DECODING THE NEXUS BETWEEN SOCIOECONOMIC FACTORS AND POVERTY ALLEVIATION IN THE NORTHERN PROVINCE OF SRI LANKA

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Abstract

The economic downturn due to the catastrophic Civil War that lasted for 30 years followed by unstable governance, and the pandemic outbreak has made it difficult for Sri Lanka to achieve the sustainable development goal [SDG No.01] of *No Poverty* (World Health Organization [WHO], 2015). Poverty undermines the stability of a nation and weakens its economy, politics, and social well-being. The Civil War that existed in Sri Lanka has affected the economic stability and the social well-being of the households in war-torn regions. The objective of this study is to investigate the poverty dynamics in a developing economy that has been impacted by Civil War and to ascertain the extent to which socioeconomic factors influence poverty alleviation in such an economy. This study employed a self-administered questionnaire to collect data from 300 farming households located in the Thunukai Divisional Secretariat Division of Mullaitivu District in the Northern Province. The findings of Ordinary Least Square and the Probit Models demonstrate that the availability of sufficient land enriched with long-term crops, sufficient water availability, technological advancement in agriculture, balanced gender participation in agricultural activities, and a substantial increase in farming expenditure play a crucial role in alleviating poverty within the households. The theoretical recommendations were provided to optimize the use of the identified predictors in the model estimation such as the reinstatement of community development practices, reformation and redevelopment of the local industries that improve the economic overhead and the involvement of communal activities in the vulnerable areas of society to rebuild the social overhead.

Keywords: Poverty, Agriculture, Poverty Measures, Land Management, Poverty Alleviation

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1. Introduction

Eradicating poverty in the modern era has become a sustainable goal. Many societal views assume that poverty is primarily caused by the recession, and conservative policies of the governmental parties; nevertheless, the reality deviates from these assumptions. Poverty is rampant across developing countries due to inefficiencies in domestic production, governance, natural resource utilization, and industrial development among other things (Allen & Thomas, 2020; Almagro *et al*., 2016). As per Barbier (2010), poverty is largely contributed by the rural poor who are momentously situated around fragile, less favorable environmental areas than the urban poor. Bekun and Akadiri (2019) stated that nearly 736 million people live in absolute poverty in developing nations[3], Ineffective agricultural practices are evidenced as a major contributor to poverty amongst many other factors, especially more than three-quarters of the population experiencing poverty lives in rural regions with the livelihood being agriculture.

Sri Lanka as a developing nation has experienced a progressive decline in its economy and an intensified surge in poverty among the war[4]-torn regions in the country (Weerakoon, Kumar, & Dime, 2019; Kelegama, 2002). From 1984 until 2009, the country's GDP showed a downward trend, however after that, the country's GDP growth was substantial (Central Bank of Sri Lanka [CBSL], 2019; Department of Census & Statistics [DCS], 2011; DCS, 2015; DCS, 2018; DCS, 2019; DCS, 2022).

According to the headcount index, the total population living in poverty was 1,339,000 in 2012/13, and 843,913 in 2016, and according to the multi-dimensional poverty index, 2.500,000 people are vulnerable to falling into poverty before 2024 (DCS, 2015; DCS, 2018; DCS, 2019; DCS, 2022). Since 2016, the number of people living in poverty has increased substantially. As per the annual reports published by the Central Bank of Sri Lanka, the domestic production of the country has shown a significant decline since 2015, further reinforcing the argument of economic imbalance and poverty in Sri Lanka (CBSL, 2019).

Furthermore, the consequence of the war has affected the efficacy of both economic overheads and social overheads among the war-torn regions. The aforementioned chaos has resulted in the underutilization and unutilization of resources, mainly the key factors of production. The Northern Province of Sri Lanka covers an area of 8,890.07 sq. km, approximately 13.5% of the total land on the island. Upon review, the Mullaitivu District was stated to be one of the forecasted regions in Northern Province to fall into the poverty line and covers nearly 31%[5] of land coverage (DCS, 2022; Chief Secretary's Secretariat – Northern Province [CSSNP], 2017; CSSNP, 2018; CSSNP, 2019; CSSNP, 2020). On average more than 62% of the households in the Mullaitivu District depend on agriculture and animal husbandry for their livelihood (DCS, 2019; DCS, 2022). Reviewing the land management of Mullaitivu District, an average of 11.12% of the land is being used for agriculture;

[3] The people who live in absolute poverty within the territories of developing nation has an earning of less than $1.90 per day.
[4] Civil War existed for more than 03 decades and ended late in 2009.
[5] Mullaitivu District covers nearly 2516.90 square kilometres of land.

with an average of 63.18% of land covered by dense and open forest and an average of 5.97% of land being unutilized in the form of non-agricultural land, scrubland, grassland, non-forested marshland and barren land (CSSNP, 2017; CSSNP, 2018; CSSNP, 2019; CSSNP, 2020). As discussed above, nearly an average of more than 70% of the land in Mullaitivu is managed ineffectively. The effective utilization of such lands can result in a greater yield and thus can contribute to the alleviation of poverty within the region.

In this background, the primary objective of this paper is to investigate the poverty dynamics in a developing economy that has been impacted by Civil War and to ascertain the extent to which socioeconomic factors influence poverty alleviation in such an economy. The study reviews the Mullaitivu District in Northern Province to assess the factors that influence poverty.

The key significance of this study includes its distinctive methodological approach, which involved evaluating 300 farming households through primary data collection within a developing economy impacted by Civil War, rather than relying on secondary sources. While poverty is a well-researched topic, this study conducted by the author delves into the critical analysis of the impact of land & water management, gender, and crop types on poverty alleviation. Moreover, the literature on poverty in developing economies affected by Civil War is limited; thus, this study addresses the knowledge gap, and it provides insights that can be generalized to similar contexts as Sri Lanka.

The findings of the survey are generalizable to all the war-torn regions in developing nations across the world. *Furthermore, the rest of the paper is structured as follow*s: The literature review analyses poverty, its correlation with agriculture, poverty measurements, and various perspectives on factors influencing poverty. The methodology section elaborates on the research design and the operationalization of variables. Following the methodology, the data analysis section assesses poverty through the primary data from 300 sampled households using Ordinary Least Square (OLS) and Probit model estimates. The paper proceeds with a discussion and concludes with a summary and implications.

2. Literature Review

To evaluate poverty and the factors affecting it, the literature of different scholars was reviewed. The paper hereby focuses on key thematic areas such as an overview of poverty, poverty in agriculture, the dynamics of poverty, land and poverty, poverty measures, and theoretical frameworks associated with poverty.

Poverty an overview

Poverty is an emerging concept in the modern era. Poverty is defined as the "individuals or families whose resources are so small as to exclude them from the minimum acceptable way of life of the member state in which they live" (European Union Council Decision [EUCD], 1975). Alcock (1996) defined poverty as a shortfall in material, social, or emotional resources. It's a monetary phenomenon in which an individual shows a limited consumption on the physiological and psychological components utilizing his/her average disposable income, these impacts both the economic and social overheads in a country. DCS over the years 2011/15/18/19

specified poverty as a state of being deprived of reasonably defined minimum levels of well-being such as access to certain consumption or income levels, housing, health and education facilities, and certain rights recognized in accordance with human needs and socio-economic conditions. As per the research findings from developed countries, poverty is defined as a measurement of an individual household's income as compared to the poverty line (Nolan & Whelan, 1996). Poverty is a multidimensional concept that relies on health (child mortality, nutrition), education (years of schooling, school attendance), and standard of living (electricity, sanitation, drinking water, floor, cooking fuel, and assets) (Bourguignon & Chakravarty, 2019; DCS, 2022). The simultaneous process of polarization and institutionalization creates inequality within society across multidimensional factors that result in inefficiency of resource utilization, thus leading to poverty (Townsend, 2013, pp. 3-139). Poverty can either be socially exclusive where an individual experiences inaccessibility to specific goods or services in a society, or capability based where an individual experiences limitation upon developing capabilities to achieve certain functionalities (Laderchi, Saith, & Stewart, 2003). Overall, poverty acts as a significant influence on the domestic economy.

Poverty within agriculture

Agriculture is a rapidly expanding industry around the world. Poverty in agriculture is crucial as poor farmers are attracted to poor lands, evidenced by the existence of a significant proportion of poor lands in the United States (Schultz, 1950). In line with a study conducted in the Philippines, poverty is more prevalent among farming households, accounting for 57% of poverty contributions, significantly greater than the contribution of non-farming households, which is 17% (Reyes, Tabuga, Asis & Datu, 2012). Nonetheless, to support the argument on the pervasiveness of poverty in agriculture, the study conducted based on developing countries around the world says that poverty began to rise while agricultural share began to deteriorate; with the open economy, resulting from globalization, industrialization, and digital revolution, ensuing the smallholder agriculture to decline in comparison to the other sectors (Christiaensen & Martin, 2018, pp 413-416; S.Tomar, Tembe, Sharma, & V. Tomar, 1996).

Poverty measures

Poverty varies depending on the individuals, communities, and regions and is determined by varied forms of measurement. Asiedu, Nunoo, Patrick, Sarpong, and Sumaila (2013) stated that poverty measurements can either be monetary[6] or non-monetary in nature. The measurements which are monetary and quantitative embrace the income, expenditure, headcount ratio, poverty gap, and poverty severity. Besides, the non-monetary or multidimensional encompasses, vulnerability, land ownership, asset holding, debt level, availability of health services, education, social infrastructure, and financial capital as well as the political and geographical marginalization.

[6] Monetary approach implies the absolute income, or the expenditure computed by the minimum number of goods required by a household or an individual to survive.

The poverty Headcount Index (HCI) measures the proposition of the population whose consumption falls below the poverty line, represented as HCI = NP/N[7] (Atkinson, 1987). The Poverty Gap Index (PGI) measures the spread of poor below the poverty line by assessing the average depth of poverty, represented as PGI = (1/n) q∑i=1[(L-Ci)/L]α[8] (Foster & Shorrocks, 1988; Household Budget Survey [HBS], 2007). The Income Gap Ratio measures the mean consumption or the income of a poor that is I=1-μp/z[9] (U. Nair, M. Nair, & Haridas, 2008), which can also be presented as the ratio between the poverty gap index and headcount index (PGI/HCI). Foster Greer Thorbecke (FGT) measures poverty based on the extent of disparity amongst the poor within a region $FGT_2 = 1/N \, {}^{q}\sum_{i=1} [(z-c)/z]^2$ [10] (James, Joel, & Erik, 2010). Few other Islamic nations across the globe use the Al Kifayah method to measure poverty; Al Kifayah method analyses the essentials that are needed by the households in order to sustain daily needs, the method mainly incorporates the key variables[11] namely, shelter, food, health, education, and transportation; if the total income is observed to be lesser than the cost of total needs in a household then the household is classified to be poor and is eligible for the financial aid by the Islamic institution (Rasool, Salleh, & Harun, 2012).

Dynamics of poverty

The review of literature has demonstrated that household size, infant and child mortality, child/adult ratio, and consumption or income have a bivariant correlation to poverty (Musgrove, 1980; Visaria, 1977; Van de Walle, Dominique, & Martin, 1992; Birdsall & Sabot, 1991). Various other research findings concluded that gender plays a significant role in society, thus, determining poverty in both developing and developed nations; poverty remains persistent for women and is considered impermanent for men (Dreze & Sen, 1989; Bardhan, 1985; Standing, 1985; Bennett, 1991; Haddad, 1991; Behrman, 1991). The national studies conducted in various South Asian countries concluded that age is a factor that influences poverty; Aging affects both health and economic stability, resulting in a higher likelihood of poverty in such populations (Deaton & Paxson, 1991; Ravallion, Gaurav, & Van de Walle, 1991). Amongst rural households, education is a key determinant of poverty; the literature suggested that lack of education results in cultural chaos, such as male domination, alcoholism, and domestic violence (Economic Research Service, 2003; Cotter, 2002). The rise in unemployment within a country has a substantial effect on those who are asset-less than on those who are asset-based self-employed, reinforcing the fact that unemployment is a serious proposition that leads to poverty (Udall & Sinclair, 1982; Furuokaa, Idrisa, Limb, & Borohb, 2019). Moreover, wage

[7] Np denotes the number of poor and N represents the total population.

[8] L represents the poverty line, C shows the average consumption expenses per adult equivalent person, i represents the individual persons, n represents the total population, and the q shows the number the persons with average consumption expenses per adult equivalent persons lower than the poverty line.

[9] μp denotes the mean consumption or income of the poor.

[10] q represents the total number of poor, n represents the total population, c depicts the consumption expenditure.

[11] The variables are determined based on the *maqasid al-shariah.*

discrimination based on gender, caste, or ethnic group, impacts productivity and poverty among individuals and communities (Birdsall & Sabot, 1991; Osmani, 1991).

Agriculture and poverty are intertwined, with farming households enduring significant losses in agriculture due to the lack of knowledge and resilience in adapting to changes in the industry; hence, it affects farmers both psychologically and physiologically, thus, lack of knowledge and resilience towards change acts as a driver towards poverty (Winslow, Shapiro, Thomas, & Shetty, 2004; Pender, & Gebremedhin, 2008). Hertel and Rosch (2010) argued poverty is a serious dilemma in a country that links directly to climatic changes; the findings suggest that poverty and climatic change, as well as climatic change and agriculture, have a proportionate relationship. A study based in Indonesia concluded that the growing poverty in agriculture is mainly due to the deficiencies in quality human resources and other agricultural resources including social facilities, as well as access to information and communication; Moreover, several other works of the literature suggested that the lack of irrigation facilities due to poor economic activity is a significant contributor towards poverty (Amarasinghe, Samad, & Anputhas, 2005). Failing to meet the breakeven within the agricultural sector results in a significant reduction in individual consumption costs, resulting in the establishment of poverty within communities (Shaw, 2004). After all, when it comes to the spatial clustering of rural poverty and food insecurity in Sri Lanka, greater poverty is observed in rural regions where agriculture is the livelihood, so it is overly assumed that agricultural poverty is a significant determinant of the country's economic stability (CBSL, 2019; DCS, 2011; DCS, 2015; DCS, 2018; DCS, 2019; DCS, 2022).

Land and poverty

Apart from other poverty dynamics across the globe, challenges in climatic changes, biodiversity loss, and food security have become vital issues to influence agriculture across the globe and thus have started to affect poverty within the regions (Branca, Lipper, McCarthy, & Jolejole, 2013; Hurni, 1997). The study based on enhancing the effectiveness of land management stated that the technical and technological innovations in the form of forest harvesting or wood harvesting utilizing the appropriate tree species, grazing or mowing harvest, and tillage mobilize an average of 0.5% of the global standing biomass and results in the gradual increase in *N2O* and *CH4* oxidation in the soil, microbial decomposition, evapotranspiration rates, and surface albedo; thus the aforementioned techniques lead to the enrichment of the land productivity and reduces the poverty (Saugier, Roy, & Mooney, 2001; Pan *et al*., 2011; Schulze, Luyssaert, Haberl, Law, & Korner, 2012; Raupach, 1994; Farley, Jobbagy, & Jackson, 2005; Kirschbaum, 2011; Anadon, Sala, & Maestre, 2014; Baron *et al*., 2002; Long, & Qu, 2018; Mann, 1986). The study conducted by Aouissi, Benabdallah, Chabaane, and Cudennec suggested that the reduction of *N* fertilizers by a minimum of 20% and the utilization of the vegetation filter strips result in a significant contribution to the improvement of water quality and thus help to improve the effectiveness of land management and land productivity (Aouissi, Benabdallah, Chabaane, & Cudennec, 2014; Kassie, Zikhali, Pender, & Kohlin, 2010). Moreover, the study findings of researchers across Asia suggested that the utilization of conventional tillage, conservation tillage, no-tillage, contour farming, terraces, and

buffer strips help to enhance the water productivity and land productivity within a region (Ullrich & Volk, 2009; Kahlon & Khurana, 2017; Jepsen *et al*., 2015; Volkov, Cherkashina, & Shapovalov, 2019). Overall, the study findings hereby conclude that effective land management helps in uplifting the land productivity which results in the alleviation of economic stability within the region.

Theoretical framework of poverty

Over the years, literature has explored theories to reduce poverty. In this paper, the author presents pertinent theories that demonstrate the determinants of poverty in today's economy.

The individualistic theory being a classical economic theory of poverty says that individuals are responsible for poverty in their respective households; Individualistic theory's characteristics state that the problems that the poor face in day-to-day life can be avoided through hard work and better choices; genetic qualities such as intelligence play a larger role in the choices made, resulting in poverty within the household; and self-development goals can streamline individuals toward success (Rainwater, 1970; Gwartney & McCaleb, 1985; Ryan, 1976; Valentine, 1968).

Amidst the 80s, Marxian economists and radical theorists reviewed the macro perspective of the markets and deduced progressive social theory which states that the macro factors in a market significantly affect poverty more than the individual factors (Jencks, 1996; Tobin, 1994; Chubb & Moe, 1996). As per the said review, the economic, political, and social systems limit the opportunities and resources to achieve income and well-being. The economic system within the country is structured in such a way that the poor get less recognition irrespective of their competencies. The political systems show deceptive participation and interest by the poor; accounting due to the discrimination and vulnerability experienced by the poor within the legal and political systems. Poverty among households/individuals can be attributed to the social stigma associated with ethnicity, gender, disability/health difficulties, and religion, all of which result in opportunities being drained regardless of individual capabilities.

The inability or constraints encountered by people, organizations, and cultures to create income and well-being with the available resources are assessed by geographical theories of poverty, which assert a successful redistribution of resources. Disinvestments, the proximity to natural resources, density within a geography, and diffusion of innovation are a few of the key factors that an economy lacks to attain competitive advantage (Morrill & Wohlenberg, 1971; Lyson & Falk, 1992; Bradshaw, King, & Washlstrom., 1998).

Finally, the cyclic theory of poverty examines poverty from the perspective of mutual dependence between individual circumstances and communal resources (Myrdal, 1957). The cycle of poverty is something in which the individual factors get interconnected to the community and *vice-versa*; it shows how individuals become deprived in their social context, affecting their psychological abilities (Bradshaw, 2000; Sher, 1977).

Criticism of the theoretical framework of Poverty

According to the literature review, the author has identified several key factors that contribute to poverty, including household size, infant and child mortality, child/adult ratio, consumption or income, gender, age, education, unemployment, caste, ethnic group, wage discrimination, lack of adaptability, climatic changes, and ineffective utilization of resources such as land, water, human resources, information, and other social facilities. Criticism of the theories that explain the factors identified in the literature review is as follows:

The impact of household size, infant and child mortality on poverty can be explained by the cyclic theory and the individualistic theory. The cyclic theory views poverty as a self-perpetuating cycle, where household size and infant/child mortality play a role in perpetuating poverty. The individualistic theory views poverty as a result of individual behavior and choices, such as poor decision-making and lack of motivation. In this theory, household size and infant/child mortality can be seen as the result of these choices. The impact of a high child/adult ratio on poverty can be understood through both the cyclic theory and the individualistic theory. According to the cyclic theory, on one hand, a high child/adult ratio can limit access to job opportunities and education, which can contribute to poverty. On the other hand, the individualistic theory argues that such a ratio can lead to an increase in the financial burden on households, thereby resulting in poverty.

The progressive social theory and the cyclic theory of poverty offer different explanations for how factors like income/consumption, gender, age, caste, ethnicity, lack of adaptability, wage discrimination, and unemployment impact poverty. The progressive social theory emphasizes social and economic structures that perpetuate disparities, advocating for redistributive policies and social safety nets. The cyclic theory focuses on how these factors lead to poverty cycles due to limited resources and opportunities, which hinder investment in education, healthcare, and business opportunities. Both theories acknowledge the role of systemic discrimination, but differ in their proposed solutions, with progressive theorists advocating for policies that promote social equality, and cyclic theorists highlighting the need for policies that break intergenerational poverty cycles. Overall, each theory provides distinct perspectives on the complex factors that contribute to and perpetuate poverty.

The impact of education on poverty can be explained by the progressive social theory and the individualistic theory. The progressive social theory views poverty as a result of systemic issues in society and education as a means of reducing poverty. The individualistic theory views poverty as an outcome of individual factors and education as a means of reducing poverty if individuals make the right decisions. Both theories suggest that a combination of structural and individual factors play a role in the impact of education on poverty levels. Lack of access to education for low-income communities can perpetuate poverty, while individual motivation and decision-making can play a role in pursuing education and improving one's financial situation.

Climatic change and its impact on poverty can be explained by geographical theory and cyclic theory. The geographical theory views poverty as being linked to environmental factors such as climate change, with the effects of climate change having a significant impact on poverty levels in vulnerable communities. The cyclic

theory views poverty as a recurring phenomenon caused by structural factors such as unemployment, low wages, and lack of education, with the effects of climate change exacerbating these factors and leading to a cycle of poverty. Both theories suggest that a combination of environmental and structural factors play a role in the impact of climate change on poverty levels, including crop failure, food insecurity, loss of livelihoods, and natural disasters.

Ineffective resource utilization, including land, water, information, and social facilities, can contribute to poverty. This can be explained by individualistic theory, which suggests that individuals may lack the necessary skills or motivation to use resources effectively; geographical theory, which highlights how location-specific factors like access to infrastructure and services can limit effective resource use; and cyclic theory, which posits that a lack of education or skills can perpetuate poverty by hindering individuals from utilizing resources effectively. Addressing these structural factors is crucial in breaking the cycle of poverty and improving living standards.

Table 1: Criticism of theoretical framework

Determinants / Theories	**Individualistic Theory**	**Progressive Social Theory**	**Geographical Theory**	**Cyclic Theory**
Household Size, Infant & Child Mortality	Poor work ethic and decisions result in poverty.	-	-	Individual deprivation and the social-psychological impact that leads to poverty.
Child/Adult ratio	Poor decision-making due to stress on households leads to poverty.	-	-	Results in financial stress and perpetuate poverty.
Income / Consumption, Gender, Age, Caste, Ethnic group, Lack of Adaptability, Wage Discrimination & Unemployment	-	Inadequate Income and prejudice affect financial stability and well-being, leading to decreased health and economic stability, which in turn contribute to poverty.	-	Results in financial stress and perpetuate poverty.
Education	Inadequate education results in restricted job prospects and poor decision-making, both of which contribute to poverty.	The absence of education leads to a shortage of opportunities, which in turn causes poverty.	-	-

Climatic Changes	-	-	The limitations and difficulties experienced by people, organizations, and cultures due to climatic changes can result in poverty.	Results in financial stress and perpetuate poverty.
Ineffective Resource Utilization	Result in poor decision-making and a scarcity of resources, both of which contribute to poverty.	-	Limitations or challenges experienced by people, organizations, and cultures in utilizing the available resources.	This impacts the interdependence of individual circumstances and communal resources, leading to poverty.

Source: Developed by author

3. Methodology of the Study

Although scholars have created a wide variety of measures to eradicate poverty and alleviate the poor living standards of households, poverty remains an unresolved issue in many rural contexts. Natural disasters and war are a few of the key determinants that influence poverty within developing nations. Upon looking into the context of Sri Lanka, the Civil War [12]which existed for more than three decades confronted a greater level of effect on the economic stability of the nation. The conflict that existed within the nation has influenced the domestic production of various industries/sectors in various provinces, with the agriculture sector being one of the most affected (CBSL, 2019; DCS, 2022). Since 2006, the Northern Province of Sri Lanka has contributed to more than 10% of the country's overall poverty, which is bolstered by the highest vulnerability score of 18.4% for the propensity to fall below the poverty line by Mullaitivu District from 2019 till 2024 (DCS, 2018; DCS, 2019; DCS, 2022). Thereby, the author selected the farming households from the Mullaitivu District in Northern Province as a sample. While the research findings of various researchers and governmental authorities focus on multidimensional poverty than monetary poverty, this study specifically examines the monetary poverty among households in war-torn regions.

The survey was carried out using a self-administered questionnaire, targeting 300 subsistence farming households in the Mullaitivu District of the Northern Province. The sampling technique employed was stratified simple random sampling from the Thunukai Divisional Secretariat Division, one of the six DS divisions in the Mullaitivu District. The sample within the stratum was heterogeneous, while the stratum, compared to other DS divisions within Mullaitivu and other districts in the

[12] Civil War represents the Liberation Tigers of Tamil Eelam. By 1983, the conflict had begun throughout the nation and had gone through four major stages. Eelam War I began in 1983 and was followed by Eelam War II in 1990–1994; Eelam War III in 1995–2001; and Eelam War IV in 2006–2009.

Northern Province, was homogeneous. Hence, the sample selected could be easily generalized. The study conducted overall was confined to objectivity; the study herein used a pragmatic philosophical stance with a positivist paradigm. The study employed deductive thinking to confirm the theoretical underpinnings that existed. Additionally, the operationalization of the variables identified is depicted in *Table 2* below.

Table 2: Operationalization of the variables

Name of the Variable	Description of the variable	Data Source
Poverty Gap	Difference between the Official Poverty Line (OPL) and per individual consumption expenditure in a household.	Primary Data
Poverty Gap Squared	Square of the Poverty gap deduced.	Primary Data
Poor / Non-Poor	If the value of the poverty gap is positive, then the individual is poor and vice versa is non-poor.	Department of Census & Statistics & Primary Data
Farming expenditure	The total expenses for the cultivation inclusive of pre-harvest, harvest, and post-harvest stages.	Primary Data
Water availability	Is the water through major/minor tanks and the well water sufficient or deficit for cultivation?	Primary Data
No. of family members	Size of each household.	Primary Data
Gender	Gender within the household dominates cultivation/agriculture.	Primary Data
Type of crops	The type of the crops whether the cultivable are long-term crops (paddy, beans, grains, coconut, banana, mango) or short-term crops (vegetables).	Primary Data
Caste	Caste the farmer in the household belongs to.	Primary Data
Latest technology	The latest technology used in cultivation by the farmer from each household.	Primary Data
Total Land Owned	The amount of land owned by the farmers in each household.	Primary Data

Source: Developed by author

*Note 1***:** The table demonstrates the overall summary of the identified variables through the preliminary research conducted to assess both the poverty gap and the propensity to become poor/non-poor.

Stata/MP 13.0 was used to gather and analyze survey findings. The household consumption expenditure was initially computed, followed by the individual contribution to the household expenditure/consumption expenditure per capita in the household. Finally, the consumption expenditure per capita was deducted from the Mullaitivu District's Official Poverty Line (OPL) for the month of April 2021 (DCS, 2021). The net difference calculated was termed to be the poverty gap for the district. The factors that influence poverty were classified mainly into social factors and economic factors. Furthermore, the results were forecasted in two main econometrics models. Models 1 and 2 employed the Ordinary Least Square technique and model 3 employed the Probit Model technique.

The dependent factor in Model 1 is the poverty gap, while the independent factors are the social and economic elements that determine poverty. The estimated model is as follows:

Model 1

Poverty gap = β_0 + β_1*Farming expenses + β_2*Type of Crop + β_3*Total Land Owned + β_4*Water Source + β_5*No technology + β_6*Gender + β_7* Number of Family Members → Equation (1)

The dependent factor in Model 2 is the poverty gap square, and the independent factors are the social and economic variables that determine poverty. The estimated model is as follows:

Model 2

Poverty gap squared = β_a + β_b*(Total land owned*Type of crop) + β_c*Caste + β_d*(Total Land Owned*Water Sufficiency) + β_e*No technology + β_f*Gender + β_g* Number of Family Members → Equation (2

Finally, Model 3 estimates the Probit Model, which assesses the propensity to become poor as described by social and economic variables.

Model 3

Poor/Non-Poor = β_8 + β_9*Type of crops + β_{10}* Water Availability + β_{11}* No technology + β_{12}*Gender → Equation (3)

Overall, the survey was conducted within defined ethical boundaries, such as ensuring anonymity, briefing the farming household on the importance and outliers of the study at the time of the field survey, and conducting the survey at the farmers' convenience.

4. Findings

The study herewith analyzes poverty from social and economic perspectives. The social factors include caste, gender, and the number of family members; economic factors include farming expenditure, the latest technology used, total land owned by the household, type of crops cultivated, and availability of water. The survey findings deduced three economic models. The results were empirically derived based on stratified simple random sampling from the Thunukai Divisional Secretariat Division, Mullaitivu. Of the 300 households sampled in the survey, it was observed that 56.3%

of the sample group was categorized as both economically and socially poor. The estimated model summary of all three models is as follows:

Table 3: Summary of inter-variable correlation.

Variables	(1) Poor	(2) Gapsqu	(3) Gap
landlongtermcrop	-	958,398***	-
		(296,712)	
lowcaste	-	432,234	-
		(1.323e+06)	
totlandwater	-	1.827e+06***	-
		(355,357)	
notechnology	1.651***	-246,144	354.6*
	(0.284)	(1.362e+06)	(195.9)
female	1.871***	-945,964	982.2***
	(0.256)	(1.332e+06)	(170.7)
familymem	-	1.400e+06**	-455.9***
		(705,517)	(84.74)
longcrop	1.084***	-	353.9**
	(0.225)		(161.6)
waterdeficient	1.291***	-	770.7***
	(0.337)		(205.1)
farmexp	-	-	-0.0494***
			(0.0177)
totland	-	-	-277.2***
			(77.35)
Constant	-2.645***	-5.349e+06*	1,650***
	(0.371)	(3.050e+06)	(457.0)
Observations	300	300	300
R-squared	-	0.170	0.501

Source: Compiled by author

Note 1: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Note 2: The table provides an overview of the influence of socio and economic factors towards the poverty gap, poverty gap squared, and propensity to become poor/non-poor. The *landlongtermcrop* refers to the product of total land owned and the long-term crops; the *totalandwater* refers to the product of total land owned and the water sufficiency; *farmexp* refers to the farming expenses, *notechnology* refers to the unutilization/underutilization of the technology by the household, *familymem* refers to the total number of family members, *female* refers to the farming individuals who dominate the household to be female, *longcrop* refers to the long term crops such as paddy, beans, grains, nuts, coconut, banana, and mango, *waterdeficient* refers to the deficiency of water for cultivation, *totland* refers to the total land owned by the farmer from individual household and *lowcaste* states whether the farmers within the households are from the low caste namely, Koviar, Nalavar, Pallar, and Vannar.

Note 3: The uncorrelated variables got omitted during the generation of intervariable correlation.

Upon the estimation of *Model 1*, the poverty gap was considered the dependent variable, and the other socioeconomic factors were taken as the independent variables. A total of ten independent variables were factored in. Furthermore, at a 0.05 significance level, the farming expenses, types of crops, total

land, water availability, latest technology, gender, and family members showed a significant connection with the poverty gap.

Upon the estimation of *Model 2*, the squared of the poverty gap was considered the dependent variable, and the product of total land and the type of crop, caste, the product of total land and water availability, the latest technology, number of family members, and gender were significant independent variables amongst the socioeconomic factors, assessed at a 95% significance level.

The Jarque-Bera test conducted on the estimated models showed that the variables for the poverty gap and poverty gap squared were not normally distributed. The outcome of the Ramsey Reset test concluded that the variables did not show any linearity across either equation, with the explained variables being the poverty gap and the poverty gap squared. Upon reviewing the multicollinearity within the estimated equation, the VIF values obtained for the poverty gap and the poverty gap squared were below the VIF threshold of 5. Hence, the estimated model showed a strong relationship between the estimated variables. Finally, the estimated models assumed a null hypothesis where the poverty determinants have no significant effect on the poverty gap and the poverty gap squared. The hypothesis test was carried out for each poverty determinant factor provided in the equations above. At a 95% confidence interval, the variables were either less than the conventional t-statistics of 1.96 or the probability was less than the 0.05 threshold. Therefore, the null hypothesis for the variables in equations 1 and 2 was rejected. Hence, it was concluded that the identified independent variables significantly influence the poverty gap and poverty gap squared.

OLS model estimate explained by the poverty gap clearly defined that an increase in the farming expenditure and number of family members within a household by one unit resulted in a significant downfall in the poverty gap by 0.049 and 455.936 units respectively. An increase in the cultivation of long-term crops by one unit resulted in an increase in the poverty gap by 353.850 units. Similarly, the increase in the land availability of the households by one unit resulted in the downfall of the poverty gap by 277.16 units. The increase in water deficiency and under/un utilization of technology by one unit resulted in an increase in the poverty gap by 770.66 and 354.59 units respectively. Finally, the increase of the female-dominant workforce by a unit resulted in the increase of the poverty gap by 982.221 units.

The Ordinary Least Square estimate model dependent on the poverty gap square implied that a unit increase in the lands cultivated with long-term crops increased the poverty gap squared by 958,397.8 units. Similarly, a unit increase of low caste members within a household increased the poverty gap squared of the respective household by 432,234 units. A unit increase in the water availability for the total cultivable land used increased the poverty gap squared by 1,826,685 units. One unit of increase in under/un utilization of the technology resulted in the gradual decrease of the poverty gap squared by 246,143.5 units. An increase in the female-dominant workforce by one unit within a household resulted in the reduction of the poverty gap square by 945,964.2 units. Finally, the increase in the number of family members within a household by one unit increased the poverty gap squared by 1,399,853 units.

After all, the estimation of *Model 3* assessed the factors that influence the propensity to become poor through a Probit Model. Upon assessing the propensity to become poor, the author used the dummy variables such as the long-term crop, water deficiency, the under/un utilization of the latest technology, and the female workforce within each household.

According to the research study, all 300 observations were incorporated into the analysis. The Probit Model demonstrated a statistically significant likelihood ratio chi-square of 241.89, accompanied by a p-value of 0.0000. This indicates a significant fit of the model, superior to a model devoid of any predictors. Four variables were identified as significant indicators influencing the propensity to become poor. The chi-square statistics for the Probit Model suggested that the probability of the chi-square fell below the threshold of 0.05. Consequently, the study inferred a significant correlation between independent variables - namely long-term crops, water deficiency, absence of technology, and female - and the dependent variable, which was the household's poverty status *(poor)*. The collective effects of the independent variables were evaluated using the *'test'* command. The findings revealed that the cumulative effect of long-term crops, water deficiency, absence of technology, and the female-dominant workforce was statistically significant. Upon scrutinizing the coefficient of the Probit index and the predictors, several key insights were deduced. A unit increase in the production of long-term crops such as paddy, grains, coconut, banana, and mango resulted in a 1.08 unit rise in the likelihood of a household becoming poor. Similarly, a unit increase in water deficiency led to a 1.29 unit increment in the propensity for poverty. Moreover, a unit increase in the avoidance of technological implications resulted in a 1.65 unit increase in the risk of poverty. Finally, a unit increase in the female workforce within the household corresponded to an approximately 1.87 unit increase in the likelihood of the household falling into poverty.

5. Discussion

According to the Quantitative study conducted on rural farming households in the Northern Province to assess monetary poverty, 56.3% of the respondents in the sample were poor. The analysis focused mainly on assessing the dynamics of poverty and the impact of socioeconomic factors on the alleviation of poverty. Furthermore, the discussion herein reviews the survey results and the literature review in the presence of the theoretical framework.

Amarasinghe, Samad, and Anputhas (2005) and Saugier, Roy, and Mooney (2002) identified that deficiencies in quality human resources, agricultural resources, social facilities, information, and communication contribute significantly to poverty. However, they failed to consider the impact of crop selection on poverty. The Probit Model estimate and the OLS model estimates inferred from the survey findings revealed that the cultivation of long-term crops such as paddy, grains, coconut, banana, and mango increases the likelihood of poverty. The presence of long-term crops requires significant time and expenditure before revenue generation, resulting in financial difficulties for farming households in the Mullaitivu District. The study supports the individualistic and geographical theories of poverty, as the choice of crops is determined by individual households.

Schulze, Luyssaert, Haberl, Law, and Korner (2012); Farley, Jobbágy, and Jackson (2005) and Amarasinghe, Samad, and Anputhas (2005) argued that the unavailability of water, especially irrigation water, is a crucial factor contributing to poverty. The argument presented by the previous researcher is consistent with the Probit and OLS model estimates explaining the poverty gap in this study. However, it contradicts the OLS model estimate explaining the poverty gap squared by this study conducted by the author. Water availability in the Mullaitivu District is limited, and households depend largely on rainwater collected in reservoirs and dams. The Probit Model indicates that water unavailability increases the likelihood of households becoming poor, while the OLS model estimate shows that an increase in water unavailability for cultivation increases the poverty gap. However, the poverty gap squared model estimate shows that having access to enough water for the entire plot of land owned increases poverty levels. Farmers in Mullaitivu face water scarcity and poor water management techniques, resulting in yield losses. Despite being aware of the ineffectiveness of their practices, farmers continue to employ them due to a lack of knowledge and reluctance to adapt to new agricultural approaches. These findings support the geographical, individualistic, and cyclic theories of poverty.

The studies conducted by Economic Research Service (2003), Cotter (2002), Gunatilaka, Wan, and Chatterjee (2009), and Winslow, Shapiro, Thomas, and Shetty (2004), emphasized the importance of education and knowledge limitations in contributing to poverty, hence failed to focus on technical/technological skills and applications. In contrast, the author's survey findings highlight the significance of technical knowledge in influencing poverty levels in the Mullaitivu District. The Probit model estimate and the OLS model estimate based on the poverty gap stated that the lack of technology is associated with a gradual increase in poverty, while an increase in technological utilization leads to poverty reduction. In contrast, the OLS model estimate based on the poverty gap squared emphasized that the lack of technology alleviates poverty as the adaptation of new technology results in high costs and minimal contribution towards consumption expenditure. Thus, the unutilization and underutilization of modern techniques/technologies by households are explained by the progressive social theory and the individualistic theory of poverty.

Previous literature and the author's survey findings both emphasize the importance of gender and education in poverty (Dreze & Sen, 1989; Bardhan, 1985; Standing, 1985; Bennett, 1991; Haddad, 1991; Behrman, 1991; Economic Research Service, 2003; Cotter, 2002; Birdsall & Sabot.,1991). Women tend to be more vulnerable to poverty and their poverty is often considered impermanent as compared to men. In the Mullaitivu District, male-dominated workforces are prevalent, and households with a female-dominated workforce tend to have limited productivity. The survey findings indicated by the Probit Model and OLS model estimates explained by the poverty gap stated that an increase in the female-dominant workforce leads to an increased propensity for households to fall into poverty, in contrast, the OLS model estimate explained by the poverty gap squared stated that the utilization of female workforce in addition to male workforce increases the overall productivity and thus reduces poverty. The lack of female workforce involvement in traditional cultivations of short-term and long-term production contributes to

inefficiency and a greater likelihood of households falling into poverty. The persistence of gender disparities in the workforce could be attributed to personal preferences based on social norms, as suggested by the progressive social theory and the cycle theory of poverty.

The research findings of Musgrove in the year 1980, Visaria in the year 1977, and Van de Walle, Dominique, and Martin in the year 1992 stated that the relationship between household size and poverty is complex and can vary depending on various factors such as income, access to resources, and cultural norms. While previous research highlighted the impact of household size on poverty, the survey findings of the author provide a different perspective on this issue in the context of the Mullaitivu District. The OLS model estimate explained by the poverty gap suggested that an increase in family members reduces the level of poverty, which is contrary to the findings of previous research. This could be due to the fact that larger families in the Mullaitivu District often have access to more resources, such as land and labor, which could increase their income and reduce their poverty level. On the other hand, the OLS model estimate explained by the poverty gap squared indicates that an increase in the number of family members raises the level of poverty within the household. This is due to the fact that larger families often incur increased costs, notably in aspects like childcare and schooling, which could overstretch their budget and deepen their level of poverty. The argument presented by the author is consistent with both individualistic and cyclic theories of poverty, as it suggests that poverty can be both a result of individual choices and circumstances as well as broader structural and systemic factors that perpetuate poverty over time.

As per the findings of Amarasinghe Samad, and Anputhas in the year 2005, resource availability as land, capital, and labour influences poverty. The findings of Amarasinghe, Samad, and Anputhas in the year 2005 are supported by the survey findings of the author. Mullaitivu possesses a sufficient scale of land reserves that are either unutilized or underutilized. There are a significant number of households that possess a limited number of lands for cultivation. Due to the limited land reserves, a considerable proportion of households pursue subsistence/small-scale agriculture. An increase in the land reserves results in the gradual transformation of subsistent farming into large-scale production. The assessment herein is explained by the geographical theory of poverty.

Musgrove (1980), Visaria (1977), Van de Walle, Dominique, and Martin (1992), Birdsall and Sabot (1991), Deaton and Paxson (1991), Ravallion, Gaurav, and Van de Walle (1991), argued that income/economic stability, in general, is bivariant that influences poverty. The literature findings limit the assessment of the expenditure toward the propensity to become poor. The survey findings of the author highlight the importance of agricultural expenditure towards poverty. In line with the survey findings, an increase in farming expenditure that includes the cost of labour, raw materials, and other miscellaneous expenses in pre-harvest, harvest, and post-harvest results in the gradual decrease of the poverty gap. The progressive growth in agricultural expenditure represents an increase in cultivation, which improves the avenues for revenue creation and keeps households from falling into poverty. The influence of agricultural expenditure on poverty can be argued further using the progressive social theory and cyclic theory of poverty.

Birdsall and Sabot (1991), and Osmani (1991) argued, that gender, caste, or ethnic group impact productivity and poverty among individuals and communities. Previous literature is consistent with the author's survey findings. The survey mainly argued that the caste system within the households in Mullaitivu shows a substantial relationship with the households' proclivity to fall into poverty. Households based on the caste system are granted restricted privileges such as the allocation of water from irrigation sources, particularly during the Yala season, financial assistance from Samurdhi, fertilizers and seedlings from agricultural outlets within the village, and so on. The practice is an unwritten paradigm that exists within the territories of the Mullaitivu District. The progressive rise of low caste members, notably Koviar, Nalavar, Pallar, and Vannar, results in a subsequent increase in the poverty gap square; the family will fall farther into poverty. Farming households are being deprived of opportunities due to the social stigma of discrimination and inequality. Hence, this clearly explains the progressive social theory of poverty.

6. Conclusion

In summary, the research examining the nexus between socioeconomic aspects and poverty reduction in Sri Lanka's Northern Province revealed intriguing findings based on survey data from 300 farming households. The study employed both OLS model estimates and Probit Model analysis to determine key factors that are significantly related to poverty, including farming expenses, crop variety, land size, water access, modern technology, gender, caste, and the number of family members.

The study findings conclude that adequate investment in education, job creation, income diversification, and improvements in healthcare and housing alleviate poverty in war-affected areas within a developing economy like Sri Lanka. Moreover, the findings suggest that factors such as a reliance on long-term crops, water scarcity, inadequate or inefficient use of land and technology, and an unstructured female workforce contribute to a higher risk of poverty.

The research provides insights into the complex interplay between socioeconomic factors and poverty alleviation in the Northern Province of Sri Lanka. By understanding these factors and developing targeted policies and programs, it is possible to make significant progress toward poverty reduction in war-affected regions across any developing economy.

7. Implications

The poverty gap and the propensity to become poor can be reduced through various means. Initially, the Grama Niladhari Divisions [GND] across each Divisional Secretariat [DS] need to initiate community development practices to alleviate poverty across farming households. The poor need to be pushed with human capital development and communal self-support focused on the importance of choices in agricultural practices. Introducing manufacturers of cutting-edge technology to local industries in each GND should be a priority, and ongoing training workshops for farming households are essential to highlight the impact of these technologies on poverty reduction. In addition, these zones should undergo strategic enterprise initiatives, including redevelopment and the implementation of tax-based incentives to bolster the local economy. Finally, private investments can be channeled by

emphasizing the importance of the impenetrability of the economy. The theoretical application can be made in a way that social movements can exert pressure on the vulnerable parts of the system and force change to occur; create and develop alternate industries, medical care, and facilities within the market that have access, openness, innovation, and a willingness to serve the poor in order to gain wellbeing; attract more private investment by emphasizing the importance of available resources whichever are under/un-utilized; finally, changes to be implemented in the fiscal, supply side and monetary policies to eradicate poverty from its grassroots level.

Acknowledgment

This paper benefited from the helpful comments from the Professors and Senior Lecturers from the University of Sri Jayewardenepura. The author would extend sincere gratitude towards the employees from the Provincial Council of Mullaitivu District, and the Divisional Secretariat of Thunukai, for their unwavering assistance in making the survey a success. Also, the author extends his gratefulness to all the other stakeholders who contributed toward making the survey much more successful.

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