

Waste Management Practices of Kindergartens in Thiruvananthapuram, Kerala

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CERTIFICATE OF APPROVAL

This is to certify that this dissertation entitled **“Waste Management Practices of Kindergartens in Thiruvananthapuram, Kerala”** is a record of genuine work done by Mr. ABHIJITH. P, fourth semester Master of Social Work student of this college under my supervision and guidance and that it is hereby approved for submission.

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ABSTRACT

Waste management has become a major environmental concern that requires behavioural change alongside technological and policy interventions. Early childhood provides a critical foundation for developing lifelong environmental values and responsible behaviours, making kindergarten an ideal setting for environmental education. The present study, "Waste Management Practices of Kindergartens in Thiruvananthapuram, Kerala," explored the waste management practices implemented in selected private kindergartens and examined their potential to support the integration of structured waste management education into early childhood education.

The study adopted a qualitative research approach with a case study design, involving five private kindergartens within Thiruvananthapuram City Corporation. Using purposive sampling, five teachers and five management representatives were selected. Data were collected through semi-structured interviews and field notes and analysed using Braun and Clarke's thematic analysis.

The findings revealed that waste management practices, including waste segregation, recycling, reuse and daily cleanliness activities, function as meaningful environmental learning experiences rather than routine institutional practices. Administrative commitment, supportive infrastructure and experiential, child-centred teaching approaches were found to promote environmental responsibility among children. The study also identified opportunities for curriculum integration while highlighting challenges related to teacher preparedness, institutional resources, and policy support. The study concludes that strengthening existing institutional practices through curriculum development, teacher capacity building, and supportive policy frameworks can effectively integrate structured waste management education into early childhood education and foster environmentally responsible citizens.

Keywords: Waste Management Practices, Early Childhood Education, Kindergarten, Environmental Education, Experiential Learning, Sustainability

CHAPTER 1

INTRODUCTION

CHAPTER 1: INTRODUCTION

1.1.Introduction

Waste management has become one of the most important environmental and public health challenges of the twenty-first century. Rapid population growth, urbanization, industrial expansion and changing patterns of production and consumption have contributed to an unprecedented increase in municipal solid waste generation across the globe. Improper waste handling and disposal have created serious environmental consequences, including pollution of land, water and air and also contribute to climate change, biodiversity loss and public health risks (WHO, World Health Organization, 2024). These challenges have shifted global attention towards sustainable waste management approaches that emphasize waste reduction, segregation, reuse, recycling and responsible disposal rather than conventional disposal methods alone (UNEP, 2024)

According to the World Bank, the world generated approximately 2.01 billion tonnes of municipal solid waste annually and this volume is projected to increase to 3.40 billion tonnes by 2050 under a business-as-usual scenario (Kaza, Yao , Bhada-Tata , & Van Woerden, 2018). More recent global assessments indicate that waste generation continues to rise rapidly, reinforcing the urgency of adopting circular economy principles and sustainable waste management practices. International organizations now recognize that effective waste management requires behavioural transformation alongside technological and infrastructural interventions (UNEP, 2024).

The significance of sustainable waste management is also reflected in the United Nations Sustainable Development Goals (SDGs). Goal 11 promotes sustainable cities and communities through improved urban environmental management, while Goal 12 emphasizes responsible consumption and production patterns. Goal 13 further highlights climate action by encouraging environmentally responsible practices that reduce greenhouse gas emissions associated with poor waste management (United Nations, 2015). These global commitments demonstrate that waste management is not merely an environmental concern but a critical component of sustainable development and social well-being.

India has witnessed a substantial increase in municipal solid waste generation as a consequence of rapid economic growth and urban expansion. Based on the annual reports submitted by the State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs), in the year 2022-23, the total quantity of municipal solid waste generated in the country during the reporting period is estimated at 1,70,939 tonnes per day (TPD). Although policy initiatives such as the Swachh Bharat Mission and the Solid Waste Management Rules, 2016 have strengthened institutional mechanisms for waste management, challenges related to source segregation, recycling and public participation continue to affect implementation (Central Pollution Control Board, 2023). These issues suggest that infrastructural development alone cannot achieve sustainable waste management without corresponding changes in people's attitudes and everyday practices.

Within the Indian context, Kerala presents a distinctive model of decentralized waste management. Initiatives implemented through the Suchitwa Mission and the Haritha Karma Sena have encouraged community participation and localized waste management systems (Suchitwa Mission, 2023). Despite these efforts, increasing plastic consumption, changing lifestyles and rapid urbanization continue to create significant challenges in waste segregation and disposal. Studies indicate that the effectiveness of waste management policies largely depends on active public participation and environmentally responsible behaviour rather than administrative interventions alone. This perspective highlights waste management as a social and behavioural process that is embedded within everyday life rather than merely a technical or engineering function.

Behavioural research suggests that environmentally responsible habits develop through continuous interaction with the social environment during childhood. Early experiences strongly influence the formation of values, attitudes and behavioural patterns that often continue throughout adulthood (Bandura, 1986). Consequently, environmental education during the preschool years provides a unique opportunity to nurture sustainable habits before less desirable behaviours become firmly established (Davis, 2014). Developing responsible waste management practices during early childhood can therefore contribute to long-term environmental stewardship and responsible citizenship.

The concept of Education for Sustainable Development (ESD) recognizes education as a key strategy for addressing environmental challenges and promoting sustainable lifestyles. UNESCO emphasizes that sustainability education should begin during early childhood

and should encourage children to acquire the knowledge, values, attitudes and skills necessary to contribute to a sustainable future (UNESCO, 2020). Rather than relying exclusively on theoretical instruction, ESD promotes experiential, participatory and child-centred learning that enables children to internalize environmental values through everyday experiences.

Kindergartens provide an ideal environment for fostering such learning experiences. As structured educational settings, they expose children to daily routines that encourage cleanliness, responsibility, cooperation and care for the environment. Activities such as proper disposal of waste, organizing classroom materials, cleaning shared spaces and participating in recycling-related tasks provide meaningful opportunities for environmental learning. Child-centred pedagogical approaches, particularly the Montessori philosophy, further support experiential learning by encouraging independence, practical life activities and active engagement with the surrounding environment. Through repeated participation in these routines, children gradually develop habits that contribute to environmentally responsible behaviour. Existing research demonstrates that experiential environmental education positively influences children's understanding and practice of sustainable behaviours. Studies have shown that participation in practical activities, observation of role models, and interaction with natural environments enhance environmental awareness and encourage responsible waste management practices among young children (UNESCO, 2020), (Davis, 2014). Research has also emphasized the importance of teacher commitment, institutional support and activity-based pedagogy in strengthening sustainability education within kindergarten settings. These findings indicate that educational institutions can play a transformative role in promoting environmental responsibility during early childhood. Although environmental education has gained increasing recognition, structured waste management education has not been systematically integrated into early childhood education in many contexts (UNESCO, 2020). In several kindergarten settings, waste management practices exist primarily as routine activities rather than as organized educational experiences with clearly defined learning objectives. Much of the existing literature focuses on community-level waste management, environmental awareness campaigns, or older school-aged children, leaving institutional waste management practices in kindergarten settings comparatively underexplored.

The present study, titled "Waste Management Practices of Kindergartens in Thiruvananthapuram, Kerala," seeks to explore waste management practices within

selected private kindergarten institutions by examining the experiences of teachers and management representatives. The study investigates how existing institutional practices contribute to environmental learning and explores their potential to support the integration of structured waste management education into early childhood education. By examining waste management as both an educational and social process, the study aims to contribute to the fields of environmental education, early childhood education and social work. The findings are expected to provide evidence for curriculum development, institutional strengthening, and policy formulation while supporting broader efforts to promote sustainable development through environmental education from the earliest stages of learning.

1.2.Statement of the Problem

Waste management has become a major environmental and public health concern across the world due to increasing urbanization, population growth and changing consumption patterns. The growing volume of municipal solid waste, particularly non-biodegradable waste such as plastics, has created significant challenges for governments and communities in ensuring proper collection, segregation, recycling and disposal (Kaza, Yao , Bhada-Tata , & Van Woerden, 2018). Although technological innovations and policy interventions have improved waste management systems in many regions, their effectiveness largely depends on the behaviour and active participation of individuals and institutions (UNEP, 2024). Sustainable waste management is increasingly recognized as a behavioural issue that requires educational and social interventions in addition to technical solutions (UNESCO, 2020).

Environmental behaviour develops gradually through repeated experiences, observation and social interaction. Early childhood represents a critical stage in this developmental process because habits, attitudes and values established during the preschool years often continue throughout adulthood (Bandura, 1986). Research in environmental education suggests that children learn sustainable behaviours more effectively through participation in everyday activities than through theoretical instruction alone ((Davis, 2014). Introducing environmental responsibility during early childhood can contribute significantly to the development of lifelong sustainable practices. Kindergartens provide an important institutional setting for cultivating such behaviours. Through daily routines such as maintaining cleanliness, disposing of waste properly, organizing learning materials and participating in practical life activities, children are exposed to experiences that encourage

responsibility and environmental awareness. In many private kindergarten settings, these practices are already embedded within everyday institutional routines and are implemented through child-centred and experiential approaches, particularly within Montessori-based educational systems. These practices often remain informal and are rarely recognized as components of a structured educational programme.

Despite the presence of routine environmental practices in many institutions, structured waste management education has not been systematically integrated into early childhood education in India or Kerala (UNESCO, 2020). Existing environmental education programmes at the preschool level often focus on general awareness and cleanliness without providing a comprehensive framework for developing knowledge, values, skills, and behaviours related to waste reduction, segregation, reuse, recycling, and sustainable disposal. The absence of a structured curriculum limits opportunities to strengthen environmental responsibility during one of the most formative stages of child development (Davis, 2014).

A review of existing literature reveals that previous studies have primarily focused on community-based waste management systems, policy implementation, environmental awareness campaigns, or waste management practices among older school children and adults. While these studies have contributed significantly to understanding environmental sustainability, comparatively little attention has been given to institutional waste management practices within kindergarten settings (UNESCO, 2020). Furthermore, limited qualitative research has explored the experiences of teachers and management representatives who play a central role in shaping environmental learning among young children through everyday institutional practices.

Within Kerala, research has largely concentrated on decentralized waste management systems, public participation, and local governance initiatives implemented through agencies such as the Suchitwa Mission and the Haritha Karma Sena (Suchitwa Mission, 2023). Although these studies provide valuable insights into community-level waste management, they do not adequately explain how early childhood educational institutions contribute to environmental behaviour formation. The educational potential of kindergarten practices remains underexplored despite increasing recognition of the importance of sustainability education.

Another important gap exists between institutional practice and educational policy. Many kindergartens already implement activities that promote cleanliness, responsibility and environmental care through everyday routines. These practices are generally viewed as administrative or disciplinary activities rather than educational experiences that can support structured waste management education. There is limited evidence regarding how these existing institutional practices can be systematically utilized to develop an age-appropriate environmental education framework for young children (Davis, 2014).

Environmental sustainability is closely associated with community participation, behaviour modification, social responsibility and sustainable development. Social workers play an important role in promoting environmental justice, facilitating community-based interventions, and advocating for educational initiatives that encourage responsible environmental behaviour ([IFSW], 2020). Understanding waste management practices within kindergarten institutions therefore contributes not only to environmental education but also to the broader objectives of social work by promoting sustainable behavioural change from early childhood. Against this background, there is a clear need to explore how waste management practices are implemented within private kindergarten institutions and how these practices support environmental learning among young children. There is also a need to understand the experiences of teachers and management representatives, the institutional mechanisms that facilitate environmental education, and the opportunities and challenges associated with integrating structured waste management education into early childhood education.

1.3. Background of the Study

Waste management has changed considerably over the past few decades. Earlier, waste was mainly collected and disposed of through open dumping or landfilling. As cities expanded and consumption increased, these methods became inadequate because they created serious environmental and health problems. This shift encouraged governments and environmental organizations to promote waste reduction, reuse, recycling and scientific disposal methods as part of sustainable development.

Global concern about waste management has grown with the increase in municipal solid waste generation. The World Bank reported that the world produces more than two billion tonnes of municipal solid waste every year and that this amount will continue to rise if current trends remain unchanged (Kaza, Yao , Bhada-Tata , & Van Woerden, 2018). The report also points out that successful waste management depends not only on infrastructure

but also on people's behaviour and participation. This understanding has encouraged many countries to focus on environmental education as a long-term solution.

The idea of a circular economy has further influenced waste management policies around the world. Instead of treating waste as a useless by-product, the circular economy encourages the recovery and reuse of materials. The approach aims to reduce pressure on natural resources while promoting sustainable production and consumption. As a result, environmental education has become an important strategy for encouraging responsible behaviour among citizens. Education is widely accepted as an effective means of promoting sustainable development. UNESCO introduced the concept of Education for Sustainable Development (ESD) to help learners develop the knowledge, skills, values, and attitudes needed to address environmental challenges. ESD encourages active participation and experiential learning instead of relying only on classroom instruction. Children are expected to learn sustainability through everyday experiences and practical activities that become part of their daily lives (UNESCO, 2017).

Early childhood is one of the most important stages for developing values and habits. During this period, children learn by observing others, imitating behaviour and participating in routine activities. Habits developed during these years often continue into adulthood. Environmental education introduced during early childhood can therefore influence future attitudes towards waste management and environmental responsibility. The Montessori approach supports this view by emphasizing learning through experience. Practical life activities such as cleaning, arranging materials, caring for the environment and completing everyday tasks help children become independent and responsible. These activities also introduce children to concepts related to waste management in a natural way. Instead of learning through lectures, children understand responsibility by practising it in their daily routines.

In India, waste management has received greater attention through programmes such as the Swachh Bharat Mission and the implementation of the Solid Waste Management Rules, 2016. These initiatives encourage waste segregation at source and promote community participation in maintaining a clean environment. Despite these efforts, many local bodies continue to face difficulties because behavioural change has not progressed at the same pace as policy development.

Kerala has adopted a decentralized approach to waste management through programmes implemented by the Suchitwa Mission and the Haritha Karma Sena. These initiatives encourage households and institutions to segregate waste and manage biodegradable waste at the local level. Although these programmes have improved waste management practices, rapid urbanization and increasing plastic consumption continue to create challenges. Public participation remains essential for the success of these initiatives.

Educational institutions can make an important contribution to sustainable waste management by encouraging responsible behaviour from an early age. Kindergartens provide a structured environment where children participate in daily routines that promote cleanliness, discipline and responsibility. Activities such as disposing of waste properly, keeping classrooms clean, and participating in simple environmental activities help children develop positive habits through experience. Although many kindergartens already practise these activities, they are often treated as part of daily discipline rather than as structured environmental education. Research on waste management in Kerala has mainly focused on community participation and local governance, while the educational role of kindergarten institutions has received limited attention. There is also a lack of qualitative studies exploring how teachers and management members promote waste management through everyday institutional practices.

The present study was undertaken within this context. It seeks to understand waste management practices in private kindergartens in Thiruvananthapuram and explore how these practices support environmental learning among young children. The study also examines whether existing institutional practices can provide a foundation for integrating structured waste management education into early childhood education.

1.4.Relevance and Significance of the Study

Waste management has become an important area of concern due to its impact on environmental sustainability, public health, and quality of life. While considerable attention has been given to waste management at the household and community levels, the role of early childhood educational institutions in promoting sustainable waste management practices has received comparatively little attention. This study attempts to address that gap by examining waste management practices in private kindergartens and their educational significance.

The study contributes to the field of early childhood education by highlighting the importance of introducing environmental responsibility during the formative years of child development. Children develop attitudes and habits through observation and daily experiences. Understanding how waste management practices are incorporated into kindergarten routines can provide valuable insights for designing age-appropriate environmental learning experiences that encourage lifelong sustainable behaviour. The findings may also contribute to curriculum development in early childhood education. Many kindergarten institutions already engage children in activities related to cleanliness, organization, and environmental care. However, these activities are often treated as routine practices rather than structured learning experiences. The study may help educators and curriculum developers recognize the educational value of these practices and integrate waste management concepts into early childhood programmes in a systematic manner.

The research has practical significance for kindergarten management and teachers. It documents existing institutional practices and identifies approaches that support environmental learning within the classroom. The findings may encourage educational institutions to strengthen their waste management systems and adopt participatory methods that involve children, teachers, parents, and supporting staff in promoting sustainable practices. The study also has relevance for policymakers and educational administrators. As environmental education receives greater attention within national and international policy frameworks, there is a need to develop educational strategies that begin during early childhood. The findings may provide evidence for incorporating structured waste management education into preschool curricula and institutional guidelines. Such initiatives can strengthen environmental education and support sustainable development goals at the local level.

The study emphasizes the importance of behaviour change as a foundation for effective waste management. Sustainable waste management cannot be achieved through infrastructure and policy measures alone. It requires environmentally responsible attitudes and practices that are developed through continuous learning and socialization. By exploring how these values are introduced in kindergarten settings, the study contributes to broader discussions on environmental conservation and sustainable living.

The study has particular significance for the profession of social work. Contemporary social work extends beyond individual and community welfare to include environmental justice and sustainable development. Social workers promote behavioural change, community

participation, and social responsibility through education and advocacy. Environmental issues such as waste management directly affect the health and well-being of communities, especially vulnerable populations. Understanding institutional practices that encourage environmental responsibility among young children can support preventive and developmental approaches within social work practice.

The findings may also encourage collaboration among schools, families, local self-government institutions, and community organizations in promoting environmental awareness. Such partnerships can strengthen local waste management initiatives and create opportunities for community participation in sustainability programmes. Building environmental responsibility through collective action is consistent with the principles of community organization and participatory development that guide social work practice. The study contributes to academic literature by providing qualitative evidence on waste management practices in private kindergarten institutions in Kerala. Existing research has largely focused on community waste management systems or environmental awareness among older students. By exploring the experiences of teachers and management representatives in kindergarten settings, the study adds a new perspective to the fields of environmental education and early childhood education.

The study provides a foundation for future research. It may encourage scholars to examine environmental education practices in different educational settings, compare institutional models, and evaluate the long-term influence of early environmental learning on children's behaviour. The findings may also support the development of intervention programmes that integrate waste management education into preschool education and community-based environmental initiatives.

In this way, the study contributes to educational practice, policy development, environmental sustainability, and social work by emphasizing the importance of developing environmentally responsible behaviour during early childhood through meaningful institutional experiences.

1.5. Chapterization

The present study is organized into six chapters. Each chapter deals with a specific aspect of the research and together provides a systematic understanding of the study.

Chapter I: Introduction

This chapter introduces the research topic and presents the context of the study. It includes the introduction, statement of the problem, background of the study, significance of the study and chapterization. The chapter explains the need for the study and establishes its relevance in the field of early childhood education, environmental sustainability, and social work.

Chapter II: Review of Literature

This chapter reviews national and international literature related to waste management, environmental education, early childhood education, and sustainability practices in educational institutions. It also presents the theoretical framework and identifies the research gap that forms the basis of the present study.

Chapter III: Research Methodology

This chapter describes the methodological framework adopted for the study. It includes the research approach, research design, study setting, participants, sampling technique, sources of data, tools and methods of data collection, pilot study, ethical considerations, data collection procedure, and methods of data analysis. The chapter explains the procedures followed to conduct the study systematically.

Chapter IV: Case Description

This chapter presents the data collected from teachers and management representatives of selected private kindergartens. The responses are presented in narrative form along with relevant verbatim statements to reflect the participants' experiences and institutional practices. The chapter focuses on describing the data without interpretation or analysis.

Chapter V: Data Analysis and Interpretation

This chapter analyses the data using thematic analysis. The findings are presented under major themes and sub-themes that emerged from the interviews. The chapter interprets the findings in relation to the research objectives, theoretical framework, and existing literature. It highlights key patterns and insights regarding waste management practices and environmental learning in kindergarten settings.

Chapter VI: Findings, Conclusion, and Recommendations

This chapter presents the major findings, suggestions, and conclusions of the study. It also discusses the implications for social work practice and provides recommendations for future research

CHAPTER 2

LITERATURE REVIEW

CHAPTER 2: REVIEW OF LITERATURE

2.1. Introduction

This chapter reviews studies on waste management, environmental education, and related behavioural aspects in early childhood settings. It examines how practices are influenced by knowledge, attitudes, institutional systems, and social interactions. The final part of the chapter identifies the research gap based on the reviewed literature.

2.2. Review of Literature

2.2.1. Environmental Education and Sustainability in Early Childhood

Early childhood is recognised as a critical stage for developing environmental awareness and sustainable behaviours. The following studies examine the role of environmental education, policy frameworks, and educational practices in fostering environmental responsibility among young children.

At the international level, (UNESCO, 2017), through its report *Education for Sustainable Development Goals: Learning Objectives*, developed a comprehensive framework for integrating sustainable development into education systems worldwide. The report was prepared through policy analysis, international consultations, and expert reviews under the Education for Sustainable Development (ESD) framework. It emphasised that sustainability education should equip learners with the knowledge, skills, values and attitudes necessary for promoting sustainable societies. The report further recommended that environmental education should begin during early childhood through participatory and experiential learning approaches that encourage children to internalise environmentally responsible behaviours from an early age.

The significance of integrating environmental education into early childhood is also reflected within the Indian education system. The (Ministry of Human Resource Development, 2020), formulated through extensive stakeholder consultations, expert committee recommendations, and policy reviews, advocates play-based, activity-oriented, inquiry-driven and experiential learning for children aged three to eight years. The policy recognises environmental awareness, cleanliness, and sustainable living as integral components of foundational education and emphasises that such experiences foster responsible citizenship and lifelong environmental values. The (NCERT, 2023), through

its curriculum framework developed using curriculum review and expert consultations, recommends embedding environmental sustainability within everyday classroom experiences rather than treating it as an independent subject. The framework highlights experiential and inquiry-based pedagogies as effective approaches for nurturing environmental awareness and sustainable behaviour among young learners.

Empirical evidence further strengthens these policy recommendations. (Ardoin & Alison , 2020) conducted a systematic review of 66 empirical studies published over a twenty-five-year period to examine the effectiveness of Early Childhood Environmental Education (ECEE) programmes involving children from birth to eight years of age. The review found that most programmes were implemented in formal preschool settings using play-based, nature-oriented and experiential learning approaches. The findings demonstrated that environmental education significantly enhanced children's environmental literacy while also contributing to their cognitive, language, social-emotional and physical development, indicating that environmental learning supports holistic child development alongside sustainability education.

Supporting these findings, (Kirmani, Sheikh, & Ahmad's , 2024) examined the alignment between the National Education Policy 2020 and the Sustainable Development Goals through a qualitative policy analysis based on policy documents, research articles, books, and government reports. The study found that NEP 2020 provides a strong framework for promoting experiential learning, environmental education, and holistic child development. However, the authors also emphasised that successful implementation depends upon curriculum integration, teacher preparedness, institutional infrastructure, and sustained policy support.

The reviewed studies demonstrate a strong international and national consensus that early childhood education provides the ideal foundation for fostering environmental awareness and sustainability. They consistently emphasise that integrating environmental education through experiential learning, supportive educational policies, and curriculum frameworks can promote lifelong environmental responsibility while contributing to children's holistic development.

2.2.2. Experiential and Child-Centred Environmental Learning

Experiential and child-centred learning approaches are widely recognised as effective pedagogical strategies for promoting environmental awareness and sustainable behaviours among young children. The following studies examine how active participation, play, and hands-on learning contribute to environmental education in early childhood settings.

Research consistently demonstrates that experiential learning enables children to understand environmental concepts more effectively than traditional instructional methods. Akyol, Kahriman-Pamuk, & Ridvan Elmas, (2018), investigated the effectiveness of educational drama in promoting Education for Sustainable Development among pre-service preschool teachers and young children. Adopting a qualitative phenomenographic approach, the study collected data through interviews, photographs, and field notes from pre-service teachers and a preschool teacher who implemented drama-based environmental activities. The findings revealed that educational drama significantly enhanced teachers' sustainability competencies while improving children's understanding of environmental concepts through active participation and experiential engagement. The study concluded that participatory pedagogies provide meaningful opportunities for integrating sustainability into preschool education (Akyol, Kahriman-Pamuk , & Ridvan Elmas , 2018).

Buil, Roger-Loppacher, & Tintoré, (2019), examined the effectiveness of activity-based environmental education in promoting recycling habits among preschool children. The mixed-method study involved preschool children, teachers, and parents, with data collected through questionnaires, interviews, and focus group discussions and analysed using descriptive statistics and thematic analysis. The findings indicated that activity-based environmental education significantly improved children's recycling habits and environmental awareness while encouraging family participation in sustainable practices. The study highlighted that environmental learning becomes more effective when classroom activities are reinforced within the home environment (Buil, Roger-Loppacher, & Tintoré, 2019). Mukhlis, Elvira, & Putri Santoso, (2023), explored environmental learning models adopted in early childhood education using a qualitative descriptive design involving teachers and early childhood practitioners. Data were collected through interviews, observations, and document analysis and analysed using content analysis. The study revealed that environmental knowledge alone is insufficient to develop sustainable

behaviour. Instead, behavioural change occurs when environmental concepts are integrated into children's everyday classroom experiences through meaningful, experiential activities that encourage active participation and repeated practice (Mukhlis, Elvira, & Putri Santoso, 2023).

Recent studies continue to reinforce the effectiveness of experiential pedagogies. Poje, Marinić, Stanisavljević, & Dika, (2024), investigated sustainability knowledge and environmental practices among children and teachers in eco-oriented kindergarten settings using a mixed-method approach comprising questionnaires, classroom observations, and interviews. The findings demonstrated that integrating sustainability into daily educational experiences significantly enhanced children's environmental awareness and responsible environmental behaviours (Poje, Marinić, Stanisavljević, & Dika, 2024). Abanoz, (2025), examined the effectiveness of an early STEM programme in improving children's understanding of waste management concepts using a quantitative pre-test and post-test design. The study found a considerable improvement in children's understanding of recycling following the intervention, although greater emphasis was needed to strengthen children's understanding of waste reduction and reuse practices (Abanoz, 2025).

Ariman, Tuğba Abanoz, Özgün Çelik, Hortoğlu , & Kartal, (2026), explored the effectiveness of the *My Green World* sustainability programme through a qualitative case study involving ten five-year-old preschool children from a private preschool in Türkiye. Data were collected using pre- and post-interviews before and after an eight-week intervention programme. The findings revealed significant improvements in children's environmental knowledge, particularly regarding recycling and reuse practices. The study further demonstrated that experiential activities combined with family participation strengthened children's environmental attitudes and facilitated the transfer of sustainable behaviours into their everyday lives (Ariman, Tuğba Abanoz, Özgün Çelik, Hortoğlu , & Kartal, 2026).

These studies provide strong empirical evidence that experiential and child-centred pedagogies play a crucial role in environmental education during early childhood. Through activity-based learning, educational drama, STEM-based interventions, nature-oriented experiences, and family involvement, children actively construct environmental knowledge, develop positive attitudes, and gradually internalise sustainable behaviours. These findings highlight that meaningful environmental learning is best achieved when

children learn by doing, exploring, observing, and participating in authentic real-life experiences rather than through direct instruction alone.

2.2.3. Institutional Waste Management Practices and Behaviour Formation

Educational institutions play a vital role in promoting sustainable waste management by creating environments that encourage responsible environmental behaviour. The following studies examine institutional waste management practices, community participation, and behavioural interventions that support environmental sustainability.

The growing challenges associated with solid waste management have highlighted the need for educational institutions to promote responsible waste management practices from an early age. The Central Pollution Control Board, (2023), through its *Annual Report on Municipal Solid Waste Management in India*, assessed the implementation of the Solid Waste Management Rules, 2016 using secondary data obtained from State Pollution Control Boards, Urban Local Bodies, and government agencies. The report revealed a steady increase in municipal solid waste generation across the country and identified persistent gaps in source segregation, recycling, and scientific waste disposal despite improvements in waste processing infrastructure. The report emphasised that long-term sustainability depends not only on technological interventions but also on behavioural change and environmental education among citizens (Central Pollution Control Board, 2023).

The Suchitwa Mission, Suchitwa Mission, (2023), implemented by the Ministry of Housing and Urban Affairs, was designed to strengthen scientific waste management through source segregation, recycling, and citizen participation. Developed through national policy planning and implemented in collaboration with Urban Local Bodies, the programme places considerable emphasis on Information, Education, and Communication (IEC) activities, school participation, and community awareness as mechanisms for cultivating responsible waste management behaviours. The mission recognises that educational institutions serve as important platforms for promoting sustainable environmental practices among children and communities (Suchitwa Mission, 2023).

Within the Kerala context Suchitwa Mission, (2023), examined the implementation of decentralised solid waste management initiatives across the state through programme reports, administrative records, and implementation data obtained from Local Self-

Government Institutions. The report found that decentralised waste management systems, source-level segregation, and community participation substantially improved waste management practices across Kerala. However, it also identified inadequate public awareness, inconsistent waste segregation practices, and implementation gaps at the grassroots level as continuing challenges. The report emphasised the need for sustained behavioural change and environmental education to strengthen waste management systems (Suchitwa Mission, 2023).

The HarithaKeralam, (2021), evaluated integrated environmental conservation and waste management initiatives implemented through Local Self-Government Institutions, educational institutions, Kudumbashree units, and community organisations. Using a participatory implementation approach, the programme demonstrated that coordinated stakeholder collaboration significantly improved environmental awareness, community participation, and sustainable waste management practices. The report further recognised educational institutions as key agents in cultivating environmental responsibility among children through continuous environmental learning (HarithaKeralam, 2021).

More recent evidence from the Kerala Solid Waste Management Project, (2023), highlighted that strengthening source segregation, institutional capacity, behavioural change, and environmental awareness programmes is essential for achieving sustainable waste management across the state. Drawing upon implementation reports, field assessments, and Local Self-Government data, the project identified educational institutions as important settings for promoting responsible environmental practices through early intervention and awareness programmes (KSWMP, 2023). The Hindu, (2023), based on government reports, expert opinions, and field observations, reported that although Kerala has made notable progress through decentralised waste management systems, challenges related to infrastructure, source segregation, public participation, and behavioural practices continue to hinder effective implementation (The Hindu, 2023).

These studies demonstrate that effective waste management extends beyond infrastructure and technological solutions to include institutional commitment, community participation, behavioural change, and continuous environmental education. They consistently highlight educational institutions as critical spaces for developing responsible waste management practices by integrating environmental awareness into everyday institutional culture and fostering collaboration among schools, communities, and local governance institutions.

2.2.4. Policy, Curriculum Integration and Institutional Support

The successful integration of environmental education in early childhood depends not only on classroom practices but also on supportive educational policies, institutional commitment, teacher preparedness, and stakeholder collaboration. The following studies examine the role of policy frameworks, curriculum integration, and institutional support in strengthening environmental education and sustainable practices.

Educational policy plays a crucial role in creating an enabling environment for environmental education. The Ministry of Human Resource Development, (2020), developed through extensive stakeholder consultations and expert committee recommendations, advocates experiential, multidisciplinary, and holistic learning across all stages of education, particularly during Early Childhood Care and Education (ECCE). The policy recommends integrating environmental awareness, cleanliness, and sustainability into foundational learning through play-based and activity-oriented pedagogies (Ministry of Human Resource Development, 2020). The National Curriculum Framework for School Education, (2023), through curriculum review and expert consultations, proposed embedding environmental concepts within everyday classroom experiences, emphasising inquiry-based and experiential learning rather than treating environmental education as a separate subject (NCERT, 2023).

Further strengthening this perspective, Kirmani, Sheikh, & Ahmad's, (2024), examined the alignment between the National Education Policy 2020 and the Sustainable Development Goals through a qualitative policy analysis of policy documents, research articles, books, and government reports. The study found that NEP 2020 provides a strong foundation for promoting sustainability education, experiential learning, and holistic child development. However, the authors highlighted that the successful implementation of environmental education depends upon adequate teacher preparedness, institutional infrastructure, curriculum integration, and continuous policy support (Kirmani, Sheikh, & Ahmad's , 2024).

At the implementation level, national and state-level initiatives have demonstrated the importance of institutional collaboration and stakeholder participation. The Suchitwa Mission, (2023), promotes scientific waste management through Information, Education and Communication (IEC) activities, school participation, and community engagement, recognising educational institutions as important centres for behavioural change (Suchitwa Mission, 2023). The Haritha Keralam Mission (2021) adopted a participatory

implementation model involving Local Self-Government Institutions, educational institutions, Kudumbashree units, and community organisations. The initiative highlighted that coordinated stakeholder participation strengthens environmental awareness, promotes sustainable practices, and encourages environmental responsibility among children and communities (HarithaKeralam, 2021).

The Kerala Solid Waste Management Project, (2023), further reinforced the importance of institutional capacity building by emphasising source segregation, environmental awareness programmes, infrastructure development, and behavioural interventions as essential components of sustainable waste management. Drawing upon programme evaluations and field assessments, the project recognised educational institutions as strategic spaces for introducing environmental education from an early age while stressing the need for stronger institutional support and coordinated policy implementation (KSWMP, 2023). The Suchitwa Mission, (2023), identified that decentralised waste management systems become more effective when supported by public awareness, institutional participation, and continuous environmental education, highlighting the importance of collaboration between schools, local self-government institutions, and the wider community (Suchitwa, 2018).

These studies demonstrate that effective environmental education extends beyond classroom teaching and requires a comprehensive support system comprising educational policies, curriculum integration, teacher preparedness, institutional leadership, infrastructure, and stakeholder collaboration. The literature consistently indicates that creating a supportive institutional and policy environment is essential for integrating structured waste management education into early childhood settings and for ensuring the long-term sustainability of environmental learning initiatives.

2.2.5. Environmental Behaviour Formation in Early Childhood

Environmental responsibility is not developed through isolated lessons but through continuous experiences that shape children's attitudes, habits, and values. The following studies examine how environmental behaviours are formed during early childhood through experiential learning, observation, repetition, family involvement and everyday environmental practices.

Research consistently indicates that early childhood is a critical period for the development of pro-environmental behaviours. UNESCO, (2017) emphasised that Education for

Sustainable Development should cultivate not only environmental knowledge but also values, attitudes and behaviours through participatory and experiential learning. The report argued that environmental responsibility develops gradually when children are actively engaged in meaningful experiences that enable them to understand the relationship between their actions and the environment (UNESCO, 2017).

Supporting this perspective, Ardoin & Alison, (2020), conducted a systematic review of 66 empirical studies involving children from birth to eight years of age to examine the outcomes of Early Childhood Environmental Education programmes. The review found that programmes adopting play-based, nature-rich, and experiential learning approaches significantly enhanced children's environmental literacy while simultaneously promoting social-emotional development, cooperation, problem-solving skills, and environmentally responsible behaviour. The authors concluded that repeated exposure to environmental experiences during early childhood contributes to the long-term development of sustainable attitudes (Ardoin & Alison , 2020).

Mukhlis, Elvira, & Putri Santoso, (2023), explored environmental learning models in early childhood education through a qualitative descriptive study involving teachers and early childhood practitioners. Using interviews, observations, and document analysis, the researchers found that environmental knowledge alone does not necessarily translate into responsible behaviour. Instead, sustainable behaviours are developed when environmental concepts are integrated into children's daily routines through repeated practical experiences, active participation, and meaningful interactions with their surroundings (Mukhlis, Elvira, & Putri Santoso, 2023).

Comparable findings were reported by Poje, Marinić, Stanisavljević, & Dika, (2024), who examined sustainability knowledge and environmental practices among children and teachers in eco-oriented kindergarten settings using questionnaires, classroom observations, and interviews. The study demonstrated that integrating sustainability into everyday classroom activities significantly strengthened children's environmental awareness, responsibility, and sustainable behavioural practices. The authors observed that consistent engagement in environmentally responsible activities enabled children to internalise positive environmental habits from an early age (Poje, Marinić, Stanisavljević, & Dika, 2024).

Recent intervention studies further reinforce the importance of experiential learning in behaviour formation. Abanoz, (2025) evaluated an early STEM-based sustainability programme using a quantitative pre-test and post-test design and found that structured environmental activities substantially improved children's understanding of recycling concepts, although additional efforts were required to strengthen their understanding of reduction and reuse practices (Abanoz, 2025). Ariman et al. (2026) conducted a qualitative case study involving ten preschool children who participated in an eight-week sustainability intervention. Using pre- and post-interviews, the study revealed that practical environmental activities, combined with family participation, significantly enhanced children's waste-related knowledge, environmental attitudes, and the transfer of sustainable behaviours into their everyday lives (Ariman, Tuğba Abanoz, Özgün Çelik, Hortoğlu , & Kartal, 2026).

These studies demonstrate that environmental behaviour is gradually developed through continuous exposure, observation, imitation, repetition, and active participation in meaningful environmental experiences. The literature consistently suggests that environmentally responsible behaviours are more effectively sustained when environmental learning extends beyond classroom instruction and is reinforced through daily practices, family involvement, and supportive educational environments

2.3. Theoretical Framework

2.3.1. Albert Bandura's Social Learning Theory (1977)

Albert Bandura's Social Learning Theory explains that individuals learn behaviour through observation, imitation, and interaction with others within their social environment. This theory is highly relevant in early childhood settings where children tend to learn more from what they see rather than what they are told. In kindergarten environments, teachers and staff act as primary role models, and children continuously observe their behaviours, including how they manage waste, maintain cleanliness, and follow routines. When staff consistently demonstrate proper waste management practices such as using bins, segregating waste, and maintaining a clean environment, children are more likely to imitate these behaviours in their daily activities. The theory also highlights the role of reinforcement, where repeated exposure to positive practices strengthens behavioural adoption. In the context of the present study, this theory helps in understanding how children develop waste management practices through observation of staff behaviour and peer interaction. It emphasizes that children's behaviour is socially constructed within the

institutional environment, making it essential to analyse staff practices as a key influencing factor in promoting sustainable waste management behaviour in kindergarten settings.

2.3.2. Urie Bronfenbrenner's Ecological Systems Theory (1979)

Urie Bronfenbrenner's Ecological Systems Theory explains that human behaviour is influenced by multiple layers of environmental systems, ranging from immediate surroundings to broader societal contexts. The theory identifies different levels such as the microsystem, which includes immediate environments like family and school, the mesosystem, which represents interactions between these settings, and broader systems such as community and cultural influences. In the context of kindergarten settings, children's waste management behaviour is shaped by their daily interactions within the classroom, including relationships with teachers, peers, and the institutional environment. At the same time, external influences such as parental practices, community waste management systems, and government initiatives also play a role in shaping behaviour. This theory is highly relevant to the present study as it helps in understanding waste management as a multi-level process influenced by both internal and external factors. It highlights that behaviour cannot be studied in isolation but must be understood within the context of the environment in which children and staff operate. From the perspective of this study, the theory supports the need to analyse institutional systems, staff behaviour, and external influences together to understand how waste management practices develop and are sustained in kindergarten settings.

2.4. Research Gap Analysis

An overall review of the twenty selected studies, including international research, policy documents, government reports and empirical studies on environmental education and waste management, reveals a growing emphasis on sustainability education, recycling behaviour and environmental awareness among preschool and school-aged children. The reviewed literature employed diverse methodologies, including qualitative studies, mixed-method designs, conceptual analyses, policy reviews and quasi-experimental interventions. Across these studies, common themes emerged, including the significance of experiential learning, activity-based pedagogy, teacher involvement, institutional leadership and early childhood as a critical period for developing environmentally responsible behaviour. Several studies also highlighted the effectiveness of recycling activities, eco-school programmes and sustainability initiatives in promoting positive environmental practices among young learners.

Despite these contributions, the existing literature primarily focuses on children's environmental awareness, sustainability education, or the effectiveness of specific educational interventions, with limited attention to institutional waste management practices within kindergarten settings. In the Indian and Kerala contexts, research has largely examined community-level waste management, decentralised waste management systems and policy implementation, while the role of kindergarten institutions as spaces for environmental behaviour formation remains underexplored. There is a lack of qualitative research examining the experiences of teachers and management representatives in organising waste management practices and facilitating environmental learning through everyday institutional routines. Another significant gap is the absence of studies exploring how existing waste management practices, institutional readiness and experiential pedagogical approaches can collectively support the integration of structured waste management education into early childhood education. Existing research seldom examines waste management as an embedded educational process rather than a technical or environmental issue. The opportunities and challenges associated with curriculum integration, institutional capacity, and stakeholder collaboration have also received limited scholarly attention.

The present study addresses these gaps by adopting a qualitative case study approach to explore the experiences of teachers and management representatives in selected private kindergartens in Thiruvananthapuram City Corporation. By examining existing waste management practices, institutional readiness, experiential teaching approaches, the role of early childhood education in fostering environmental responsibility, and the opportunities and challenges for curriculum integration, the study contributes context-specific evidence that can inform curriculum development, institutional innovation, policy formulation, and social work practice in the field of early childhood environmental education.

CHAPTER 3

METHODOLOGY

CHAPTER 3: METHODOLOGY

3.1.Introduction

Research methodology is a systematic and scientific framework for collecting, analysing, and interpreting data. This provides an outline of the way research has been carried out. Thus, it includes the methods, tools, samples, and research design, which, in turn, help answer specific research questions to address the research problem. Also, research methodology ensures that the research is valid, reliable, and ethical.

The present study explores the waste management practices followed in private kindergartens in Thiruvananthapuram, Kerala. It examines the experiences and perspectives of teachers and management representatives regarding waste management practices and their role in promoting environmental learning among young children.

The chapter provides an overview of the research process and explains the methods adopted to answer the research questions and achieve the objectives of the study.

3.2. Title of Study

“Waste Management Practices of Kindergartens in Thiruvananthapuram, Kerala”

3.3. Research Question

General Research Question

How do waste management practices in private kindergartens support the integration of structured waste management education in early childhood education?

Specific Research Questions

1. What are the existing waste management practices implemented in private kindergarten settings?
2. How do institutional practices support the integration of structured waste management education within kindergarten settings?
3. How do teachers describe their experiences of using experiential and child-centred approaches to promote waste management practices among kindergarten children?
4. How do teachers and management representatives describe the role of early childhood education in fostering environmental responsibility?
5. What opportunities and challenges influence the integration of structured waste management education into kindergarten education?

3.4. Definition of Concepts

3.4.1. Waste Management Practices

Theoretical Definition: “Waste management practices refer to the systematic processes of reducing, segregating, collecting, reusing, recycling, and disposing of waste in an environmentally responsible manner” (UNEP, 2019).

Operational Definition: In this study, waste management practices refer to the everyday strategies, routines, and activities adopted by private kindergartens for handling waste, as understood through the experiences and descriptions of management representatives and teachers during interviews.

3.4.2. Early Childhood Education

Theoretical Definition: “Early childhood education encompasses educational programmes and strategies that promote the holistic development and learning of children from birth to eight years of age” UNESCO (2019).

Operational Definition: In this study, early childhood education refers to educational programmes provided in private kindergarten institutions for children in the age 3-6 yrs, where environmental values and waste management practices are incorporated through child-centred and experiential learning approaches.

3.4.3. Private kindergarten

Theoretical Definition: “Private kindergartens are early childhood educational institutions established and managed by private individuals or organizations rather than the government” (UNESCO, 2005).

Operational Definition: In this study, private kindergartens refer to privately managed institutions providing pre-primary education within Thiruvananthapuram, where waste management practices are explored through the perspectives of management representatives and teachers.

3.4.4. Experiential Learning

Theoretical Definition: “Experiential learning is the process through which knowledge and skills are acquired by engaging in direct experiences, reflection, and active participation” (Kolb, 1984).

Operational Definition: In this study, experiential learning refers to activity-based teaching methods such as waste segregation, recycling activities, teacher modelling, observation, and participation through which environmental concepts are introduced and reinforced in kindergarten settings.

3.4.5. Institutional Readiness

Theoretical Definition: “Organizational readiness for change is defined as the extent to which organizational members are psychologically and behaviorally prepared to implement change successfully” Weiner, B. J. (2009).

Operational Definition: In this study, institutional readiness refers to the availability of supportive policies, infrastructure, teacher involvement, administrative commitment, and educational practices within private kindergartens that facilitate the integration of structured waste management education.

3.4.6. Teachers

Theoretical Definition: “Teachers are educational professionals who facilitate learning and development among children through instructional and interactive processes” (UNESCO, 2015).

Operational Definition: In this study, teachers refer to kindergarten educators who share their experiences and everyday practices related to waste management and environmental learning within the classroom setting.

3.4.7. Waste Management Education

Theoretical Definition: “Waste management education refers to the process of developing knowledge, values, skills, and responsible behaviours related to waste reduction, segregation, reuse, recycling, and environmentally sustainable disposal practices through formal and informal learning experiences” (UNESCO, 2017).

Operational Definition: In this study, waste management education refers to the environmental learning opportunities, institutional initiatives, classroom activities, and everyday practices through which private kindergartens promote waste management concepts and sustainable behaviours among children, as understood and described by

management representatives and teachers through semi-structured interviews.

3.4.8. Institutional Practices

Theoretical Definition: “Institutional practices refer to the established routines, procedures, and organizational activities that guide the functioning of an institution” (Scott, 2014).

Operational Definition: In this study, institutional practices refer to the policies, routines, and daily organizational activities adopted by kindergartens to implement and sustain waste management practices, as described by participants.

3.4.9. Institutional Support

Theoretical Definition: “Institutional support refers to the organizational commitment, resources, leadership, and administrative mechanisms provided to facilitate the implementation of a programme or practice” (Weiner, 2009).

Operational Definition: In this study, institutional support refers to the assistance, infrastructure, leadership initiatives, and administrative efforts provided by kindergarten management to facilitate waste management practices within the institution.

3.4.10. Management Representatives

Theoretical Definition: “Management representatives are individuals who occupy leadership and administrative positions within an organization and are responsible for planning, organizing, directing, coordinating, and supervising organizational activities to achieve institutional goals” (Koontz, Weihrich, & Cannice, 2020).

Operational Definition: In this study, management representatives refer to principals, administrators, or institution heads who provide information regarding institutional policies, administrative practices, and organizational support related to waste management.

3.5. Research Approach

The present study adopts a qualitative research approach to explore waste management practices in kindergarten settings. This approach is suitable for understanding people's experiences, opinions and practices in their natural setting. It helps the researcher explore

a subject in depth and gain a detailed understanding of the issue under study. The study focuses on the waste management practices followed in private kindergartens in Thiruvananthapuram, Kerala. It examines the experiences and perspectives of teachers and management representatives regarding these practices and their role in promoting environmental learning among young children.

A qualitative approach was chosen because the study aims to understand institutional practices rather than measure them through numerical data. It allowed the participants to share their experiences freely and explain their views in detail. This approach also helped the researcher understand the context in which waste management practices are carried out and the factors that influence them within kindergarten institutions.

3.6. Research Design

The present study adopted a case study design. A case study design is suitable for examining a subject within its natural setting. It helps the researcher understand practices, experiences and situations in detail. The study focuses on waste management practices followed in private kindergartens in Thiruvananthapuram, Kerala. It examines how these practices are carried out within the institution and how teachers and management representatives view their role in promoting environmental learning among young children.

The case study design enabled the researcher to collect detailed information from the selected institution and understand the existing practices in their actual context. It also helped identify the factors that support or influence waste management practices in kindergarten settings. The design was selected because it matched the objectives of the study and allowed a detailed examination of the issue from the perspectives of the participants.

3.7. Research Site

The study was conducted in selected private kindergartens located within the Thiruvananthapuram City Corporation area of Kerala. The city was chosen because it has a large number of private kindergarten institutions that follow different educational approaches and have adopted various waste management practices as part of their daily functioning.

The selected institutions provided an appropriate setting to understand how waste management is practised at the kindergarten level and how these practices contribute to

environmental learning among young children. The research site also offered the opportunity to interact with teachers and management representatives who are directly involved in planning and implementing institutional waste management activities. The selection of the research site was based on its relevance to the objectives of the study and the accessibility of participants who could provide detailed information on the phenomenon under investigation.

3.8. Sampling Technique and Sample Size

The present study adopted a non-probability sampling technique, specifically purposive sampling to select the participants. Purposive sampling was considered appropriate as it enabled the researcher to select participants with direct experience and knowledge of the phenomenon under investigation. The study included teachers and management representatives from five selected private kindergartens within the Thiruvananthapuram City Corporation. The institutions were selected based on their relevance to the research objectives, willingness to participate, and permission granted by the management. One management representative and one teacher were selected from each institution, as they were directly involved in the planning, implementation, and supervision of waste management practices. Their experiences and perspectives provided rich, context-specific information, enabling the researcher to gain a comprehensive understanding of institutional waste management practices and their role in promoting environmental learning among young children.

3.8.1. Unit of the Study

The unit of the study comprised five selected private kindergartens located within the Thiruvananthapuram City Corporation area. These institutions were selected to understand the waste management practices followed in kindergarten settings and their role in promoting environmental learning among young children.

3.8.2. Participants

The participants of the study included teachers and management representatives from the selected kindergartens. Two participants were selected from each institution, consisting of one teacher and one management representative. They were chosen because of their involvement in the planning, implementation and supervision of waste management practices within the institution.

3.9. Inclusion- Exclusion Criteria

3.9.1. Inclusion Criteria

- Management representatives (Principals/Administrators/Heads) at least 2 years from selected private kindergartens.
- Teachers with at least 2 years of professional experience.
- Institutions actively implementing waste management or environmental education practices.
- Participants who were available and willing to share their experiences.

3.9.2. Exclusion Criteria

- Teachers working in special schools or institutions for children with special needs.
- Teachers who are retired, resigned, or not currently employed in kindergarten education.
- Teachers with temporary or substitute appointments.
- Government and aided kindergartens, as the study is limited to private kindergartens.

3.10. Sources of Data

The study made use of both primary and secondary sources of data. The combination of these sources helped the researcher obtain a detailed understanding of waste management practices in private kindergartens and supported the achievement of the research objective.

3.10.1. Primary Data

Primary data is the original material that was gathered directly from the source for this particular research study in order to compile first-hand data that is tailored to the study's requirements. Primary data were collected directly from the participants of five private kindergarten of Thiruvananthapuram city corporation through semi-structured interviews. The interviews focused on institutional waste management practices, environmental learning activities, and the participants' experiences and perspectives.

Field notes were also maintained during the data collection process. These notes recorded observations, non-verbal responses, and contextual details that supported the interpretation of the interview data.

3.10.2. Secondary Data

Secondary data were collected from a variety of published and unpublished sources related to the study. These included government reports published by the Central Pollution Control Board (CPCB), the Ministry of Environment, Forest and Climate Change (MoEFCC), UNICEF and the Integrated Child Development Services (ICDS).

Government policy documents, official reports, research articles, newspaper articles, books and other relevant publications were also reviewed. These sources provided background information, theoretical support, and contextual understanding for the study

3.11. Tools for Data Collection

The study used an interview guide and field notes as the tools for data collection. These tools helped the researcher collect detailed information on waste management practices followed in the selected private kindergartens.

3.11.1. Interview Guide

A semi-structured interview guide was prepared by the researcher for collecting primary data from teachers and management representatives. The guide consisted of open-ended questions based on the objectives of the study. It allowed the participants to share their experiences, opinions, and institutional practices in their own words. At the same time, it gave the researcher the flexibility to ask additional questions whenever further clarification was required.

Separate interview guides were prepared for teachers and management representatives to address their respective roles and responsibilities related to waste management practices in the institution.

3.11.2. Field Notes

Field notes were maintained throughout the data collection process. They included observations made during the visits to the selected kindergartens, descriptions of the physical setting, waste management facilities, and other relevant institutional practices. The field notes also recorded non-verbal expressions and contextual details that were not captured during the interviews. These observations helped the researcher understand the interview data within the institutional context.

3.12. Pre- Test

A pre-test was conducted before the main data collection to assess the suitability of the interview guides prepared for the study. The purpose of the pre-test was to examine the clarity, relevance and sequence of the questions and to identify any difficulties that might arise during the interview process.

The pre-test was carried out with one management representative and one teacher from a private kindergarten who were not included in the final sample. The interview with the management representative was conducted to assess the suitability of the interview guide prepared for management participants. Similarly, the interview with the teacher was conducted to assess the suitability of the interview guide prepared for teaching staff. The pre-test helped the researcher determine whether the questions were easy to understand and relevant to the objectives of the study. Based on the responses received minor modifications were made to the wording and order of a few questions to improve clarity and ensure better flow during the interviews.

The pre-test also helped the researcher estimate the time required for each interview and gain familiarity with the data collection process. The participants who took part in the pre-test were excluded from the final study to avoid duplication of data.

3.13. Data Collection Procedure

Data collection was carried out after obtaining permission from the selected private kindergartens. The researcher contacted the management of each institution and explained the purpose and objectives of the study before starting the data collection process. The interviews were conducted with teachers and management representatives from the five selected kindergartens. Two participants were selected from each institution, consisting of one teacher and one management representative. The participants were informed about the objectives of the study and their voluntary participation before the interviews began.

The interviews were conducted individually using a semi-structured interview guide. They were held at a time and place convenient to the participants to ensure a comfortable environment for discussion. Each interview lasted between 30 and 60 minutes. The participants were encouraged to express their views and experiences freely. The interviews were conducted in Malayalam to enable the participants to communicate comfortably. Responses were recorded with the consent of the participants and field notes were maintained throughout the data collection process. The recorded interviews were later transcribed and translated into English for analysis. The information gathered through

interviews and field observations formed the basis for the thematic analysis carried out in the study.

3.14. Data Analysis

The data collected through the semi-structured interviews were analysed using thematic analysis proposed by Braun & Clarke (2006). This method was chosen because it helps identify and organise patterns that emerge from qualitative data. It is widely used to understand participants' experiences, views, and practices. After the completion of data collection, the interviews conducted in Malayalam were transcribed and translated into English. The transcripts were read several times to gain familiarity with the data. Important statements and ideas related to the objectives of the study were identified and coded.

Similar codes were grouped together to form categories. These categories were then reviewed and organised into broader themes based on their common meaning. The themes reflected the waste management practices followed in the selected kindergartens, the experiences of teachers and management representatives, and the role of these practices in promoting environmental learning among young children.

The findings are presented under major themes and sub-themes with relevant verbatim statements from the participants. The themes were interpreted in relation to the objectives of the study and the existing literature to provide a meaningful understanding of the research problem.

3.15. Ethical Considerations

Ethical considerations were given utmost importance throughout the research process to protect the rights, privacy and dignity of the participants. Prior to the commencement of the study permission was obtained from the Department of Social Work and the management of the selected private kindergartens. The purpose, objectives and significance of the study were clearly explained to all participants and informed consent was obtained before conducting the interviews. Participation was entirely voluntary and participants were informed of their right to withdraw from the study at any stage without any obligation or adverse consequences.

Privacy and confidentiality were strictly maintained throughout the study. The identities of both the participants and the institutions were kept anonymous and all information collected during the interviews was used solely for academic purposes. Interview transcripts and field

notes were stored securely and accessed only by the researcher. The interviews were conducted in a respectful, non-judgmental and participant-friendly manner, allowing participants sufficient time to respond and the freedom to decline any question they were uncomfortable answering. The study adhered to the ethical principles of voluntary participation, informed consent, confidentiality, privacy, respect and the protection of participants from any form of harm or inconvenience.

3.16. Assumptions, Limitations, and Scope.

3.16.1. Assumptions of the Study

The study is based on certain assumptions that guide the research process:

- The participants shared their experiences and opinions honestly during the interviews.
- Institutional practices observed during the study period represent routine functioning.
- The information collected through interviews and field observations is sufficient to understand the waste management practices and their educational significance in the selected institutions.

3.16.2. Limitations of the Study

The study is subject to certain limitations:

- The study focused on private kindergarten institutions. Government and aided kindergartens were not included in the research. So, the findings cannot be applied to all types of early childhood educational institutions.
- The research examined existing waste management practices and the experiences of the participants at a particular point in time. It did not assess the long-term impact of these practices on children's environmental behaviour or learning outcomes.
- The findings were based primarily on the **perceptions of management representatives and teachers**, without incorporating the direct perspectives of children.

3.16.3. Scope of the Study

The scope of the study defines the extent and focus of the research:

- The study explores the existing waste management practices followed in selected private kindergartens within the Thiruvananthapuram City Corporation area and examines their educational significance.
- The study focuses on the experiences and perspectives of teachers and management representatives regarding institutional waste management practices, experiential learning approaches and environmental education.
- The study provides insights into the opportunities and challenges associated with integrating structured waste management education into early childhood education, which may support future curriculum development and policy initiatives.
- The findings of the study may be useful for kindergarten management, educators, curriculum developers, policymakers and social work professionals in strengthening environmental education and sustainable waste management practices in early childhood settings.
- The study serves as a foundation for future research on environmental education, institutional waste management practices and behaviour formation among young children in diverse educational settings.

CHAPTER 4

CASE DESCRIPTION

CHAPTER 4: CASE DESCRIPTION

4.1. Introduction

This chapter presents the data collected from teachers and management representatives of selected private kindergartens in Thiruvananthapuram, Kerala. The data were gathered through semi-structured interviews to understand the waste management practices followed in these institutions and their role in promoting environmental learning among young children. The participants shared their experiences and views on waste segregation, disposal practices, environmental activities, institutional support, and the involvement of children in waste management. They also discussed the challenges faced in implementing these practices and their suggestions for strengthening environmental education in kindergarten settings. The responses reflect the practices and experiences of different institutions and provide a detailed understanding of the phenomenon under study.

The data are presented in a narrative form for each participant. Relevant verbatim statements have been included wherever necessary to preserve the originality and meaning of the participants' responses. The descriptions focus on institutional practices, teaching methods, environmental activities, stakeholder participation, and perceptions regarding waste management education.

This chapter is limited to the presentation of data collected during the field study. No interpretation or thematic analysis is carried out at this stage. The information presented here forms the basis for the analysis and discussion provided in the following chapter.

4.2. Demography Details

The study included ten participants from five selected private kindergartens in Thiruvananthapuram City Corporation. Each institution was represented by one management representative and one teacher representative. For representation each kindergarten was assigned a code from KG01 to KG05. The management representatives were coded as KG01-M to KG05-M, and the teacher representatives were coded as KG01-T to KG05-T.

4.2.1. Demographic Details

Sl. No	Participant Code	Designation	Gender	Age	Educational Qualification	Professional Experience
1	KG01-M	Founder/ Principal	Female	55 Years	BA. English, Montessori Diploma and Certificate Programmes	More than 20 years in early childhood education
2	KG02-M	Principal	Female	53 Years	Bachelor's Degree in Literature	More than 20 years in early childhood education, 3 years as Principal
3	KG03-M	Founder/ Principal	Female	45 Years	M.A. Literature, Montessori Diploma	10 years in preschool education, 6 years in administration
4	KG04-M	Founder	Female	40 Years	Graduate, Diploma in Montessori Education, Pursuing MBA.	8 years as Principal in Early Childhood Education Centre.
5	KG05-M	Founder	Male	56 Years	Bachelor's Degree in Economics, Diploma in Early Childhood Education	7 years as Founder/Administrator
6	KG01-T	Teacher	Female	47 Years	B.A., B.Ed.	25 Years of experience in early learning centres, 18 years in UAE and 7 years in India

7	KG02-T	Teacher	Female	40 Years	B.Sc. Natural Science, B.Ed.	3 Years in present institution and worked on LP Sections in North Indian states also.
8	KG03-T	Teacher	Female	30 Years	MBA, Post Graduate Diploma in Montessori Education	3 Years of experience, no previous experience in teaching
9	KG04-T	Teacher	Female	29 Years	M.A. Economics, Diploma in Montessori Education	2 Years of experience, no previous experience in teaching
10	KG05-T	Teacher	Female	32 Years	B.A. Economics, TTC, Montessori Training	5 Years of experience in present institution

4.3.Case Presentation

4.3.1. Participant 1 (KG01-M)

KG01-M is a 55-year-old female who serves as the Founder and Principal of the kindergarten. She holds a Bachelor's degree in English and has completed a Montessori Diploma along with certificate programmes in Montessori education. Having spent more than two decades in the field of early childhood education, she has witnessed significant changes in preschool education and has remained committed to creating learning environments that promote children's independence, responsibility, and holistic development. Her professional journey reflects a deep interest in Montessori philosophy and a strong belief that early childhood is the most important stage for shaping lifelong values and behaviours.

During the interaction the participant recalled that her entry into preschool education was not initially planned. She began her career as the head of another preschool institution where she worked for nearly ten years. That experience exposed her to different approaches

to early childhood education and gradually strengthened her interest in Montessori pedagogy. She explained that she wanted to establish a learning environment where children could learn through exploration rather than instruction and where practical experiences would become an integral part of their daily lives. Speaking about the foundation of the institution, she shared, *"The school was started because I wanted to practise Montessori education in its true sense and create an environment where children could learn naturally."*

The participant described the institution as one that gives equal importance to academic learning, life skills, emotional development and environmental responsibility. According to her, every activity within the school is designed with the intention of helping children to become independent and socially responsible individuals. Rather than separating environmental education from the daily routine, the institution incorporates it into classroom practices, play activities, meal times and interactions with the surrounding environment. She remarked that *"children learn more from what they do every day than from what they are told."* This philosophy has shaped the way waste management is approached within the institution.

While discussing her role as Founder and Principal, KG01-M explained that she oversees academic planning, staff guidance, institutional administration and the implementation of Montessori principles. She regularly observes classroom practices and encourages teachers to maintain consistency in helping children develop good habits. She believes that the learning environment itself functions as a silent teacher and that every aspect of the classroom should encourage responsibility and order. She stated that *"everything in the classroom has a place, and children learn to return every material to its place after use."* According to her, this simple practice not only develops discipline but also introduces children to the idea of caring for shared resources and reducing unnecessary waste.

The participant repeatedly emphasized that waste management should not be viewed as an isolated environmental activity. Instead, she described it as a natural extension of children's daily experiences. Children are encouraged to clean their tables after eating, arrange learning materials properly, dispose of waste in designated containers and maintain the cleanliness of both indoor and outdoor spaces. These activities are not presented as compulsory tasks but as opportunities for children to take responsibility for their surroundings. She explained, *"Waste management is not a separate lesson. It becomes part of the child's everyday routine and daily discipline."*

According to KG01-M, practical life activities form the foundation of environmental learning within the institution. Children participate in activities such as watering plants, wiping tables, arranging shelves, cleaning spills and sorting materials after classroom sessions. She observed that repeated participation in these activities helps children understand the importance of order and cleanliness without requiring formal instruction. The participant noted that *"when children clean the space where they have eaten or worked, they begin to value the effort involved and naturally become more careful."* She believes that these experiences gradually shape children's attitudes towards the environment and influence their behaviour beyond the classroom.

The participant also described how waste generated within the institution is managed systematically. Separate containers are used for different categories of waste, and children are introduced to the practice of placing materials in the appropriate bins with the guidance of teachers. Plastic waste is periodically handed over to the Haritha Karma Sena, while biodegradable waste is managed within the institution through suitable methods. Reusable materials are retained for classroom activities whenever possible. She explained that even simple classroom experiences can become opportunities for environmental learning if teachers consciously involve children in the process.

KG01-M highlighted the importance of experiential learning in early childhood education. She observed that young children imitate the behaviour of adults and peers more readily than they respond to verbal instruction. Therefore, teachers are expected to demonstrate environmentally responsible practices consistently. She stated, *"Children watch us all the time. If we throw something carelessly, they will do the same. If we show responsibility, they follow that too."* This understanding has encouraged the institution to create a culture in which every member of the staff consciously models positive environmental behaviour.

The participant further explained that behaviour formation during the preschool years occurs through repetition and observation. In her experience, children between the ages of two and five acquire habits very quickly when they are given regular opportunities to practise them. She shared that once a few children begin following a routine, others naturally imitate them, making behaviour change a collective process within the classroom. Reflecting on this developmental stage, she remarked, *"The first five years are the easiest years to build habits. If children learn responsibility now, they carry it throughout life."*

The institution also uses nature-based activities to strengthen children's relationship with the environment. Gardening is incorporated into the daily routine, and children are encouraged to care for plants by watering them and observing their growth. The participant believes that giving children responsibility for living things develops empathy and respect for nature. She explained that *"when a child takes care of a plant every day, the child develops a connection with nature that cannot be taught through books."* These activities also provide opportunities to discuss natural resources, cleanliness, and the importance of protecting the environment in ways that are meaningful to young children.

Parental involvement emerged as another important aspect of the participant's narrative. KG01-M explained that children often carry the habits learned in school back to their homes. Parents have informed the institution that children remind family members to switch off lights, keep their surroundings clean, arrange their belongings properly and dispose of waste responsibly. Such feedback reinforces the institution's belief that environmental education introduced during early childhood can influence not only children but also the families with whom they interact. According to the participant, *"Many parents tell us that their children correct them at home. That is when we realise that learning has gone beyond the classroom."*

Despite these positive experiences, the participant acknowledged several challenges. One of the major concerns identified was the lack of continuity between school practices and home environments. While children follow structured routines within the institution, similar practices may not always be reinforced at home. As a result, teachers often need to revisit the same habits after weekends or vacations. The participant also pointed out practical difficulties in managing biodegradable waste during holidays and limitations in infrastructure for processing waste within the institution. Nevertheless, she believed that these challenges should not discourage schools from introducing environmental practices at an early age.

When discussing the future of waste management education, KG01-M strongly advocated for its inclusion within early childhood education. She suggested that simple concepts such as waste segregation, reuse and environmental responsibility should be introduced through practical experiences rather than formal lessons. Colour-coded bins, classroom demonstrations, storytelling and outdoor activities could make these concepts meaningful for young children. She expressed the opinion that *"if segregation becomes a habit in childhood, it will never feel like an extra responsibility in adulthood."*

Towards the end of the interaction, the participant reflected on the broader purpose of education and the responsibility of educational institutions in shaping future citizens. She believed that academic achievement alone cannot prepare children for the future unless it is accompanied by values, responsibility and respect for society and the environment. She observed that everyday routines within the kindergarten provide opportunities to cultivate these qualities in subtle but lasting ways. Concluding the discussion, she stated, *"Teaching children to care for their surroundings is actually teaching them to care for society. The habits they develop now will shape the kind of citizens they become in the future."*

The interaction with KG01-M presented a detailed account of how waste management practices are woven into the daily life of the institution through Montessori principles, practical experiences, and routine participation. The participant consistently described environmental responsibility as an essential part of early childhood education and viewed the kindergarten as a space where simple everyday activities become opportunities for developing habits that may continue throughout life.

4.3.2. Participant 2 (KG02-M)

KG02-M is a 53-year-old female serving as the principal of the kindergarten. She holds a Bachelor's degree in Literature and has more than twenty years of experience in the field of early childhood education, including three years as the principal of the present institution. Her long association with preschool education has enabled her to understand the significance of nurturing positive habits and values during the early years of a child's life. Throughout the interaction, she presented the kindergarten as a space where children learn not only academic concepts but also life skills and social responsibilities through everyday experiences.

The participant explained that her role extends beyond academic administration. She oversees the overall functioning of the institution, supervises teachers, monitors classroom practices and ensures that the learning environment supports the holistic development of children. According to her, every activity within the institution is planned with the intention of promoting independence, discipline, and responsible behaviour. She stated, *"Our focus is not only on academics but also on developing good habits, discipline and values among children from an early age."* This philosophy guides the daily practices followed within the institution and shapes the way environmental education is introduced to children.

While describing the institutional environment, KG02-M explained that the kindergarten follows an activity-oriented approach to learning where children are encouraged to interact with their surroundings through observation and participation. The classrooms and outdoor spaces provide opportunities for experiential learning, enabling children to connect classroom concepts with real-life experiences. She shared that children regularly participate in activities such as observing plants, collecting leaves, identifying different colours and textures found in nature and discussing their observations with teachers. According to the participant, *"These environmental activities help children develop awareness and respect for nature through direct experience."* She believed that such activities create an emotional connection with the environment and gradually foster a sense of responsibility towards nature.

The participant described waste management as an integral component of the institution's daily routine rather than a separate educational programme. Children are encouraged to dispose of waste materials properly after classroom activities and meal times, while teachers consistently reinforce these habits through demonstration and guidance. Waste bins are placed in accessible locations, allowing children to participate actively in maintaining the cleanliness of their classrooms. Although the institution does not currently use colour-coded bins inside every classroom, teachers explain the importance of proper waste disposal and encourage children to use the designated waste containers independently.

KG02-M explained that the institution follows systematic procedures for managing different categories of waste. Plastic waste generated within the school is collected separately and handed over to the Haritha Karma Sena for further processing. Paper waste produced during classroom activities is stored and periodically sent for recycling. The institution also maintains appropriate facilities for the disposal of sanitary waste whenever required. Speaking about these practices, she remarked, *"Plastic waste is handed over to the Haritha Karma Sena, while paper waste is systematically collected and recycled."* She further observed that the institution is continuously exploring ways to strengthen its waste management practices by introducing more child-friendly methods of waste segregation.

The participant repeatedly emphasised that children learn environmental responsibility more effectively through participation than through verbal instruction. According to her, teachers intentionally create situations where children can practise responsible behaviour

in their everyday routines. Birthday celebrations, classroom activities and snack times are used as opportunities to teach proper waste disposal and cleanliness. Teachers first demonstrate the expected behaviour and then encourage children to imitate it until it becomes part of their routine. Reflecting on this process, she stated, *"Teachers first demonstrate the correct behaviour and the children imitate it."* She explained that over time children begin to dispose of waste appropriately without reminders, indicating that the behaviour has become internalised.

During the interview, KG02-M highlighted the importance of repetition in behaviour formation during early childhood. She observed that young children readily imitate adults and peers, making the preschool years an ideal period for developing environmentally responsible habits. According to her, once a behaviour is practised consistently within the classroom, children begin to perform it naturally and often encourage one another to follow the same practice. She believed that environmental responsibility develops gradually through repeated experiences rather than through isolated awareness programmes.

The participant also described several activities that encourage children to understand the value of reuse and conservation. Teachers utilise waste and discarded materials for simple craft activities, enabling children to experience creative reuse in an enjoyable manner. Such activities encourage children to recognise that many materials can serve useful purposes even after their original function has ended. Through these experiences, children begin to appreciate the importance of reducing waste generation while simultaneously developing creativity and problem-solving skills.

Nature-based learning occupies an important place within the institution's educational practices. KG02-M explained that children are frequently taken outdoors to observe plants, flowers, insects and seasonal changes in their surroundings. Teachers use these experiences to initiate conversations about caring for nature and maintaining cleanliness. The participant believed that direct interaction with the environment strengthens children's emotional attachment to nature and makes environmental learning more meaningful than classroom instruction alone.

The interview also revealed the strong role played by teachers in reinforcing environmental values. According to KG02-M, teachers function as role models whose behaviour significantly influences children's actions. She explained that young children carefully

observe the behaviour of adults and tend to imitate whatever they see. Therefore, teachers consciously demonstrate responsible waste disposal, cleanliness and respect for the environment during their daily interactions with children. She observed, *"Teachers are extremely important role models because young children closely observe and imitate their behaviour."* The participant believed that consistency between what teachers say and what they practise is essential for effective environmental education.

As Principal, KG02-M ensures that environmental practices are implemented consistently across the institution through regular monitoring and staff guidance. She explained that teachers and management work together to maintain a clean and organised environment where children feel responsible for their surroundings. In addition to internal supervision, Corporation authorities periodically inspect the institution to assess hygiene and environmental conditions, while the Haritha Karma Sena visits regularly for waste collection. According to the participant, *"Officials from the Corporation regularly inspect the institution to ensure environmental hygiene and proper waste management practices."* She believed that these external monitoring mechanisms encourage institutions to maintain high standards of environmental management.

Parental participation emerged as another important aspect of the participant's narrative. KG02-M explained that parents are regularly advised to send only the amount of food their children can consume in order to minimise food wastage. They are also encouraged to use reusable containers instead of disposable packaging materials whenever possible. The institution maintains regular communication with parents to ensure that environmental practices introduced in school are reinforced at home. She believed that consistent messages from both school and family create stronger and more lasting behavioural change among children.

The participant shared that many parents have reported positive changes in their children's behaviour after joining the institution. Children often remind family members to dispose of waste properly, keep their surroundings clean and avoid littering. Some even encourage adults to adopt environmentally responsible practices at home. Reflecting on these experiences, she remarked, *"Children actively transfer classroom learning into their home environment and even correct adults when necessary."* Such feedback strengthened her belief that environmental education in early childhood has the potential to influence not only individual children but also their families and the wider community.

KG02-M also described innovative programmes organised by the institution to make environmental learning enjoyable. She referred to the celebration of an eco-friendly Holi festival in which children used colourful paper pieces instead of chemical colours and later participated in cleaning the activity area themselves. Through this activity, children experienced both celebration and responsibility in a meaningful way. The participant explained, *"Through this activity, children enjoy the celebration while simultaneously learning responsibility and cleanliness."* She believed that learning experiences become more effective when children actively participate rather than simply observe.

Despite expressing satisfaction with the institution's existing practices, the participant identified challenges that extend beyond the school environment. According to her, one of the major concerns is the persistence of irresponsible waste disposal practices in public spaces despite the availability of waste management facilities. She observed that schools can only create lasting change when families and communities reinforce similar values. She commented, *"The major challenge exists outside the school environment, where people continue to litter despite the availability of waste disposal facilities."* This concern reinforced her conviction that environmental education should begin during the earliest years of formal education so that responsible habits become deeply rooted before undesirable behaviours develop.

Towards the conclusion of the interaction, KG02-M expressed the view that environmental responsibility should become an inseparable part of children's everyday experiences. She believed that simple routines such as proper waste disposal, maintaining cleanliness, caring for nature and participating in reuse activities can gradually shape children's attitudes and behaviours for the future. According to her, meaningful environmental education does not require separate lessons but should emerge naturally through everyday participation, teacher guidance, parental cooperation and institutional commitment. She concluded by expressing confidence that when children learn these values during early childhood, they carry them into their families, communities and later stages of life, contributing to the development of a more environmentally responsible society.

4.3.3. Participant 3 (KG03-M)

KG03-M is a 45-year-old female who serves as the Founder and Principal of the kindergarten. She holds a Master's degree in Literature and a Montessori Diploma and has been associated with preschool education for the past ten years, including six years of

administrative experience. Her professional journey reflects a deep interest in child development and a firm belief that the experiences children receive during their early years play a decisive role in shaping their personality, values and future behaviour. Throughout the interaction, she consistently viewed early childhood education as a process of nurturing responsible and independent individuals rather than merely preparing children for formal schooling.

The participant shared that the institution was established with the vision of creating a child-centred learning environment where children could explore, interact and learn through meaningful experiences. The school follows the Montessori philosophy, which emphasises independence, responsibility and learning through direct participation. According to the participant, the educational approach adopted by the institution is intended to help children become active learners who develop confidence through everyday experiences rather than through rote instruction. She remarked, *"We believe that environmental responsibility should become part of a child's everyday life through simple routines and meaningful experiences rather than being taught only as a separate concept."*

As the Founder and Principal, KG03-M is responsible for academic planning, curriculum implementation, staff supervision, parent communication and the overall administration of the institution. She explained that leadership within the school is based on collaboration, where teachers actively participate in planning and reviewing classroom practices. Regular discussions are organised to reflect on children's learning experiences and identify new ways of improving the educational environment. She believed that every member of the institution contributes to children's holistic development and that collective decision-making strengthens the quality of preschool education. During staff meetings, attention is given not only to academic activities but also to campus cleanliness, waste management, and environmental learning initiatives that can enrich children's daily experiences.

The participant described the physical environment of the institution as an extension of the learning process. The classrooms are organised according to Montessori principles, with materials arranged at children's level so that they can access and return them independently. Every object has a designated place, encouraging children to develop orderliness and responsibility from an early age. She explained that this prepared environment allows children to function independently while gradually learning to care for shared spaces. According to her, maintaining an organised environment itself becomes an educational

experience that promotes discipline and respect for resources. Beyond the classroom, the institution provides indoor activity areas and outdoor learning spaces where children interact with nature through observation and exploration. Children are encouraged to observe plants, insects, seasonal changes and other elements of the natural environment. The participant explained that these experiences help children develop curiosity and emotional attachment towards nature, making environmental responsibility more meaningful. She believed that children who experience nature directly are more likely to develop habits that support environmental conservation.

Waste management within the institution is closely linked with these everyday experiences. KG03-M explained that environmental responsibility is not introduced through separate classroom lessons but through regular routines that become part of children's daily lives. Children are encouraged to dispose of waste in designated bins, clean their workspaces after activities, organise classroom materials, and participate in maintaining a neat environment. These practices are repeated consistently until they become natural habits. She observed that when children participate in such routines from an early age, responsibility develops gradually without external pressure.

The participant further explained that practical life activities form the foundation of environmental education within the institution. Children participate in watering plants, caring for the school environment, arranging learning materials, and cleaning their workspaces after completing activities. Such experiences help them understand that caring for the environment is a shared responsibility rather than the responsibility of adults alone. She noted that these activities are intentionally woven into the daily schedule so that environmental values become part of children's natural experiences rather than abstract concepts.

The institution also conducts activity-based programmes related to environmental conservation throughout the academic year. Children participate in environmental celebrations, nature observation programmes, and creative activities that encourage sustainable thinking. Reusable materials are incorporated into classroom craft activities, allowing children to understand that many objects can have value beyond their original purpose. According to KG03-M, these activities encourage creativity while simultaneously introducing concepts related to reuse and resource conservation.

The participant emphasised that children understand environmental concepts more effectively when they experience them through participation. Rather than expecting young children to memorise environmental messages, the institution provides opportunities for them to practise environmentally responsible behaviour in meaningful contexts. Through repeated participation, children gradually begin to associate cleanliness and proper waste disposal with their everyday routines.

KG03-M explained that the institution follows systematic procedures for managing waste generated within the campus. Food waste and diaper waste are handed over through the authorised waste collection mechanism arranged by the Corporation, ensuring hygienic disposal. The institution also complies with sanitation guidelines prescribed by local authorities and regularly reviews its internal practices to maintain a safe environment for children. She believed that maintaining proper waste management systems is essential not only for environmental reasons but also for protecting children's health and well-being.

While discussing collaboration with external agencies, the participant stated that the institution maintains a positive relationship with the local corporation and authorised waste collection services. Although the present collaboration primarily focuses on waste collection and disposal, she believed there is considerable scope for stronger partnerships in the future. Awareness programmes, demonstrations on waste segregation, composting methods and sustainability workshops organised by local agencies could further strengthen environmental education within preschools. Reflecting on the importance of collective responsibility, she stated, *"Effective waste management is a shared responsibility, and stronger collaboration between educational institutions and local agencies can create an environment where children grow up seeing sustainable practices as a normal part of everyday life."*

The participant repeatedly highlighted the importance of teacher involvement in environmental learning. Teachers are expected to model responsible behaviour through their own actions and create prepared environments that encourage children to function independently. Classroom routines such as cleaning after activities, organising materials and maintaining order are reinforced consistently through observation and repetition. According to KG03-M, children acquire responsibility not through instruction alone but by watching the behaviour demonstrated by adults around them.

Parental involvement was identified as another essential component of environmental education. The participant observed that children come from diverse family backgrounds and the support they receive at home often influences the speed with which positive habits develop. Some children already possess good hygiene and cleanliness practices when they enter preschool, while others require more guidance and repeated exposure. She therefore considered communication between teachers and parents to be an important part of behaviour formation. Parents are encouraged to view environmental education as an aspect of overall character development rather than as an additional learning area. She explained, *"The strongest environmental education happens when children see the same values being practised both at school and at home, because repeated experiences in both settings help those habits last for life."*

Although the participant expressed satisfaction with the institution's existing practices, she also identified several challenges. Scientific disposal of certain categories of waste, particularly diaper waste, requires external support and careful handling. She also pointed out that smaller preschool institutions may face limitations in establishing advanced waste management infrastructure because of financial constraints, limited space and technical requirements. Another challenge identified was the varying level of awareness among parents regarding the importance of environmental education during early childhood. While many parents actively support the institution's efforts, some continue to place greater emphasis on conventional academic learning than on habit formation and environmental responsibility.

Despite these limitations, KG03-M maintained that infrastructure alone cannot create environmentally responsible citizens. She believed that lasting behavioural change begins with repeated experiences and consistent practice. According to her, when children regularly dispose of waste properly, care for their surroundings and use resources responsibly, these actions gradually become part of their personality. She reflected, *"The greatest challenge is not teaching children responsible habits but ensuring that the same values are consistently reinforced by the family, the institution, and the community so that children experience environmental responsibility as a way of life."*

Towards the conclusion of the interaction, the participant expressed the view that environmental education should be recognised as an essential component of holistic child development. She advocated for continuous professional development programmes for

teachers, greater parental awareness, stronger collaboration with local self-government institutions and the creation of child-friendly environmental learning spaces within preschools. Activity-based learning, according to her, should remain the foundation of environmental education because young children understand concepts more effectively through participation than through verbal instruction alone. Summarising her vision, she stated, *"If we want future generations to become environmentally responsible citizens, we must begin during early childhood by creating learning environments where responsible behaviour is experienced, practised, and valued every single day."*

This interaction presented a comprehensive account of how institutional leadership, Montessori philosophy, participatory management, teacher collaboration, parental involvement, and everyday experiences are brought together within the kindergarten to nurture environmental responsibility among young children through consistent practice and meaningful engagement.

4.3.4. Participant 4 (KG04-M)

KG04-M serves as the Founder of the kindergarten and has been associated with the field of early childhood education for the past eight years. She is a graduate with a Diploma in Montessori Education and is currently pursuing an MBA. Her professional journey reflects a strong commitment to creating an educational environment where children develop independence, responsibility and self-discipline through meaningful experiences rather than direct instruction. Throughout the interaction, she consistently emphasised that the primary objective of early childhood education is not merely to prepare children academically but to nurture habits and values that shape their personality and future life.

The participant explained that her decision to establish the institution was influenced by her belief in the Montessori philosophy, which views every child as an active learner capable of developing through exploration and practical experience. According to her, children possess an innate curiosity that should be supported through a carefully prepared environment where they can work independently while receiving gentle guidance from teachers. She observed that education during the early years should focus on helping children become self-reliant individuals who are capable of making responsible choices in their everyday lives.

As the Founder, KG04-M is involved in planning the academic framework of the institution, supervising teachers, monitoring classroom practices and ensuring that Montessori principles are reflected throughout the learning environment. She described her role as one of continuous observation and guidance, where the responsibility of the educator is to create conditions that allow children to learn naturally. Rather than directing every activity, teachers observe children's interests and developmental needs and provide opportunities that encourage exploration and independent learning.

During the discussion, the participant highlighted one of the fundamental principles of Montessori education, namely the importance of maintaining an appropriate child-teacher ratio. She explained that meaningful observation and individual guidance are possible only when the number of children in a classroom remains manageable. According to her, each child develops at a different pace and requires personal attention during the learning process. She remarked, *"The Montessori method works effectively only when the teacher can observe every child carefully and guide them individually. Maintaining the proper child-teacher ratio is therefore very important."* She believed that overcrowded classrooms limit opportunities for observation and reduce the effectiveness of practical learning experiences that are central to Montessori education.

KG04-M further explained that the prepared environment plays an equally significant role in children's development. Every learning material is arranged systematically and placed within the child's reach so that children can independently select, use and return the materials after completing their work. Through these repeated routines, children gradually develop orderliness, concentration, responsibility, and respect for shared resources. According to the participant, the environment itself functions as a silent teacher that continuously encourages positive behaviour without the need for constant verbal instruction.

The participant described Montessori education as a holistic approach that nurtures every dimension of child development. She explained that practical life activities strengthen children's physical coordination, concentration, emotional regulation, confidence and social responsibility. Everyday activities such as folding mats, arranging materials, cleaning workspaces, watering plants and caring for classroom objects are viewed as educational experiences rather than routine chores. She observed that these simple activities prepare children not only for academic learning but also for responsible participation in society.

Reflecting on this philosophy, she stated, *"Children learn responsibility not by listening to instructions but by practising it every day through their own actions."*

While discussing environmental education, KG04-M explained that waste management is naturally integrated into these practical life exercises. Children are encouraged to maintain cleanliness within the classroom, dispose of waste appropriately, organise learning materials after use and care for their immediate surroundings. Rather than introducing waste management as a separate subject, the institution allows children to experience environmental responsibility through repeated participation in daily routines. She believed that when children are actively involved in maintaining their environment, responsible behaviour develops gradually and becomes a part of their personality.

The participant explained that practical life activities provide children with numerous opportunities to understand the value of cleanliness and resource conservation. After completing classroom activities, children independently arrange materials in their designated places, clean their work areas, and ensure that unnecessary waste is not left behind. Through such experiences, they begin to understand that maintaining the environment is a shared responsibility. She observed that these practices are repeated every day until they become habits that children perform naturally without external reminders.

According to KG04-M, one of the greatest strengths of Montessori education lies in its ability to foster independence. Children are encouraged to complete age-appropriate tasks on their own, solve simple problems independently and take responsibility for their belongings and surroundings. She explained that this independence gradually develops into self-confidence and self-discipline, enabling children to make responsible decisions in different situations. She remarked, *"Montessori education helps children develop self-discipline and responsibility through continuous practical experience rather than external enforcement."* In her opinion, these qualities form the foundation for environmentally responsible behaviour later in life.

The participant also discussed the role of observation in behaviour formation. She explained that young children constantly observe the behaviour of teachers and peers and naturally imitate what they see. Therefore, teachers must consistently model responsible practices such as proper waste disposal, careful use of materials and respect for the classroom environment. She believed that children internalise these behaviours more

effectively through observation than through formal instruction. The institution therefore places great importance on ensuring that every adult within the school demonstrates the values that children are expected to develop.

KG04-M highlighted several benefits of Montessori education that extend beyond academic achievement. She observed that children educated through this approach often demonstrate greater concentration, patience, independence, cooperation and responsibility compared to conventional learning environments. Since children are given opportunities to make choices and complete tasks independently, they develop confidence in their own abilities while learning to respect the needs of others. The participant believed that these qualities contribute significantly to the development of environmentally responsible citizens because children learn to care for both themselves and their surroundings.

During the interview, she also reflected on the possibility of extending Montessori principles to other educational settings. According to her, effective environmental education does not necessarily require expensive learning materials or sophisticated infrastructure. Many Montessori principles, particularly those related to practical life education, can be adopted in government schools, Anganwadis, and other preschool settings through simple daily routines. Activities such as organising classroom materials, cleaning shared spaces, watering plants, and practising waste segregation can be incorporated into any educational environment with minimal resources. She observed, *"The philosophy of Montessori education can be implemented even without expensive materials through consistent practical activities and daily routines."*

The participant acknowledged that implementing Montessori education also involves several challenges. One of the major concerns identified was the financial investment required to establish and maintain a prepared environment with specialised learning materials. She explained that many institutions struggle to allocate sufficient resources for quality Montessori education. In addition, the availability of trained Montessori educators remains limited, making it difficult for institutions to implement the philosophy effectively. According to KG04-M, successful Montessori education depends not only on infrastructure but also on teachers who understand child development and possess the patience to guide children through observation rather than direct instruction.

Another challenge identified by the participant relates to parental expectations. She observed that many parents continue to evaluate preschool education primarily in terms of academic outcomes and often underestimate the significance of practical life activities. Cleaning, organising materials, or caring for plants may appear to be ordinary tasks, but within the Montessori framework they serve as important learning experiences that contribute to children's cognitive, emotional and social development. She remarked, *"Financial limitations and limited parental awareness are among the major challenges in implementing Montessori-based environmental education."* She believed that increasing parental awareness would strengthen the continuity between school experiences and home practices.

Throughout the interaction, KG04-M repeatedly emphasised that early childhood represents the most appropriate period for developing environmental responsibility because children at this age are naturally curious, receptive, and eager to imitate positive behaviour. She believed that introducing habits related to cleanliness, waste segregation, and care for the environment during these formative years enables children to carry these practices into later stages of life. In her opinion, environmental education should not depend upon awareness campaigns conducted occasionally but should become part of children's everyday experiences through continuous practice.

Towards the conclusion of the interview, the participant expressed her aspiration that early childhood institutions should place greater emphasis on practical learning experiences that promote responsibility and sustainability. She advocated for teacher training programmes, parental orientation, and institutional policies that encourage environmental education through participation rather than memorisation. She believed that schools should provide opportunities for children to experience responsibility in meaningful ways so that positive habits become deeply rooted during the earliest years of life. Summarising her perspective, she stated, *"Early childhood is the most important stage for cultivating environmental responsibility, and practical learning is the key to creating lifelong positive habits."*

The interaction with KG04-M provided a comprehensive understanding of how Montessori philosophy supports environmental education through individualised learning, practical life activities, prepared environments and consistent behaviour modelling. Her experiences reflected a strong conviction that when children are given opportunities to participate

actively in caring for themselves and their surroundings, environmental responsibility gradually becomes an inseparable part of their everyday life.

4.3.5. Participant 5 (KG05-M)

KG05-M is a 56-year-old male who serves as the Founder of the selected kindergarten. He holds a Bachelor's degree in Economics and a Diploma in Early Childhood Education and has been functioning as the Founder and Administrator of the institution for the past seven years. His interaction reflected a strong belief that preschool education should focus on the overall development of children by nurturing discipline, independence, responsibility and environmental awareness alongside academic learning. Throughout the interview, he repeatedly emphasised that the habits developed during the preschool years lay the foundation for children's future behaviour and social responsibility.

The participant explained that the kindergarten was established with the objective of providing quality early childhood education in a child-friendly environment where children could learn through experience and participation. Before assuming his present role, he had worked as a teacher and later as an academic coordinator in another private preschool, experiences that enabled him to understand both classroom practices and institutional administration. As the Founder and Administrator, he oversees academic planning, staff supervision, parent communication, extracurricular activities, and the overall functioning of the institution. He described leadership within the institution as a collaborative process and remarked, *"A kindergarten functions best when the management, teachers, and parents work together for the overall development of the child."*

According to KG05-M, the institution believes that preschool education should extend beyond classroom instruction and create opportunities for children to develop values that remain with them throughout life. He explained that the school consciously integrates discipline, independence, cleanliness, and environmental responsibility into children's everyday experiences rather than treating them as isolated topics. Reflecting on the philosophy of the institution, he stated, *"Our aim is to build a strong foundation for children by nurturing responsible behaviour, confidence, and respect for their surroundings from an early age."*

While describing the physical environment of the kindergarten, the participant explained that considerable attention has been given to creating a space that supports children's

learning and independence. The classrooms are spacious and arranged in a manner that allows children to access learning materials comfortably without depending on adults. The institution also has an outdoor play area and a small garden where children are encouraged to interact with nature through observation and participation. Nature walks, gardening activities and outdoor group experiences form part of the regular learning process, helping children understand the importance of caring for their surroundings. According to the participant, *"The physical environment itself becomes a teacher because children learn responsibility by interacting with their surroundings every day."*

The participant viewed waste management as an essential component of children's daily routine rather than a separate environmental programme. Dustbins are placed at convenient locations throughout the campus, enabling children to dispose of waste independently after classroom activities and meal times. Teachers consistently guide children to use these facilities properly until the behaviour becomes habitual. He explained that when waste disposal becomes part of children's everyday routine, cleanliness is no longer perceived as an externally imposed rule but develops naturally through practice.

KG05-M explained that the institution has established systems to manage waste generated within the campus efficiently. Separate bins are available for different categories of waste, while plastic waste is regularly handed over to the Haritha Karma Sena for scientific disposal. Paper waste generated during classroom activities is collected separately for recycling, and cleaning materials are readily available to ensure that the campus remains hygienic throughout the day. Visual reminders in the form of simple charts and pictures are displayed in classrooms to reinforce positive environmental behaviour among children. Reflecting on the institution's approach, he observed, *"Waste management becomes effective only when it is practised consistently as part of the daily routine."*

The participant believed that appropriate infrastructure plays an important role in supporting children's behaviour formation. Although he expressed satisfaction with the existing facilities, he suggested that introducing additional child-friendly colour-coded bins and composting facilities would further strengthen children's understanding of waste segregation and environmental responsibility. He remarked, *"Good infrastructure makes it easier for children to develop good habits from an early age."* In his opinion, the physical environment should continuously encourage children to participate in environmentally responsible practices through accessibility and repetition.

According to KG05-M, waste management within the institution is organised through regular classroom routines rather than occasional awareness programmes. Teachers guide children during classroom activities, meal times, and play sessions to ensure that waste is disposed of appropriately. The management regularly observes these practices, discusses them during staff meetings, and identifies areas requiring improvement. The participant believed that consistency is more effective than isolated interventions and explained, *"Continuous observation and daily practice are more effective than occasional awareness programmes."* He considered routine participation to be the key mechanism through which children internalise environmentally responsible behaviour.

The participant also highlighted the significant role played by teachers in sustaining environmental practices within the institution. Teachers receive orientation and regular guidance from the management regarding cleanliness, hygiene and environmental education. Rather than conducting occasional awareness sessions, teachers are encouraged to integrate environmental concepts into children's everyday classroom experiences. According to KG05-M, *"Environmental education should be integrated into daily learning rather than treated as a separate topic."* He believed that children learn more effectively when environmental values become part of their routine activities instead of being presented as theoretical lessons.

The institution also collaborates with external agencies to strengthen its waste management practices. The participant explained that recyclable waste is regularly handed over to the Haritha Karma Sena, while sanitation and hygiene guidelines issued by the Corporation are carefully followed. Health officials occasionally conduct awareness sessions that benefit both teachers and support staff by providing updated information on hygiene and environmental management. Speaking about these partnerships, he remarked, *"Collaboration with local agencies strengthens the institution's environmental practices."* Such collaborations, according to him, contribute to maintaining institutional standards and ensure that the kindergarten remains connected with broader community initiatives.

Parental involvement emerged as another important dimension of the participant's narrative. KG05-M explained that environmental practices are discussed during parent meetings, where families are encouraged to reduce food wastage, use reusable lunch containers, and reinforce at home the habits children learn in school. The institution considers parents as partners in children's development and believes that consistent

messages from both home and school are necessary for lasting behavioural change. He stated, *"Parent-school cooperation is essential for developing lasting environmental habits."*

The participant shared that parents frequently report positive changes in their children's behaviour after joining the institution. Many children remind family members to use dustbins properly, avoid littering, and maintain cleanliness at home. Such experiences have strengthened the institution's conviction that environmental education introduced during early childhood can influence not only children but also their families. Reflecting on these observations, he commented, *"Children often become ambassadors of environmental responsibility within their own families."*

KG05-M further explained that the kindergarten implements several sustainability-oriented activities that encourage children to develop respect for nature through participation. Gardening, nature observation, classroom cleaning and simple reuse activities are regularly organised as part of the learning process. Through these experiences, children understand that caring for the environment is an everyday responsibility rather than an occasional activity. The participant observed, *"Children learn environmental responsibility best through direct participation."* He believed that experiential learning creates stronger and more lasting impressions than verbal instruction alone.

Innovation within the institution is reflected through the use of reusable materials for craft activities and the practice of encouraging children to clean the activity area after completing programmes and celebrations. According to the participant, these simple routines help children appreciate both creativity and responsibility simultaneously. He remarked, *"Every activity should end with children taking responsibility for cleaning their own space."* Such practices, in his opinion, contribute to the gradual development of self-discipline and ownership among children.

When discussing the sustainability of these practices, KG05-M explained that repetition and positive role modelling form the foundation of behaviour formation. Teachers consciously demonstrate environmentally responsible behaviour and children observe and imitate these actions during their daily interactions. As these experiences are repeated consistently, children gradually adopt them as part of their own routine. He reflected, *"Repeated practice and positive modelling create lifelong habits."* This understanding

guides the institution's approach towards environmental education and classroom management.

The participant also explained that although the institution does not maintain a separate written policy on waste management, environmental responsibility is embedded within its organisational culture. Expectations regarding cleanliness and proper waste disposal are communicated to every teacher, support staff member, and child as part of the institution's routine functioning. Environmental considerations are also incorporated into management decisions related to school activities and procurement of materials. According to him, *"Environmental responsibility is part of our institutional culture rather than just a written rule."* He further added, *"Environmental responsibility should be part of every institutional decision,"* emphasising that sustainability should guide institutional planning at every level.

Despite the positive practices followed within the institution, KG05-M identified certain challenges. He explained that maintaining consistency becomes difficult when children observe contradictory behaviours outside the school environment. While children may practise responsible waste disposal within the institution, exposure to littering and irresponsible practices in public spaces can influence their behaviour. Nevertheless, he believed that continued reinforcement within the school and cooperation from families can gradually strengthen positive habits.

Towards the end of the interaction, the participant reiterated his conviction that early childhood education provides the strongest opportunity to nurture environmentally responsible citizens. He believed that children remember actions they perform repeatedly more than instructions they merely hear. Summarising his perspective, he observed, *"Children remember what they practise every day more than what they are simply told."* He expressed hope that educational institutions would continue to strengthen experiential learning approaches so that environmental responsibility becomes an inseparable part of children's everyday lives and contributes to the development of a more sustainable society.

4.3.6. Participant 6 (KG01-T)

KG01-T is a 47-year-old female teacher with a Bachelor of Arts and Bachelor of Education degree and twenty-five years of teaching experience. A significant part of her professional career was spent abroad before she returned to Kerala and continued working in early childhood education. Her extensive teaching experience across different educational

settings has shaped her understanding of child development, classroom management and behaviour formation. Throughout the interaction, she consistently expressed a deep emotional attachment to the teaching profession and viewed her role as extending far beyond academic instruction to include the formation of values and responsible habits among young children.

The participant shared that teaching has always been an integral part of her identity and that she consciously chose to remain in the classroom despite opportunities to undertake administrative responsibilities. She explained that interacting with children gives meaning to her professional life and that the classroom is the place where she feels most fulfilled. Reflecting on her passion for teaching, she remarked, *"Teaching has always been my passion and identity."* She further expressed her emotional connection with children by stating, *"I genuinely love being with children. I feel happy when I hear them. When I do not hear them, I feel that something is missing. I believe I was born to be a teacher, and I cannot imagine leaving the classroom."* These reflections illustrated her commitment to working directly with children and shaping their development through everyday interactions.

While discussing her educational background, KG01-T explained that she completed her teacher education at the Teacher Training Centre in Kumarapuram, Thiruvananthapuram. However, she observed that environmental education and waste management were not included as structured components of the curriculum during her training. Although students participated in campus cleaning activities during occasions such as Gandhi Jayanti, there was little academic discussion on sustainability or scientific waste management. She stated, *"Waste management was not part of our curriculum. There was no structured academic content related to environmental sustainability or waste management."* Even after joining her present institution, she had not participated in any formal training programme related to waste management, relying instead on her own experiences and classroom practices to guide children.

A significant part of the participant's narrative centred on her experience of living and working abroad. She explained that environmental responsibility in those countries was not promoted merely through awareness campaigns but was deeply embedded within everyday life through effective systems and infrastructure. Every household had separate facilities for different categories of waste, and waste collection was carried out systematically by local authorities. According to her, *"The waste management system abroad was highly*

organised. Proper waste segregation facilities were available everywhere." She believed that such an environment itself functioned as an educator because people gradually adopted responsible practices through repeated exposure rather than through formal instruction. Reflecting on this experience, she observed, *"People learned correct practices simply by living in that environment."*

The participant elaborated that the availability of proper infrastructure and strict implementation of regulations contributed significantly to behaviour formation among both children and adults. She recalled that people would rarely dispose of waste carelessly in public spaces because appropriate facilities were easily accessible and littering attracted penalties. She explained, *"Children and adults automatically learned responsible behaviour because the environment encouraged it."* She further added, *"If someone had a piece of waste in their hand, they would keep carrying it until they found a dustbin instead of throwing it on the ground."* According to her, environmental responsibility eventually became part of everyday life because the surrounding system consistently reinforced desirable behaviour.

The participant shared a memorable incident from her experience abroad to illustrate the depth of environmental responsibility among children. She recalled observing a child who continued searching for a proper place to dispose of a small piece of paper and mistakenly attempted to use a fire bucket because of the determination not to litter. She reflected, *"Children would search for a dustbin before disposing of even a small piece of paper. Such habits develop because children grow up in an environment where proper waste disposal is consistently practiced."* This experience strengthened her belief that children's behaviour is strongly influenced by the environment in which they grow and learn.

Drawing from these experiences, KG01-T explained that waste management within her present classroom begins with the development of simple everyday habits. The first concept introduced to children is the importance of disposing of waste properly. Young children may initially throw pencil shavings or eraser pieces on the floor during classroom activities, but teachers patiently guide them towards appropriate practices through demonstration and encouragement. She explained, *"The first lesson we teach is that waste should always be disposed of in the dustbin."* According to her, the presence of accessible waste bins within the classroom enables children to immediately practise what they learn, making behaviour formation a continuous process rather than a theoretical exercise.

The participant strongly believed that young children learn more effectively through observation than through repeated verbal instruction. She explained that teachers consciously model appropriate behaviour because children naturally imitate the actions of adults around them. Once a few children begin following responsible practices, their classmates also adopt similar behaviours through peer influence. Reflecting on her classroom experience, she stated, *"Children learn best through observation and action. Once they see the teacher and a few classmates following good practices, they naturally imitate them. Learning happens through daily experiences rather than continuous verbal reminders."* This understanding guides her approach to behaviour formation within the classroom.

Food waste management emerged as another important aspect of the participant's classroom practices. She explained that children are encouraged to value food and avoid unnecessary wastage. Rather than forcing children to finish their meals, teachers communicate with parents and request them to pack food according to the child's appetite. Positive reinforcement is used to encourage desirable behaviour, with appreciation being given to children who avoid wasting food. She observed, *"We teach children that food should never be wasted."* She further explained, *"When children avoid wasting food, we appreciate them, and this positive reinforcement motivates others to do the same."* Such practices, according to her, gradually help children develop respect for food and responsible consumption habits.

Throughout the interview, KG01-T repeatedly emphasised the influential role of teachers in children's behaviour formation. She believed that teachers spend a substantial amount of time with children and therefore function as primary role models during the preschool years. According to her, *"Teachers are the primary role models. If teachers consistently practice cleanliness and proper waste disposal, children will naturally adopt those habits."* She shared that many parents had informed her that after classroom discussions on cleanliness and organisation, their children began arranging toys properly and maintaining cleanliness at home. Reflecting on these experiences, she remarked, *"This shows the strong influence teachers have on children's behaviour."*

The participant explained that although children are not assigned formal waste management duties, behaviour formation remains an integral part of everyday classroom teaching. Teachers create situations in which children learn responsibility through participation rather than through compulsory assignments. She observed, *"Behaviour formation is an integral*

part of classroom teaching. We create an environment where children understand and practice responsibility on their own." This approach, according to her, encourages children to internalise responsible habits naturally while participating in routine classroom activities.

KG01-T also highlighted the importance of peer influence in shaping children's behaviour. Contrary to the belief that one child with undesirable behaviour can negatively influence an entire class, she explained that positive behaviour often spreads rapidly among preschool children. She stated, *"If a few children consistently practice good habits, the rest of the class usually follows. Positive peer influence is very powerful in shaping behaviour."* She further explained that appreciation, encouragement, and recognition are more effective than punishment in promoting responsible behaviour. For children with developmental challenges, additional demonstrations and guidance may be required, but she maintained that positive reinforcement remains the most effective strategy for all children.

Parental involvement formed another significant part of the participant's narrative. She explained that environmental values introduced in school often extend into children's home environments through everyday interactions. Parents frequently share experiences of children reminding family members not to waste food or litter in public places. According to the participant, *"Parents often tell me that their children remind family members not to waste food or litter. Many children even correct their parents at home after learning these habits in school."* Such experiences strengthened her belief that environmental education during early childhood has the potential to influence families as well as children.

The participant strongly advocated introducing environmental education during the preschool years. She believed that habits developed during early childhood remain with individuals throughout life and contribute to responsible citizenship. Reflecting on the long-term significance of early intervention, she observed, *"It is extremely important. Children who develop environmental responsibility from a young age become responsible citizens in the future. They can even influence society by encouraging others to maintain cleanliness and protect nature."* She viewed environmental education as an investment that benefits not only individual children but also the wider community.

Having experienced educational systems both abroad and in India, KG01-T reflected on the differences she had observed between the two contexts. She noted that many countries maintain cleaner public environments because waste management infrastructure is efficient

and environmental responsibility is consistently reinforced through public systems. In contrast, she expressed concern that many public places in India continue to suffer from poor waste disposal practices despite the country's rich natural environment. She stated, *"The biggest difference is the level of environmental protection. Abroad, public spaces are exceptionally clean, and waste disposal systems are efficient and accessible. This is painful to witness because we have a beautiful environment that deserves better care."* These observations reinforced her belief that environmental responsibility should be supported by both education and public infrastructure.

Towards the end of the interaction, KG01-T emphasised that schools alone cannot achieve lasting behavioural change unless similar opportunities exist within the community. She believed that children require supportive environments beyond the classroom where they can apply the values learned at school. She suggested that adequate public infrastructure, community participation, and social responsibility are essential for sustaining environmentally responsible behaviour. Summarising her perspective, she stated, *"Schools are already teaching children good environmental practices through role modelling and classroom activities. However, children need opportunities to practice these behaviours outside school as well. Environmental education should therefore be strengthened not only in schools but also through community participation and public responsibility."*

The interaction with KG01-T presented a rich account of how classroom experiences, teacher modelling, peer influence, positive reinforcement, parental cooperation, and supportive environments contribute to the development of environmentally responsible behaviour among young children. Her narrative reflected a strong conviction that meaningful environmental education begins with simple daily practices that gradually become lifelong habits and extend beyond the classroom into families and society.

4.3.7. Participant 7 (KG02-T)

KG02-T is a 40-year-old female teacher with a Bachelor's degree in Natural Science and a Bachelor of Education (B.Ed.). She has been working in the present institution for the past three years and has previous teaching experience in schools in Thiruvananthapuram and North India, primarily at the upper primary level. Her transition into kindergarten education provided her with a different perspective on child development, where learning extends beyond academic instruction and focuses on the formation of habits, values and responsible behaviour during the earliest years of life. Throughout the interaction, she demonstrated a

strong conviction that environmental responsibility should be nurtured through everyday experiences rather than through isolated classroom lessons.

The participant explained that her primary responsibility as a kindergarten teacher is to facilitate children's overall development by integrating discipline, cleanliness, responsibility and environmental awareness into their daily routines. She viewed the classroom as an environment where children gradually learn life skills through repeated practice and guidance. Rather than considering waste management as a separate concept, she regarded it as part of children's everyday behaviour that develops naturally through continuous reinforcement. Reflecting on her role, she observed that teachers have the responsibility to help children become independent individuals who are capable of caring for themselves and their surroundings.

While discussing her professional preparation, KG02-T shared that her B.Ed. programme included subjects related to health education, environmental health, pollution, and diseases associated with environmental conditions. She explained that she had not received specialised training focusing specifically on waste management education for young children or on child-friendly methods of introducing waste segregation. Although she had attended awareness programmes organised by the Corporation and Health Department regarding sanitation and environmental hygiene, she believed that her understanding of environmental education had largely developed through practical classroom experience. She remarked, *"Most of my knowledge has been acquired through practical experience and general awareness programmes rather than structured professional training."*

The participant described waste management within the kindergarten as a structured and organised process that differs significantly from waste management practices at home. According to her, the presence of teachers, classroom routines, and continuous supervision creates an environment where children are consistently encouraged to develop responsible habits. Waste baskets are placed inside classrooms and children are guided to dispose of chocolate wrappers, pencil shavings, and other classroom waste immediately after use. She explained that repeated guidance eventually transforms externally guided behaviour into independent action. Reflecting on this gradual process, she stated, *"The most significant change occurs when repeated guidance transforms into a self-directed habit, and children begin disposing of waste responsibly without reminders."*

A recurring theme throughout the participant's narrative was the diversity of children's backgrounds and its influence on behaviour formation. She explained that children enter kindergarten with different experiences and habits shaped by their home environments. Some children are already familiar with cleanliness practices, while others have never been exposed to systematic waste disposal routines. Those who initially throw waste on the floor gradually learn appropriate behaviour through patient explanation, repeated demonstrations and continuous encouragement. According to the participant, *"Continuous encouragement and repetition enable even untrained children to develop responsible waste disposal habits over time."* She expressed satisfaction that almost all children in her Pre-KG and UKG classes eventually adopt these practices through regular reinforcement.

KG02-T believed that kindergarten education should initially focus on developing basic cleanliness habits before introducing more advanced concepts such as waste segregation. She explained that very young children may not immediately understand scientific classifications such as biodegradable and non-biodegradable waste, but they can certainly understand the importance of keeping their surroundings clean and using a dustbin appropriately. In her opinion, these foundational habits create the basis upon which more complex environmental concepts can later be built. She remarked, *"Developing basic habits of cleanliness during early childhood lays the foundation for understanding waste segregation and environmental responsibility in later years."*

The participant further explained that repeated reinforcement forms the core of her teaching approach. Since children's prior experiences vary considerably, she patiently demonstrates proper waste disposal practices and consistently reminds them to use the dustbin until the behaviour becomes habitual. She observed that while many children initially require frequent correction, they gradually begin managing their own waste independently through continuous practice. By the time they reach UKG, most children dispose of waste appropriately without waiting for instructions from teachers. Reflecting on this transformation, she stated, *"Repeated reinforcement during early childhood gradually transforms proper waste disposal into a natural daily habit."*

An important aspect of the participant's classroom practice involves encouraging children to take responsibility for maintaining the cleanliness of their own environment. Whenever children notice paper or waste materials near their desks, they are encouraged to pick them up and place them in the dustbin independently. She shared that children sometimes

voluntarily collect waste near another child's seating area without being instructed to do so. According to her, these simple actions gradually nurture a sense of ownership and responsibility towards shared spaces. She reflected, *"Encouraging children to participate in classroom cleanliness develops responsibility, ownership, and respect for their environment."*

Beyond waste disposal, KG02-T highlighted the role of everyday classroom routines in promoting independence and responsibility among young children. She explained that children are encouraged to remove their shoes before entering the classroom, use separate footwear within different areas of the school, and maintain personal hygiene by using individual towels for handwashing. Such routines gradually help children develop self-discipline and independence while reinforcing the importance of cleanliness in their daily lives. She observed, *"Simple everyday routines play a significant role in nurturing independence, self-discipline, and responsible behaviour among young children."*

According to the participant, environmental education is not confined to formal lessons but is embedded within children's everyday experiences. She believed that when children learn to keep their surroundings clean, organise their belongings, and dispose of waste properly, they are simultaneously learning to respect their environment. Environmental responsibility therefore develops through repeated participation in ordinary activities rather than through theoretical instruction alone. Reflecting on this understanding, she remarked, *"Environmental responsibility develops through everyday practice rather than through theoretical instruction alone."*

KG02-T also described the institutional waste management system followed within the kindergarten. Plastic waste is collected separately and handed over to the Haritha Karma Sena for further processing, while paper waste and other recyclable materials are managed separately. Sanitary waste, including diapers, when necessary, is disposed of safely through the institution's incinerator. She explained that systematic management of different categories of waste helps maintain a hygienic environment while also providing children with opportunities to observe organised environmental practices. According to the participant, *"The institution follows an organised waste management system by ensuring that different categories of waste are disposed of through appropriate methods."*

The participant further explained that the institution receives regular visits from Corporation and Health Department officials who inspect cleanliness and sanitation, particularly before the monsoon season. These visits include guidance on disease prevention and environmental hygiene, reinforcing the institution's existing practices. She believed that such external support contributes positively to maintaining high standards of environmental management within the school. She observed, *"Regular inspections and guidance from the Corporation contribute to maintaining proper environmental hygiene within the school."*

While discussing classroom pedagogy, KG02-T emphasised the effectiveness of activity-based learning methods. Rhymes, action songs, practical demonstrations and simple discussions are frequently used to introduce concepts related to cleanliness and waste management. Children actively participate in these activities, making learning enjoyable and easier to understand. She explained that teachers first demonstrate the desired behaviour before encouraging children to imitate it. Reflecting on this approach, she stated, *"Activity-based learning and demonstration make environmental education more effective for kindergarten children."*

The participant repeatedly stressed the importance of observation and imitation in early childhood learning. In her experience, children learn environmental responsibility primarily by watching the behaviour of adults rather than by listening to verbal explanations. When teachers consistently practise proper waste disposal and maintain cleanliness, children naturally imitate these actions and gradually internalise them as part of their own routine. She remarked, *"Children learn environmental responsibility primarily through observation and imitation rather than through verbal instruction alone."* This understanding forms the basis of her classroom teaching practices.

KG02-T believed that introducing environmental values during early childhood has long-term benefits that extend far beyond the classroom. She explained that young children deeply respect and trust their teachers, making them highly receptive to positive behavioural guidance. Habits developed during kindergarten often continue into later stages of education and adulthood while also influencing family practices. Reflecting on the significance of early intervention, she observed, *"Early childhood is the most effective stage for developing lifelong habits related to cleanliness and environmental responsibility."*

Parental cooperation emerged as another important dimension of the participant's narrative. She explained that parents are encouraged to send only the quantity of food their children can comfortably consume to reduce unnecessary food waste and to use reusable containers whenever possible. Many parents have shared that their children remind family members to use dustbins properly, keep their surroundings clean, and organise household belongings neatly after learning these practices in school. According to KG02-T, *"Children often become positive agents of change by transferring the environmental practices learned at school to their families."* She believed that such continuity between school and home strengthens behaviour formation significantly.

Throughout the interaction, the participant consistently described teachers as powerful role models in children's lives. She explained that children closely observe every action performed by adults and naturally imitate those behaviours. Therefore, teachers must consciously demonstrate the values they expect children to practise by maintaining cleanliness, disposing of waste responsibly, and caring for the classroom environment. She reflected, *"Teachers should model the values they expect children to practise because children imitate actions more readily than instructions."* In her opinion, genuine behaviour modelling is more effective than repeated verbal instruction in developing environmental responsibility among young children.

When discussing challenges, KG02-T identified differences in children's home environments as the primary obstacle to consistent behaviour formation. Some children arrive at school already possessing positive environmental habits, while others require sustained guidance and encouragement. Nevertheless, she remained optimistic that patience and repeated practice enable nearly all children to develop responsible behaviour over time. Rather than using punishment, she advocated gentle correction, positive reinforcement, and continuous demonstration as effective teaching strategies.

Towards the conclusion of the interview, KG02-T strongly advocated introducing environmental education during the kindergarten stage itself. She believed that activity-based learning, teacher role modelling, parental cooperation, and adequate institutional facilities together create the most effective environment for nurturing environmental responsibility. She also suggested that schools should receive better waste management infrastructure and teachers should have access to specialised practical training related to early childhood environmental education. Summarising her perspective, she stated,

"Environmental responsibility develops most effectively when children repeatedly practise positive behaviours in their daily lives under the guidance of teachers and parents."

The interaction with KG02-T presented a comprehensive understanding of how continuous guidance, experiential learning, teacher role modelling, parent-school collaboration, and supportive institutional practices contribute to the development of environmental responsibility among kindergarten children. Her narrative reflected the belief that simple habits introduced through daily routines during early childhood gradually evolve into lifelong values that shape responsible individuals and environmentally conscious communities.

4.3.8. Participant 8 (KG03-T)

KG03-T is a 30-year-old female teacher with a Master's degree in Business Administration and a Post Graduate Diploma in Montessori Education. Before entering the field of early childhood education, she worked in the corporate sector with organisations including Reliance and Jain University. Despite having a promising corporate career, she chose to pursue teaching because of her deep interest in working with young children. She explained that her passion for early childhood education motivated her to undertake Montessori training and eventually become a preschool teacher. At present, she has three years of experience in preschool education and is actively involved in facilitating children's learning through the Montessori approach. Throughout the interaction, she consistently reflected the belief that meaningful education begins with experience and that lifelong habits are formed during the earliest years of childhood.

The participant described Happiness Place School as a newly established preschool that follows the Montessori philosophy of education. According to her, one of the institution's strengths is its emphasis on maintaining a low teacher-child ratio, allowing every child to receive individual attention and guidance. She believed that personalised interaction enables teachers to understand children's developmental needs more effectively and create opportunities for holistic growth. Reflecting on the educational philosophy of the institution, she remarked, *"Maintaining a low teacher-child ratio enables us to provide personalised attention and support each child's overall development."* She viewed this individualised approach as essential for nurturing independence, responsibility, and positive behavioural habits among young learners.

While discussing her professional preparation, KG03-T explained that her Post Graduate Diploma in Montessori Education included subjects related to school management, practical life education, and environmental awareness. Unlike conventional teacher education programmes that rely heavily on theoretical instruction, Montessori training emphasised learning through direct experience and practical engagement. Children are introduced to activities such as watering plants, planting saplings, caring for nature and disposing of waste properly as part of their daily learning experiences. She reflected, *"Montessori education emphasises hands-on learning, where children develop environmental responsibility through practical daily activities rather than theoretical instruction."* According to the participant, these experiences enable children to internalise environmental values naturally without feeling that they are being formally taught.

The participant viewed waste management in a kindergarten setting as much more than the disposal of waste materials. In her understanding, it is fundamentally a process of behaviour formation that helps children develop responsibility towards themselves and their surroundings. She explained that children gradually learn to care for their environment by cleaning up after themselves, organising classroom materials, disposing of waste properly and maintaining order within their learning space. Such experiences become integrated into their daily routine and eventually shape their behaviour beyond the classroom. Reflecting on this perspective, she observed, *"Waste management is essentially habit formation through practical daily experiences."*

KG03-T explained that the major categories of waste generated within the preschool include diaper waste, food waste, paper waste from classroom activities and natural materials such as leaves collected during nature-based learning experiences. The institution follows a systematic waste management process in which diaper waste is collected separately and handed over to authorised waste collection personnel through the Corporation. Food waste is also collected through the local waste management system, while biodegradable natural materials require minimal intervention because they naturally decompose. According to her, *"The major waste generated in our preschool includes diaper waste, food waste, and paper waste, all of which are managed through systematic waste collection mechanisms."* She believed that the presence of organised waste management systems within the institution creates an environment where children observe responsible environmental practices as part of their everyday experiences.

Throughout the interview, the participant strongly emphasised the significance of introducing environmental education during early childhood. She explained that the Montessori method differs from traditional education because it does not rely on memorisation or direct instruction. Instead, children learn naturally through participation, observation, and repeated engagement with carefully designed activities. She drew parallels between environmental education and other Montessori learning experiences, explaining that just as children develop writing skills through preparatory exercises before holding a pencil, environmental responsibility is cultivated gradually through practical life activities. Reflecting on this approach, she remarked, *"Children learn naturally through experience and hands-on activities rather than through direct instruction or memorisation."*

According to KG03-T, environmental concepts are integrated into children's daily routine through practical life exercises rather than being presented as isolated lessons. Activities such as watering plants, planting saplings, caring for nature and disposing of waste in designated bins form part of children's everyday classroom experiences. These activities encourage children to participate actively in maintaining their environment and gradually develop a sense of ownership and responsibility towards nature. She observed, *"Practical life activities help children develop environmental responsibility naturally as part of their daily routine."* In her opinion, such repeated experiences are far more effective than conventional classroom explanations in shaping long-term behaviour.

The participant described several environmental activities organised within the institution to strengthen children's understanding of sustainability and conservation. Reduce, Reuse, and Recycle concepts are introduced through simple craft activities using reusable materials, enabling children to explore creativity while understanding the value of resource conservation. The school also celebrates occasions such as World Environment Day and Ocean Day through activity-based programmes designed specifically for young learners. One activity described by the participant involved creating a model ocean using blue-coloured water, aquatic animals and pieces of plastic waste. Children used tongs to remove the plastic waste and place it in the dustbin, thereby learning that plastic pollution harms marine life and that proper waste disposal protects the environment. Reflecting on this experience, she remarked, *"Activity-oriented learning helps children understand environmental conservation much more effectively than classroom explanations."*

KG03-T observed that although preschool children may not immediately understand every environmental concept, repeated participation gradually transforms these experiences into meaningful habits. Through activities involving paper tearing, craft work, recycling projects and classroom cleaning, children begin associating environmental responsibility with everyday life. According to her, *"Even if children do not fully understand the concept initially, repeated participation helps environmental values gradually become part of their behaviour."* She believed that the objective of early childhood environmental education is not to impart scientific knowledge but to nurture positive habits that can later support deeper environmental understanding.

The participant repeatedly emphasised that early childhood is the ideal period for introducing waste management practices because this is the stage when lifelong habits are formed. She explained that many children initially throw waste carelessly simply because they have never been taught proper disposal practices. However, after repeated guidance, they naturally begin picking up waste and placing it in the dustbin without reminders. Children are also encouraged to arrange and clean their own toys after play instead of depending on adults to perform these tasks. Reflecting on the importance of early intervention, she stated, *"Habits developed during early childhood remain throughout life, making this the ideal stage to introduce waste management practices."*

Teacher role modelling emerged as one of the central themes throughout the participant's narrative. KG03-T explained that preschool children possess what Montessori education describes as an "absorbent mind" and naturally imitate the behaviour of adults around them. She shared that even songs taught during a summer camp continued to be sung by children several months later, demonstrating their remarkable capacity for observation and imitation. According to her, *"Children in this age group have an absorbent mind and quickly imitate the behaviour and actions of adults around them."* This understanding influences her own classroom practice, where she consciously models responsible behaviour for children to observe and imitate.

The participant illustrated this process with a simple classroom example. If a teacher ignores a piece of waste lying on the floor, children are likely to do the same. However, when the teacher immediately picks up the waste and disposes of it properly, children instinctively imitate the behaviour. Similarly, teachers first demonstrate classroom cleaning activities before encouraging children to participate independently. Over time, children

begin cleaning their own spaces while singing classroom clean-up songs without requiring further instruction. She reflected, *"When teachers consistently model positive environmental behaviour, children naturally imitate and adopt those same habits."*

According to KG03-T, repetition is one of the most important principles within Montessori education. Children are never forced to perform activities but are provided with prepared environments that encourage exploration and repeated practice. Initially, children may continue playing without paying attention to environmental routines, but after repeatedly observing the same behaviour, they gradually begin participating voluntarily. She explained, *"Daily repetition and consistent role modelling help transform simple classroom activities into permanent behavioural habits."* In her opinion, this process of observation, imitation, and repetition forms the foundation of lifelong environmental responsibility.

The participant also highlighted the strong institutional support provided by the management in maintaining cleanliness and environmental responsibility. The principal places great importance on ensuring that classrooms remain organised and hygienic at all times, while support staff regularly maintain different areas of the campus, including small facilities such as the fish pond. This systematic approach creates an environment where cleanliness becomes a shared institutional value rather than an individual responsibility. She remarked, *"Strong management support and emphasis on cleanliness create an environment where environmental responsibility becomes part of everyday school life."*

While discussing teacher development, KG03-T expressed the view that continuous practice is more valuable than one-time training programmes. Most teachers already understand the importance of cleanliness and waste management, but environmental education becomes meaningful only when these behaviours are consistently incorporated into everyday classroom routines. Children may not immediately respond to instructions, but through repeated observation they gradually adopt the same practices independently. According to her, *"Environmental habits are developed through daily routine and repetition rather than through one-time instruction."* She believed that teachers should consciously integrate environmental practices into children's daily experiences instead of treating them as occasional lessons.

Parental cooperation formed another important aspect of the participant's narrative. She explained that most parents willingly follow the school's recommendations regarding

healthy and environmentally sustainable practices. Many families avoid unnecessary plastic items and send children's meals in steel lunch boxes, reflecting increasing awareness of both health and environmental concerns. She also observed that family background significantly influences children's behaviour. Some children arrive at school already practising hygiene habits such as washing their hands before meals, while others require repeated guidance because such practices are absent at home. Reflecting on this difference, she stated, *"Family background plays a crucial role in developing children's cleanliness and environmental habits, and schools often have to reinforce behaviours that are not practised at home."*

The participant strongly believed that parents should also receive awareness programmes related to hygiene and waste management because children's behaviour develops through the combined influence of home and school environments. The institution regularly advises parents regarding healthy food habits, personal hygiene, and environmental responsibility. According to KG03-T, *"Parental awareness is equally important because children learn many lifelong habits from their home environment."* She believed that consistency between school practices and family routines significantly strengthens children's behavioural development.

Towards the conclusion of the interview, KG03-T emphasised that activity-based learning represents the most effective method for teaching environmental responsibility to young children. She suggested that kindergartens should organise colour-coded waste segregation activities, recycling games, Reduce-Reuse-Recycle projects and nature-based learning experiences that encourage children to participate actively rather than listen passively. Environmental celebrations should become opportunities for meaningful experiential learning instead of isolated events. Reflecting on her educational philosophy, she observed, *"Children learn more effectively by doing than by listening, making activity-based learning the best approach for environmental education."*

The participant also advocated a collaborative approach involving schools, families, teachers, local authorities, and government agencies in strengthening environmental education. She believed that educational institutions should receive appropriate waste management infrastructure, structured guidelines, and continuous support while teachers should have opportunities for ongoing professional orientation in scientific waste management practices. Summarising her perspective, she remarked, *"When schools,*

families, and society work together to cultivate environmental responsibility from an early age, children grow into environmentally conscious and responsible citizens."

The interaction with KG03-T presented a detailed understanding of how Montessori philosophy, experiential learning, teacher role modelling, institutional support, parental collaboration, and activity-based pedagogy collectively contribute to the development of environmental responsibility among young children. Her narrative consistently reflected the belief that simple experiences repeated every day during early childhood gradually become lifelong habits that extend beyond the classroom into children's homes and communities.

4.3.9. Participant 9 (KG04-T)

KG04-T is a 29-year-old female teacher with a Master's degree in Economics and two years of teaching experience in early childhood education. Although she has not yet completed formal Montessori training, she is currently planning to pursue a Diploma in Montessori Education to strengthen her understanding of child-centred pedagogy and professional practice. Her transition into preschool education followed a period of preparation for competitive examinations, after which she chose to enter the teaching profession. Throughout the interaction, she reflected a strong commitment to children's holistic development and demonstrated a clear belief that the kindergarten years provide the ideal foundation for cultivating lifelong habits, values, and environmental responsibility.

As a classroom teacher, KG04-T explained that her responsibilities extend beyond academic instruction to include nurturing children's discipline, independence, cleanliness and social behaviour through everyday classroom experiences. She viewed the classroom as a space where learning takes place through participation rather than passive instruction and believed that teachers have an important role in shaping children's attitudes through their daily interactions. According to her, *"My primary responsibility is teaching the children and supporting their overall development. Along with academic learning, I help them develop good habits, discipline, and independence through daily classroom activities."*

The participant explained that although she had not undergone formal Montessori training before joining the institution, the management provided her with an intensive two-month in-house orientation programme. During this period, she received practical guidance on

understanding children's behaviour, classroom organisation, behaviour management and Montessori teaching methods. The orientation also introduced her to the institution's waste management practices and the importance of experiential learning in early childhood education. Reflecting on this experience, she observed, *"Practical in-house training helped me understand how to teach environmental responsibility through experience-based learning rather than theoretical instruction alone."* She believed that this training enabled her to adapt successfully to the Montessori philosophy despite the absence of formal certification.

While describing the waste management practices followed within the institution, KG04-T explained that the kindergarten maintains a structured system through collaboration with the Haritha Kerala Mission. Recyclable materials such as paper and plastic are collected separately and handed over to the authorised collection agency during scheduled visits. Food waste generated within the school is disposed of using a designated disposal pit inside the campus. Diapers and other sanitary waste are not disposed of within the institution because of the absence of an incineration facility and concerns regarding children's health. Instead, such waste is sent back home with the child. According to the participant, *"Food waste is disposed of within the institution, while recyclable waste such as plastic and paper is managed through authorised collection agencies."*

The participant viewed waste management as an integral part of children's daily learning experiences rather than a separate educational activity. She explained that the Montessori approach encourages children to learn through practice, observation and participation. Whenever children notice waste materials in the classroom or campus, they are encouraged to pick them up independently and place them in the dustbin. Teachers intentionally create opportunities for children to perform these simple tasks so that responsibility develops through repeated experience. Reflecting on this approach, she stated, *"Children learn waste management most effectively when they actively practise the behaviour themselves rather than simply listening to instructions."*

According to KG04-T, repeated participation is essential for transforming environmental practices into everyday habits. She explained that the objective of the institution is not simply to teach children about waste disposal but to help them develop responsibility, independence, and cleanliness as part of their daily lifestyle. Through consistent opportunities to practise these behaviours, children gradually begin performing them

naturally without external reminders. She remarked, *"Repeated practical experience transforms environmental practices into lifelong habits among young children."*

An important aspect of the participant's narrative was the emphasis placed on self-learning within the Montessori approach. Children are encouraged to perform tasks independently using child-friendly materials designed for their developmental stage. KG04-T explained that self-cleaning activities have recently been introduced within the institution, where children use small brushes and dustpans to clean their own spaces after completing activities. These experiences help children understand that maintaining cleanliness is a shared responsibility rather than a task performed only by adults. She believed that such practical exercises contribute significantly to the development of independence and self-confidence.

The participant observed that young children possess remarkable observation skills and often learn environmental practices more quickly than adults. In her experience, demonstrating an activity two or three times is usually sufficient for children to understand and imitate it. Even children who initially find it difficult gradually learn by observing older classmates, particularly those in the UKG section. She explained, *"Young children possess strong observation skills and learn quickly through repeated demonstration and imitation."* According to her, peer learning plays an important role in reinforcing environmental behaviour within the classroom.

KG04-T repeatedly highlighted the importance of teacher role modelling in behaviour formation. She explained that teachers and support staff consciously practise proper waste disposal and cleanliness because children carefully observe adult behaviour. The institution follows a simple principle that whenever waste is noticed, the responsible person should ensure that it is cleaned immediately. Teachers consistently demonstrate these practices, and children gradually imitate them in their own daily routines. Reflecting on this process, she observed, *"Teachers and staff act as role models, and children learn environmental responsibility by observing their behaviour."*

While discussing waste segregation, the participant explained that children currently use a common dustbin within the classroom, and the actual segregation of waste is carried out later by caretakers and staff members. She acknowledged that formal waste segregation has not yet been introduced directly to children but believed that they possess the ability to

understand the concept when presented appropriately. Drawing upon Montessori teaching practices, she explained that children already participate in sorting activities involving colours and objects, making colour-coded waste segregation a feasible extension of their existing learning experiences. She stated, *"Colour-coded waste bins can make waste segregation easier and more meaningful for kindergarten children."* In her opinion, introducing colour-coded bins would enable children to associate different categories of waste with visual cues and develop segregation habits naturally through repetition.

Although the institution currently focuses on developing basic cleanliness habits, KG04-T explained that it does not conduct structured recycling activities involving children. She believed that complex recycling concepts may not be developmentally appropriate for very young learners and would require substantial parental involvement. Instead, the institution prioritises simple habits such as proper waste disposal, self-cleaning and maintaining cleanliness within the classroom. According to the participant, *"At the kindergarten level, developing basic environmental habits is more effective than introducing complex recycling activities."* She believed that once these foundational habits are established, more advanced environmental concepts can be introduced during later stages of education.

Environmental awareness within the institution is further strengthened through activity-based programmes conducted during occasions such as World Environment Day and other environmental observances. KG04-T explained that children participate in role plays, skits, and classroom activities that communicate environmental messages in simple and enjoyable ways. These programmes are organised over several days, allowing children repeated exposure to the concepts through active participation. Reflecting on these initiatives, she remarked, *"Role plays and activity-based learning help young children understand environmental concepts in an engaging and meaningful way."* She believed that children remember experiences they actively participate in more effectively than concepts presented only through verbal explanation.

The participant also highlighted the transfer of classroom learning into children's home environments. Parents frequently report that children continue habits introduced in school, such as arranging books neatly, maintaining cleanliness, and organising personal belongings independently. Older kindergarten children, particularly those in UKG, often demonstrate stronger transfer of learning and influence the behaviour of younger siblings at home. According to KG04-T, *"Children actively transfer the positive habits learned in*

school to their home environment through observation and repeated practice." Such feedback reinforces the institution's confidence in the effectiveness of experiential learning approaches.

Throughout the interaction, KG04-T acknowledged the important role played by the management in sustaining environmental practices. She explained that the principal continuously monitors the implementation of waste management procedures and ensures that teachers, caretakers, and support staff fulfil their respective responsibilities. The institution also recognises staff members who consistently maintain cleanliness and follow prescribed practices, thereby creating a culture of accountability and appreciation. She remarked, *"Strong leadership and continuous monitoring by the management play a vital role in maintaining effective waste management practices within the institution."* The participant believed that institutional commitment provides the foundation upon which successful environmental education is built.

Parental involvement emerged as another significant aspect of the participant's narrative. She explained that teachers maintain regular communication with parents regarding children's classroom activities and encourage them to observe whether environmental habits continue at home. The institution plans to share videos of self-cleaning activities with parents so that similar practices can be reinforced within the family environment. According to the participant, *"Collaboration between parents and the school is essential for sustaining children's environmental habits beyond the classroom."* She believed that when children receive consistent guidance from both teachers and parents, environmental responsibility becomes a natural part of their everyday behaviour.

Interestingly, KG04-T considered parents to have an even greater influence than teachers because children spend most of their time at home and share a strong emotional bond with their families. She explained that children naturally imitate the behaviour they observe in their parents, making family practices crucial for long-term behaviour formation. However, she also recognised that busy lifestyles often prevent some parents from consistently reinforcing these habits. She reflected, *"Parents play a crucial role in shaping children's environmental habits, as children spend more time observing them at home."* This observation highlighted the importance of continuity between school and home in achieving lasting behavioural change.

The participant strongly advocated introducing waste management education from the earliest years of schooling. She disagreed with the common perception that kindergarten children are too young to understand environmental concepts and instead argued that young children possess exceptional observation and learning abilities. In her experience, habits introduced during early childhood become deeply embedded in children's personalities and continue throughout life. She therefore supported extending Montessori-inspired practical learning methods to government schools and Anganwadis as well. Reflecting on this view, she stated, *"The earlier environmental habits are introduced, the more naturally they become lifelong behaviours."*

Towards the conclusion of the interaction, KG04-T emphasised that meaningful environmental education depends upon practical participation, teacher demonstration, parental reinforcement, and consistent opportunities for children to practise responsible behaviour. She advocated the introduction of colour-coded bins, simple waste segregation activities, and experience-based learning approaches that enable children to understand environmental responsibility through action rather than theory. Summarising her perspective, she observed, *"Early practical learning, continuous reinforcement by teachers and parents, and experience-based education are the most effective ways to develop lifelong environmental responsibility among children."*

The interaction with KG04-T provided a detailed account of how Montessori principles, activity-based learning, teacher role modelling, institutional support, and parent-school collaboration contribute to the development of environmental responsibility among young children. Her narrative consistently reflected the belief that when children are given opportunities to experience responsible behaviour through everyday practice, these actions gradually become enduring habits that extend beyond the classroom into their homes and communities.

4.3.10. Participant 10 (KG05-T)

KG05-T is a female kindergarten teacher who holds a Bachelor of Arts in Economics, a Teacher Training Certificate (TTC), and a Diploma in Desktop Publishing (DTP). She has also received training in the traditional Montessori method, which has provided her with a strong understanding of child development, behaviour formation and classroom management. Throughout the interaction, she consistently emphasised that the purpose of Montessori education is to nurture independent, disciplined and responsible individuals

through practical experiences rather than through direct instruction. She viewed early childhood as the most appropriate stage for developing positive habits that remain with children throughout their lives.

The participant explained that her primary responsibility as a kindergarten teacher is to guide children in becoming self-reliant by encouraging them to perform everyday activities independently. According to her, Montessori education differs from conventional teaching because children are not expected to learn merely by listening to instructions. Instead, teachers demonstrate activities, observe children's responses, and provide opportunities for repeated practice until the desired behaviour develops naturally. Reflecting on the philosophy of Montessori education, she remarked, *"The essence of Montessori education is allowing children to perform tasks independently so that positive behaviour develops naturally through practice."*

While discussing the Montessori method, KG05-T highlighted the importance of specially designed learning materials that support children's practical and sensory development. She explained that these materials encourage children to interact directly with their environment and learn through experience rather than memorisation. She also pointed out that the specialised nature and high cost of Montessori materials limit their availability mainly to Montessori institutions. Despite this limitation, she believed that the philosophy underlying these materials could be adapted in other educational settings through practical demonstrations and repeated classroom activities.

A major part of the participant's narrative centred on the Exercise of Practical Life (EPL), which she described as the foundation of Montessori education. According to her, children participate in everyday activities such as folding handkerchiefs, buttoning clothes, pouring water, sweeping with a broom and dustpan, arranging materials, and maintaining order within the classroom. These activities strengthen coordination, concentration, discipline, responsibility and independence while preparing children for later academic learning. She explained that the purpose of these exercises extends beyond skill development and contributes significantly to character formation. Reflecting on their importance, she stated, *"Exercise of Practical Life forms the foundation for developing discipline, responsibility, and independent behaviour in young children."*

The participant explained that waste management is not introduced as an independent subject within Montessori education but is naturally incorporated into practical life activities. Children become familiar with cleaning materials such as brooms, dustpans, and waste bins through classroom demonstrations. Teachers first present the correct method of using these materials, after which children gradually repeat the same activities independently. According to KG05-T, environmental responsibility develops through these everyday practical experiences rather than through theoretical lessons. She remarked, *"Environmental responsibility is taught through practical life activities rather than through direct theoretical instruction."*

Throughout the interview, the participant repeatedly emphasised that observation followed by independent practice forms the core of Montessori learning. She explained that teachers always demonstrate an activity before expecting children to perform it themselves. Children carefully observe the presentation and gradually imitate the demonstrated behaviour through repeated practice. This approach, according to her, is applicable not only to academic learning but also to the development of environmental responsibility and positive social behaviour. She observed, *"Observation followed by independent practice is the core method of learning in Montessori education."*

KG05-T strongly believed that behaviour is shaped through repeated practical experiences rather than through repeated verbal instruction. She explained that children gradually internalise responsible habits when they repeatedly perform practical activities independently. Concepts such as cleanliness, organisation, and proper waste disposal become part of children's everyday routine because they experience them continuously rather than merely hearing about them. Reflecting on this process, she remarked, *"Behaviour is shaped through repeated practical experience rather than through repeated verbal instruction."*

When discussing the introduction of waste management during early childhood, the participant expressed the view that environmental responsibility should begin at the kindergarten stage itself. She explained that whenever children generate even a small piece of waste, teachers immediately encourage them to place it in the dustbin. Although children may initially forget or ignore the instruction, continuous guidance and repetition gradually transform this behaviour into a habit. She reflected, *"Children develop proper waste disposal habits through continuous repetition and practice from a very young age."*

According to her, these early habits create a strong foundation for responsible environmental behaviour in later life.

The participant observed that institutions following the Montessori philosophy generally integrate such practices into their everyday routine. She believed that Montessori-trained teachers possess a better understanding of behaviour formation and are therefore better equipped to guide young children through practical learning experiences. While acknowledging that not every kindergarten follows the same structured approach, she maintained that Montessori principles provide an effective framework for developing discipline, responsibility, and environmental awareness among children through everyday participation.

While describing waste management practices within her institution, KG05-T explained that paper and plastic waste generated through classroom activities are collected and handed over through the regular Haritha Karma Sena collection system. Since the institution does not possess facilities for disposing of sanitary waste such as diapers, these materials are generally sent back home with the child whenever necessary. She believed that the organised waste collection system supports the institution in maintaining a clean environment without requiring complex internal waste processing mechanisms. Reflecting on this arrangement, she stated, *"Plastic and paper waste are disposed of through the Haritha Karma Sena collection system, ensuring proper waste management."*

The participant also highlighted the importance of child-friendly infrastructure in promoting independent behaviour. She explained that classrooms are equipped with small waste bins designed according to children's height and physical ability, enabling them to dispose of waste comfortably without adult assistance. Such simple infrastructural modifications encourage children to take responsibility for their own actions while strengthening habits of cleanliness and order. She observed, *"Providing child-friendly bins encourages independent waste disposal and supports habit formation among young children."*

When discussing waste segregation, KG05-T acknowledged that complete segregation of different waste categories may be difficult for very young children because of their developmental stage. However, she believed that older kindergarten children, particularly those in LKG and UKG, are capable of understanding simple distinctions such as paper

waste and other common materials. According to her, *"Basic waste segregation can gradually be introduced to older kindergarten children, although complex categorisation may be difficult at this stage."* She therefore advocated a gradual approach in which children first develop basic disposal habits before progressing to more advanced environmental concepts.

The participant repeatedly emphasised the effectiveness of Montessori materials in facilitating children's understanding. She explained that children grasp concepts much more quickly when they are allowed to interact directly with learning materials instead of receiving only verbal explanations. Practical engagement strengthens both understanding and retention, enabling children to apply what they learn within their everyday environment. She reflected, *"Practical learning through Montessori materials enhances children's understanding and retention of concepts."*

Apart from practical demonstrations, KG05-T also uses rhymes, oral interactions, and brief classroom discussions to introduce concepts related to cleanliness and waste management. Recognising that young children have a limited attention span, she presents these ideas through short and engaging activities that can be repeated regularly. According to her, repetition through enjoyable classroom experiences helps children absorb information naturally without feeling burdened by formal instruction. She remarked, *"Young children have a remarkable ability to quickly absorb information through oral interaction and repetition."*

Teacher role modelling formed another major aspect of the participant's narrative. She explained that young children consider their teachers important role models and naturally imitate their behaviour. Whenever teachers consistently demonstrate proper waste disposal and cleanliness, children gradually adopt the same practices through observation. She illustrated this with a simple classroom example in which children initially require reminders to dispose of sweet wrappers properly but eventually begin doing so independently. Some children even keep wrappers safely in their bags until they find a dustbin rather than throwing them on the ground. Reflecting on this process, she stated, *"Teachers play a significant role in shaping children's environmental behaviour through modelling and repeated guidance."*

The participant further explained that consistent repetition is essential for transforming externally guided behaviour into children's natural habits. She compared waste disposal practices with other classroom routines such as greeting teachers and asking permission before leaving the classroom, explaining that these behaviours also require repeated daily reinforcement before becoming automatic. According to her, *"Consistent repetition by teachers gradually transforms instructed behaviours into children's natural habits."* She believed that patience and continuity are more effective than punishment when teaching young children responsible behaviour.

When asked about children's participation in environmental activities, KG05-T clarified that kindergarten children are not assigned responsibilities such as cleaning classrooms or maintaining the school environment because such tasks are more appropriate for older age groups. Instead, the institution focuses on developing simple habits such as placing waste in the dustbin, avoiding littering, and maintaining personal cleanliness. She explained that these basic practices create the behavioural foundation upon which broader environmental responsibility can later be built. Reflecting on this approach, she observed, *"Developing basic habits of proper waste disposal is more appropriate for kindergarten children than assigning environmental cleaning responsibilities."*

The participant also discussed the challenges associated with implementing the Montessori approach on a wider scale. Although she considered Montessori education highly effective in promoting responsible behaviour, she pointed out that the high cost of specialised learning materials often limits its adoption by many government and resource-constrained institutions. Nevertheless, she believed that even without expensive materials, teachers can successfully introduce environmental concepts through demonstrations, oral interactions, and repeated classroom practice. She remarked, *"The Montessori approach is highly effective, but the high cost of specialised materials may limit its implementation in many kindergarten settings."*

Parental involvement was viewed by KG05-T as an important but sometimes inconsistent factor in behaviour formation. She explained that many parents appreciate the positive habits children develop at school but are often unable to reinforce these practices consistently because of work commitments and busy schedules. Consequently, teachers bear significant responsibility for ensuring that environmental habits are repeatedly practised within the classroom. At the same time, she believed that stronger collaboration

between parents and teachers would further strengthen children's behavioural development. According to her, *"Teachers have an important responsibility in repeatedly guiding children when parental reinforcement may be limited."*

Towards the conclusion of the interaction, KG05-T advocated the introduction of structured practical activities related to waste management in every kindergarten. She suggested that children should receive regular opportunities to practise proper waste disposal through demonstrations, observation, repetition, and practical life exercises rather than through theoretical lessons alone. Institutions should also receive improved resources and practical teaching materials to strengthen environmental education. Summarising her perspective, she remarked, *"Developing sustainable habits during early childhood creates responsible individuals who are more likely to protect and care for the environment throughout their lives."*

The interaction with KG05-T presented a comprehensive understanding of how Montessori philosophy, practical life activities, behaviour modelling, repetition, and experiential learning collectively contribute to the development of environmental responsibility among young children. Her narrative consistently reflected the belief that simple habits introduced through daily practice during the kindergarten years become the foundation for lifelong environmental awareness, responsibility, and sustainable behaviour.

CHAPTER 5

DATA ANALYSIS AND INTERPRETATION

CHAPTER 5: DATA ANALYSIS AND INTERPRETATION

5.1. Introduction

This chapter presents the analysis and interpretation of the data collected from the management representatives and teachers of selected private kindergartens in Thiruvananthapuram City Corporation. The data obtained through in-depth interviews were analysed using thematic analysis to understand how existing waste management practices support the integration of structured waste management education in early childhood education. The interview transcripts were examined carefully to identify recurring patterns, meaningful ideas, and shared experiences, which were organised into themes and sub-themes. Verbatim quotations have been incorporated throughout the chapter to preserve the authenticity of the participants' voices and to support the interpretation of the findings.

The findings are presented under six major themes that correspond to the objectives and research questions of the study. The themes examine the existing waste management practices followed in kindergarten settings, institutional readiness for integrating waste management education, teachers' experiences in facilitating experiential environmental learning, the role of early childhood education in fostering environmental responsibility, and the opportunities and challenges associated with integrating structured waste management education. The final theme synthesises these findings to explain how existing kindergarten practices can serve as a foundation for integrating structured waste management education into the early childhood curriculum. Together, these themes provide a comprehensive understanding of the potential of kindergarten education in promoting environmentally responsible behaviour from an early age.

Data Analysis and Interpretation

Research Question 1: What are the existing waste management practices implemented in private kindergarten settings?

5.2.THEME 1: EXISTING WASTE MANAGEMENT PRACTICES IN PRIVATE KINDERGARTEN SETTINGS

Waste management practices in private kindergarten settings extend beyond the simple collection and disposal of waste. The findings reveal that these practices are closely integrated into the daily functioning of the institution and are viewed as opportunities for

nurturing responsibility, discipline and environmental awareness among young children. Across the interviews, both management representatives and teachers described waste management as a routine educational practice that is embedded within classroom activities, institutional culture and children's everyday experiences rather than as an isolated environmental initiative. The existing practices demonstrate that kindergartens provide children with repeated opportunities to engage in cleanliness routines, proper waste disposal, and care for their surroundings from an early age.

The narratives of the participants indicate that waste management within kindergarten settings is supported through a combination of organised disposal systems, classroom routines, recycling and reuse activities and collaboration with external agencies. While the methods adopted varied slightly across institutions, there was a shared understanding that environmental responsibility is cultivated through consistent practice and participation. Participants also highlighted the role of institutional infrastructure, teacher guidance and partnerships with local waste management agencies in maintaining a clean and child-friendly environment. Together, these practices form the existing foundation upon which structured waste management education can be further strengthened and integrated into early childhood education.

SUBTHEMES

5.2.1. Daily Waste Disposal and Classroom Cleanliness Practices

This sub-theme examines the routine waste disposal and classroom cleanliness practices adopted in kindergarten settings. It highlights how daily habits such as proper waste disposal, maintaining clean learning environments and encouraging children's active participation contribute to the development of cleanliness, responsibility and environmentally responsible behaviour from an early age.

"The first lesson we teach is that waste should always be disposed of in the dustbin." (KG01-T). "Dustbins are placed at convenient locations throughout the campus, enabling children to dispose of waste independently after classroom activities and meal times." (KG05-M). "Whenever children notice waste in the classroom, they are encouraged to pick it up and place it in the dustbin independently." (KG04-T). "Children participate in cleaning activities, organise classroom materials, maintain their workspaces, and dispose of waste in designated places after completing their activities." (KG04-M).

Interpretation:

Daily waste disposal and classroom cleanliness practices emerged as one of the most common waste management practices across the selected private kindergarten settings. The findings indicate that cleanliness is integrated into the everyday routine of the institution rather than being treated as a separate environmental activity. Children are encouraged to dispose of waste in designated bins, clean their workspaces, arrange classroom materials after use, and maintain an orderly learning environment through regular participation. Both management representatives and teachers viewed these practices as opportunities to develop responsibility, discipline, and respect for shared spaces from an early age. The provision of child-friendly infrastructure, such as easily accessible dustbins and organised classroom environments, further supports children's active participation in maintaining cleanliness.

The participants also highlighted that these routine practices encourage children to take ownership of their surroundings instead of depending on adults to maintain the classroom environment. Through continuous participation in simple activities such as disposing of waste, organising learning materials, and cleaning activity areas, children gradually develop positive habits that become part of their everyday behaviour. The findings suggest that daily waste disposal and classroom cleanliness practices serve not only as institutional maintenance measures but also as important experiential learning opportunities that introduce environmental responsibility in a practical and developmentally appropriate manner. These everyday experiences provide a strong foundation for cultivating environmentally responsible behaviour and support the integration of structured waste management education within early childhood settings.

5.2.2. Waste Collection, Segregation, and Disposal Mechanisms

This sub-theme explores the systems adopted by kindergartens for the collection, segregation and disposal of waste. It focuses on the institutional practices and mechanisms that facilitate proper waste handling, promote source segregation and create opportunities for children to develop environmentally responsible habits through their participation in routine waste management activities.

"Separate bins are available for different categories of waste, while plastic waste is regularly handed over to the Haritha Karma Sena for scientific disposal." (KG05-M).

"Food waste is disposed of within the institution, while recyclable waste such as plastic and paper is managed through authorised collection agencies." (KG04-T). "The major waste generated in our preschool includes diaper waste, food waste, and paper waste, all of which are managed through systematic waste collection mechanisms." (KG03-T). "Since the institution does not have facilities for disposing of diapers, these are usually sent back home with the child whenever necessary." (KG05-T).

Interpretation:

The findings reveal that the selected private kindergartens have established systematic mechanisms for the collection, segregation and disposal of waste generated within their campuses. Although the methods adopted vary across institutions, all participants reported organised procedures to ensure hygienic and environmentally responsible waste management. The major categories of waste identified include food waste, paper waste, plastic waste and sanitary waste such as diapers. Plastic and other recyclable materials are commonly handed over to the Haritha Karma Sena or authorised waste collection agencies for scientific disposal, while food waste is either managed within the institution through designated compost or disposal pits or collected through local waste management systems. The management of sanitary waste showed greater variation across institutions. Some participants reported using digital platforms such as the Aakri App to facilitate the collection of diaper waste by authorised agencies, a few institutions indicated the use of incinerators for the safe disposal of sanitary waste, while others preferred to send used diapers back with the child to enable disposal by parents at home.

The analysis indicates that these diverse disposal mechanisms reflect the efforts made by institutions to adopt context-specific and scientifically appropriate waste management practices within the limitations of their available infrastructure and resources. The collaboration with external agencies, use of technological platforms and adoption of institution-specific disposal methods demonstrate a conscious commitment to maintaining a hygienic and environmentally responsible learning environment. Although children are not directly involved in every stage of waste segregation and disposal, these organised institutional practices expose them to responsible waste management systems and create a supportive environment for integrating structured waste management education into early childhood learning. The findings suggest that the presence of well-defined waste collection

and disposal mechanisms provides a strong institutional foundation for promoting sustainable environmental practices within kindergarten settings.

5.2.3. Recycling and Reuse Practices in Kindergarten Settings

This sub-theme examines the recycling and reuse practices implemented in kindergarten settings to minimise waste and promote resource conservation. It highlights how discarded and reusable materials are incorporated into classroom activities, enabling children to understand the value of recycling, creativity and responsible resource utilisation through hands-on learning experiences.

"Reduce, Reuse, and Recycle concepts are introduced through simple craft activities using reusable materials, enabling children to explore creativity while understanding the value of resource conservation." (KGO3-T). "Innovation within the institution is reflected through the use of reusable materials for craft activities and encouraging children to clean the activity area after completing programmes and celebrations." (KGO5-M). "Activity-based learning methods such as rhymes, demonstrations, and practical activities are used to help children understand cleanliness and the proper use of materials." (KG02-T). "Children participate in activities such as gardening and practical life exercises, where they learn to value and make responsible use of available resources." (KG03-M)

Interpretation:

The findings indicate that recycling and reuse practices are incorporated into kindergarten education primarily through activity-based learning experiences rather than through formal instruction on waste management concepts. Participants explained that reusable materials generated within the institution are often utilised for craft work, creative projects and classroom activities, providing children with opportunities to understand the importance of resource conservation through direct participation. Instead of discarding usable materials immediately, teachers encourage children to explore alternative uses for them, thereby promoting creativity alongside environmental responsibility. These practices introduce the principles of reducing waste and reusing available resources in a manner that is developmentally appropriate for young children.

The analysis further reveals that recycling and reuse practices are closely linked with experiential learning and practical engagement. Through craft activities and the use of reusable classroom materials, children are introduced to the responsible use of resources in

a simple and meaningful manner. Although structured recycling programmes were not common across all institutions, participants reported conscious efforts to minimise waste by reusing available materials and incorporating sustainable practices into classroom activities. These initiatives provide valuable opportunities to strengthen environmental education and support the integration of structured waste management education in kindergarten settings.

5.2.4. Collaboration with Haritha Karma Sena and Local Self-Government Institutions

This sub-theme explores the collaboration between kindergarten institutions, Haritha Karma Sena, and Local Self-Government Institutions in supporting effective waste management practices. It highlights how external partnerships facilitate scientific waste collection, disposal and environmental awareness, while strengthening institutional efforts to promote sustainable waste management and environmental responsibility among young children.

"Plastic waste collected from the institution is regularly handed over to the Haritha Karma Sena, which ensures its proper collection and disposal." (KGO5-M). "The institution receives regular visits from Corporation and Health Department officials who provide guidance on sanitation and environmental hygiene." (KG02-T). "We maintain good coordination with local authorities and authorised agencies to ensure that waste generated within the institution is disposed of safely." (KGO4-M). "The support extended by local bodies and waste collection agencies helps the institution maintain a clean and environmentally safe campus." (KG03-M)

Interpretation:

The findings reveal that collaboration with external agencies plays an important role in strengthening waste management practices within the selected private kindergarten settings. Participants reported that institutions regularly coordinate with the Haritha Karma Sena, local self-government institutions, Corporation officials, and authorised waste collection agencies for the safe collection and disposal of different categories of waste. These collaborations enable institutions to manage recyclable and sanitary waste scientifically while ensuring compliance with environmental and public health standards. Regular inspections and guidance from local authorities also contribute to maintaining cleanliness and promoting good sanitation practices within the school environment.

The analysis further indicates that these partnerships strengthen institutional waste management by extending responsibility beyond the school. Through waste collection services, technical support, and guidance on proper waste handling, external agencies help kindergartens maintain organised and sustainable waste management practices. The collaboration with local self-government institutions and authorised waste management agencies enhances the institutions' capacity to promote environmental responsibility and supports the integration of sustainable practices within early childhood education.

Research Question 2: How do institutional practices support the integration of structured waste management education within kindergarten settings?

5.3.THEME 2: INSTITUTIONAL READINESS FOR INTEGRATING WASTE MANAGEMENT EDUCATION

The successful integration of waste management education in early childhood settings depends not

only on the existence of waste management practices but also on the preparedness of institutions to support and sustain such initiatives. The findings reveal that the selected private kindergartens have developed organisational structures, infrastructure, routines and administrative practices that contribute to creating an environment conducive to environmental learning. The participants viewed waste management as a shared institutional responsibility that extends beyond classroom activities and is reflected in the overall functioning and culture of the institution.

The narratives indicate that institutional readiness is demonstrated through the commitment of management, the availability of child-friendly learning environments, clearly established routines, regular monitoring of practices and a willingness to strengthen existing systems. Although the level of preparedness varied across institutions, there was a common understanding that environmental responsibility should be embedded within everyday institutional practices. These findings suggest that the existing institutional arrangements provide a supportive foundation for integrating structured waste management education into kindergarten settings and promoting sustainable environmental values among young children.

SUBTHEMES

5.3.1. Administrative Commitment towards Environmental Education

This sub-theme examines the commitment of kindergarten management towards promoting environmental education through institutional leadership, planning and support. It highlights how administrative initiatives, policy decisions and the provision of resources create an enabling environment for integrating waste management practices and fostering environmental responsibility within the institution.

"Environmental responsibility should begin during early childhood, and it is the institution's responsibility to create opportunities for children to practise these habits every day." (KG01-M). "Maintaining a low teacher-child ratio allows us to provide individual attention and effectively guide children in developing responsible habits and values." (KG03-M). "The management continuously monitors whether teachers and staff are following the institutional practices because consistency is essential for developing children's behaviour." (KG04-M). "The institution encourages all staff members to work together in maintaining cleanliness and environmental responsibility, making it a shared commitment rather than an individual task." (KG05-M).

Interpretation:

The findings indicate that administrative commitment plays a significant role in supporting the integration of waste management education within kindergarten settings. Across the selected institutions, management representatives viewed environmental responsibility as an important component of early childhood education and demonstrated a clear commitment to incorporating it into the daily functioning of the institution. This commitment was reflected in the emphasis placed on maintaining a clean learning environment, providing opportunities for practical learning and encouraging teachers and support staff to consistently reinforce positive environmental practices among children.

The analysis further reveals that administrative commitment extends beyond policy decisions and is reflected in the leadership, planning and organisational culture of the institution. Management representatives actively support teachers by establishing routines, monitoring the implementation of environmental practices and ensuring that cleanliness and responsible behaviour are maintained throughout the campus. The collaborative involvement of management, teachers, and non-teaching staff creates a supportive

institutional environment where environmental responsibility becomes an integral part of children's everyday experiences. These findings suggest that strong administrative leadership provides the foundation for successfully integrating structured waste management education into early childhood education.

5.3.2. Infrastructure and Learning Environment

This sub-theme explores the role of physical infrastructure and the learning environment in supporting waste management education within kindergarten settings. It examines how child-friendly facilities, waste management resources, and environmentally conducive classroom environments facilitate experiential learning and encourage the development of responsible environmental behaviours among young children.

"Dustbins are placed at convenient locations throughout the campus, enabling children to dispose of waste independently after classroom activities and meal times." (KG05-M). "Colour-coded waste bins can make waste segregation easier and more meaningful for kindergarten children." (KG04-T). "Maintaining a low teacher-child ratio enables us to provide personalised attention and create an environment where children learn through experience." (KG03-M). "Providing child-friendly bins encourages independent waste disposal and supports habit formation among young children." (KG05-T).

Interpretation:

The findings indicate that the physical environment and institutional infrastructure play an important role in supporting waste management education within kindergarten settings. Participants highlighted that child-friendly facilities such as accessible dustbins, organised classrooms, prepared learning environments, and adequate space for practical activities encourage children to participate actively in maintaining cleanliness. These infrastructural arrangements enable children to perform simple environmental practices independently and reinforce the principles of responsibility and self-directed learning that form the foundation of early childhood education.

The analysis further reveals that the learning environment extends beyond physical facilities and includes the overall organisation of the classroom and institutional setting. Participants emphasised that a well-planned environment, supported by appropriate teacher-child ratios and opportunities for experiential learning, creates favourable

conditions for developing environmental responsibility among young children. Suggestions such as the introduction of colour-coded bins and improved waste management facilities also reflect the institutions' willingness to strengthen their existing systems. These findings suggest that a supportive infrastructure and learning environment significantly enhance institutional readiness for integrating structured waste management education into kindergarten settings.

5.3.3. Institutional Policies, Routines, and Organisational Culture

This sub-theme examines the institutional policies, daily routines and organisational culture that support waste management education in kindergarten settings. It highlights how established practices, shared responsibilities and a culture of environmental responsibility create a consistent and supportive environment for integrating sustainable waste management into children's everyday learning experiences.

"Children are expected to return every material to its designated place after use because discipline and order are part of our daily routine." (KG01-M). "The institution follows common practices that are implemented consistently by teachers and staff so that children observe and gradually adopt them." (KG04-M). "Environmental responsibility develops through everyday practice rather than through theoretical instruction alone." (KG02-T). "Practical life activities help children develop environmental responsibility naturally as part of their daily routine." (KG03-T).

Interpretation:

The findings reveal that the selected kindergarten institutions have developed organisational routines and practices that promote environmental responsibility as part of their everyday culture. Rather than relying on formal written policies alone, participants described an institutional environment where cleanliness, order and responsible behaviour are reinforced through daily routines and shared practices. Activities such as returning learning materials to their designated places, maintaining classroom cleanliness, disposing of waste properly and caring for the learning environment are consistently integrated into the daily schedule. These routine practices create a structured atmosphere where children repeatedly engage in environmentally responsible behaviours as part of their normal learning experience.

The analysis further suggests that organisational culture plays a significant role in supporting waste management education within kindergarten settings. The consistency maintained by management, teachers, and support staff in following institutional routines provides children with a stable environment for observation and learning. Participants indicated that environmental responsibility is embedded within the overall functioning of the institution and reflected in its values, expectations, and daily interactions rather than being confined to specific awareness programmes. Such an organisational culture strengthens institutional readiness by creating an environment where sustainable practices become an integral part of early childhood education.

5.3.4. Monitoring and Implementation Mechanisms

This sub-theme explores the monitoring and implementation mechanisms adopted by kindergarten institutions to ensure the effective execution of waste management practices. It focuses on the systems of supervision, regular evaluation and reinforcement that help sustain environmental initiatives, maintain institutional standards and encourage consistent participation in waste management activities.

"The management continuously monitors whether teachers and staff are following the institutional practices because consistency is essential for developing children's behaviour." (KG04-M). "The institution receives regular visits from Corporation and Health Department officials who provide guidance on sanitation and environmental hygiene." (KGO2-T). "Strong leadership and continuous monitoring by the management play a vital role in maintaining effective waste management practices within the institution." (KGO4-T). "The institution encourages all staff members to work together in maintaining cleanliness and environmental responsibility, ensuring that the practices are followed consistently." (KGO5-M).

Interpretation:

The findings indicate that continuous monitoring and consistent implementation are essential components of institutional readiness for integrating waste management education. Participants explained that management regularly supervises the implementation of cleanliness routines and waste management practices to ensure that they are followed uniformly by teachers, support staff and children. This ongoing supervision helps maintain

consistency in institutional practices and reinforces environmental responsibility as part of the daily functioning of the kindergarten.

The analysis further reveals that monitoring extends beyond internal supervision and includes the involvement of external agencies such as the Corporation and Health Department, which provide periodic inspections and guidance on sanitation and environmental hygiene. Participants emphasised that the combined efforts of institutional leadership, staff coordination and external monitoring contribute to maintaining effective waste management practices within the school. These mechanisms strengthen institutional accountability and create a supportive environment for the successful integration of structured waste management education in early childhood settings.

5.3.5. Opportunities for Institutional Strengthening

This sub-theme examines the opportunities available for strengthening institutional efforts to integrate structured waste management education in kindergarten settings. It focuses on the potential for enhancing infrastructure, teacher capacity, innovative environmental initiatives and collaborative partnerships to create a more sustainable and effective environmental learning environment.

"Colour-coded waste bins can make waste segregation easier and more meaningful for kindergarten children." (KG04-T). "Parents should also receive awareness programmes because children learn many lifelong habits from their home environment." (KG03-T). "The Montessori approach is highly effective, but the high cost of specialised materials may limit its implementation in many kindergarten settings." (KG05-T). "With better facilities and continuous support, institutions can further strengthen environmental education and waste management practices among children." (KGO2-M).

Interpretation:

The findings suggest that while the selected kindergartens have established effective waste management practices, there remains considerable scope for further institutional strengthening. Participants identified several areas that could enhance the integration of environmental education, including the provision of child-friendly waste segregation facilities, increased parental awareness, improved learning resources, and greater institutional support. Suggestions such as introducing colour-coded bins and expanding

environmental activities indicate the willingness of institutions to improve their existing practices and make waste management education more meaningful for young children.

The analysis further reveals that strengthening institutional capacity requires collaborative efforts involving management, teachers, parents, and external stakeholders. Participants emphasised the need for continuous teacher orientation, parental involvement and improved infrastructural facilities to sustain environmental practices within kindergarten settings. They also pointed out that resource constraints, particularly the cost of specialised Montessori materials and waste management infrastructure, may limit implementation in some institutions. Addressing these areas would enhance institutional readiness and create a stronger foundation for integrating structured waste management education into early childhood education.

Research Question 3: How do teachers describe their experiences of using experiential and child-centred approaches to promote waste management practices among kindergarten children?

5.4.THEME 3: TEACHERS' EXPERIENCES IN FACILITATING EXPERIENTIAL ENVIRONMENTAL LEARNING

Teachers occupy a central position in introducing environmental values and waste management practices to young children within kindergarten settings. Their everyday interactions, classroom practices, and teaching approaches create opportunities for children to develop responsibility towards their surroundings through meaningful learning experiences. As facilitators of early childhood education, teachers influence not only children's knowledge but also the formation of attitudes, habits and behaviours that contribute to environmental responsibility.

This theme explores the experiences of teachers in facilitating experiential environmental learning through child-centred pedagogical practices adopted within their respective institutions. It focuses on the various approaches used to engage children in environmental learning, including practical life activities, activity-based learning, observation and imitation, repetition in behaviour formation and other child-centred teaching strategies. Together, these aspects provide an understanding of how teachers create learning environments that support the development of environmentally responsible behaviour and contribute to the integration of structured waste management education in early childhood education.

SUBTHEMES

5.4.1. Activity-based and Experiential Learning

This sub-theme explores how activity-based and experiential learning approaches are used to promote waste management education in kindergarten settings. It highlights the role of hands-on activities, interactive experiences and active participation in enabling children to understand environmental concepts and develop responsible waste management behaviours through meaningful learning experiences.

"Activity-oriented learning helps children understand environmental conservation much more effectively than classroom explanations." (KG03-T). "Children learn waste management most effectively when they actively practise the behaviour themselves rather than simply listening to instructions." (KG04-T). "Children understand responsibility through participation and experience rather than through verbal instruction alone." (KG01-M).

Interpretation:

The findings reveal that activity-based and experiential learning constitute one of the primary approaches adopted by teachers to facilitate environmental education in kindergarten settings. Participants consistently emphasised that young children learn more effectively through direct participation than through theoretical instruction. Environmental concepts are introduced through activities such as classroom cleaning, gardening, craft work, waste disposal and nature-based experiences, allowing children to actively engage with their surroundings while developing an understanding of responsible environmental behaviour. Teachers viewed these practical experiences as meaningful opportunities for children to learn by doing, making environmental education both enjoyable and relevant to their daily lives.

The analysis further suggests that experiential learning creates a child-centred environment where environmental values are developed through active engagement, exploration and participation. Rather than treating waste management as a separate topic, teachers integrate it into everyday classroom activities, enabling children to gradually internalise positive habits through experience. This approach not only strengthens children's understanding of environmental responsibility but also promotes independence, participation and lifelong

learning. The findings highlight that activity-based and experiential learning provide a strong pedagogical foundation for integrating structured waste management education into early childhood education.

5.4.2. Practical Life Activities as Environmental Learning Experiences

This sub-theme examines how practical life activities are utilised as opportunities for environmental learning in kindergarten settings. It highlights how everyday tasks such as cleaning, waste disposal and organising materials enable children to develop environmental awareness, responsibility and sustainable habits through active participation in routine classroom practices.

"Exercise of Practical Life forms the foundation for developing discipline, responsibility, and independent behaviour in young children." (KG05-T). "Children first observe the teacher demonstrating an activity and then perform it independently through repeated practice." (KG05-T). "Self-cleaning activities have been introduced where children use small brushes and dustpans to clean their own spaces after completing activities." (KG04-T). "Practical life activities such as watering plants, planting saplings, and caring for nature help children develop environmental responsibility through everyday experience." (KG03-T).

Interpretation:

The findings indicate that practical life activities form an integral part of experiential environmental learning within kindergarten settings. Participants described these activities as everyday experiences through which children develop responsibility, independence and respect for their surroundings. Activities such as watering plants, cleaning workspaces, arranging classroom materials, using child-friendly cleaning tools and caring for the environment provide opportunities for children to learn through active participation rather than passive observation. Teachers viewed these practical experiences as effective means of introducing environmental responsibility in a manner that is appropriate to the developmental stage of young children.

The analysis further reveals that practical life activities contribute to environmental learning by encouraging children to perform simple tasks independently and repeatedly within their daily routine. Through demonstration, guided participation, and hands-on

experiences, children gradually develop confidence in caring for themselves and their environment. Participants believed that these activities nurture responsibility and self-discipline while helping children internalise positive environmental behaviours through meaningful practice. The findings suggest that practical life activities serve as a strong foundation for experiential environmental learning and support the integration of structured waste management education within early childhood settings.

5.4.3. Learning through Observation and Imitation

This sub-theme explores how children acquire environmentally responsible behaviours by observing and imitating the actions of teachers and peers in kindergarten settings. It highlights the importance of role modelling, demonstration and consistent environmental practices in helping children internalise positive waste management behaviours through everyday classroom interactions.

"Children in this age group have an absorbent mind and quickly imitate the behaviour and actions of adults around them." (KG03-T). "Children learn environmental responsibility primarily through observation and imitation rather than through verbal instruction alone." (KG02-T). "Teachers play a significant role in shaping children's environmental behaviour through modelling and repeated guidance." (KG05-T). "Teachers and staff act as role models, and children learn environmental responsibility by observing their behaviour." (KG04-T).

Interpretation:

The findings reveal that observation and imitation are among the most effective learning processes through which environmental responsibility is developed in kindergarten settings. Participants consistently explained that young children closely observe the behaviour of teachers and other adults and naturally imitate the actions they witness in their everyday environment. Rather than depending solely on verbal instructions, teachers consciously demonstrate practices such as proper waste disposal, maintaining classroom cleanliness, and caring for learning materials, allowing children to learn these behaviours through observation and participation. This modelling approach enables environmental values to be communicated in a simple and developmentally appropriate manner.

The analysis further indicates that teachers perceive themselves as important role models in shaping children's environmental behaviour. By consistently practising responsible actions within the classroom, teachers create opportunities for children to internalise these behaviours through imitation and repeated exposure. Participants believed that when children observe positive environmental practices being followed by adults, they gradually adopt them as part of their own routine. The findings suggest that learning through observation and imitation strengthens experiential environmental learning by transforming everyday classroom interactions into meaningful opportunities for behaviour formation and environmental responsibility.

5.4.4. Repetition and Behaviour Formation

This sub-theme explores the role of repetition in reinforcing environmentally responsible behaviours among young children. It highlights how the consistent practice of waste management activities through daily classroom routines enables children to internalise positive habits, develop self-discipline and gradually adopt sustainable environmental behaviours as part of their everyday lives.

"Repeated practical experience transforms environmental practices into lifelong habits among young children." (KG04-T). "Repeated reinforcement during early childhood gradually transforms proper waste disposal into a natural daily habit." (KG02-T). "Even if children do not fully understand the concept initially, repeated participation helps environmental values gradually become part of their behaviour." (KG03-T).

Interpretation:

The findings indicate that repetition plays a crucial role in the development of environmental behaviour among kindergarten children. Participants consistently emphasised that responsible habits are not formed through one-time instruction but through continuous practice and reinforcement in everyday classroom activities. Teachers encourage children to repeatedly engage in simple actions such as disposing of waste in designated bins, organising learning materials, cleaning activity areas and maintaining personal and classroom cleanliness. Through these repeated experiences, children gradually become familiar with environmentally responsible practices and begin to perform them independently.

The analysis further reveals that participants view behaviour formation as a gradual process that develops through consistent exposure and active participation rather than immediate understanding. Repetition enables children to internalise environmental values and transform externally guided actions into natural habits that become part of their daily routine. Teachers observed that regular reinforcement, coupled with practical experiences, strengthens children's sense of responsibility and promotes lasting behavioural change. These findings suggest that repetition serves as a key pedagogical strategy in experiential environmental learning and contributes significantly to the development of lifelong environmentally responsible behaviour among young children.

Research Question 4: How do teachers and management representatives describe the role of early childhood education in fostering environmental responsibility?

5.5.THEME 4: EARLY CHILDHOOD EDUCATION AS A FOUNDATION FOR ENVIRONMENTAL RESPONSIBILITY

Early childhood is widely recognised as a critical period for the development of attitudes, values, and behaviours that influence an individual's future actions and lifestyle. Experiences during these formative years play an important role in shaping children's understanding of themselves, their surroundings and their responsibilities towards society and the environment. Environmental education introduced at this stage provides opportunities for children to develop positive habits and behaviours through meaningful experiences that can extend into later stages of life.

Within the context of environmental education, early childhood settings serve as important spaces for nurturing responsibility, respect for nature and sustainable practices through everyday learning experiences. The role of teachers, classroom interactions, family involvement and the learning environment collectively contribute to the development of environmentally responsible behaviour among young children. This theme explores the significance of early childhood education in laying the foundation for environmental responsibility through habit formation, role modelling, value development, home-school continuity and the gradual development of sustainable behaviours.

SUBTHEMES

5.5.1. Early Habit Formation

This sub-theme explores the importance of early childhood as a critical period for developing environmentally responsible habits. It highlights how consistent exposure to

waste management practices and participation in daily environmental activities enable children to cultivate positive habits that form the foundation for lifelong sustainable behaviour.

"The habits and values developed during early childhood remain with children throughout their lives, making this the most appropriate stage to introduce environmental responsibility." (KG03-T). "When discipline and cleanliness become part of a child's daily routine from an early age, they gradually develop into lifelong habits." (KG04-M). "The best time to cultivate responsibility towards the environment is during early childhood because children naturally absorb and practise what they experience every day." (KG01-M).

Interpretation:

The findings indicate that early childhood is widely perceived as the most significant stage for the formation of positive environmental habits and behaviours. Participants consistently emphasised that habits developed during the early years become deeply rooted and continue to influence children's actions throughout their lives. Environmental practices such as proper waste disposal, maintaining cleanliness, caring for learning materials and respecting the surroundings are introduced through simple daily routines, allowing children to gradually internalise these behaviours as part of their everyday life. Rather than treating environmental responsibility as a separate concept, teachers and management representatives viewed it as a habit that should be nurtured through continuous exposure and regular practice from a young age.

The analysis further reveals that habit formation is achieved through consistency, repetition, and meaningful experiences rather than through one-time instruction. Participants believed that when environmentally responsible behaviours are practised regularly within the kindergarten setting, children begin to perform them naturally and independently without external reminders. The early years therefore provide a valuable opportunity to establish a strong behavioural foundation that can influence future attitudes towards environmental conservation and sustainable living. These findings suggest that promoting environmental responsibility during early childhood contributes significantly to the development of lifelong positive habits and strengthens the role of kindergarten education in fostering sustainable behaviour.

5.5.2. Development of Lifelong Environmental Values

This sub-theme examines how environmental values developed during early childhood contribute to lifelong responsible behaviour. It highlights that continuous engagement in meaningful environmental experiences enables children to internalise values such as responsibility, respect for nature and sustainable living, which continue to influence their attitudes and behaviours throughout later stages of life.

"The values that children acquire during their early years remain with them throughout life and influence the way they interact with society and the environment." (KG01-M). "When children are exposed to environmental practices from a young age, they carry those values into adulthood and become more responsible individuals." (KG03-T). "Teaching environmental responsibility during kindergarten helps children understand that caring for the environment is a part of everyday life rather than a separate activity." (KG05-T).

Interpretation:

The findings indicate that environmental education during early childhood extends beyond the development of immediate habits and contributes to the formation of lifelong values. Participants consistently emphasised that the experiences and lessons acquired during the kindergarten years influence children's attitudes and behaviours well into adulthood. By introducing concepts such as cleanliness, responsibility and care for the environment through everyday experiences, institutions create opportunities for children to develop values that guide their future actions and decision-making.

The analysis further reveals that participants perceive environmental responsibility as a value that is gradually internalised through continuous exposure and meaningful experiences during early childhood. Rather than viewing waste management as a short-term behavioural practice, they considered it an important life skill that shapes children's relationship with their environment and society. The participants believed that values developed during this formative stage encourage children to become environmentally conscious individuals who continue to practise sustainable behaviours throughout their lives. These findings highlight the significance of early childhood education in laying the foundation for lifelong environmental values and promoting a culture of sustainability.

5.5.3. Home-School Continuity in Behaviour Formation

This sub-theme explores the role of continuity between home and school in reinforcing environmentally responsible behaviours among young children. It highlights how

consistent environmental practices and collaboration between parents and teachers strengthen the development of sustainable habits, enabling children to apply waste management behaviours across different everyday settings.

"Children often take the habits they learn at school back home and encourage their family members to follow the same practices." (KG03-M). "Environmental education becomes more effective when parents reinforce at home what children learn in the classroom." (KG02-T). "Many parents share that their children remind them not to litter and insist on disposing of waste properly after learning these practices at school." (KG05-T). "The combined efforts of the school and the family are essential for developing lasting environmental habits among young children." (KG04-M).

Interpretation:

The findings indicate that the development of environmental responsibility among young children is strengthened through the continuity of learning between the school and the home environment. Participants emphasised that while kindergartens introduce children to responsible environmental practices through daily activities and routines, the reinforcement of these behaviours within the family plays a significant role in sustaining them. When children encounter similar expectations and practices in both settings, they are more likely to internalise environmental values and incorporate them into their everyday lives.

The analysis further reveals that children often act as carriers of environmental awareness by transferring the habits and values acquired in school to their homes. Participants shared that children frequently encourage family members to adopt responsible practices such as proper waste disposal and maintaining cleanliness, demonstrating the influence of early childhood education beyond the classroom. This reciprocal relationship between home and school creates a supportive environment for behaviour formation and highlights the importance of parental involvement in strengthening environmental education. The findings suggest that collaboration between educational institutions and families is essential for nurturing consistent and sustainable environmental behaviour among young children.

Research Question 5: What opportunities and challenges influence the integration of structured waste management education into kindergarten education?

5.6.THEME 5: OPPORTUNITIES AND CHALLENGES IN INTEGRATING STRUCTURED WASTE MANAGEMENT EDUCATION

The integration of structured waste management education into kindergarten settings requires a supportive educational environment, appropriate pedagogical practices and the active involvement of multiple stakeholders. Early childhood education provides valuable opportunities for introducing environmental concepts through meaningful and age-appropriate learning experiences that encourage responsibility towards the environment. At the same time, the successful implementation of such initiatives depends on the availability of adequate resources, institutional support, teacher preparedness and collaboration between schools, families and the wider community.

This theme explores the various opportunities that can strengthen the integration of waste management education in kindergarten settings while also examining the practical challenges that may influence its implementation. It focuses on curriculum integration, teacher preparedness, institutional and resource-related constraints, and the role of policy and stakeholder support in promoting sustainable environmental education during early childhood.

SUBTHEMES

5.6.1. Scope for Curriculum Integration

This sub-theme explores the potential for integrating structured waste management education into the kindergarten curriculum. It highlights opportunities to incorporate age-appropriate environmental concepts and experiential learning activities into everyday classroom experiences, thereby fostering environmental responsibility and sustainable behaviours from early childhood.

"Waste management education should become a structured part of early childhood education because children learn best when these practices are introduced from a young age." (KG04-M). "Children should be given opportunities to learn about waste management through regular classroom experiences so that these practices become part of their daily routine." (KG05-T). "Activities such as gardening, waste segregation, craft work using reusable materials, and classroom cleaning can easily be incorporated into the existing learning process." (KG03-T). "A structured approach to environmental education

in kindergarten will help develop responsible citizens who are conscious of their role in protecting the environment." (KG02-M).

Interpretation:

The findings indicate that kindergarten education offers considerable scope for integrating structured waste management education within the existing curriculum and daily learning experiences. Participants emphasised that environmental education should not be treated as an isolated topic but should be woven into routine classroom activities that are meaningful and appropriate to the developmental level of young children. By incorporating concepts related to cleanliness, waste segregation, recycling, and care for the environment into everyday learning experiences, institutions can create opportunities for children to develop environmental responsibility in a natural and engaging manner.

The analysis further suggests that curriculum integration would strengthen the consistency and sustainability of environmental education within kindergarten settings. Participants believed that a structured approach would provide teachers with clear guidance while ensuring that all children receive regular exposure to environmental concepts through age-appropriate activities. Rather than introducing additional academic content, the integration of waste management education into existing classroom routines and experiential learning activities can enhance children's understanding of sustainable practices and contribute to the development of lifelong environmentally responsible behaviour.

5.6.2. Teacher Preparedness and Professional Capacity

This sub-theme examines the preparedness and professional capacity of teachers to facilitate structured waste management education in kindergarten settings. It highlights the importance of environmental knowledge, pedagogical competence and continuous professional development in enabling teachers to effectively integrate experiential and child-centred environmental learning into classroom practices.

"Teachers should receive regular training on environmental education and waste management practices so that they can effectively guide young children." (KG02-T). *"A teacher's awareness and commitment play an important role in shaping children's environmental attitudes and behaviours."* (KG03-T). *"Children learn best when teachers themselves practise and demonstrate environmentally responsible behaviour in their everyday classroom activities."* (KG05-T). *"Providing teachers with adequate orientation*

and updated knowledge on waste management will strengthen the quality of environmental education in kindergarten settings." (KG04-M).

Interpretation:

The findings indicate that teachers play a pivotal role in the successful integration of structured waste management education within kindergarten settings. Participants emphasised that, beyond subject knowledge, teachers require adequate awareness, practical skills and a strong commitment to environmental responsibility to facilitate meaningful learning experiences for young children. Since environmental education in early childhood is primarily delivered through experiential and activity-based approaches, the preparedness of teachers becomes essential in planning, guiding, and reinforcing these learning experiences in an effective manner.

The analysis further suggests that continuous professional development and capacity building can enhance teachers' ability to integrate waste management concepts into everyday classroom practices. Participants highlighted the importance of orientation programmes, training opportunities, and exposure to innovative environmental teaching strategies that can strengthen teachers' confidence and competence. Improved professional capacity would enable educators to move beyond routine cleanliness activities and adopt a more structured and purposeful approach to environmental education, thereby supporting the effective integration of waste management education within the kindergarten curriculum.

5.6.3. Institutional and Resource-related Challenges

This sub-theme explores the institutional and resource-related challenges that influence the integration of structured waste management education in kindergarten settings. It highlights constraints such as limited infrastructure, inadequate learning resources, financial limitations and the absence of structured support systems, which affect the effective implementation and sustainability of environmental education initiatives.

"The Montessori approach is highly effective, but the cost of specialised materials and learning resources can make its implementation difficult for many institutions." (KG05-T).

"The introduction of colour-coded waste bins and better waste management facilities would make waste segregation more meaningful and easier for children to understand." (KG04-T). "Limited resources and infrastructure can affect the extent to which environmental activities are organised within the institution." (KG02-M). "Strengthening waste

management education requires continuous investment in learning resources, infrastructure, and institutional support." (KG03-M).

Interpretation:

The findings indicate that although the participating institutions have adopted several waste management practices, certain institutional and resource-related challenges may influence the effective integration of structured waste management education. Participants highlighted the need for improved infrastructure, child-friendly waste management facilities and adequate teaching-learning materials to support experiential environmental education. Suggestions such as introducing colour-coded waste bins, expanding environmental learning resources and creating dedicated spaces for practical activities reflect the importance of a supportive institutional environment in strengthening waste management education.

The analysis further reveals that financial and resource constraints remain important considerations for many institutions. Participants observed that implementing specialised teaching approaches and maintaining appropriate environmental learning facilities require continuous investment and institutional commitment. While these challenges do not prevent the integration of waste management education, addressing them would enhance the quality of experiential learning and create more opportunities for children to actively engage in sustainable environmental practices. These findings suggest that strengthening institutional resources is essential for ensuring the long-term effectiveness of structured waste management education in kindergarten settings.

5.6.4. Policy and Stakeholder Support for Sustainable Integration

This sub-theme explores the role of policy support and stakeholder collaboration in facilitating the sustainable integration of structured waste management education in kindergarten settings. It highlights the importance of coordinated efforts among educational authorities, local self-government institutions, environmental agencies and schools in providing policy guidance, institutional support and resources to strengthen environmental education and promote sustainable practices.

"The successful development of environmental responsibility among children requires the combined efforts of the school, parents, and the community." (KG03-M). *"Environmental practices taught in school become more effective when parents reinforce the same habits at home."* (KG02-T). *"The support provided by the Haritha Karma Sena and local self-*

government institutions helps schools manage waste in a scientific and organised manner." (KG05-M). *"Greater support from government agencies and educational authorities would strengthen the integration of environmental education within kindergarten settings."* (KG04-M).

Interpretation:

The findings indicate that the successful integration of structured waste management education requires the active involvement of multiple stakeholders beyond the kindergarten setting. Participants emphasised that teachers and management alone cannot ensure the development of sustainable environmental behaviour unless these efforts are reinforced by parents, local communities, and relevant government agencies. The collaborative participation of families and external stakeholders creates a supportive environment where children experience consistent environmental values across different contexts, thereby strengthening the effectiveness of early environmental education.

The analysis indicates that policy support and institutional collaboration are essential for sustaining waste management practices in kindergartens. Participants acknowledged the support of local self-government institutions and the Haritha Karma Sena while emphasizing the need for stronger policy initiatives, awareness programmes and institutional guidance to integrate waste management education into early childhood education effectively.

CHAPTER 6

FINDINGS, SUGGESTIONS AND CONCLUSIONS

CHAPTER 6: FINDINGS, SUGGESTIONS AND CONCLUSIONS

6.1. Introduction

This chapter presents the major findings of the study based on the thematic analysis of data collected from management representatives and teachers of the selected private kindergartens in Thiruvananthapuram City Corporation. The findings are organised according to the research objectives and themes that emerged from the analysis, providing a comprehensive understanding of the existing waste management practices, institutional readiness, pedagogical approaches and the role of early childhood education in promoting environmental responsibility.

In addition to summarising the key findings, the chapter presents suggestions derived from the participants' perspectives and the overall interpretation of the study to strengthen the integration of structured waste management education in kindergarten settings. The chapter concludes by highlighting the significance of introducing environmental responsibility during early childhood and reflects on the potential of kindergarten education in fostering sustainable behaviours and lifelong environmental values among children.

6.2. Findings

Research Question 1: What are the existing waste management practices implemented in private kindergarten settings?

The study found that waste management practices in private kindergarten settings are embedded within the daily functioning of the institution and serve as important opportunities for promoting environmental responsibility among young children. Rather than being limited to waste collection and disposal, these practices are integrated into classroom routines, experiential learning activities, and institutional culture, enabling children to develop environmentally responsible behaviours through active participation and consistent practice.

- The study found that daily waste disposal and classroom cleanliness practices are systematically incorporated into children's everyday routines, encouraging them to maintain cleanliness, organise learning materials and dispose of waste responsibly, thereby fostering discipline, responsibility and respect for their surroundings.

- The organised waste collection, segregation, and disposal mechanisms are implemented across the institutions through context-specific practices such as waste segregation, scientific disposal of recyclable waste, management of biodegradable waste and appropriate handling of sanitary waste with the support of authorised agencies.
- The study identified that recycling and reuse practices are promoted through activity-based learning experiences, including craft activities using reusable materials, gardening and practical classroom exercises, enabling children to understand resource conservation and sustainable practices through direct participation.
- The collaboration with external agencies, including the Haritha Karma Sena, local self-government institutions, Corporation authorities and authorised waste collection agencies, strengthens institutional waste management systems by ensuring scientific disposal, technical guidance and the maintenance of hygienic learning environments.
- The existing waste management practices function as experiential learning opportunities, where environmental responsibility is developed through repeated participation, teacher guidance and everyday institutional routines rather than through formal theoretical instruction. These practices provide a strong foundation for introducing structured waste management education within kindergarten settings.

Research Question 2: How do institutional practices support the integration of structured waste management education within kindergarten settings?

The study found that institutional practices play a vital role in creating an enabling environment for the integration of structured waste management education within kindergarten settings. Administrative commitment, supportive infrastructure, established institutional routines, continuous monitoring, staff motivation mechanisms and a willingness to strengthen existing systems collectively contribute to embedding environmental responsibility within the everyday functioning of the institution. The findings further reveal that innovative institutional initiatives, such as recognising and rewarding teachers for their contributions towards maintaining cleanliness and promoting environmental practices, encourage greater staff participation and reinforce a culture of shared responsibility. These practices ensure that waste management is experienced by

children as a regular part of their learning environment rather than as an isolated activity while strengthening the institutional foundation for structured waste management education.

- Strong administrative commitment supports the integration of waste management education by promoting environmental responsibility as a shared institutional value and encouraging teachers, staff and management to consistently reinforce sustainable practices among children.
- The child-friendly infrastructure and learning environments, including accessible waste disposal facilities, organised classrooms and experiential learning spaces, enable children to actively participate in environmental practices while fostering independence and responsible behaviour.
- Institutional policies, daily routines and organisational culture facilitate the integration of waste management education by embedding cleanliness, order, and environmental responsibility into the everyday experiences of children through consistent institutional practices.
- The continuous monitoring and implementation mechanisms, supported by institutional leadership and external agencies, ensure the effective and consistent execution of waste management practices, thereby strengthening institutional accountability and sustainability.
- Innovative institutional recognition and motivation mechanisms can strengthen the implementation of waste management practices. One participating institution adopted a staff recognition system that considered teachers' initiatives in maintaining cleanliness, environmental responsibility and active participation in institutional waste management activities as part of the evaluation for recognising outstanding performance. Such motivational practices encourage greater staff involvement, reinforce institutional commitment, and contribute to the effective integration of waste management education within kindergarten settings.
- Institutional readiness can be enhanced through continuous strengthening efforts, including improved infrastructure, child-friendly waste management facilities, teacher orientation, parental involvement and increased institutional support, creating a stronger foundation for integrating structured waste management education into early childhood education.

Research Question 3: How do teachers describe their experiences of using experiential and child-centred approaches to promote waste management practices among kindergarten children?

The study found that teachers facilitate waste management education primarily through experiential and child-centred pedagogical approaches that encourage active participation, observation, and continuous practice. Rather than relying on formal classroom instruction, teachers integrate environmental concepts into children's everyday experiences through practical activities and routine interactions, enabling them to develop environmentally responsible behaviours in a natural and developmentally appropriate manner.

- Activity-based and experiential learning serve as the primary pedagogical approach for promoting waste management practices. Teachers use activities such as gardening, classroom cleaning, waste segregation exercises, environmental demonstrations, and interactive learning experiences, such as encouraging children to remove plastic waste from a model water habitat to help children understand environmental concepts through direct participation and experience rather than theoretical instruction alone.
- Practical life activities provide meaningful opportunities for children to develop responsibility, independence, and environmental awareness through hands-on experiences. Activities such as using child-sized brooms and dustpans to clean their workspaces, arranging learning materials, watering plants, and caring for the classroom environment enable children to learn environmental responsibility through everyday practice.
- Observation and imitation play a significant role in children's environmental learning, as teachers consciously model environmentally responsible behaviours, enabling children to acquire positive habits by observing and replicating the actions of adults within the classroom environment.
- The repetition and continuous reinforcement are essential for transforming environmental practices into habitual behaviour. Regular participation in waste disposal, cleanliness routines, and practical activities enables children to internalise responsible environmental practices and perform them independently over time.
- The teachers perceive experiential and child-centred learning as more effective than theoretical instruction for introducing environmental responsibility during early childhood. By creating opportunities for active engagement, exploration, and

independent participation, teachers support the development of positive environmental attitudes and behaviours while providing a strong pedagogical foundation for integrating structured waste management education within kindergarten settings.

Research Question 4: How do teachers and management representatives describe the role of early childhood education in fostering environmental responsibility?

The study found that teachers and management representatives perceive early childhood education as the most critical stage for nurturing environmental responsibility and sustainable behaviour. Participants emphasised that the habits, values and attitudes developed during the formative years become deeply embedded and influence children's future interactions with society and the environment. Early childhood education therefore serves as an important foundation for cultivating environmentally responsible citizens through continuous exposure, meaningful experiences and collaborative learning between the school and the family.

- Early childhood is a crucial period for habit formation, during which environmentally responsible practices such as proper waste disposal, cleanliness and care for the surroundings can be effectively introduced through daily routines and repeated experiences, leading to the development of lasting positive behaviours.
- Environmental education during the early years contributes to the development of lifelong environmental values, enabling children to internalise responsibility, respect for nature and sustainable living practices that continue to influence their attitudes and behaviours throughout adulthood.
- Environmental responsibility is best nurtured through the integration of sustainable practices into children's everyday routines and experiences, where repeated participation in simple activities such as cleanliness, waste disposal, and care for the surroundings enables environmental behaviour to develop naturally as part of daily life rather than through formal instruction alone.
- The continuity between home and school plays a significant role in strengthening environmental behaviour formation. When parents reinforce the practices introduced in kindergarten, children are more likely to internalise positive environmental habits and consistently apply them across different settings.
- The children often become agents of environmental change within their families, transferring the habits and values acquired in kindergarten to their home

environment by encouraging family members to practise responsible waste disposal and cleanliness. This demonstrates that early childhood environmental education extends beyond the classroom and contributes to fostering a broader culture of environmental responsibility within the community.

Research Question 5: What opportunities and challenges influence the integration of structured waste management education into kindergarten education?

The study found that the integration of structured waste management education into kindergarten education is supported by significant opportunities within existing educational practices while also being influenced by institutional, resource-related and policy-level challenges. Participants perceived that the experiential nature of early childhood education provides a favourable environment for introducing waste management concepts, but emphasised that successful integration requires strengthened teacher capacity, adequate institutional resources, and collaborative support from multiple stakeholders.

- The existing kindergarten curriculum and daily classroom activities provide considerable scope for integrating structured waste management education, as concepts related to cleanliness, waste segregation, recycling, gardening and care for the environment can be meaningfully incorporated into routine learning experiences without creating an additional academic burden.
- Teacher preparedness and professional capacity are critical for effective curriculum integration, highlighting the need for regular training programmes, environmental education orientation and continuous professional development to enhance teacher's competence and confidence in facilitating experiential environmental learning.
- Institutional and resource-related constraints such as limited infrastructure, inadequate teaching-learning materials, the absence of child-friendly waste segregation facilities and the high cost of specialised educational resources may affect the effective implementation of structured waste management education within kindergarten settings.
- Supportive institutional leadership and innovative practices create favourable opportunities for successful integration. Administrative commitment, staff motivation initiatives and continuous institutional efforts to strengthen environmental practices contribute to building a culture that supports sustainable waste management education.

- The successful integration of structured waste management education requires collaborative policy and stakeholder support, involving educational institutions, parents, local self-government bodies, waste management agencies and government authorities. Such partnerships strengthen environmental education by ensuring continuity between school and home, improving institutional capacity and creating a comprehensive framework for fostering environmentally responsible behaviour among young children.

6.3. Recommendations

Based on the findings of the study, the following suggestions are proposed to strengthen waste management practices and facilitate the integration of structured waste management education in kindergarten settings. These recommendations are intended for educational institutions, policymakers and social work practitioners to promote environmental responsibility and sustainable behaviour among young children through innovative and child-centred approaches.

- Introduce child-friendly colour-coded waste segregation systems within kindergarten classrooms to help children distinguish different categories of waste through everyday practice and visual learning.
- Establish Environmental Learning and Recycling Corners within kindergarten classrooms, where recycled materials and nature-based resources can be creatively transformed into learning aids, art materials, and interactive waste management activities. Such spaces can provide continuous opportunities for experiential environmental learning while fostering creativity, resource conservation and environmentally responsible behaviour among young children.
- Develop an Institutional Environmental Action Plan that systematically integrates waste management education into the daily functioning of the kindergarten through planned activities, monitoring mechanisms and clearly defined environmental goals.
- Introduce teacher recognition and incentive mechanisms that acknowledge innovative environmental initiatives and active contributions towards maintaining a clean and sustainable learning environment, thereby motivating greater staff participation and institutional commitment.
- Establish an Institutional Green Committee comprising management representatives, teachers, support staff and parent representatives to periodically

review environmental practices, develop innovative initiatives, and coordinate waste management activities within the kindergarten.

- Develop an "Environmental Innovation Kit" for kindergartens containing reusable learning materials, activity cards, storytelling resources and simple experimental tools that enable teachers to introduce waste management concepts through experiential and inquiry-based learning.
- Develop a collaborative knowledge-sharing forum for kindergarten educators to document and exchange innovative experiential teaching strategies, environmental activities, and waste management practices, thereby promoting continuous pedagogical innovation and strengthening environmental education in early childhood settings.
- Introduce a "Green Habit Portfolio" for every child to document the gradual development of environmental habits such as proper waste disposal, cleanliness, care for plants, and responsible use of resources, thereby encouraging positive reinforcement and long-term behaviour formation.
- Design family-based environmental engagement programmes that involve parents and children in simple weekly sustainability activities at home, strengthening the continuity of environmental values between the kindergarten and family environment.
- Develop a structured early childhood waste management curriculum framework that integrates environmental concepts into existing classroom routines through age-appropriate, activity-based and experiential learning methods, ensuring uniform implementation across kindergarten settings.
- Introduce a model "Eco-Kindergarten Certification Programme" that recognises institutions demonstrating exemplary environmental practices, innovative waste management initiatives and effective integration of sustainability education, thereby encouraging continuous institutional improvement.
- Establish a dedicated Green Innovation Fund for Early Childhood Institutions to support the development of environmental learning corners, recycling laboratories, child-friendly waste management infrastructure, and innovative sustainability projects within kindergarten settings.
- Integrate environmental sustainability competencies into teacher education and certification programmes, ensuring that prospective early childhood educators are

equipped with the pedagogical knowledge and practical skills required to facilitate experiential waste management education.

- Develop a comprehensive state-level framework for early childhood environmental education that integrates structured waste management education into the kindergarten curriculum while establishing minimum standards for age-appropriate environmental learning, child-friendly waste management infrastructure, and experiential pedagogical practices across both private and government early childhood institutions.

6.4. Implications for Social Work Practice

The findings of the study highlight that waste management education in early childhood extends beyond environmental conservation and serves as a medium for promoting responsible citizenship, community participation and sustainable behaviour. From a social work perspective, environmental responsibility should be viewed as a developmental and social learning process that can be nurtured through collaborative interventions involving children, families, educational institutions and the wider community. Social workers can play a significant role in strengthening these processes by integrating environmental education into child development, community mobilisation and policy advocacy initiatives.

At the micro level, social workers can work with children and families to promote environmentally responsible behaviours through life skills education, behaviour modification techniques and family-based environmental activities. By encouraging parents to reinforce positive environmental practices at home and facilitating experiential learning opportunities for children, social workers can strengthen the continuity between home and school, enabling sustainable habits to develop during the formative years of childhood.

At the mezzo level, social workers can facilitate partnerships between kindergarten institutions, parents, local self-government institutions, community organisations and environmental agencies to promote collaborative environmental action. They can organise environmental clubs, family participation programmes, and community-based awareness initiatives that encourage active stakeholder involvement in waste management education. Social workers can also support teachers by facilitating innovative environmental learning programmes and creating platforms for sharing best practices in experiential environmental education across educational institutions.

At the macro level, social workers can contribute to policy development and environmental advocacy by promoting the integration of structured waste management education into early childhood education frameworks. Through research, advocacy and collaboration with educational authorities and policymakers, social workers can support the development of child-friendly environmental policies, curriculum reforms and institutional guidelines that strengthen sustainability education. Social workers can advocate for inclusive environmental programmes that recognise young children as active participants in sustainable development and encourage the creation of environmentally responsible communities through early intervention and lifelong habit formation.

6.5. Conclusion

The present study explored waste management practices in selected private kindergartens in Thiruvananthapuram and examined their potential for integrating structured waste management education into early childhood education. The findings indicate that waste management extends beyond routine sanitation and is embedded in children's daily learning through cleanliness activities, waste segregation, recycling, reuse and collaboration with external agencies. Institutional commitment, supportive infrastructure, administrative leadership and continuous monitoring foster an enabling environment, while teachers play a central role in promoting experiential, child-centred learning through observation, imitation, repetition and active participation.

The study concludes that early childhood provides a crucial foundation for developing lifelong environmental values and sustainable behaviours, with continuity between home and school reinforcing responsible environmental habits. While opportunities exist to integrate structured waste management education into kindergarten settings, challenges such as limited infrastructure, teacher preparedness, institutional resources and the absence of a formal curriculum framework need to be addressed. Overall, the findings indicate that private kindergartens have a strong foundation for integrating structured waste management education, supported through curriculum development, institutional innovation and enabling policy frameworks to promote environmentally responsible citizens and sustainable development.

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APPENDIX

TOOL FOR MANAGEMENT

PART 1 (BACKGROUND & ROLE)

1. Could you briefly describe your kindergarten and also tell me about your background and role in managing it?
2. Could you describe the overall physical environment of your kindergarten and how the available spaces and facilities support children's activities and daily routines?

PART 2 (INFRASTRUCTURE READINESS)

3. How is your institution equipped to manage waste on a daily basis?
4. How well do you think the existing infrastructure supports regular waste management practices?

PART 3 (GOVERNANCE & MONITORING)

5. How are waste management practices organised and monitored in your institution?
6. How does the management ensure that waste-related guidelines are followed consistently?

PART 4 (PROFESSIONAL SUPPORT SYSTEM)

7. What kind of support does the institution provide to staff for implementing waste management practices?
8. Does the institution collaborate with external experts or organisations for environmental activities?

PART 5 (STAKEHOLDER ENGAGEMENT)

9. How does the institution engage with parents in promoting environmental practices?
10. What role do parents play in reinforcing environmental practices among children?
11. How does the institution collaborate with local systems like LSG or Haritha Karma Sena?

PART 6 (SUSTAINABILITY & INNOVATION)

12. What kinds of environmental or sustainability practices are implemented in your kindergarten?

13. Has the institution introduced any innovative or unique practices related to waste management?
14. How do you ensure that these practices are sustained over time?

PART 7 (POLICY & INSTITUTIONAL COMMITMENT)

15. What policies or guidelines does your institution have regarding waste management?
16. How is waste management integrated into institutional planning and decision-making?
17. How does the institution promote an environmentally responsible culture?

PART 8 (REFLECTION & SUGGESTIONS)

18. What challenges does the institution face in implementing effective waste management?
19. What improvements or support would help strengthen waste management practices in kindergartens?

TOOL FOR STAFF

PART 1 (BACKGROUND & ROLE)

1. Could you please tell me a little about yourself and your role in this kindergarten?
2. Can you describe the kind of training or exposure you have received related to education and waste management?

PART 2 (KNOWLEDGE & UNDERSTANDING)

3. In your understanding, how would you describe waste management in a kindergarten setting?
4. Can you describe the different types of waste generated in this kindergarten and how they are managed on a daily basis?
5. Are you aware of any government initiatives related to waste management?
6. How do you approach teaching waste management to young children in a way that they can easily understand and practice?

PART 3 (ATTITUDES & BELIEFS)

7. What are your views on the importance of introducing waste management practices in early childhood education?
8. Do you feel it is your responsibility to promote environmental practices?

PART 4 (DAILY PRACTICES)

9. Can you describe how waste is managed during daily routines in the kindergarten?
10. How do you guide children in proper waste disposal practices?
11. What types of environmental activities are conducted in the kindergarten?

PART 5 (ROLE MODELLING)

12. In your experience, how do children learn about cleanliness and waste-related practices by observing others in the classroom?
13. How do you personally demonstrate good environmental practices to children?

PART 6 (INSTITUTIONAL SUPPORT)

14. How does the institution support staff in waste management practices?
15. Are roles and responsibilities clearly defined for waste management?

PART 7 (TRAINING & PROFESSIONAL DEVELOPMENT)

16. What kind of training or guidance have you received on waste management?
17. Do you feel confident in teaching children about environmental practices?
18. What kind of training or support would help you improve?

PART 8 (PARENT & COMMUNITY ROLE)

19. How do parents respond to environmental practices promoted by the kindergarten?
20. How do parents influence children's cleanliness and environmental habits?

PART 09 (SUGGESTIONS)

21. What improvements would you suggest for waste management in kindergartens?
22. What are the best ways to teach children sustainable practices?

