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Editorial

The Sri Lanka Journal of Development Administration (SLJDA), published by the Sri Lanka Institute of Development Administration, is allotted to studies in administrative, economic, management, development, social and political disciplines. This volume features eight articles that present contemporary perspectives from practitioners in public management, offering valuable insights into several critical topics. The reviewed articles in this collection span a range of disciplines, contributing to the broader spectrum of public management knowledge and practice.

The featured article by Ms. Premathilaka and Prof. Madhuwanthi examines the challenges male science teachers face in delivering Sexual and Reproductive Health (SRH) education in Sri Lankan public schools. Using a phenomenological approach, the study identifies four key challenges: student curiosity, inadequate teacher training, curriculum limitations, and parental resistance. The article underscores the importance of addressing these obstacles to ensure the effective delivery of SRH education and promote the well-being of students.

Ms. Gamage's article explores Participatory Action Research (PAR) as a key methodological approach in development planning. PAR empowers marginalized communities through collaboration and knowledge co-creation. The article examines its theoretical foundations, historical evolution, and practical applications, presenting PAR as an alternative to traditional methods in research. It emphasizes PAR's role in fostering social justice and inclusivity while addressing challenges in its implementation.

Ms. Kularathne's article examines the challenges faced by state-owned business enterprises in Sri Lanka, many of which incur significant financial losses. Poor governance emerges as a primary factor contributing to their underperformance. The article advocates for reforming these entities as an alternative to privatization, highlighting the importance of further research to identify and implement effective reformation strategies.

Ms. Liyanage's article examines alternative strategies for poverty alleviation in Sri Lanka. The study highlights key challenges and opportunities within current poverty alleviation programs and proposes four policy recommendations with corresponding implementation tools. Furthermore, it

presents a comprehensive framework aimed at improving the effectiveness and sustainability of poverty reduction efforts in the country.

The featured article by Mr. Ranathunga, Prof. De Silva, Emeritus Prof. Amarasinghe and Prof. Kularatne explores co-management as an effective participatory approach to address challenges in small-scale fisheries (SSF) caused by ecosystem dependency, economic globalization, and climate change. It explains key requirements for operationalizing co-management as strong local leadership, cohesive community networks, robust local organizations, indirect regulations, and ecological knowledge.

Ms. Chandrasiri's article examines the agro-food industry's environmental impact and the need for green supply chain management. Highlighting the industry's significance and controversies, the author presents a strategic framework for sustainable practices using a systematic review of related journal articles. The proposed framework addresses environmental hazards in farming, processing, transportation, and warehousing, offering guidance for sustainable operations.

The article by Ms. Liyanage and Dr. Arandara examines the impact of inspections on understanding and compliance with the Factory Ordinance, utilizing data collected from a group of factories, some of which had been during the last 3 years. The findings reveal that inspections significantly enhance both understanding and compliance with the ordinance, with inspected factories showing higher scores in both areas.

Ms. Balasooriya's documentary examines the evolution of administrative literature over the past fifty years, focusing on the Sri Lanka Journal of Development Administration (SLJDA). Marking half a century since training for administrative officers began, the study highlights the journal's role since its launch in 1970. By analyzing SLJDA’s publications, the documentary provides insights into the growth of administrative thought and learning.

“Research is seeing that everyone else has been seen and thinking what nobody else thought”.

Thus, I believe the pile of articles compiled in this volume will provide insights for public policy decisions in diverse disciplines.

Professor W. Indralal De Silva
Emiratis Professor in Demography, University of Colombo

Exploring Challenges Faced by Male Science Teachers in Teaching Sexual and Reproductive Health Education in Public Schools in Sri Lanka: With Special Reference to Rathnapura District

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Abstract

Sexual and Reproductive Health (SRH) education is necessary to improve self-efficacy, decrease false information, increase correct knowledge, and explain and reinforce good values and attitudes. SRH education is the key strategy for promoting safe sexual behavior among adolescents. Nevertheless, the national health survey conducted in 2012/13 showed that only 59% of the youth received SRH education in Sri Lankan schools, yet only less than 1% of adolescents were found to have satisfactory SRH level. The key factors that influence comfort in delivering sexual education are identified as disruptive behavior, insufficient time and lack of dedicated classrooms. Therefore, this study explores the challenges faced by male science teachers in teaching SRH education in public schools in Sri Lanka and provide suggestions to overcome those challenges. This is a phenomenological study that used a sample of 10 male science teachers who teach the ordinary level science subject in public schools in the Ratnapura district. Primary data were collected through face-to-face in-depth interviews with the consent of the participants by using a semi-structured interview guide and done a thematic analysis. The challenges were identified under four major themes: 1) students' curiosity in SRH consisting with sub-themes of age-appropriate knowledge, fear of misinterpretation; 2) lack of teacher training and development for SRH education including sub-themes such as dealing with sensitive topics, continuous professional development; 3) curriculum barriers, comprising sub-themes of insufficient curriculum content, time limitation for teaching SRH, disconnection between biological and social components of SRH, inadequate supporting tools for SRH and 4) parental resistance for teaching SRH education containing sub-themes of educational level of parents, fear of encouraging sexual activity. The study concluded that teaching SRH education in public schools in Sri Lanka poses a variety of challenges for male science teachers and it is required to address those challenges to deliver a comprehensive SRH education for the well-being of the students.

Keywords: Sexual and Reproductive Health Education, Male Science Teachers, Public Schools, Sri Lanka

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Introduction

Sexual and Reproductive Health (SRH) covers every aspect of individual's physical, mental and social wellbeing with respect for the reproductive system and all of its operations (WHO, 2024). SRH indicates that humans may have fulfilled and safe sexual relationships, reproduce and have the flexibility to choose if, when and how frequently to do (ibid). SRH has been identified and developed as an international human right law and the United Nations confirmed that SRH is a human right established in the core human right conventions (Pizzarossa & Perehudoff, 2017). Good sexual health not only includes the attainment of physical, emotional, mental, and social wellbeing about sexuality, but it also focuses on the absence of disease, dysfunction, or infirmity (WHO, 2017). SRH education includes subject areas such as physical education, puberty, pregnancy and sexually transmitted infections such as HIV/AIDs, as well as feelings and connections that come with having sex and the main goal of the SRH education is to help the adolescents develop the information, self-reliance and abilities to successfully move into adulthood while maintaining good sexual health (ibid).

Though in Sri Lanka there has been an educational program for adolescents on SRH in schools for many years, a sizable proportion of youth demonstrated low access to SRH education and a low level of knowledge on pregnancy, contraception, and socially transmitted infections. Although it is limited, respondents felt that the SRH education received in school is useful for their life (De Silva et al, 2024). One area of national concern has been the lack of knowledge on the requirements of adolescents in Sri Lanka with regard to their sexual and reproductive health (ibid). The national health survey conducted by 2012/13 showed that only 59% of the youth received SRH education in Sri Lankan schools. Also, this survey finds that only less than 1% of adolescents were found to have satisfactory SRH level (Mataraarchchi et al., 2023a). This inadequate SRH education creates negative results within the country. Statistics from the National Child Protection Authority of Sri Lanka indicated that from January to October 2023, there were about 8,000 incidents of child abuse (Fernando, 2023). Also, according to the 2022 statistics of the Police Department of Sri Lanka, 79 child abuse incidents and 1,500 rape cases were reported in the first 9 months of the year, and it was a significant increase from the first 9 months of pervious year (The Morning , 2024). Further, the sources

of Ministry of Health in Sri Lanka stated that, in the 2nd quarter of year 2023, 14,501 cases of sexually transmitted diseases were confirmed (STI National Data, 2023). The World Bank data informed that, the rate of adolescents' fertility has been relatively stable over the last 10 years, with births per thousand adolescents aged 15-19 standing at 19.5% in 2010 and 20.5% in 2020 (Mataraarchchi et al., 2023a).

The key factors influencing comfort in delivering sexual education are identified as disruptive behavior, insufficient time and lack of dedicated classrooms (Rose, 2019). Over emphasis on abstinence, an unconducive learning environment, existence of sexual practices linked to coming of age rites, peer pressure, lack of sexual and reproductive health reinforcement by parents and inadequate training for teachers are also identified as challenges to deliver the Sexual and Reproductive health education (Likupe et al., 2020). Teachers, particularly those who are male, find it difficult to teach the subject of sex education because some parents consider that they are filtering with girls (Espinosa & Barraza, 2021). Challenges identified as being faced by teachers in teaching SRH education include students' ignorance about sex education and reproductive health, parental resistance, cultural and religious taboos and insufficient teacher preparation (Munyai et al., 2023). Besides, teachers feel uncomfortable talking about wet dreams, female genitals and masturbation (Milton, 2003). A Sri Lankan study confirmed that children did not receive an adequate sexual education from the schools (Jayasooriya & Mathangasinghe, 2019). In a recent Sri Lankan survey carried out among unmarried youths concluded that there is a significant knowledge gap on SRH and age-specific and gender-sensitive SRH education is important to address the current gap in SRH knowledge (De Silva et al, 2024). Also, a study conducted among the female science teachers on teaching SRH education revealed that it is needed in public school curriculum as students' knowledge on that is at a lower level, and teachers have noticed that students are attempting to get SRH knowledge through informal sources such as friends and internet which may mislead them (Madhuwanthi & Madhubhasha, 2021). Since both the male and female teachers engage in teaching SRH education in schools in Sri Lanka, exploring about the male teachers' perspective may inform new insights in education context.

Therefore, this research attempts to examine the challenges faced by male science teachers in teaching SRH education in public schools in Sri Lanka, with special reference to Ratnapura district.

Literature Review

Teaching SRH Education

The United Nations Population Fund defines SRH as a condition of total physical, mental, and social wellbeing in all areas pertaining to the reproduce system. According to UNESCO, SRH education is necessary to improve self-efficacy, decrease false information, increase correct knowledge, and explain and reinforce good values and attitudes. Adolescents must have early access to pertinent and high quality SRH education and information in order to be safe and healthy (Ram et al., 2020). School based SRH education play an essential role in the initiation of sex education and has been proven to reduce risky sexual behavior in adolescents.

Efforts to undermine sexuality education are normal but at present the importance of the education system in promoting SRH has been widely acknowledged. SRH education has been a part of the curriculum for the public schools in Sri Lanka since early 1990s, and currently it is taught through two subjects, namely the Science stream and the Health and Physical Education stream. Nevertheless, research has identified a significant lack of knowledge about SRH education as a key contributor to the growing burden of SRH issues within Sri Lanka (UNFPA, 2017). Research shows that a large number of young people in Sri Lanka have little information about SRH, which leads to engaging in problematic sexual conduct and also only 58% students were satisfied with the current system of school-based SRH instruction (Mataraarachchi et al., 2023b). Furthermore, field survey conducted in 2019 among teenagers who had never married, results showed that 10% of males in the 15-19 age group and 7% of those in the 20-24 age group said that SRH was never mentioned in their schools at all (Kumarasinghe & De Silva, 2022).

Challenges faced by teachers in teaching SRH education

Enhancing teacher's interest in teaching SRH education appears to be a challenging task as some teachers are reluctant to discuss SRH with students

in the classroom mainly due to the sensitivity of the topic. Teachers' fear in teaching SRH education, thinking it may boost children's "sexual awakening" and could lead to them engaging in sexual conduct (Shibuya et al., 2023; Donovan, 1998). However, teachers also experience personal discomfort with certain subjects. For instance, some teachers may be afraid to teach puberty in classroom (Bunoti et al., 2021).

Another major obstacle is teachers' reluctance to teach SRH due to lack of training in teaching SRH (Donovan, 1998). Teachers may feel uneasy when unexpected questions arise since they are not prepared to answer them. Some teachers are not confident enough to deliver SHR education without having formal training on it (Wakjira & Habedi, 2024). The teaching capacity of teachers may be affected by their experiences of teaching SRH and their gender (Lama, 2022).

SRH education was seen as opposition to religious and cultural norms, as it confronts local ideas of sexual morality. Particularly, in the Asian cultural norms, that oppose teaching SRH education to students, believing it is contrary to their culture or religion (Latifnejad et al., 2013). There were concerns that some topics were too sensitive as they were believed to promote pre-marital and casual sex among learners (Zulu et al., 2019). Because of this, teachers feel uneasy teaching SRH and worry about possible resistance from parents, who also have cultural backgrounds that discourage teaching SRH to their children (Mahoso et al., 2023).

Also, issues associated with SRH curriculum are obstructing the smooth delivery of SRH education such as inadequate coverage of topics, effectiveness of SRH teaching approaches, lack of comprehensive teaching materials to help teachers adapt the curriculum to specific setting (De Silva et al., 2024; Wakjira & Habedi, 2024). This is extremely problematic as teachers' skills to effectively implement sex education curriculum are influenced by their own views, values and attitudes (Ocran, 2021). It's believed that existing school SRH education curriculum's structure and design are uneven and inadequate at supporting adolescents' sexual health. Comprehensive information about SRH, including relationships, social concerns, sexual behavior and life skills is lacking (Acharya et al., 2019).

Apart from that, parental resistance might compromise teachers' loyalty to the SRH education curriculum because they could skip certain important topics in

order to avoid parental criticisms (Zulu et al., 2019). Less educated rural people are more likely to reject sexuality education, believing those conflict with their cultural beliefs and practices (Adekola & Mavhandu-Mudzusi, 2021). Uncooperative parents prevented their children from asking questions and they disapproved of any SRH related school programs (Lama, 2022). It was found that female science teachers in Sri Lanka were willing to teach SRH education in public schools, yet traditional SRH curriculum content, inappropriate pedagogy, lack of training and resources, and difficulties in dealing with sensitive topics were refraining them from doing it (Madhuwanthi & Madubhasha, 2021). Though many challenges are posing in teaching SRH education in schools, it is pivotal to provide that education for the adolescents.

Methodology

This is a qualitative study which adopted phenomenological research design. The study focused on male science teachers in public schools in Rathnapura district. A total of 10 male science teachers were interviewed covering girls only, boys only and mixed public schools, reaching a level of saturation (table 1). The sample was purposively selected to ensure inclusion of participants with diverse views and experiences about SRH education. Primary data were collected from the participants through face-to-face in-depth interviews with the consent of the participants by using a semi-structured interview guide. The data were analyzed through thematic analysis.

Data Analysis

To explore challenges encountered by male science teachers in teaching SRH education in public schools, data were collected through 10 participants whose age ranging from 32 to 58 years. The majority of them are married and have studied in mixed schools. They have been teaching science for a quite considerable period in public schools in Sri Lanka.

Table 1
Sample Profile

Participants	Age of teacher (in years)	Marital status of teacher	Living area of teacher	School of teacher	Currently teaching school	Service period (in years)
Participant 1	59	Married	Urban	Mixed	Girls	37
Participant 2	45	Married	Urban	Mixed	Girls	11
Participant 3	32	Unmarried	Rural	Mixed	Girls	7
Participant 4	38	Married	Semi Urban	Mixed	Boys	12
Participant 5	32	Unmarried	Semi Urban	Single Gender	Girls	5
Participant 6	38	Married	Semi Urban	Mixed	Girls	11
Participant 7	45	Married	Urban	Mixed	Girls	13
Participant 8	54	Married	Semi Urban	Mixed	Mixed	25
Participant 9	34	Unmarried	Rural	Single Gender	Boys	9
Participant 10	44	Married	Urban	Mixed	Mixed	14

Source: *Field data, 2024*

The participants described a variety of challenges they are encountering when teaching SRH education in public school. Based on their explanation researchers identified main themes and sub-themes as appeared in the table 2.

Students' Curiosity in SRH

According to the male science teachers, students are very curious about SRH knowledge and related matters. Their curiosity begins at the age of 11 or 12 and they start to learn, discuss, inquire and experience it. However, students often quench that curiosity through friends, peers, internet and their own efforts. While curiosity is a natural part of the adolescent development, seeking information from unreliable and inappropriate sources may lead to misconceptions and misunderstanding.

"If the schools can minimize this curiosity at the early ages of students, we can minimize the SRH related issues prevailing in the society" (Participant 5)

In such circumstances providing them accurate information and SRH knowledge is challenging for teachers in two ways; teaching the students age-appropriate SRH knowledge and addressing male science teachers' fear of students misinterpreting SRH knowledge/concepts.

Age-appropriate knowledge

Male science teachers acknowledged the gap between the age at which students' curiosity arises and the delivery of formal SRH education in public schools. The public schools enter into SRH topics in grade 10 whereas many adolescents have already formed opinions about sex, reproduction and relationships by that time. The opinions of the students are presumed to be either accurate or inaccurate. Some students ask the teachers to teach certain topics in advance to ensure their opinions about SRH knowledge. Consequently, it may complicate the delivery of SRH education for the students.

"Many students have curiosity about SRH before they learn this subject in grade 10. Mostly they go to experience things because of this curiosity" (Participant 6)

Fear of misinterpretation

Fear of misinterpreting SRH concepts is a common concern among male science teachers, as it may impart inaccurate knowledge and false information to the students, potentially damaging the student-teacher relationship and engagement. Usually, the conversations about SRH are less common and discouraged in Sri Lankan context through cultural lens of privacy and traditional values. There may be a higher chance of misunderstanding and misinterpretation of SRH related matters, which is a problematic.

Teachers' training and development for SRH education

The primary goal of SRH education is to equip students with the knowledge and skills to make responsible choices about their SRH. Provisioning of such a comprehensive education should be a methodical effort. Teaching a subject like SRH which includes sensitive topics is even more essential but complex.

The male science teachers in the study described their displeasure and lack of confidence in teaching SRH education in the absence of proper training and development for teachers. Accordingly, science teachers compromise the contents or topics of the subject to be taught, level of knowledge to be imparted, and instructional strategies to be adopted, leading to demeaning the quality of the subject. The challenge of lack of training and development has been narrowed down into two sub-themes as dealing with sensitive topics in the subject and provisioning of continuous professional development for teaching the subject.

Dealing with sensitive topics

In the absence of training, the teachers mostly rely on the curriculum for directions. The syllabus offers an organized overview of the topics that should be taught in the classroom, but it frequently lacks depth, particularly when it comes to difficult and dynamics subjects like SRH. Teachers have a certain amount of comfort and maturity when it comes to discussing sensitive subjects in SRH, such as consent, sexual activity, puberty, contraception and etc. without sufficient preparation, teachers face challenges to have a direct discussion about these subjects, which may lead them to ignore or treat them insufficiently.

“I have not undergone any training in teaching SRH. We only have a given syllabus” (Participant 2)

Continuous professional development

According to teachers, they usually didn’t receive any professional support relate to the SRH education and willing to have a professional growth, especially in sectors like SRH where social and medical research is always changing, and knowledge is expanding quickly. Teachers must be knowledgeable in the most recent knowledge about gender identity, consent, STIs, contraception, and other crucial SRH topics. And also, they require the instructions on how to navigate these subjects’ sensitivity in a classroom context.

“There is not any training program or workshop conducted by the ministry of education regarding SRH education recently. What I teach is the classroom that I have learnt during my Advance Level class as a student” (Participant 4)

Curriculum Barriers

The theme curriculum barriers include content-related, curriculum-wide procedural, structural and delivery-related obstacles that obstruct the effective delivery of SRH education. Having curricular and instructional alignment between grade levels is necessary to support student achievement and to meet learning objectives. However, male science teachers have mentioned that curriculum barriers pose a lot of disadvantages for both the students and teachers. They have revealed them through four sub-themes as insufficient curriculum content, time limitation for teaching SRH education, disconnection between biological and social components of SRH, and inadequate supporting tools for teaching of SRH education.

Insufficient curriculum content

As per the teachers, prevailing science curriculum content of public schools is insufficient to cover SRH areas, and SRH contents are dispersed in the science subject. Due to the limited scope of SRH education, teachers have to regularly fill in knowledge gaps, which makes it challenging to provide students with a comprehensive education on SRH.

Teachers described that the curriculum ignores the larger emotional, social and psychological aspects of SRH instead of that mechanics of reproduction. This overemphasis on biology leads to an imbalanced learning experience.

"Only the Reproductive system, process and few diseases are only talking within the curriculum. But there is another huge area that needs to be covered to create a full aware student" (Participant 3)

Time Limitation for teaching SRH education

Public school science stream curriculum currently covers three subjects: biology, chemistry and physics, with SRH education included in the biology syllabus. The time allocated for science classes is not enough to fully cover the syllabus of those three subjects. Hence, it does not allow to teach SRH education effectively, by productively engaging in discussions with the students and answering their questions. Teachers may therefore rush through the SRH given topics, which would hinder students' comprehension and interest in the SRH area.

"Time limitation for SRH education would not let us to teach comprehensive SRH education. We need to cover the whole syllabus within limited time period and prepare students to sit the examination" (Participant 10)

Disconnection between biological and social components of SRH

According to the teachers, the disconnection between the biological and social components of SRH education is a critical challenge. In the absence of adequate instructions and curricular support, teachers are quite confused how to address the broader social contexts of SRH. Biological information of SRH is real, objective, and uncontroversial, making it simpler to teach. However, social dimensions of SRH like gender roles, gender norms, social structures, social expectations, consent and emotional bonds require a distinct set of educational methods and sensitivities. Due to the narrow teaching focus, mostly on biological aspects of SRH as specified in the curriculum, the social aspects of SRH education are degraded, which is fundamental for the well-being of adolescents. Thus, the male science teachers find it challenging to impart knowledge on relationships and the emotional aspects of SRH education.

"The syllabus highly includes biological concepts and themes of SRH. So, our main focus is covering biological aspects of SRH and merely touching the areas of social and emotional aspects of SRH." (Participant 5)

Supporting tools for teaching SRH education

Modern educational environment relies more on digital tools and resources to enhance learning whereas contemporary adolescents are technology-savvy. Male science teachers have identified this premise as a favourable condition for delivering SRH education for students in effective manner. As described by the male science teachers, SRH education often deals with complex biological processes that are sometimes difficult for students to grasp through verbal explanations alone, it would be easier to understand them using supporting tools such as photos, diagrams, videos etc. Digital and visual aids can assist mitigate the discomfort by focusing the discussion on factual, scientific representations, rather than subjective or culturally influenced views. However, the challenge encountered by the male science teachers is the absence of digital materials and visual aids created especially for SRH education in the public schools in Sri Lanka. This includes not having access

to tools that may make learning more engaging and dynamic, such as computers, television, multi-media projectors, podcasts, and instructional software.

“We don’t have diagrams, authorized videos to enhance the understanding of the content which can’t explain verbally” (Participant 4)

Parental resistance for teaching SRH education

Interviews with the male science teachers exposed that parents’ resistance has become a challenge for male science teachers to transmit SRH knowledge for students in public schools. According to the teachers, parents’ unawareness about SRH education, cultural norms and religious beliefs largely contribute to negative attitudes towards SRH education. It may be due to the level of education among the parents, and also, they might think that SRH education leads to promote sexual engagement among the students.

Educational level of parents

The male science teachers revealed that parents with a better educational level have a more favorable perception of teaching SRH education in public schools. These parents seemed to have a greater awareness of the value of this kind of knowledge in fostering responsible sexual conduct, reducing sexually transmitted infections, and improving adolescent health. Due to a lack of knowledge or misunderstanding about the SRH education, uneducated and/or less educated parents have considered it a violation of a taboo. These parents may place a high priority in upholding traditional values since they frequently feel that SRH topics introduced in schools are inappropriate. Due to societal expectation and family customs, a highly educated parent from a conservative cultural background could however be resistant to SRH education.

“It appeared that educational level of parents greatly effects on the resistance towards the SRH education. Apart from that cultural believes and the family opinions may affect the parental resistance.” (Participant 6)

Fear of encouraging sexual activity

Another common misconception held by parents about SRH education is that the subject may promote sexual activities among the adolescents. This could be a serious consideration to many parents to resist the subject. They believe

that SRH education encourages sexual experimentation and/or teaching the students how to have sex. Parents who have this idea might believe that keeping their children in silence or avoiding them accessing SRH knowledge will keep them safer.

"Some parents are afraid that SRH education taught in schools promotes sexual activities and experiments, while parents are trying to hide such sensitive topics from their children". (Participant 2)

The key challenges faced by male science teachers in teaching the SRH education are succinctly articulated in table 2 with the main themes and sub-themes.

Table 2

The main and sub-themes emerged from data analysis

Themes	Sub Themes
Students' Curiosity in SRH	- Age-appropriate knowledge - Fear of misinterpretation
Teacher training & development	- Dealing with sensitive topics - Continuous professional development
Curriculum Barriers	- Insufficient curriculum content - Time limitation for teaching SRH - Disconnection between biological and Social components of SRH - Inadequate supporting tools for SRH
Parental Resistance	- Educational level of parents - Fear of encouraging sexual activity

Source: *Field data, 2024*

Discussion

Exploring of the challenges faced by male science teachers in teaching SRH education in public sector schools in Sri Lanka identified four key thematic areas: students' curiosity in SRH, lack of teacher training and development for SRH education, curriculum barriers, and parental resistance fir teaching SRH. Students' curiosity about the SRH matters has been further affirmed by students explaining that sexuality education needs to begin before the puberty since young people are more curious about sex and sex-related information

due to the effects of globalization and internet access (Pokharel et al. 2006). Puberty is a time of peak curiosity and sexual intention. It is also a time when misconceptions about the reproductive process and its effects to become apparent, leading to a permissive attitude toward sexual conduct (Pradnyani et al., 2019). Also, findings emphasize the challenge of lack of training and development in teaching SRH education. Compatible with that finding, some studies have stated the necessity of special training for SRH education (Wakjira & Habedi, 2024). It has been shown that teachers frequently lack the necessary training to effectively teach the subject and find it awkward to bring up sexuality related topics (Ngissa et al., 2024). Without proper training, teachers will compromise the contents of teaching in an arbitrary manner, deciding how, when and what to teach to students (Zulu et. al., 2019). It is noted that the responsibility of sexuality education is undertaken with neither in-depth knowledge of the subject matter nor adequate instruction in how to deliver SRH education (Donovon, 1998).

Also, curriculum barrier is another significant challenge to provide comprehensive SRH education to students. This finding has been supported by studies, arguing that most traditional curricula focus on abstinence-based approaches and biological aspects of reproduction, which do not provide students with the necessary social, emotional, and psychological skills to manage SRH responsibly (Goldman, 2010).

The challenge of parental resistance for teaching SRH education in schools has been found in research, with parents believing that education could prompt an earlier start to sexual activity and being concerned about discussions related to diverse gender and sexual identities (Obach, 2022). Nevertheless, some parents do support teaching SRH education at the schools, whereas they are not in a position to discuss such matters at home (Ram et al. 2020).

Conclusion

This phenomenological study intends to explore the challenges encountered by male science teachers in teaching SRH education in public schools in Sri Lanka and it collected primary data from the male science teachers in Rathnapura district. The data revealed that male science teachers face a variety of challenges from the students, from the parents, through the curriculum and the absence of proper training and development for teaching SRH education.

Knowing the benefits of teaching SRH education for the adolescents, it is suggested for policymakers to incorporate comprehensive SRH education within the public-school curriculum and work on capacity building of teachers through training. Also, by getting the parents' engagement, and the use of culturally sensitive teaching methods, teachers can overcome these challenges and contribute to a more informed healthy society.

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Participatory Action Research (PAR): An Alternative Approach to Development Planning

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Abstract

Participatory Action Research (PAR) has emerged as a transformative methodology in development planning, aiming to empower marginalized communities through collaborative knowledge creation, capacity-building, and participatory decision-making. Rooted in critical pedagogy and social justice frameworks, PAR challenges traditional top-down approaches by fostering inclusivity, mutual learning, and context-specific solutions, prioritizing community agency and self-determination. This article explores the theoretical foundations, historical evolution, and practical applications of PAR, emphasizing its potential to address socio-economic inequalities, enhance participatory governance, and contribute to sustainable development. However, implementing PAR faces challenges such as ethical dilemmas, power imbalances, and resource limitations, necessitating strategic approaches for effective application. The article concludes that PAR offers a viable alternative to conventional development methodologies, providing a framework for more inclusive, community-driven, and sustainable policy outcomes.

Keywords: Participatory Action Research (PAR), Development Planning, Community Empowerment, Social Justice, Knowledge Co-creation

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Introduction

In contemporary development discourse, the concepts of participation, sustainability, and empowerment have gained significant prominence (Michener, 1998). Initially applied in third-world contexts to empower oppressed communities, PAR has since found relevance in developed countries as well (Piercy et al., 2011; Reason, 1994). Defined as a collaborative process of research, education, and action, PAR explicitly aims at social transformation (Kindon et al., 2007). Inspired by Paulo Freire's (1970) *Pedagogy of the Oppressed*, it advocates for the active involvement of community members in the research process, enabling them to become research partners rather than mere subjects (Piercy et al., 2011).

Participatory Action Research (PAR) is a collaborative methodology integrating research, education, and action with an explicit aim of fostering social transformation (Kindon et al., 2007; Hall, 1981). Originating from Paulo Freire's (1970) seminal work Pedagogy of the Oppressed, PAR has evolved significantly, enriched by the contributions of numerous scholars (Brydon-Miller, 1997; Fals-Borda & Rahman, 1991). Fundamentally, PAR seeks to enable marginalized and oppressed communities to transform their socio-economic environment through active participation in research and action. Researchers, in this context, assume a facilitative role, acting as catalysts and supporters rather than authoritative figures (Fals-Borda & Rahman, 1991). By empowering community members to become co-researchers, PAR promotes mutual learning and shared ownership of the research process (Piercy et al., 2011).

Purpose of the article

The primary purpose of this article is to develop a conceptual framework for employing PAR as an alternative to traditional development planning. By critically examining PAR's theoretical underpinnings and practical applications, the article seeks to demonstrate how it can lead to more inclusive, sustainable, and context-specific development outcomes. This article aims to bridge the gap between academic research and practical implementation, providing a robust foundation for future empirical research and policy formulation.

Justification

Rethinking conventional development paradigms is imperative because traditional approaches often exclude marginalized voices and fail to address context-specific needs (Rahman, 1993). PAR offers a novel contribution by fostering empowerment, inclusivity, and participatory decision-making. Unlike traditional methodologies, which prioritize external expertise and top-down interventions, PAR emphasizes collaboration and local ownership of development processes (Glassman & Erdem, 2014). This approach ensures that solutions are culturally relevant and sustainable, addressing the real concerns of communities. Furthermore, as development challenges grow increasingly complex, innovative frameworks like PAR are crucial for creating equitable and effective solutions.

Theoretical Overview and Literature Synthesis

Defining PAR

When defining Participatory Action Research (PAR), it becomes evident that diverse theoretical foundations underpin this methodology. According to McIntyre (2008), PAR emphasizes lived experiences, individual and social change, and the construction of knowledge through action. This approach bridges the gap between knowledge creation and practical application, legitimizing action as a mode of inquiry (McIntyre, 2008, p. xii).

Brydon-Miller (1997) identifies three fundamental criteria characterizing PAR in his article “Participatory Action Research: Psychology and Social Change”:

1) Involvement of marginalized groups: PAR primarily engages individuals and communities who are traditionally oppressed, marginalized, or powerless.
2) Focus on community-defined topics: PAR addresses specific issues identified by the concerned community to drive positive social transformation.
3) Transformation through education and knowledge sharing: PAR enhances participants’ education and skills, fostering collective knowledge creation and contributing to social change (Brydon-Miller, 1997, p. 661).

Additionally, Stringer (2007) underscores the importance of flexibility in PAR, noting that it adapts to specific cultural and social contexts. Banks and Armstrong (2023) emphasize its iterative nature, which fosters continuous dialogue and mutual understanding between researchers and participants. Expanding on this, Zuber-Skerritt (2015) introduces Participatory Action Learning and Action Research (PALAR), a methodology integrating lifelong learning principles with PAR to broaden its applicability beyond development studies to fields such as education and community health. This research paradigm critiques traditional top-down methodologies, offering a framework for fostering empowerment, social justice, and inclusivity in various socio-political contexts.

This research paradigm emphasizes the active participation of marginalized communities in knowledge generation and decision-making processes, positioning them as co-researchers rather than passive subjects. It critiques traditional top-down methodologies and offers a framework for fostering empowerment and inclusivity in diverse socio-political contexts.

Historical Evolution of PAR

Though there are several interpretations of PAR's history and origin (Brydon-Miller & Maguire, 2009), this paper discusses the historical revolution, which started around the 1960s and progressed by passing important milestones in the 1970s, 1977s, 1980s, and so on.

In the early 1960s, after the Cuban revolution, the liberation movements in Latin America work theories on the mechanism of cultural and economic dependency, advancing towards the participatory research agenda (Hall, 1992) in Brazil. Then, the early 1970s was highlighted as the proliferation of approaches of participatory and participatory action research in India, Africa and Latin America (Kindon et al., 2007). This represented a new epistemology of practice, which reflected the movements in India with Mahatma Gandhi. Mahatma Gandhi's method, called the practice of "soul power", is based on the transformation of local people's knowledge into voicing their concerns and resisting British rule of power (Sivananda, 2007; cited in Kindon et al., 2007).

Marja-Liisa Swantz in Tanzania introduced the term "participatory research" to describe her work, which was conducted in integrating local village members and their knowledge to address locally controlled development

issues such as youth and employment in the coastal region and socio-economic causes of malnutrition in Kilimanjaro (Kindon et al., 2007; Hall, 1992). In 1977, Participatory Research Network was created through the International Council of Adult Education, and Participatory Research became a prominent methodological concept (Sillitoe et al., 2002). It brought together not only social scientists but community organizers, literacy teachers, administrators, urban activists and factory workers (Sillitoe et al., 2002). When highlighting the important milestones of the evolution of PAR, another persuading scholar is Paulo Freire, a Brazilian educator who wrote his book Pedagogy of the Oppressed (1910/1993), which introduced the principles of PAR and the notion of "conscientization." This contribution of Freire lighted a new concept in the social science research area, and most of the researchers were motivated by his work (Brydon-Miller, 1997; Johnson & Martinez Guzman, 2013).

Another important milestone is the first wave of PAR, which took place in Colombia with Orlando Fals-Borda and colleagues and developing alternative institutions and procedures for research which could foster social change (Kindon et al., 2007). Following the first wave of PAR in the 1980s, the second wave of PAR occurred in the context of community development and international development. In this era, alternative approaches were introduced to traditional, top-down, rigid, cumbersome development surveys (Kindon et al., 2007). Further, by the 1990s, PAR was highly recognized and blended with strands of Action Research and critical social sciences (Kindon et al., 2007; Whyte, 1991).

History reveals that PAR has emerged as an alternative approach to cumbersome development practices, pursuing practical issues of concern to people (Kindon et al., 2007).

Table 1

Key Milestones in the Evolution of PAR

Time Period	Milestone/Development
1960s	The origins of PAR can be traced to liberation movements in Latin America, particularly following the Cuban revolution (Hall, 1992).
Early 1970s	The proliferation of participatory approaches in India, Africa, and Latin America was influenced by Mahatma Gandhi's methodologies and local empowerment movements (Kindon et al., 2007).
1977	Establishment of the Participatory Research Network by the International Council of Adult Education.
1980s	The first wave of PAR in Colombia, led by Orlando Fals-Borda, focused on developing alternative institutions and fostering social change.
1990s	The blending of PAR with critical social sciences and action research, highlighting its adaptability to diverse socio-political contexts (Kindon et al., 2007).

Developing the Argument: Critiques, Frameworks, New

Perspectives Epistemological and Ontological Foundations of PAR

Participatory Action Research (PAR) challenges traditional positivist paradigms by advocating for the co-creation of knowledge through collaboration with marginalized communities. Unlike conventional research, which often centralizes knowledge within academic institutions and assumes objective realities measurable by professionals, PAR emphasizes that knowledge is socially constructed, situated, and dynamic (Kindon et al., 2007; Reason & Bradbury, 2006). This counter-hegemonic stance promotes inclusivity and democratizes knowledge production.

PAR's ontology recognizes human beings as dynamic agents with the capacity for reflexivity and self-change. Its epistemology underscores that knowledge is validated through lived experiences and contextual relevance. Kindon et al. (2007) argue that adopting a participatory worldview requires researchers to be explicit about their perspectives and adopt a reflexive approach throughout the research process. Reason and Bradbury (2006) further emphasize that

inquiry in PAR serves a democratic and practical ethos, fostering collaboration and mutual learning.

Critique of Conventional Research Paradigms

Traditional positivist approaches prioritize quantitative data, objectivity, and researcher-centric methodologies. This often leads to power imbalances, where participants are treated merely as data sources rather than active contributors. Glassman and Erdem (2014) critique these methodologies, likening them to exploitative economic models where participants provide raw data in exchange for little to no benefit. Brydon-Miller (1997) highlights the ideological and evaluative biases implicit in such approaches, emphasizing that all scientific knowledge about social realities inherently reflects certain political and normative convictions.

On the contrary, conventional positivists suggest that validity and reality can only be established through quantitative means. Glassman and Erdem (2014), referring to Hall (1975), further argue that oppressive relationships can exist between participants and traditional academic researchers, where researchers assume ownership of data and participants are exploited. According to Brydon-Miller (1997), PAR addresses these power imbalances by engaging researchers and communities as equal partners in the research process.

Principles of Knowledge Generation in PAR

PAR posits that knowledge generation should be democratic and participatory. Communities are actively involved in identifying issues, generating solutions, and implementing actions. This approach not only addresses immediate community needs but also fosters long-term empowerment and capacity-building (Johnson & Martinez Guzman, 2013; Rahman, 1993). Unlike traditional methodologies that often exclude marginalized voices, PAR emphasizes inclusivity and social justice. The engagement of local communities ensures that knowledge is relevant to the specific socio-cultural context and is actionable in real-world scenarios.

Considering this, PAR provides a transformative framework for addressing the hierarchical nature of traditional development paradigms. Rahman (1993) underscores that in conventional approaches, ordinary people have had no voice in their own development, being passive victims of hegemonic practices imposed by dominant groups. PAR, by contrast, generates knowledge that is

not value-free but evolves from the lived experiences and priorities of marginalized communities.

Addressing Power Dynamics

Power dynamics are central to PAR's critique of traditional research. By positioning both researchers and participants as co-creators of knowledge, PAR seeks to dismantle hierarchical relationships inherent in conventional methodologies. Cornwall and Jewkes (1995) highlight the ethical imperative of mutual respect and equitable collaboration, which is fundamental to the success of PAR. This approach ensures that participants are not passive subjects but active agents in the research process.

Kindon et al. (2007), referring to Allen (2003), further emphasize that PAR enables negotiation for common goals among participants from different positions, fostering persuasion through argument in an atmosphere of equality. This shared authority among participants is essential for dissolving power inequities historically perpetuating underdevelopment and social exclusion.

Practical Application and Flexibility of PAR

PAR's methodological flexibility allows it to bridge the gap between theoretical inquiry and practical application. By addressing community-defined needs and translating them into actionable strategies, PAR has demonstrated success in fostering empowerment, enhancing self-esteem, building solidarity, and promoting sustainable development (Piercy et al., 2011). Its adaptability has led to widespread adoption in diverse socio-political contexts since the 1970s, making it a viable alternative to rigid, top-down development models.

Moreover, unlike traditional research, which often prioritizes quick results, PAR acknowledges the complexity of social change processes, requiring sustained engagement and iterative cycles of action and reflection. Despite being resource- and time-intensive, the long-term impact of PAR on community well-being justifies its continued use as a transformative development approach.

A Viable Alternative to Traditional Research

PAR offers a transformative alternative to conventional research paradigms. By critiquing the limitations of traditional positivist methodologies and

emphasizing collaboration, inclusivity, and empowerment, PAR provides a robust framework for sustainable and community-driven development. The dynamic interplay between knowledge generation and community action underscores its potential to foster meaningful social change and contribute to a more equitable and just society.

Future research should continue to explore and refine PAR methodologies, ensuring their adaptability and relevance across diverse contexts. Furthermore, policymakers and development practitioners are encouraged to adopt PAR principles to create more inclusive and participatory development processes that genuinely address the needs and aspirations of marginalized communities.

Self and Community Empowerment

According to Tandon (1982), research aims to solve social problems by unlocking human creativity and mobilizing available resources. In community development, reality should be constructed by the local community, which is directly affected, rather than imposed by hierarchical "top-down" professional investigators using the positivist approach (Rahman, 1993). While this perspective acknowledges the role of professionals in development, it stresses the importance of equally empowering both researchers and the community. In light of this, Participatory Action Research (PAR) strongly advocates for self and community empowerment by promoting the shared agency of academic researchers and local communities. Furthermore, PAR facilitates the inclusion of marginalized voices in the development agenda.

Kindon (2007), referencing Allen (2003), identified three key benefits of PAR: negotiation to achieve common goals among diverse participants, persuasion through reasoned dialogue in a setting of equality, and shared authority in decision-making. PAR prioritizes the equitable distribution of power rather than domination, aiming to dissolve entrenched power inequities within society (Kindon et al., 2007). These inequities have created a world where some nations thrive while others remain underdeveloped or marginalized, thereby widening the gap between those who "have" and those who "don't have." Historically, developed nations or dominant parties have enjoyed more power and exerted authority over less developed nations by utilizing existing structures, thus assuming the role of responsible authority at local, national, and global levels. Rahman (1993) contends that under such authority,

intellectuals and professionals are responsible for assessing reality and producing knowledge that guides policy and action.

In contrast to traditional top-down development practices, PAR presents a novel methodology that reshapes the roles of academic researchers, participants, and community members (Glassman & Erdem, 2014). It emphasizes the lived experiences and realities of community members, prioritizing collaborative inquiry over abstract, hypothesis-driven research. Glassman and Erdem (2014) assert that the goal of PAR is not to test hypotheses with pre-established questions but to enhance human conditions by addressing real-world issues through the active participation of the community. This organic approach fosters the development of practical solutions that belong to the people and the society they inhabit.

The methodology of PAR emphasizes action-oriented research that engages directly with the community. Instead of viewing participants as mere study subjects, PAR recognizes them as co-researchers who contribute to the research process. This collaborative approach ensures that knowledge generation is not only more inclusive but also more relevant to the community's needs. By bridging the gap between theory and practice, the participatory nature of PAR fosters a deeper understanding of social realities and drives self and community empowerment.

By challenging the traditional hierarchical structures of knowledge production, PAR promotes a model of shared learning and mutual respect. It seeks to democratize the research process, ensuring that all participants have an equal voice in identifying problems, designing research methods, and implementing solutions. In doing so, PAR helps to address systemic power imbalances and contributes to the creation of more just and equitable societies.

To summarize, PAR offers a transformative approach to research and community development by emphasizing empowerment, collaboration, and practical action. It transcends traditional research paradigms by empowering communities to construct their own realities, fostering ownership and agency. As a participatory and action-driven methodology, PAR holds significant potential for addressing complex social problems in a manner that is both inclusive and sustainable.

Challenges in Implementing PAR

Over the past several decades, the interest and importance of PAR has spread around the world. As with any other discourse in development, PAR is also being highly criticized due to issues of empowerment, ethical concerns, data rigour and validity, and the time and cost involved. Further, Gregory (2000) and Lennie (2005) highlighted considerable differences in power and knowledge among PAR participants as a major issue.

Ethical Concerns in PAR

Practicing in PAR may raise critical issues in research ethics (Kindon et al., 2007), during the collaborative process of changes. Those issues which are due to the particularities of PAR, issues of authority or other issues like relationship building and deciding who is taking part are not identified as unique (McIntyre, 2008) According to Kindon (2007), though institutional guidelines exist for handling ethical issues, they do not soundly address them. However, this essay argues that it is necessary to practice ethics in care without diluting the positive potential effects of PAR in development in the vehicle of ethical issues.

It is important to identify alternative approaches towards participatory ethics without displacing the established importance of beneficence, respect for persons and justice (Kindon et al., 2007). However, there is no unique one which can alleviate the many more ethical issues and risks integrated throughout PAR (McIntyre, 2008). Under such critical perspectives, both researchers and participants should be committed to working together to provide equity, safety, and parity in resources within the PAR process (Kindon et al., 2007; McIntyre, 2008). This essay further highlighted the importance of properly maintaining an ethical and transparent status that,

‘Endangers trust and reciprocity with the people who invite us to their lives’ (McIntyre, 2008, p. 13).

Negative power effects on participation

Though there are highly positive arguments that PAR can empower, liberate and emancipatory participants, critiques argue about the negative power effect of PAR, causing unintended disempowerment among participants (Lennie, 2005; Kindon et al., 2007).

Data and Rigor

There is a great debate among academics about the reliability and validity of data gathered through a participatory approach (Byrne, 2008). Particularly, schools of thought such as logical positivism, empiricism, and structuralism reject the social value bias from researchers in what they consider to be "scientific" research (Rahman, 1993) . They argued about data collected in Participatory Action Research are merely raw numbers or information, which do not make any sense in terms of validity and reality parameters (Brydon-Miller & Tolman, 1997). Also, the epistemological standpoint of PAR argued that no research in the analysis can be value-free. However, Brydon-Miller and Tolman (1997) argued that judging the validity of information is not an easy task and is a challenging process, and it cannot be finalized with only one or two perspectives. When compared to existence evidence of the impacts of development projects, this essay observes that only rigour and validity of the data do less to progress the world. Further, Brydon-Miller and Tolman (1997), referring to Brinberg and McGrath (1985) and Maxwell (1992), have pointed out that not only the validity of the data but also integrity and quality should be assessed in relation to the purpose and context of the research conducted, and it is not something that can be purchased with scientific technique.

Resource and Time Integrity

Compared with traditional approaches, PAR requires more time and resources as it is not just a data collection process in the field. It requires more initial attempts to adapt and develop a particular community with the process. More donors who want instant results from their investment in society have no preferences for practising PAR, even though it really addresses the social need as a permanent remedy.

However, this paper argues that constraints like time and resources should not dilute the potential positive impacts that PAR can generate on society.

A complex and heterogeneous society

Lennie (2006) pointed out that, 'In addition, due to factors such as differences in power and knowledge among those involved, participatory methods can produce unintended disempowering effects and must therefore be undertaken

with great skill and care'(p:28) referring Gregory (2000); Lennie (2005); McKie (2003).

PAR has a major challenge in addressing social heterogeneity due to gender, age, class, ethnicity, ability, income and cast. In addition to those categories of variation, every person in a society has different ways of thinking, persuasion, and behaviour patterns, and they all have different attitudes. These attitudinal differences among participants may cause considerable differences in findings as the way they grab the context may vary in accordance with their perception towards the matter. Under this situation, PAR practitioners may be misled or in trouble in searching for the "real" reality of local knowledge.

Ontological and epistemological premises of PAR acknowledge diversified heterogenic ideas rather than generalize the "local knowledge" with mean, median, or any statistical magic, as traditional researchers do without accepting or concerning the diversification in society. By contrast, diversification in nature, whether it is gender, class, ethnicity or any other factor, never fails to amaze the PAR practitioner and his findings, which ultimately benefit society.

Proposed Conceptual Framework

The conceptual framework proposed in this article illustrates how PAR operates as a cyclical and iterative process involving key principles, processes, and outcomes. This framework visually represents the interaction between various elements and highlights the unique contributions of PAR to development planning.

Core Principles

- Participation: Active involvement of marginalized communities in the entire research and decision-making process.
- Inclusivity: Ensuring diverse community representation across gender, class, ethnicity, and other social categories.
- Empowerment: Enhancing the capacity of communities to take control of their development agenda.

Key Processes

- Collaborative Inquiry: Researchers and community members work together to identify issues, collect data, and generate solutions.
- Knowledge Co-creation: Knowledge is jointly produced by integrating local insights with academic research.
- Action and Reflection: Solutions are implemented in practice, followed by reflection to assess outcomes and refine strategies.

According to Oliveira (2024), PAR's co-creation process strengthens community ownership and ensures that outcomes are relevant and sustainable. Keahey (2021) highlights how PAR contributes to sustainable development by promoting context-specific solutions and long-term engagement.

Discussion and Conclusion

Discussion

The conceptual framework presented in this article highlights PAR's cyclical and iterative nature, emphasizing its adaptability and collaborative processes. In this discussion, key elements of the framework are analyzed, underscoring PAR's role as a transformative research methodology.

One of the core strengths of PAR is its ability to foster empowerment by actively involving marginalized communities in decision-making processes. By engaging communities as co-researchers, PAR not only addresses immediate issues but also builds long-term capacity, enhancing self-reliance and resilience (Brydon-Miller, 1997; Johnson & Martinez Guzman, 2013). The collaborative inquiry process ensures that research is relevant, actionable, and rooted in local contexts, which is crucial for sustainable development (Keahey, 2021)

Furthermore, PAR's iterative cycles of action and reflection allow for continuous learning and improvement. Banks and Armstrong (2023) emphasize that this iterative nature fosters deeper understanding and dialogue, bridging the gap between theory and practice. This adaptability enables PAR to address diverse socio-political challenges, making it applicable across various fields, such as education, community health, and environmental management (Ortrun Zuber-Skerritt, 2015)

Despite its many strengths, PAR is not without challenges. It requires significant time, resources, and commitment from researchers and community members. Ethical concerns about power dynamics and representation also need careful consideration (Cornwall & Jewkes, 2010). Practitioners must ensure that the research process remains inclusive and equitable, avoiding the pitfalls of tokenism or exploitation.

In light of these discussions, PAR offers a viable alternative to traditional research paradigms by fostering genuine community engagement, co-creating knowledge, and promoting social justice. However, its success largely depends on the commitment to ethical principles, continuous reflection, and the willingness to adapt to specific community contexts.

Conclusion

In conclusion, PAR offers a transformative alternative to conventional research paradigms. By critiquing the limitations of traditional positivist methodologies and emphasizing collaboration, inclusivity, and empowerment, PAR provides a robust framework for sustainable and community-driven development. The dynamic interplay between knowledge generation and community action underscores its potential to foster meaningful social change and contribute to a more equitable and just society.

Future research must continue to explore and refine PAR methodologies, ensuring their adaptability and relevance across diverse contexts. Furthermore, policymakers and development practitioners are encouraged to adopt PAR principles to create more inclusive and participatory development processes that genuinely address the needs and aspirations of marginalized communities.

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Governance Issues in the State-Owned Business Enterprises in Sri Lanka

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Abstract

Sri Lanka is characterised with a fairly large public service which represents a considerable portion of GDP. In 2022, the total loss incurred by Sri Lankan SOBEs is Rs. 744.7 billion , which was a major reason for the fiscal deficit. Highest losses made by CPC and CEB where the combined losses have increased to more than 1.5 percent of GDP. Despite many other issues, governance issues have been affected significantly for the poor performance of CPC and CEB. One of the solutions is to privatise the two entities since Sri Lankan experience with privatization has proven increased performance in terms of productivity, efficiency and effectiveness. However, according to the current government policy, privatization is not possible. Therefore, in this article reformation of the two SOBEs is suggested which needs further research.

Keywords: State-Owned Business Enterprises, Privatisation, Governance, Restructuring

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Introduction

The purpose focuses on governance issues related to the two most significant and continuous loss making State-Owned Business Enterprises (SOBEs) in Sri Lanka, namely Ceylon Petroleum Corporation (CPC) and Ceylon Electricity Board (CEB) based on secondary data to answer the research question: What are the governance issues which have contributed to the poor performance of two Sri Lankan SOBEs, namely Ceylon Petroleum Corporation and Ceylon Electricity Board.

Sri Lanka has achieved better financial position by achieving higher GDP (Gross Domestic Product) rate compared to the past. Being a welfare country, many products and services are provided through SOEs (State-Owned Enterprises). Despite the business objectives, SOEs have to keep a balance between market competition and public service. Currently there are 52 operational SOBEs in Sri Lanka, Out of those, ten SOBEs account for 95 percent of the asset base while playing a strategic role in the national economy including CPC and CEB (Ministry of Finance, Economic Stabilization & National Policies , 2023). The primary objective of CPC is to import, refine, and distribute petroleum products throughout Sri Lanka (Ceylon Petroleum Corporation, 2022) while the main responsibility of CEB is generation, transmission and distribution electrical energy (Ceylon Electricity Board, 2022). Despite of profit reported in 2007, CPC has reported continuous loss while CEB has never reported profit since 2006 (Ministry of Finance and Planning, 2012a and Ministry of Finance, Economic Stabilization & National Policies , 2023). However, both are providing essential services without passing the full cost of products and services to the public, which is one of the reasons for continuous losses.

Nevertheless, it is clear that there is urgent need to find solutions to improve the performances of CPC and CEB, since those two put a crucial pressure on national budget. This provides an interesting research question to investigate. There may be several reasons for a particular enterprise for poor performances such as marketing issues, policy issues, corporate governance issues etc. While appreciating other issues, this research is focused on governance issues which have contributed to the poor performance of CPC and CEB.

The key findings support the notion that both SOBEs incurred continuous and significant losses due to different reasons. However, the most significant issue has been related to lack of transparency and corruption, poor accountability mechanisms and improper financial planning. Further, CEB maintains poor financial management, appointing unqualified officials and poor accountability mechanisms. This paper suggests the most promising way to improve the performance of CPC and CEB includes reforming the entities, with clear goals and objectives, establishing proper organizational culture and supportive.

The article is organised in the following manner: First it starrts with an overview of the literature on the concept of governance. Second, it outlines the key features of the recent reforms of Sri Lankan public sector with a special reference to privatization followed by the implications of privatization for the country's economy. Third, it explains the performance of two selected SOBEs, CPC and CEB before and after privatization in order to examine the imact of privatization on the overall performance of two organisations. A discussion of key findings and some recommendations including future research agenda concludes the article.

Literature Review

Being a hot topic globally, a wide range of meanings are attributed to the term 'governance' (Coghill, Ariff, Tam and Wilkins, 2005).The literature on governance describes several models, while in this article the integrated governance model is mostly used to explain the governance issues. Sri Lanka is considered as a welfare government (Kumara & Handapangoda, 2008) and has undergone several public sector reforms. According to the literature, privatization process was successfully carried out which increased performance of SOEs (Salih, 2000).

Governance

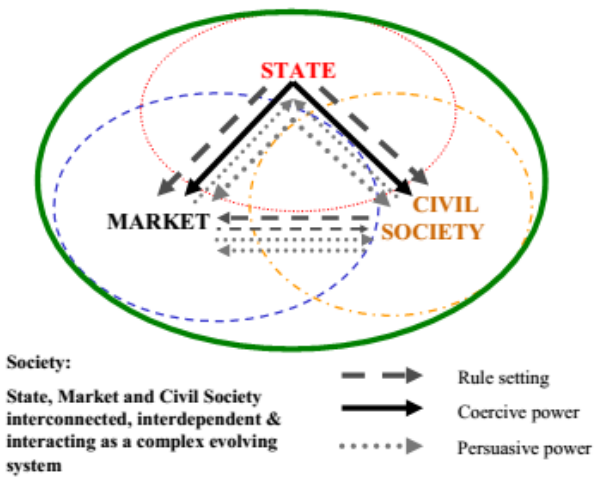
The term 'governance' is used in different ways with variety of meanings (Rhodes, 1996; Stoker, 1997 as cited in Stoker, 1998). One of the definitions for governance is "process by which the diverse elements in a society exercise authority which in turn influences policy and decisions affecting public life and economic and social development" (Corkery, 1999 as cited in Coghill, et

al., 2005, pp2-3). Another is "the exercise of economic, political and administrative authority to manage a country's affairs at all levels. It comprises the mechanisms, processes and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences" (UNDP, 1997 as cited in Samaratunge & Pillay, 2011, p.389). Overall, governance is all about the power, relationships, accountability, influences on one another, "who makes decisions and how different stakeholders have their say" (Samaratunge & Pillay, 2011, p. 390).

According to Samaratunge, Coghill, & Herath (2008), while the key, state is not the only actor who impose power and authority on other stakeholders, infact governance comprise of complex mechanisms, processes, relationships and institutions. Coghill et al. (2005) describe governance in three clearly identifiable sectors namely, the state (public), the market (corporate) and civil society. These three domains "intersect, overlap and intermingle; the relative power and influence of each changes dynamically" in fact, the interactions among these three sectors (figure 1) called 'integrated governance' (Samaratunge et al., 2008, p.679). How ever, "the relative power and influence of each sector is not fixed but dynamic" (Samaratunge & Pillay, 2011, p. 391).

Figure 1

Integrated governance



Source: *Samaratunge, Coghill, & Herath, 2008, p. 17*

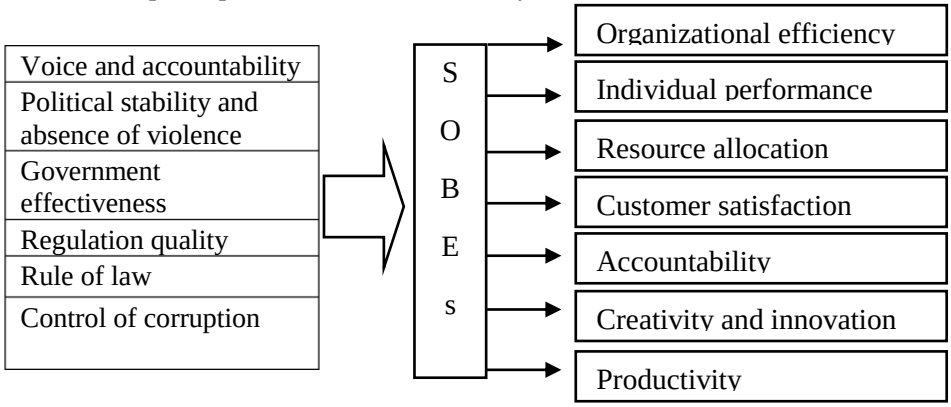
Werlin (2003) as cited in Samaratunge& Pillay(2011, p.389) conceives that the difference between the rich and poor countries as "poor countries suffer inadequate governance rather than inadequate resources". Furthermore, the former UN Secretary General Kofi Annan has emphasized that "good governance is perhaps the single most important factor in eradicating poverty and promoting good governance" (United Nations, 1998 as cited in Samarathunga & Pillay, 2011, p. 389). Therefore it is clear that the governance issues in public sector has to be addressed with greater emphasis to achieve national development of a country.

There are four main principles of good governance that are used to measure the quality of governance namely, transparency, accountability, predictability and participation (ADB, 2022). Albeit the governance issues could be analysed in different ways, during this essay, the main focus will be the governance issues in terms of management relationships among stakeholders of SOBEs.

According to Kaufmann et al. (2003)as cited in Ethugala, 2009, six main governance principles could be identified as voice and accountability, political stability and absence of violence, government effectiveness, regulation quality, rule of law and control of corruption. The inter-relationship between governance, SOBEs and the features which shows how governance is practices is given in the Figure 2.

Figure 2

Governance principles and inter-relations of SOBEs



Source: *Kaufmann et al., 2003 as cited in Ethugala, 2009, p.32*

Background of Sri Lanka

Sri Lanka is a republic and a unitary state which was a former British colony and got its independence in 1948. The official name is 'Democratic Socialist Republic of Sri Lanka' and governed by a hybrid executive presidential parliamentary system. The executive president is the head of the government, the head of the state and the commander of the armed forces(The Constitution of the Democratic Socialist Republic of Sri Lanka , 2011).

Sri Lanka is the 60th most populated country with a population of 21,919,000 (World Fact Book, 2021). The Human Development Index (HDI) value for 2021 was 0.782 in which falls in the high human development category (UNDP, 2021). The International Monetary Fund (IMF) classified Sri Lanka as a lower middle-income country in 2021 (IMF, 2021).

During the period of 2005-2012, the per capita income has doubled, poverty has dropped from 15.2 percent to 7.6 percent and unemployment rate has dropped from 7.2percent to 4.9 percent (IMF, 2012b; World Bank ,2013). However, according to the Multidimensional Poverty Index (MPI), approximately one out of every six (16.0%) people in Sri Lanka are multi-dimensionally poor in 2021 (Department of Census and Statistics, 2021). Further, more than eight out of every ten (80.9 percent) people who are poor live in rural areas and more than half (51.3 percent) of all people living in estate sector are living in poverty whereas urban poverty is estimated at 4.4 percent in 2021 (Department of Census and Statistics, 2021).

The economic growth rate reported an average of 6.5 percent during 2005-2006 and 8.2 percent in 2011. However, this was dropped 4.21 percent in 2021, in fact, according to the IMF, Sri Lanka's fiscal position is weak. One of the reasons for the weak fiscal position is the inefficiency in the public sector. (IMF, 2021). Therefore, it is important to find the root causes of the problems and mitigate them.

Public sector reforms of Sri Lanka

Sri Lanka is well-known as a welfare state characterized by a relatively large public sector. The role of the state was questioned during late 20th century, leading towards the retrenchment of public service (Kumara and Handapangoda, 2008). The country's proportion of public expenditure to GDP

was steadily on the increase since 1950's for debt servicing, welfare spending and capital expenditure of the state. Infact, public expenditure has risen from 22.5percent to 37.5percent during the period from 1951-1955 to mid 1980's (Hulme & Sanderathne, 1996 as cited in Kumara and Handapangoda, 2008). The traditional model of public administration was highly criticized due to the costly and inefficient nature. In response to economic, institutional and ideological changes, public sector reforms became an international phenomenon, where Sri Lanka was no exception (Bennington & Cummane, 2000; Hughes, 1998 as cited in Samarahunge & Bennington, 2002).

Until 1977, the government followed a very conservative economic policy, where the public sector was the main player in production, distribution and financing in the economy (Kumara and Handapangoda, 2008). This includes banking, plantations, large scale industries, transport, insurance, telecommunication, postal services, ports, electricity, import and distribution of petroleum, roads, health and education. Throughout this period, new state-owned enterprises were established, state monopolies were created and some private enterprises were nationalised(Salih, 2000, p. 176). The SOEs were governed by non-financial objectives such as redistributive justice, regional development, price regulation of essential products and employment generation (Kelegama, 1993 as cited in Salih, 2000, p.176).

With the winning of the election in 1977 by the party with right-wing liberal ideas, an open economy was introduced. Same as any other aid-dependent country, Sri Lanka also had to seek for the financial assistance from international aids, accepting five itemed liberalization package of IMF. This included trade liberalization, devaluation of exchange rate, policy measures for attracting Foreign Direct Investments and encouraging private sector, dismantling price controls and a massive public investment program (Balasooriya , Alam, & Coghill, 2008, p.59)

Privatization

The financial burden of Sri Lanka's State-Owned Enterprises (SOEs) is substantial. For instance, the national airline's losses exceeded 1percent of the country's GDP, while the Ceylon Petroleum Corporation's losses in the first four months of 2022 surpassed the combined education and health budgets for

the entire year of 2023. These staggering figures highlight not only the direct financial costs of these losses but also the significant opportunity cost. By diverting substantial resources to sustain ailing SOEs, Sri Lanka deprives itself of crucial investments in critical sectors like infrastructure, education, and healthcare. These sectors are vital for long-term economic growth, human development, and overall societal well-being (Rafi, 2024)

A considerable amount of GDP is spent to maintain the SOEs which was a huge burden for the national budget. As a result of the open economy, a huge influx of imported goods to the country made the situation worse by causing difficulty for SOEs to compete (Balasooriya et al., 2008). Other than that, many other issues were associated with SOEs such as overstaffing due to recruiting under political patronage, operational inefficiency resulted in poor financial performance, poor product quality and supply shortages, inability to mobilise resources to cater the demand and labour unrest. In fact, SOEs were creating significant burden on national budget (Salih, 2000). As a solution, privatization was introduced with the objectives of improving economic efficiency, increasing competitiveness, and maintaining the sustainability of the private sector in the economy (Balasooriyaet et al., 2008, p. 60).

Sri Lanka was one of the pioneers among developing countries to adopt privatization of State-Owned Enterprises policy (Balasooriya, et al. 2008). However, the privatization process stagnated until it was declared as the state policy in 1987 (Knight-John & Athukorala, 2005; Salih, 2000). As Salih (2000) posits, government followed some steps in preparation. These were, improving the commercial orientation of the State-Owned Enterprises ; allowing the private sector to compete in commercial activities by abolishing public sector monopolies; transferring management of some loss making public enterprises to the private sector under a contract system; franchising certain parts of public enterprises to the private sector; and closing down of several non-economical enterprises (p. 177). According to Balasooriya et al., (2008), there were three broad objectives of privatization as: economic (reduce taxes through proceeds of sales, exposing activities to market forces and thereby reducing the public sector borrowing requirements); management efficiency (expecting the private sector is more efficient) and ideology (idea that the market is better than the state provision) (Minogue, 1998; Hughes, 2003 as cited in Balasooriya et al., 2008 p.60). As Salih (2000) states, privatization was aggressively pursued since 1989 and as a result of that, 43

industrial sectorenterprises which are less complex and 92 bus depots in public transport sector were privatized by mid 1994. During the second phase, by 1997 this number rose up to 75 with many plantation companies and major utility-oriented industries such as gas and telecommunications (Salih, 2000).

Outcomes of privatization

The results of privatization vary from country to country, as well as case to case. Peter, Debruijne, & Rwegasira (2010) posit that, the literature on privatization performance is mixed. However, they put forward the results of a study conducted by Boubakri and Cosset (1998) using 79 enterprises from 21developing countries either fully or partially privatized during the period1980 to 1992, showing there is a significant increases in profitability, operating efficiency, capital investment spending, output, employment, and dividends (p. 51).Supporting this argument, Williamson (2003) and Salih (2000) also emphasize privatization in Sri Lanka has achieved higher efficiency, higher productivity and accessibility. Hodge& Coghill (2007) point out that in governance perspective, privatization increased managerial and market accountability, but with lower political accountability in Australian context.

However, Vernon-Wortzel & Wortzel(1989) argue that "privatization is no more a solution to the problems of SOEs than SOEs were a solution to the problems they were created to solve" (p. 633). Furthermore, the problems associated with SOEs are not the ownership,but the weaknesses of goals and objectives, absence of proper organizational cultures and supportive systems.

SOEs in Sri Lanka

In accordance to the previous manifesto "Mahinda Chinthana", the importance of the public sector is highly emphasized. In the vision statement it states "the creation of prosperity to the majority of the people who cannot purely rely on market based solutions requires connectivity through roads, electricity, telecommunications, information technology, education, and health services. hence, the development strategy relies not only on promoting investments on infrastructure based on commercial and economic returns but also on the creation of equitable access to such infrastructure development to enable

people to engage in gainful economic activities" (Ministry of Finance and Planning, 2010, p. 4).

In the "Vistas of Prosperity and Splendour" policy document also emphasizes the importance of SOEs in strategic sectors of the economy, such as energy and infrastructure. These SOEs will continue to be owned and operated by the government, but will be expected to operate efficiently and profitably (Ministry of Finance, Planning and Economic Development,2020).

Therefore, the magnitude and importance of public enterprise sector still remains higher in Sri Lankan context.

"Public Enterprise" means any public Corporation, Board or other body, which was or is established under any written law, including Companies Act, where the Government has the controlling interest"(Ministry of Finance and Planning, 2012b, p.8).There are more than 244 public enterprises at present and they could be classified in to five namely, Regulatory Bodies, Promotional Agencies, State-Owned Enterprises, Educational Agencies, Development Agencies, and Research Institutions (COPE, 2013). Public enterprises consist of commercial corporations, government owned companies, statutory boards, subsidiaries of above. Out of those categories, government owned companies (also termed SOBEs) include two types of entities i.e. entities "established and operated under the Companies Ordinance/Act in which Government has a direct controlling interest by virtue of its shareholding and corporations" and government owned companies converted in terms of the "Conversion of Public Corporations or Government Owned Business Undertakings into Public Companies Act, No. 23 of 1987"(Ministry of Finance and Planning, 2012b).

The performance and the governance issues of public enterprises are oversight by the Auditor General and the Parliamentary Committee on Public Enterprises (COPE) (Saravananthan, 2007). According to the annual report of Ministry of Finance and Planning (2022), currently there are 52 operational SOBEs in Sri Lanka. Out of those, ten SOBEs account for 95 per cent of the asset base while playing a strategic role in the national economy. Said enterprises are, Sri Lanka Ports Authority (SLPA), Airport and Aviation Services Limited (AASL), SriLankan Airlines (SLA), Ceylon Petroleum Corporation (CPC), Ceylon Electricity Board (CEB) and National Water Supply and Drainage Board (NWS & DB) which dominate non-financial

sector state business enterprises, and the Bank of Ceylon (BOC), People's Bank (PB), National Savings Bank (NSB), Sri Lanka Insurance Corporation (SLIC) which dominate the banking and insurance sector of SOEs (Ministry of Finance and Planninga, 2012, p.426).

The total number of employees in SOBEs is 251,278 and the average annual cost per employee is Rs. 469,185. This is 6.8 per cent more than for a central government employee. The revenue received from SOBEs in terms of dividends and levies have increased by 12.5 per cent, to Rs. 27.5 billion in 2012 from Rs. 24.6 billion in 2011, which accounted for almost 20 per cent of non-tax revenue. However, government has not received any dividend income from comparatively large enterprises such as National Water supply and Drainage Board, Sri Lanka Ports Authority and Airport and Aviation Services Limited due to capital investment expansions while CPC, CEB and SLA incurred heavy losses (Ministry of Finance and Planning, 2022).

Performance of SOBEs

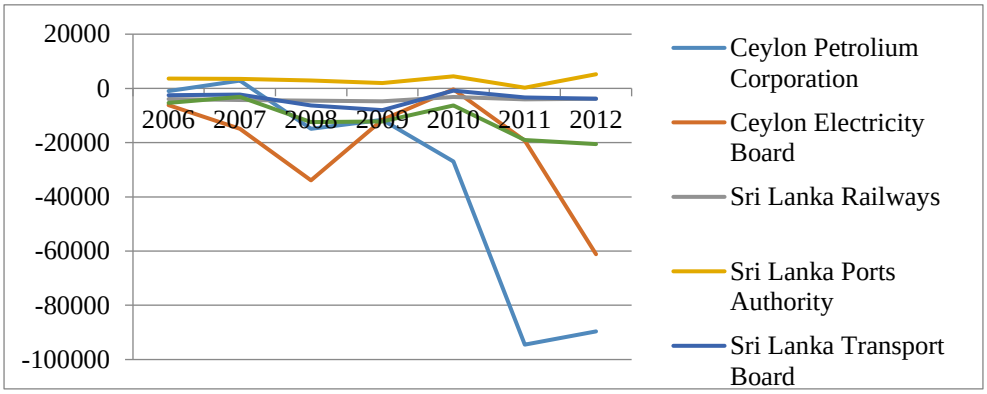
Being business oriented entities, SOBEs have to compete with domestic private businesses and sometimes with foreign business entities in a competitive market. At the same time they have to deliver their services to the poor communities and remote areas. Therefore, market operations alone, does not ensure a justifiable service. In that context, SOBEs have a great challenge to perform (Ministry of Finance and Planning, 2022).

According to the Ministry of Finance and Planning , several SOBEs have gained relatively higher importance despite their turnover, in terms of serving low income households. The SOBEs such as Lak Sathosa, Ceylon Fisheries Corporation, Sri Lanka Transport Board, and National Livestock Development Board are good examples. Sri Lankan State-Owned Enterprises (SOEs) experienced a sharp decline in financial performance in 2022, significantly deviating from historical trends. The collective losses of 52 key SOEs skyrocketed to Rs. 744.7 billion, marking a sixfold increase compared to the previous year. While a group of 34 SOEs demonstrated resilience by achieving a combined net profit of Rs. 214 billion amidst challenging economic conditions, a contrasting 18 SOEs incurred a substantial collective loss of Rs. 958.7 billion in 2022 (Ministry of Finance and Planning, 2022)

Six state-owned enterprises – the Ceylon Petroleum Corporation, Road Development Authority, National Water Supply and Drainage Board, Airport and Aviation Services (Sri Lanka) Ltd, Ceylon Electricity Board, and SriLankan Airlines – were primarily responsible for the escalating public guaranteed debt as of 2021. The total public guaranteed debt is LKR 1.5 Trillion (Advocata, 2022). Sandaratne (2013) argues the amount of total loss from SOBEs - Rs. 185 billion, which was a major reason for the large fiscal deficits of the government in 2012. In 2012 the fiscal deficit of 6.4 percent of GDP has been higher than the 6.2 per cent GDP deficit it had expected. He further explains that it would be difficult for the government to achieve its fiscal deficit target of 5.8 percent of GDP this year, if losses of public enterprises remain the same and the bulky fiscal deficit is in turn will be a ground for economic instability.

Figure 3

The performance of selected SOBEs



Source: *Ministry of Finance and Planning (2013)*

Ceylon Petroleum Corporation (CPC)

The CPC was established by Act No. 28 of 1961 with the main objectives of "to carry on business as an importer, exporter, seller, supplier and distributor of Petroleum products, to carry on business of exploring for the exploiting, producing, and refining of Petroleum and to carry on any such business as may be incidental or conducive to the attainment of the objectives"(Ceylon Petroleum Corporation, 2022). There are 2,616 permanent employees in CPC. The associate company is Ceylon Petroleum Storage Terminal Ltd (CPSTL) which is responsible for the provision of storage and distribution facilities and

information technology services to CPC (Ceylon Petroleum Corporation, 2008). In 2007, CPC reported a profit of Rs. 2.8 billion, even with the effect of global oil price increase. According to the Chairman of CPC, "efficient operations at the refinery, effective usage of storage capacity, strategic procurement decisions, and timely adjustment of domestic fuel prices and effective management of foreign exchange all contributed to this result" (Ceylon Petroleum Corporation, 2007, p.3). However, CPC reported a significant Rs. 11.8 billion loss in 2021 (Ceylon Petroleum Corporation, 2022), and according to CPC the main factors behind were the concessions granted to the general public, power plants and airlines, despite the recorded highest oil prices prevailed during the year .

Commenting on the losses incurred, IMF states that, despite of the global oil price increase, the continued supply fuel oils to CEB at a subsidized rate and providing petroleum to the consumers without passing the full cost have been contributed to the losses of CPC to increase of 1.25 per cent of GDP in 2010. The main governance issues led to the losses of CPC will be discussed.

Ceylon Electricity Board

The Ceylon Electricity Board was established in terms of Parliament Act No.17 of 1969 as the successor to the Department of Government Electrical Undertakings. The main responsibility is "generation, transmission and distribution electrical energy to reach all categories of consumers nationwide" with the vision of 'Enrich Life through Power'(Ceylon Electricity Board, 2010, p.1). The present workforce of CEB is more than 24,272 employees, with more than1,000 professionally-qualified executives (Ceylon Electricity Board, 2022). The performance of CEB shows an ambiguous pattern (see figure 3). In 2008, the loss incurred was Rs. 33.8 billion, whereas a significant decrease could be observed in 2009 and 2010, as Rs.11.5 billion and Rs. 0.3 billion respectively. Conversely, in 2011 and 2012 this loss has increased at a significant rate as Rs. 19.2 billion and Rs. 61.1billion respectively (Ministry of Finance and Planning, 2012a). In fact, IMF (2012a) states that, the losses of the CEB has risen to 0.25per cent of GDP, despite an increase in electricity prices of 8 per cent, due to higher oil prices and a shift from hydro to costlier thermal power.

With the aim of reducing the loss, currently electricity price revision has been done. This is more than 60 per cent of increase at a single time and the present power tariffs are the highest in the region (Central Bank, 2001 as cited in Wijewardena, 2013). Therefore people raise questions, whether the consumer has to pay for the inefficiencies within the corporation? (Wijewardena, 2013). Yet, the CEB is still running at a huge loss infact, CEB incurred an operating loss of Rs. 167.2 billion for the year 2022 (Ministry of Finance and Planning, 2022).

Governance issues of CPC

Lack of transparency and corruption

According to the COPE report, there are three questionable transactions have been performed, namely importation of low standard petrol from ENOC Company in June 2012, importation of low standard fuel for aircrafts in March 2012 and importation of low standard diesel from VITOL Company in July 2012. In 2011 also CPC was blamed for the low quality oil importation where number of vehicles and about 125 oil pumps were damaged. The CPC had to pay compensations for the damages (Lanka Business Online, 2011). Nevertheless, COPE is not satisfied with the given explanations by the CPC regarding the said transactions, thus the case has been handed over to the Auditor General for further investigations and to submit a report to COPE (COPE, 2013).

Furthermore, COPE has observed an overpayment made to the Fujairah Petroleum Products Limited, for the purchase of low Sulphur fuel oil. Since this matter has been sent to the Cabinet, COPE decided to seek the cabinet decision authorising of the above transaction (COPE, 2013).

Poor accountability mechanisms

COPE found out that the consolidated accounts of Ceylon Petroleum Storage Terminal Ltd. (CPSTL) has prepared by the CPC based on un-audited statements, thus cannot be accepted. But the Chief Accounting Officer (CAO) has explained that CPSTL had not been appointed auditors and CPC hasadvised CPSTL to submit audited accounts. However, CAO was instructed to submit the name list of board of directors of the CPSTL to summon them before COPE (COPE, 2013).

In addition, CPC has not tabled their annual reports since 2010. "As per the Public Enterprises Circular No.12, the annual reports of all public corporations should be tabled in Parliament within 150 days after the close of the financial year" (COPE, 2013, p.8). Therefore, violation of the provisions of the circular is a serious problem regarding the accountability of CPC.

Improper financial planning

It is a great challenge for SOBEs to perform in a competitive market while compromising on furnishing national interest of the country. A major reason for the heavy losses incurred is not passing the burden to the general public. According to the COPE report (2013),CPC was supplying fuel at a subsidized rate to CEB, resulting 60% of the loss amounting Rs. 41 billion out of Rs. 77.7 billion up to 30.09.2012. Yet, IMF (2012a) has warned that the issue should be addressed promptly since the collapse of the entity would affect the banking sector too.

Another evidence of poor financial planning was the hedging transaction (COPE, 2013). The agreement was made in 2008, between CPC and Standard Charted Bank (SCB) in relation to 'zero-cost collar' derivative transactions on Singapore Gasoil. There, CPC has purchased a call option from SCB and sold a put option to SCB which resulted periodic payment to SCB when oil prices are higher. Conversely, CPC was required to pay SCB if the oil prices decreased below the agreed floor (Beaton, 2012).However, world oil prices fell rapidly during the second half of 2008 whilst the transaction was a loss to CPC. It was a questionable agreement, since there was a clear decreasing trend of world oil price (Beaton, 2012).

Governance issues of CEB

Poor financial management

In COPE report, it is mentioned that "it was highly concerned by the Committee that the difference between the income and expenditure of the CEB continuously increasing due to the escalating generation cost which would ultimately lead to a severe financial crisis" (2013, p.59). This is mainly due to poor financial management. It should be noted that in 2012 CPC has provided fuel to CEB at subsidized price which cost Rs. 54 billion(Ministry of Finance and Planning, 2012a). Therefore the performance of CPC and CEB

are very much interconnected. Furthermore, COPE has pointed out the higher debt burden of the CEB.In 2011, the total borrowings from banks has raised to Rs. 43.8 billion from Rs. 14.6 billion. Hence, this directly affects the banks' performance (Ministry of Finance and Planning, 2012a).

Appointing unqualified officials

According to the COPE report (2013) the post of Finance Manager of CEB had been vacant for long. It is clear that without a qualified finance manager, poor financial performance is possible. Moreover, the post of Human Resource Manager is not held by professionally qualified personnel, but by an engineer who does not possess knowledge on the subject (COPE, 2013).

Poor accountability

It is noted by the COPE that CEB has provided a erroneous corporate plan for 2009-2013 that does not contain information on 2013. Since the document is misleading, COPE has expressed its dissatisfaction and ordered the CAO to investigate on the matter to find the responsible officials. Also it is noted that the internal audit mechanism is not up to the standards (COPE, 2013).

Comparing the governance issues of CPC and CEB, it is clear that there are some similarities; inter connections as well as differences. The comparison is shown in Table 1.

Table 1
Comparison of governance issues of CPC and CEB

Good Governance principle	Governance issue	CPC	CEB
Transparency	Lackof transparency in transactions	Yes	-
	Lack of transparency in appointments	-	Yes
	Corruption	Yes	-
Accountability	Poor accountability mechanisms	Yes	Yes
Predictability	Poor financial management	Yes	Yes
Participation	No evidence	-	-

Source: *Ethugala, 2009; Hodge & Coghill, 2007; COPE, 2013*

Conclusion

It is clear that, while there are number of reasons, governance issues also have contributed considerably for the heavy losses incurred by CPC and CEB. The most significant governance issues found in CPC are lack of transparency and corruption, poor accountability mechanisms and improper financial planning while in CEB poor financial management, appointing unqualified officials and poor accountability mechanisms are observed. To achieve better performance, privatization is a better solution since there are evidences of significant increases of efficiency, profitability, productivity and accessibility both in international and Sri Lankan contexts. However, this contradicts current government policy. Within such a political and ideological context, the only option is to reform state enterprises. Therefore, this paper concludes the most promising way to improve the performance of CPC and CEB is reforming the entities, with special concern on goals and objectives, establishing proper organizational cultures and supportive systems to ensure good governance. However, further researches are needed to find out all the issues leading to low performances and to find a better mechanism to be adopted.

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Alternative Strategies for Poverty Alleviation during the Economic Crisis in Sri Lanka: Insights from Literature for Policy Level Recommendations

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Abstract

Poverty is one of the central issues of mankind, which can cause severe consequences, including hunger, diseases, political violence, and even civil wars and terrorism. According to research data from the World Bank, 25% of people in Sri Lanka live under the poverty line by 2022. In the decades after the independence, the Sri Lankan government has focused on social welfare strategies in fields such as free education, health services, food rationing, land reforms, and subsidies for agriculture. Social welfare policies implemented by the government have been successful in reducing the poverty level. However, the literature reveals that despite all these efforts to alleviate poverty, governments have been unable to achieve the required status through these programs. On the other hand, currently, Sri Lanka is experiencing the worst economic crisis in its history, which requires quick and solid policy reforms in every sector, including welfare and poverty. The state will no longer be able to facilitate most of the social welfare programs as it was before. Thus, poverty alleviation programs are expected to face challenges such as fiscal deficits. Moreover, the economic crisis has made people's lives worse. As per the World Bank data, an additional 2.5 million people have fallen into poverty in 2022, meaning that the number of people who need assistance is increased. This situation forces the government to seek new possibilities and alternatives to reducing poverty. This work aims to address the above gap by researching the alternative and supplement strategies that can be used in poverty alleviation policy in Sri Lanka. A range of earlier studies on causal theories of poverty and poverty alleviation strategies were critically analyzed to identify the challenges and possibilities in existing poverty alleviation program in coping with the economic crisis. Based on the study, four policy-level recommendations are presented as alternative strategies with identified policy tools for each strategy: improving the behavioural insights of people, enhancing good governance in poverty alleviation programs, focusing on the capability approach of poverty alleviation, and strengthening the participatory approach. Further, the strengths and challenges of these policy recommendations will also be discussed.

Keywords: Economic crisis, Poverty alleviation, Sri Lanka, Welfare policy

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Introduction

Poverty has been identified as one of the most crucial issues in the world, and it can cause severe consequences, including hunger, diseases, political violence, civil wars, and even terrorism (Madduma Bandara, 2016: Semasinghe, 2015). In 2019, 648 million people worldwide lived under the poverty line of 2.15 USD per day (Poverty and Inequality Platform n.d.). Poverty can be identified as an obstacle to a country's development, sustainability, and political stability (Semasinghe, 2015). Therefore, poverty alleviation is a top priority in the global context. The United Nations' seventeen sustainable development goals also start with "Ending poverty in all its forms everywhere" (Singh & Chudasama,2020, p. 1).

As a result of the poverty alleviation and welfare programs carried out in Sri Lanka after independence, a significant decline in the poverty rate could be observed over the decades. Continuous efforts in free education, health services, food rationing, land reforms, and agriculture subsidies have also decreased multidimensional poverty (Semasinghe, 2011). In 2023, Sri Lanka's Human Development Index was recorded as 0.780, the highest in South Asia (UNDP, 2023). Targeted direct intervention programs, reducing state monopoly in welfare, and introducing a new policy framework for poverty reduction are some of the critical changes in national poverty and welfare policy that helped reduce poverty in the country (Gunetilleke, 2000; Madduma Bandara, 2016). Despite these achievements in poverty alleviation, people do not meet acceptable standards of life, failing to meet the minimum level of nutrition, shelter, and clothing (Madduma Bandara, 2016). The governments have failed to reach the expected targets for poverty reduction in Sri Lanka (Madduma Bandara, 2016; Semasinghe, 2011).

On the other hand, due to the corruption and mismanagement of resources over the decades, Sri Lanka is moving through the worst-ever economic crisis in history. Inflation and unemployment are bombarding people like never before, increasing poverty levels. The World Bank data indicated that the poverty rate doubled in Sri Lanka between 2021 to 2022 from 13.1 per cent to 25 per cent. According to World Bank, additional 2.5 million people fell into poverty in 2022 (UNDP, 2023). This means that the number of people who need assistance has increased. However, the government is seeking policy reforms to recover the economy, and it is expected that the cost-cutting measures will

be implemented in the welfare sector. The existing poverty alleviation and welfare programs are at risk of meeting inadequate funds. Alternative poverty alleviation and welfare strategies should be discovered to cope with the economic crisis. Based on the research question "What are the alternative poverty alleviation strategies that can be employed amidst the economic crisis in Sri Lanka?" this study aims to fill the gap described above in searching for new methods and strategies for poverty reduction in the country. This analysis examines the challenges and possibilities present in the main poverty alleviation program (Samurdhi) in Sri Lanka parallel to the economic crisis. It also aims to explore the possibilities of reducing poverty using alternative strategies based on the theories related to poverty alleviation with reference to the Sri Lankan context. Next, four policy-level alternative strategies to reduce poverty will be identified: enhancing good governance in poverty alleviation programs, improving behavioural insights of people, focusing on the capability approach, and strengthening participatory approach. The above strategies will be discussed along with the required policy instruments needed to employ these strategies and anticipated challenges in the policy implementation process.

Literature Review

Defining and Measuring Poverty

Poverty is a very complicated and multidimensional concept, and according to the literature, there is no consensus on defining poverty among scholars. However, the literature reveals that there are two approaches to poverty: the "welfarist approach" and the "non-welfarist approach" (Madduma Bandara, 2016; Semasinghe, 2015). The authors further describe that the welfare approach takes a monetary term while the non-welfare approach talks either about the people's basic needs or their capabilities. When using monetary terms to measure poverty, it is questionable whether the real life of humans is measured. In addition, to proceed with this approach, we need data that is primarily lacking in developing countries (Semasinghe, 2015).

In contrast, the non-welfarist approach focuses on the multidimensional nature of poverty. According to Semasinghe (2015), this approach takes two paths: the basic needs approach and the capability approach. The basic needs

approach, based on income, is widely used by researchers and scholars. In contrast, the capability approach takes on economic and social development through many dimensions. Poverty is not only about a lack of material, wealth, or resources (Semasinghe, 2011). The author further mentions that malnutrition, education, maternal health, sanitation, housing, and drinking water are some dimensions that directly relate to poverty. Though the income dimension was the key to measuring poverty until the recent past, non-income dimensions related to human development are now given equal priority (Semasinghe, 2015).

Theories of Poverty

Poverty can be caused by various factors, and Brady (2019) categorizes three main theories of the causes of poverty: behavioural theories, structural theories, and political theories. Behavioural theories describe how incentives and culture become the sources of behaviour for poverty (Brady,2019). According to him, when governments tend to offer more "generous" welfare policies, they demotivate people from engaging in productive poverty reduction activities such as employment. However, the author further states that, in developing countries, more focus is on how market inefficiencies demotivate people for poverty reduction measures. On the other hand, culture also explains the causes of poverty, mainly how it can induce intragenerational and intergenerational poverty (Brady, 2019). Next, structural theories demonstrate how economic and demographic contexts cause poverty through three main channels: direct channel, indirect channel, and interactive channel. Economic structures represent development, industrialization, deindustrialization, and spatial and skills mismatches, while demographic structures include neighbourhood disadvantage, age/sex composition, residential segregation, urbanization, and demographic transitions (Brady, 2019, p.161). Thirdly, political theories explain that poverty results from politically driven policies. It elaborates on how elites and businesses gain power in capitalist democracies, producing inequality. Further, how the political institutions govern the distribution of resources also causes poverty.

Poverty Alleviation Strategies

Over the decades, poverty alleviation has become a key concern in government policy-making, especially in developing countries. Poverty and social welfare policies are mutually connected. Welfare services act as safety nets for poor people, and social welfare policies aim to reduce poverty (Semasinghe, 2015). Four categories of approaches can be identified in poverty alleviation: community organizations-based micro-financing, capability and social security methods, market-based approaches, and good governance (Singh & Chudasama, 2020). In evaluating these strategies in a developing country, the authors state that these four types have positives and challenges in each category. Therefore, a combined approach of all is necessary to drive poverty alleviation. They conclude that "to address multidimensional poverty, an integrated and multidimensional poverty alleviation approach is needed" (Singh & Chudasama, 2020, p.18). Another categorization of poverty alleviation methods introduces three types of strategies: market-based, social services, and targeted transfer schemes (Gunatilaka, 1999).

Several policy instruments can be used in the poverty alleviation process. Althaus, Bridgman, and Davis (2018) present seven types of policy instruments: advocacy, networks, money, government action, law, behavioural economics, and narrative. The authors further emphasize the importance of choosing the right mix of instruments for the problem at hand for a good policy solution. Behavioural economics is one of the essential policy tools that can be used in poverty alleviation." The focus of behavioural economics is the distorting effects of behavioural biases. These create gaps between what people want to achieve (to maximize welfare) and what they choose or prefer (which often fails to maximize their welfare)" (Althaus et al., 2018, p.111). They can make people choose different paths by making the environment easier because it concentrates on how people feel and think (Althaus et al., 2018). Behavioural policy applications can be employed at low costs and are suitable during fiscal constraints (Moseley & Stoker, 2013). Law (rules and regulations), advocacy, and networking are other policy tools discussed in this research paper.

Poverty Alleviation Strategies in Sri Lanka

When looking at the history of Sri Lanka after its independence from the British in 1948, several poverty alleviation approaches could be observed from time to time. Components of the policy cycle can be attributed to poverty alleviation in Sri Lanka, as described in this section. Until the introduction of trade liberalization in 1977, social and welfare policy in Sri Lanka was more fiscal (universal provisions) and even after 1977, education and health services continued as free components. As such, school uniforms, textbooks, and even mid-day meals were provided by the government. However, the food subsidies were cut, and a value-based approach was adopted to issue food stamps to low-income earners. In 1990, the government shifted to a direct target intervention program called "Janasaviya", which addressed income transfer and production generation (Gunetilleke, 2000). Later, in 1995, this program was replaced by a new project called “Samurdhi", which had the same basic model with expanded elements. This shift occurred due to the change in the governing regime at that time. According to the multiple stream model illustrated by Zahariasis (2016), which describes policy agenda-setting variables, the new policy reform was introduced to align with the party ideology. This Samurdhi program is the major poverty alleviation project in Sri Lanka.” The program assists the poor by providing services for five mutually bound components: welfare, microfinance, infrastructure development, social services, and livelihood development programs” (Madduma Bandara, 2016, p.282). The author states that these policies and programs have caused a significant decline in the absolute poverty level in Sri Lanka; the poverty headcount ratio has declined from 28.8% in 1995 to 6.7% in 2012. The welfare component includes food stamps, subsidies for fuel (for lighting kerosene lamps), nutrition packages for pregnant and lactating mothers, and milk-feeding subsidies for children between two and five years. Eighty (80%) per cent of the total budget of the Samurdhi program is allocated to the welfare component (Madduma Bandara, 2016). The major problem with welfare is the dependency mentality of beneficiaries.

Along with these benefits, being a "Samurdhi" welfare recipient makes families eligible for many other subsidies, such as scholarships for education, low-interest rates for credit, and subsidized prices for electricity and water supply connections. Therefore, the recipients want to remain as beneficiaries,

so they hide the actual income data from officials. Further, officers at grass root level appointed to monitor and supervise beneficiaries refrain from forcing beneficiaries to reveal the actual situations, as they want to maintain their relationships with the neighbourhood (Madduma Bandara,2016). This implies the ineffectiveness of the policy cycle's policy monitoring and evaluation stage.

Though the Samurdhi program gradually contributed to the decline in the poverty ratio, the literature finds some drawbacks. Politicization, mal-targeting, and corruption are vital weaknesses (Madduma Bandara, 2016; Gunetilleke, 2000). It is widely accepted that 25 per cent of the beneficiaries are mal-targeted mainly because of political influence. Even though grassroots-level officers remove the names of ineligible beneficiaries from the list, they somehow get their names back on the list with the support of local politicians. This is a well-known criticism of the program. However, none of the governments tried to solve it as there was a possibility of losing the voters' base if they acted on that. The government's failure to act on this issue can be related to "politics" in the multiple-stream framework, as Zahariasis (2016) states that any of the proposed solutions would negatively impact party ideology and the political movement of the party.

The Economic Crisis in Sri Lanka

Sri Lanka is located in South Asia with a population of 21.5 million. It was under British colonial rule and gained independence in 1948. Currently, Sri Lanka is facing its worst economic crisis in seventy years. As a country that depended highly on tourism, the economy was first attacked by the COVID-19 pandemic in early 2020. Depletion of foreign reserves, together with massive borrowings that happened over decades, dragged the country into a severe economic crisis (Gamage,2023; Imtiyaz, 2023). In 2022, Sri Lanka officially declared its bankruptcy by defaulting on debts (Social Indicator,2023). The foreign exchange deficit heavily impacted imports, including fuel, medicine, and food essentials. Fuel shortage interrupted the transport sector and the continuous supply of electricity, collapsing major export industries and essential services (Fernando, 2022; Senanayake, 2023).

Accordingly, the currency of Sri Lanka was further depleted against the US dollar, and inflation and unemployment increased (Senanayake, 2023). The

country's poverty level is expected to increase with low purchasing power (UNDP,2023). Applying Brady's (2019) theory, this is an example of poverty caused by politically driven policies. Therefore, the most recent cause of poverty in Sri Lanka is inappropriate economic policy decisions. According to the World Bank data, there is an increase in the poverty rate to 25 per cent in 2022, compared to 13.1 per cent in 2021 (UNDP, 2023). A food crisis is predicted, and at the same time, the direct effects of the economic crisis will impact access to education and health sectors (UNDP, 2023). With all these effects, the government is moving towards new policy reforms in all sectors with a cost-cutting approach. Government poverty alleviation programs will take a new direction. With minimum budgets allocated for welfare, alternative strategies should be considered to face this critical issue of humankind amidst the economic crisis in Sri Lanka.

When analyzing the Samurdhi program, it can be stated that it is a comprehensive poverty alleviation approach with many of the strategies we find in the literature, such as micro-financing and social safety nets. However, in dealing with the economic crisis in Sri Lanka, low budgetary, highly effective, and sustainable alternative strategies should be identified to suppress the drawbacks of the "Samurdhi" program. The capability and good governance approaches could be employed for poverty alleviation by fulfilling the above criteria. This paper will present policy recommendations based on capability, good governance, behavioural insights, and community-based approaches.

Methodology

The author carried out a systematic literature review as the methodology. The review had the following steps in its process.

Search Strategy

The literature review used two electronic search databases: Google Scholar and the University of Sydney online library. These databases were selected since they give indexes of peer-reviewed literature and cover a wide range of publications. It used a time frame from 1971 to 2024 and keywords "theories of poverty, state welfare policies and poverty alleviation, and the economic

crisis in Sri Lanka". Accordingly, 18600 articles from Google Scholar and 824 from the University of Sydney online Library were screened.

Inclusion and Exclusion Criteria

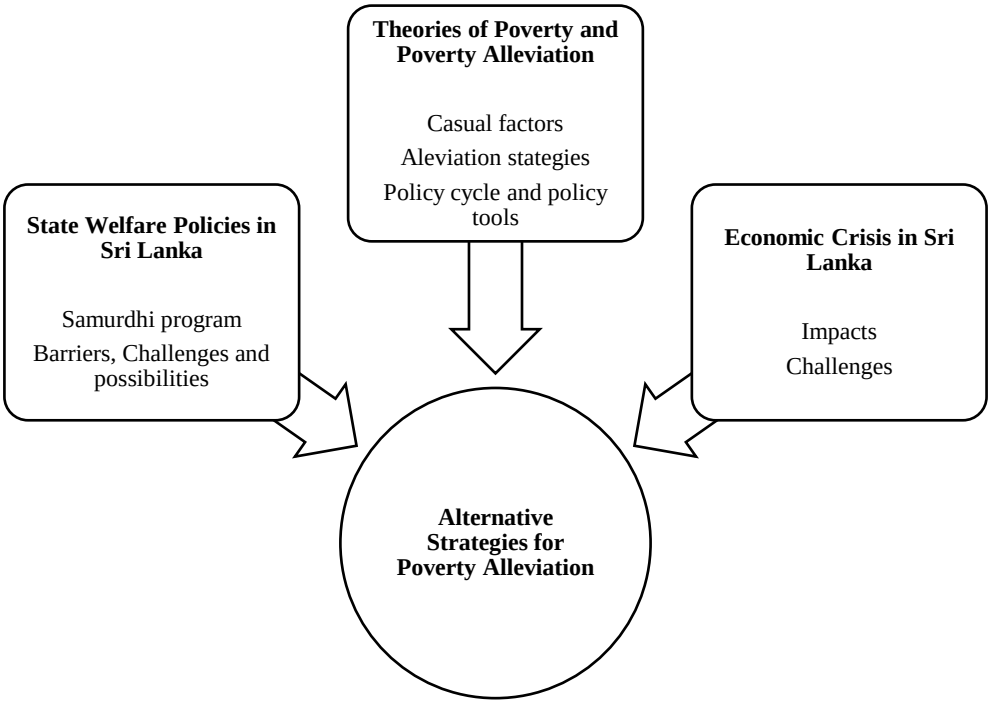
In the second stage, the inclusion and exclusion criteria were characterized. The selection of articles was confined to those written in English, aligning with the language of this literature review to maintain language consistency. Google Scholar yielded English articles, resulting in no alteration in volume. However, the number of articles available via the University of Sydney online library decreased to 127. Subsequently, the shortlisted articles underwent a further screening process to ascertain the presence of peer review and full-text availability. This sorting led to a shortlist of reviewed articles, 127 (peer-reviewed and full text available) from the University of Sydney online library, and 778 from Google Scholar. The reason for selecting peer-reviewed sources is to ensure the quality, credibility, and reliability of the information being used and to verify the accuracy of the content and the validity of the research methods. The full-text availability option ensured access to the complete content of the articles, as it is essential to understand the research, as abstracts alone might not provide sufficient depth or context.

Quality and Eligibility Assessment

Then the article titles and abstracts were carefully reviewed manually to assess their relevance to theories of poverty and poverty alleviation strategies. Finally, after being removed for duplication, fifteen (15) articles were selected for review. However, sufficient peer-reviewed literature related to the economic crisis in Sri Lanka was not found. Therefore, some grey literature sources, such as reports were also used for the analysis. Research papers were divided and analyzed into three main categories: articles related to theories and causal factors of poverty, articles related to state welfare policies in Sri Lanka, and articles related to the economic crisis. The findings of these three categories were then combined to produce four policy-level recommendations, as shown in Figure 1.

Figure 1

Analytical Framework for Methodology



Alternative Strategies for Poverty Alleviation

Enhancing Good Governance in Poverty Alleviation Programs

The Samurdhi program is criticized for lacking participatory, transparent, and accountable measures. Mainly, the reported mal-targeting of beneficiaries occurs due to the lack of transparency in the program. Policy tools such as rules and regulations can be used in this process to enhance good governance. Laws, as policy tools, can facilitate, coerce, or prohibit an action or behaviour (Althaus et al., 2018, p.110). Transparency in selecting beneficiaries could be improved through laws by giving direction to employees on their duties. In addition, involving information and communication technologies (ICT) can also increase transparency and good governance in the Samurdhi program. ICT literacy of the employees and beneficiaries would be challenging in proceeding with this approach. However, increased good governance not only

in poverty alleviation programs but also in the entire government structure would enhance the involvement of third-sector contributions for poverty alleviation amidst the economic crisis. The third sector, which includes United Nations agencies and international non-governmental organizations (INGOs), can effectively address financial restrictions in poverty alleviation efforts. Key components of good governance such as transparency and accountability are essential in building trust and credibility with donor agencies. For instance, Singh and Chudasama (2020) emphasize that adopting robust good governance practices is a prerequisite to securing aid from multinational donor agencies (p.3). These practices ensure that resources are utilized efficiently and reach the intended beneficiaries, thereby increasing donor confidence. Transparency in operations allows for clear and open reporting of how funds are allocated and spent, which is critical for building trust with donors. Accountability mechanisms ensure that there are checks and balances in place to prevent misuse of funds, further reinforcing donor confidence. Guptha (2011) discusses how effective government involvement can enhance NGO led poverty alleviation programs, citing examples from West Bengal, India. In this context, the government's role in facilitating coordination among various stakeholders, providing necessary infrastructure, and ensuring a conducive policy environment is highlighted as critical for the success of such programs.

Improving Behavioural Insights of People

As mentioned in the behavioural cause theory, the beneficiaries have become demotivated to engage in productive activities such as employment, developing a dependent mentality (Brady, 2019). Behavioural insights are one of the policy tools that can be used to eliminate this situation. When attributing to the Samurdhi program, beneficiaries can be motivated to engage in income-earning activities by being guided towards various opportunities, such as entrepreneurship. There are over three hundred divisional secretariats nationwide for divisional administration under the Ministry of Home Affairs (Ministry of Home Affairs, Sri Lanka, 2021). Each divisional secretariat has counsellors, science and technology officers, and small and medium-scale entrepreneurship development officers who can effectively be employed in behavioural insight development programs. There is no extra cost for these resource persons as the government already employs them, and a bottom-up approach can be taken to nudge people for behavioural changes. However, this

type of program needs strong coordination between government organizations, which would be challenging in achieving the objectives. The government can enforce rules and regulations introduced as policy tools (Althaus et al., 2018) to create a collaborative environment to implement behavioural economic programs.

Focus on the Capability Approach of Poverty Alleviation

The present economic crisis in Sri Lanka is predicted to be long-lasting as the recovery measures would take time to respond to the critical issues. Therefore, poverty alleviation programs need to take the capability approach path. According to this theory, poverty is not an expected outcome of a lack of wealth or resources (Semasinghe, 2011). Instead, it is more about quality of life, and when people lack choices when meeting basic needs, they can be considered poor. Further capability approach emphasizes that poverty alleviation is an integrated approach with both economic and social developments (Semasinghe, 2011). As such, "the capabilities produced as outcomes of welfare policies are interrelated and reinforce one another" (Semasinghe, 2011, p.153). For example, education enhances other basic needs such as health and nutrition. The Samurdhi program already has a significant component for social and spiritual development (Madduma Bandara, 2016). This component addresses women's empowerment to a certain extent, and there is a possibility of expanding these programs to meet the demands of the capability approach (Semasinghe, 2015). Global studies have also revealed that educating young women is a very effective antipoverty behaviour (Brady, 2019). The economic and social status of women in Sri Lanka is markedly superior to that of their regional counterparts (Gunetillake, 2000). For example, Sri Lanka scored a Gender Development Index of 0.947 in 2022 in “High Human Development” category (UNDP, 2022). It indicates that gender gap is relatively narrow, reflecting a high level of gender equality in health, education and command over economic resources. Therefore, engaging women in the capability approach is likely to yield more favourable outcomes in Sri Lankan context.

After assessing rural poverty in Sri Lanka through a capability approach, Semasinghe (2011) concludes that public health policies can effectively reduce rural poverty while suggesting that education and housing policies may also play a vital role. Enhancing individual capabilities leads to human

development of the society, thus producing long-term sustainable outcomes in poverty alleviation in Sri Lanka during the economic crisis. Advocacy, networking, and rules and regulations can be effectively used as policy tools in this process (Althaus et al., 2018).

Strengthening Participatory Approach

The participatory approach is a well-used strategy in poverty alleviation (Singh & Chudasama, 2020). The third sector organizations, including non-government organizations (NGOs) and community-based organizations (CBOs), can play a vital role in this approach (Gunetilleke,2000). Before 1990, this approach was minimal in poverty alleviation strategies in Sri Lanka; however, the government itself invited the third sector to strengthen the country's welfare (Kelegama, 2001). Besides the Samurdhi program, thousands of NGOs and CBOs engage in poverty alleviation in Sri Lanka in agricultural development, small enterprise development, health and nutrition, environmental protection, and micro-credit sectors (Gunetilleke, 2000). In coping with the economic crisis, these projects can be focused on food security by encouraging home gardening and access to natural capital. In the rural communities in Sri Lanka, there is ample space in home gardens to cultivate vegetables and fruits, which provide basic and essential nutrition. Advocacy from religious leaders in these areas would be an effective policy tool (Althaus et al., 2018). On the other hand, networking can also be a policy tool when all the stakeholders related to poverty alleviation, such as politicians, public officials, NGOs, CBOs, and communities, act together to achieve the targets.

Conclusion

The country's present economic crisis will likely challenge the continuous progress achieved in poverty alleviation in Sri Lanka. Therefore, alternative or supplement strategies are needed for the sector to cope with increasing poverty levels and decreasing funds. Enhancing good governance in poverty alleviation programs, improving the behavioural insights of the people, focusing on the capability approach of poverty alleviation, and strengthening participation in the programs could be identified as policy-level recommendations to poverty alleviation during the economic crisis. Though there are challenges in achieving these policies in action, they would be

beneficial in producing sustainable outcomes in poverty alleviation amidst the economic crisis in the Sri Lankan context.

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Key Requirements for Co-management in Small-Scale Fisheries

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Abstract

The contribution of small-scale fisheries (SSF) to nutrition, food security, employment generation, and poverty alleviation in the developing world is substantial. Co-management, which is a participatory fisheries management approach involving the fishers, state, other stakeholders, and relevant external agents, is endorsed by many practitioners as an effective strategy to address major issues in SSF caused by the increased dependence on ecosystem services, economic globalization, and climate change. In most parts of the world, co-management is now well-established as a mainstream approach to addressing major issues in SSF. In this paper, a systematic literature review with content analysis of selected case studies was employed to explore the key problems in the SSF and to examine how co-management has intervened to resolve major SSF issues. Finally, it attempted to explore the key requirements for operationalizing co-management. The paper builds on lessons learned from case studies from Uruguay, Zambia, Timor Leste, and Sri Lanka, where SSF plays a significant role in fisheries. The paper emphasizes the role of Ostrom's modified principles, which demonstrates the ability of common pool resource users such as small-scale fishers to manage their resources sustainably. We take the position that the existence of Ostrom's modified design principles is a significant requirement for operationalizing co-management. The presence of strong, committed, and respected local leaders, unity, and cohesion of community networks, availability of strong local organizations, and enforcement of indirect regulations such as community-based protected areas and closed seasons, and strong local knowledge base on ecological systems are recognized as key requirements for operationalizing co-management. The results also show that healthy socio-economic conditions and appropriate ecological settings enhance the drive for co-management.

Keywords: Community participation, Fisheries management, Sustainable development

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Introduction

Small-scale fisheries (SSF) is a dynamic and diverse sector, engaging both men and women throughout its value chain and providing food and livelihoods for millions of people around the world (Pittman et al, 2019). SSF contributes to about half the global fish catches and employs more than 90 percent of the world's 39 million capture fishers and fish workers (FAO, 2019). Basurto et al., (2017) are of the view that it is not possible to have a universal definition for SSF due to its diversity. Nevertheless, this sector is primarily characterized by fishers operating smaller crafts, using a small amount of capital, fishing in shallower waters, targeting local and domestic markets, and home consumption (Amarasinghe and Bavinck, 2017: Koralagamage, 2020: Pathmanandakumar, 2017).

The coastal fisheries sector, which is identified as the Small-scale fisheries (SSF) sector in Sri Lanka makes an important contribution to nutrition, food security, sustainable livelihoods, and poverty alleviation in Sri Lanka (Amarasinghe and Bavinck, 2017). Around 93 percent of Sri Lanka's 59,000-strong fishing fleet is engaged in small-scale fishing, accounting for 63 percent of the total fish production of the country (Ministry of Fisheries, 2021). Although their contribution to food security, employment generation, and poverty alleviation is enormous, it is widely accepted that small-scale fishers face difficulties due to their vulnerability to social, environmental, and economic issues (Jentoft et al., 2017). They struggle under various stresses emerging from poverty, powerlessness, and marginalization (Jentoft et al., 2017). The sustainable development of SSF remains a considerable challenge, particularly in the contexts of poverty, the high dependence of increasing populations on ecosystem services, economic globalization, and climate change (Evans et al., 2011). Conflicts in respect of fisheries tenure, access, and user rights in fisheries socio-economic systems are other salient problems in this sector (Dahlet, et al., 2021).

As set out in the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication, endorsed by the FAO Member States in 2014, the remedies include secure tenure, access to fairer markets, better education, improved health, etc., within a human rights framework (FAO, 2015: FAO, 2017: Jentoft et al., 2017). The significance of community involvement as an alternative approach to bringing

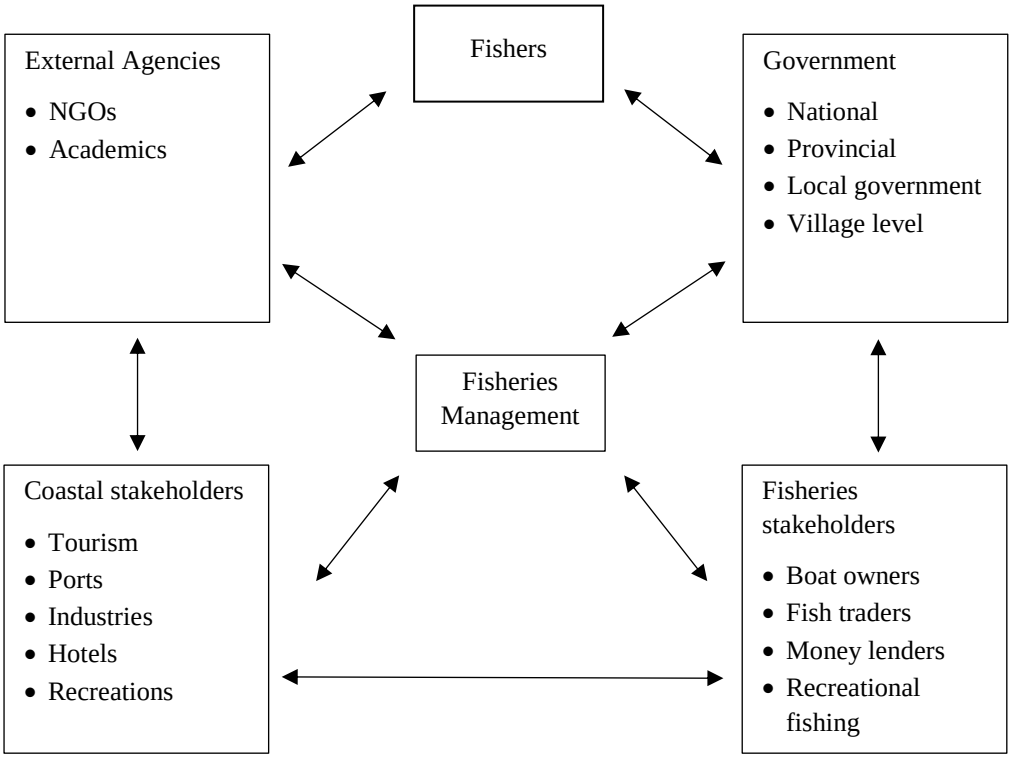
remedies to issues in SSF is widely acknowledged (Evans et al., 2011: Kosamu, 2015: Trimble and Berkes, 2015).

The highest form of community involvement in fisheries management is generally termed co-management. Co-management is often considered as a relationship between a resource user group and other organizations for fisheries management in which some degree of responsibility and authority is conferred to both parties (Evans et al., 2011). Co-management programs have been implemented in multiple countries and contexts to increase the participation of fishing communities in the management and improve the long-term sustainability of resources (Quimby and Levine, 2018). The philosophy behind co-management is that those who are affected by management (e.g., fishers and other resource users) should be involved in making management decisions, thereby improving the legitimacy of the state involvement in fisheries management through more inclusive and transparent decision-making processes (Cavallé, et al., 2020: Evans et al., 2011: Pathmanandakumar, 2017: Pomeroy and Rivera-Guieb, 2005). Co-management is also called participatory, joint, multi-party, or collaborative management (Pomeroy and Rivera- Guieb, 2005). In a more descriptive analysis, Pomeroy and Rivera-Guieb (2005) define co-management as a partnership arrangement in which the community of local resource users (fishers), government, other stakeholders (boat owners, fish traders, boat builders, business people, etc.), and external agents (non-governmental organizations (NGOs), academic and research institutions) share the responsibility and authority for the management of the fishery where responsibilities and rights in management, referred to as ‘negotiated power’ are established.

Benefits of co-management are identified in terms of ensuring sustainable fishing, reducing the cost of fisheries management, obtaining the support of fishers to avoid breaking rules (Gutiérrez et al., 2011: Pathmanadakumar, 2017), using the wealth of knowledge and experience of fishers for management process (Gammanpila, 2018: Gutierrez et al., 2011), empowerment of communities (Jentoft, 2004), ecological benefits such as preservation of resources (Gutierrez et al., 2011: Pomeroy, 2003), social benefits such as strengthening of the communities (Gutierrez et al., 2011: Quimby and Levine, 2018), conflict resolution (Kaluma and Umar, 2021), increased compliance with regulations through peer pressure; and better

monitoring, control, and surveillance by fishers (Gutierrez et al., 2011). Nevertheless, the success stories of co-management are not widespread (Jentoft *et al.*, 2017: Pathmanadakumar, 2017: Pittman et al., 2019).

Figure 1
Co-management as a partnership



Source: *Pomeroy and Rivera- Guieb (2005)*

Objectives of the Study

Traditional fisheries management strategies have failed to take into account the precautionary approach to maintain and protect sustainable fisheries, biodiversity, and marine ecosystem and the conflicts among resource users. Therefore, there is an urgent need to move towards a more participatory, co-management model of governance (Arceo, et al., 2013). Pathmanandakumar (2017) mentions that though the government institutions in Sri Lanka, from time to time, have supported establishing and implementing co-management measures in the SSF sector through various policy and project initiatives, the

existing co-management initiatives are not very satisfactory. Therefore, it is timely to examine the issues in the SSF sector and to explore what is required to establish effective co-management initiatives.

The objectives of this paper include the identification of existing issues in SSF, examination of the success of the co-management interventions and to explore the key requirements for successful co-management regimes. The overriding objective of the study is to recommend the key requirements in SSF where co-management platforms would thrive.

Methodology

A multi-step procedure was used to compile a list of participatory management efforts in the SSF, along with any corresponding information on evaluations or assessments of such initiatives. The procedure involved two main phases: i) a literature survey through an electronic search for published literature and ii) the systematic selection of case studies with available and appropriate data for analysis.

The first step in the literature search involved a comprehensive search for various electronic library databases (including Google scholar, Web of Science, WorldFish Library Catalogue, and Scopus) using keywords (different combinations of co-management, participatory fisheries management, community participation in fisheries) and following up references therein. Through the electronic literature search, a total of 108 fisheries co-management-related articles were retrieved. From this sample, 64 articles were excluded because they did not refer to qualitative or quantitative impacts of co-management related to fisheries or aquatic systems in developing countries. This left 44 articles from which to identify potential case studies, issues in SSF, potential solutions, prerequisites, and appropriate conditions for co-management.

This paper proceeds in three stages. First, the issues and problems in the SSF are identified using selected literature. Secondly, it attempts to examine how the co-management efforts had intervened to solve burning issues in SSF by using several case studies found in the literature. The analysis of case studies using Ostrom's modified design principles was conducted to identify different issues in the SSF. The following modified principles were used: i) The Common pool resources (CPR) has clearly-defined boundaries (effective

exclusion of external unentitled parties) ii) There is congruence between the resource environment and its governance structure or rules iii) Decisions are made through collective-choice arrangements that allow most resource appropriators to participate iv) Rules are enforced through effective monitoring by monitors who are part of or accountable to the appropriators v) Violations are punished with graduated sanctions vi) Conflicts and issues are addressed with low-cost and easy-to-access conflict resolution mechanisms vii) Higher-level authorities recognize the right of the resource appropriators to self-govern viii) In the case of larger common-pool resources, rules are organized and enforced through multiple layers of nested enterprises. Finally, the paper attempts to explore the key requirements for operationalizing co-management in SSF through the selected case studies.

Results and Discussion

Issues in the SSF Sector

According to the selected case studies, there are many issues in the SSF sector. Overexploitation of resources is identified as a primary issue in the global SSF sector since the 1990s (Basurto, et al., 2017). Therefore, sustainable use of resources has become a primary area of concern in the SSF. Conflicts in respect of fisheries tenure, access, and user rights in fisheries socio-economic systems are other salient problems in this sector worldwide (Dahlet et al., 2021). The rights of fishers are violated due to the acquisition of beach areas for tourism and other commercial activities, leading to the loss of anchorage sites, beach-seining sites, and space available for craft and gear repair, and fish processing (Amarasinghe, 2020). There are ample examples of such conflicts in the SSF sector (Bavinck. 2015: Gammanpila et al, 2018: Ibrahim, 2020: Pethiyagoda and Amarasinghe, 2015: Wickramasinghe and Bavinck, 2015). Pethiyagoda and Amarasinghe (2015) note that when diverse resource users with different interests work towards maximizing their benefits, it causes negative externalities on others, leading to conflicts. Among other issues related to SSF are the lack of community involvement in areas such as training and capacity building in scientific fish handling, the failure of community organizations to take up fish marketing aiming at breaking middlemen's oligopolies, and the lack of an 'early warning mechanism (Amarasinghe, 2020). The high rates of resource exploitation, unregulated technology change,

increasing fishing pressure, etc. too pose threats to the total ecosystems, leading to resource degradation (Sri Lanka Forum of Small-scale Fisheries, 2019).

Climate change is also considered an important factor affecting the SSF (Sri Lanka Forum of Small-scale Fisheries, 2019). The rise in sea level has resulted in the loss of landing centers, beach-seining sites, fish-drying sites, displacement of fishing populations, etc. (Sri Lanka Forum of Small-scale Fisheries, 2019). Seawater intrusion has also affected Lagoon ecosystems, causing a decline in productivity (Sri Lanka Forum of Small-scale Fisheries, 2019). Among many populations, those living in coastal areas experience the highest climate change risks which have very serious consequences on the well-being of fishing communities who form the most important coastal stakeholder group (Deepananda, et al., 2016a: Sri Lanka Forum of Small-scale fisheries, 2019).

Role of Co-management in the SSF

According to the literature, co-management has been adopted in many small-scale fisheries in developing countries as a management mechanism. It is widely accepted that common-pool resource users such as small-scale fishers are capable of successfully managing their resources under a proper participatory management process (Cox et al., 2010: Ostrom, 1990: Pomeroy, 2003: Pomeroy and Rivera- Guieb, 2009: Sandstrom and Rova, 2010). In this essay, we consider several examples of co-management in SSF to demonstrate the role of co-management in effectively managing the SSF.

Several researchers have studied the co-management efforts in the yellow clam fishery in Uruguay (Defeo et al., 2016: Pittman et al., 2019). Uruguay's yellow clam fishery began as a small and stable open-access fishery in the 1960s and continued in the same manner until the 1980s when a period of rapid expansion began (Defeo et al., 2016). Landings from 1981 to 1985 increased by 3.5 times their pre-1980 levels but catches were greatly reduced by the 1980s due to severe reductions in stock, resulting in the shutdown of the fisheries from 1987 to 1989 – a strategy agreed upon by both fishers and the government agencies (Defeo et al., 2016). The shutdown provided an opportunity to improve the governance of the fishery, which reopened in 1989 with a new governance scheme and fresh management tools in place (e.g.

quotas, and spatial-temporal zoning). Most importantly, the new tools and previous experience of stock collapse led to the high, voluntary participation of the fishers themselves in deciding and implementing rules –creating a de facto co-management regime. This had positive effects including the reduction of landing sites to low levels; an increase in species availability, unit prices, and revenues per unit of effort; and reduced variability in many fishery indicators (Defeo et al., 2016). This first co-management phase was therefore very successful and lasted until late 1994 (Defeo et al., 2016). Pittman et al., (2019) found that fishers in Uruguay had a high level of satisfaction with co-management initiatives. The case study of the small-scale yellow clam fishery in Uruguay provides an excellent example of how longstanding co-management regimes can improve the capacity of small-scale fishers to address the issues affecting small-scale fisheries (Pittman et al., 2019).

In 2011, participatory fisheries management was introduced in Zambia through the revised Fisheries Act number 22 of 2011 (Haambiya et al., 2015: Kaluma and Umar, 2011). Before this, the state was entirely responsible for fisheries management. The Act of 2011 expected the active participation of communities in fisheries management through village fisheries management committees (Kaluma and Umar, 2011). Once the 2011 Fisheries Act was promulgated, it was expected that local fishing communities would engage in fisheries governance across all main fisheries in Zambia. The system of Village Fisheries Management Committees (VFMC) was introduced to strengthen co-management. Potential VFMC members were nominated by fishers through community meetings held with several stakeholders including traditional leaders, officials from the Department of Fisheries, and fishers. The nominated fishers were trained and appointed by the Department of Fisheries as Village Fisheries Management Committee members. They act as the main agents of managing the fishery (Kaluma and Umar, 2011).

Tilley et al., (2019) have used two case studies in Timor Leste; i.e., the Biacou community on the north coast and the Adara community on the west coast. Both case studies reveal the functioning of co-management persists in Timor-Leste and is implemented for fisheries management of near-shore coastal resources at limited scales, by building on locally legitimate institutions (Tilley et al., 2019). Co-management operates in Timor Leste, by utilizing or interacting with these traditional, legal, and religious institutions, connecting with state mechanisms to manage diverse fisheries issues (Tilley et al., 2019).

They find that co-management is a valuable and important tool for the development of local rules, and for facilitating the engagement of resource owners and stakeholders in multi-scale governance.

Several scholars, including Amarasinghe and Bavinck (2011), Amarasinghe and Bavinck (2017), Cohen et al. (2021), Deepananada et al. (2016), Fernando et al. (2015), Gammanpila et al. (2018), Joseph (2015), Pathmanadakumar (2017), have paid attention to co-management or community-based fisheries management initiatives in Sri Lanka. Cohen et al., (2021) note that very few examples of successful co-management initiatives can be observed in the coastal fisheries sector in Sri Lanka. However, there are a few examples of successful co-management initiatives including beach seine fisheries (Deepananda, et al., 2016a) and stilt fisheries (Deepananda et al. 2016b) of the southern coast and inland fisheries (Fernando, et al., 2015). In these instances, communities demarcate their fishery areas in agreement with the local fisheries inspectors. Communities are effectively involved in the management of their demarcated areas and provide valuable information on physical and biological factors back to the fisheries authorities at the beginning and end of each fishing season (Deepananda et al. 2015). Joseph (2013) views that most of the co-management initiatives in Sri Lanka were project-driven. He claims that there is a clear need for the policy on co-management to be translated into strategy and brought into the mainstream, and not allow it to operate in 'project mode'. Joseph (2013) further notices that lack of legal and institutional arrangements for wider stakeholder participation, lack of fisheries development and management plans, lack of institutional strengthening, and lack of tangible benefits from co-management are other major deficiencies identified in co-management initiatives in Sri Lanka.

Key Requirements for Co-management

In 1990, Ostrom introduced 08 design principles for sustainable governance of common-pool resources (CPR), which earned her esteemed Nobel Prize. Gutiérrez et al., (2011) recognize Ostrom's intervention as a landmark conceptual development in fisheries management, where community-based management or co-management was accepted as a solution to the dilemma of CPR users explained by Hardin (1968) as the tragedy of commons. Ostrom's principles include i) The CPR has clearly-defined boundaries (effective exclusion of external unentitled parties) ii) There is congruence between the

resource environment and its governance structure or rules iii) Decisions are made through collective-choice arrangements that allow most resource appropriators to participate iv) Rules are enforced through effective monitoring by monitors who are part of or accountable to the appropriators v) Violations are punished with graduated sanctions vi) Conflicts and issues are addressed with low-cost and easy-to-access conflict resolution mechanisms vii) Higher-level authorities recognize the right of the resource appropriators to self-govern viii) In the case of larger common-pool resources: rules are organized and enforced through multiple layers of nested enterprises. Hence, Ostrom (1990) notes that the ability to agree on the rules, and the ability to monitor each other's activities, are key pre-conditions for a community to make rules successfully. In addition, she highlights the importance of a system of threats or punishments, if rules are continuously broken ("graduated sanctions"). Ostrom's principles can be recognized as a basis and framework for successful community-based management of resources (Araral, 2014: Pinkerton and Weinstein, 1995: Frischmann, et al., 2019).

However, there are disagreements on Ostrom's (1990) theory, where it is argued that Ostrom (1990) has not clearly distinguished the difference between commons and private property rights and she believes that private property is possible only if the government protects and enforces it (Block and Jankovic, 2016). Cox et al (2010) analyzed 91 studies to evaluate and analyze resource systems and modified Ostrom's (1990) design principles. They found that Ostrom's (1990) principles were empirically well supported but reformulated principles 1, 2, and 4 after a qualitative analysis and divided each of these three principles into two, establishing 11 design principles in total. Principle 1 originally stipulates the presence of well-defined boundaries around a community of users and boundaries around the resource system of this community. Each component helps to internalize the positive and negative externalities produced by participants and bear the costs of appropriation and receive some of the benefits of resource provision. The main complaints concerning this principle are that it is too rigid and that, in many systems, loose social or geographic boundaries are needed to facilitate more flexible, ad hoc arrangements between participants. Therefore, they suggest 02 conditions to fulfil principle 01. I) Individuals or households who have the right to withdraw resource units from the common pool resource (CPR) must be clearly defined. 2) The boundaries of CPR must be properly defined.

Ostrom's (1990) second design principle refers to the "congruence between appropriation and provision rules and local conditions." Cox et al., (2010) argue that like the first principle, this principle also stipulates two separate conditions. I) Appropriation rules restricting time, place, technology, and/or quantity of resource units are related to local conditions. 2) The benefits obtained by users from a CPR, as determined by appropriation rules, are proportional to the number of inputs required in the form of labour, material, or money, as determined by provision rules. Cox et al., (2010) also suggest two separate conditions for principle 4; effective monitoring by monitors, who are part of or accountable to the appropriators as mentioned. 1) Monitors are present and actively audit CPR conditions and appropriator behaviour. 2) Monitors are accountable or are the appropriators.

Several researchers have shown the applicability of Ostrom's design principles in different SSF settings. Hence, the presence of modified design principles can be recognized as a significant requirement for operationalizing co-management. Gammanpila et al., (2019) have tried to assess the institutional robustness of the community-based management system of the brush park fishery in Negombo, which is a small-scale fishery where traditional ecological knowledge (TEK) is utilized, using Ostrom's modified design principles. Gammanpila et al., (2019) find those remnants of community-based fisheries management (CBFM) exist in the brush park fishery of the Negombo estuary. For example, somewhat strong property rights such as exclusive rights that come from generation to generation exist in the fishery, which helps to prevent CPR issues (Gammanpila et al., 2019). However, the intensification of brush park fisheries in the Negombo estuary was not reported in the recent past (Gammanpila et al., 2019). The knowledge of brush park fishers about productive seasons and lean seasons with seasonal salinity variations in the estuary caused by monsoonal rains and the effect of wind conditions on the harvest was found to be accurate, which indicates that brush park fishers possess a wealth of indigenous knowledge that has been gathered through their experience (Gammanpila et al., 2019). Opinions expressed by members of the fishing community about the institutional robustness of community-based management in the brush have indicated a wide variation. Of the 11 Ostrom's modified design principles, only three (i.e., congruence between appropriation and provision, monitoring of users, and monitoring of resources) had a mean score of 4 representing high compliance.

Four design principles (i.e., congruence with local conditions, conflict resolution mechanisms, minimal recognition of rights to organize, and multi-level institutional structure) had low compliance in the brush park fishing community indicating the need for intervention of state or a centralized management unit (Gammanpila et al., 2019). The design principles of the lowest compliance in the fishing community were those related to clearly defined user boundaries, clearly defined resource boundaries, and graduated sanctions (Gammanpila et al., 2019). They conclude that the degree of community-based management is not effective in the successful management of the fishery and it has not developed to a level of a strong co-management framework. However, they are of the view that there is a potential for integrating some institutional design principles through the intervention of centralized management authorities. The formation of brush park fisher societies that support intercommunity linkages to facilitate the sustainable use of resources through a co-management system has been recommended as a suitable measure to sustain this traditional fishery (Gammanpila et al., 2019).

Deepananada et al., (2016) have studied 08 beach seine communities in southern Sri Lanka to examine the compliance of their management practices with Ostrom's modified design principles. Their findings indicate that the beach seine fisher community of southern Sri Lanka manages its CPR through self-governing institutions, and they show high compliance with modified design principles for a CPR management system. They conclude that beach seine fishing in southern Sri Lanka is an example of a community–based coastal fisheries management system that relies on strong locally designed rules as well as evolved norms where institutional and governance systems contribute to sustainability.

Reviews of case studies have revealed some patterns or commonalities among successful cases, which demonstrates certain requirements for successful co-management. Gutierrez et al. (2011) and Haambiya et al., (2015) identify the presence of community leaders as one condition that facilitates the success of co-management. They are of the view that leadership is critical for the successful co-management of fisheries. The presence of at least one person with entrepreneurial skills, well-motivated, respected as a local leader, and personally committed to the co-management implementation process, was essential (Gutierrez et al., 2011). The traditional authorities or skilled, committed, and motivated local leaders act as an entry point through which

the state can involve the entire community. Strong local leaders with intentions of promoting collective gain at the expense of self-interests promote strong social cohesion among the resource users and reinforce success in co-management (Gutierrez et al., 2011). Unity of the community and its togetherness and cohesion founded on local norms, trust, communication, and connectedness in networks and groups was also an important global attribute leading to successful fisheries co-management (Gutierrez et al., 2011). According to Kosamu (2014), the sustainability of small-scale fisheries depends mainly on the strength of the collective social capital of the local communities, and, with weak local social capital, degrees of government involvement does not make any difference. The results of Gutierrez et al., (2011) show that additional resources should be spent on efforts to identify community leaders and build social capital rather than only imposing management tactics without users' involvement. Amarasinghe and Bavinck (2011) identify that the availability of strong local organizations such as Cooperatives in Sri Lanka is a great source of social capital promoting collective action. 'Direct regulation' mechanisms such as Total Allowable Catch (TAC) in form of individual and community fish quotas and enforcing 'indirect regulations' such as community-based protected areas, closed seasons, limiting the number of resource users, and community restrictions on the type, size, and gears permissible contribute positively towards co-management (Gutierrez et al., 2011: Kaluma and Umar, 2011). Increasing the legitimacy of regulations is another condition that re-enforces strengthening co-management schemes (Kaluma and Umar, 2011). Amarasinghe and Bavinck (2017) stress the importance of considering broader ecological systems in co-management rather than isolated fisheries issues. Sandstrom and Rova (2010) are of the view that the ability to foster an adaptive management process in which rules are continuously revised and changed according to what is known about the ecological system is another important requirement to sustain co-management efforts. Gutierrez et al. (2011) also find that robust social capital, combined with clear incentives through catch shares and conservation benefits derived from protected areas also strengthens the efforts of co-management.

The legitimacy of community engagement has also been recognized as an important requirement. Tilley et al., (2019) highlight the need for a set of guiding principles to ensure legitimate community engagement, and avoid

external intervention that may reinforce the marginalization of certain user groups or traditional power hierarchies.

Conclusion

The review of the literature shows that operationalizing co-management is a well-recognized mechanism for addressing major issues in the SSF. However, co-management regimes would not be successful unless appropriate conditions or requirements are met within the community concerned. According to the results, characteristics of many successful co-management regimes comply with Ostrom's modified design principles. The presence of strong, committed, motivated and respected community leaders driven by a passion for community engagement, legitimacy of community organizations, availability of strong social capital, unity, and connectedness of community organizations are important requirements for operationalizing co-management.

The results also show that the success of co-management differs according to the socio-economic conditions of the resource users and the ecological setting. The situations with better socio-economic conditions are more likely to establish stronger co-management regimes. Co-management would be more effective in benthic and demersal fisheries over multi-species fisheries. Providing the necessary legal frameworks and strengthening the legitimacy of regulations or the 'rules of the game' are also important requirements for operationalizing co-management in SSF.

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Environmental Sustainability of the Agro-food Industry through Strategic Green Supply Chain Management

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Abstract

The agro-food industry and environmental sustainability are two areas that have raised concern among scholars in recent times. When it comes to the agro-food industry it is one of the most important and controversial industries in terms of environmental impact. Therefore, the concern towards establishing green elements within the supply chain has become essential for related actors to operate responsibly in the industry. Hence, this research would provide benefits to a range of organizations engaged in upstream and downstream supply chains such as farming, packaging, warehousing, distributing entities, and customers. The purpose of this research is to critically evaluate and establish a strategic green supply chain management framework for the agro-food industry. Thus, the key objectives are outlined as follows: to evaluate key areas and specific elements in Green Supply Chain, to evaluate the key elements, green practices or strategies specific to the agro-food industry, and finally, to develop and establish an effective strategic green supply chain management framework for the agro-food industry. This study used systematic review as its research strategy. The PRISMA flow diagram was applied to select the journal articles for the review. Accordingly, 14 articles were selected and analyzed using the thematic synthesizing technique. The findings indicated that the general green supply chain elements would not be applicable as it is at the agro-food supply chain due to the nature of the industry. It also observed that the expansion in the agro-food industry does necessarily generate considerable environmental hazards mainly in farming, processing and packaging, transportation, and warehousing echelons. The proposed strategic framework for the agro-food industry is a comprehensive approach to guide the respective supply chain partners while educating them on strategies to minimize the environmental hazards, factors require for the implementation, and areas of organizational performance.

Keywords: Agro-food Industry, Environment Sustainability, Green Supply Chain, Strategic Framework, Systematic Review

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Introduction

Green Supply Chain Management (GSCM) is one of the most researched areas in the field of Supply Chain Management. Greening the supply chain or embedding environmental sustainability into the supply chain has become an emerging trend in the corporate community. Thus, Zhu et al. (2012) defined GSCM as integrating environmental concerns with supply chain management.

Environmental sustainability is one of the key drives towards sustainability which is a construct of the triple bottom line. The expansion of the agro-food industry and environmental sustainability seem to have a negative correlation since, it is accepted that the expansion in agriculture could result in deforestation, which consequently contributes to global warming and climate change (Rueda et al., 2017).

The agro-food sector deals with food. Therefore, the supply chain elements utilized in this industry are more significant than the supply chain elements observed in the general manufacturing sector (Raut et al., 2019). Accordingly, it is expected to provide a thorough understanding of critical areas and elements applicable to the agro-food sector.

It is found that there is a lack of studies on supply chain management in the agro-food industry. Therefore, this study contributes to the literature by developing a framework for GSCM in the agro-food industry. As a controversial industry in terms of environmental sustainability, this study would generate invaluable insights into a comprehensive framework for GSCM in the agro-food industry.

The research aims to evaluate and establish a strategic GSCM framework for the agro-food industry. Accordingly, the following objectives are designed to align with the aim;

- Evaluate the key elements, green practices, or strategies specific to the agro-food industry.
- Develop and establish an effective strategic GSCM Framework for agro-food industry.

This research would provide benefits to a range of organizations engaged in supply chain activities such as farming, packaging, warehousing, distributing, and customers. The developed framework would provide a systematic

approach with a series of eco-friendly elements and practices to guide and educate the relevant entities. Additionally, the framework would benefit the supply chain partners to understand the critical elements and implementation factors specific to the agro-food industry while, improving the image, profits, recognition, and providing hygiene and healthy produce to customers.

Literature Review

GSCM is an emerging area in the field of supply chain management. Therefore, it has been the central focus of many scholars in doing investigations related to supply chain management. However, there is hardly any evidence of a single definition for GSCM, as the researchers have defined the term in different ways.

Ahi and Searcy (2013) researched the available definitions presented by different scholars on GSCM and Sustainable Supply Chain Management (SSCM). They analyzed 22 definitions for GSCM and 12 definitions for SSCM and found that the scope of GSCM is narrower than the SSCM. Moreover, it explains the importance of devising a reasonably acceptable definition for GSCM focusing on the scope and the theory. Chin et al. (2015) and Zhu et al. (2012) introduced the GSCM as the incorporation of environmental concerns into supply chain management. Hervin et al. (2005) viewed the GSCM as a collection of eco-friendly supply chain elements such as green purchasing, green manufacturing/ materials management, green distribution/ marketing, and reverse logistics. Thus, the key idea underpinning the GSCM is the conservation of the environment while limiting the influences from supply chain activities.

Key elements specific to the agro-food industry

Horton et al. (2015) explored the total agri-food system and illustrated it graphically including the areas of the eco-system, climate, resources, supply chain activities, and outcomes. The study identified four key attributes that could be observed in a general agri-food system that constitutes with 1. Agricultural activities and land use strategies, 2. Crop production and harvesting strategies, 3. Processing, storage, and distribution, and 4. Retailing and consumption. Moreover, the losses and waste generated from each of the

segments directly impact the environment and are thus expected to seek solutions by managing the agricultural eco-system.

Bhat and Joudo (2019) proposed a food traceability system and outlined the agro-food supply chain components as farming, processing and packaging, storage and transportation, and retailing. Iakovua et al. (2014) identified agro-food supply chain echelons as farming, industrial production, packaging, transportation, warehousing, and distribution. Based on these echelons the scholars adopted green supply chain areas related to the agro-food industry as sustainable farming, supply chain management, marketing, environmental management, reverse logistics, and corporate social responsibility. Krishnan et al. (2019) assessed a mango food supply chain to determine the areas required to redesign by embedding environmental sustainability. As per the study, cultivation, processing, pulp packaging, and transportation stages were identified as significant areas to adopt green practices.

Green practices/ strategies specific to the agro-food industry

Aivazidou et al. (2015) determined the importance of managing water footprint in agro-food supply chains and classified the water footprint management strategies applicable at each of the supply chain levels namely, farming, processing, packaging, logistics, and retailing. Moreover, it examined the relationship of water footprint management strategies with corporate green image and the financial performances of organizations involved in the agro-food industry. This study proved that the implementation of water footprint management strategies has a substantial influence on an organization's green image while positively impacting the profitability of the supply chain (Aivazidou et al., 2016). A study done by Sanchez et al. (2011) examined the water management aspect of the agro-food industry evaluating two Spanish taxation models: waste control tax and sanitary tax. The study found that imposing taxes to preserve water is an inadequate measure. Furthermore, it suggested the necessity of designing strong environmental regulations for proper water management by food processing entities.

Burrell (2011) explored the 'Good Agricultural Practices (GAP) utilized in agri-food supply chains. The term 'GAP' is defined as the on-farm practices used to ensure social, economic, and environmental sustainability. More importantly, the study revealed vertical and horizontal extensions of GAP; the

vertical aspect was concerned with utilizing GAP within external areas such as upstream and downstream of the supply chain whereas the horizontal aspect focused on practices applicable within the farm. Kaur (2013) found that it is a timely requirement to construct agriculture policies to promote green farming, for instance, policies on land management, fertilizer usage, and resource deployment. Tilman et al. (2011) found that the expansion of the cultivation fields is essential to meet the global demand in 2050 and suggested investing in improving and transferring agriculture-based technology, for instance, sustainable use of nitrogen as the practical option to minimize land clearing.

Del Borghi et al. (2014) introduced green practices applicable in the cultivation phase such as the use of organic fertilizers and balanced use of inorganic fertilizers, crop rotation, and water management. Moreover, once the processing is done the residuals and used water are treated effectively by utilizing the waste in generating fertilizer and implementing water treatment plants respectively. The scholars also emphasized the packaging is mainly based on recyclable products where pallets are reusable. Similarly, Dinu (2016) identified the waste management practice at each echelon of the agri-food supply chain as the key practice to reduce environmental depreciation. Moreover, it emphasized the capturing and the use of biodegradable waste to make organic fertilizer generated at each echelon of the supply chain.

Thorlakson, Hainmuellerb, and Lambinc (2018) analyzed Farming for the Future, a set of standards implemented by Woolworth Holdings Ltd. of South Africa. This study determined that the voluntary engagement of firms to implement environmentally friendly farming management practices has contributed positively to adopting a green agricultural supply chain. Furthermore, Miranda-Ackerman and Azzaro-Pantel (2017) emphasized the impact of eco-labeling on agricultural practices referring to the orange juice supply chain. This study justified that it is beneficial to use the general eco-labeling practices representing the overall supply chain, moreover, confirmed that organic certification is important in eco-labeling as well as in upgrading environmental performances.

Evidence of effective strategic GSCM Frameworks

Ghobakhloo (2013) developed an interactive framework to support the implementation of GSCM in a typical supply chain. This framework mainly

focused on greening the supply chain components such as product design, material management, manufacturing, marketing, distribution, and reverse logistics. More importantly, the scholars also proposed practices for achieving environmental friendliness at each level. For instance, it incorporated the product life cycle assessment and environmentally friendly design aspects to deliver a green product design. It emphasized the factors such as green material selection and green material sourcing as significant under the green material management component. Moreover, it focused on factors like the minimization of resources consumption, waste, and energy to green the manufacturing component. The elements, reuse, recycling, and remanufacturing were considered under reverse logistics. Also, this framework emphasized utilizing green activities at the point of disposal.

Lakshmimeera and Palanisamy (2013) delivered a framework to evaluate the GSCM practices. This framework outlined the green practices under four broader supply chain elements namely inbound, operational, outbound, and reverse logistics. The scope of the inbound component focused on areas of supplier management to incorporate green practices. The product design, technology and processes, and other internal operations were considered under the operational component and the factors such as packaging, warehousing, inventory management, and distribution were considered under the outbound operations aspect. The management of disposal items is outlined under reverse logistics. Apart from these core practices it also presented two supportive elements such as management practices and consumer involvement that enable the implementation of core practices.

Kusi-Sarpong, Sarkis, and Wang (2016) designed a framework for the evaluation of the green practices that could be adopted in the supply chain of the Ghanaian mining industry. The goal of this framework is to achieve sustainable organizational performance. The attainment of this goal is based on six major practices such as green information technology and systems, strategic supplier partnership, operational and logistics integration, internal environmental management, eco-innovation, and end-of-life practices. However, an Interpretive Structural Modelling model proposed by Muduli et al. (2013) on the Indian mining industry outlined several other factors required for the implementation of green practices such as top management commitment, performance evaluation, and reward, communication, green training, employee empowerment, green teamwork, work culture, green

motivation, accept change, trust and respect, and strategic planning capabilities.

Iakovou et al. (2014) introduce a methodological framework for GSCM in the agri-food sector. The scholars listed several activities to implement under six thematic areas to use in operating towards greening the AgriChains. The presented six thematic areas are: sustainable farming, supply chain management, marketing, reverse logistics, corporate social responsibility, and environmental management. Moreover, this framework suggested a comprehensive and state-of-the-art approach to implementing GSCM while focusing on reducing operational costs in farming thereby uplifting the income of the farmer community.

Methodology

This research adopts a deductive approach, utilizing a systematic review process as its research strategy. It evaluates publications extracted from the Elsevier and Emerald databases, focusing on themes such as general Green Supply Chain Management (GSCM) and GSCM within the agro-food industry. The selected journal articles, spanning the period from 2009 to 2019, were chosen based on the PRISMA flow diagram, ensuring the inclusion of peer-reviewed academic journals published in English. Consequently, the publications included in this study are both current and relevant. The collected data will be analyzed using a qualitative thematic synthesizing technique, underscoring the research's qualitative methodological approach.

The review process began with planning, followed by an extensive search of relevant literature. Key terms such as GSCM elements and practices, GSCM frameworks, environmental sustainability in supply chain management, GSCM in the agri-food industry, agri-fresh food supply chains, perishable food supply chains, and agro-food supply chains were employed to identify suitable publications.

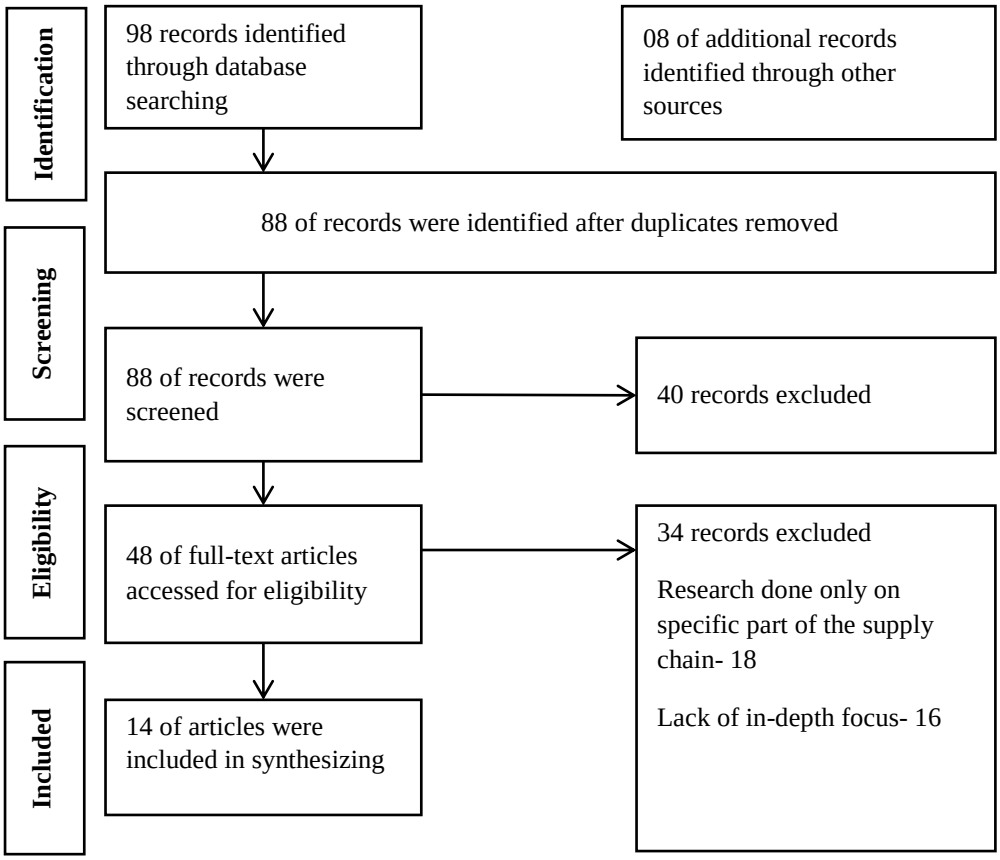
The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram was used to select qualified journal articles for this study (Liberati et al., 2009; Moher et al., 2009). Moher et al. (2009) emphasized the utility of the PRISMA flow diagram in systematically arriving at a final set of qualified articles for review. This four-phase process involves identification, screening, eligibility, and inclusion (See Figure 1). Initially,

many articles are identified; however, as they pass through the screening and eligibility stages, the number of articles included in the review is narrowed down.

As illustrated in Figure 1, the literature search initially identified 106 records, with 98 sourced from database searches and 8 from other sources. After removing duplicates, 88 records were screened based on the selection criteria related to the chosen databases and time frame. From this stage, 48 articles were selected for the eligibility phase. Upon accessing these articles, 18 were excluded due to their partial focus on supply chains, and 16 were eliminated due to the limited in-depth focus. Ultimately, 14 articles were qualified for inclusion in the review.

Figure 1:

PRISMA flow diagram



Source: *Adapted from Moher et al. (2009)*

Data Analysis

Thematic synthesizing is the data analysis technique employed in this research. Saunders, Lewis, and Thornhill (2017) stated this method as the basic method that could be used in qualitative data analysis. Moreover, a key advantage of this technique is that it allows the researcher to explore themes, identify patterns and organize data related to the research question. Therefore, this technique provides a systematic approach to analyzing qualitative data (Saunders, Lewis, and Thornhill, 2017).

Discussion and Findings

Key areas and specific attributes in Green Supply Chain

As per the analysis, it is apparent that the supply chains generally share a myriad of attributes or elements under a few key areas. However, few of the studies have focused on classifying GSC elements under key broader areas and many of the studies were found to be focused on elaborating on the specific elements of the green supply chain required for applying environmental friendliness. For instance, Sarkis (2012) categorized the key areas of the green supply chain as upstream supply chain, downstream supply chain, and internal supply chain operations. However, Sari (2017) classified the green supply chain elements under four broader areas: inbound, production, outbound, and reverse logistics.

The reviewed literature suggested that there is no agreement among scholars regarding the specific attributes of the green supply chain. Sari (2017), Sarkis (2012), Rostamzadeh et al. (2014) and Green et al. (2012) highlighted green purchasing as an important element in a typical green supply chain. As per their evidence, the major concern behind green purchasing is supplier management for purchasing eco-friendly raw materials for production. Green production is stressed as one of the green elements in which the main concern was to implement eco-friendly manufacturing processes (Sarkis, 2012, Sari, 2017 and Rostamzadeh et al., 2014). Sari (2017) and Rostamzadeh et al. (2014) outlined the focused areas of green production as utilization of cleaner technology, capacity utilization, and remanufacturing capacities.

Sarkis (2012) and Rostamzadeh et al. (2014) agreed with the elements, green transportation, green distribution, green packaging, and green warehousing.

Rostamzadeh et al. (2014) emphasized the factors utilized under the green transportation aspect as eco-friendly and efficient modes of transportation and distribution, and eco-driving. The green warehousing aspect is concerned with minimizing and balancing the carbon footprint of warehouses by following practices such as eco-packaging, balanced inventory levels, and sale of excess, used and scrap inventories, equipment, and other materials. However, Sari (2017) classifies these elements under a broader category, namely 'outbound operations'. Reverse logistics is another widely spoken element of the green supply chain, and the covered aspects under this element are the recovery of products, and waste management (Sarkis, 2012, Sari, 2017 and Rostamzadeh et al., 2014).

Accordingly, based on the evidence, the accepted elements/attributes specific to a green supply chain are, green purchasing, green production, green transportation, green distribution, green packaging, green warehousing, and reverse logistics.

Key elements, green practices, or strategies specific to the agro-food industry

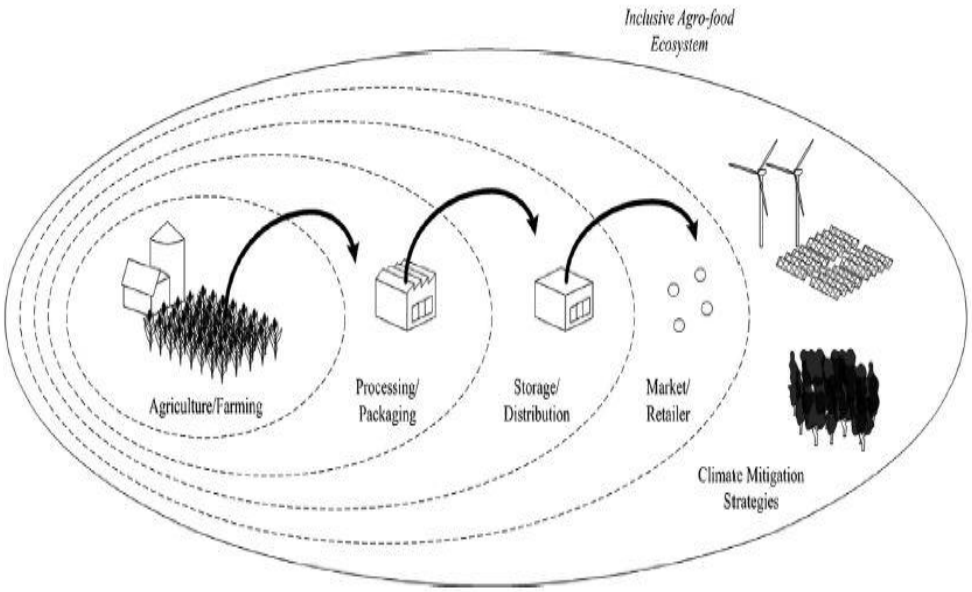
The analyzed literature provides compelling evidence regarding the key elements relevant to the agro-food industry. Tsolakis et al. (2014) indicate that the components present in the agro-food supply chain differ significantly from those of a general supply chain, suggesting that the general green supply chain elements may not be applicable in this context.

According to Tsolakis et al. (2014), an agro-food supply chain encompasses several critical elements, including farming, warehousing, processing, transportation, and distribution. In addition to these components, Accorsi et al. (2015) highlight the importance of market and retail aspects, emphasizing the contribution of end consumers to the supply chain (see Figure 1). Moreover, Garofalo et al. (2017) and Manzini and Accorsi (2013) underscore the significance of end-of-life practices alongside the other supply chain elements. Another crucial aspect noted in the literature is the integration of cold storage with green transportation, as discussed by Tasca, Nessi, and Rigamonti (2016) and Sharma, Chandna, and Bhardwaj (2017).

These insights collectively illustrate the unique characteristics and requirements of the agro-food supply chain, highlighting the need for tailored approaches to green supply chain management in this specific context.

Figure 1:

Agro-food Ecosystem



Source: *Accorsi et al. (2015)*

As explained above, a new echelon, green farming applies to the agro-food green supply chain that is not presented in the general green supply chain (Tsolakis et al., 2014, Accorsi et al., 2015). The green production element discussed under the general green supply chain change as green processing and packaging under the agro-food green supply chain. However, the green transportation and warehousing, and reverse logistics or end-of-life practices elements could be applied to both contexts without any change (Garofalo et al., 2017, Manzini and Accorsi, 2013, Tsolakis et al., 2014, Accorsi et al., 2015). Based on the synthesized literature, the green elements applicable to the agro-food supply chain could be outlined as green farming, green processing and packaging, green transportation and warehousing, and reverse logistics.

GSCM implementation in the agro-food industry is another area that has raised concern among scholars. Thus, Sharma, Chandna, and Bhardwaj (2017)

revealed 13 performance indicators, and 79 sub-indicators related to GSCM implementation in the agro-food industry. As per the study, the indicators, internal environmental management, environment designs, and regulatory pressure were considered crucial in implementing GSCM in the agro-food industry. Similarly, Gardas et al. (2017) emphasized that organizational environmental management, regulatory pressure, and competitive pressure are crucial in implementing the GSCM in the agro-food industry. Akhtar et al. (2016) explained that the factors; data focus and adjustable leadership style utilized in agro-food supply chains are supportive in gaining financial and non-financial outcomes via waste management, eco packaging, and energy efficiency practices. Furthermore, Green et al. (2012) described the antecedents required for the implementation of a typical green supply chain as internal organizational management and green information systems.

Sharma, Chandna, and Bhardwaj (2017), Gardas et al. (2017), and Green et al. (2012) agreed on the organizational environmental management as a factor required for the implementation of GSCM and all the scholars mentioned above emphasized the top and middle management commitment under the organizational environmental management element. However, Akhtar et al. (2016) stressed the necessity of an adaptable leadership style for managers to capture the changes that occur in internal and external environments to take effective decisions. Moreover, the availability of a green information system or a data repository to gather and develop knowledge related to greening the supply chain while improving the supply chain processes and activities is another implementation element discussed in the literature (Akhtar et al., 2016, Green et al., 2012).

Based on the synthesized literature, each echelon in the agro-food supply chain plays a role in environmental degradation, contributing to issues such as greenhouse gas emissions, soil erosion, biodiversity loss, and water pollution (Horton et al., 2015; Tasca, Nessi, and Rigamonti, 2016; Garofalo et al., 2017). These environmental impacts manifest at varying degrees across the supply chain, making it crucial for green elements—such as sustainable farming, eco-friendly processing and packaging, green transportation and warehousing, and reverse logistics—to be strategically implemented. These practices, when employed effectively, can significantly reduce the ecological footprint of the agro-food supply chain.

Tasca, Nessi, and Rigamonti (2016), along with Garofalo et al. (2017), emphasized that eco-friendly practices within the green farming element primarily focus on fertilizer use, cultivation methods, and pest control. Tasca, Nessi, and Rigamonti (2016) observed that the use of organic fertilizers, as well as a combination of organic and inorganic fertilizers, produces mixed results regarding environmental sustainability, highlighting the need for technological advancements in organic farming to enhance eco-friendliness. In contrast, Garofalo et al. (2017) supported the use of organic fertilizers such as manure, agri-food waste, and compost as sustainable alternatives to inorganic fertilizers, citing their positive effects on soil health and water conservation. Both studies discussed the emissions generated by conventional pest control mechanisms and advocated for integrated pest management systems to reduce environmental impact. Additionally, green cultivation practices, such as crop rotation, the use of energy-efficient machinery, and the adoption of biofuels, were highlighted as crucial for minimizing the environmental footprint (Tasca, Nessi, and Rigamonti, 2016; Garofalo et al., 2017).

Accorsi et al. (2015) and Garofalo et al., (2017) agreed upon the use of renewable energy sources for implementing green processing. Waste management is another practice considered under green processing (Garofalo et al., 2017). Bortolini et al. (2018) highlighted that there should be a balanced use of reusable and disposable packaging (47.1% reusable and 52.9% disposable) to reduce environmental impact, however, this initiative is not cost-efficient.

Sari (2017) and Rostamzadeh et al. (2014) suggested strategies for green transportation in the agro-food supply chain including eco-driving, energy-efficient transportation, avoidance of empty or half-loaded running, and utilization of combined modes of transportation. Moreover, the green warehousing element applied strategies such as maintenance of optimum inventory levels and investment recovery (Rostamzadeh et al., 2014). However, Sharma, Chandna, and Bhardwaj (2017) and Gardas et al. (2017) emphasized the importance of understanding the relationship between transportation with cold storage for the agro-food supply chain to minimize waste and emissions to improve environmental performance.

Reverse logistics mainly consider waste management utilizing strategies such as reducing, recycling, and remanufacturing. Thus, the recovery of the agro-food products could be utilized in generating compost. Sari (2017) identified the practice of taking back packages as a strategy under reverse logistics.

Effective strategic GSCM Frameworks for agro food industry

Sari (2017) and Green et al. (2012) developed two frameworks providing two different insights to evaluate the GSCM practices of a typical supply chain. Sari (2017) evaluated the influence of GSCM practices on organizational performance and classified the green practices under four broader supply chain elements: inbound operations, production, outbound operations, and reverse logistics. However, Green et al. (2012) without merely evaluating the practices, focused on the implementation stage and performance evaluation stage. As the first level of this model, it outlined two key requirements as Internal Environmental Management and Green Information System focusing on the implementation of environmental friendliness within the organization. Then, it outlined the green supply chain elements, green purchasing, cooperation with consumers, eco-design, and investment recovery, and finally combined with the outcome of improved organizational performances.

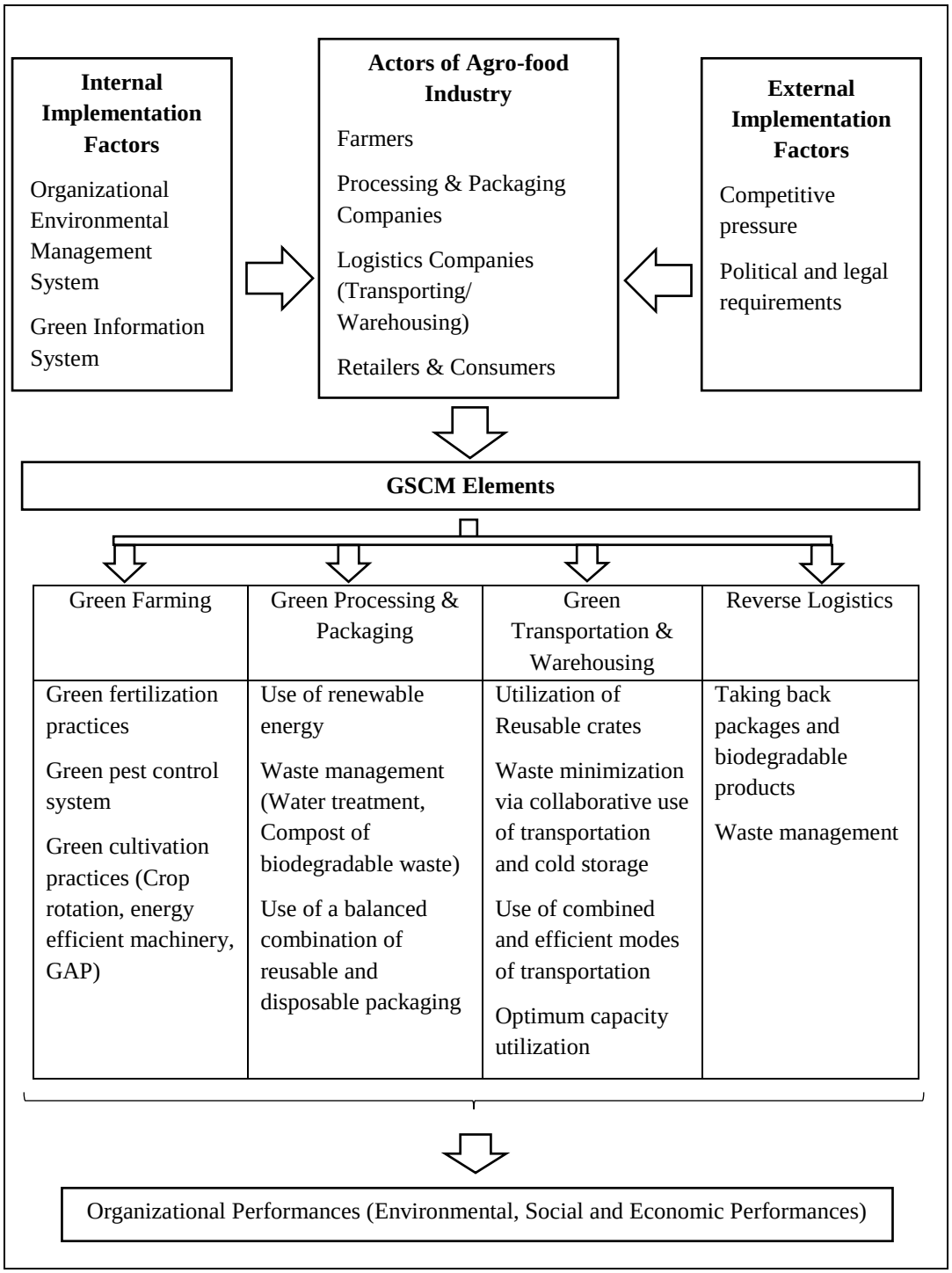
Manzini and Accorsi (2013) presented a conceptual framework for the food supply chain integrating multiple decisions and activities with the aim of achieving quality, safety, sustainability, and efficiency in the supply chain and ultimately within the food products and processes. To elaborate, this framework constitutes three main models eco-farm, eco-factory, and eco-logistics containing a wider scope. The eco-farm model comprised activities related to harvesting and purchasing of raw materials. The eco-factory section contained the processes and activities related to manufacturing and processing of the products, and maintenance and monitoring of the machines, and the plant whereas the eco-logistics model included the logistic activities and processes related to the delivery of raw materials, distribution of finished products, and reverse logistics. However, Gardas et al. (2018) is concerned on evaluating the relationships among implementation factors, green supply chain elements, and organizational performances of the agro-industry.

The proposed strategic framework for GSCM in the agro-food industry

Based on the above discussion, *Figure 2* illustrates the proposed strategic framework for Green Supply Chain Management (GSCM) in the agro-food industry. According to this framework, the key actors involved in the agro-food supply chain, as identified through the literature review, are: (1) Farmers, (2) Processing and packaging companies, (3) Logistics companies (transportation and warehousing), and (4) Retailers and consumers. Each of these actors is influenced by both internal and external factors that facilitate the implementation of GSCM elements within the agro-food supply chain. These pressures encourage stakeholders to focus on greening their core functions, which include: (1) Green farming, (2) Green processing and packaging, (3) Green transportation and warehousing, and (4) Reverse logistics.

Moreover, the adoption of environmentally sustainable practices by each actor at every stage of the supply chain contributes to the overall environmental sustainability of the supply chain. This, in turn, enhances organizational performance in three key dimensions: (1) Economic, (2) Environmental, and (3) Social. Economic performance is improved through cost efficiencies, environmental performance is bolstered by the implementation of eco-friendly practices, and society benefits through improved health and well-being. Consequently, the strategic focus on GSCM promotes a more sustainable and socially responsible agro-food supply chain.

Figure 2:
Proposed strategic green supply chain management framework for agro-food industry



Conclusion

This systematic review revealed that the green supply chain attributes typically applied to general supply chains are not fully applicable to the agro-food industry. Consequently, this study identified the specific green supply chain elements relevant to the agro-food sector as green farming, green processing and packaging, green transportation and warehousing, and reverse logistics. Additionally, the factors supporting the implementation of these elements were classified into internal and external categories. External factors include competitive pressure and political and legal requirements, while internal factors encompass an organization's environmental management system and green information system.

The study further outlined green strategies and practices that can be implemented within each element as guidelines for supply chain partners in the agro-food industry. Under green farming, the strategies include eco-friendly fertilization, pest control, and cultivation methods. For green processing and packaging, key strategies involve the use of renewable energy, effective waste management, and a balanced approach to using reusable and disposable packaging. Green transportation and warehousing strategies focus on utilizing reusable crates, minimizing waste through collaborative transportation and cold storage efforts, optimizing transportation modes, and maximizing capacity utilization. The reverse logistics element emphasizes strategies such as taking back packaging materials and biodegradable products, along with effective waste management.

Based on these findings, the study developed a strategic Green Supply Chain Management (GSCM) framework tailored to the agro-food industry. This framework highlights the organizational requirements, resources, and initiatives necessary to engage each actor in the supply chain and achieve an environmentally sustainable agro-food supply chain. Ultimately, the framework aims to promote sustainable organizational performance across the sector.

Recommendation

The development of the agro-food industry has led to increased environmental hazards, such as deforestation and greenhouse gas emissions. This reality

serves as a catalyst for supply chain partners to adopt more eco-friendly practices within their operations. The findings of this study support existing supply chain actors in recognizing and implementing green practices. Furthermore, the research contributes to the theoretical development of Green Supply Chain Management (GSCM) knowledge within the context of the agro-food industry.

Additionally, the proposed framework serves as a guideline for both current and prospective supply chain actors engaged in the agro-food sector, emphasizing the importance of environmentally sustainable practices. Consequently, this framework can be utilized by various stakeholders, including researchers, policymakers, and supply chain partners, as a roadmap for adopting and monitoring environmentally sustainable practices in the agro-food supply chain. By leveraging this framework, stakeholders can work collaboratively toward reducing the environmental impact of the agro-food industry while enhancing overall sustainability.

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Impact of Factory Inspections on Understanding of and Compliance with the Factories Ordinance in Sri Lanka

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Abstract

In Sri Lanka, occupational safety and health legislation is implemented by the factories ordinance (FO), which is enforced by factory inspecting engineers through factory inspection and partly by awareness programs. Awareness programs are not frequently conducted, and sometimes do not cover every type of industry. Therefore, the main way to enforce FO is through the inspection of factories. The objective of inspections is to make them more compliant with the provisions of the FO, which may result in making workplaces safer and reducing work-related accidents. However, although previous studies have shown that the size of the firm, safety culture, and financial capability affect safety performance in factories, there are no studies on safety and health inspections and how they affect the understanding of occupational safety, health legislation, and compliance with legislation. Therefore, this study aims to evaluate the impact of workplace inspections on the understanding of and compliance with FO.

This study uses primary data collected through a questionnaire during the inspection of 102 factories as the unit of analysis. Among the 102 factories in the study, 50 factories had been inspected (treatment) previously, and the remaining 52 had not been inspected (control) during the last five years. The outcome variables are understanding of and compliance with the FO. Details such as the registration of the factory under the Board of Investment, the size of the factory, the nature of the industry, and the gender, age, and work experience of the respondents were also collected for use as covariates. Because the factories for inspection were not chosen randomly, a selection bias was present. To address this issue, the study utilizes the propensity score matching technique to estimate data that closely match factories from both the treatment and control groups based on similar characteristics. The estimation results reveal that inspections have a positive effect on the understanding of FO and compliance with it in factories where officers in charge of inspected factories have 2.406 higher scores (out of eight) compared to officers in the non-inspected factories. Similarly, the inspected factories had approximately 1.872 (out of 9) higher compliance scores than non-inspected factories. This is based on the results provided by one of the matching methods, the nearest neighbour, and these results are consistent with the radius matching, kernel matching, and coarsened exact matching results that were conducted as a robustness check.

Keywords: Occupational Safety and Health, Factories Ordinance in Sri Lanka, Workplace Inspections, Compliance and Understanding

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List of Abbreviations

- **CEM** – Coarsened Exact Matching
- **FO** – Factories Ordinance
- **ILO** – International Labour Organization
- **OSH** – Occupational Safety and Health
- **PSM** – Propensity Score Matching

Introduction

The International Labour Organization (ILO) (2022) estimates that 2.78 million workers lose their lives each year due to work-related accidents and diseases. In addition, 374 million workers suffer from non-fatal occupational accidents. This is just an estimation, as many workplace accidents are not reported to relevant authorities. Additionally, long-term work-related illnesses or deaths may go unreported as illnesses or deaths may occur many years after employment ends. This statistic highlights the significance of occupational health and safety (OSH) within organizations. According to the ILO, occupational accidents encompass unforeseen or unplanned incidents in the workplace, leading to one or more workers experiencing personal injuries, diseases, or fatalities. These negative incidents not only cause serious physical damage but also emotional consequences for the employees involved and severely affect co-workers, first responders, and families, resulting in costs estimated at 4% of the global gross domestic product (ILO, 2022). The emergence of occupational safety as a subject of concern for organizations can be attributed to the 19th century, a period marked by rapid industrialization that brought forth unprecedented economic, technological, and social shifts (Swuste, Van Gulijk, & Zwaard, 2010). Because most employees spend approximately one-third or more of their workdays on the job, OSH policies and laws play an important preventative role. However, OSH is often neglected, resulting in adverse consequences.

Background of occupational safety and health in Sri Lanka

Occupational safety is becoming extremely important worldwide, and Sri Lanka is no exception. As a developing and middle-income country in South Asia, Sri Lanka has long relied on industries such as apparel, tourism, tea export, and agriculture as its primary economic sector.

The estimated labour force participation rate for 2022 is reported to be 52.3%, according to the Sri Lanka Labour Force Survey - Annual Report. With ongoing industrialization and the increasing establishment of factories and construction projects, the incidence of occupational and industrial accidents and diseases is consistently high in the country. In this context, the implementation of an appropriate OSH is important.

The introduction and execution of effective protective measures against OSH play a crucial role in safeguarding the physical, mental, and social well-being of the workforce. Although industrial diseases are relatively uncommon, occupational accidents are common in Brazil. It is mandatory to report occupational accidents, diseases, and hazardous incidents transpiring in workplaces to the Industrial Safety Division of the Department of Labor, as stipulated by the regulations outlined in Factories Ordinance (FO) No. 45 of 1942.

The following charts show details of occupational/industrial accidents that have occurred in Sri Lanka in the recent past:

Figure 1.1

Fatal Occupational injuries per 100,000 workers (annual: 2014-2019)

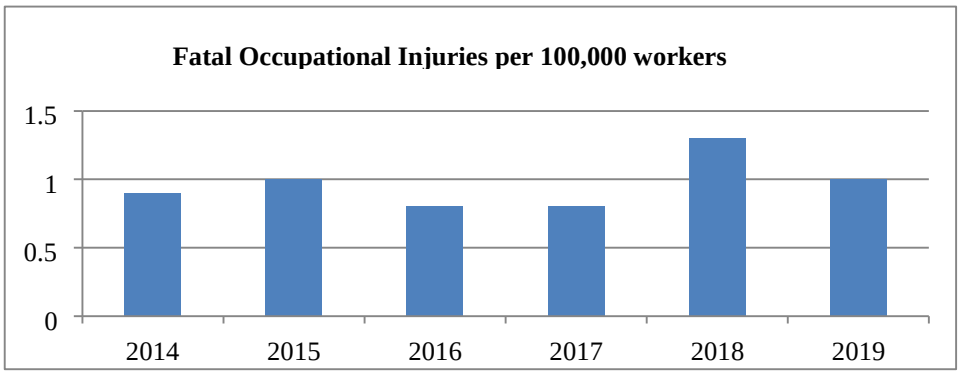
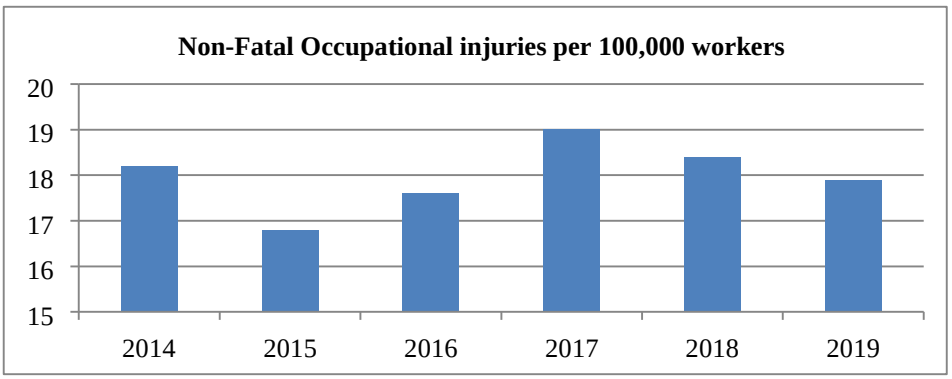


Figure 1.2

Non-Fatal Occupational injuries per 100,000 workers (annual: 2014-2019)



Source:*https://www.ilo.org/shinyapps/bulkexplorer21/?lang=en&segment=&1d=SDG_F881_SEX_M IG_RT_A*

Fig:1.1 and Fig:1.2 respectively illustrate the fatal and non-fatal occupational injuries per 100,000 workers (annual) from 2014 to 2019 in Sri Lanka. This is based on the statistics of occupational accidents reported to the Department of Labor, and the exact number of work-related accidents in the country may increase as not every accident is not reported to the Department of Labor. Furthermore, the rate after 2019 showed a sudden deviation as a result of the pandemic, and it is evident that Sri Lanka has not achieved significant progress in ensuring OSH throughout the period.

OSH implementation in Sri Lanka

Factories Ordinance No. 45 of 1942, with subsequent amendments and regulations, is the main legal act in Sri Lanka to ensure OSH in workplaces; it sets out the rights and obligations for both employees and employers to ensure OSH at workplaces to promote and maintain the highest degree of physical, mental, and social well-being. The Industrial Safety Division of the Department of Labour is the only government organization with the authority to enforce the Factories Ordinance. This authority has been decentralized through 10 district factory inspecting engineers' offices around the country, and the enforcement of the ordinance in each particular area is done by factory inspecting engineers working at these offices by conducting regular factory inspections.

Significance of the Study

As mentioned above, OSH has been a challenge for factories and the Department of Labor in Sri Lanka. Factory inspections have been implemented as the primary countermeasure to address this challenge. Although the number of inspections has been relatively limited due to insufficient financial resources, their effectiveness must be confirmed. By doing so, the government can decide to maintain or even increase the allocation of resources for inspections. Alternatively, improvements in current practice will be required if inspections are found to be ineffective, as they have been effective in some countries. Since no studies have investigated its effectiveness in a scientific manner, the findings of the present study will provide useful information for policy makers and practitioners.

Literature Review

Workplace inspections may also play a significant role in improving OSH. However, this is not the only factor influencing OSH improvement in factories. Workplace OSH management practices are related to various factors (Arocena and Nunez, 2010; Hasle and Limborg, 2006). Work-related accidents may accrue direct and indirect costs, such as pain and suffering of injured persons and their families, production loss, time loss for possible overtime work, compensation, possible loss of goodwill of the company, and legal costs. Most studies have revealed that occupational health and safety management is the key to promoting health and safety at work to reduce the different types of costs related to accidents at work. (Frick, 2011; Robson et al., 2007).

Different factors may affect OSH management in various companies, and recently, significant research attention has been directed toward examining the relationship between organizational factors and employee safety behaviours (Flin et al., 2000; Neal et al., 2000; Oliver et al., 2002; Seo, 2005). The specific form of organizational climate is the safety climate, which affects the safety attitudes and behaviors of workers in different workplaces (Cooper and Phillips, 2004; Zohar, 1980). The number of employees in workplaces, safety culture, and financial capability of companies have been identified in many studies as factors associated with good or bad OSH management practices. Furthermore, positive performance results in a decrease or absence of negative safety outcomes (Christian, Bradley, Wallace, & Burke, 2009). A study in Canada revealed that attitudes towards safety performance and age were the most effective predictors of safety performance in the construction industry (Dedobbeleer et al,1987). Several external factors may also affect workplace occupational safety. Some of these are national and international legislation, stakeholders, and external control bodies (for example, Ko, Mendeloff, & Gray, 2010).

Organizational leaders are responsible for improving the safety climate within their organizations (Wu et al., 2008), which will in turn have a positive effect on workplace safety performance. Supervisors can motivate and empower subordinates by providing an exciting vision of the future.

However, in developing countries, neglecting OSH policies and laws is vital for weak OSH management in workplaces and the reasons for this are largely unknown. (AkpinarElci et al., 2017). Neglecting OSH policies can have adverse and sometimes deadly consequences. This issue is particularly concerning in developing countries, and one of the reasons for this is the lack of awareness of OSH policies (Akpinar-Elci et al., 2017).

A safe workplace provides both indirect and direct benefits to employees. Workers and firms themselves are direct beneficiaries of safe workplaces, as workers are mostly affected by accidents and firms may not face losses. Generally, insurers, contractors, consumers, families, and society are indirect beneficiaries of a safe workplace (Mossink, 2002).

Inspection of workplaces by OSH inspectors is an important aspect of a country's labor administration system. The main objectives of this inspection are the enforcement of legislation relating to conditions of work and the safeguarding of workers at work, providing technical information and advice to employers and employees, complying with the provisions of the legislation, and the identification of defects or abuses not specifically covered by current legal provisions. Following safety provisions, creating a safe workplace is considered safety compliance (Neal et al., 2000).

An evaluation of an inspection campaign regarding noise in workplaces showed that inspections have a substantial impact on risk management activities in Swedish workplaces (Björkdahl et al., 2008). They found significant differences in exposure measurements, plans

of action against noise, and measures to reduce noise between inspected and uninspected factories. This revealed how the inspection of workplaces influences OSH measurements.

Furthermore, the efficiency of a risk management tool, such as occupational exposure limits (OELs), partly depend on the responsible parties' awareness and understanding of it (Linda Shenk, 2013). OSH legislation also plays an important role in reducing work-related accidents and diseases by making people aware of safety precautions in the workplace. Enforcement bodies are responsible for making this effective. In this context, inspection activities may prove to be more efficient than information, as shown to affect compliance

with occupational safety and health (OHS) regulations in Sweden (Björkdahl et al., 2008).

Similarly, the quality of OSH inspections should be improved, and professional qualifications of OSH inspectors are immensely important for the effectiveness of workplace inspections (Niskanen et al., 2014).

Data Collection

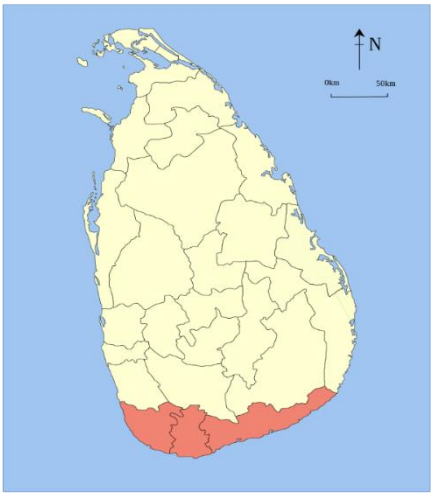
Data

Sample of the Study

This study utilized primary data gathered from a questionnaire administered during the inspection period. The questionnaire was distributed to 102 factories randomly selected from a pool of 2000 registered factories in the Southern Province that fall under the supervision of the Galle District Factory Inspection Engineers Office in Sri Lanka. The province consists of three districts, all of which are under the Galle district factory inspecting engineer office. Among these 102 factories, 50 factories had been inspected (treatment) previously, and the remaining 52 had not been inspected (control) during the last five years.

Figure 3.1

The three districts under the Galle district factory inspecting engineer office of Southern province in Sri Lanka



Source: *https://en.wikipedia.org/wiki/Southern_Province,_Sri_Lanka*

The survey questionnaire

The survey questionnaire (Appendix 1) consisted of four parts. The first section of the questionnaire included several general inquiries about the factories, covering aspects such as the factory's size, industry to which it belongs, location, and whether it is registered under the Board of Investment. These factors are explained in detail in the following sections. Additionally, this section collects information about the officer in charge of OSH at the factory, including gender, age, and work experience. The second part of the questionnaire focused on assessing OSH officers' understanding of FO. Specific questions were designed to gauge the knowledge and comprehension of FO. The third section of the questionnaire evaluates the extent to which factories comply with FO, as reported by the officer in charge. The final part of the questionnaire served as an observational record utilized by the inspection officer to report the actual conditions of the factory in terms of the implementation of safety measures outlined in the FO.

In accordance with the regulations outlined in Extraordinary Gazette no. 09/2019, the registration of factories under the FO was categorized into four size categories. These categories were employed to determine the size of each factory, defined as 1-25, 26-125, 126500, and over 500 workers. Additionally, the nature of the industry was considered using a classification system consisting of 14 categories, as specified by the ILO. Furthermore, this study considers the location of the factories. Factories in the Southern Province were situated across three districts: Galle, Matara, and Hambantota. Galle and Matara are recognized as being more industrialized than Hambantota. This is attributed to Galle being the capital district of the province, hosting an international harbour, and Matara being a district with an industrial zone. Another concern was the registration of factories under the Board of Investment (BOI), the authorized government promotion agency of Sri Lanka. Factories registered in the BOI are export-oriented because all foreign investments must go through this agency.

Results and Discussion

Methodology

This study utilized the propensity score matching method with several algorithms, and the results were robust when checked using the coarsened exact matching method.

Propensity Score Matching Method (PSM)

Owing to the non-random selection of factories for inspection, selection bias exists. Thus, the study utilized PSM to compare the results of the treatment group, which received an inspection, with those of the control group, which did not receive treatment. PSM is widely employed in observational studies to minimize the influence of potential confounding biases. The propensity score serves as a balancing score, meaning that by matching records based on the propensity score, the distribution of confounding variables between the matched records is expected to be similar. Consequently, a new control group created using PSM should exhibit greater similarity to the treatment group in terms of confounding factors.

As mentioned above, the treatment group consisted of 50 factories, whereas the control group consisted of 52 factories. The registration of factories under the BOI, factory size, factory type, and location were used as matching variables in the PSM method.

Coarsened Exact Matching

The Coarsened Exact Matching (CEM) method provides a complementary approach to PSM by matching units based on exact matching criteria. The primary objective of CEM is to improve the quality of matching by identifying units with identical values for the selected covariates, thereby creating comparable treatment and control groups. By achieving this close alignment between the matched units, the CEM effectively reduces potential bias and enhances the accuracy of the treatment effect estimation.

Through exact matching, the CEM ensured that similar units were grouped, eliminating any discrepancies between the treatment and control groups that could lead to confounding factors.

This process is particularly valuable when dealing with a large number of covariates because it reduces the dimensionality of the data and simplifies the matching process.

Results

This chapter provides an overview of the empirical findings and discusses their interpretations.

Descriptive Statistics

The descriptive statistics of the covariates of the two groups are shown in Table 4.1, and those of the outcome variables are shown in Table 4.2.

Table 4.1

Descriptive statistics of the covariates of the control and treatment groups

Variable	Treated		Control		Mean difference	SE
	Mean	SD	Mean	SD		
Factory characteristics						
BOI registration (dummy)	0.400	0.495	0.019	0.139	-0.381***	0.071
Size (scale:1 to 4)	2.420	1.032	1.635	0.561	-0.785***	0.164
Factory type (dummy)	0.600	0.495	0.596	0.495	-0.004	0.098
Factory location (dummy)	0.840	0.370	0.580	0.502	-0.282**	0.088
OSH in charge characteristics						
Gender(dummy)	0.760	0.431	0.769	0.425	0.009	0.085
Age(years)	35.220	5.828	38.000	5.269	2.780**	1.099
Work experience(years)	5.620	2.320	5.865	2.597	0.245	0.488
Group size	50		52			

Table 4.2
Descriptive statistics of outcome variables

Variable	Treated		Control		Mean difference	SE
	Mean	SD	Mean	SD		
Outcome variables						
Understanding FO (score: 0 to 8)	5.740	2.319	1.942	2.437	-3.798***	0.471
Compliance with FO (score:0 to 9)	6.480	2.823	2.865	2.808	-3.615***	0.328
Group size	50		52			

Main Results

As previously demonstrated, there were significant variations in the distribution of covariates between the two groups. To address this issue, a matching process was implemented using the PSM method. The PSM method allows the comparison of units across different groups by estimating the probability of assignment to a particular group, known as the propensity score. Four factory-related characteristics were selected as matching variables: factory registration under the BOI, factory size, factory type, and location. These variables were deemed crucial for capturing the key characteristics and contextual factors that may have influenced the outcomes under investigation.

The matching process involved calculating the propensity score for each unit, which represents the likelihood of being assigned to a specific group based on observed factory-related characteristics. By matching units with similar propensity scores, we aimed to create balanced groups that best aligned the units within the two groups, thus minimizing the influence of potential confounding factors.

Before matching, the propensity scores of the two groups may show noticeable differences, indicating imbalances in the distribution of covariates. This indicates the need for matching to ensure comparability between groups and to reduce the potential bias caused by these imbalances. After the matching process, the propensity scores of the two groups were expected to exhibit a similar distribution. This indicates that matching successfully aligned the units in the two groups based on their factory-related characteristics. The post-matching distribution of propensity scores allowed for a fairer and more

reliable comparison between the groups, as any remaining differences were minimized.

By presenting the distributions of propensity scores before and after matching in Figure 4.1, the effectiveness of the matching process can be visually assessed, providing insights into the balance achieved between the groups and the improved comparability of the units. During the matching process, a total of 88 units out of the 102 factories were successfully matched, resulting in a matching rate of 86%. The degree of overlap between the matched units is visually depicted in Figure 4.2.

Figure 4.1

Distribution of the propensity score for the two groups before and after matching

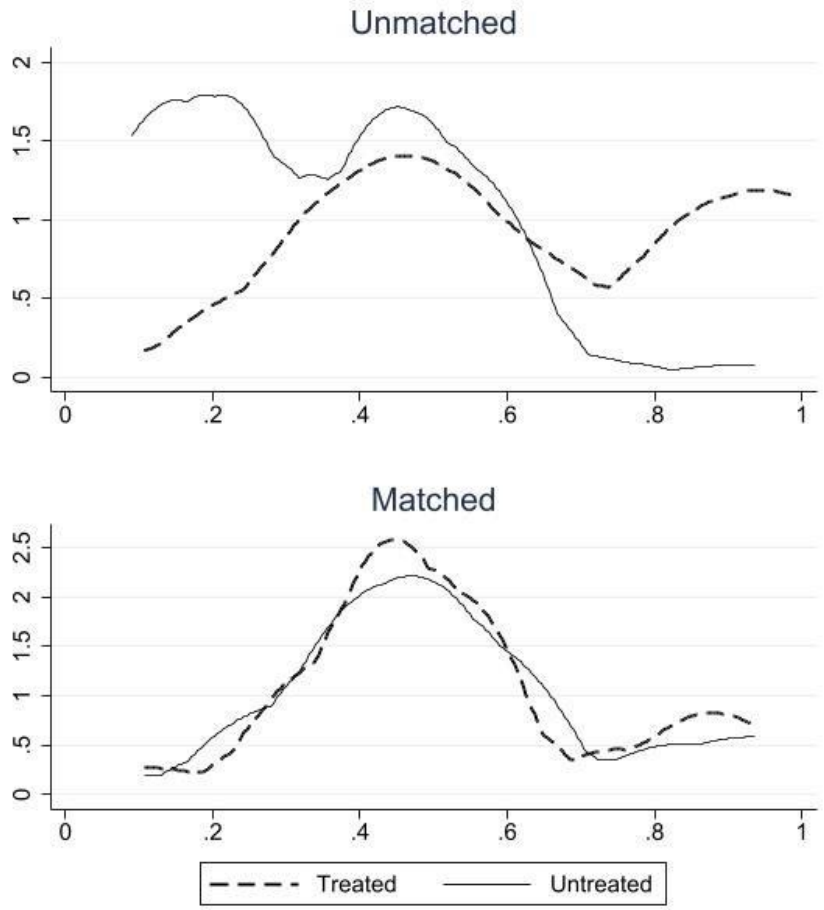


Figure 4.2
Overlap of matching units

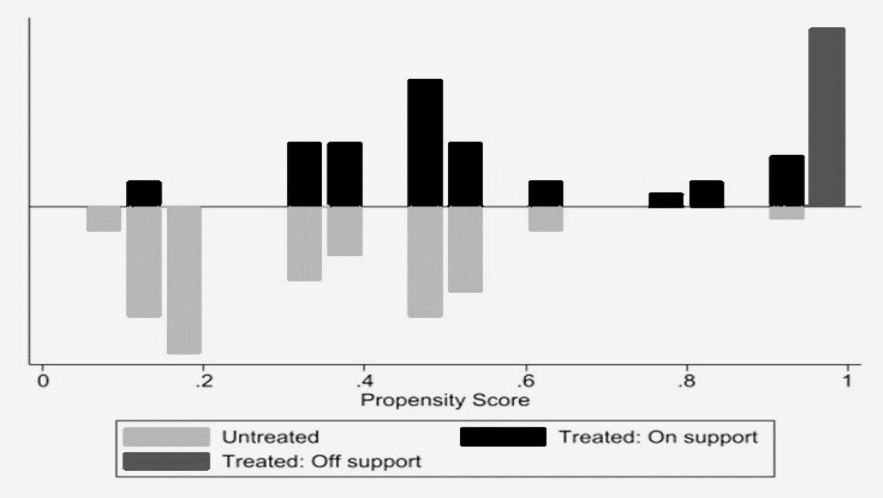


Fig 4.2 displays the standardized percentage of bias across the matching covariates before and after the matching process. The standardized percentage of bias was used to quantify the degree of imbalance or discrepancy in the distribution of covariates between the two groups.

Before matching, the standardized percentage bias may exhibit significant variations across matching covariates. This indicates the presence of systematic differences between groups, which can introduce bias and affect the validity of the study results. After the matching process, the standardized percentage of bias should ideally be reduced, indicating a more balanced distribution of covariates between the two groups. The decrease in bias indicates that the matching procedure successfully minimized systematic differences, leading to improved comparability and reduced potential for bias in the subsequent analysis.

By visualizing the standardized percentage of bias before and after matching in Fig 4.3, the matching process reduced the bias of the three covariates, except for factory type.

Therefore, our matching process would allow for a more reliable evaluation of the treatment or intervention effect, as any remaining bias would be minimized, resulting in a more accurate estimation of the true treatment effect.

Figure 4.3

Standardized percentage of bias across matching covariates before and after matching

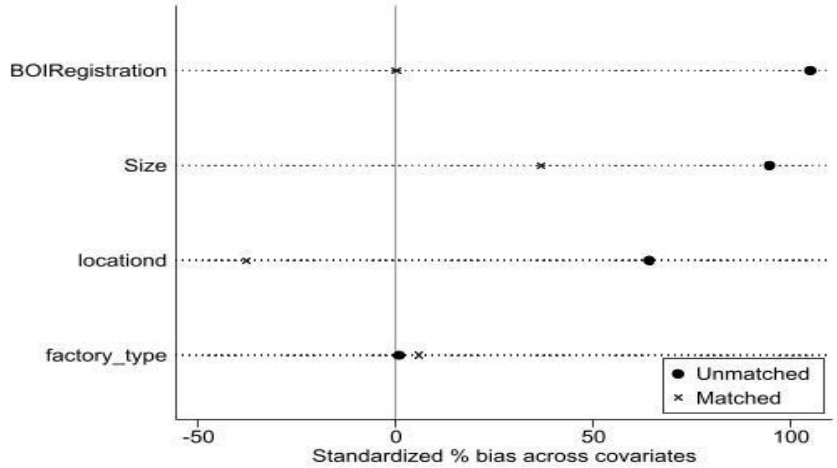


Table 4.3 presents the extent of the bias reduction achieved for each covariate during the matching process. This provides a comprehensive overview of the reduction in systematic differences between the treatment and control groups by matching units based on their covariate values. This table quantifies the improvement in balance across various covariates, indicating the effectiveness of the matching procedure in minimizing bias and creating comparable groups.

Table 4.3

Bias reduction in each covariate during the matching process

Variable	Unmatched/ matched	Mean Treated	Control	% bias	% reduct [bias]	T test t	P>t
BOI Registration	U	.4	.01923	104.8		5.34	0.0000
	M	.16667	.16667	0.0	100.0	-0.00	1.000
Size	U	2.42	1.6346	94.6		4.80	0.0000
	M	2.0556	1.75	36.8	61.1	1.62	1.109
Factory Type	U	.6	.59615	0.8		0.04	0.969
	M	.52778	.5	5.6	-622.2	0.23	0.817
Location	U	.84	.55769	64.0		3.22	0.002
	M	.77778	.94444	-37.8	41.0	-2.08	0.041

By employing these algorithms, I aimed to identify the control units that closely resemble the treated units in terms of their propensity scores. This matching process allowed for a more accurate estimation of the effect of inspection by comparing similar units and minimizing potential confounding variables.

The nearest-neighbour algorithm identifies the control units that have the closest propensity scores to the treated units. This approach ensures that each treated unit is matched with the most similar control unit, based on its propensity score. The kernel algorithm estimates the weights of the control units based on their proximity to the treated units in terms of propensity scores. This weighted matching approach assigns higher weights to control units that are similar to the treated units, resulting in a more precise estimation of the treatment effect. The radius algorithm sets a specific radius around each treated unit, and matches the control units within that radius based on their propensity scores. This approach allows flexibility in the matching process by considering only the control units within a certain range of similarity to the treated units.

By employing these three matching algorithms, we aimed to enhance the robustness and reliability of the estimated inspection effect. Each algorithm offers advantages and considerations, allowing for a comprehensive analysis of the treatment effect while accounting for variations in the matching process. Table 4.4 presents these results.

Table 4.4

PSM estimation results

Outcome variable	Nearest neighbor	Radius	Kernel
Understanding of FO (Scale 0 to 8)	2.406***	3.141***	1.872***
	(0.673)	(0.433)	(0.642)
Compliance with FO (Scale 0 to 9)	1.872**	2.690***	1.183*
	(0.774)	(0.509)	(0.741)
N (Treated)	36	36	33
N (Control)	52	52	52

**** p< 0.01 **p< 0.05*

According to the nearest neighbor matching estimation presented in Column 2 of the first row, inspections led to a significant increase in the score related to the understanding of officers in charge of OHS on the safety guidelines in the FO context. Specifically, the score increased by 2.41 units compared to the control group. This increase is not only statistically significant at the 99% confidence level, but also substantial in magnitude, representing a growth of over 30%. Similarly, kernel matching and radius matching also indicated a significant positive impact on the score related to understanding by 3.14 and 1.87, respectively. Both estimates were statistically significant at the 99% confidence interval.

These findings suggest that the implementation of inspections had a positive impact on enhancing the comprehension of OHS guidelines among the officers in charge. This implies that inspections play a vital role in improving safety awareness and knowledge within the FO, potentially leading to better compliance with safety protocols and reducing workplace hazards.

In Table 4.4, the second row presents the outcomes of the scores associated with compliance regarding safety regulations within the FO. This score holds particular significance during the implementation of FO regulations, as it serves as a key indicator of adherence and conformity to prescribed safety guidelines. Based on the nearest neighbor matching results presented in Column 2, it is evident that inspections have had a positive impact on the compliance score of the treatment group compared to the control group. Specifically, the compliance score increased by 1.87 units, which corresponds to an increase of approximately 20%. This increase was statistically significant at 95% confidence level. Similarly, the results obtained from the kernel matching and radius matching techniques also demonstrated a statistically significant positive influence on the compliance score. Kernel matching indicated a significant increase of 2.69 units in the compliance score, whereas radius matching indicated a significant increase of 1.18 units. Both estimates were statistically significant at the 95% confidence level.

These findings indicate that the implementation of inspections effectively improved compliance levels within the treatment group. This suggests that the inspection process successfully encouraged adherence to regulations, protocols, or guidelines, leading to a higher level of compliance among the inspected entities.

To ensure the robustness and reliability of the PSM estimation results, we conduct additional analysis using the CEM method. CEM offers an approach complementary to PSM matching units based on exact matching criteria, thereby confirming its robustness.

Using CEM, the analysis sought to strengthen the validity and robustness of the findings obtained from the PSM estimation. By comparing the results of PSM and CEM, any discrepancies or inconsistencies can be identified, providing a more comprehensive understanding of the impact of factory inspections on FO implementation. The CEM estimation results are presented in Table 4.5 and the estimation procedure is presented in the Appendix 2.

Table 4.5

CEM estimation results

Outcome variable	ATT	SE	t-stat	P>I t I
Understanding of FO (Score 0 to 8)	2.157***	0.607	3.550	0.001
Compliance with FO (Score 0 to 9)	1.461**	0.670	2.180	0.033
N (Treated)		28		
N (Control)		38		

**** p< 0.01 **p< 0.05*

The outcomes presented in Column 2 of Table 4.5 are aligned with the PSM results and provide further evidence of a positive and significant effect of inspections. The score associated with the understanding of FO increased by 2.16 units, with a confidence interval of 99%. Similarly, the compliance score demonstrated a significant improvement, with an increase of 1.46 units and a confidence interval of 95%.

These findings indicate that inspections have a substantial impact on enhancing both the understanding of FO and compliance with its regulations. The statistically significant effects underscore the effectiveness of inspections in promoting a better comprehension of FO guidelines and increasing compliance levels within the studied context.

The credibility of the findings concerning the compliance score was reinforced by the objective measurement of factory compliance with FO regulations. This measurement was performed by the factory inspection engineer as part of the data collection process. This objective assessment provides additional validity

to the results, ensuring that compliance levels were evaluated in a reliable and unbiased manner. Overall, these findings reinforce the importance and effectiveness of inspections as a means of improving the understanding and compliance with FO regulations. They highlighted the value of such regulatory mechanisms in fostering a culture of safety and adherence to guidelines, ultimately leading to enhanced workplace practices and reduced occupational risks.

Discussion

The findings of the study indicate that the implementation of inspections has had a positive effect on enhancing the understanding of Occupational Health and Safety (OHS) guidelines among officers in charge, and has effectively improved compliance levels within the treatment group. This is achieved through the systematic process of factory inspections.

Based on these results, both outcome variables surpassed the 70% threshold, indicating a commendable level of achievement. In particular, the understanding of FO reached 71.75%, which corresponds to a score of 5.74 out of 8, while compliance with FO attained 72%, equaling a score of 6.48 out of 9. These results demonstrate that factory inspections have yielded significant improvements in both the comprehension of regulations and their effective implementation within the factory premises.

These findings highlight the effectiveness of factory inspections in enhancing the overall understanding of FO regulations among the workforce. This increased understanding is crucial as it empowers employees to better grasp the requirements and guidelines set by regulatory authorities, leading to a more informed and compliant workforce. Moreover, the study reveals that compliance with FO regulations has notably increased following the implementation of factory inspections. The considerable 72% compliance rate, with a score of 6.48 out of 9, signifies that the factory premises are now adhering more closely to the prescribed guidelines. This heightened compliance not only ensures a safer working environment, but also fosters a culture of adherence to regulations, ultimately contributing to the overall efficiency and sustainability of factory operations.

The satisfactory levels of both understanding and compliance achieved through these factory inspections are evidence of the significance of regulatory oversight in promoting best practices within industrial settings. By identifying areas of improvement and addressing non-compliance issues, factory inspections would play a vital role in safeguarding the welfare of workers.

During factory inspections, the officer in charge, management, and employees are provided with detailed instructions on the importance of adhering to OHS guidelines. The inspecting officer carefully observes each guideline in factory operation and identifies the hazardous areas. They also offer guidance on the necessary precautions to ensure a safe working environment. Subsequently, the inspecting officer prepares a comprehensive report that outlines the observations made during the inspection, including any potential risks and non-compliance with OHS guidelines. This report is forwarded to the officer in charge of OHS, who receives recommendations from the Factory Engineer regarding further actions to be taken to address the identified issues.

This entire inspection process serves as a guiding mechanism that encourages and reinforces compliance among the relevant officers, management, and employees. This highlights the importance of adhering to regulations, protocols, and guidelines and fostering a higher level of compliance within inspected entities. Overall, inspections play a pivotal role in promoting a culture of safety in the workplace, ultimately leading to improved OHS acquiescence. Consequently, factories in the treatment group achieved higher scores than those in the control group in both understanding and compliance.

Finally, one challenge should be highlighted. Although the present study found that inspections effectively improved the understanding of and compliance with FO, there is still room for improvement in the outcomes. This is particularly because the items for the outcomes are mainly at the basic level for OHS management; therefore, full marks should ideally be obtained by factories. In this regard, the effectiveness of inspections should undoubtedly be appreciated, but the results also present a further challenge.

Conclusion

Conclusion

The FO is the main legal enactment in Sri Lanka to ensure that industry-related institutions adhere to OHS measures. This study examined the effect of factory inspections on the implementation of the FO in the industry. It uses two outcome variables: understanding and compliance with FO. Because the selection of factories for inspection in this study was not random, the PSM method was used to estimate the effect of inspection by comparing the best-matching units in the two groups. The estimation used data obtained through a survey questionnaire that was administered by visiting and interviewing officers in charge of the OHS in these 102 factories. To conduct this research, a random selection process was conducted among approximately 2,000 registered factories in the Southern Province of Sri Lanka. From this pool, 102 factories were selected as the study samples. Among the selected factories, 52 underwent inspections by a factory inspection engineer or representative as part of the FO implementation, whereas the remaining 50 factories were not inspected. Because the selection for inspection was not randomized, the PSM method was employed to estimate the effect of inspections. This approach involved comparing the best-matching units from the two groups to assess the impact of inspections on the desired outcomes. Data for the estimation were collected through a survey questionnaire administered by visiting and interviewing officers in charge of OHS within these 102 factories.

The results related to understanding FO highlight the significance of inspections as an effective intervention for promoting a safer working environment and emphasize the importance of OHS practices. The notable increase in the understanding of officers in charge underscores the potential benefits and efficacy of regular inspections for fostering a culture of safety in factory settings.

The observed 20% increase in compliance demonstrates the substantial impact of inspections on promoting and enforcing proper practices in the studied context. By ensuring that organizations meet the required standards and regulations, inspections play a crucial role in mitigating risks, maintaining safety, and fostering a culture of compliance. These results emphasize the

importance of regular inspections as a mechanism to enhance compliance and uphold standards. The statistically significant increase in compliance scores further supports the effectiveness of inspections in driving positive changes and improving adherence to guidelines and regulations.

The inclusion of CEM as an additional matching method contributes to the overall credibility and reliability of the findings. This allows for a thorough assessment of the treatment effect by employing multiple matching techniques, further enhancing confidence in the conclusions drawn from the analysis. The reliability and validity of the findings regarding compliance scores were enhanced using an objective measurement method. Factory compliance with FO regulations was assessed by a factory inspection engineer as an integral part of the data collection process. This objective evaluation approach adds further credibility to the results, ensuring that the compliance levels were measured in a reliable and unbiased manner. By employing an expert in the field to assess compliance, this study strengthens the validity of its findings and reinforces the trustworthiness of the conclusions drawn regarding the impact of inspections on compliance scores.

Limitations and future directions

This study encountered certain limitations related to data collection, as it was conducted solely within one province in Sri Lanka, and the sample size was relatively small. The restriction to a single province limits the generalizability of the findings as the results may not be representative of the entire country or other provinces. To enhance the external validity of future research, data collection from multiple provinces would be advantageous as it would provide a more comprehensive understanding of the broader population.

Moreover, the absence of a random assignment to the treatment and control groups poses a limitation in terms of internal validity. Random assignment helps minimize bias and ensures that any observed effects can be attributed to the treatment itself. In the absence of randomization, there is a potential for selection bias, and the possibility of confounding variables affecting the observed outcomes cannot be fully ruled out.

To improve the internal validity of future studies, it would be beneficial to employ a randomized design in which factories are randomly assigned to

treatment and control groups. This would enhance the ability to draw causal inferences and strengthen the validity of the research design. Overall, considering data limitations and addressing them through broader sampling across multiple provinces and implementing random assignments would contribute to both the internal and external validity of future studies, thereby providing more robust and reliable insights into the impact of inspections on FO implementation.

Although the sample factories were selected randomly, non-response bias check should have been implemented in order to confirm if the random selection was successful. In the resent study, unfortunately the check was impossible as the information of non-selected factories was not accessible.

The present study did not make a sub-sample analysis, although it may provide more nuanced results for further discussion. This is particularly because of the small sample size with the matching for realizing causal inference more convincingly.

Finally, since the study was designed and implemented based on the demand derived from practice, a guiding theoretical framework was not provided. Due to this, the choice of variables used in the study and the theoretical contributions of the study are weak. Future studies should be strongly grounded in a theory or theories, so that the authors can more easily explain the focus, the boundary conditions, literature reviewed, and how their studies contribute to theory and prior related research.

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Review on Sri Lanka Development Administration Journal (1970 – 2015)

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Introduction

The Sri Lanka Journal of Development Administration is the official scholarly journal published by the Sri Lanka Development Administration Institute (SLIDA). Established in 1969 as the Sri Lanka Administrative Training Institute and formally instituted by the Sri Lanka Development Administration Act No. 09 in May 1982, SLIDA trains administrative service officers. Located at 28/10 Malalasekara Mawatha, Colombo 07, the institute's primary functions include conducting service initiation training and capacity development courses for six services across Sri Lanka.

Since 1969, the Sri Lanka Administrative Service Academy has been engaged in literary activities related to administrative functions, maintaining a library with a rich collection of books on administration. This research aims to study the growth of administrative literature over fifty years, focusing particularly on the Sri Lanka Journal of Development Administration.

Background

Fifty years have passed since training and education for administrative service officers began in Sri Lanka. Examining the administrative literature written over this period is thus a timely research theme. As a first step, a statistical analysis was conducted on the Sri Lanka Development Administration Journal, the official academic journal published by SLIDA. The journal began in 1970, with the first volume and issue published in November 1970. This study analyzed 35 journal issues and 307 articles published up to 2015.

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The Sri Lanka Development Administration Journal can be divided into three distinct eras based on the periods during which it was published and the names it was given:

1) 1970 – 1977: Journal of Development Administration
2) 1984 – 1996: Sri Lanka Journal of Development Administration
3) 2003 – 2015: Sri Lanka Journal of Development Administration: New Series

These periods reflect changes in the journal's format and content, with significant transformations in the structure of the articles and the physical presentation of the journal. The editors have consistently published academic articles that support the education and development of administrative services.

Objectives

The objectives of this research were to explore the scope and direction of administrative studies as reflected in the Sri Lanka Development Administration Journal. Specifically, the research aimed to:

- Analyze the subject areas of the journal's contributing writers.
- Investigate the reference sources and citation patterns in the articles.
- Examine publication trends and the number of articles per issue over time.
- Measure the length of each article.

Based on these objectives, the following research questions were formulated:

- What is the direction of the administrative subject matter covered in the journal?
- What are the specific subject areas addressed by the writers?
- How many articles were published in each issue?
- How many reference sources were used in the articles?
- What is the average length of an article in terms of page count?

The research also examined the journal's title, the publishing institute, the chronology of its publication, and its physical format. Data analysis was conducted separately for each era of the journal's publication to provide a comprehensive understanding of its evolution and impact on the field of administration.

Methodology

Research Design

This study utilizes a bibliometric approach within a desk research framework to investigate the breadth and evolution of articles published in the Sri Lanka Journal of Development Administration (SLJDA). The research relies exclusively on secondary data sourced from the published issues of the journal. Bibliometric analysis quantitatively examines recorded knowledge across various formats, such as books, journals, CD-ROMs, and microfiche. This method is particularly suitable for historical and evolutionary investigations due to its robust theoretical foundation and diverse analytical techniques.

Data Collection

The study followed a systematic process for data collection, including comprehensive archival research to identify and collect every issue of the journal published from its inception in 1970 through 2015, and compiling detailed quantitative statistics from the collected issues. Publication details (issue numbers, publication dates, and page sizes), article metrics (total number of articles, article lengths, and number of references cited), and authorship patterns (number of authors per article, including single vs. multiple authorship trends) were collected. Each issue was meticulously reviewed to extract the necessary data points, involving manual examination and recording of relevant information.

Data Analysis

Descriptive statistics were used to summarize the data, while trend analysis was conducted through year-wise distribution of articles, citation analysis, and authorship patterns to identify temporal trends. Graphs and charts were created to visualize the trends and patterns identified in the data.

Findings

In relation to the objectives of the research, the research questions were formulated to investigate: What is the direction of the administrative subject? What are the subject areas of the writers? How many articles were published in each issue? How many reference sources were used? How long are the articles?

The title of the journal has been modified several times, identifying three distinct eras in its evolution:

1) 1970 – 1977: Journal of Development Administration
2) 1984 – 1996: Sri Lanka Journal of Development Administration
3) 2003 – 2015: Sri Lanka Journal of Development Administration: New Series

1970 – 1977: Journal of Development Administration

The inaugural volume of the journal was published in November 1970, with the subsequent volume released in May 1971. By 1977, a total of seven volumes had been published continuously, each comprising two issues per year. During this period, the journal was titled the Journal of Development Administration and was published by the Academy of Administrative Studies, Ceylon.

The back cover of the journal featured a white background, with the title and publisher's name printed in red and other information in black. In future publications, this design was maintained, with a white background on the back cover and color screens applied annually to the front cover section displaying the title and publisher's information. The journal was produced to a clear standard using the printing technology available at the time. The physical dimensions of the journal were 24.5 cm in height and 18.5 cm in width. It was published separately in English and Sinhala, catering to a diverse readership.

The chief editor of the journal was the director of the institute at the time of publication. For the first issue, Mr. H.S. Wanasinghe served as the chief editor. Subsequently, the editor-in-chief for each issue was the director serving at the

time the journal was published, ensuring that the journal's leadership remained aligned with the institute's current administrative direction.

Table 1 illustrates the number of issues, the year of publication for each edition, and the number of articles published in each journal from 1970 to 1977.

Table 1

Journal of Development Administration (1970 – 1977): Number of Pages and Articles

Published Year and Month	Volume & Issue No.	No of Pages	No of Articles
1970 Nov.	Vol.1, No.1	62	8
1971 May	Vol.1, No.2	57	6
1971 Nov.	Vol.2, No.1	59	6
1972 May	Vol.2, No.2	43	7
1973 Nov.	Vol.3, No.1-2	40	6
1973 Nov.	Special Issue	59	12
1974 May	Vol.4, No.1	73	7
1974 Nov.	Vol.4, No.2	60	5
1975 May	Vol.5, No.1	80	6
1975 Nov.	Vol.5, No.2	58	5
1976 May	Vol.6, No.1	65	5
1976 Nov.	Vol.6, No.2	63	5
1977 May	Vol.7, No.1	97	5
1977 Nov.	Vol.7, No.2	45	4

This table highlights the fluctuation in the number of pages and articles per issue from 1970 to 1977. The highest number of pages published was in May 1977, Volume 7, Issue 1, with 97 pages. Conversely, the issue with the fewest pages was November 1973, Volume 3, with 40 pages. It is also notable that the page numbers of the two issues in the first and second volumes are sequentially linked. This thorough documentation provides valuable insights into the publication trends and editorial practices during this foundational period of the journal.

Figure 1

Journal of Development Administration - 1970 -1977 - No of Articles

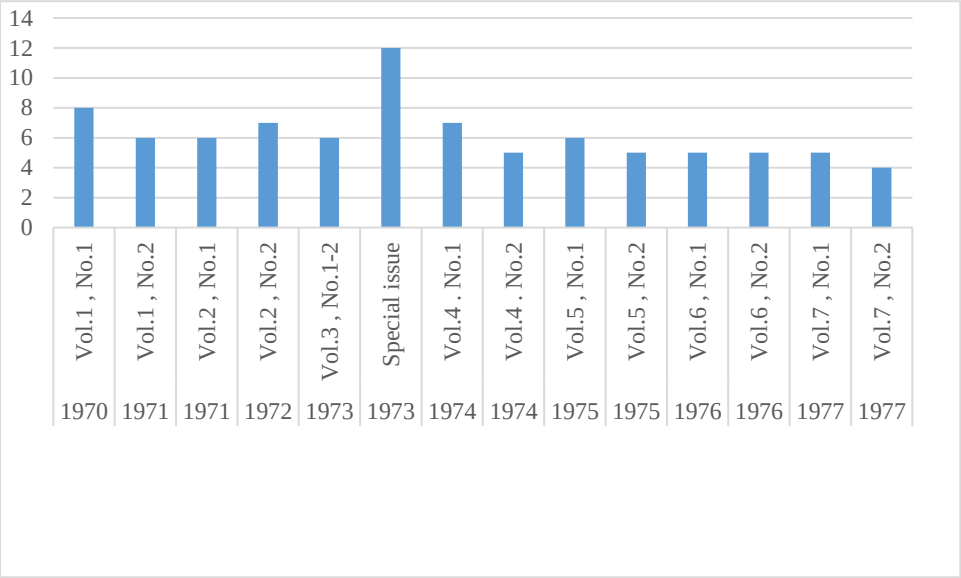


Table 2

Journal of Development Administration - 1970 – 1977

Year	Volume & Number	Articles
1970	Vol.1, No.1	8
1971	Vol.1, No.2	6
1971	Vol.2, No.1	6
1972	Vol.2, No.2	7
1973	Vol.3, No.1-2	6
1973	Special Issue	12
1974	Vol.4, No.1	7
1974	Vol.4, No.2	5
1975	Vol.5, No.1	6
1975	Vol.5, No.2	5
1976	Vol.6, No.1	5
1976	Vol.6, No.2	5
1977	Vol.7, No.1	5
1977	Vol.7, No.2	4

As shown in Table No. 2, during the first era, the journal was published for seven consecutive years from 1970 to 1977, resulting in the release of seven volumes and fourteen issues. Since its inception in 1970, the highest number of articles appeared in Volume 1, Issue 1, which featured eight articles. Conversely, the fewest articles were published in Volume 7, Issue 1.

In 1973, Volume 3, Issues 1 and 2 were combined into a single publication. Additionally, a special issue was released in November 1973 under the theme "Management for Development," which comprised twelve short articles.

Throughout this period, the journal's articles were primarily authored by consultants of the institute and by both local and international experts in administrative and political fields. The journal also featured reviews of contemporary books on administration and other publications by SLIDA.

1984-1996 - Sri Lanka Journal of Development Administration

The second era of the journal's development was from 1984 to 1996. During this period, the journal's name was revised to the Sri Lanka Journal of Development Administration. The cover page of the journal was printed in different colors during this time. The first and second volumes were green and ash-colored, respectively, with dimensions of 27 cm in height and 20.5 cm in width. The journal was published exclusively in English.

As before, two issues were published each year. It was published continuously for eight years from 1984 to 1991. Volume 9 was published in 1996, after which publication ceased again. In 1985, the physical dimensions of the journal were changed to 24 cm in height and 17 cm in width. In 1986, the dimensions were changed again to 24 cm in height and 15 cm in width, and the journal featured a colored background cover page.

The number of pages in the journal increased starting with Volume 6 in 1989, and the publication period was mentioned on the title page. In 1989, Vol. 6 No. 1 of the journal was published as a special issue under the theme of “Action Learning,” with Dr. Merrick L. Jones serving as the guest editor. In 1990, Vol. 7 No. 2 focused on “Issues in Public Sector Management,” with Dr. Kofi Ankomah as the guest editor.

Table 3

Sri Lanka Journal of Development Administration - 1984 – 1996

Published year and month	Volume & Issue No.	No of pages	No of Articles
1984	Vol.1, No 1	56	6
1984	Vol.1, No 2	43	5
1985	Vol.2, No 1	50	4
1985	Vol.2, No 2	61	5
1986	Vol.3, No 1	53	5
1986	Vol.3, No 2	54	6
1987	Vol.4, No 1	27	5
1987	Vol.4, No 2	*	
1988	Vol.5, No 1- 2	31	5
1989 Jan. - June	Vol.6, No 1	88	7
1989 July - Dec.	Vol.6, No 2	90	7
1990 Jan. - June	Vol.7, No 1	173	9
1990 July - Dec	Vol.7, N0 2	168	9
1991 Jan. - June	Vol.8, No 1	176	8
1991 July - Dec	Vol.8, No 2	*	
1996 Jan. - June	Vol.9, No 1	104	7
1996 July - Dec	Vol.9, No 2	*	

**This issue was not found in the study*

Table 3 provides details on the number of pages and articles per issue of the Sri Lanka Journal of Development Administration from 1984 to 1996. During the period from 1984 to 1988, the highest number of pages published in a single issue was in 1985, Volume 2, Issue 2, which contained 61 pages. Conversely, the issue with the fewest pages during this period was Volume 4 in 1987, with 27 pages.

From 1989 to 1996, the issue with the highest page count was Volume 8, Issue 1, published in 1991, which included 176 pages. The issue with the fewest pages during this period was Volume 6, Issue 1, published in 1989, which contained 88 pages.

Table 4 presents the number of issues, the year of publication for each edition of the journal, and the number of articles published in each journal from 1984 to 1999.

Table 4

Sri Lanka Journal of Development Administration in 1984 – 1999: No of Articles

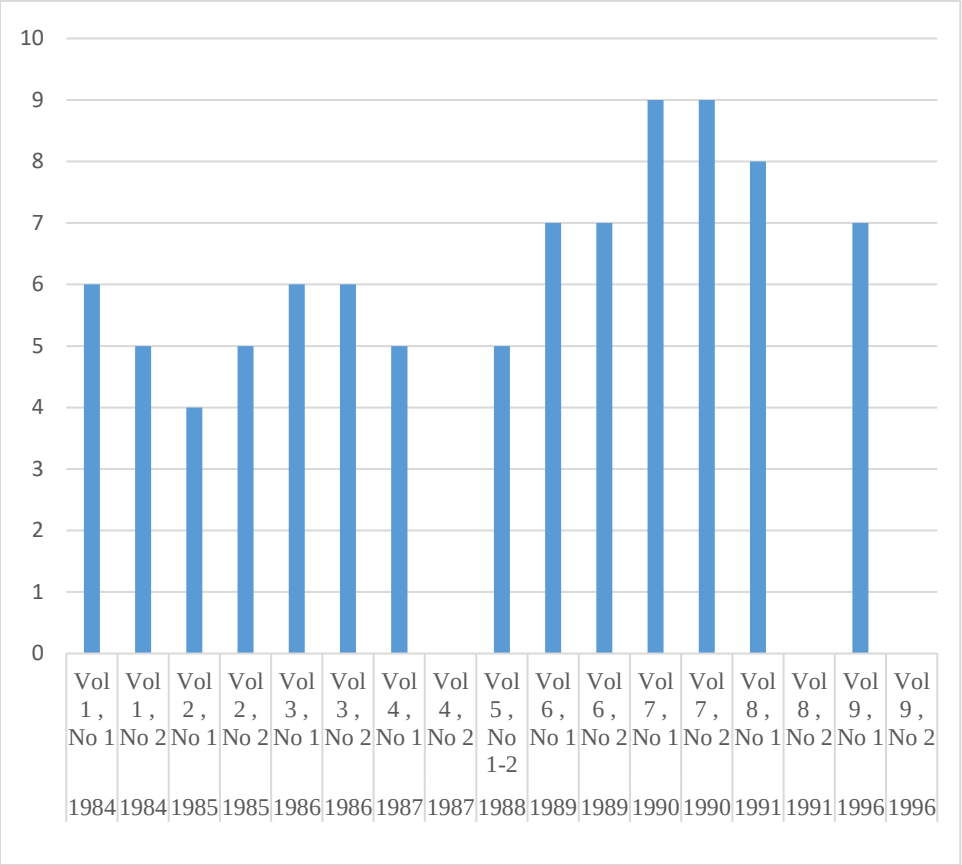
Year	Vol. & No.	Articles
1984	Vol.1, No 1	6
1984	Vol.1, No 2	5
1985	Vol.2, No 1	4
1985	Vol.2, No 2	5
1986	Vol.3, No 1	6
1986	Vol.3, No 2	6
1987	Vol.4, No 1	5
1987	Vol.4, No 2	*
1988	Vol.5, No 1-2	5
1989	Vol.6, No 1	7
1989	Vol.6, No 2	7
1990	Vol.7, No 1	9
1990	Vol.7, No 2	9
1991	Vol.8, No 1	8
1991	Vol.8, No 2	*
1996	Vol.9, No 1	7
1996	Vol.9, No 2	*

**This issue was not found in the study*

As shown in Table 4, nine volumes and eighteen issues of the Sri Lanka Journal of Development Administration were published over thirteen years, from 1984 to 1996. In 1988, both issues of Volume 5 were combined and published together. The highest number of articles was published in Volume 9 in 1990, with each issue containing nine articles. The lowest number of articles was published in Volume 2, Issue 1, in 1985 (Figure 2).

Figure 2

Sri Lanka Journal of Development Administration: 1984 -1996: No of Articles



2003 - 2015: Sri Lanka Journal of Development Administration: New Series

From 1996 to 2003, the publication of the journal was halted. It resumed in 2003 as the Sri Lanka Journal of Development Administration: New Series. In 2003, the journal received an International Standard Serial Number (ISSN 1391-8214). From this time, the journal was managed by an external editorial board. It was published biennially in 2003, 2005, and 2007, after which publication ceased until it resumed in 2014.

Between 2003 and 2015, the journal published only five volumes, each containing a single issue. During this period, the physical dimensions of the journal changed to 25 cm in height and 17 cm in width. The outer cover was

yellow with maroon-colored text. The journal continued to be published under the name Sri Lanka Journal of Development Administration in 2014 and 2015, with V.K. Nanayakkara as the chief editor. The physical size was adjusted to 23 cm in height and 15 cm in width. The cover page was printed in red for Volume 4 in 2014 and in blue for Volume 5 in 2015.

These observations indicate that while the institution showed an interest in publishing the journal, the authority and responsibility for its publication were interrupted periodically for unknown reasons.

(Note: Although the journal was published again in 2016 and 2020, this study focuses only on the period from 1970 to 2015, and thus, information beyond 2015 is not included)

Table 5

Sri Lanka Journal of Development Administration: New Series (2003 – 2015) - Number of Pages and Articles

Year	Volume & Number	Number of Pages	Articles
2003	Vol.1, No. 1	155	9
2005	Vol.2, No. 1	163	7
2007	Vol.3, No. 1	86	11
2014	Vol.4, No. 2	159	9
2015	Vol.5, No. 1	128	8

Table 5 above indicates the statistics on the number of pages and articles per issue of the Sri Lanka Journal of Development Administration during, 2003-2015. According to Table 5, the highest number of pages was published in 2005, in Volume 2, Issue 1, with 163 pages. The issue with the fewest number of pages was Volume 3 in 2007, which had 86 pages.

Table 6 below shows the number of issues, the year of publication of each edition of the journal, and the number of articles published in each journal from 2003 to 2015.

Table 6

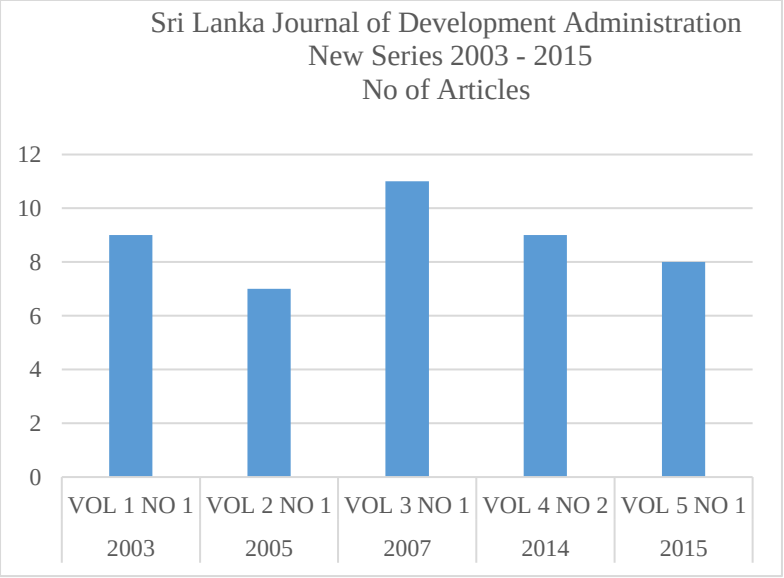
Sri Lanka Journal of Development Administration - New Series (2003 – 2015) Number of Articles

Year	Volume	Articles
2003	Vol.1, No. 1	9
2005	Vol.2, No. 1	7
2007	Vol.3, No. 1	11
2014	Vol.4, No. 2	9
2015	Vol.5, No. 1	8

As shown in Figure 3, only five volumes were published over the 18 years from 2003 to 2015. The highest number of articles was published in Volume 3 in 2007, which contained 11 articles. This volume was a special issue with the theme "Combating Corruption," and it was published in three languages: Sinhala, Tamil, and English.

Figure 3

Sri Lanka Journal of Development Administration: New series



Article Length Analysis

The length of the articles was analyzed according to the three eras of the journal's evolution.

Table 7

Journal of Development Administration: 1970 – 1977; Length of Articles

Year	Vol.& No	No of Articles	01-05	06-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45
1970	Vol.1, No.1	8	3	3	2						
1971	Vol.1, No.2	6	1	4		1					
1971	Vol.2, No.1	6	2	4							
1972	Vol.2, No.2	7	4	3							
1973	Vol.3, No.1-2	6	2	2	1						
1973	Special Issue	12	11		1 (12)						
1974	Vol.4, No.1	7	1	4	2						
1974	Vol.4, No.2	5		3	2						
1975	Vol.5, No.1	6		2	2	1	1 (24)				
1975	Vol.5, No.2	5	1 (03)	1	2		1 (22)				
1976	Vol.6, No.1	5		1	3	1					
1976	Vol.6, No.2	5		2	3						
1977	Vol.7, No.1	5		2	2		1 (27)			1 (44)	
1977	Vol.7, No.2	4		2	1	1					
Total		**82**	**25**	**33**	**21**	**4**	**2**	**1**		**1**	

The length of the articles was categorized into nine levels, ranging from 1 to 45 pages. During this period, a total of 82 articles were published. Most of the articles fell into the first three categories: 25 articles were 1-5 pages long, 33 articles were 6-10 pages long, and 21 articles were 11-15 pages long. There was one article that spanned pages 41-45 (Table 7).

The length of the articles was categorized into seven levels, ranging from 1 to 45 pages. During this period, a total of 89 articles were published. Most of the articles fell into the second category, covering 6-10 pages, with 29 articles published in this range. There were three articles that covered 36-40 pages (Table 8).

Table 9

Sri Lanka Journal of Development Administration: 2003 – 2015; Length of Articles

Year	Vol.& No.	Articles	01-05	06-10	11-15	16-20	21-25	26-30	31-35
2003	Vol.1, No. 1	9	2	1	3	3	-	-	-
2005	Vol.2, No. 1	7	-	1	3	-	2	1	-
2007	Vol.3, No. 1**	11	4	7	-	-	-	-	-
2014	Vol.4, No. 2	9	1	4	2	1	1	-	-
2015	Vol.5, No. 1	8	1	3	2	2	-	-	-
Total		**46**	**8**	**16**	**10**	**6**	**3**	**1**	-

Note: *This volume includes one page with two columns.*

The length of the articles was categorized into seven levels, ranging from 1 to 35 pages. During this period, a total of 46 articles were published. Most of the articles fell into the second category, covering 6-10 pages, with 16 articles published in this range. There was one article that covered 31-35 pages (Table 9).

Citation Study

The citation pattern of articles in the Sri Lanka Journal of Development Administration was also studied. Citations in a document reflect the merit of that document since authors usually cite the best available works. When an author cites a document, it indicates that the author has used it in their work. This implies that the author refers to all or at least the most crucial documents

used in preparing their work and extracts information from them to support and develop their papers.

Table 10

Journal of Development Administration: 1970 – 1977; No of Citations

Year	Vol.& No	No of Articles	No of Citations							
			1-5	6-10	11-15	16-20	21-25	26-30	30-35	36-40
1970	Vol.1, No.1	8	3	1						
1971	Vol.1, No.2	6								
1971	Vol.2, No.1	6	1			1				
1972	Vol.2, No.2	7						1 (29)		
1973	Vol.3, No.1-2	6		1		2				
1973	Special issue	12	There is no citation in articles							
1974	Vol.4, No.1	7	1		3					
1974	Vol.4, No.2	5	1	3		1				
1975	Vol.5, No.1	6	2	1					1 (31)	
1975	Vol.5, No.2	5	5		1			1 (27)		
1976	Vol.6, No.1	5	1				1			
1976	Vol.6, No.2	5	1				2			
1977	Vol.7, No.1	5	1							
1977	Vol.7, No.2	4	1		1			1 (26)		1 (40)
Total		**82**	**16**	**6**	**3**	**4**	**3**	**3**	**1**	**1**

The number of citations listed at the end of articles was categorized into 8 levels and tabulated in Table 10. It is important to note that not every letter was counted as a citation. Table 10 above provides information regarding citations in articles.

Table 11

Journal of Development Administration :1984 – 1990, No of Citation

Year	Vol. No	Article No	Citation					
			01-05	06-10	11-15	16 -20	21 -25	25 - 30
1984	Vol.1, No 1	6	2	1				
1984		5		2				
1985		4		1		1		
1985	Vol.2, No 2	5		2	1			
1986	Vol.3, No 1	6	2					
1986	Vol.3, No 2	6	2	1				
1987	Vol.4, No 1	5		2				
1987	Vol.4, No 2	No information						
1988	Vol.5, No 1-2	5			1		1 (24)	
1989	Vol.6, No 1	7	2	2			1 (22)	
1989	Vol.6 No 2	7					1 (27)	61
1990	Vol.7, No 1	7					1	1 (29)
1990	Vol.7, No 2				1	1	1	1 (28)
1991	Vol.8, No 1	8			3	1		
1991	Vol.8, No 2	No information						
1996	Vol.9, No 1	7	3	1	1			1 (25)
1996	Vol.9, No 2	No information						
Total		**89**	**07**	**12**	**07**	**03**	**05**	**04**

The number of citations appearing at the end of articles was categorized into 6 levels and tabulated in Table 11. Not every letter was counted as a citation, and the table above (Table 11) describes the information regarding citations in articles.

Table 11

Sri Lanka Journal of Development Administration:2003 – 2015, No of Citation

Year	Vol.& No.	Articles	01-05	06-10	11-15	16-20	21-25	26-30	31-35	Over 36
2003	Vol. 1, No 1	9	1	3	2					1
2005	Vol.2, No 1	7	1	1		1	1			
2007	Vol.3, No 1**	11	1	1	1		1			
2014	Vol.4, No 1	9		3		1		4		1 (63)
2015	Vol.5, No 1	8	1	2		1	2		1	1
Total		**46**	**4**	**10**	**3**	**3**	**4**	**4**	**1**	**3**

The number of citations appearing at the end of articles was categorized into 8 levels and tabulated in Table 12. Not every letter was counted as a citation, and the table above (Table 12) describes the information regarding citations in articles.

Summary of Research Findings

The research delved into the Sri Lanka Journal of Development Administration, focusing on its content scope, authorship, physical changes over time, and citation patterns. The journal predominantly concentrated on public service-related subjects such as public administration, management, training, reforms, and financial management. Authors, primarily professionals in administrative roles, brought practical insights to their contributions. University academics also contributed, enriching the journal with theoretical perspectives.

Moreover, the journal included book notes and reviews, enhancing its scholarly value. Physical changes, including format and font size adjustments,

occurred over time, potentially due to intermittent publication interruptions. A length-wise analysis of articles revealed a majority falling within the 6-10 page category, yet significant numbers exceeded these lengths, reflecting in-depth explorations on various topics.

In conclusion, the editorial sections provided commentary on the content of each issue, emphasizing academic rigor. Despite inconsistencies in physical format maintenance, the journal's contributors from the Administrative Service provided valuable insights. However, there is room for improvement, particularly in ensuring consistent physical formats and including more information on institute publications.

Recommendation

Based on the study findings, following recommendations are presented:

1) **Continued Publication:** Emphasize the scholarly value of the journal and prioritize publishing articles addressing critical themes.
2) **Format Consistency:** Focus on maintaining consistent physical formats to enhance readability and professionalism.
3) **Inclusive Content:** Incorporate more information on institute publications within each journal for comprehensive coverage.

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