for waste management. Most importantly many respondents pointed out that waste is generated by the public itself. There should be a consciousness among them that the waste produced by them is their responsibility. They should have the awareness to segregate the waste properly and dispose it effectively. They should refrain from dumping waste in public spaces. Waste management should be incorporated in everyone's daily life.

CHAPTER V

FINDINGS AND CONCLUSIONS

After conducting a comprehensive investigation into policymaking and implementation for sustainability in Kochi Municipal Corporation, this study aims to address:-

1. To measure the level of awareness regarding sustainable practices among elected members, officials and key decision makers of Kochi Municipal Corporation

2. To understand the key policies formed for sustainability in Kochi Municipal Corporation in the light of SDG 11

3. To assess the role of non-governmental agencies and civil society organisations in aiding policy making in the area of sustainability in Kochi

4. To assess the role of selected non-governmental agencies and civil society organisations in the implementation of sustainable practices in Kochi Municipal Corporation

5. To compare the sustainable practices in Kochi with that of Stockholm in Sweden

6. To provide suggestions for policy making and implementation to achieve SDG 11 in Kochi

Thorough an analysis of relevant policies, stakeholder interviews and case studies, this section presents the key findings and conclusions drawn from the analysis of data. These findings shed light on land use planning, protection of natural and cultural heritage, disaster management and disaster risk reduction, pollution and waste management of Kochi Municipal Corporation. These findings provide insights into the strengths and weaknesses of current sustainability policies in Kochi, as well as the challenges and opportunities for effective implementation. Furthermore, implications of these findings for future policy development and sustainable development goals in Kochi are discussed, along with recommendations for enhancing policy effectiveness and promoting long term sustainability outcomes.

In our research, stakeholder engagement emerged as a crucial factor for conducting interviews due to their unavailability, lack of awareness, lack of knowledge, biased answers, unwillingness to answer certain questions, being evasive, gate keeping the respondents.

In this research through the data analysis based on the objectives of the study we arrived on the following findings:

Our research revealed that elected members, officials, and key decision makers in Kochi exhibit a generally low level of awareness regarding sustainable practices across various dimensions such as certain policies, certain organizations working for achieving sustainability, regarding the existence of master plan etc. They had theoretical knowledge to some extend but lacked in terms of practical applications. Specifically, awareness levels were found to be lacking in areas such as land use planning, NGO's working for sustainability and urban planning for sustainability. While some respondents demonstrated basic knowledge of sustainable practices, the majority exhibited significant gaps in understanding key concepts and their implications for policy making and governance. Discrepancies were observed across different hierarchical groups, with certain segments showing higher levels of awareness compared to others. Factors contributing to low awareness levels among elected members, officials, and key decision makers include limited access to relevant information and resources, competing priorities and responsibilities, inadequate training and capacity-building initiatives, and a lack of emphasis on sustainability in formal education and professional development programs.

The analysis of sustainability policies implemented by Kochi Municipal Corporation demonstrates significant progress towards aligning with objectives of SDG 11. Housing and urban planning policies included central government and state government policies which were PMAY (Pradhan Mantri Aavas Yojana) project and LIFE mission project respectively. Kochi Municipal Corporation is trying to achieve the goal of sustainability by implementing these central and state government programs. For slum management the central government have formulated RAY (Rajiv Aavas Yojana) which is being followed by the corporation for effective slum rehabilitation. For waste management the corporation have formulated local policies such as segregation of waste and weekly collection of plastic waste after the Brahmapuram issue. C-HED has recently presented a proposal to United Nations Environment Program for the conservation and revival of Vembanad lake, which is the second largest Ramsar site in india. This is in the process of policy formulation which is hoped to be introduced soon in Kochi.

The assessment of the role of non-governmental agencies and civil society organizations in the implementation of sustainable practices in Kochi reveals both challenges and opportunities. While there is evidence of limited involvement of these organizations in certain initiatives, their contributions remain crucial for advancing sustainability goals in the city. Non-governmental agencies and Civil Societies bring diverse expertise, community connections, and innovative approaches to addressing complex sustainability challenges. Their involvement not only enhances the effectiveness and inclusivity of projects but also fosters a sense of ownership and empowerment among local communities. While assessing the role of non-governmental agencies and civil society organizations such as CPPR (centre for public policy and research) and EDRAAC (Ernakulam District Residents Association Apex Council) and Kudumbashree. we found out that their involvement in the policy making process is very minimal. They are being involved at a later stage of the implementation process which is affecting the continuity of the process. It is also seen that the interests of the key stakeholders are affecting their involvement in the process. However Kudumbashree is being greatly involved for collecting the data with regard to policies. However, it is evident that some stakeholders, including government agencies and the public, may not fully recognize or appreciate the value of these organizations in driving sustainable development. Therefore, there is a need for greater awareness-raising efforts and proactive engagement strategies to bridge the gap between different stakeholders and facilitate meaningful collaboration.

The comparison of sustainable practices between Kochi and Stockholm reveals both similarities and disparities in their approaches to urban sustainability. While Stockholm has been recognized as a global leader in sustainable development, with well-established infrastructure and ambitious climate goals, Kochi faces unique challenges related to rapid urbanization, limited resources, and infrastructure constraints. Despite these differences, there are valuable lessons to be learned from both cities. Stockholm's emphasis on comprehensive urban planning, efficient public transportation, and renewable energy integration serves as a model for sustainable cities worldwide. On the other hand, Kochi's innovative approaches to waste management, community engagement, and resource optimization demonstrate the potential for sustainability initiatives to thrive even in resource-constrained environments. Overall, the comparative study undergoes the importance of context-specific approaches to sustainable urban development and the need for

ongoing collaboration and knowledge exchange among cities worldwide to achieve the objectives of SDG 11 and create resilient, inclusive, and sustainable urban environments for all.

Suggestions and Recommendations

In an era marked by rapid urbanization and environment challenges, cities play a pivotal role in driving sustainability initiatives. Kochi, a bustling metropolis on the south west coast of India, stands as a testament to the complexities and opportunities inherent in urban sustainability, policymaking and implementation. Though Kochi municipal corporation's urban planning and waste management policies and their efforts to conserve and protect the natural heritage serves as a lens through which to examine the complexities of sustainability governance but there are still some areas which needs to be focused upon and to be given more attention to make it efficient for everyone. We suggest some measures and recommendations for effective policymaking and implementation:-

1. There should be more representatives from the public in the decision making process which would enable them to raise their concerns well and give suggestions so that it benefits everyone positively.
2. Ground level representation is low in the process of decision making. There should be more active involvement of non-governmental agencies and civil society organizations in the planning, implementation, and monitoring of sustainability initiatives. By harnessing their expertise, resources, and grassroots networks, KMC can enhance the impact and sustainability of its programs, ultimately creating a more resilient, inclusive, and environmentally sustainable city for all residents.
3. Some officials and key stakeholders tend to have theoretical knowledge but lack in terms of practical knowledge. This is because of the lack of training and development programs. Implement targeted training and capacity-building programs aimed at increasing awareness and understanding of sustainable practices among elected members, officials, and key decision makers. These programs should be tailored to the specific needs and

interests of different stakeholder groups and delivered through diverse formats such as workshops, seminars, and online resources.

4. In the implementation of programs like life mission, beneficiaries are reluctant to move or shift to a new place because of the feeling of loss of the community and sense of belonging. In such cases it is recommended to plan community engagement initiatives and programs so that such reluctance on the part of beneficiaries can be avoided.
5. Social audit should be done on monthly basis to assess the efficiency of the policies. Social audits play a crucial role in evaluating the effectiveness of policies by soliciting feedback and insights from stakeholders, including community members, NGOs, and marginalized groups. Through participatory processes, social audits assess the impact of policies on social welfare, equity, and inclusion, identifying strengths, weaknesses, and areas for improvement. By incorporating diverse perspectives and experiences, social audits enhance transparency, accountability, and responsiveness in policy implementation, ultimately promoting more equitable and sustainable outcomes.
6. Strengthen waste management policies, regulations, and enforcement mechanisms to ensure compliance with waste segregation, collection, transportation, and disposal guidelines. Implement penalties for non-compliance and incentivize businesses and individuals to adopt sustainable waste management practices.
7. The lack of coordination between departments within Kochi Municipal Corporation hampers the effectiveness of policy implementation and service delivery. Coordination gaps result in delayed responses to citizen needs, inconsistent enforcement of regulations, and fragmented urban development initiatives. Addressing this challenge requires improved communication, collaboration mechanisms, and a holistic approach to governance that prioritizes interdepartmental cooperation and synergy.
8. Harmonizing democracy and sustainable development is essential for effective policy making in Kochi. By engaging citizens in decision-making processes, promoting transparency, and fostering inclusive governance, democratic principles can ensure that policies reflect the needs and priorities of the community. Integrating sustainability considerations into policy formulation and implementation aligns with the long-term interests of both present and future generations, fostering resilience and prosperity.

9. Decentralization of power to local governments is essential for implementing sustainable policies effectively in Kochi. By empowering local authorities with decision-making autonomy, policies can be tailored to the specific needs and priorities of the community. Local governments are often better equipped to understand local challenges, engage with stakeholders, and mobilize resources efficiently. Decentralization fosters accountability and transparency, as decision makers are closer to the citizens they serve, facilitating greater public participation and oversight

CHAPTER VI

COMPARISON BETWEEN STOCKHOLM AND KOCHI

Sweden is a Scandinavian country that is ranked second in the list of sustainably developed countries in the world. While on the other hand India holds 112th position. Nestled amid the serene waters of Lake Mälaren, Stockholm stands as a beacon of sustainability, seamlessly blending modern innovation with a deep-rooted commitment to preserving its natural beauty. Sweden's capital city is not just a vibrant hub of culture and history; it is also a global leader in sustainable urban living. From its efficient public transportation systems to its eco-friendly architecture and dedication to renewable energy, Stockholm offers a compelling blueprint for cities striving towards a greener, more sustainable future. In comparing Kochi and Stockholm through a lens of sustainability, distinct narratives emerge. Stockholm, with its lush green infrastructure seamlessly woven into the urban landscape, stands as a beacon of eco-conscious living. The city's efficient public transport system, reliance on renewable energy sources, and proliferation of sustainable architecture exemplify its commitment to a greener future. In contrast, Kochi grapples with the challenges of rapid urbanization, aiming to strike a balance between development and environmental preservation. Situated along the captivating Kerala coastline, Kochi explores opportunities for sustainable waterfront development while harnessing its renewable energy potential. As these cities navigate their unique paths towards sustainability, their divergent contexts offer valuable lessons and inspiration for urban centers worldwide.

Sweden's land use planning is a model of holistic and sustainable development strategies, firmly grounded in principles of inclusivity and forward-thinking. With a comprehensive approach, Sweden seamlessly incorporates various elements of land use, spanning from urban development to environmental preservation. Central to this process is active public participation, ensuring that decisions are reflective of community needs and values. Sustainability takes precedence in policy formulation, with a clear focus on environmental conservation, resource efficiency, and social equity. Spatial planning frameworks play a pivotal role in organizing land use zones, fostering coherence at national, regional, and local levels. Noteworthy is Sweden's commitment to nurturing green spaces within urban environments, promoting biodiversity and enriching

residents' quality of life. While kochi's land use planning strikes an equilibrium between preserving its historical allure and fostering contemporary development. Its major focus is historical preservation and promoting the creation of recreational spaces. However the city has to focus more on environmental aspect while planning the use of land for its optimum and sustainable planning. It can take ideas from sweden's policies and programs for promoting sustainability.

Stockholm's housing management strategy revolves around the core values of affordability, sustainability, and community cohesion. The city's strong commitment to social housing ensures that individuals across diverse income brackets can access reasonably priced homes, supported by measures such as rent controls to maintain housing cost stability. By promoting the cooperative housing model, Stockholm encourages residents to collectively own and manage their living spaces, fostering close-knit communities and shared responsibilities. Aligning with its reputation for sustainability, the city prioritizes the construction of energy-efficient buildings using environmentally friendly materials, thereby reducing carbon footprints and promoting ecological conservation. kochi still have to go a long way to provide affordable housing for its people. Even though central government programs like LIFE mission and PMAY are being promoted the effectiveness of the program and its implementation is questionable. The angle of sustainability is still not included in the planning procedure and should be given more focus in the coming years.

Sweden's educational institutions foster a culture of sustainability through innovative programs, research endeavors, and immersive learning experiences, engaging students, faculty, and the wider community. Collaborating closely with local government and businesses, Stockholm's universities and schools pioneer sustainable solutions and initiatives. They integrate sustainability into their curriculum, research endeavors, and events, acting as knowledge-sharing centers for sustainable practices. An example of Sweden's educational institutions fostering a culture of sustainability through innovative programs is a program called "Fridays for future".

"Fridays for future" is an event in which every Friday, students across Sweden participate in strikes, rallies, and demonstrations, calling for ambitious climate policies, sustainability education in schools, and a rapid transition to renewable energy. The movement has not only amplified the voices of the youth but has also influenced political discourse, prompting

policymakers to consider climate concerns with greater urgency. Though Kochi at present is trying to involve more and more educational institutions in promoting sustainable practices but it still have much ground to cover. Youths and adults should be more conscious about their part in protecting the environment and it is the responsibility of educational institutions to provide them with such awareness and push them into pursuing actions.

Stockholm's waste management practices are exemplars of sustainability, driven by a commitment to resource efficiency and environmental responsibility. The city's emphasis on source separation and recycling empowers residents to actively participate in waste reduction efforts, diverting materials away from landfills. Additionally, Stockholm's innovative use of waste incineration for district heating not only minimizes waste volume but also provides a sustainable energy source for thousands of homes. Kochi is promoting the segregation of waste after a major havoc occurred in Brahmapuram. The source reduction practices are very less in comparison with Sweden. However we can consider the present state of Kochi as a transitional stage, moving from a traditional phase to a modern phase which considers sustainability as a part of it.

In the comparative study of Stockholm and Kochi regarding the role of educational institutions in promoting sustainability, waste management practices, housing management, and land use planning, a nuanced picture of contrasting yet interconnected approaches emerges. Stockholm, renowned for its progressive sustainability initiatives, showcases how educational institutions serve as catalysts for environmental awareness and action. Collaborative efforts between academia, government, and businesses propel the city's innovative waste management practices, sustainable housing models, and thoughtful land use planning. From biochar production to district heating from waste incineration, Stockholm sets a high standard for eco-friendly urban living.

On the other hand, Kochi, amidst its rapid urbanization, presents a landscape where challenges and opportunities intersect. While educational institutions in Kochi are stepping stones for sustainability awareness, the city grapples with finding a balance between preserving its rich heritage and fostering modern development. Kochi's waste management initiatives, such as

promoting source separation and biochar production, reflect a growing commitment to sustainability. The city's land use planning seeks to create mixed-use neighborhoods while conserving its natural ecosystems and historical landmarks.

In conclusion, both Stockholm and Kochi demonstrate the pivotal role of educational institutions in shaping sustainable urban futures. Stockholm serves as an exemplary model with its holistic approach to waste management, housing, and land use, driven by collaborative efforts and a strong sustainability ethos. Kochi, on its path towards sustainable development, showcases promising initiatives and the potential for growth in fostering a greener, more resilient cityscape. As these cities continue their journeys towards sustainability, they provide valuable insights and inspiration for urban centers worldwide, emphasizing the critical role of education in building sustainable and thriving communities. Both cities can learn from each other and build their potential by international collaborations and adapting worthwhile practices from each other.

Reference

Véron, R. (2001, April 1). The “New” Kerala Model: Lessons for Sustainable Development. World Development. https://doi.org/10.1016/s0305-750x(00)00119-4

Kuriakose, P. N., & Philip, S. (2021, November 1). City profile: Kochi, city region – Planning measures to make Kochi smart and creative. Cities. https://doi.org/10.1016/j.cities.2021.103307

Mathew, S., Trück, S., & Henderson-Sellers, A. (2012, February 1). Kochi, India case study of climate adaptation to floods: Ranking local government investment options. Global Environmental Change. https://doi.org/10.1016/j.gloenvcha.2011.11.005

Rafeeque, M. K., Rameshan, M., & Sreeraj, M. (2021, January 1). Measuring the vulnerability of coastal ecosystems in a densely populated west coast landscape, India. Elsevier eBooks. https://doi.org/10.1016/b978-0-12-819604-5.00013-5

Kochi Corporation to get German support for sustainable development projects. (2023, November 4). https://www.thehindu.com/news/national/kerala/kochi-corporation-to-get-german-

support-for-sustainable-development-projects/article67498599.ece/amp/#amp_tf=From%20%251%24s&aoh=17078134440899&referrer=https%3A%2F%2Fwww.google.com

Ravi, A. (2013, January 1). Sustainable solid waste management through ecological footprint analysis – a solution to Kochi city, India. www.academia.edu. Byhttps://www.academia.edu/97847910/Sustainable_solid_waste_management_through_ecological_footprint_analysis_a_solution_to_Kochi_city_India

K, M. P., & Viswanath, V. (2015, September 30). ECOTOURISM AND SUSTAINABLE DEVELOPMENT IN KERALA: SOME EMPIRICAL EVIDENCE. ResearchGate. https://www.researchgate.net/publication/282847549_ECOTOURISM_AND_SUSTAINABLE_DEVELOPMENT_IN_KERALA_SOME_EMPIRICAL_EVIDENCE

Kumar, N., Kumar, A., & Sharma, S. (2018, January 4). The quest for environmental sustainability in educational institutions. International Journal of Engineering & Technology. https://doi.org/10.14419/ijet.v7i1.4.9033

B. (2024, March 24). WHAT MAKES KERALA ONE OF INDIA’S MOST ECO-FRIENDLY STATES. Be-lavie. https://be-lavie.com/what-makes-kerala-one-of-indias-most-eco-friendly-states/

Ameerudheen, T. (2021, December 1). Kerala's fight against climate change reaches global forum, 18 sustainable projects hog limelight | Onmanorama. Onmanorama. https://www.onmanorama.com/news/kerala/2021/12/01/fight-against-climate-change-sustainable-projects.html

T. (2021, August 10). Housing project for P&T Colony gathers pace. The Times of India. https://timesofindia.indiatimes.com/city/kochi/housing-project-for-pt-colony-gathers-pace/amp_articleshow/85198939.cms

Hugo, G. J., Lane, M. B., & Suh, J. (2008). Planning for holistic sustainability: a study of the 'process' in Kerala (India) and Sweden. https://hdl.handle.net/2440/51093

APPENDIX

POLICY MAKING AND IMPLEMENTATION FOR SUSTAINABILITY: A CASE STUDY OF KOCHI

QUESTIONNAIRE

1 .Which political party are you affiliated to?

2. Do you think land use planning in Kochi Municipal Corporation is done in a sustainable way?

3. Is there a 'master plan' behind the working of Kochi Municipal Corporation,if so then does it take into consideration the sustainability angle?

4. What is your take on the 'Life Mission' program and it's effectiveness?

5. According to you, what does KMC do for the management of slums within it's area of jurisdiction.

6. Do you think NGOs play a role in the implementation of sustainable practices in KMC?

7. What do you think is the role of educational institutions like St Teresa's College in the implementation of Sustainable practices in Kochi?

8. What do you think about the effectiveness of programs like 'YouKAN-HEAL Kochi'?

9. What according to you is the role of EDRAAC and other civil society in promoting sustainable practices ?

10. Could you please highlight the role of Kudumbashree and CPPR in the implementation of Kochi Municipal Corporation's policies.

11. Are there any specific policies for the conservation of natural and cultural heritage sites like Mangalavanam,Fort Kochi Beach?

12. Is KMC having any policy for estuary protection ?

13. Is sustainable tourism promoted by the policies of KMC?

14. Does KMC's policies ensure that the hospitality industries are made responsible for the waste, so as to enable sustainability?

15. Does the Corporation have policies aimed at disaster management?

16. A sum of 1crore 5 lakhs is allotted by KMC's budget for the year 2023-24 towards disaster management, what do you think are the priority areas?

17. What are the specific policies of KMC that aims at flood control?

18. Are there sufficient mechanisms for the proper clearing of the drainage systems?

19. Do you think projects like YouKAN-Heal are effective in promoting sustainability?

20. What are the waste management policies of KMC?

21. What do you think are the gaps in it's implementation?

22. How do you think the waste management issues in KMC can be tackled in a better way?

23. What according to you are some measures to avoid a Brahmapuram like situation in the future?

24. How can the issue of dumping of waste in public spaces be prevented?

25. Does KMC undertake efforts for setting up sanitation facilities in public spaces?

***