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EDITORIAL NOTE

With great pleasure, the Sri Lanka Journal of Social Sciences and Humanities (SLJSSH) announces the publication of its 1st issue of Volume 3. SLJSSH is a multi-disciplinary and bi-annual journal aimed at promoting research studies in Social Sciences and Humanities. The journal attracts submissions from scholars focusing on theoretical, empirical, policy, and practitioner issues within the fields of Social Sciences and Humanities. The journal expects to encourage publication from different research streams that help enrich the discourse with a global audience and interact with experts across the social science community and beyond. All articles are subject to a rigorous double-blind peer-review process followed by thorough scrutiny by the Editorial Board to ensure high academic and research standards prior to the final publication.

By any measurable standard, our exclusive journal has been successful. SLJSSH is a cited journal in the Sri Lanka Journal Online, the journal database published in Sri Lanka by the National Science Foundation (NSF). We have seen a steady increase in readership, article submissions, and citations to our published articles. Our reputation and visibility in the academic community continue to broaden, and our editorial board constantly reassesses and revises the editorial process to ensure the most efficient and satisfying experience for both authors and staff. It is due to the support of our faculty advisors, our editorial staff's hard work, and our readers' interest. We could reach this stage through the constant guidance of the Editorial Board and the intellectual support of the readers and contributors.

I would like to acknowledge with gratitude the support of the Accelerating Higher Education Expansion and Development (AHEAD) Project for fostering collaborative research culture among the students and staff in the Faculty of Social Sciences and Languages, Sabaragamuwa University of Sri Lanka by providing funds for publication. Thanks to the Coordinating Editor, the Editorial Board, the reviewers, and the Text-Editor for generously giving their time and expertise. On a final note, the papers that you submitted, either individually or collaboratively, are much appreciated and have made a substantial contribution to the early development and success of the journal. Best wishes and thank you in advance for your contribution to the Journal.

Prof. H.M.S. Priyanath
Editor in Chief
The Sri Lanka Journal of Social Sciences and Humanities

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PANEL OF REVIEWERS

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Impact of Moonlighting on the Earning Differentials in Sri Lanka

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Abstract

Holding more than one job is called moonlighting. This creates both positive and negative impacts on individual workers as well as on the economy. This paper limits itself only to the impacts on the individual worker. This study examines the impacts of moonlighting on workers' per-hour total earnings and wage differentials. The Sri Lanka Labour Force Survey conducted by the Department of Census and Statistics of Sri Lanka in 2017 has been used for the study. The study uses 28,671 employed persons, and 2,351 are holding secondary employment. The Endogenous switching regression model has been used for the analysis. The Endogenous switching regression allows the comparison of the factors associated with total log-hourly earnings between moonlighters and non-moonlighters with and without moonlighting. Moonlighters are generally a disadvantaged group when compared with non-moonlighters. However, moonlighting facilitates the reduction of the wage gap between moonlighters and non-moonlighters. Moonlighting by moonlighters and moonlighting by non-moonlighters are economically optimal solutions for both groups. Therefore, it is evident that moonlighting has increased economic welfare. Further, it reduces wage disparities among workers in terms of ethnic groups and gender and thus leading to increased gender and ethnic welfare, while it causes to expand earning disparities by residential sectors leading to reduce their economic welfare. Creating formal opportunities for moonlighting, encouraging moonlighting among females, minor ethnic groups etc. Through micro-financing programmes would be important policy options for empowering vulnerable groups in the labour market of Sri Lanka, according to the findings of this study.

Keywords: Earnings, Economic Welfare, Labour Market, Moonlighting, Wage Differentials.

INTRODUCTION

The rapid ageing of the population with the demographic transition will cause a limitation of the labour supply shortly [after ending the population bonus in 2017 (de Silva, 2012)] creating a major incentive for holding multiple jobs in one individual. Economic literature describes this phenomenon as "moonlighting" (Shishko & Rostker, 1976). Moonlighting by an individual is a common practice (Wisniewski & Kleine, 1984) in both developed and developing regions today. That is considerably visible in advanced economies (Conen & Beer, 2021). The average rate of secondary job holding in Sri Lanka is 8.4 percent of employed persons in 2017 (LFS, 2017). Moonlighting causes to expand the capacity of the labour force and achieves greater development, since traditional growth theories argue that a higher labour input would enhance both production and productivity of the country while it records a considerable amount of microeconomic implications on economic agents.

The motive of earning extra income is one of the key reasons for moonlighting to ensure income and employment security as Bronfenbrenner & Mossin (1967) proposed to challenge the classical argument towards moonlighting dealing with the hours-constrained motive occurred as a result of insufficient working hours (Perlman,1966). Moonlighting behaviour is also highly sensitive to the

business cycles since they are a short-term shock absorber for the trade cycle effect (Partridge, 2002). It generally increases in an economic boom since it creates more temporary, casual, and contractual employment opportunities. Moonlighting can either increase or decrease in an economic recession due to the added worker effect or the discouraged worker effects. If added worker effect is more predominant, moonlighting would be enhanced since it encourages the spouse to enter the labour market even for part-time employment opportunities.

Sri Lanka is also currently facing the most severe economic crisis ever faced in history, with two-digit inflation leading to a deep currency deprivation and the reduction of the real wages of employees. According to the neo-classical labour leisure model, reducing real wages will increase the labour supply since it shrinks their purchasing power. Growing inflation (Culler & Bazzoli, 1985), unemployment (Alden, 1971), and wage rates (Krishnan, 1990; Heineck, 2009; Böheim & Taylor, 2004; Culler & Bazzoli, 1985; Dickey et al, 2009; Smith & Cooper, 1967; Van der Gaag et al,1989) are identified as financial factors associated with moonlighting literature. Moonlighting creates opportunities for the employees based on their availability of time, skills and capacities and the flexibility in their work schedules in addition to the financial requirements.

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Since most employers are also facing an economic crisis, they are cutting overtime work hours in the primary job during the period of recession (Kaufman, 2003). This encourages workers to find extra working opportunities to reduce their income insecurity and protect their living standards. However, this could lead to the creation of income inequalities in the economy through enhancing wage differentials.

Although there are several studies on secondary job holding in Sri Lanka in the aspect of identifying the determinants of moonlighting, very few studies have paid attention to their impact on the different aspects including the standard of living, economic growth, inequality spillover effects between primary and secondary occupation and total welfare of employees. Stokke, et al. (1991) have conducted a study on "Growth linkages, the non-farm sector and rural inequality: A study of Southern Sri Lanka" with a specific focus on the implications of rural social stratification on consumption and the non-farm activities in the Katuwana-Weeraketiya area of the Hambantota District in Sri Lanka in 1988. The study found that a higher level of consumption, construction activities; education and food expenditure is recorded in families mixing farm and non-farm activities than among other farmers in Hambantota. Therefore, moonlighting among farmers increases the level of consumption of both durable (housing) and non-durable goods (food) and education investments. According to Ranasinghe (2005), moonlighting among workers increases the rate of return to human capital. Studying the impact of moonlighting on the Sri Lankan economy is more significant in the aspect of policy formation in the labour market rather than studying the factors associated with moonlighting. Hence, the scope of this study is to seek the impacts of moonlighting on the earning capacity of workers due to the changing total per-hour earnings of workers and wage differentials. This study further elaborates on the impacts of moonlighting on various wage disparities between groups by gender, ethnicity and residential sector.

LITERATURE REVIEW

Moonlighting is a way of enhancing labour supply. Increasing labour supply will increase total production, according to Adam Smith (1776, cited in Spengler, 1959, p.398). On the other hand, moonlighting positively affects growth through labour productivity enhancement, thus leading to greater economic growth in the country. Moonlighting was theoretically explained by Perlman in 1966 based on traditional microeconomic theories and he conveyed underemployment as the key reason for moonlighting aligned with the classical argument. Bronfenbrenner and Mossin (1967) rejected the idea of Perlman (1966) and suggested that moonlighting is based on a moonlighting wage. They used the term 'moonlighting wage' for the wage of the second job in 1967. Sherman and Willett (1968) explained that moonlighting increases with a shortening work-week only if the wage of the primary occupation is not changed. A shorter work week is used to reduce the total hours of work of the current labour force as a method of reducing hard-core unemployment (Sherman & Willett, 1968). Under the same situation, moonlighting will reduce if the primary wage increases with no change in the work-week or moonlighting wage. If the marginal hourly rate of the primary job increases than the moonlighting wage, the worker's moonlighting will reduce and the primary hours will also reduce the labour supply. Perlman (1968) attempts to generalize the analysis of Bronfenbrenner and Mossin

(1967) and Sherman Willett (1968) by specifying the conditions of the increase or the decrease of labour supply with moonlighting. A significant benchmark in the theoretical literature on moonlighting is the work by Shishko & Rostker (1976), which made the first effort to combine the microeconomic theory on moonlighting with the demographic characteristics of a moonlighter. Therefore, the 'Economics of Multiple Job Holding' by Shishko & Rostker (1976) is identified as a key theoretical contribution to explaining moonlighting. Most of the theoretical contributions have discussed the purpose of moonlighting and they have identified four key theoretical motives for moonlighting. Hours constrained motive which explained moonlighting as a result of the underutilization of workers in the primary job (Shishko & Rostker,1976; Krishnan,1990; Kimmel & Conway,1995), financial motive which explained the tendency for moonlighting for additional financial requirements (Guariglia & Kim, 2004; Renna & Oaxaca, 2006; Asravor,2021), heterogeneous jobs motive which explains the moonlighting to perform different interest, skills and human capital attainment (Conway & Kimmel,1992;) and the flexibility motive (Conen & Buschoff, 2021; Longden & Throsby, 2021) which explains the possibility of engaging secondary employment due to the freedom of work schedules being the key four motives for moonlighting. Piasna et al (2021) have found that the key motive of multiple job holding is the quality of primary employment which covers six dimensions of income, flexibility, control of working time, job security, work pressure, unsocial hours, skills and autonomy which covers many of the above aspects. In addition, government tax policies also make a considerable impact on the multiple job holdings of workers (Tazhitdinova, 2022).

The impact of moonlighting on individuals, families, primary organizations, secondary organizations and the country was explained in the literature and each of them made an impact on the well-being of the workers. Most of the impacts are dealing with the earnings of workers and that explains the welfare of the individual and the family achieved as a result of secondary job holding. Earning from moonlighting could lead to an uplift in the living standards of workers while it could even lead to inequalities in wages.

Compensation wage differentials were initially explained by Adam Smith in "An Inquiry Into the Nature and Causes of the Wealth of Nations" (1776), and he proposed the importance of keeping higher wages to motivate workers in high-risk employment with physical and mental harm and job insecurity (in HomRoy,2016.p.1). If job insecurity is high, wages should be high but that is not practised in most of the employments in the informal sector. Workers can take over a second job to increase compensation.

According to the literature review, moonlighting would create both positive and negative impacts on the economic profile (Pietro & Speckesser (2007) and on the socio-demographic and health profile of workers (Raffel and Groff, 1990). Increasing earnings or uplifting living standards, obtaining job training, full capacity utilisation of workers' time or skills and having flexible work schedules are important positive impacts of moonlighting relating to the individual's economic background.

Most of the empirical literature supports the positive impacts of moonlighting on individual earnings and living standards (Betts, 2004; Betts, 2005; Hamersma & Heinrich, 2010). There is a higher rate of return to education for employees with two jobs than for employees with one job

(Pietro & Speckesser, 2007). Earnings from primary employment become less significant if the worker gets a higher moonlighting income (Betts, 2005). For example, physicians with a dual practice report a higher proportion of their total income from private practice (Ferrinho, et al., 2004).

Moonlighting further provides job training in different disciplines to workers and changes their perceptions, decisions and behaviours, which could influence their performance according to Betts (2004). Van der Gaag, et al. (1989) also found that moonlighting increases the vocational training of the worker. Eggleston & Bir (2006) have found that moonlighting extracts the full effort of the worker and increases the worker's level of expectations regarding the future.

Moonlighting leads to more flexible working schedules, according to Stinson (1986 cited in Averett, 2001, p.1391). Moonlighters not only have flex-time schedules but also shorter workweek arrangements than non-moonlighters, according to Jamal & Crawford (1981).

Larger impacts of moonlighting on socio, health and psychological problems of workers have been identified in previous studies such as job and workload dissatisfaction [Pearson, et al. (1994)], physical well-being [Ala-Mursula et al.(2006); Wisniewski & Kleine (1984) and Jamal & Crawford (1981)], psychological health/stress, psychosomatic complaints, psychosocial job strain (Bokemeier & Maurer, 1987), reducing fertility or childlessness [Bokemeier & Maurer(1987)] and negative spillover from work to family [Wisniewski & Kleine (1984) and Grzywacz, et al. (2002)] and family to work [Barnett, Marshall, & Pleck (1992); Burke (1989); Higgins, Duxbury & Irving (1992); Goff, Mount & Jamison (1990) cited in Hill, et al. (2001), p.50]. These areas have not been covered in detail by this research due to limitations of data availability and the yet earning profiles (the rate of returns) of workers have become the key focus of the study.

The impact of moonlighting on the rate of returns of the worker is derived using the earning function introduced by Mincer (1974), where it is assumed that changes in earnings over the life cycle have a quadratic function of years of experience as given in Equation 1.

$$\ln Y = \ln Y_o + \alpha_1 S + \alpha_2 X + \alpha_3 X^2 \qquad (1)$$

Factors associated with earnings from secondary jobs were identified in the literature review and the same factors have been included in the model determining the factors associated with the total earnings of the workers. Age (Foley, 1997; Frederiksen, et al., 2001; Gagliarducci, et al., 2010), gender (Foley, 1997; Gagliarducci, et al., 2010; Culler & Bazzoli, 1985), race/ethnicity (Krishnan, 1990; Himaz & Aturupane, 2012), residential sector (Himaz and Aturupane, 2012), and the nature of main occupation (Frederiksen, et al., 2001; Foley, 1997) have been identified as the other important factors with earnings. Age has been omitted since age has a strong correlation with years of experience. Finally, the earning function calculated in this study is estimated using the following earning function (Equation 2).

$$\ln Y = \ln Y_o + \alpha_1 S + \alpha_2 X + \alpha_3 X^2 + \alpha_5 G + \alpha_6 E + \alpha_7 RS + \alpha_8 O \qquad (2)$$

Where M is moonlighting, G is gender (being female), E is ethnicity, RS is residential sector and O is the occupation category. The Econometric model was developed based on Equation 2.

METHODOLOGY

The study is mainly based on secondary data. The Econometric Model specification based on the literature review, data, data source and data transformation is explained in Sections given below.

Econometric Specification

The endogenous switching regression model (Van der Gaag et al., 1989) and Oaxaca and Blinder decomposition methods (Averett, 2001) have been adopted in previous studies to observe the impact of moonlighting on wage differentials. The impact of public-private wage differentials on moonlighting decision-making has been derived by Van der Gaag et al. (1989) using the Endogenous Switching regression model. Conway & Kimmel (1998) have used the switching regression model in their study on "Male labour supply estimates and the decision to moonlight" to observe the differences in the hours of work put in by moonlighters who are motivated by the 'hours-constraint' motive and the heterogeneous job motive. The endogenous switching regression model is the approach used for the purpose of comparison of per-hour earnings between moonlighters and non-moonlighters under different conditions of moonlighting in the current study. Moonlighting is not a random behaviour. Therefore, moonlighting vs. Non-Moonlighting is a non-random allocation which leads to selectivity bias. This allows us to adjust it and compare between two groups on earnings.

The Endogenous Switching regression model has been used to compare the total per hour earning functions for moonlighters with those of the non-moonlighters to understand the impact of moonlighting on economic well-being while using the same explanatory variables given in Equation 2, except the variable on moonlighting. Total earning covers both earnings from the primary occupation and the secondary occupation.

Nature of occupation (O) was included in the model through two variables of being non-professional (P) and representing informal sector employment (F). This model allows for fitting binary and the continuous part of the regression simultaneously yielding consistent standard errors. Joint normality of the error terms in the binary and continuous equations is realised by this model (Lokshin and Sajaia, 2004; Leung et al., 2008). The following model describes the differences in the rate of return constraint to moonlighting behaviour. The following selection model explains the individual worker's choices for joining a secondary job and their rate of returns with and without holding secondary jobs).

If $\gamma^T Z_i + u_i > 0$ individual worker i chooses to moonlight which is described by $M_i = 1$

If $\gamma^T Z_i + u_i \leq 0$ individual worker i does not choose to moonlight which is described by $M_i = 0$

Regime1: $\ln y_{1i} = \alpha_1^T X_{1i} + \varepsilon_{1i}$ if $M_i = 1$ (3)

Regime2: $\ln y_{0i} = \alpha_0^T X_{0i} + \varepsilon_{0i}$ if $M_i = 0$ (4)

Where X_{1i} and X_{0i} are a vector of independent variables that affect the worker's decision-making to moonlight; $\ln y_{1i}$ and $\ln y_{0i}$ are dependent variables measuring earnings of moonlighters and non-moonlighters. α_1 and are vectors of parameters to be estimated. u_i, ε_{1i} and ε_{0i} are random error terms that follow a trivariate normal distribution.

After estimating the above parameters, post-estimations of switching regression are derived as follows:

$$xb_{1i} = E(\ln y_{1i}|x_{1i}) = x_{1i}\alpha_1^T \tag{5}$$

$$xb_{0i} = E(\ln y_{0i}|x_{0i}) = x_{0i}\alpha_0^T \tag{6}$$

$$yc_{1\_1i} = E(\ln y_{1i}|M_i=1, x_{1i}) = x_{1i}\alpha_1^T + \sigma_1\rho_1 f(\gamma^T Z_i)/F(\gamma^T Z_i) \tag{7}$$

$$yc_{1\_0i} = E(\ln y_{1i}|M_i=0, x_{1i}) = x_{1i}\alpha_i^T - \sigma_1\rho_1 f(\gamma^T Z_i)/\{1-F(\gamma^T Z_i)\} \tag{8}$$

$$yc_{0\_1i} = E(\ln y_{0i}|M_i=1, x_{0i}) = x_{0i}\alpha_0^T + \sigma_0\rho_0 f(\gamma^T Z_i)/F(\gamma^T Z_i) \tag{9}$$

$$yc_{0\_0i} = E(\ln y_{0i}|M_i=0, x_{0i}) = x_{0i}\alpha_0^T - \sigma_0\rho_0 f(\gamma^T Z_i)/\{1-F(\gamma^T Z_i)\} \tag{10}$$

Where x_{1i} denotes all explanatory variables for moonlighters, x_{0i} denotes all explanatory variables for non-moonlighters.

xb_{1i} represents the unconditional expectation of log per hour earning for moonlighters; xb_{0i} represents the unconditional expectation of log per hour earning for non-moonlighters, yc_{1_1i} represents the conditional expectations of log per hour earning of moonlighters with moonlighting; yc_{1_0i} represents the conditional expectations of log per hour earning of moonlighters without moonlighting; yc_{0_1i} represents the conditional expectations of log per hour earning of non-moonlighters with moonlighting; yc_{0_0i} represents the conditional expectations of log per hour earning of non-moonlighters

without moonlighting; σ_1 and σ_0 denotes standard errors of ε_{1i} and ε_{0i}. ρ_1 denotes the correlation coefficient between ε_{1i} and u_i, while ρ_0 = correlation coefficient between ε_{0i} and *μi*. f(.) denotes a normal density function and *F[.]* cumulative normal distribution (Leung, et al., 2008; Samaraweera and Wijesingha, 2021).

Switching regression is derived using the *move stay* command (Lokshin & Sajaia, 2004) in *stata* and that is not supported by *svy* command with *vce* (linearised). Therefore, sample weights are not applied in the switching regression model.

Data, Data Source and Data Transformation

The Empirical analysis of this study is based on the data available from the Sri Lanka Labour Force Survey conducted by the Department of Census and Statistics in 2017. Altogether, the survey has covered 83,818 individuals. From this number 20,373 cases below 15 years were dropped and 65 observations with special education were also dropped due to the issues of calculating a common formula for years of education. Missing observations for log earnings were dropped and 33,582 cases were dropped. The sample with log hourly earnings was 29,798 and 1,127 (664 lower cases and 463 upper cases) cases with extreme values identified in terms of the Letter Values of Stem and Leaf charts in STATA were also dropped, leaving 28,671 employees for the final analysis. Out of this number, 2,351 workers were moonlighters. The number of years of work experience is not given in the labour force survey schedule. Therefore, following Mincer (1974), the experience was calculated using age and the number of years of education instead.

MODEL ESTIMATION AND EMPIRICAL RESULTS

The main objective of this study is to explore the effect of moonlighting on the observable wage differentials such as Gender, Ethnic and Urban-non-urban gaps in labour income in Sri Lanka.

Descriptive Statistics of the variables used in the analysis are given in Table 1.

Table 1. Descriptive Statistics for the Variables of Endogenous Switching Regression

Variable	Moonlighters (2351)		Non-Moonlighters (26320)		Total (28671)	
	Mean/ Proportion	Std. Dev.	Mean/ Proportion	Std. Dev.	Mean/ proportion	Std. Dev.
Moonlighting					0.082	0.274
Log Total Hourly earnings	5.107	0.766	4.698	0.682	4.732	0.698
Years of education	8.894	3.709	9.633	3.639	9.572	3.650
Years of experience	32.415	13.087	27.953	15.261	28.319	15.144
Experience square/100	12.219	8.996	10.143	9.561	10.313	9.533
being a female (d)	0.217	0.413	0.322	0.467	0.314	0.464
being non-Sinhalese (d)	0.155	0.362	0.273	0.446	0.264	0.441
being non-urban (d)	0.933	0.250	0.828	0.378	0.836	0.370
being non Professional (d)	0.886	0.317	0.856	0.351	0.859	0.348
Being an informal sector worker (d)	0.715	0.452	0.543	0.498	0.557	0.497
Being married (d)	0.926	0.263	0.809	0.393	0.818	0.386
Living in Western Province (d)	0.898	0.303	0.735	0.441	0.748	0.434

Note: Estimated using Sri Lanka Labour Force Survey in 2017. Means were calculated for continuous variables while the proportion was calculated for dummy variables.

Endogenous Switching regression results are summarized in Table 2. In terms of the LR test and individual *z-values*, the model performs well. Individual regression coefficients in two earnings functions and the selection equation are statistically significant at different levels of significance. All the coefficients are with the expected signs.

As the main objective of this study is to examine the effects of moonlighting on determining the wage gaps between various sub-groups, the remaining paragraphs of this section emphasise only the coefficients relevant to understanding the wage gaps.

The regression results reported in Table 2 have five dummy variables measuring wage gaps; Gender (Female = 1), Ethnicity (Non-Sinhala = 1), Residence (Non-Urban =1), Professional (non-professional = 1) and employment Sector (informal = 1).

According to the Switching Regression model (Table 2), a comparison of the log-hourly earnings between moonlighters and non-moonlighters reveals that the hourly rate of returns to education is positive for both moonlighters and non-moonlighters. Human capital investments are evaluated in the wage-setting process of both primary and secondary employment. Secondary employment should compensate a sufficient amount of payment that covers the reservation wage rate for accepting a moonlighting opportunity. Therefore, a significant gap was not recorded between the two coefficients of education for moonlighters and non-moonlighters.

The years of experience caused to increase in the hourly earnings among both moonlighters and non-moonlighters to increase at a decreasing rate. The decreasing rate is higher for moonlighters than for non-moonlighters.

Being female has a significant negative relationship with the hourly earnings of both moonlighters and non-moonlighters, while the coefficient is higher for moonlighters. As a result of the discontinuous pattern of labour force participation of women due to marriage, childbirth and child caring, their earning profiles take a flatter slope than that of men. According to Mincer and Polachek (1974 cited in Kaufman & Hotchkiss, 2003, p.290), women accumulate smaller amounts of training compared to men due to the expectation of dropping out of the labour force during their childbearing stage. Females are attracted more towards low-pay secondary jobs because their human capital is relatively poor. Generally, the labour force participation rate of females has shown a slight increase from 35.7 percent in 2006 to 36.6 percent in 2017. Only one-third of females are economically active in Sri Lanka. The majority of unpaid family workers (72.6 percent in 2006 and 78.9 percent in 2017) are females, showing the involvement of females in low-paid employment even in their primary jobs (LFS report, 2006 and 2017). The wage rates of males are higher than that of females in the informal sector. For example, the average daily wage rates for females in the agricultural sector are lower than that of males, according to the Central Bank of Sri Lanka (CBSL, 2014). Hence, the

secondary job held by female workers is lower than that of males. They expect more flexibility from the secondary occupation since they need to balance work with family activities as explained in the family life course theory (Grzywacz, et al., 2002). This causes even more reductions in the wages paid to females in their secondary jobs.

Being a non-Sinhalese is a factor that reduces the hourly earnings of both moonlighters and non-moonlighters (in line with Himaz and Aturupane, 2012). This could be affected by wage discrimination based on race. Poor human capital and management barriers are serious issues even in secondary occupations since most of them are flexible and informal work arrangements.

Moonlighting is relatively lower in the urban sector than in the non-urban and low rates of moonlighting create a push-up effect on wages in the urban sector. Being a non-urban worker causes a decrease in the hourly earnings of both moonlighters and non-moonlighters. Most of the jobs in the urban sector are based on non-agricultural work while agricultural work is prominent in the non-urban sectors. Wages in non-agro-based employment are relatively higher than the wages in non-agricultural jobs. This too can increase wages in the urban sector more than in the non-urban sector.

Professional qualification is a factor that has a significant relationship with the hourly earnings of moonlighters and non-moonlighters. Non-professionals have a significant negative relationship with earnings for both moonlighters and non-moonlighters. Professionals show the opposite of this. Professionals possess expert labour and the number of available professionals is limited. Professional labour cannot be substituted for by newcomers joining the labour market. Therefore, moonlighting provides an opportunity for full capacity utilization of professionals (Eggleston & Bir, 2006). They can select the opportunities that offer higher pecuniary benefits leading to higher earnings in the secondary occupation. Professionals are sufficiently compensated by both the primary and secondary markets, so the economic welfare of professionals increases with moonlighting.

Having informal sector employment has a significant negative relationship with the earnings of both moonlighters and non-moonlighters. Hourly earnings are a bit higher for moonlighters than the non-moonlighters, indicating that moonlighting provides relatively higher hourly earnings to the workers representing the informal sector.

According to the selection function of the Switching regression model, years of experience, being in the informal sector , being non-urban, being married and being in a province other than the Western are factors that have a significant positive relationship with moonlighting, while years of education, being female, being non-Sinhalese, being non-professional have significant negative relationships with moonlighting decision making.

Table 2. Endogenous Switching Regression Model for Log per Hour Earnings

Variable	Log Per Hour Earning for Moonlighters		Log Per Hour Earning for Non-Moonlighters	
	Coefficient	SE	Coefficient	SE
Years of Education	0.039	0.005	0.048	0.001
Years of Experience	0.030	0.006	0.021	0.001
Years of Experience Square /100	-0.048	0.008	-0.032	0.001
Being Female (d)	-0.514	0.039	-0.334	0.008
Being Non-Sinhalese (d)	-0.252	0.048	-0.083	0.009
Being Non-Urban (d)	-0.235	0.066	-0.158	0.010
Being a Non-Professional (d)	-0.430	0.050	-0.319	0.011
Being in the informal sector (d)	-0.167	0.038	-0.229	0.008
Constant	4.821	0.260	4.661	0.028
Selection: Moonlighting				
Years of Education	-0.002	0.004		
Years of Experience	0.040	0.004		
Years of Experience Square /100	-0.056	0.005		
Being Female (d)	-0.244	0.026		
Being Non-Sinhalese (d)	-0.415	0.029		
Being Non-Urban (d)	0.217	0.041		
Being a Non-Professional (d)	-0.083	0.037		
Being in the informal sector (d)	0.228	0.026		
Never being married (d)	0.203	0.044		
Being in a province other than Western (d)	0.530	0.034		
Constant	-2.663	0.096		
/lns0	-0.527	0.005		
/lns1	-0.344	0.036		
/r0	0.177	0.056		
/r1	0.353	0.121		
sigma0	0.591	0.003		
sigma1	0.709	0.026		
rho0	0.175	0.054		
rho1	0.339	0.108		
LR test of indep.eqns:	chi2(2)=16.8	Prob>chi2=0.0003		

Notes:

N =28671, Dependent variable: Log per hour earning for employees

(d) Indicates dummy variables. The omitted categories in earning functions: Omitted categories: male, Sinhalese, urban, professional, formal sector

The omitted categories for selection function: Omitted categories: male, Sinhalese, urban, professional, formal sector, never married and is in Western Province

Estimated using Quarterly Labour Force Survey 2017. Sample weights are not used since *movestay* command is not supported by *svy* command in *stata*.

Selection bias was addressed after selecting employed persons. Earlier selections for labour force participation or being employed were not addressed to simplify the model. Therefore, selection biases at the initial stages are allowed in the estimates.

Svy command in stata is used to make estimations based on population by taking the inflation factor into account. In this command, the Variance Covariance Matrix of the estimated coefficients is linearized. The Movestay command for switching regression does not facilitate for svy options.

Years of Experiences = Age – (Years of education+5)

Table 3. The Mean Values of Conditional Predictions of Log Per Hour Earning Distinguished by Gender, Ethnicity and Residential Sector

Calculations of the expected means of log total hourly earnings (Rs)	Total	Sex		Ethnicity		Residential sector	
		Male (Rs)	Female (Rs)	Sinhal ese (Rs)	Non-Sinhale se (Rs)	Urban (Rs)	Non-Urban (Rs)
Conditional expectations of log per hour earning of moonlighters with moonlighting	165.23	178.00	126.38	168.50	148.47	265.10	159.70
Conditional expectations of log per hour earning of moonlighters without moonlighting	102.77	116.61	78.80	110.48	84.80	137.87	96.67
Conditional expectations of log per hour earning of non-moonlighters with moonlighting	129.05	134.76	110.42	129.49	126.63	190.72	125.47
Conditional expectations of log per hour earning of non-moonlighters without moonlighting	109.73	117.65	94.77	113.76	99.70	140.09	104.29

Note: Post estimations are derived using endogenous switching regression model for log per hour earnings in Table 2.

According to Table 3, moonlighting is more economically beneficial than non-moonlighting for both moonlighters and non-moonlighters because it leads to the increased economic well-being of workers through increased hourly earnings. Conditionally, both moonlighters and non-moonlighters earn higher earnings if they engage in moonlighting. If moonlighters moonlight then their earnings would be higher than the earnings they receive without engaging in moonlighting. Similarly, if non-moonlighters moonlight, then their earnings would be higher than the earnings they receive when they do not engage in moonlighting. This is common for males and females, Sinhalese and non-Sinhalese as well as urban and non-urban workers. This further proves that moonlighting is an optimal solution for both moonlighters and non-moonlighters.

If existing working conditions are to continue, the non-moonlighters would enjoy higher economic well-being than the moonlighters according to the hourly wage rates of workers (Table 3). If moonlighters quit moonlighting, they would be economically worse off and the highest welfare reduction would be recorded for them. Therefore, encouraging moonlighters to continue moonlighting would increase the economic well-being of workers [See, *inter alia* Betts, 2004; Betts, 2005; Hamersma & Heinrich, 2010)].

Gender, ethnic and residential disparities in hourly wages are further considered to understand the impact of moonlighting on economic well-being based on hourly wage ratios given in Table 3. In terms of gender (using Wage ratio = Hourly Male Wage/Hourly Female Wage), moonlighting causes gender disparities to reduce, indicating positive implications for economic welfare. Gender disparities in earnings decrease with moonlighting

for both moonlighters and non-moonlighters. Therefore, moonlighting is instrumental in reducing gender disparity in wages, leading to the increased gender-specific economic welfare of workers (Figure 1).

According to conditional predictions of hourly wages, ethnic disparities (using Wage ratio = Hourly wage of Sinhalese/Hourly wage of Non- Sinhalese) of hourly wages also reduces with moonlighting for both moonlighters and non-moonlighters, leading to an increase in the welfare for minority ethnic groups. Ethnicity-specific wage disparities reduce with moonlighting (Figure 2). Non-Sinhalese have few opportunities for moonlighting due to language barriers, poor human capital and management obligations (for plantation workers). Estate management imposes limitations on plantation workers to prevent them from engaging in work outside of the estate. They are entitled to estate accommodations only if they are working within the estate (Gunatilaka, 2013). Increasing the opportunities for them to enjoy secondary employment by removing such obligations would reduce the racial-specific discrimination of wages.

Residential wage disparities (using Wage ratio = Hourly wage of Urban workers/Hourly wage of Non- Urban Workers) have been further expanding between urban and non-urban working groups. Moonlighting opportunities in the urban sector are often based on non-agricultural work and as a result, the secondary wages in the urban sector are generally high. Since the available labour for secondary occupations is high in the non-urban sector, recruitment can easily be made at cheaper wage rates. The gaps between wages in urban and non-urban sectors are expanding due to these differences in secondary wages (Figure 3).

Figure 1: Gender-Specific Wage Differentials by Moonlighting
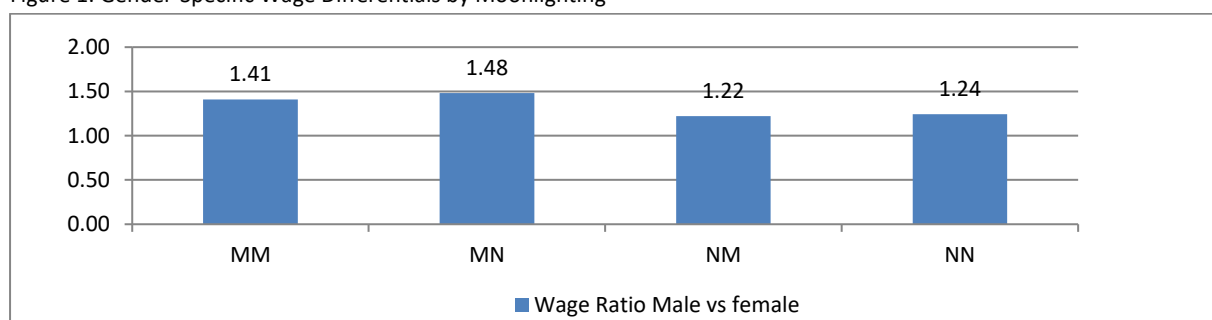
Note: MM- Moonlighters with Moonlighting, Moonlighters without Moonlighting, NM- Non-Moonlighters with Moonlighting, NN- Non-Moonlighters without Moonlighting

Figure 2: Ethnic-Specific Wage Differentials by Moonlighting
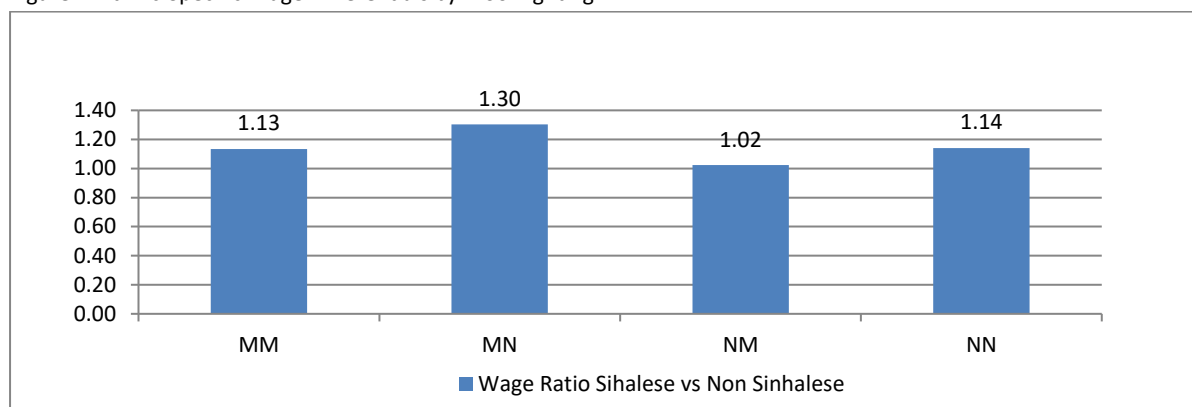
Note: MM- Moonlighters with Moonlighting, Moonlighters without Moonlighting, NM- Non-Moonlighters with Moonlighting, NN- Non-Moonlighters without Moonlighting

Figure 3: Residential Sector-Specific Wage Differentials by Moonlighting
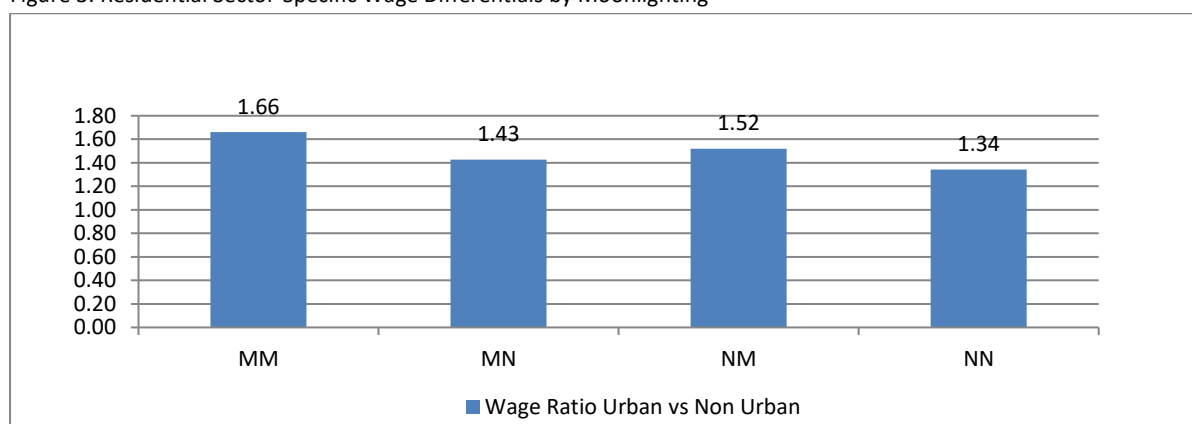
Note: MM- Moonlighters with Moonlighting, Moonlighters without Moonlighting, NM- Non-Moonlighters with Moonlighting, NN- Non-Moonlighters without Moonlighting

The overall economic well-being of workers increases with moonlighting due to increased hourly earnings and reduced gender and ethnic wage disparities in the country while it creates negative impacts through enhancing residential-specific wage differentials.

CONCLUSIONS

The study concludes that the rate of return to years of education is very similar for both moonlighters and non-moonlighters. Increasing the years of experience increases hourly earnings at a decreasing rate for both moonlighters and non-moonlighters. Females have a lower rate of returns than males for both moonlighters and non-moonlighters, thus showing gender-specific disparities in earnings. Being non-Sinhalese also has a significant negative relationship with earnings for both moonlighters and non-moonlighters. Non-urban residents have less hourly earnings for both moonlighters and non-moonlighters. If professionals are taken as a separate category, non-professional moonlighters have a lower rate of returns than non-professionals who are not moonlighting. Informal workers in general show the same trend.

The study compares the two conditions, with and without moonlighting for both moonlighters and non-moonlighters conditionally in post estimations of switching regression. At first, comparing the current conditions of moonlighters and non-moonlighters indicates that the hourly earnings of moonlighters with moonlighting are lower than the hourly earnings of non-moonlighters without moonlighting. Secondly, switching regression facilitates the application of moonlighting choice conditionally. Accordingly, the hourly earnings of moonlighters with moonlighting are higher than the hourly earnings of moonlighters without moonlighting. Further, the hourly earnings of non-moonlighters with moonlighting would be higher than the hourly earnings of non-moonlighters without moonlighting. Therefore, it is evident that moonlighting is an economically optimal solution for both moonlighters and non-moonlighters. Thus, the study concludes that moonlighting increases the economic well-being of workers.

Therefore, introducing moonlighting as an option of an employment portfolio would increase the economic well-being of both moonlighters and non-moonlighters. Self-employment assistance programmes as secondary earning opportunities could be used as a mechanism to improve their living standards. Moonlighting further contributes towards reducing gender and ethnic disparities in wages and thus increasing gender and ethnic-specific economic well-being while residential sector moonlighting causes to enhance wage differentials. Therefore, encouraging moonlighting among females through microfinancing programmes and rural development programmes will increase social welfare. Promoting women-targeted

women-targeted additional earning opportunities could be used as an empowering strategy for women. Not only introducing microfinance programmes but also creating proper marketing channels for their products would be an important mediation from the government.

Ethnic disparities in wages have been decreasing due to moonlighting, thus leading to positive social implications, as revealed by the wage ratios created using post-estimation of the switching regression. Language-promoting programmes for improving communication skills would be a good policy for improving their human capital and creating more moonlighting opportunities. Although the rate of moonlighting is high in the rural sector, especially in the agricultural sector, moonlighting earnings are relatively lower than in the urban sector. That gap could be reduced by encouraging moonlighting opportunities. Promoting non-agricultural moonlighting opportunities in the rural sector would reduce the wage disparities due to moonlighting between the urban and non-urban sectors.

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Factors Associated with Job Satisfaction among Government School Teachers in Nuwara- Eliya District of Sri Lanka

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Abstract

Job satisfaction among teachers has received immense importance in increasing the quality of education. Students' performance in schools will never be improved without teachers' commitment, effectiveness to work at school, and job satisfaction. The teachers in government schools in Sri Lanka are frustrated with their job. This study aims to examine the determinants of job satisfaction among teachers in government schools in Sri Lanka. The study was conducted in the Nuwara Eliya district. A sample of 352 teachers was selected using multi-stage stratified random sampling. Descriptive statistics, principal components factor analysis, and multiple binary logistic regression models were used in data analysis. Descriptive statistics show that most sample teachers are female (65%) and married (62%). The principal components factor analysis extracted two factors labeled as community factors and school factors from 13 dimensions describing teachers' job satisfaction based on eigenvalues. The multiple binary logistic regression model results indicate that community factors, school factors, gender, and educational qualification were significant in the model to explain the teachers' job satisfaction. Further, the odds ratio for community factors is greater than 1 and positively related to Teacher's job satisfaction. Similarly, School factors too have built a positive relationship. The model predicts the probability of being satisfied for the female is 0.52 while it is 0.21 for the male. The probability of being satisfied for degree holders is 0.02 while it is 0.52 for diplomatic teachers compared to trained teachers. It is concluded that attention should be paid to community factors and school factors to enhance the teachers' job satisfaction to improve the quality of education.

Keywords: Community factors, Factor analysis, Job satisfaction, School factors, Teachers

INTRODUCTION

Employees' job satisfaction is an essential concern in job performance, which leads to enhancing any organization's productivity. An employee's effective orientation towards his or her work is job satisfaction (Price, 2001). Job satisfaction is closely linked to an individual's behavior in the workplace (Davis & Nestrom, 1985). In the world context, the researchers have paid much attention to job satisfaction among different types of employees. Job satisfaction among teachers has received immense importance in increasing the quality of education. Today, education has become a valuable investment in human capital to achieve social and national development. A low level of education is liable for creating economic, socio-cultural, and environmental problems and directly affecting the development of a nation (Kappagode, 2013). Teachers play a dynamic role in education and the student's performance in schools will never be improved without teachers' commitment and effectiveness to work at school. Teachers' job satisfaction is essential for succeeding in qualitative education through effective involvement and true commitment to teaching. According to Kefalidou et al. 2015), the two main factors affecting educational improvement are teachers' job satisfaction and professional empowerment. In Sri Lanka, the government has been paying much attention to improving education standards at all levels.

However, educational performance associated with some exams in Sri Lanka is not satisfactory. Considering the performance of the G.C.E. Advanced Level examination, the most critical exam in the education system in Sri Lanka, the following table indicates evidence of malicious fluctuation in educational performance.

Table 1: Percentages with A3 and fail in all for G.C.E. Advance Level Examination

Year	2015	2016	2017	2018	2019	2020
A for All	2.83	3.05	3.62	2.25	3.12	2.90
Fail in All	8.64	8.36	8.21	8.34	8.91	8.64

Source: Department of examination, 2020

Table 1 shows the percentage of students having A 3 and failing in all for the G.C.E. Advanced Level examination from 2015 to 2020. It seems that the percentage of failing in all is much higher than the percentage of A for all. In addition, considering the performance of all candidates in the province in 2020, the Central province recorded 9.22% (Department of Examination, 2020) of students failing in all subjects. Enhancing educational performance is strongly related to teachers' job satisfaction. It is believed that for qualitative

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development in education, teachers' job satisfaction is an essential phenomenon (Yusuf et al., 2015). Identifying the factors affecting teacher job satisfaction is timely and nationally vital to guide the educational system to achieve its objectives. It is important in the effort to enhance the qualitative educational level. However, studies on determinants of teachers' job satisfaction are limited. The objective of this study is to identify the determinants of job satisfaction among teachers in government schools in Sri Lanka.

LITERATURE REVIEW

Job satisfaction is a combination of psychological, physiological, and environmental circumstances (Sen, 2008). Judge et al. (2012) pointed out three components of individuals' psychological responses toward their job such as cognitive (evaluative), affective (or emotional) and job satisfaction is a set of those psychological responses. Castillo & Cano (2004) examined that the work itself was the most important factor that influenced job satisfaction, with working conditions being the least important. Teacher job satisfaction is defined as a teacher's feelings and perceptions of happiness and contentment with teaching (Agyekum et al., 2013).

Job satisfaction and motivation are interrelated even though they are different two concepts. The relationship between the two concepts of motivation and job satisfaction suggests that theories of motivation are also considered theories of job satisfaction (Ngimbudzi, 2009). Job satisfaction is appeared to be positively correlated with motivation i.e. an increase in motivation causes to increase in job satisfaction while a decrease in motivation causes to decrease in job satisfaction (Singh & Tiwari, 2011).

Usually, two approaches are available in studying theories of motivation such as content theories and process theories. Content theories are also called need theories. Content theories or need theories include Maslow's hierarchy of needs, Macgregor's theory X and theory Y, Herzberg's two-factor theory, McClelland's achievement motivation theory, and Alderfer's existence theory. Several theories including Locke's value theory, Expectancy theory, Equity theory, Goal theory, and Attribution theory belong to process theories (Miner, 2005). However, it is believed that the Motivation/Hygiene theory is one of the most reliable content theories for investigating job satisfaction (Worlu & Chidoze, 2012). Motivation-hygiene theory is familiar with the two terms of Herzberg's two-factor theory and Herzberg's dualfactor theory. Motivation/hygiene theory discusses two aspects of job preference; satisfaction and dissatisfaction. Under motivation/hygiene theory, Herzberg has established two groups of factors that cause job satisfaction or dissatisfaction; intrinsic factors called motivational and extrinsic factors called hygiene (Miner, 2005). The key concept behind Motivation/hygiene theory is the difference between these motivation and hygiene factors, or intrinsic and extrinsic factors. According to Herzberg, motivational factors are associated with job satisfaction and work in increasing or improving job satisfaction (Miner, 2005). Achievement, advancement, recognition, responsibility, the work itself, and the possibility for growth are the motivation factors (Herzberg, 1966). Hygiene factors are associated with job dissatisfaction and work for reducing job dissatisfaction (Miner, 2005). Company policies and administration, relationships with supervisors, interpersonal relations, working conditions, and salary are considered Hygiene factors (Herzberg, 1966). The existence of motivational factors causes job satisfaction and the absence of those factors causes no job satisfaction. Poor hygiene factors lead to job dissatisfaction, while better hygiene factors reduce dissatisfaction. However, it cannot cause job satisfaction (Herzberg et al., 1959). According to Herzberg (1966), the opposite of job dissatisfaction is no job dissatisfaction while the opposite of job satisfaction is no job satisfaction.

Previous studies have identified some determinants that affect teachers' job satisfaction. Among them, the administration is established as an important factor. According to Talabi (2016), teachers possess satisfaction from the administration. According to the study conducted by Mahmood et al. (2011), the administration was related to teachers' job satisfaction. According to Hui et al., (2013), a significant positive relationship exists between leadership and decision-making styles of principals and teachers' job satisfaction. Vroom suggests that administration affects job satisfaction (Aziri, 2011). And also, the same study found that supervision was related to teachers' job satisfaction. Further, Pabla (2012) revealed that the level of decision-making authority is a significant factor in job satisfaction among teachers. The variables of autonomy and participation in the decision had the greatest effect on job satisfaction (Dogan, 2009). Considering responsibility, according to Herzberg (1966), responsibility is an associated factor for job satisfaction. According to Talabi (2016), teachers possess their satisfaction from responsibilities. According to Kefalidou et al. (2015), not being permanent in a position in a school and being obliged to change school environment every year, or happen to work in more than one school each year, cause to teachers be less empowered and satisfied. Vroom suggests that job nature and working conditions affect job satisfaction (Aziri, 2011). According to the study conducted by Mahmood et al. (2011), working conditions were related to teachers' job satisfaction. The level of role clearness and job involvement had the greatest effect on job satisfaction (Dogan, 2009). Pabla (2012) revealed that the level of general working conditions is a significant factor in job satisfaction among teachers. As found by Rahman (2008), the type of college has influenced on overall job satisfaction of teachers. Further, he has revealed that private college teachers are interested to have modern classroom equipment and technological facilities. According to Pabla (2012), disparities between rural and urban schools are the main reasons for the differences in job satisfaction between teachers who work in rural and urban areas. According to Herzberg (1966), job satisfaction is related to advancement. Pabla (2012) revealed that opportunities for professional advancement are a significant factor in job satisfaction among teachers. According to the study conducted by Mahmood et al. (2011), advancement was related to teachers' job satisfaction. Further, according to Talabi (2016), teachers possess satisfaction from advancement opportunities. Vroom suggests that promotion affects job satisfaction (Aziri, 2011). According to Kaliski (2007), job satisfaction is the key ingredient that leads to promotion. Pabla (2012) revealed that the level of interactions with colleagues and interaction with students is a significant factor in job satisfaction among teachers. Vroom suggests that superiors and colleagues affect job satisfaction (Aziri, 2011). As found by previous studies, the salary was a key factor for teachers' job satisfaction. Pabla (2012) revealed that salary is a significant factor in job satisfaction among teachers. According to the study conducted by Mahmood et al. (2011), the salary was related to teachers' job satisfaction. Rahman (2008) showed that teachers have

considered much on their payment. According to Kaliski (2007), job satisfaction is the key ingredient that leads to income. Vroom suggests that salary remuneration affects job satisfaction (Aziri, 2011). According to Talabi (2016), teachers possess satisfaction from fringe benefits. Pabla (2012) revealed that benefit is a significant factor for job satisfaction among teachers. The variables of health facilities, training, and educational facilities had the greatest effect on job satisfaction (Dogan, 2009). Teachers' job satisfaction is highly affected by teachers' occupational perception (Bogler, 2001). Through these occupational perceptions, the impact of principals' transformational leadership on teachers' job satisfaction is observed. According to the study conducted by Mahmood et al. (2011), human relation was related to teachers' job satisfaction. Pabla (2012) revealed that the level of personal and professional challenges are significant factors for job satisfaction among teachers. According to Herzberg (1966), job satisfaction is related to recognition. Kaliski (2007) has found that job satisfaction is the key ingredient that leads to recognition. According to Talabi (2016), teachers possess satisfaction from recognition. Pabla (2012) revealed that prestige is a significant factor in job satisfaction among teachers. According to Kaliski (2007), job satisfaction is the key ingredient that leads to the achievement of other goals. According to Herzberg (1966), job satisfaction is related to achievement. Pabla (2012) discovered that job satisfaction among rural school teachers is less than among urban school teachers. According to the study conducted by Mahmood et al. (2011), a significant difference in job satisfaction was not found between urban and rural teachers. It is generally accepted that demographic factors may play a role in the level of job satisfaction (Bogler, 2001). Many previous studies have found that teachers' characteristics; gender, age, marital status, and educational qualifications are related to job satisfaction. According to Rahman (2008), gender has been decided as a significant determinant that influences on job satisfaction of teachers. Sharma & Jyoti (2006) have concluded that job satisfaction among female teachers is more than that among male teachers. Rahman (2008) too concluded that female teachers were more satisfied than their male counterparts. According to the study conducted by Mahmood et al. (2011),

female teachers are found to be more satisfied than male teachers. According to Rahman (2008), age has been decided as a factor that did not affect on job satisfaction of teachers. According to the study conducted by Crossman & Abou-Zaki (2003) with Lebanese bank, employees have decided that lower educational qualifications were related to least job satisfaction. According to Talabi (2016), teachers possess satisfied with educational policies. According to Sumanasena et al. (2020), the nature of work, recognition, responsibility, advancement, and personal growth have a relationship with job satisfaction among teachers as the intrinsic factors while school policy and administration, supervision, interpersonal relationships, and job security were significant as extrinsic factors.

Literature shows various categories of determinants for teachers' job satisfaction. De Nobile and McCormick (2006) have identified three groups of determinants that cause teacher satisfaction. It includes School factors, Community factors, and Characteristics of Teachers. Teachers' satisfaction in Ghana too was determined by three sets of factors; school factors, community factors, and the characteristics of the teacher (Agyekum et al., 2013). These determinants are obvious in developing countries (Agyekum et al, 2013). This study attempts to study the determinants of teachers' job satisfaction focusing on the three categories identified by De Nobile and McCormick (2006). Following, De Nobile and McCormick (2006), the three main categories of determinants of Teachers' job satisfaction (TJS) tested in this study are School factors (SF), Community factors (CF), and Characteristics of teachers (CT). School factors are derived based on several dimensions related to school while the Community factors are derived based on several dimensions related to the community. Characteristics of the teacher include demographic characteristics such as age gender etc. In this study, 17 dimensions/variables (questions or statements) related to teachers' job satisfaction (TJS) in government schools in Sri Lanka were considered reflecting those three categories. This study used overall teacher job satisfaction as the dependent variable. Figure 1 shows the conceptual framework for this study.

Figure 1: Conceptual Framework
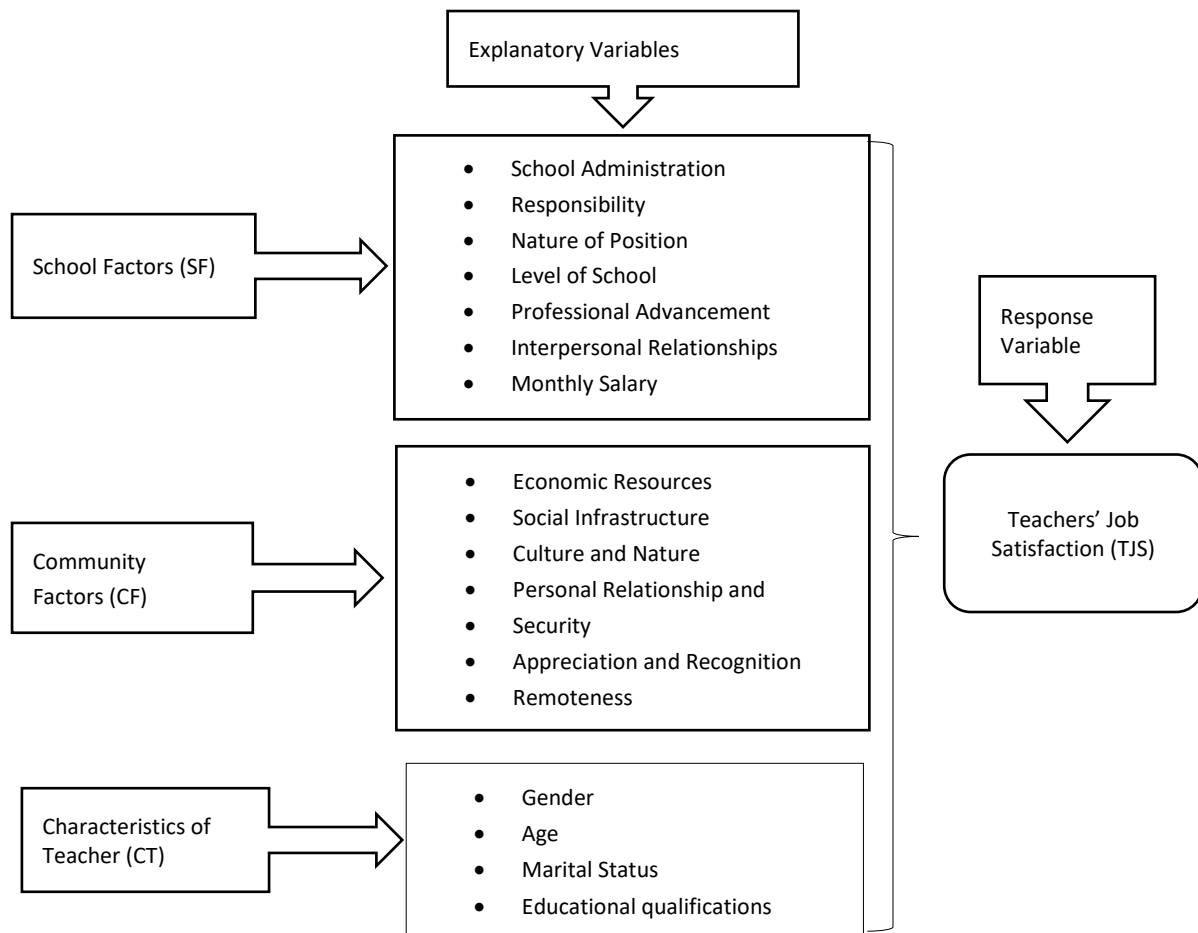
Source: Developed by the researcher, 2021

Based on the literature review and as shown by the conceptual framework, this study constructed a hypothesis as given below.

H1: There is an impact of CF on TJS of school teachers in Sri Lanka

H2: There is an impact of SF on TJS of school teachers in Sri Lanka

H3: There is an impact of CT on TJS of school teachers in Sri Lanka

MATERIALS AND METHOD

This study employed a quantitative research approach to achieve the objectives. Primary data collected through a structured questionnaire was used in this study. The population size is the total number of teachers in the Nuwara Eliya educational zone, which is 9933 (Ministry of Education, 2017). The sample size was 370 and it was decided based on the Morgan table developed by Krejcie & Morgan, (1970). Multi-stage stratified sampling was applied to select a sample of teachers from government schools in Sri Lanka. Nuwara Eliya district was selected randomly from 25 districts in the first stage. Nuwara Eliya district has been divided into five educational zones: Haguranketha, Hatton, Kothmale, Walapane, and Nuwara-Eliya Nuwara Eliya educational zone was selected randomly for the study at the second stage. In Sri Lanka's educational system, the government schools are divided into four categories as Type1AB, Type1C, Type 2, and Type 3, and representing all these types sample sizes were distributed for each category based on proportional allocation. The questionnaire was distributed to 370 respondents.

However, only 95% (352) of them have responded while 5% (18) have not responded. The lottery method was adopted in selecting a district and an educational zone while a random number table was adopted in selecting the final element, teachers for the study to ensure randomness.

The construction of the questionnaire was based on the literature review and it focused on the three categories of determinants identified by De Nobile and McCormick (2006). The questionnaire included mainly two parts. The First part focused on the determinants associated with teachers' job satisfaction with the aspect of Community Factors (CF), School Factors, and Characteristics of Teachers (TC) identified by De Nobile and McCormick (2006). 17 dimensions/variables (questions or statements) related to teachers' job satisfaction (TJS) in government schools in Sri Lanka were included reflecting those three categories. Many of them were measured on a 5-point Likert scale for Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), and Strongly Agree (SA). For example "I work in an area with greater economically resourced communities (Opportunities are available to engage in production, profit and income generating activities)" and "My monthly pay is enough for providing necessary things in my life" are the statements for the variables, Economic Resources, and Monthly Salary respectively. Respondents are instructed to mark each statement using a 5-point Likert scale. The responses were received by adopting numerical values ranging from one for Strongly Disagree to five for Strongly Agree. A few were measured on a binary or multi-category nominal scale. In addition, overall job satisfaction was measured by including one question, "By overall consideration, I would satisfy to be

in teaching". For this statement, a binary nominal scale was used for the response, 1 for "yes" and 0 for "no". A description of the variables is given in table 2.

Table 2: Description of variables used in the analysis

Variables	Abbreviation	Measurement Scale	Variables	Abbreviation	Measurement Scale
				LS	Ordinal
Economic Resources	ER	Ordinal Likert's scale 1-5	Level of School	PA	Likert's scale 1-5
Social Infrastructures	SI	Ordinal Likert's scale 1-5	Professional Advancement	IR	Ordinal Likert's scale 1-5
Culture and Nature	CN	Ordinal Likert's scale 1-5	Interpersonal Relationships	MA	Ordinal Likert's scale 1-5
Personal Relationship and Security	PR	Ordinal Likert's scale 1-5	Monthly Salary		Ordinal Likert's scale 1-5
Appreciation and Recognition	AR	Ordinal Likert's scale 1-5	Gender	GE	Nominal- binary
Remoteness	RM	Ordinal Likert's scale 1-5	Age	AG	Continuous
School Administration	SA	Ordinal Likert's scale 1-5	Marital Status	MS	Nominal- binary
Responsibility	RE	Ordinal Likert's scale 1-5	Educational Qualifications	EQ	Nominal Multi Category
Nature of Position	NP	Ordinal Likert's scale 1-5	Overall Job Satisfaction	OJS	Nominal- binary

Source: Developed by the researcher, 2021

This study mainly employed two techniques, Principle Components Factor Analysis and the Multiple Binary Logistic Regression model to analyze data. In addition, descriptive statistical analyzing techniques were used to identify the special characteristics of the sample. Factor analysis was used to reduce a large number of variables, 13 dimensions (variables) related to job satisfaction which were measured in Likert's scale into fewer numbers of factors. In Factor Analysis, initial factors are decided by principle components analysis. Factor loadings derived using varimax rotation with Kaiser normalization were used to put labels on factors. Factor analysis extracted the maximum common variance from all variables and put them into a common score. As an index of all variables, this score was used for further analysis. The factor model used in the analysis is given below.

$$Z_1 = a_1^T X = a_{p1}X + a_{11}X_1 + \ldots\ldots + a_{pp}X_p$$

$$Z_2 = a_2^T X = a_{p2}X + a_{22}X_2 + \ldots\ldots + a_{pp}X_p$$

$$Z_p = a_p^T X = a_{pp}X + a_{pp}X_p + \ldots\ldots + a_{pp}X_p$$

Derived factors and some other variables were used as explanatory variables in the Multiple Binary Logistic Model to identify the determinants of teachers' overall job satisfaction. The binary dependent variable is Being satisfied and Not being satisfied. Independents variables are factors derived from principle components factor analysis, gender, age, marital status, and Educational qualifications.

Table 3: Types of Explanatory Variables for Multiple Binary Logistic regression analysis

Explanatory Variable	Continuous	Categorical
Factor 1	√	
Factor 2	√	
Age	√	
Gender		√
Marital status		√
Educational Qualification		√

Source: Developed by the researcher, 2021

Table 3 indicates that the variables used for Multiple Binary Logistic regression analysis belonged to continuous, binary categorical, and multi-categorical. To check whether the assumptions for logistic regression are violated, types of explanatory variables are essential. The test used for checking multicollinearity depends on the types of explanatory variables.

The Multiple Binary Logistic Regression model is used in the analysis as follows

Wald test Statistics as given below were applied to check the significance of each explanatory variable.

$$W_T = \frac{[\hat{\theta} - \theta_0]^2}{1/I_n(\hat{\theta})} = I_n(\hat{\theta})\,[\hat{\theta} - \theta_0]^2$$

The overall goodness of fit of the logistic model was assessed by his test statistics as given below.

$$G_{HL}^2 = \sum_{j=1}^{10} \frac{(O_j - E_j)^2}{E_j(1 - E_j/n_j)} \sim \chi_8^2$$

In addition to the main analysis, several tests, Pearson's coefficient of correlation, T-test, ANOVA, Chi-square test, Q-Q plot, KMO test, and Bartlett test of sphericity were utilized to fulfill some requirements for the main analysis.

RESULTS AND DISCUSSION

Key Characteristics of Respondents

Key teacher characteristics considered in this study are age, gender, educational qualification, and marital status of teachers working in government schools in the Nuwara Eliya district.

Table 4: Teachers' Job satisfaction by Gender, Educational qualification, and Marital Status

Characteristics	Categories	Satisfaction		All (%)
		Yes (%)	No (%)	
Gender	Female	53	47	65
	Male	27	73	35
Total		196	156	352
Educational Qualifications	Bachelor	36	64	38
	Diploma	46	54	46
	Training	61	39	16
Total		196	156	352
Marital Status	Married	38	62	62
	Not married	50	50	29
	widowed	65	35	6
	Divorced/separated	67	33	3
Total		196	156	352
Overall Job Satisfaction		56	44	

Source: Researcher's finding using sample survey day analysis, 2021.

The sample consisted of 352 teachers from the population of government teachers who work in the Nuwa Eliya district. Table 4 shows the distribution of the sample based on gender, education qualification, marital status ad overall job satisfaction. Considering overall job satisfaction, 56% of teachers have satisfied with their job while 44% have not satisfied. Considering the gender distribution of the sample, the female percentage was 65% and the male percentage was 35%. Job satisfaction among males is (27%) lesser than the female (53%). The majority of the teachers (46%) are qualified with a diploma and the job satisfaction of graduate teachers (36%) is lesser than the job satisfaction among diplomatic (46%) and trained teachers (61%). Most of the teachers in the sample (62%) were married while the unmarried percentage was 32% and widowed and divorced/separated percentages were 6% and 3% respectively. Job satisfaction among married teachers (38%) is lesser than among unmarried teachers (50%).

Figure 2: Teachers' Job satisfaction by age category
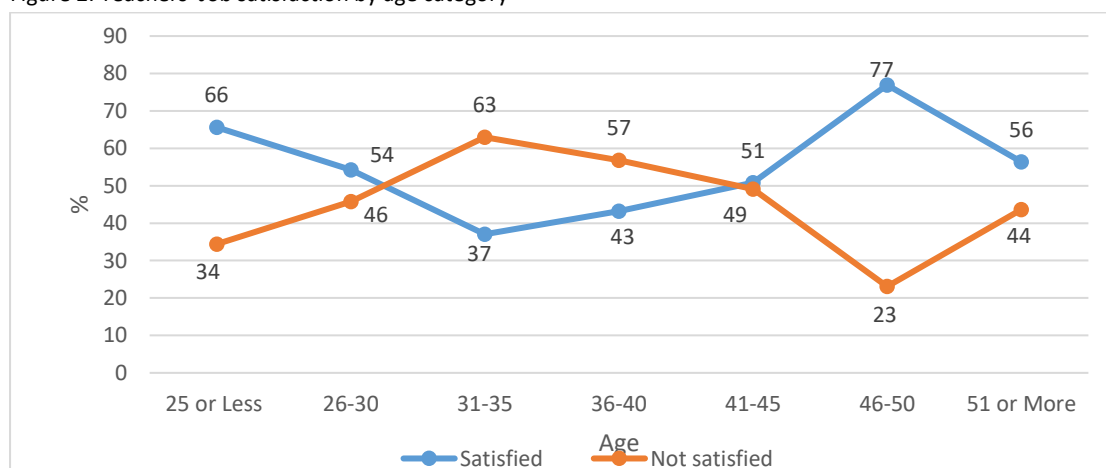
Source: Researcher's finding using sample survey day analysis, 2021

Figure 2 shows the percentages of satisfied and not satisfied teachers with their job by age group. For the age group 31-35 and 36-40, the percentage of satisfaction (37%,43%) is lower than the percentage of dissatisfaction while for the age groups 25 or less, 26-30, 46-50, and 51 or more, percentage with satisfaction (66%,54%,77%,56%) is higher than the percentage with dissatisfaction. The highest percentage (63%) of dissatisfaction was recorded for the age group 31-35 while the highest percentage (77%) of satisfaction was recorded for the age group 46-50.

Variables Reduction

Factor analysis was used for the reduction of 13 variables into fewer factors. The key requirement for principle components factor analysis is a correlation among variables. The correlation among these 13 variables is given in table 5 and it shows most of the variables are highly correlated. The correlation matrix and the Kaiser-Meyer-Olkin (KMO) test were applied to assess the suitability of principal components factor analysis for the collected data.

Table 5: Correlation Matrix

		ER	SI	CN	PI	AR	RM	SA	RE	NP	LS	PA	IR
SI	Correlation Coe.	.889											
	Sig.	.000											
CN	Correlation Coe.	.289	-.148										
	Sig.	.003	.141										
PI	Correlation Coe.	.918	.645	.574									
	Sig.	.000	.000	.000									
AR	Correlation Coe.	.921	.740	.289	.918								
	Sig.	.000	.000	.003	.000								
RM	Correlation Coe.	.973	.913	.216	.825	.865							
	Sig.	.000	.000	.031	.000	.000							
SA	Correlation Coe.	-.459	0.000	-.918	-.750	-.574	-.354						
	Sig.	.000	1.000	.000	.000	.000	.000						
RE	Correlation Coe.	.395	.740	-.763	.057	.342	.460	.574					
	Sig.	.000	.000	.000	.571	.000	.000	.000					
NP	Correlation Coe.	.892	.761	.406	.884	.730	.806	-.471	.189				
	Sig.	.000	.000	.000	.000	.000	.000	.000	.059				
LS	Correlation Coe.	-.081	.152	-.135	-.295	-.460	.028	.471	.081	.111			
	Sig.	.422	.131	.180	.003	.000	.784	.000	.422	.271			
PA	Correlation Coe.	-.158	.296	-.921	-.459	-.289	-.108	.918	.763	-.135	.406		
	Sig.	.117	.003	.000	.000	.003	.284	.000	.000	.180	.000		
IR	Correlation Coe.	.205	.577	-.872	-.112	.205	.264	.671	.975	0.000	0.000	.821	
	Sig.	.041	.000	.000	.268	.041	.008	.000	.000	1.000	1.000	.000	
MA	Correlation Coe.	-.158	.296	-.921	-.459	-.289	-.108	.918	.763	-.135	.406	0.912	.695
	Sig.	.117	.003	.000	.000	.003	.284	.000	.000	.180	.000	.000	.000

Source: Researcher's finding using sample survey day analysis, 2021

Bartlett test of sphericity was applied to assess the overall correlation matrix and it was significant at the .001 level (approximate χ^2 = 381.05). It found that the value of the KMO test is 0.81and it is greater than .50 and significant. Both values indicate that the data was appropriate for principal components factor analysis. Table 6 shows a critical portion of the results of the principle components factor analysis.

Table 6: Eigenvalues of Principal Component Factor Analysis

Factor	Total	% of Variance	Cumulative %
1	6.53	50.227	50.227
2	4.874	37.492	87.719
3	1.351	10.393	98.112
4	0.245	1.888	100
5	1.01E-13	1.11E-13	100
6	1.00E-13	1.03E-13	100
7	1.00E-13	1.01E-13	100

8	-1.00E-13	-1.02E-13	100
9	-1.00E-13	-1.02E-13	100
10	-1.01E-13	-1.06E-13	100
11	-1.01E-13	-1.07E-13	100
12	-1.01E-13	-1.11E-13	100
13	-1.03E-13	-1.20E-13	100

Source: Researcher's finding using sample survey day analysis, 2021

As shown in Table 6, the Eigenvalue of the first factor is 6.53 and it has explained 50.2% of the variance for the original 13 variables while the eigenvalue for the second factor is 4.87 and it explained 37.5% of the variance. It shows that 87.7% of the variance for original variables is accounted for by the first two factors together. It reveals that the first two factors extracted from 13 dimensions by the principal components method are sufficient and significant to reflect 13 variables.

Table 7: Factor Loadings of extracted two factors

Components (Variables)	Factor 1 Loadings	Factor 2 Loadings
Economic Resources	-0.093	0.994
Social Infrastructures	0.455	0.887
Culture and Nature	-0.906	0.356
Personal Relationship and Security	-0.501	0.852
Appreciation and Recognition	-0.18	0.931
Remoteness	0.001	0.978
School Administration	0.877	-0.459
Responsibility	0.907	0.362
Nature of Position	0.852	-0.045
Level of School	0.348	-0.009
Professional Advancement	0.98	-0.15
Interpersonal Relationships	0.916	0.209
Monthly Salary	0.98	-0.15

Source: Researcher's finding using sample survey day analysis, 2021

Table 7 provides the factor loadings derived by varimax rotation with Kaiser normalization. Factor loadings were used to decide on components for each factor and to put labels on factors by investigating the components. Of 13 variables, 7 are more related to factor 1 than factor 2. Of 13 variables, 6 are more related to factor 2 than factor 1.

Table 8: Factor Scores, Factor label, and reliability

Factor Label	Variables	Eigenvalues						Variance %			Cumulative Variance %	Reliability (Alpha)		
Factor 1 School Factors (SF)	School Administration													
	Responsibility													
	Nature of Position													
	Level of School	6.53						50.2			50.2	0.79		
	Professional Advancement													
	Interpersonal Relationships													
	Monthly Salary													
	Factor 1 Factor scores	.009	.103	-.151	-.066	-.008	.025	.143	.169	.014	.061	.169	.167	.169
		ER	SI	CN	PR	AR	RM	SA	RE	NP	LS	PA	IR	MS

Factor Label	Variables	Eigenvalues			Variance %			Cumulative Variance %			Reliability (Alpha)			
Factor 2 Community Factors (CF)	Economic Resources, Social Infrastructures, Culture and Nature, Personal Relationship and Security, Appreciation and Recognition, Remoteness	4.87			37.5			87.7			0.69			
	Factor 2 Factor scores	.179	.173	.041	.142	.165	.178	-.061	.089	.154	.007	-.002	.062	-.002
		ER	SI	CN	PR	AR	RM	SA	RE	NP	LS	PA	IR	MS

Source: Researcher's finding using sample survey day analysis, 2021.

Factor 1 measures the extent of School Administration, Responsibility, Nature of Position, Level of school, Professional advancement, Interpersonal relationships, and Monthly Salary. Therefore factor 1 can be labeled as "School Factors as given in table 8. Factor 2 measures the extent of Economic Resources, Social Infrastructures, Culture and Nature, Personal relationships and Security, Appreciation and Recognition, and Remoteness. Therefore, factor 2 can be labeled as "Community Factors as given in table 8.

The reliability of each factor was assessed by reliability alpha (Cronbach's alpha). As shown in table 8, the reliability alpha for both factors is greater than 0.60 ensuring that the factors are reliable. Further, the explanation of 87.7% of the total variability of the original 13 variables by the first two variables indicates the sufficiency and significance of School factors and community factors to reflect all 13 variables.

Determinants for Teachers' Job Satisfaction

Multiple binary logistic regression techniques were applied to identify the determinants of teachers' job satisfaction. Overall job satisfaction of teachers among government schools measured in nominal binary scale was used as response variables. The two factors extracted by principal components analysis which are reflecting job attribute variables and Age, Gender, Marital status, and Educational qualification that related to teachers' characteristics were used as explanatory variables. A prerequisite for running a multiple binary logistic regression model is independence among explanatory variables (Assumption of Multicollinearity). To use parametric techniques (ex. ANOVA, T-test) for finding relationships among continuous variables variable, the normality assumption was checked for community factors, School factors, and age.

Figure 3: Q-Q Plot for normality
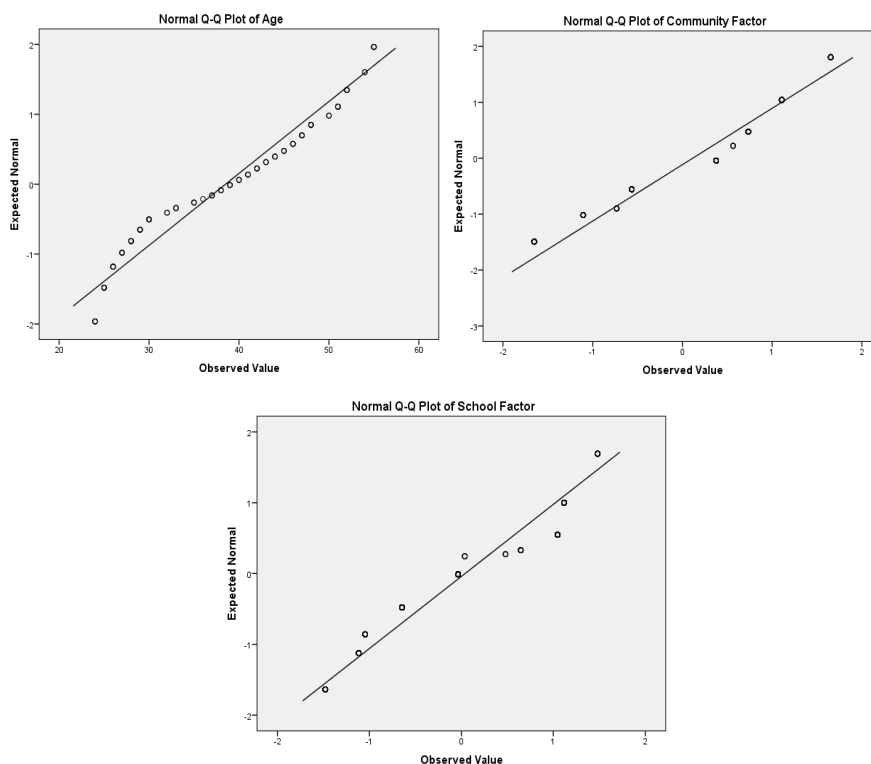
Source: Researcher's finding using sample survey day analysis, 2021.

The above plots revealed that the normality assumption is satisfied for the variables, Age, Community factor, and School factor. Therefore, Pearson's correlation, T-test, and ANOVA were applied to check multicollinearity among those variables.

Table 9: Checking multicollinearity among Explanatory Variables

Determinants	Factor 1	Factor 2	Age	Educational Qualification	Gender
Factor 2	Pearson Correlation (p value=1.000)				
Age	Pearson Correlation (p value=0.007)	Pearson Correlation (p value=0.008)			
Educational Qualification	ANOVA (p value=0.061)	ANOVA (p value=0.211)	ANOVA (p value=0.131)		
Gender	T-test (p value=0.118)	T-test (p value=0.281)	T-test (p value=0.322)	Chi-Square (p value=0.071)	
Marital status	ANOVA (p value=0.127)	ANOVA (p value=0.059)	ANOVA (p value=0.345)	Chi-Square (p value=0.322)	Chi-Square (p value=0.218)

Source: Researcher's finding using sample survey day analysis, 2021.

Table 9 provides the results of a different kind of test for multicollinearity among all variables used for logistic regression analysis based on the variable type. It clearly shows that the relationship between Age and Factor 1 and age and factor 2 are significant at 0.01 level. Relationships among other variables are not significant. Therefore, the variable age was removed from the model due to the violation of the assumption of multicollinearity.

Table 10: Results of Multiple Binary Logistic Regression Model

Explanatory Variables		B	S.E.	Wald	Sig.	Exp(B)
Community Factors		.482	.250	3.728	.050	1.619
School Factors		.777	.253	9.477	.002	2.176
Gender (Female)		1.404	.515	7.439	.006	4.070
Marital Status				3.779	.286	
	Married	-22.05	23024.1	.000	.999	.000
	Unmarried	-20.95	23024.0	.000	.999	.000
	Divorced	-20.18	23024.1	.000	.999	.000
Educational Qualification				7.021	.030	
	Bachelor's Degree or above	-2.572	.991	6.735	1.000	.076
	Diploma	1.370	.915	2.240	.134	3.936
Constant		-1.309	.429	9.306	.451	.270
-2 Log likelihood			105.244			
Hosmer and Lemeshow Test			5.941 (p value=0.547)			

Source: Researcher's finding using sample survey day analysis, 2021.

Table 10 depicts the results of the multiple binary logistic regression model. Hosmer and Lemeshow's goodness of fit test value is 5.941 with a p-value of .547, which indicated that the model adequately fits the data in this study. Wald statistic provides a test of the statistical significance of each variable in the model. The Community factors and School factors are statistically significant in the model to explain teachers' job satisfaction at 0.05 level and 0.01 levels respectively. This result was supported by the findings of previous several studies conducted by different researchers. According to Agyekum et al. (2013), teachers' satisfaction in Ghana was determined by school factors, community factors, and the characteristics of the teacher. De Nobile and McCormick (2006) have too identified three types of determinants of teacher satisfaction including community factors, school factors, and characteristics of Teachers. Gender is statistically significant in the model at 0.01 level in this study. This result agrees with the previous work by De Nobile and McCormick (2006) that has identified characteristics of teachers including demographic characteristics, and gender as a determinant of teachers' job satisfaction. Further, this result is emphasized in the study conducted by Sharma & Jyoti (2006) and they have concluded that job satisfaction among female teachers is more than that among male teachers. Educational Qualification is statistically significant in the model to explain teachers' job satisfaction at 0.05 level in this study. Supporting this result, a pre-study conducted by Crossman & Abou-Zaki (2003) using Lebanese bank employees showed that lower educational qualifications were related to least job satisfaction.

The odds ratio for the community factor is greater than 1 and it is positively related to Teachers' job satisfaction.

When the community factor increases by one unit, the odds of being satisfied increase by 1.6 times. The model predicts the probability of being satisfied is 0.05 at the minimum level of community factors while at the maximum level it is 0.58 and it indicates a 0.53 difference in the probability of job satisfaction between the maximum and minimum level of community factors. Of teachers with a maximum level of the community factor, 58% are satisfied with teaching while only 5% of the teachers with a minimum level are satisfied. Similarly, the Odds ratio for the school factor is greater than 1 and the School factor too is positively related to job satisfaction. When the School factor increases by one unit, the odds of being satisfied increase by approximately 2 times. The model predicts the probability of being satisfied at the minimum level of the school factor is 0.06 while at the maximum level it is 0.54 and it indicates a 0.48 difference in the probability of job satisfaction between the maximum and minimum level of the School factor. Of teachers with maximum level of the School factor, 54% are satisfied with teaching while only 6% of the teachers with minimum level are satisfied.

Considering the gender, the Odds ratio of satisfaction for males and females is 4 indicating the odds of being satisfied are 4 times more for females than they are for males. The model predicts the probability of being satisfied for the female is 0.52. Further, it shows that 52% of female are satisfied while 48% is not satisfied. The probability of being satisfied for males is 0.21. Further, it shows that only 21% of the male are satisfied while 79% are not satisfied. The probability of being satisfied for the female is more than twice as it is for the male.

The odds ratio of job satisfaction between the teachers qualified with a degree and trained teachers is 0.76. The model predicts the probability of being satisfied for degree holders is 0.02. Further, it shows that a fewer amount, 02% of teachers with a degree are satisfied while 98% are not satisfied. The probability of being satisfied for degree holders is less than for trained teachers. The odds ratio of job satisfaction between the teachers qualified with a diploma and trained teachers is 3.936. The probability of being satisfied for the diplomatic teacher is 0.52. Further, it shows that only 52% of diploma holders are satisfied while 48% are not satisfied. The probability of being satisfied for diploma holders is approximately twice as it is for trained teachers. Among the three categories of qualifications, the highest satisfaction is seen with the teachers with a diploma. However, the least job satisfaction is revealed among graduate teachers.

CONCLUSION

This study investigated the determinants of teachers' job satisfaction focusing on the three categories identified by De Nobile and McCormick (2006). Descriptive statistics for key characteristics of the teachers have provided important facts about the nature of the sample distribution. A distinct overview of the sample for gender, age, marital status, and education qualification was achieved through this. The majority of the teachers (65%) in the sample were female. Considering the age, the highest percentage (24%) was recorded from the 26-30 age group. Most of the teachers in the sample are married (62%) and considering their educational qualification, 46% are diploma holders.

This study uses 13 dimensions of teachers' job satisfaction which are measured on a likeret scale. The results of the principal components factor analysis extracted two uncorrelated factors reflecting 13 dimensions based on their eigen-values. According to the factor loading, Factor 1 measures the extent of School Administration, Responsibility, Nature of Position, Level of school, Professional advancement, Interpersonal relationships, and Monthly Salary. Therefore factor 1 was labeled as "School Factors". Factor 2 measures the extent of Economic Resources, Social Infrastructures, Culture and Nature, Personal relationships and Security, Appreciation and Recognition, and Remoteness. Therefore, factor 2 was labeled as "Community Factors". Multiple binary logistic regression techniques were applied to identify the determinants of teachers' overall job satisfaction. The two factors, community factors, and school factors, extracted by principal components factor analysis which are reflecting 13 dimensions of job satisfaction and teachers' characteristics such as Age, Gender, Marital status, and Educational qualification were used as explanatory variables while the overall job satisfaction was used as the response variable.

Due to the assumption of multicollinearity (p-value: 0.07, 0.008), the explanatory variable, age was removed from the model. Wald statistic derived from multiple logistic regression model showed that community factors (p-value: 0.050), school factors (p-value: 0.002), and teachers' characteristics such as gender and education qualification (p-value: 0.006, 0.030) were significant in the model to explain teachers' job satisfaction. However, marital status was not significant (p-value: 0.286) and it had no direct effect on the Teachers' job satisfaction. The logistic model predicts that the odds ratio for the community factor is greater than 1 and it is positively related to Teachers' job satisfaction. Of teachers with a maximum level of the community factor, 58% are satisfied with teaching while only 5% of the teachers with a minimum level are satisfied. Similarly, the odds ratio for the school factor is greater than 1 and the School factor too is positively related to job satisfaction. The model predicts that of teachers with a maximum level of the School factor, 54% are satisfied with teaching while only 6% of the teachers with a minimum level are satisfied. Considering the gender, the Odds ratio of satisfaction for males and females is 4 indicating the odds of being satisfied are 4 times more for females than they are for males. The model predicts that 52% of female are satisfied while 48% is not satisfied. Further, it shows that only 21% of the male are satisfied while 79% are not satisfied. The odds ratio of job satisfaction between the teachers qualified with a degree and trained teachers is 0.76. The model predicts that a fewer amount, 02% of teachers with a degree are satisfied while 98% are not satisfied. The odds ratio of job satisfaction between the teachers qualified with a diploma and trained teachers is 3.936. Further, it shows that only 52% of diploma holders are satisfied while 48% are not satisfied. The probability of being satisfied for diploma holders is approximately twice as it is for trained teachers. Among the three categories of qualifications, the highest satisfaction is seen with the teachers with a diploma. However, the least job satisfaction is revealed among graduate teachers.

Hosmer and Lemeshow's goodness of fit test value is 5.941 with a p-value of 0.547, which indicated that the model adequately fits the data in this study. This study contributes to existing knowledge by fitting a model to identify determinants for job satisfaction among teachers in government schools in Sri Lanka. Mainly community factors reflecting 7 dimensions, school factors reflecting 6 dimensions, and gender and educational qualification representing teacher characteristics were the significant explanatory variables in this

study supporting the three categories identified by De Nobile and McCormick (2006) to a great extent. Spector (1997) suggests that employees tend to stay in their jobs when they are satisfied with their jobs. Teachers' job is one of the main factors which contribute to education improvement (Kefalidou et al. (2015). It is concluded that attention should be paid to community factors and school factors to enhance the teachers' job satisfaction in an attempt of improving the quality of education. This study provides imperative guidance to policy implications to improve education by addressing to determinants for teachers' job satisfaction found in this study.

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Herder and Crop Farmer Conflict: A Perspective in North-Central Nigeria

SLJSSH

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Abstract

Conflict in the Nigerian agricultural community has in recent times attracted attention at the national level, this is because crop farmers have fled their communities due to the violence. This study was conducted in the north-central region of Nigeria to investigate the conflict between crop farmers and herders in the area. The study used the random sample technique, where one hundred and twenty crop farmers were sampled and interviewed from selected communities. Descriptive statistics, Likert-type scale, and Chi-square were used for the analysis. Observations revealed that the farmers are aware of the existence and location of the stock route. Results revealed that the triggers of conflict between the two stakeholders in the agricultural community include rape, rustling, crop damage, pollution of the water point, access to grazing lands, and bush burning. The implications of the conflict include loss of property, loss of lives, and crop damage. Identified institutions involved in resolving conflict in the area are traditional institutions, farmer associations, local government authorities, and the court of law. The study further revealed that the institutions' effectiveness in resolving conflicts varies with the triggers. The analysis further reveals that the traditional institution is the most effective in managing the conflict but the least used avenue in the study area. Therefore, it was recommended that grazing reserve demarcation for herdsmen should be carried out along the various grazing tracks to avoid encroachment into farmland.

Keywords: Conflict Management, Farmer/Herder, Grazing Land, Stock Route, Triggers of Conflict

INTRODUCTION

Conflict is prevalent in all spheres of human endeavor; it is the occurrence of disagreement or a clash between and among groups or individuals. The agricultural sector in Nigeria is not an exception to the conflict situation; hence there has been a lingering hostile relationship between crop farmers and herders. Among all natural resources, access to land has remained a dominant factor underlying contentions among different groups, especially crop farmers – herders. This has given rise to aggressive and violent engagements between these groups. Crop farmers derive their livelihood through the ownership, and management of land resources and the cultivation of same for agricultural produce: While herders own and manage livestock for their livelihood. Herdsmen in Nigeria rely on the natural wild vegetation to graze their cattle, the quality and quantity of the vegetation and water availability is the attraction to graze in a particular location and time. Ofuoku and Isife, (2009) stated that conflict between crop farmers and herdsmen is an old phenomenon. Farmers - herders clashes have become widespread among coastal countries of West Africa; Nigeria is not an exception, such conflicts abound and are widespread all over the country. In recent times, for instance, quite some farmers were displaced and rendered homeless in the latest hostility between crop farmers and herdsmen (Amnesty International, 2018). Cotula and Toulon (2004) reported that conflicts have not only heightened the level of insecurity but

have also demonstrated a high potential to exacerbate the food crisis in Nigeria due to the loss of farmer lives, animals, crops, and other valuable properties. Nyong and Fiki, (2005) reported that resource-related conflicts are responsible for over 12 percent decline in per capita food production. In recent times many farmers have fled from their communities due to killings, and destruction of farm crops, livestock, properties, and other infrastructures by the herdsmen most especially in north central Nigeria like Benue, Plateau, Kogi, Nassarawa, Taraba, Niger, and Kwara (Ilo et al., 2019). Furthermore, many casualties were recorded from January 2014 to March 2018 as a result of farmer – herder conflicts in Niger state (Amnesty International, 2018). The lack of harmony among the key players in Nigeria's agriculture sector is a drawback to the aspiration of the country's goal of achieving food security. Furthermore, the farm families involved, who constitute a majority of the country's poor would be most affected. It is therefore pertinent to explore the dynamics of the crisis to better understand the scenario and proffer approaches to managing and coping with the situation in a sustainable manner. Against this backdrop, the causes and consequences of the conflict between the crop farmer and herdsmen, the occurrence of conflict, and institutions managing and coping with the conflict were examined in the study area.

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LITERATURE REVIEW

Theoretical background

Karl Max's theory of structural conflict posits that the cause of conflict between groups is an unequal distribution of economic resources, leading to discontent and, eventually, revolution. The herder-farmer conflict can be situated broadly in social conflict, specifically conflict of interest. It is posited that conflict is a distinct category of social behavior where two parties want to have something they cannot exclusively have (Rummel, 1976). Conflict is an existing condition of disagreement between at least two parties (Nicholson, 1992). In other words, the pursuit of incompatible objectives by two parties usually results in a conflict situation. Hence, conflict is inevitable when two or more groups struggle over power and resources; likewise, it may involve physical hostility (Jeong, 2000). Such struggle may involve violent engagement resulting in bodily harm and loss of life. Be that as it may, not all diversity in perception results in physical hostility. Therefore, conflict might just be an alternate view of an issue or circumstance (Barash and Webel, 2002).

Furthermore, the resource dependency theory highlights the relationship between organizations and the resources they need to operate (Pfeffer and Salancik, 1978). These resources could be human, material, or financial, and the scarcity of which places those not in control of such resources at risk of stagnation and eventual extinction. Farmers and herders alike depend on land as a resource, hence, both parties seek access and control for land-base resources such as water points, grasslands, forests, etc. Conflict as part of human socialization is most often than not generated by competition for this scarce resource. The struggle for access and ownership of this resource base has continued to precipitate mutually exclusive dominance behavior among users. Hence, natural resources such as water points, grasslands, forests, and forest resources continue to generate conflict within and between groups such as farmers and herders. This study hinged on resource dependency and structural conflict theories.

Conceptual framework

There are three approaches to the conceptualization of conflict, these are the social-psychological conceptualization of conflict, the sociological concept of conflict, and the semanticist conceptualization of conflict (Bernard 1957). The social-psychological concept has to do with the individual and involves statistical, clinical, and experimental processes. Under this concept, issues considered have to do with hatred, hostility, stereotyping, scapegoating, aggression, fighting, quarreling, and violence. The sociological conceptualization is concerned with the relationships between systems (groups). This is more inclusive in that it includes the functional interaction pattern of humans. This approach utilizes historical data, statistical analysis, individuals, content analysis, and possibly mathematical deduction. In this concept, conflict arises as a result of incompatible or mutually exclusive goals. Such goals cannot be met simultaneously even though they are both desirable. Such conflicts may be viewed as rational. The semanticist conceptualization views conflict as an outcome of a verbal or conceptual misunderstanding. This approach is hinged on the ability to communicate adequately to eliminate misunderstanding among groups. The philosophy of this approach is that the universe is in fundamental harmony, and conflict happens when there is an error (Bernard 1957). This work is situated in the sociological conceptualization of conflict (Figure I).
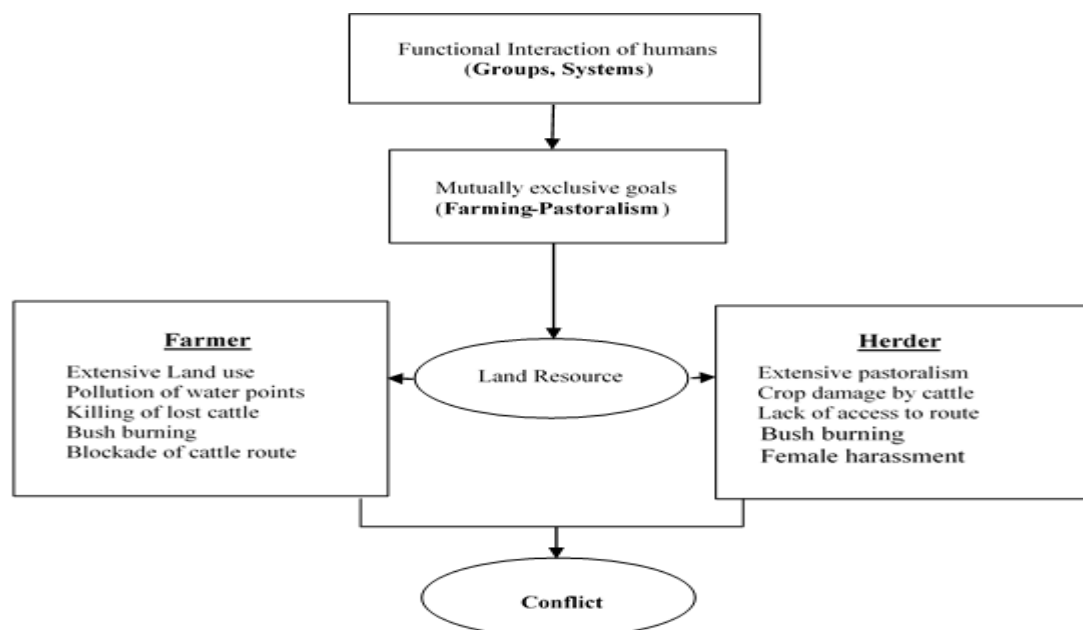
Figure I: Conceptual Framework of herder/farmer conflict
Source: Authors' construct 2021

Empirical Evidence
Causes of Herder-Farmer Conflict

Conflicts between herders and crop farmers have resulted in increased violence and general insecurity in Nigeria. The incidences have resulted in citizens being consistently murdered and properties destroyed. Sunday (2013), reported a significant positive relationship between freshwater scarcity and conflicts among farmers and herders in Northern Nigeria. The study further revealed that the struggle for access to the water source is among the most potent predictor of the causes of conflict in the zone. Hoffmann et al. (2008) opined that the connection between crop farmers and cattle herders began worsening when the farmers started to raise dairy cattle which led to the utilization of crop residue by the

farmers thereby creating scarcity for the herders. Ofuoku and Isife (2009), reported the destruction of crops, overgrazing of land, female harassment by the herders, contamination of streams by cattle, disregard for local traditional authorities, and indiscriminate bush burning as causes of conflict between the two parties in Delta state, Nigeria. De Haan (2002) asserted that damage to crops by cattle and other property (water system and infrastructure) by the cattle herders themselves are the major causes of conflict mentioned by the farmers, though setting ablaze of rangelands and fadama and blockage of the stock route and water points by crop farmer are critical direct reasons cited by the cattle herders. Aliyu (2015), researched the causes of conflict between the herder and farmer in Katsina State, Nigeria. He identified crop damage by cattle, encroachment of cattle routes, inadequate grazing reserves, lack of access to water points, pollution of water points, and cattle rustling among others as the causes of conflict in the state.

The most predominant cause of conflict between these two agricultural-land users is the obstruction of water points and damage to crops (Aliyu, 2015). Adebayo and Olaniyi (2008), found that farmers' and herders' socioeconomic variables such as age, religion, gender, education, marital status, and place of residence were significantly related to the causes of the conflict. Also, Bello (2013) enumerated the major causes of herders-farmers conflict including the damaging of crops by cattle and other properties (reservoirs, water system, and infrastructure), setting ablaze of rangelands, fadama, and blockage of stock routes.

Effect of the Conflict on Livelihood

The effects of conflict between the farmer/herder include a drop in crop yields and harvest, which results in reduced income for farmers. Other effects include displacement from ancestral homes and loss of life, properties, and stored produce (Ofuoku and Isife, 2009). Dimelu et al., (2017), also asserted that socioeconomic life, crop harvest, and farm communities are disturbed when such conflicts occur (Nweze, 2005). The conflict also depletes farmers' savings and reduces credit qualification and repayment capability. Summarily, the food security status of the farmer and the food value chain to urban inhabitants are threatened (Ofem and Inyang, 2014).

MATERIAL AND METHODS

Study area

The study was conducted in Niger state in the north-central zone of Nigeria. The state lies on latitude 8° to 11°:30' North and Longitude 03° 30' to 07° 40' East. The State has a land area of 74,244 square Kilometres, which is 8% of the total land area of Nigeria, and a population of about 3,950,249 (National Population Commission, 2006). The ethnic groups

in the state are Bissan, Dibo, Fulani, Gbagi, Hausa, and Nupe. The area has two distinct seasons which are wet and dry. Rainfall of about 1000-1500mm per annum with a relative humidity of 62% and temperature ranges between 29^0 - 32^0C. The area is agriculturally oriented with a large percentage of its populace fully engaged in farming and agro-allied activities. The major crops grown in the area includes maize, sorghum, cowpea, cassava, millet, sesame, yam, melon, and soybean.

Source of data collection

The study utilized primary data collected from Bosso, Shiroro, and Munya local government areas of Niger state. The data were collected using the interview method with the aid of a structured questionnaire. The locations were purposively selected for the study due to the high occurrence of crop farmer–herder conflicts in the area.

Sampling technique and sampling size

A mixture of sampling techniques was utilized for the study. Purposive and simple random sampling techniques were used for the study. One hundred and twenty crop farmers were sampled and interviewed from the selected communities. This research utilized both quantitative and qualitative variables (Kothari, 2004). The quantitative variables were measured as intervals and ratios, these include age and effectiveness of conflict-resolving strategies (Sarantakos, 2005). Qualitative variables were measured in ordinal and nominal terms, these include among others educational level, gender, marital status, and other demographic variables (Kerlinger, 1986). These variables were organized utilizing frequencies and percentages.

Analytical technique

A combination of analytical techniques was used for the study. This comprises descriptive statistics, Likert - type scale, and the Chi-square. Descriptive statistics such as percentages, frequency distribution, and mean, were used to describe and categorize the socioeconomic characteristics of respondents, causes and consequences of conflict, and occurrence of conflict. While the Likert-type scale and Chi-square were used to further evaluate the institutions managing the conflicts.

RESULT AND DISCUSION

Socio-economic Characteristics of the Respondents

Results show that most of the respondents 76.70% are males while the remaining 23.30% are females (Table 1). This finding implies that males are dominant in crop farming in the study area, perhaps the reason being that men are more energetic and active when it involves tedious farm production activities than women.

Table 1: Socio-economic characteristics of the respondents

Characteristics	Frequency	Percentage
Gender		
Male	92	76.7
Female	28	23.3
Total	**120**	**100.0**
Age of respondent		
< 25	21	17.5
26 – 35	40	33.3
36 – 45	28	23.3
46 – 55	24	20.0
56 – above	7	5.8

Mean	**46**	
Total	**120**	**100.0**
Marital status		
Single	29	24.2
Married	62	51.7
Widow	3	2.5
Divorced	14	11.7
Separated	1	.8
Widower	11	9.2
Total	**120**	**100.0**
Educational level		
Quranic	21	17.5
Primary	15	12.5
Secondary	29	24.2
Tertiary	20	16.7
Adult education	5	4.2
Non-formal	30	25.0
Total	**120**	**100.0**
Extension service		
Yes	26	21.7
No	94	78.3
Total	**120**	**100.0**

Source: field survey, 2018.

This finding is in line with the report of Adesiji et al., (2012) who asserted that male dominance and supremacy are prevalent in Nigeria's agricultural community. The mean age of the respondents was found to be 46 years, however, the result reveal that 74.1% (simple majority) of the farmers were below the mean age indicating that farmers are still in their active and productive years.

This finding implies that crop farmers may respond strongly to aggressive actions from any group that constitutes a threat. The tendency for conflict/disagreement/aggression to occur would be high due to youthful exuberance. Furthermore, findings concerning marital status revealed that 51.7% were married. It was also observed that about 11.7% of crop farmers were widowed, 11.7% divorced, and 8% were separated respectively. Further observation revealed that the majority (75%) of the respondents had formal education. The implication of this finding is that crop farmers that had formal education would be more enlightened than those that had no formal education and thus likely to be more refined in the manner they carry out their business. Regarding extension contact, the study reveals that a simple majority (78.3%) of respondents do not have access to extension services relating to the conflict. This finding implies that crop farmers are left to interpret their rights and privileges without recourse to the rights and privileges of other land users. This may lead to unpleasant situations and repercussions.

Level of awareness of stock route among farmers

Passage (stock route) for livestock movement has for long been mapped out across Nigeria, in the past, such passages were adhered to by crop farmers and herders alike. Strict compliance with the stock routes forestalls encroachment by either party into the other's rights and privileges to access land resources. Doubtful is the situation in recent times as to whether or not adherence to the stock routes are been complied with. Observations from the study showed that the majority (83.3) of the farmers in the study area know the stock routes (Table 2).

This finding is contrary to the report of Ajibefun, (2017) who asserted that the majority of the herders–farmers in their study area are not aware of the existence of stock routes. Further findings showed that a simple majority (83.3%) of the respondents have local stock routes around their community. This is because both crop farmers' and herders' conflicts are prevalent in the area, and to ensure harmony in the community, passages are created for herders to access water points and graze lands. The existence and location of the routes are also known to a majority of crop farmers (81.7%). This finding implies that all things being equal clashes between the two parties should be minimal provided the stock routes are utilized. The question that begs for an answer is "what then causes the conflicts between crop farmers and herders?"

Table 2: Level of Farmer Awareness of Stock Route

Variable	Frequency	Percentage
Knowledge of route		
Aware	100	83.3
Not aware	20	15.8
Total	120	100.0
Local stock route		
Yes	100	83.3
No	20	16.7
Total	120	100.0
Location of route		
Aware of location	98	81.7
Not aware of the location	22	18.3
Total	120	100.0

Source: field survey, 2018.

4.3 Seasonality of crop farmers and herders conflict

The conflict between crop farmers and herders does happen during the rainy and dry seasons, be it as it may, the frequency varies between seasons. Figure 1 shows that 93.3% of the respondents reported that the conflict mostly happens during the rain-fed cropping season.
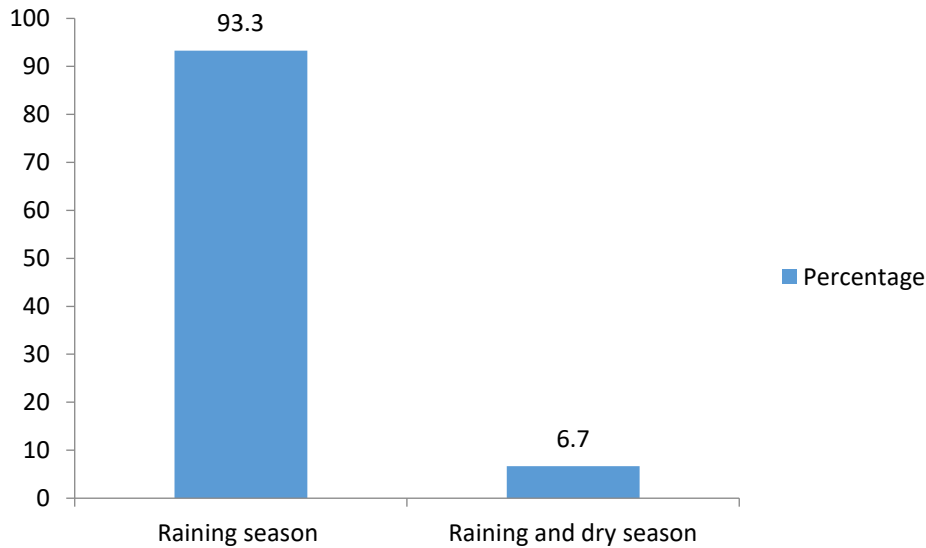
Figure 1: Seasonal Occurrence of Conflict between Crop Farmers and Herders
Source: field survey, 2018.

This is so because crop farming in the country depends on rain for the moisture requirement of their crops. Hence, farmers seize the opportunity of the season and cultivate all available cultivable land in the community; with the occupation of the cultivable lands by the crop farmers, the herders have to make do with what is left. During the off-season, the conflicts are rather minimal (6.7%), this is because just a few crop farmers utilize the dry season to cultivate crops through irrigation. This finding implies that sensitization on adherence to stock routes by both parties through extension can be intensified to forestall or minimize incidences of conflicts in the agricultural community during the rainy season.

Triggers and implications of conflict between crop farmers and herders

Triggers of conflict between crop farmers and herders

The right to enjoy land resources is mostly the privilege of the indigenous people of an area. This is buttressed by the land tenure regimes operational in a region. Hence, the root cause of conflicts in Nigeria's agricultural community is access to nature's bounty, in this case, land resources. However, the triggers of conflict situations are usually the disregard for the rights and privileges of the other party to access the resource. The major trigger (causes) of conflict between the herdsmen and crop farmers ranges from crop destruction by cattle, indiscriminate bush burning, rape cases, early commencement of grazing, and pollution of water points. Observation reveals that the major cause of conflict between herdsmen and crop farmers is the destruction of farmers' crops (Table 3). The situation where stray cattle destroy crops on the farm most often than not constitutes a colossal loss to the farmer. The damage incurred by the farmer as a result of cattle incursion into the farm is usually not a concern to the herder. There are allegations that cattle encroach into farms to graze under the watch of the herdsmen or even deliberately driven into un-harvested farmlands. This finding is in agreement with Tonah (2006) who pointed out that the most frequent cause of herders and crop farmers conflict is the destruction of crops by cattle. Land is a natural resource that many lay claim to because of being the first to take possession or dwell in the area.

Table 3: Triggers of conflict between crop farmers – herders

Variables	Frequency	Percentage	Rank
Crop damage	108	25.41	1st
Indiscriminate bush burning	77	18.12	3rd
Rape	64	15.06	4th
Early grazing	62	14.59	5th
Pollution of water	34	8.00	6th
Access to grazing lands	80	18.82	2nd

Source: field survey, 2018.

Results show that access to grazing lands is another major cause of herders' and crop farmers' conflict. The herders believe that land is a common resource endowed by nature hence they should not be prevented from accessing it. Another cause of conflict between the crop farmer and herders is bush burning by the herders in the study area. This happens during the dry season when dry grasses are set on fire to facilitate the regeneration of fresh pastures. Such fires may destroy crops on the farm which attracts negative reac-

tions from farmers. This is because, in the process of burning, the fire spreads into adjourning farms thereby destroying crops stands and those stored in bans.

This finding is in line with Ofuoku, (2010) who reported that bush burning destroys crops on the field which is considered a major trigger of conflict between farmer-herder. During the dry season herders believe that if the dried vegetation is burnt, fresh pasture would regenerate, the traditional practice of bush burning is common among herders. In every society rape is taboo, in Africa particularly, herders have been accused of raping women in the bush. This finding is corroborated by Ofuoku and Isife, (2009) who pointed out that rape is one of the major triggers of conflict in Nigeria.

Implication of crop farmers and herders conflict

The implications of the conflict between crop farmers and herders range from loss of property, the decline in the income of the farmer, loss of lives, crop damage on the farm, and loss of harvested crops due to arson. Figure 2 presents the aftermaths of farmer - herder conflict. The study reveals that the majority (32 %) of the respondents had experienced a reduction in farm income during such conflicts; while 12% lost their properties (Figure 2). The study also observed that 18% of the respondents experienced the loss of a relation or community member from the conflicts. The crop farmer-herder conflict has left many widows and orphans in its wake. This finding is in line with the report of Amnesty International, 2018; Ofuoku and Isife, 2009 pointed out that loss of lives always trails attacks by herdsmen.

Furthermore, 7% of the respondents lost their crops during the conflict. The study also reveals that 31% of the respondents have their harvested crops burned down during the conflicts (Figure 2). Some crop farmers lost a whole or part of their crops during indiscriminate bush burning. This result is in line with Ofuoku, (2010) who pointed out that the reduction in output and income of farmers is an outcome of crop damage by cattle and indiscriminate bush burning.
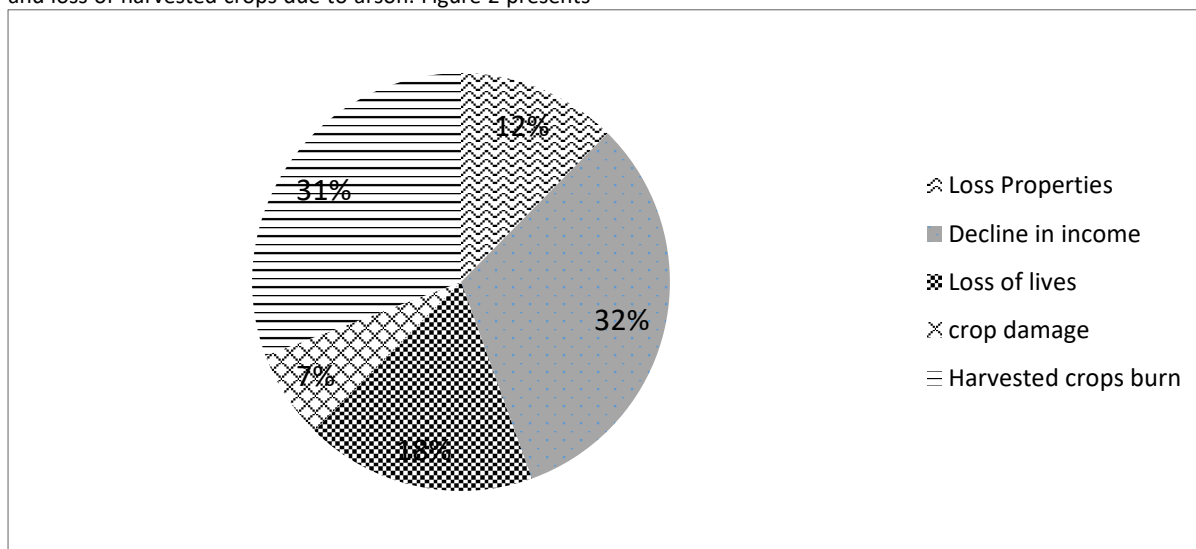
Figure 2: Implications of crop farmers and herders' conflict
Source: field survey, 2018.

Displacement of crop farmers in the host communities was also observed. Farmers flee or abandon their communities when such conflicts occur. This is because farmers fear reprisal attacks by herders. Female farmers stopped going to distant farms for fear of attack by herdsmen, Also, displaced farmers have become a source of liability to other farmers whom they have to beg for food, and this has created a vicious cycle of poverty in the community. Furthermore, findings reveal that farmers experienced crop damage during the pre-harvest period and the harvesting period.

Conflict management institutions and settlement strategies

Conflict is inevitable, however, the escalation to physical aggression must be prevented through interventions targeted at making or keeping the peace. The conflict in the Nigerian agricultural community has attracted the attention of both governmental and non-governmental organizations. The study identified conflict management institutions as reported by the respondents in the study area which include; courts of law, traditional institutions, farmer associations, Table 4: Conflict management institutions and strategies

and Local Government Authorities (LGA). The majority (75.8%) of the respondents reported that conflict in the study area was mostly resolved through traditional rulers while a few reported resolution through farmer associations (Table 4). Further observation revealed that settlement of damages inflicted on a victim is usually through payment of compensation, a verbal warning, or an amicable resolution (Table 4). Findings also show a verbal warning to be the most utilized means of settlement for conflict triggers in the study area.

The implication of this finding is that damages incurred from herder encroachment on farms by crop farmers are most often not compensated. The prevalence of such a situation will worsen the already bad situation; giving rise to aggressive behavior towards the herders by the crop farmers. Table 4 further reveals that a simple majority (54.17%) indicated that the judgment they received was not adequate to compensate them for the damage incurred. This means that they are not satisfied with the outcome of the conflict settlement.

Variable	Frequency	Percentage
Institutions		
law court	10	8.3
traditional rulers	91	75.8
farmers association	6	5.0
local government authorities	13	10.8
Total	120	100.0
Means of settlement		
payment of compensation	24	20.0
verbal warning	80	66.7
amicable resolution	16	13.3
Total	120	100.0
Victim's disposition to settlement		
Judgment is not adequate	65	54.17
Judgment is adequate	55	45.83
Total	120	100.0

Source: field survey, 2018.

Suitability and effectiveness of conflict management institutions in the study area

This section assesses the association of management institutions with the triggers of conflicts between crop farmers and herders. It also examined the perception of the crop farmers as it concerns the effectiveness of the institutions in resolving conflict situations in the study area. Results show that the courts are significantly associated with the conflicts triggered by bush burning and access to grazing areas at a 1% and 10% significant level (Table 5).

Table 5: Cross-tabulation of institutions with conflict triggers

Triggers	Traditional Rulers	Courts	Local Government	Crop Farmer Association
Rape	2.73	2.46	14.67**	11.01*
bush burning	3.66	29.46***	7.98*	3.06
Grazing area	0.32	9.81*	18.85***	4.94
Theft of cattle	2.00	2.00	3.00	2.60

Source: field survey, 2018.

Furthermore, the Local Government councils seem to be significantly associated with conflicts triggered by rape, bush burning, and access to grazing areas at 5%, 10%, and 1% respectively: Whereas the crop farmer association is significantly associated with only rape as a trigger of conflict at 1%. These findings imply that these institutions (the courts, local government councils, and crop farmer associations) are more often than not engaged in resolving these conflicts situations: Of concern is the non-significance of the association of the traditional institution to any of the triggers. This implies that the traditional institutions are not engaged at a significant level in conflict resolution in the study area. Does this mean that the traditional institution cannot resolve the conflicts? Doubtful as it may appear to be, the traditional institution is endowed with instruments of authority to wade through the intricacies of the relationship between the crop farmer and the herders; however, that would not be without support from the government. Furthermore, of critical concern is the non-significance of any of the institutions with cattle rustling. This is because rustling is a criminal act and hence if the culprit is not apprehended the best that could happen is to allege a suspect.

The effectiveness of a strategy to an objective is established when the desired outcome is obtained, and the intervention of the highlighted institutions in resolving conflicts can only be said to be effective when peace is restored or maintained as the case may be. The respondents were asked to indicate on a scale of 4 whether or not institutions involved in resolving conflict do achieve restoring peace or maintain peace. Furthermore, the responses were analyzed using the Chi-square model to determine the significance of their responses. The responses are as presented in Table 6 below; results indicate that courts are effective in resolving conflicts, this is evident in the residual for the response agree is 30. The result is significant at a 1% level of significance. For the traditional ruler, the residuals for the responses agree and strongly agree are 23 and 19 respectively. This indicates that most respondents agree that traditional institutions effectively resolve conflicts in the study area. The result for farmer associations shows residuals of 5 for disagree and 15 for agree indicating a popular opinion that the farmer associations also achieve the desired outcome when they engage in conflict resolution. The analysis returned a residual of 4 for the response 'disagree' and 19 for 'agree' to Local Government Committees. This indicates a popular opinion that the committees also achieve the desired outcome when they engage in conflict resolution. The results for all the response variables were found to be significant at the 1% level of significance. Turner et al., (2006) in their study in the Niger republic, reported a usually high level of success in conflict resolution involving internal committees such as village chiefs and council of elders. This finding corroborates the finding of this study on the suitability of committees in resolving conflict between the two groups.

Table 6: Chi-square analysis of institutional effectiveness in resolving crop farmer/herder conflicts

	Observed	Expected	Residual	Chi-Square
Courts				43.47***
Strongly Disagree	18	30	-12	
Disagree	28	30	-2	
Agree	60	30	30	
Strongly Agree	14	30	-16	
Traditional Ruler				60.73***
Strongly Disagree	4	30	-26	
Disagree	14	30	-16	
Agree	53	30	23	
Strongly Agree	49	30	19	
Farmer Association				20.40***
Strongly Disagree	11	30	-19	
Disagree	35	30	5	
Agree	45	30	15	
Strongly Agree	29	30	-1	
Local Government Committees				23.40***
Strongly Disagree	13	30	-17	
Disagree	34	30	4	
Agree	49	30	19	
Strongly Agree	24	30	-6	

Source: field survey, 2018.

CONCLUSION AND RECOMMENDATION

Nigeria has vast arable land, however, effective governance seemed to be lacking in its administration, hence the farmer/herder conflict situation prevailing in the country. Conflict in the agricultural community is triggered by the infringement or otherwise of the right and privileges of either the crop farmer or herder. This research work identified rape, bush burning, grazing area, and theft of cattle as triggers of conflict between the farmer and the herder in the study area. The study also found the court of law, traditional institutions, farmer associations, and Local Government Authorities as conflict management/ resolution institutions in the area. Furthermore, the courts, traditional institutions, and farmer associations were found to be effective in resolving conflict between the farmer and herder.

The losses suffered as a result of the conflict by the farmer include crops (both on the field and harvested), properties, and life. Mediation between the two groups in a conflict situation is carried out by institutions in the community. The mediation strategies include compensation and amicable resolution of damages and tense conflict situations. Furthermore, the institutions involved in conflict resolution vary in their effectiveness in resolving conflicts between the stakeholders in the study area. It is therefore imperative to consider the effectiveness of an institution in the deployment of conflict management strategies. Hence, engaging these institutions as well as empowering them to handle conflict situations between conflicting groups is expedient for the peaceful coexistence of the herders and farmers and agricultural development in the area.

Farmers suffer losses through conflict with the herder, it is pertinent for government to have conflict managing committees comprising traditional leaders, farmer associations, security organizations, and the legal institution for prevention and mediation of conflict situations. Furthermore, sensitization of both the farmer and herder about the conflict triggers should be done to reduce the occurrence of such triggers in the study area. Limitations of this study reside in the exclusion of the herder's perspective as well as the lack of a cross-interaction between the two groups; this study believes that bringing the parties together would reveal more inherent causes of the conflict and provide insights for a solution. Future research should bring together the two groups through a focus group discussion and survey for a combined analysis and outcome.

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Do the Transaction Cost Determinants Affect the Livelihoods of SANASA Beneficiaries? A Case of Colombo District, Sri Lanka

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Abstract

The livelihood development of low-income groups is a big challenge in many less developed countries. Meanwhile, scholars argue that Transaction Cost (TC) is the main factor that averts the livelihood improvement of low-income groups. This study attempted to examine how the Livelihood Success (LS) of the low-income groups is affected by the determinants of the TC. The study selected the members of SANASA society, one of the leading cooperative societies involving livelihood improvement activities in Sri Lanka. The study selected the Colombo district, the main commercial region in Sri Lanka to conduct the survey and gathered data from 130 SANASA beneficiaries, employing multistage sampling. A structural questionnaire was administered to collect primary data which were analyzed using the Partial Least Square Structural Equation Modeling. The results revealed that the TC determinants; uncertainty, and opportunism have a positive relationship with TC and negatively relate to LS. Meanwhile, rational ability and transaction frequency have negatively affected TC and positively impacted LS. The TC has a partial mediator role in the relationship between TC determinants and the LS of SANASA beneficiaries. Thus, the study provides a significant contribution to the literature by providing empirical evidence of the practical efficacy of TC and its impact on LS of the SANASA beneficiaries. Further, the study enables the policymakers and SANASA beneficiaries to develop strategies to mitigate TC by improving the rational ability and transaction frequency, both helping to avoid the opportunistic behavior of exchange partners and decreasing the transaction uncertainty, improving LS.

Keywords: Livelihoods, Opportunism, Rational ability, SANASA beneficiaries, Transaction cost, Transaction uncertainty.

INTRODUCTION

Livelihood development of low-income groups generates more positive influences on an economy such as achieving sustainable development goals, poverty reduction, employment generation, and equity, and finally leads to economic growth and development (Khan et al., 2020). Empowering the community through Community-Based Organizations (CBOs) is a powerful approach to improving the livelihoods of low-income groups (Gunasekara, Premaratne & Priyanath, 2017). There are several CBOs in Sri Lanka that assist to uplift the livelihoods of low-income groups and among them, SANASA is identified as one of the broadly disseminated CBOs that involve the livelihoods of low-income groups. At present, the SANASA movement has 8424 primary SANASA societies, 13 business entities employing 16,000 employees, catering its services to 3.7 million individual users, and acquiring total assets worth LKR 150 billion. It is the apex body of over 8400 primary societies dealing in microfinance in territories designated from the rural assemblies to the communities, subdivided throughout the country inclusive of predominantly populated areas (www.sanasa.coop/index.html, 2021). It is composed of some members who contribute initial share capital, attend meetings, and make regular savings (David & Mosley, 1997).

Today SANASA federation has a membership of 20% of the country's total population as direct and indirect membership. Most prominently, root-level membership of SANASA spread into the most remote villages comprising farmers, field workers, and other marginalized communities (Herath et al., 2013). Hence, SANASA assists livelihood development through micro-finance (Herath et al., 2013; Owen, 2007).

Although CBOs conducted in Sri Lanka highly support the development of livelihood during the recent 4-5 decades, still poverty (11.7% in 2022) can be recognized as one of the main issues in the economy (Central Bank of Sri Lanka, 2022). Scholars discuss the reasons for this issue from different perspectives. From an economic perspective, market failure discriminates against small-scale producers creating cost disadvantages (Carmel & Nicholson, 2005; Storey, 1999). According to Storey (1999), market failure is a key reason which leads to discrimination against micro-level producers in favor of large firms. For example, the formal financial sector tends to discriminate against micro-level producers providing credits for large firms, since the failure rate of micro-level producers is much higher than that of large producers (Nguyen & Canh, 2021). Considering the product market, micro-level producers fail to compete with

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large firms due to the problems of market information, management and business experiences, technology, and product quality (Maseko et al., 2012; Nguyen & Canh, 2021). Thus, market failure leads to averting the success of micro-level producers as compared to large-scale producers (Nguyen & Canh, 2021). Therefore, small-scale producers need support in providing credits, equipment, infrastructure facilities, etc. Nooteboom (1993) explained that costs of production lead to discrimination against small-scale producers in three aspects: scale, scope, and knowledge and experience. Micro-level producers generally have a small capacity for little products (Yoshino & Taghizadeh-Hesary, 2016). Often, they have poor benefits from economies of experience and inadequate capacity to access knowledge (Yoshino & Taghizadeh-Hesary, 2016). They do not have the capacity to change their scale due to several limitations such as lack of resources, knowledge, and experience, and have the ability to gain relatively fewer economies of scale (Nooteboom 1993; Yoshino & Taghizadeh-Hesary, 2016). Meanwhile, scholars (Carmel & Nicholson, 2005; Garcia et al., 2022; Jagwe, Ouma, & Machethe, 2009) indicated that micro-level producers have higher mortality due to the limitations mostly reflected in Transaction Costs (TC). The TC leads to discrimination against micro-level producers damaging their survival and success (Okoye, et al., 2016). Thus, TC can be identified as a prominent criterion in generating negative influences and discouraging small producers' livelihood success (Priyanath & Habaragamuwa, 2020). In general, TC refers to the costs that are associated with an economic exchange (Williamson, 1985). Since most of the people who get the assistance of SANASA are relatively small-scale producers, TC faced within several stages of their businesses is a common problem associated with them (Owen, 2007). As stated above most probably the SANASA assistance taken people are from rural marginalized communities and they generally lag in education, market experiences, developed technology, and advanced knowledge (Jagwe, Ouma, & Machethe, 2009). Also, most commonly they are settled in rural areas with lower infrastructure facilities. These factors are identified as the roots of TC among marginalized rural communities (Jagwe, Ouma, & Machethe, 2009). TC disturbs the reaping best out of CBOs in alleviating poverty and upgrading sustainable livelihoods among low-income earners. Small-level producers like SANASA beneficiaries play a vital role in the Sri Lankan economy generating more employment opportunities, reducing rural poverty, female and community empowerment and achieving sustainable development, etc. (Chigonda, 2017). Nevertheless, TC leads to distortion that sustainability reflects a downgrade in Sri Lankan small-producer success (Priyanath & Lakshika, 2020). However, complete empirical work on examining the livelihood success of SANASA beneficiaries from a TC perspective represents a significant gap in the literature. Therefore, this study attempts to bridge this gap by studying empirically how TC determinants affect the livelihoods of SANASA beneficiaries in Sri Lanka.

This study has several theoretical, empirical, and practical importance and its findings expand the understanding of the way of improving the livelihoods of SANASA beneficiaries by mitigating TC. When referring to the previous literature, many scholars study TC and agriculture (Bhattarai & Bhusal, 2015; Jagwe, Ouma, & Machethe, 2009), industry (Carmel & Nicholson, 2005; Dyer & Chu, 2003; Miththrananda, & Priyanath, 2020), and services (Priyanto, Mazkie, & Khusaini, 2014; Silva, 2021). It cannot identify clear research in the literature which were conducted focusing on the effect of TC

on livelihoods. In this nature, the study is important since the findings may help to design new strategies to improve LS by minimizing TC. Further, the study helps to understand the relative efficacy of TC theory in different contexts and how it works practically especially in the low-income group in Sri Lanka which generates broad importance. The rest of this paper has been arranged as presenting theoretical and empirical literature in section 2, Methodology in section 3, Results and discussion in section 4, and section 5 concludes the paper.

THEORETICAL BACKGROUND

The study reviewed transaction cost economics developed by Coase (1937) and initially followed by Williamson (1979) and the concept of sustainable livelihood inaugurated at the Institute of Development Studies (IDS) (Solesbury, 2003).

Transaction Cost Economics: Williamson (1979) explained that the transfer of a particular good or service between technologically separable interfaces is known as transaction cost. TC is defined as the transfer of a certain good or a service between technologically separable interfaces (Williamson, 1981). Coase (1937) stated that in the real world a perfectly competitive market does not exist and the exchange partners pay certain costs to eliminate the imperfection as the imperfection arises because of information scarcity. The asymmetrical information leads to bounded rationality for one party and opportunism for the opposite partners (Williamson, 1981). The bounded rationality of humans arises intrinsically due to the incapability of information handling (Simon, 1990). The barriers to collecting, processing, and evaluating the information to make proper transaction decisions are called bounded rationality (Zhang, 2009). The existence of asymmetrical information hinders transaction parties from making rational decisions which are known as bounded rationality and thereby encourages the exchange partners to behave opportunistically against the focal transaction party is identified as opportunism (Williamson, 1985). The opportunism of the exchange partners is defined as exchange partners' searching for self-interests with guile (Rokhan, Heide & Wathne, 2003). Opportunism exists when one exchange partner has more information and hence tends to behave opportunistically against the other exchange partner who has less information (Williamson, 1981). TC is determined by uncertainty, transaction frequency, and asset specificity (Williamson, 1985). Transaction uncertainty is defined as the unpredictability of future transactions due to the changeable behavior of exchange partners and the external transaction environment i.e., political, legal, policies, and social (Williamson, 1991). These particular unpredictable events differ in the terms of transaction agreements (Williamson, 1991). Transaction frequency is identified as how often the transaction is. It implies a repeat transaction with the same exchange partners (Williamson, 1991).

TC consists of four categories; searching, negotiation, monitoring, and enforcement (Priyanath, 2017; Williamson, 1985). The search cost is identified as the cost incurred to seek the supplier who offers the lowest price and customers who offer the highest prices (Hobbs, 1996; Priyanath, & Habaragamuwa, 2020). When a supplier with the lowest prices of input and a buyer who offers the highest price is found, then there exists a request to sign legally bound contracts or agreements which includes negotiation cost or contractive cost as payment needs to be made to the lawyer and other payments to provide goods to the parties (Hobbs, 1996; Williamson, 1985). The monitoring cost is identified as

the cost incurred in the monitoring of the transaction activities which are made according to the agreement (Hobbs, 1996). When the contract is registered under government regulations and hence the cost incurred within this process is called enforcement cost (Hobbs, 1996; Williamson, 1985). As a result of the transaction, the enforcement cost arises which is a definite payment that needs to be paid to the government when making a transaction (Hobbs, 1996; Williamson, 1985). Therefore, the producers have to incur costs to seek suppliers and buyers, negotiate with the exchange partners, contract on a long-term basis and monitor the transaction agreements mainly due to the existence of asymmetrical information (Hobbs, 1996; Dyer, 1997; Williamson, 1985). Hence, these costs are called TC (Dyer, 1997; Williamson, 1985; Zhang, 2006).

Livelihood success: The livelihood system is defined as a changing realm that integrates both opportunities and assets that exist in a group of people to achieve their goals, inspirations, interactions, and exposure to an array of either advantageous or harmful social, ecological, political, and economic perturbations which might constraint or assist capacities of the groups to make a living (Babulo et al., 2008). The concept of sustainable livelihood goes beyond merely meeting of basic needs of the poor in a sustainable way (Babulo, et al., 2008). It is identified as putting people at the midpoint of development and expanding the effectiveness of the development support (Department of International Development [DFID], 2008). A livelihood is identified as sustainable if it can meet and cope with and also if it can recover from shocks and stress, maintain and develop its assets and capabilities and finally be able to provide opportunities for the future generation which are sustainable and also which provide net benefits to the other livelihoods in the local and global arena and in short and long-term (Chambers & Conway, 1992). Further, Beall and Kanji (1999) identified livelihood as a broader variety of activities which are dealt with vulnerabilities and hazards, possessing strong interaction among members at levels of household, external, community, and institutional wise amidst the management of strong social networks. The widely adopted DFID sustainable livelihood framework has four strands. First, people have vulnerability contexts (sudden shocks, trends over time, and seasonal changes). Second, the capital assets people use for their livelihoods (natural capital, financial capital, physical capital, human capital, and social capital). Third, people's livelihood strategies (choices and methods), and fourth policies, institutions, and processes held to form people's access to assets and livelihood activities (Brocklesby & Fisher, 2003). Researchers who examined the success of sustainable livelihoods employed the capital asset-based approach for their studies since it is more influential for people's livelihood (Priyanath & Habaragamuwa, 2020; Priyanath & Lakshika, 2020). As mentioned above, five types of capital have been included in the framework. According to Scoones (1998), the assets that influence the sustainable livelihood analysis framework can be grouped into five major categories named; human, natural, social, financial, and physical. Moser (2006) identified that the resource endowment consists of two categories; tangible (financial, physical, natural) and intangible (social, human) assets. Scoones (2009) and Carney (1998) have used an asset-based approach in varying contexts but majorly in poverty evaluation, assessment of livelihood strategies, risk management, vulnerability, and improved livelihood outcomes. These impacts include obtaining a higher income for the targeted population, less vulnerability, better food security, and well-being, and usage of natural resources more sustainably (Scoones, 2009).

In most recent studies, human capital is highlighted as the main driving force deciding livelihood success (Avila-Foucat and Rodiguez-Robayo, 2018; Mushongah and Scoones, 2012). Simply, these are labor resources that are included in households consisting of both the dimensions of qualitative and quantitative. The dimensions such as age, household size, and the number of persons engaged in earning activities in a household are defined under the quantitative aspect. The natural resources which are useful in maintaining improved livelihoods are widely grouped into three major categories; forest resources, water resources, and forest resources, as well as other environmental resources, especially general pool resources, are also included (Avila-Foucat et al., 2018; López-Feldman, 2014). The major determinants of financial capital can be identified as credit accumulations, savings, subsidies, total income, pensions, and remittances. People save in terms of liquid assets such as lumpy property i.e., livestock for future benefit or as cash balances when markets are absent for financial intermediation (Devereux, 2001). Physical capital is identified as the basic infrastructure i.e., shelter, water, transportation, communication, energy, and the production tools and equipment which enable the people to aspire to their livelihoods. The physical capital is also associated with the infrastructure required for agricultural production and transportation, household living conditions i.e., household appliances, infrastructure, and basic needs (Riveros-Cañas, Rodríguez-Robayo, & Cesín, 2016). Social capital is identified as one of the most significant aspects by scholars of all types of capital under the livelihood success framework (Avila- Foucat et al., 2018). The major aspects of this include the cooperation among the households' membership among various institutional networks, groups, norms, relationships of trust, and reciprocity (Mushongah et al., 2012).

HYPOTHESES

This study analyzes the impact of transactional cost determinants on the livelihood success of the SANASA beneficiaries. The transactions between the partners cannot be efficiently organized due to bounded rationality or in other words inadequate rational ability (Williamson, 1985). The TC is arisen because of fear of focal partners in making decisions due to the risk of exchange partners' opportunistic behavior (Hobbs, 1996; Williamson, 1985). Business firms are careful when they are making decisions in which they don't possess adequate information. According to Williamson (1985), members in asymmetrical information blocks make rational decisions, and hence it is called bounded rationality i.e., it limits the individual's capacity to receive, store, retrieve and possess information without any error. The increase in access and capability to assess information through the encouragement of formal and informal networks of small-scale producers in Sri Lanka has significantly reduced their bounded rationality (Priyanath & Premaratne, 2017; Priyanath & Buthsala, 2017). Consequently, it may lead to a higher TC. When TC increases it may impact significantly the economic performance (Priyanath et al., 2017), and further it may prevent the livelihood success of the co-operative members. Thus, it requires firms to incur costs to search for the information, assess and evaluate information, and get legal advice before making vital transaction decisions i.e., that the bounded rationality increases and hence shows a positive relationship with TC, ultimately would cost

the livelihood success (Hobbs, 1996). Thus, it hypothesizes that;

H1: Rational ability has a negative effect on the transaction cost of SANASA beneficiaries.

H2: Rational ability has a positive impact on the livelihood success of SANASA beneficiaries.

Opportunism is another determinant of TC, defined as which encourages exchange patterns to behave opportunistically against the focal transaction parties (Williamson, 1985). It arises due to the availability of asymmetrical information in the market and thereby the transactions will be more costly. An exchange partner who has much information tends to behave opportunistically against the party who possesses less information (Williamson, 1981). Business firms need to incur costs in searching for prices, negotiating transaction details with exchange partners, and getting legal advice for agreements. When transaction parties have identical perceptions of mutual success, then the avoidance of possible opportunism and support towards each other through the exchange of opinions, ideas, and resources in a free manner will occur with the motive of enhancing livelihoods (Tsai & Ghoshal, 1998). Due to common understanding, transaction parties are influenced to trust each other as they expect that all are working for collective goals and thereby, they will not be hurt by the pursuit of self-interest of other members' i.e., opportunistic behavior (Miller, Besser & Weber, 2010). This higher TC resulting from the firm's success is discouraged (Priyanath et al., 2017). Therefore, it assumes that,

H3: Opportunism has a positive effect on the transaction cost of SANASA beneficiaries.

H4: Opportunism has a negative impact on the livelihood success of SANASA beneficiaries.

Uncertainty is a straightforward assumption and distinguishes it from the assumption of perfect information according to the neoclassical view. Information with regards to past, present, and future are not perfectly available and known due to different reasons. Without the existence of bounded rationality and opportunism, uncertainty would be less problematic due to general rules which would generally prevail (Williamson, 1985). To avoid uncertainty, under distinguished opportunistic behavior and bounded rationality, the agents establish and implement a structure of governance to reduce TC (Williamson, 1981). Mutual understanding among transaction parties in the avoidance of opportunistic behavior of the exchange partners, uncertainty in business, and encouragement to share resources and opportunities with a minimum negotiation cost (Chiu, Hsu & Wang, 2006) and this commonality among transaction parties leads to decrease TC and thereby improving livelihoods of the members in the community. Thus, this study hypothesizes that;

H5: Uncertainty has a positive effect on the transaction cost of SANASA beneficiaries.

H6: Uncertainty has a negative impact on the livelihood success of SANASA beneficiaries.

Transaction frequency is identified as the repetition of similar transactions (Everaert, Sarens, & Rommel, 2010). Further, it was elaborated on the frequency of transactions occurring between business enterprises and exchange partners which help them to generate a relational contract (Boyle, Dwyer, Robicheaux & Simpson, 1992). The relational contract is known as social embeddedness and as self-enforcing governance (Dyer & Singh, 1998; Noordewier, John & Nevin, 1990; Uzzi, 1999). The cooperatives and mutual

benefits are the main considerations in the relational contract (Lu, 2007). These relational contracts lead to an increase in the level of satisfaction between present exchange partners preventing the requirement to seek a new partner and decreasing transaction costs incurred in searching for a novel reliable partner (Doucette, 1996). Hence, transaction frequency decreases TC. Thus, the study hypothesizes that;

H7: Transaction frequency has a negative effect on the transaction cost of SANASA beneficiaries

H8: Transaction frequency has a positive impact on the livelihood success of SANASA beneficiaries

This study attempts to discuss the effect of TC on the relationship between TC determinants and the livelihoods of SANASA beneficiaries. Therefore, it is necessary to identify the overall relationship among TC determinants, TC, and livelihood success of SANASA beneficiaries. When TC is high, it may avert economic performance as stated by Priyanath and Premarathna (2017) and further, they confirmed when a firm faces high TC, it will discourage the firm's success. According to the hypotheses developed in the above section, opportunism, and uncertainty increase the TC while rational ability and frequency lead to a decrease in TC. SANASA beneficiaries have to incur additional costs based on the opportunism of other parties in making their livelihood. Although the additional costs are due to this opportunism, the parties act opportunistically because the SANASA beneficiaries have limited rationality, they face uncertainty over individual behavior and the environment. These additional costs reduce the success of the livelihood of SANASA beneficiaries. Accordingly, transaction cost determinants have a negative impact on livelihood success, and transaction costs as a mediating variable exacerbate that negative impact. Therefore, this study assumes that:

H9: Transaction cost has a mediate effect on the relationship between transaction cost determinants and the livelihood success of SANASA beneficiaries.

MATERIALS AND METHODS

The main focus of this study is to identify the effect of TC determinants on the livelihood success of SANASA beneficiaries. The study mainly used a deductive and explanatory approach and utilized a quantitative research design. Primary data were collected from SANASA beneficiaries using multistage sampling techniques. First, the study selected the Colombo district randomly. Second, a list of SANASA societies that function in the Colombo district was collected from the Department of Cooperative Development. Third, one SANASA society was randomly selected from each divisional secretariat among thirteen DS divisions in the Colombo district. Fourth, respondents who were engaging with SANASA for income-generating activities were selected as a cluster to gather data. Therefore, the sample size used in this study is 130 SANASA beneficiaries.

The major research instrument used in this study was the questionnaire which was grouped widely into three sections; demographic section, the aspects of transaction cost, and livelihood success. Each respondent was asked to fill out the questionnaire after providing a brief introduction and explaining the study's objectives. Under the demographic section, variables such as the age of the respondent, gender, income level, marital status, and the highest educational qualification were questioned. The section on transaction cost was further subdivided into two sub-sections; transaction costs and TC determinants. These sections on transaction cost and livelihood success utilized a seven-point Likert

Scale in which the respondents were asked to specify the degree to which they agree or disagree with various statements. The Seven-Point Likert's scale having ratings of "strongly disagree" (1) and "strongly disagree" (7) were utilized.

In this study, the transaction cost was measured by the adoption of Williamson's (1985) classification i.e., searching, negotiating, monitoring, and enforcement costs. To measure the search cost, six items were adopted which was done by Dyer and Chu (2003). Five items were employed to measure negotiation costs as adopted by Dyer and Chu (2003). Nguyen and Crase (2011) and Dyer and Chu (2003) used four items to measure monitoring cost and thereby it was adopted in this study. To measure enforcement costs, four items were adopted (Dyer and Chu, 2003). Livelihood success was measured using five dimensions i.e., physical, social, natural, financial, and human capital (Gunasekara, Premaratne & Priyanath, 2017). The opportunism of the exchange partners against SANASA beneficiaries is identified as the behavior of seeking self-interests with the guile of the exchange partners. This was measured using eight items i.e. sincerity in dealings, exaggeration of needs, truthfulness in dealings, dishonesty in dealings, good faith bargaining, cheating in dealing, unfairness in dealing, and agreement which was engaged in by the exchange partner. These eight items were adopted based on Dahlstrom and Nygaard (1999), and Rokkan, Heide, and Wathne (2003).

This study measured the rational ability of the SANASA beneficiaries using three dimensions i.e. ability to access information which means lower information asymmetry, and ability to assess information as the study observed that not only the information asymmetry but also the inability to evaluate information averts decision-making ability of the human beings and ability to make good and effective decisions. Hence, this study used eight items to measure the ability to access information, four items were employed to measure the ability to assess information, and four items were used to measure the decision-making ability.

Environmental uncertainty is measured using uncertainty in demand and supply forces. Demand uncertainty was measured using four items as used in empirical studies by scholars like John and Weitz (1988), and Noordeweir et al. (1990). Supply uncertainty was measured employing four items that were adopted by Chen and Chen (2003). In contrast, the measurement of behavioral uncertainty was been operationalized using the degree of difficulty in assessing the performance of the exchange partners (Rindfleisch & Heide, 1997; Shin, 2003) and risk of opportunistic behavior of the exchange partners were the two items employed in this study to measure behavioral uncertainty of the livelihood beneficiaries as previously developed by Chen (2002) and adopted by Kamyabi and Devi (2011). Transaction frequency in this study was measured employing a simple item: the repetition of transactions between SANASA beneficiaries and exchange partners as adopted by John and Weitz (1988), and Everaert et al. (2010). Livelihood success was measured using five dimensions including human, physical, natural, financial, and social capital as adopted by Gunasekara, Premaratne, and Priyanath (2017).

The collected data were recorded and coded into a Microsoft Excel sheet and then it was exported to Smart PLS (Version 3) as a CSV file. Through Partial Least Square Structural Equation Modeling (PLS-SEM), the evaluation of measurements of variables and hypothesis testing were done. The main software used to analyze PLS-SEM was Smart PLS version 3. Under the measurements of variables, the first-order analysis, and second-order analysis were assessed individually. According to first-order analysis, the validity and reliability of these particular constructs were tested depending on items and indicators in the questionnaire. The validity of the constructs was measured via convergent validity and discriminant validity. The reliability is assessed through indicator reliability and internal consistency reliability. If there is successful reliability and validity exist, then it is considered good to fit the second-order analysis i.e., the final model. It is evaluated by utilizing the validity and reliability of the indicators and latent variables. Further, the multicollinearity, significance of path coefficients, coefficients of determination, effect size, and predictive relevance were assessed under hypothesis testing in the inner model.

RESULTS

The 130 respondents indicated that 50 designating 38.46% were males and 80 representing 61.54% were females. The age statistics exhibited that the least age groups were those aged between 31 to 40 years which represented 8.46% of the respondents sampled for the study. Further, the highest age groups were those between 21-30 years. These age groups were made up of 79 respondents which represented 60.77% of the respondents. The highest age group was followed by those between 41- 50 years and 51 years and above. This age group represents 20% and 10.76% of the respondents respectively. Furthermore, the marital status of respondents shows that 30 have never been married, 92 were married, 6 were separated and 2 were widows. Percentage-wise 23.08% were never married, 70.77% were married, 4.62% were separated and 1.54% were widows. In terms of education, none of the respondents was without any formal education. The most represented educational levels were those up to the Advanced level which was made up of 55 respondents or 42.30% of the respondents. This was followed by 51 respondents representing 39.23% who were with a diploma and 22 respondents representing 16.92% who were with a bachelor's degree. The least represented educational level was those up to the ordinary level who were 2 in number or 1.53% of the respondents. 29 of the respondents, or 22.38% of the respondents earned less than Rs. 20,000; 41, or 31.54% earned between Rs. 20,000-Rs. 40,000; 32 respondents, or 24.62% earned between Rs. 40,000- Rs. 60,000 and Rs. 60,000- Rs. 80,000 earned by 18 which was 13.85% respectively; 10 respondents or 7.69% of the respondents earned above Rs. 80,000.

The measurement model was tested under PLS-SEM to establish the construct reliability and validity of the outer model. The overall assessment was conducted under two steps; first-order and second-order analysis. In the first step, the reliability scores between questionnaire items with the construct were generated under first-order analysis. Table 01 depicts that the generated outer loading values are above the minimum threshold criterion of 0.7. Contrary, the T-test posits that the factor loadings were statistically significant because all outer loadings are above 1.96 at a 95% confidence level depicting that altogether the constructs under first-order analysis satisfied indicator reliability. Under internal consistency reliability, table 01 further proved that both Cronbach's α (Cro. α) and Composite Reliability (CR) values are above 0.7. Further, table 01 posited the convergent validity of first-order constructs in the dependent variable since all values were above 0.5 (AVE should be equal to or greater than 0.5).

Table 01: Analysis of the first-order constructs

	T Stat	Load-ings	Cro. α	CR	AVE
1. Ability to assess information (Asses Info.)			0.967	0.976	0.911
Ability to evaluate information about the behavior of market prices.	147.31	0.965			
Ability to evaluate the input prices and quality related to products before the purchase decision.	54.00	0.942			
Ability to evaluate the potential threat coming from competitors.	60.52	0.942			
Ability to evaluate the change in the business environment, political situations, and external shocks.	129.52	0.967			
2. Ability to make decisions (DMA)			0.983	0.988	0.952
Ability to make a satisfactory sale decision evaluating information	294.28	0.981			
Ability to face the threats coming from competitors	308.53	0.983			
Ability to face the changes coming from the external business environment.	128.14	0.972			
Ability to make good transaction decisions avoiding various issues	137.14	0.967			
3. Ability to access information (Access Info.)			0.987	0.989	0.915
Ability to find accurate information about market prices for a product	48.55	0.938			
Ability to find sufficient information about new markets and buyers	39.14	0.929			
Ability to find sufficient information about reliable buyers	124.10	0.965			
Ability to find sufficient information about threats coming from the competitors	256.24	0.977			
Ability to find accurate information about input prices.	147.98	0.970			
Ability to find sufficient information about new input suppliers	148.70	0.961			
Ability to find sufficient information about reliable suppliers	84.57	0.946			
Ability to find sufficient information about product techniques	161.54	0.969			
4. Buyers' opportunism (BOPPO)			0.983	0.985	0.882
Buyers do not provide a truthful clear picture of the deal when negotiating.	35.86	0.934			
Total honesty will not be expected from our buyers when negotiating.	55.73	0.933			
Generally, most buyers exaggerate their needs to get what they want	34.72	0.911			
Buyers always change the pre-agreed facts to get their benefits	135.82	0.960			
Complete good-faith deals will not be expected from buyers	141.30	0.960			
Need to check carefully every step of the transaction that is made with buyers to avoid cheating	27.63	0.888			
Generally, most buyers are dishonest in transaction activates	156.06	0.966			
Generally, most buyers are not sincere in transaction activities.	92.77	0.949			
Generally, most buyers do not fair in transaction activities	98.68	0.948			
5. Suppliers' opportunism (SOPPO)			0.989	0.990	0.917
Suppliers do not provide a truthful clear picture of the deal when negotiating.	116.15	0.967			
Complete honesty will not be expected from suppliers when negotiating.	118.94	0.953			
Generally, most suppliers exaggerate their needs to get what they want	142.07	0.971			
Suppliers always change the pre-agreed facts to get their benefits	188.23	0.972			
Complete good-faith deals will not be expected from suppliers	203.87	0.978			
Need to check carefully every step of the transaction that is made with suppliers to avoid the cheating	29.55	0.919			
Generally, most of the suppliers are dishonest in transaction activates	49.71	0.936			
Generally, most of the suppliers are not sincere in transaction activities.	131.66	0.963			
Generally, most of the suppliers do not fair in transaction activities	137.71	0.958			
6. Behavioral uncertainty (BUNCERT)			0.921	0.962	0.926
It is very easy to understand the performance of buyers	54.16	0.962			
The risk of opportunistic behavior of buyers is very low	62.74	0.963			
7. Environmental uncertainty (EUNCERT)			0.983	0.986	0.895
Future market shares for the product can easily be forecasted	45.65	0.930			
Future sales volume for the product can easily be forecasted	70.72	0.945			
Future prices for the product can easily be forecasted	38.56	0.944			
Customers' demand for the product in the future is stable	89.24	0.953			
The future market for input supply can easily be forecasted	93.91	0.959			

Future input supply can easily be forecasted	170.41	0.969		
Future input prices can easily be forecasted	26.75	0.910		
Input supply for the product in the future is stable	122.55	0.957		
8. Transaction frequency (Frequency)			0.960	0.980	0.961
Sale substantially higher number of products for regular buyers.	264.25	0.981		
Purchase a substantially higher amount of inputs from regular suppliers.	264.25	0.981		
9. Enforcement cost (Enfo. Cost)			0.961	0.972	0.897
There is a cost to resolving transaction disputes	39.13	0.943		
There is a labor cost to resolve transaction disputes.	154.62	0.969		
There is a traveling cost to resolve transaction disputes	116.97	0.964		
There is a communication cost to resolving transaction disputes	25.72	0.911		
10. Monitoring cost (Moni. Cost)			0.984	0.988	0.955
There is a cost for monitoring whether the transaction activities are undertaken according to the agreements.	172.80	0.975		
There is a labor cost for monitoring whether the transaction activities are undertaken according to the agreements.	199.88	0.981		
There is a traveling cost for monitoring whether the transaction activities are undertaken according to the agreements.	166.61	0.980		
There is a communication cost for monitoring whether the transaction activities are undertaken according to the agreements.	114.39	0.974		
11. Negotiation cost (Nego. Cost)			0.980	0.987	0.962
There is a labor cost to handle legal matters and negotiate with exchange partners to decide details relating to the transaction.	129.15	0.975		
There is a traveling cost to handle legal matters and negotiate with exchange partners to decide on details relating to the transaction.	337.67	0.987		
There is a communication cost to handle legal matters and negotiating with exchange partners to decide details relating to transactions.	230.11	0.981		
12. Searching cost (Search Cost)			0.976	0.984	0.954
We incur costs to search for new buyers and suppliers.	325.18	0.986		
There is a labor cost to handle advertising activities	192.36	0.975		
There is a traveling cost to handle advertising activities	129.99	0.968		
13. Financial capital (Finance Cap.)			0.956	0.979	0.958
Income has increased due to Sanasa benefits	146.82	0.979		
Savings have increased due to Sanasa benefits	135.66	0.978		
14. Human capital (Human Cap.)			0.984	0.987	0.939
Improved professional knowledge because of Sanasa	131.86	0.968		
Improved general knowledge	121.04	0.963		
Improved skills	304.97	0.982		
Gained a lot of experience in doing business	85.84	0.964		
Improved the efficiency	170.86	0.969		
15. Natural capital (Natural Cap.)			0.983	0.989	0.967
The available natural resources are sufficient for the business	301.44	0.982		
The risk of natural disasters is low in this area	229.51	0.982		
There is an increase in the supply of natural resources due to Sanasa's assistance and benefits	352.42	0.986		
16. Physical capital (Physical Cap.)			0.978	0.989	0.978
There is an increase in the number of buildings and machinery	377.97	0.989		
There is an increase in land assets due to Sanasa	389.07	0.989		
17. Social capital (Social Cap.)			0.964	0.982	0.966
There is an increase in the mutual corporation among the Sanasa members	304.52	0.983		
There is an increase in trust among the Sanasa members	316.23	0.983		

Source: Survey data, 2022

The discriminant validity, table 02 depicted that none of the inter-construct correlation values are above the square root of the AVE and then this satisfied the criterion of discriminant validity of the first-order constructs.

Table 2: Discriminant validity of first-order constructs

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1.	Assess Info.	**.88**																
2.	DMA	.61	**.87**															
3.	Access Info.	.71	.59	**.91**														
4.	BOPPO	.74	.66	.62	**.92**													
5.	SOPPO	.78	.71	.82	.67	**.93**												
6.	BUCERT	.42	.40	.37	.43	.47	**.87**											
7.	EUNCERT	.52	.50	.45	.54	.53	.72	**.86**										
8.	Frequency	.63	.69	.58	.58	.67	.52	.71	**.92**									
9.	Enfo. Cost	.58	.64	.57	.56	.58	.44	.61	.81	**.91**								
10.	Moni. Cost	.43	.29	.44	.25	.43	.28	.26	.35	.37	**.75**							
11.	Nego. Cost	.65	.54	.67	.49	.79	.38	.41	.56	.49	.51	**.88**						
12.	Search Cost	.67	.56	.67	.49	.78	.35	.42	.61	.52	.50	.87	**.86**					
13.	Finance Cap	.40	.26	.45	.32	.35	.11	.17	.26	.27	.24	.32	.34	**.84**				
14.	Human Cap	.62	.43	.63	.54	.56	.20	.25	.36	.34	.29	.44	.43	.66	**.94**			
15.	Natural Cap	.57	.56	.58	.44	.61	.51	.57	.56	.58	.44	.61	.54	.26	.45	**.82**		
16.	Physical Cap	.44	.25	.43	.28	.26	.35	.44	.25	.43	.28	.26	.35	.43	.63	.54	**.76**	
17.	Social Cap	.37	.49	.59	.38	.41	.56	.57	.42	.69	.38	.43	.56	.56	.58	.44	.61	**.81**

Source: Survey Data, 2021.

Based on the scores of latent variables of the first-order constructs, the second-order level constructs were formed as demonstrated in table 3. As computed in the first-order level, the same reliable and validity tests were performed in the second-order- level as well. Thus, altogether indicator reliability of the thirteen latent variables, including five constructs under the dependent variable livelihood success, four constructs under the mediate variable (TC), and four constructs as independent variables in second order was evaluated. According to table 3, all path coefficients of

standardized factor loadings were above the threshold value of 0.7. Contrarily, all the t-statistics were above 1.96 and hence it demonstrated that all are significant at 95% confidence levels. Table 03 further depicted that Cronbach's α was higher or greater than the required value of 0.7 and composite reliability was also larger than the recommended value of 0.7. Further, the computed results confirmed that the convergent validity of the second-order construct had an AVE above 0.5.

Table 03: Analysis of the second-order constructs

Construct	T- Statistics	Loadings	Cro. α	CR	AVE
Rational Ability			0.984	0.990	0.969
Ability to access information	163.65	0.979			
Ability to assess information	660.62	0.993			
Ability to make decisions	192.87	0.982			
Uncertainty			0.959	0.980	0.960
Behavioral uncertainty	221.62	0.980			
Environmental uncertainty	198.87	0.980			
Opportunism			0.991	0.996	0.991
Buyers' opportunism	909.72	0.996			
Suppliers' opportunism	855.09	0.995			
Transaction frequency			0.991	0.995	0.978
Transaction frequency	65.29	0.952			
Transaction costs			0.990	0.993	0.972
Monitoring cost	266.34	0.987			
Enforcement cost	356.64	0.987			
Negotiation cost	511.46	0.992			
Searching cost	185.09	0.978			
Livelihood success			0.992	0.994	0.968
Financial capital	108.04	0.968			
Human capital	371.72	0.988			
Natural capital	348.60	0.987			
Physical capital	280.61	0.985			
Social capital	632.71	0.992			

Source: Survey data, 2022

Thereafter the discriminate validity of second-order constructs was computed and presented in table 04 and demonstrated that none of the inter-construct correlation values was above the square root of AVE hence concluded that it satisfied the criterion of discriminant validity of the second-order constructs.

Table 04: Discriminant validity of the second-order constructs

	1	2	3	4	5	6
1. Livelihood success	**0.984**					
2. Opportunism	0.756	**0.996**				
3. Rational ability	0.800	0.930	**0.985**			
4. Transaction costs	0.832	0.948	0.950	**0.986**		
5. Frequency	0.851	0.879	0.898	0.943	**0.998**	
6. Uncertainty	0.839	0.925	0.919	0.951	0.970	**0.980**

Source: Survey data, 2022

This study assessed the multicollinearity of the structural model with the support of VIF value. The collinearity implied that the two constructs were measuring the same variable and it happened when the correlations among constructs were high (Hair, Ringle, and Sarstedt, 2012).

Table 05: Multicollinearity

	VIF
Rational ability	1.711
Opportunism	1.310
Uncertainty	2.102
Frequency	1.588
Transaction costs	3.587

The collinearity among dependent variables in the structural model was lower than the threshold value of 5 as depicted in table 05, implying that there were no issues of multicollinearity detected among variables when the VIF value was lower than the recommended threshold value of 5, thus there was no issue of multicollinearity among variables.

In the evaluation of the structural model, the second step involved assessing the significance of the hypothesized relationships. To evaluate path coefficients, as the first step, the PLS algorithm was conducted, and thereafter it was vital to identify the significance, magnitude, and path coefficients' signs. The t-values were used to estimate the statistical significance of each path coefficient. The critical t-value for a two-tailed test was identified as 1.96 at a significance level of 0.05 (Hair et al., 2012). Thus, table 06 exemplified hypotheses that were supported and not supported based on t-value.

Table 06: Path coefficients and hypotheses

Hypotheses	Path coefficients	T Statistics	P Values	Decision
H1: Rational ability -> Transaction costs	0.277	2.928	0.004	**Supported**
H2: Rational ability -> Livelihood success	-0.149	2.119	0.014	**Supported**
H3: Opportunism -> Transaction costs	0.378	2.614	0.009	**Supported**
H4: Opportunism -> Livelihood success	-0.393	2.227	0.027	**Supported**
H5: Frequency -> Transaction costs	0.439	3.694	0.000	**Supported**
H6: Frequency -> Livelihood success	-0.323	1.528	0.127	**Not Supported**
H7: Uncertainty -> Transaction costs	0.079	0.389	0.698	**Not Supported**
H8: Uncertainty -> Livelihood success	-0.324	1.180	0.239	**Not Supported**
H9: Transaction costs -> Livelihood success	-0.451	2.287	0.036	**Supported**

R^2 for Livelihood success = 0.74, and for TC = 0.49

Source: Survey data, 2022.

The mediating effect as depicted in table 07, was identified by obtaining the bootstrapping result under the second-order construct in SmartPLS. There should be significance t-statistic value relevance with path coefficient value and the relationship between three variables to establish a significant mediate effect on the relationship between the two variables. According to the computations, it was identified that there was a mediating effect of TC between TC determinants and livelihood success.

Table 07: The mediate effect

Relationship	β	T Statistics	P Values	Decision
Rational ability -> Transaction costs -> Livelihood success	0.125	2.230	0.030	**Partial Mediation**
Opportunism -> Transaction costs -> Livelihood success	-0.170	2.340	0.021	**Partial Mediation**

Source: Survey data, 2022.

Table 06 demonstrates that there is a negative relationship between rational ability and TC (β = -0.277 and t-value = 2.928). It satisfied hypothesis H1. It implies that if the SANASA beneficiaries have adequate and reliable information accompanied by better market experiences, their rational ability of him/her is relatively high, and this it affects the decrease of TC. Priyanath and Buthsala (2017) mentioned that rational ability has a significant negative impact on the TC of Small Industries in Sri Lanka. Ranatunga et al. (2021) revealed similar situations in Small and Medium Scale Industries in Sri Lanka. They mentioned that rational ability has a negative impact on TC. Further, table 06 depicts that rational ability maintains a positive relationship with livelihood success (β = 0.149 and t- value 2.119) satisfying the hypothesis H2. Thus, the results confirmed that the increase in the rationality of the SANASA beneficiaries leads to increase livelihood success. If they have accurate and timely information, it might lead to improving rationality. When individuals have the ability to access information, obviously it creates accurate judgments (Priyanath et al., 2016). The finding shows that the SANASA beneficiaries who have relatively advanced rationality yield more success in their livelihoods.

Table 06 above indicates that there is a significant positive relationship between opportunism with transaction cost (β = 0.378 and t-value = 2.614). This satisfies hypothesis H3 of the study. According to Foss & Weber (2016), opportunism takes the front seat in determining TC. As well a study conducted by Priyanath and Premaratne (2017) has stated that opportunism among small-scale operators in Sri Lanka is relatively high. The small-scale market in Sri Lanka operates with information asymmetry due to a lack of education, market experience, advanced technology, and developed infrastructure, which leads to experience opportunism. This opportunism has led to retard the livelihood success of the SANASA beneficiaries representing a negative relationship between opportunism and livelihood success. Table 06 shows this relationship expressing the values as, β = -0.393 and t-value = 2.227. Therefore, this result supports hypothesis H4. Opportunism always leads to making transactional powers unstable (Mithrananda & Priyanath, 2020). Hence, the ones who do not have adequate information and related experience will face opportunism of exchange partners that affect failures in their livelihood activities. Thus, the results confirmed that the SANASA beneficiaries suffer a hazard from the opportunistic behavior of exchange partners and opportunism discourages the livelihood success of the SANASA beneficiaries.

The results in table 06 indicate that transaction frequency is negatively associated with TC (β = -0.439 and t-value = 3.694). The results support hypothesis H5. It implies that repeated transaction leads to decrease TC. However, transaction frequency has not significantly influenced on livelihood success of the SANASA beneficiaries. The results do not support hypothesis H6. Uncertainty is another prominent determinant when discussing TC among SANASA beneficiaries. Table 06 generated with the assistance of gathered data represents that there is no significant relationship between uncertainty and TC. The results do not accept hypothesis H7. Further, hypothesis H8 is not statistically accepted but it represents a negative relationship between uncertainty and the livelihood success of the SANASA beneficiaries. Finally, table 06 depicts that there is a significant negative relationship between TC and livelihood success (β = -0.451 and t-value = 2.287). Thus, it satisfies the H9. Searching costs, negotiation costs, monitoring costs, and enforcement costs result in

limitations in one's livelihood successes (Priyanath & Lakshika, 2020). A livelihood is sustainable when it can cope with and recover from external and internal shocks (Scoones, 2015; Serrat, 2017).

Further, to strengthen the study findings, table 07 has analyzed the mediate effect of TC between the TC determinants and livelihood success. It represents that TC acts as a significant partial mediator between opportunism and livelihood success (β = -0.170 and t statistics = 2.340). The mediate role of TC between rational ability and livelihood success also has been assessed. Table 07 shows that there is a significant partial mediation effect of TC between rational ability and livelihood success (β = 0.125 and t statistics = 2.330). Finally, the mediate effect of TC between transaction frequency and livelihood success has been analyzed. However, according to the results, it is proved that the TC formed with the major determinants such as opportunism, and rational ability generate negative influences on means of sustainable livelihoods and the TC acts as a mediate role between several determinants (opportunism and rational ability) and the livelihood success among the SANASA beneficiaries.

CONCLUSION

The study revealed that there is a positive relationship between opportunism and TC while opportunism maintains a negative relationship with the livelihood success of the SANASA beneficiaries. TC acts as a mediating role between opportunism and livelihood success. It has been recognized that information asymmetry plays a major role in generating opportunism among the SANASA beneficiaries. As they are a set of rural poor communities, they are lagging in education, experience, technology, and infrastructure facilities. Hence, they are unable to access and assess information and made poor transaction decisions. This scenario influences negatively their livelihoods. The study discovered that there is a negative relationship between rational ability with TC and a positive relationship between rational ability and the livelihood success of the beneficiaries. Further, TC plays a mediate role between rational ability and the livelihood success of the beneficiaries. If the beneficiaries are relatively more rational and can make the best decisions at the best time, it leads to reduce the scope of TC among the beneficiaries and it might lead to uplifting their livelihoods. The study exposed that transaction uncertainty leads to influences the livelihoods of the beneficiaries negatively. Transaction uncertainty is relatively high among the SANASA beneficiaries. Since they operate on a smaller scale, they do not have advanced technological approaches and better educational experiences. The transaction uncertainty disturbs the livelihoods of the SANASA beneficiaries in terms of both environmental and behavioral uncertainty.

The study has made several contributions by synthesizing livelihood success, TC determinants, and TC into a novel framework and empirically testing it. In this way, the study extended the understanding of the relative worth of theories into a different economic and social context. The empirical results provided sufficient evidence to recognize the strength of TC and its determinants' negative impact on the livelihood success of the SANASA beneficiaries confirming a mediating role of the TC in between TC determinants and livelihood success beneficiaries. Hence, the study supported the insights of TC theory revealing that the SANASA livelihood beneficiaries can be impacted by the increase in TC attributed to the livelihood success decreasing with the increase in TC determinants and expanding the TC.

This study has vital implications for both academics and policymakers. The study crucially recommends that the policymakers take a critical look at those variables as they have affected the livelihood success of SANASA beneficiaries and the success of SANASA philosophy. It is also highly recommended that the SANASA organization invest in understanding TC faced by livelihood beneficiaries and reduce the TC associated with their livelihood success achievement. TC of the SANASA beneficiaries arises due to asymmetric information. It is recommended to develop strategies to mitigate TC by improving the rational ability and transaction frequency of SANASA beneficiaries, helping to avoid the opportunistic behavior of exchange partners and decreasing the transaction uncertainty, thereby improving livelihood success.

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Absurdity of Human Existence in Albee's Drama *Who's Afraid of Virginia Woolf?*

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Abstract

This research paper aims to analyze how Edward Albee's characters in his drama, Who's Afraid of Virginia Woolf? live their absurd or meaningless lives. Through this paper, I have attempted to reveal the existential absurdity of human life in modern society using the literary theory of Existentialism. This research paper is a qualitative study of Albee's drama based on existential philosophers' literary theories: Sartre, Camus, and Beauvoir. The drama is employed as a primary source, and existential theory has been used to explain the characters' roles. This research paper finds that the two major characters in this drama, Martha and George, are trying to figure out who they are. They wish to have their own child in the future, but they cannot do it. As a result, they create an imaginary son to satisfy their desire for a baby. The conclusion of this paper is that Albee's characters, just as everyone in the real world, want their own issue that makes their life meaningful. The major characters in this drama want their own issue to run their dynasty forever. Therefore, they are looking for their identity in this modern world, but they are living their absurd lives.

Keywords: absurdity, American Dream, existence, freedom of choice, meaninglessness

INTRODUCTION

In his plays, Edward Albee, a renowned practitioner of existential philosophy in America during the 1960s, emphasizes the absurdity of existence. Compared to Samuel Beckett, Eugene Ionesco, and Jean Genet, his plays are more critical of the American dream and social behaviour, yet they are not as dark as theirs. Albee's seminal drama *Who's Afraid of Virginia Woolf?* is a social critique that shows the meaningless existence of human beings in the modern world.

The play starts in George and Martha's home at 2:00 am early morning. They've returned from Martha's father's house, where they attended a party. They are very inebriated and, as Martha explains to George, are expecting their visitors, Nick and Honey, whom she had met at a party. Nick is a Biology professor at a college. His wife is shallow-minded, but he is a gorgeous, self-assured man in his thirties. At first, George didn't like the late-night guests. While everyone was drinking and conversing, Martha and George had a verbal quarrel that embarrassed the guests. In front of their visitors, Nick and Honey, Martha makes fun of George and mocks his failure. Later on, she even mentions their imaginary son, which they (Martha and George) promised to keep hidden. George is enraged by her breaking the arrangement she and her spouse had reached. When Nick and George are alone, Nick tells George that he wed Honey because she had a lot of money in her home and because he had mistakenly believed she was pregnant.

Martha makes fun of George in front of the visitors on a regular basis, and the two of them are always fighting. Martha tries to make love to him, but George seems uninterested. Martha becomes outraged and quickly drags Nick upstairs to seduce him. George is humiliated and angry, and he loses control of his rage, flinging a book at the doorbell. Honey is awakened by the ringing of a bell, and she informs George that she has no children because she is scared of childbirth agony. George devises a plan to torment Martha by informing her that he has received a telegram informing him of their son's death. Nick realizes that the son is not real but a creation of their imagination. Martha is absolutely shocked and heartbroken after Nick and Honey leave. The play finishes with George attempting to soothe Martha.

Albee's drama *Who's Afraid of Virginia Woolf?* is a social play with an existential subject. Existentialism holds that existence is meaningless and futile, yet we prefer to live by inventing new ways to find meaning. To find meaning in life, Martha and George construct an imaginary son in the play. In the realm of illusion, it is simple to live. The discussion of their history and other relatives suggests that they are childless, and their childlessness has isolated them from the rest of society.

Despite the fact that their son is imaginary, they are grateful to have one. They kill two birds with one stone by creating an imagined son: they get a method of seeking significance in their life, and they gain a higher social status. Their

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improved social standing is really a mirage. They are aware of it, yet they act as if they aren't. To live, we all need to have a lot of pretensions. Life isn't worth living without it.

Although George has long been a professor in the history department, he hasn't been able to reach the level of success that his wife Martha and his father-in-law, the college dean, had hoped for. Martha repeatedly humiliates him as a result of this. He, on the other hand, remains unmoved. As there is no way out of the absurdity and futility of existence, he accepts all of Martha's accusations and disdain. But when she enrages him once again by informing her new visitors, Nick and Honey, about his former life and his failed attempt to create a novel, George vows to avenge Martha. He tells Martha to stop criticizing him, but she responds by saying she wants to say more. She has already spoken openly about their son. Because of Martha's sexual attempts toward Nick and their upstairs scene, George decides to use his final ace against her. Martha and their guests are informed of their child's death by George.

They are attempting to escape reality by creating an imaginary son in order to find purpose in life. The Reality of life is always harsh; life is meaningless and absurd and realizing this makes it much more difficult to survive. The cause of the tragedy is realization. They build an illusion: son, in order to evade the awful fact of life. When they murder that imaginary one, however, they do not cease to exist; they continue to live as before. It is obvious and significant that their acceptance of life's futility is a natural process, not a result of their disagreement.

When the childless couple kills their imagined son because they have grasped the absurdity of existence, they continue to live as before. There is no hope or meaning in life, and there is no option to live as well. Why do Martha and George make a fictitious kid, while Nick and Honey make a fake pregnancy? Why did George murder his made-up child? Why does he have such a hatred for Martha and Nick? George and Martha create an imaginary son. When George becomes angry with Martha, he kills the unborn child. What does this occurrence demonstrate? Why does George console Martha after the visitors have left and the child's death has occurred? A final dilemma comes from all of these diverse questions: what is the solution?

REVIEW OF LITERATURE

Critics find plenty of food for thought in Albee's dramas. Many critics and academics have made an effort to decipher and evaluate his writings. Albee contends that all of the moral, religious, political, and social systems that man built to deceive himself have collapsed, leaving the world incomprehensible. Schechner (1963) in *The Tulane Drama Review*, writes:

> Albee makes dishonesty a virtue, perversion a joke, and adultery a simple party game. (.. .) The American theatre, our theatre, is so hungry so voracious, so corrupt, so morally blind, so perverse that Virginia Woolf becomes a success. (10)

According to Schechner, *Who is Afraid of Virginia Woolf*? is a perverse and corrupt drama, yet it succeeds because of society's corruption. Albee's portrayal of such situations is not a mistake, but rather the result of the pressure of American society. He discovers that the corrupted and decadent people of American society readily welcome such dramas. Albee's representation of social reality and disturbing the American-conscious people is praised by him.

On the other hand, Potter (1995) studied *Who's Afraid of Virginia Woolf?* in the background of a morality game. He also discovers parts of morality play in this play. He finds in this play too the aspects of morality play. He claims that the human drama of a morality play has a life cycle that is comparable but fundamentally different. By using his free will and appetite to escape a situation he has put himself in, the man manages to lose his innocence. As opposed to "simple oblivion," regeneration—always followed by rebirth—marks the conclusion of human existence. However, he is compelled to achieve salvation and eternal life by divine grace.

According to Potter, man's involvement with heavenly matters and ignorance of the divine as a result of his transformation from reality into an illusion is what causes the fall in the morality play. Therefore, misperception serves as the basis for man's fall.

In Albee's drama, critic Dumenil (1995), discovers women's equality. For him, the media and its frequent use of Freudian sexuality are the results of their equal involvement in parties and drinking. He has this to say:

> In particular, women wanted equality with men in matters of style and behaviour. They insisted upon their rights to drink and smoke in public to be unrestrained in their behavior and in particular to obtain sexual satisfaction. This new emphasis on sexuality was evident in changed expectations about material sexual relationships. Prompted by the media popularization of Freud and the increasing availability and use of birth control the ideal marriage was more sexual. (180)

Here, Dumenil claims that the women of the 1960s were trying to be equal with the males. For this, they are energized by the media, which popularized Freudian sexuality. They have used sex to control the male and be equal with them. They take these pills for birth control and try to be ever energetic and young. This illusion encourages them to go on it but that is leading them to their doom which they have never thought.

Surprisingly, Zimbardo (1975), found the Biblical themes and symbols in Albee's *Who's Afraid of Virginia Woolf?.* He discovers Albee developing a contemporary theme in which he [Albee] regularly employs Biblical symbols. Zimbardo shows:

> Albee, in creating this theme, has used a pattern of symbolism that is an immensely expanded allusion to the story of Christi's sacrifice. But the symbolism is not outside the story of modern man and his isolation and hope for salvation. He uses allusion to support his own story. He has chosen traditional Christian symbols, thinks not because they are tricky attention-getters, but because the sacrifice of Christ is perhaps the most effective way that the story has been told in the past. (45)

Who's Afraid of Virginia Woolf ? has Biblical connotations, according to Zimbardo, is startling but not pointless. Christ's suffering can be paralleled to that of George or Martha.

From reviewing the above-mentioned literature, this researcher came to the conclusion that this drama hasn't been interpreted under the lens of existentialism. The characters' absurd lives and meaningless existence have never been analyzed before. For that reason, this qualitative research paper has been prepared under the lens of existential philosophy.

METHODOLOGY: EXISTENTIALISM AS A TOOL

In this research paper, this researcher has used existentialism as a tool for the qualitative interpretation of Albee's drama *Who is Afraid of Virginia Woolf*. As library research, textual evidence are explored and justified with the ideas of different existential theorists. For this, it is essential first to make clear what existentialism really is.

Existentialism is a philosophy that emerged in Europe following World War II; however, its roots may be traced back to Kierkegaard in the eighteenth century. The name is a combination of the words "exist" and "essence." To put it another way, man exists before he obtains essence or a distinct identity. Thus, existentialism not only explores the variety of human experiences, but also reveals how the objects, people, and events we perceive are coloured by our own subjective patterns. As the critics, the meaning of existentialism also varies. In *The Dictionary of Philosophy*, Mautner (1996) opines that though the views of different philosophers vary, they are similar in basic concepts. He writes:

> The existentialists differ widely from one another and, given their individualistic emphasis; it is not surprising that many of them have denied involvement in any 'movement' at all. Kirkegaard was a devout Christian; Nietzsche was an atheist; Jean-Paul Sartre was a Marxist and Heidegger, at least briefly, a Nazi. Kierkegaard and Sartre enthusiastically insisted on the freedom of the will; Nietzsche denied it; Heidegger hardly talked about it at all. But one would not go wrong in saying that existentialism represented a certain attitude particularly relevant to modern mass society. Existentialists have a shared concern for the individual and for personal responsibility. (141)

This extract clarifies that existential philosophers were not following the same trend, ideology, or thoughts.

Tarnas (1991), on the other hand, finds existentialism to be grimmer and more chaotic. He assumes the human condition in this alien world is absurd and bleak. He writes:

> . . . [A] mode and philosophy reflecting a pervasive spiritual crisis in modern culture. It addresses the most fundamental naked concerns of human existence – suffering and death, loneliness, guilt spiritual emptiness, ontological insecurity, the sense of cosmic absurdity, the frailty of human reason, and the tragic impasse of the human condition. Man is condemned to be free. (389)

Tarnus observes that man must make decisions and is aware of the ongoing costs of errors. He is forced into a limited existence that is surrounded on all sides by nothingness, and he never knows what his future holds.

Existentialism is a reaction to conventional philosophy, which treats philosophy as a science. Traditional philosophers developed objective, universally true, and certain knowledge. Existentialists reject the conventional approach of attempting to understand the ultimate essence of the universe through abstract systems of thought. Rather, they seek to understand what it means to be an 'individual' human being in the world. They emphasize that everyone, including philosophers seeking perfect knowledge, is a restricted human being. As a result, every individual is faced with critical and difficult decisions to make with limited information and time. Existentialists

are obsessed with the human predicament. In this connection, Sartre (1994) says:

> We are like actors who suddenly find themselves on stage in the middle of a performance, but without having a script, without knowing the name of the play or what role they are playing, without knowing what to do or say yes, without even knowing whether the play has an author at all -whether it is serious or a farce. We must personally make a decision, to be something or other – a villain or a hero, ridiculous or tragic. Or we can simply exit, immediately. But that is also choosing a role – and that choice too is made without our ever knowing what the performance was about. (qtd. in Skirbekk and Ciilije, 44).

The essential source of human beings' freedom in each and every instant is emptiness and the non-existence of an essence. In light of his position, the human being has the freedom in making decisions that help him solve his problems and exist in the world. When a human being is born into the world, he or she is doomed to be free.

Despite the fact that all existential philosophers believe existence has no value and that we are simply creatures thrown into a strange universe with no past or history, they encourage us to live. Despite the absurdity of life living attempts to offer meaningless life, they do not yield us to terminate the meaningless existence. Despite life's absurdity, 'living' attempts to give meaning to it. We die meaningless deaths, but we should fight for our lives. Albert Camus uses the mythological character Sisyphus as an example of someone who had an absurd life yet survived. He was sentenced to drag the rock to the peak of the mountain just to have it roll back down.

Again, he should come down and take the stone up, again to roll it down. This futile act was Sisyphus's punishment, but he lived his life happily. Camus also cites the example of Oedipus' blinding. Greek Oedipus was prophesied to kill his father and married his mother. How much he tried, he could not whitewash his fate, and when he realized the reality, he did not kill himself, just blinded himself and struggled with his fate. He would kill himself like his wife-cum mother but he chose to live, and struggle for his existence.

Sartre has a lot of criticism of God. He is a devout atheist who does not believe in God. He believes that God does not exist and that if he does, he is also useless. He backs up his claim by stating, "Existentialism isn't so aesthetic that it exhausts itself in proving the absence of God. Rather, it states that even if God exists, it makes no difference " (51). Despite his repeated references to freedom, he has a negative attitude toward it. He considers freedom to be a burden rather than a blessing for him; man is condemned to be free (52) because he must select his path in life and is accountable for his acts. As a result, a person's life is decided by their choices.

There are no predetermination or fate-like elements in our lives; everything happens based on our choices. According to Sartre (1984), there is no predetermined essence; rather, the essence is created via choice. As a result, the most important thing is to exist. He claims that existence and liberty are inextricably linked. "Freedom is existence, and existence precedes essence," says Sartre (66). When he talks about freedom, he also mentions that individual freedom is contingent on the liberty of others. In this approach, Sartre, like most existentialists, emphasizes human responsibility

and freedom of choice, implying that there is no absolute authority to govern a man.

In human life, however, existence comes first, since each individual is constrained by his historical and environmental circumstances. As a result, he is the creator of his own story. Unlike Kierkegaard and other theistic existentialists, Sartre claimed that existentialism is concerned with the treatment of individuals rather than God, a pre-determined ethic, or a universal idea of divine power.

Individual subjectivity is heavily emphasized in existential philosophy. Sartre, like other existentialists, emphasizes the individual's subjectivity, which distinguishes it from inanimate objects. Simone de Beauvoir, Sartre's lifelong girlfriend and intellectual colleague, is a strong supporter of his philosophical worldview (1908-86). But it would be a mistake to assume that just because she was close to Sartre, her ideas are a carbon copy of his. She provides a fresh and distinctive view of existentialism while maintaining a perspective similar to Sartre's. She, in contrast to him, likes to focus on the moral and personal aspects of life. She made an effort to meld existentialism with feminism. Sartre never finished the research on ethics that he had promised, and Beauvoir takes a feminist stance when discussing existentialism. A life of existence is defined as a passive acceptance of the role that one has been socialized into, whereas a life of transcendence is defined as actively and freely evaluating one's options with the aim of remaking one's future, according to Audi (1995).

Beauvior argued that there is no such thing as a fundamental 'female nature' or' male nature.' Man has a 'transcending' nature, according to popular belief, and will seek purpose and direction outside the home. Women are 'immanent,' which implies they want to be right where they are. As a result, she will take care of her family, drive a car that is good for the environment, and do other things that are more domestic. Beauvoir did not agree with our gender perceptions for this reason. Adhikary (2020) wrote:

> Existential psychology is about human existence and the human drama of survival. It helps in overcoming or confronting existential anxieties and living an authentic life. Existentialist psychologists avoid treating a person as if they were isolated from events and situations in the world. The features of choice, responsibility, and freedom in human lives are of particular importance in existential psychology. For both good and bad, people are expected to seize their freedom and take responsibility for the choices they make in their lives.

Here, he made it clear that existential anxiety compels a man to make a choice for his fortune.

In conclusion, existential philosophy or existentialism highlights the absurdity of the human state in the world. It not only makes us aware of the futility of our efforts and the meaninglessness of our lives, but it also motivates us to confront our troubles and afflictions and continue to live joyfully like Sisyphus and Oedipus did. Despite shining a light on the world's dark and bleak human state, it entices us to live by inspiring us to develop a love for life and living. Existentialism seeks to promote this positive concept as one of our primary sources of living.

TEXTUAL ANALYSIS: STRUGGLE FOR EXISTENCE

The existence of humans is always under doubt. But it is caused by humans and the civilization they have established, not by other creatures or agents. Albee's *Who's Afraid of Virginia Woolf?* represents the human struggle for existence. The world of the 1960s in America was enthralling. The Second World War, its aftermath, America's status as a superpower, and the materialization of American society have all cast doubt on individuals' abilities. Almost all characters in *Who's Afraid of Virginia Woolf?* are also struggling for existence.

Because Martha was the daughter of the college's dean, George married her. He would not marry Martha if this were not the case, since she is 'unbearable' and older than him. George's father sees him as a potential son-in-law, as well as the sources of power he possesses. We can see how disgusted George is with Martha in the dialogue between Nick and George. He doesn't appear to like Martha at all:

> GEORGE: How old are you?
>
> NICK: Twenty-eight
>
> GEORGE: I'm forty-something. [waits for reaction . . . get none.] Aren't you surprised? I mean . . . don't look older? Doesn't his . . . grey quality suggest the fifties? Don't I sort of fade into backgrounds . . . get lost in the cigarette smoke? Hunh?
>
>
> NICK : [looking around for an astray] : I think you . . . fine.
>
> GEORGE: I've always been lean . . . I haven't put on five pounds since I was your age. I don't have a paunch, either . . . what I've got . . . I've got this little distension just below the belt . . . but it's hard . . . it's not soft flesh. I use the handball courts. How much do you weigh?
>
> NICK: I . . .

We can obviously conclude from George's attitude toward Martha that he is not least satisfied by his conjugal relationship with Martha. He just married in an effort to progress in his profession.

Nick, on the other hand, is married to Honey as a result of a fake pregnancy. He admits that this isn't the only reason; he married her because her father is wealthy. When Honey informed Nick that she was pregnant, he realized that he would have to marry her in order to function in society. Because of her affluence, he was also willing to marry her. He confides in George, saying:

> NICK: Sure. [with no emotion, accept the faintest distaste, as GEORGE takes his glass to the bar] I married her because she was pregnant.
>
> GEORGE [pause] : Oh? [pause] But you said you didn't have any children . . . when I asked you, you said . . .
>
> NICK: She wasn't really. It was a historical pregnancy. She blew up, and then she went down.
>
> GEORGE: And while she was up, you married her.
>
> NICK: And then she went down.

Nick is not hesitant to tell George about his interest in his father-in-law's money. Though he is a religious person he owns much money by the means of religion. And Nick was thinking about wealth which can be seen in the following dialogue:

NICK: We are talking about my wife's money . . . not yours.

GEORGE: O.K. . . . talk.

NICK: No. [pause] my father-in-law . . . was a man of the Lord, and he was very rich.

GEORGE: What faith?

NICK: He . . . my father-in-law . . . was called by God when he was six, or something, and he started preaching, and he baptized people, and he saved them, and he traveled around a lot, and he becomes pretty famous . . . not like some of them, but he became pretty famous . . . and when he died he had a lot of money.

GEORGE: God's money.

NICK: No . . . his own.

Nick's struggle for his position and wealth is justifiable and natural. Though he seems greedy and selfish, we all have a similar instinct in us. His struggle, but, would not benefit him forever. Life itself is futile and without meaning, then what is the meaning of such little advance in the means of economic matters?

As a result, we see people struggling for survival in many forms all throughout the world. Because our society is so complicated and critical, we must struggle for our survival in either a moral or an immoral manner. Nick has even planned to sleep with faculty spouses in order to advance in college. Among them is Martha. Honey and Martha, with the exception of George and Nick, are fighting for survival. They don't have any kids between them. Martha has raised an imaginary child to be a respected member of society with the help of George. Because she fears the pain of delivery, Honey did not want to become pregnant, but she used the pregnancy to get married to Nick. Her hurried marriage to Nick reveals her struggle for existence. The imaginary child of Martha and George is just for camouflaging society. They have to 'make' the child survive in society as they do not live easily without the child.

The most turbulent period in American society was the 1950s and 1960s. It was just after World War II. The Vietnam War was still to come, and civil rights movements, blacks, and women's liberation movements were causing a lot of turbulence in American culture. The long-ago American Dream was fading, and the Beats and Hippies were only getting started. People were becoming more tangible and automated, and family values were eroding. Albee's *Who's Afraid of Virginia Woolf?* is placed in such a circumstance.

According to Albee, all societal ideals are empty, which leads to impotent and corrupt religion, loveless and sterile marriages, unsuccessful jobs, riches that were obtained illegally, squandered education, and failed vocations. Albee suggests that the nation is a desolate wasteland where individuals must create a different reality to make up for what is absent as a result of the decline of these principles. Albee has denounced the moral and spiritual harm that unwisely pursuing the "American Dream" and excessive material affluence cause to people. Before America established a distinct shape as a nation, the notion of the 'American Dream it realized was becoming a part of European cultural tradition.

FAILURE OF FINDING MEANING IN LIFE

We arrive in this planet knowing nothing about it. We strive to find purpose in our lives after we have our conscience. Because there is no purpose in life, this hunt for meaning is always pointless. Everyone struggles to find significance in their lives. They strive to find meaning through a variety of methods. Martha and George are in the same boat. They invent a fake child in order to find purpose in life.

However, in their quarrel, they lose their temper and kill the boy they have created. Though they struggle to find purpose in their lives – as we all do – they are not in despair; as the curtain closes, we see George consoling Martha.

The futility of life's "meaning search quest" leads to the recognition of life's absurdity. The search for Martha and George's imaginary son leads them to the reality of a pointless world. Nick and Honey, on the other hand, are looking for significance in their lives as well. Honey is determined to marry Nick by any means necessary, and she succeeds. She had hoped that life would be easier and more meaningful after that, but nothing has changed. Her marital life is also devoid of novelty. She is unable to find any newness or significance in her life, even after her marriage.

Nick's strategy of sleeping with prominent professors' wives in order to advance in college seems to be failing. He begins by experimenting with Martha, the daughter of the college dean and wife of history instructor George, but this does not appear to be productive. His struggle to find significance in life is symbolized by Martha's finding him a lousy spouse. Martha refers to him as a flop:

ARTHA [her glass to her mouth]: You're certainly a flop in some departments.

NICK [wincing]: I beg your pardon . . . ?

MARTHA [unnecessarily loud]: I said, you're certainly a flop in some . . .

NICK [he, too, too loud]: I'm sorry you are disappointed.

MARTHA [braying]: I didn't say I was disappointed! Stupid!

NICK: You should try me sometime when we haven't been drinking for ten hours, and maybe . . .

MARTHA [still braying]: I wasn't talking about your potential; I was talking about your goddam performance.

NICK [softly]: Oh.

MARTHA [she is softer, too]: Your potential is fine. It's dandy. [Wiggles her eyebrows]. Absolutely dandy. I haven't seen such dandy potential in a long time. Oh, but baby you sure are a flop.

NICK [snapping it out]: Everybody's a flop to you! Your husband's a flop, I'm a flop . . .

MARTHA [dismissing him]: You're all flops. I am the Earth Mother, and you're all flops.

It demonstrates Nick's inability to find meaning in his life by improving his position. In the first socioeconomic ladder, he has failed. He does not, however, appear disgusted. That is the individual's existential spirit, which endures men and motivates them to go farther. Even if he fails in his first effort, he shows no signs of dissatisfaction or defeat.

Nick's marriage to Honey is a similar attempt to find meaning and even dream in life, but it fails as well. He married Honey because he assumed she was expecting a child. However, he eventually discovered that he had been deceived. He stays with her in the hopes of inheriting more money from her father. However, he is unable to

comprehend this. He still thinks she will have a child. It is also a decision to degrade cultural and familial values, and it is an unavoidable choice to live in a degenerative state. Every choice, in this sense, is an effort or commitment to existing in the true sense, which each character strives for in the never-ending journey for the self and being.

ACCEPTANCE OF THE FUTILITY OF EXISTENCE

Martha and George are husband and wife from the 1950s. George was a 46-year-old college professor and he married to Martha, as she was the 52-year-old daughter of the college's dean. They don't have any children. They have made an imaginary son in the eyes of society, but they have agreed not to tell anybody else about it. They are just returning from the college dean's party when the action begins. To George's and our amazement, Martha has extended an invitation to a late-night party to the new biology professor Nick and his wife Honey.

When the visitors come, Martha and George dispute and quarrel with one another in various ways. Honey learns about Martha's son, which George had banned. The back story of George and Nick is also revealed. Honey was married to Nick because she was pregnant, which subsequently turns out to be untrue. Nick had also had a look at his father-in-law's property. George is enraged enough to 'kill' their kid due to Martha's constant mockery of George's failure and her sexual attempts toward Nick. As a result, he notifies Martha of their son's death in front of the visitors, which disgusts her immensely. We discover them consoling each other later after the visitors have left.

The sophisticated process is hidden underneath the seemingly simple plot. The creation of an imaginary son is the pinnacle of today's showy but empty existence. Because modern individuals lack meaning in their lives, they seek to create meaning from nothing. However, such creations are of little use to them. Their imaginary child does not heal them completely, but it does heal them for a while. They have forgotten the futility of hollow existence by creating the imagined child. However, once they destroy it – break out of the illusion – they resolve to live life genuinely, i.e. absurdly and meaninglessly.

The couple is a suffocating example of the 'existential hero.' They move on with their lives without complaining or regretting their lack of meaning. They are unaffected by the tragedy because they have grasped the true meaning of life, which is that life has no intrinsic meaning. As a result, they do not abandon their attempts to find purpose in their lives, even when they are aware that there is none. Even after witnessing the hollowness of existence, we, like Oedipus or Sisyphus, find vitality and enthusiasm for life. They don't grumble or point the finger at anybody. They embrace the results since it was entirely generated by them and not by others.

At last, we find both reconciled with each other and trying to bring happiness in life again. They have already been reconciled because the antagonism between them is also worthless and absurd:

> MARTHA: Did you . . . did you . . . have to?
> GEORGE [pause]: Yes
> MARTHA: It was . . . ? You had to?
> GEORGE [pause]: yes

> MARTHA: I don't know
> GEORGE: It was . . . time.
> MARTHA: Was it?
> GEORGE: Yes
> MARTHA: Was it?
> GEORGE: Yes
> MARTHA [pause]: I'm old.
> GEORGE: It's late
> MARTHA: Yes
> GEORGE [long silence]: It will be better.
> MARTHA [long silence]: I don't . . . know
> GEORGE: It will be . . . maybe.
> MARTHA: I'm . . . not . . . sure.

When they become aware of their failure, they simply dismiss it as a failure of their endeavor, and they appear to be ready to try again. The most essential finding of existentialism is perseverance. It is also the fundamental value of life that has brought mankind to this point. This individual's corpus is the civilization and development of humanity's central nervous system. They would have gone extinct like dinosaurs many ages ago if they had not tried again after the initial setback.

After so many failures, an individual's effort and love for life elevate the human being above so many other species. Human creatures are competent beings who, unlike animals, cannot forget their failures and instead continue on to complete another job. The excitement of Martha and George exemplifies man's search for existence and even purpose.

Their revelation confirms the futility of existence once more. They don't have a kid; they don't obtain George's promotion to the dean; they don't gain permission to publish his work, but they don't surrender to failure or the ground. They believe that if one crumble, another will be ready to take its place. Nick, on the other hand, intends to be promoted to a higher position. Martha refers to him as a "flop" as he makes love to her.

Martha and George are able to persuade their visitors to believe in their son. But, eventually, everyone, including the visitors Nick and Honey, emerges from the fog of deception. They are aware of their son's delusory fantasies. Honey changes her mind and claims that she needs a kid as they pretend and make their visitors believe in the child, fascinated by the same false optimism. Martha goes so far as to mention their son's lady pals, his college studies, and so on. Martha is genuinely attempting to replace one failure with another. Later, George informs Martha and Nick about their son's death, which comes as a shock to them:

> GEORGE: Well, Martha . . . I'm afraid our boy isn't coming home for his birthday.
> MARTHA: Of course, he is.
> GEORGE: Martha . . . [long pause] . . . our son is . . . dead. He was killed . . . late in the afternoon. [silence] He drove against into a . . .
> MARTHA: YOU CANNOT DO THAT.
> GEORGE: . . . large tree.
> MARTHA: You can't decide that for yourself . . . He is not dead.

GEORGE: Martha, I'm not a God. I don't have the power over life and death, do I? There was a telegram . . . and I ate it. (136)

The sentimentality of the situation is reflected in the silence of their quarrel. Martha can't believe George would breach their pact by killing their son. George, on the other hand, is attempting to adjust to a new world. Despite his belief in God, he appears to be more powerful than God by murdering his kid in a struggle for survival. This is startling news for Martha, and the entire home is in mourning.

The act of creating a kid and then killing it is absurd. However, it is still meaningful since it is a rebuttal to the illusion and failure of a previous decision. When George asserts that he has no control over life and death since he is a wretched creature on this planet, he is demonstrating an existential predicament. If Martha had followed George's instruction not to discuss the kid, George would not have killed him. The son must either perish or come into being once exposed. He is just the moon that Martha wishes to grab; she has a series of nightmares, some of which criticize George and others which question conventional ideals.

When people realized the dismal fact of existence, they snuffed out the light in their lives, yet existential philosophy and existential authors like Albee elegize life and optimism in individuals. Albee, therefore, calls for the survival of an optimistic life while confirming the futility of being in life.

CONCLUSION

To conclude, Albee's *Who's Afraid of Virginia Woolf?* has the theme of existentialism and it shows human life is meaningless. Albee creates an optimistic play that urges the "hopeless" to enjoy a life of absurdity. Albee subtly proposes to us, through his four characters, that we might make the fruitless and meaningless life meaningful by understanding reality. We should be positive about the meaningless existence since it has always been like way, and our denial will not alter anything. The drama's narrative isn't all that essential. Nothing new occurred there. A couple had invited another couple for drinks. All four drank heavily late at night and criticized one another. Finally, the guests went out. The arguing hosts had finally calmed down and decided to retire for the night. Their discussions and imprisonment, though, are crucial. They have fascinating conversations on the futility of existence and its realization. They've seen the absurdity of life and are prepared to face it.

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Study the Nature of the Need for a Passenger Information Management System for the Department of Railways in Sri Lanka: In Passengers' Perspective

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Abstract

Sri Lanka South Asian country has a high demand for railway services as public passenger transportation. Although more than 3.7 million passengers use the railways daily, the lack of a Passenger Information Management System (PIMS) for the Sri Lanka Railways (SLR) is still a problem. Therefore, this study's main objective is to identify the need for a PIMS in SLR. A cluster sampling technique was applied to select a sample of 327 passengers serviced from the Colombo Fort Railway Station, the premier central railway station in Sri Lanka. An interviewer-administered questionnaire was used to collect data. Descriptive Statistics, one-way ANOVA, and multiple regression were used as analytical techniques. According to the analysis, the average value of the index related to the need for a PIMS is 39.18. Most passengers need a PIMS index value higher than the average value. It reveals the majority need for a PIMS. Computer knowledge, online knowledge level, knowledge of electronic card usage, the primary purpose of using the train service, train service usage frequency, and satisfaction with the M-ticketing service were identified as the factors affecting the need for a PIMS for the SLR using one-way ANOVA. Regression analysis proves that the attitude towards an online ticketing procedure, the service at the ticket counter, and the ease of knowing about the train schedule have a significant effect on the need for a PIMS. It implies that the need for a PIMS will decrease if the service at the ticket counter is more efficient and if there is an easy way for train passengers to get information about the train schedule quickly. It is suggested that the SLR should establish an easy-to-use, secure PIMS covering all sectors, using a simple interface that is tailored to the individual at all levels and further demonstrated that the government and the SLR should pay special attention to the issue.

Keywords: Passenger Information Management System (PIMS), Public transport, Railway Service, Sri Lanka

INTRODUCTION

Transportation facilities are an important factor that plays a crucial role in the development process of the economic growth of a country. Especially, the transportation facilities of industrialized countries are like the backbones of those countries. Sri Lanka is also a developing country and hence with a huge demand for public transportation. The public service sector in Sri Lanka has failed to gain any competitive advantages due to its inability to provide quality services to its customers. These institutes have incurred capital losses due to a lack of profitability. According to reports by the Central Bank, state-owned institutions like Sri Lankan Airlines, Mihin Lanka, the Sri Lanka Railways, and the Sri Lanka Transport Board (SLTB) have reported continuous losses over the past few years. The Department of Railways of Sri Lanka is a government department that is under the purview of the Ministry of Transport. It is one of the transport service providers and is the only train transportation institution in the country (Sri Lanka Railway, 2016).

Railway services are available in many countries around the world and there is a continuous demand for fast, reliable, and passenger-friendly services. Therefore, there is a need to make railway services more efficient for the increased transportation of passengers and goods. This cannot be done by human power alone. Smart computerization is the latest technology that can be used in railway systems. Manipulation of passenger data in railway services is a major task where a huge amount of passenger data is required to provide fast and efficient service. Also, the data should be stored systematically and accessible quickly upon demand. With the use of inter-database connectivity, smart computerization provides a more efficient service for passenger authentication and other related services.

At a time when the world is moving forward with information technology, a newspaper report in the Daily News of August 13, 2019, stated that Dilantha Fernando, the General Manager of Sri Lanka Railways had said that the Sri Lanka Railways (SLR) was planning to introduce an electronic ticketing system for passengers. It was also stated that the

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e-ticketing service is expected to be activated using QR code systems, smart cards, and automation machines. However, further discussions with SLR staff revealed that Sri Lanka Railways does not possess such an electronic ticketing facility at present. They confirmed further that the SLR, which was established in 1858, did not possess its own passenger management information system either, though the SLR has an information management system called M-ticketing, which is conducted in partnership with Mobitel. This system is used for booking train seats, but there are issues with the booking process in the system. Online services are not available through the M-ticketing Information Management System (Department of Railway, 2018).

There is a relationship between service quality and customer satisfaction, and customer satisfaction increases when service quality is high (Choocharukui et al, 2013). SLR has formulated plans to improve the quality of services through the renovation of railway stations, the improvement of sanitary facilities, and the widening and upgrading of platforms (Sri Lanka Railways, 2018). At a time when technology is highly advanced in the 21st century, Sri Lanka Railways, which handles over 3.72 million passengers daily (Sri Lanka Railways, 2016), needs to focus only on the above aspects to improve the quality of passenger transport services at a time when day-to-day operations are highly efficient. However, there is an issue, where from the point of view of the Sri Lanka Railways Department, which is somewhat satisfied with the services provided by them to local and foreign passengers, while according to World Bank reports, the train services provided by the Sri Lankan government has a negative image (Perera & Bandara, 2016).

The passenger information management and service system are a hallmark of a modern rail network. It is one of the high-quality service offerings provided by a train system. Internationally recognized rail transport service is an approach to service efficiency through the use of information technology for ticket issuance, seating, train operations, land management, property and asset management, procedural formulation, and inventory control. Exploratory factor analysis has been conducted to identify the customer satisfaction criteria for rail transport (Yaparathna & Ratnajeewa, 2018).

Passengers have to deal with train ticket issuing officers at the Railway Department, having to spend time in queues to buy their tickets, as well as in the distributing of train tickets, which is a huge exercise and a daily waste of money to maintain a stock of tickets. And even the expended effort has become a problematic situation. Furthermore, the government of Sri Lanka has to bear the additional cost of importing the paper used to print railway tickets. The wrong attitudes among the employees and the lack of physical resources to adhere to IT procedures and encourage their use have also become a challenge to the Department of Railways (Sri Lanka Railways, 2018). Also, railway employees have train commuters as railway employees use the train services. Because of these circumstances, it is timely to evaluate the need for a Passenger Information Management System (PIMS) for Sri Lanka Railways from a customer perspective, which has been done through this study.

According to way, the use of information systems has become more common in organizations with the advancement of information and communication technology. This has made daily tasks much easier. Information systems for public transport in Sri Lanka are presently used only by Sri Lankan Airlines. This is also limited only to the airport. An information system has not yet been used for the bus and rail services, which are widely used by passengers. More than 3.7 million passengers use the trains daily. The lack of a Passenger Information Management System (PIMS) for the Sri Lanka Railways, which is in such high demand, is also a problem. Accordingly, the research problem of this study is the nature of the need for a Passenger Information Management System (PIMS) for the Sri Lanka Railways Department.

Hence the main objective of this study is to identify the nature of the need for a Passenger Information Management System (PIMS) for the Sri Lanka Railways Department. There are a few specific objectives of the study, which are; to identify the distribution of the need for a Passenger Information Management System (PIMS) for the Department of Railways and to identify factors affecting the need for a Passenger Information Management System (PIMS) for train passengers.

LITERATURE REVIEW

A study has been conducted by Bachok (2007) to identify the need for an information system for passengers using public transport in Malaysia. The purpose of this study is to determine the effectiveness of a passenger information system provided by the Rail Passenger Service in the Klang Valley in Malaysia. It is proposed to develop a long-term and real-time information medium for integrated public transport information and private messaging. It has been identified that the delay in the delivery of information to train commuters should be done within a period of eight to ten minutes. In providing effective public transport information, its content should be accurate, timely, and prescribed (Bachok, 2007). Improving the use of public transport and intelligent transportation systems will not only increase migration access but also help reduce traffic congestion and air pollution in urban areas. In general, a major problem with public transportation is the lack of accurate information for passengers. For that reason, the team has introduced an easy-to-use information tool for passengers. The city of Milan has introduced a real-time information system for public transport based on the management of public events, delays, and service disruptions. Here, the structure of the system distinguishes physical locations and uses different types of nodes. Most interestingly, this system has the ability to express various interpretations (Bruglieri et al., 2015).

In view of the 150th anniversary of Sri Lanka Railways, its service has been evaluated from an employee and customer perspective. An analysis revealed that there were two main reasons for the deterioration of the railway service and that these two factors were interrelated. These reasons are human resource relations and poor administration of technology. While 47% of the passengers responded positively to the online ticketing procedure, 6% did not agree with it. The reason given was that the procedure was not suitable for purchasing all types of tickets, especially for the third-class category. It has been stated that it is assumed by the public request that the ticketing process should be developed in a way that is applicable to all (Kesavan et al., 2015).

Currently, a project has been launched to establish the first automated train ticketing system in Sri Lanka, but it has been suspended due to a lack of funds. It is intended to implement the automatic ticketing system at 50 selected

major railway stations as the first phase. After the automatic train ticketing system is activated, passengers are expected to be relieved from long queues. Tickets can be purchased in four different ways. That is, through mobile applications, vending machines, electronic cards at the gates, or over the counter. The ticketing system seeks to revolutionize the outdated railway network in Sri Lanka with world-class imported machines to facilitate the long-suffering commuters. According to the Railway Department's Annual Report 2017, 136.5 million passengers traveled by train in 2016, with an increase of 0.5% to 136.6 million in 2017. But so far it is clear that there is no proper plan for the implementation of this project (Thavapalakumar, 2020). A study by Bachok (2007) selected user socio-demographic profiles to study the effectiveness of a passenger information system. In addition to that, the researcher shows that there are three stages for accessing information related to training services, namely pre-tour, train terminal, and in-train.

A study has been conducted to identify the impact of management information systems on the performance of government organizations. Demographic information is also used to measure performance Shehadeh & Nazem, (2013). Saputra (2010) analyzed the responses of train passengers in Indonesia's rail service, using ethnography, age, occupational status, level of education, and income as demographic factors. The variables used to measure passenger satisfaction are station access, ticket price, ticket queue, the accuracy of the information, response, and employee behavior. Studies have been carried out by Chandrakumara & Pathmini)2015) and Perera & Bandara)2016) to study the quality of railway services in Sri Lanka. In order to measure the quality, the service received from the railway ticket window has also been studied through the five variables of tangibility, reliability, response, sensitivity, and assurance. Kesavan et al.,)2015) used the online ticketing procedure as one of the variables to study the quality of Sri Lanka Railways.

During discussions with senior officials of the Sri Lanka Railway Department, the officials stated that if there was a passenger information management system for the department, it would be convenient for passengers as well as railway employees. According to further inquiries, officials at the ticket counters at the Colombo Fort Railway Station were of the view that the main reason for the loss of Sri Lanka Railways was the failure to modernize the Railway Department. According to them, although information management systems have been introduced to the railways at various times, the Railway Department has not been able to establish them due to political pressures and trade union actions. They further stated that no study has been conducted so far by the Railway Department or any other department on the extent to which railway employees and passengers are prepared to work with the information management system and the level of need for such a system.

Although its effectiveness and performance have been measured in relation to information management systems, no method has yet been used to measure its needs. Studies on the quality of Sri Lanka Railways, factors related to automated ticketing machines, and ticket counters, and factors related to train to the ticket, to measure the need for a passenger information management system based on the findings of discussions with railway officials, factors related

Table 01: List of Variables used for the Analysis

to train information, factors related to train passengers and goods being transported could be understood and be utilized.

Accordingly, while considering previous studies, ethnography, age, occupational status, level of education and income can be used as demographic factors for this study. Domestic and foreign researchers have not measured the need for a Passenger Information Management System (PIMS), and this research will measure this need. It can be pointed out that this would greatly assist not only the fields of information and communication but also any researchers conducting new studies.

RESEARCH METHODOLOGY

Research Design: This section describes the methodology used to identify the need for a Passenger Information Management System (PIMS) for the Sri Lanka Railway Department. Empirical research is a method of research that uses verified evidence to obtain research results. Accordingly, this study is also empirical research. This study used quantitative data. The objectives of this study are primarily to identify the need for a Passenger Information Management System (PIMS) for Sri Lanka Railways. Accordingly, there are 338 railway stations in Sri Lanka and 175 of them are major railway stations. Among them, the Colombo Fort Railway Station is the hub of the railway system and is also the main transit point. Therefore, the basis for this study is the Colombo Fort Railway Station. Accordingly, the population of the study includes all passengers arriving at the Colombo Fort Railway Station. This is an infinite population as we do not know the exact size of the population here.

Sampling Procedure and Sample Size: This study was done during the COVID-19 pandemic period. There were some difficulties related to the data collection process. The cluster Sampling technique was used to determine the sample size due to unawareness of population size or sampling frame. According to information from the passengers and officers of the railway department, used three WhatsApp groups as clusters including travelers from Colombo Fort. There were three hundred and twenty-seven passengers in all three groups and it became impossible to approach the passengers to obtain data.

Data collection method: The questionnaire method to obtain primary data was used in the fieldwork related to social science research. The Questionnaire method was used in this study to collect primary data as quantitative data, as well as case study method, was applied to gather qualitative data. Here, the questionnaire was prepared using a Google form and released to the respondents. The questionnaire consists of five parts. The first part includes ethnographic information, the second part with technical information, the third part with information on the use of railways, the fourth part with the train ticket counter and other information related to the train service, and the last one with the Likert scale used to measure variables.

Variables: This study was directed as a survey study. The data were collected from a sample of railway passengers. The following Table 01 indicates the variables with scales and levels which are used to collect data and analyses the data.

Variable Name	Scales of measurement	Categories
Gender	Nominal	Male Female
Age group	Nominal	Below 20 years 21-30 Years 31-40 years 41-50 years 51-60 years Over 40 years
Living area	Nominal	Rural Semi-Urban Urban
Level of education	Nominal	Never go to school Grade 1-5 Grade 6 – 10 Up to G.C.E O/L Up to G.C.E A/L Up to Diploma Graduate or above
Professional status	Nominal	Government sector Private sector Business Retired Student Unemployed Self-employment Others
Technical capability	Ordinal (Likert scale)	Likert statements
Technical factors	Ordinal (Likert scale)	Likert statements
Need to know passenger and freight information	Ordinal (Likert scale)	Likert statements
Ease of knowing train schedule information	Ordinal (Likert scale)	Likert statements
Ticket counter service	Ordinal (Likert scale)	Likert statements
Attitude to the Online Ticketing Procedure	Ordinal (Likert scale)	Likert statements

Source: Compiled by the researcher using literature review, 2017

Data analysis: Software such as Eviews, SPSS, and Minitab was used to analyze the data for the purpose of this study. Here, descriptive statistical techniques were used under the univariate analysis method. Descriptive statistical techniques can be used to describe in detail the patterns of data contained in the variables used in this analysis. Accordingly, mean, mode, and median can be used to describe the central tendency, and range, variance, and standard deviation can be used to describe the deviation of the data. Furthermore, variables can be analyzed in univariate analysis using each type of chart and diagram, such as column charts, pie charts, histograms, frequency distributions, etc. T-test, one-way ANOVA, and numerical analysis methods were used to identify factors affecting a Passenger Information Management System (PIMS). Furthermore, a model was developed under multiple regression. Accordingly, the classification of the variables in this study can be illustrated by the following conceptual diagram (Figure 1):

Figure 01: Analytical framework
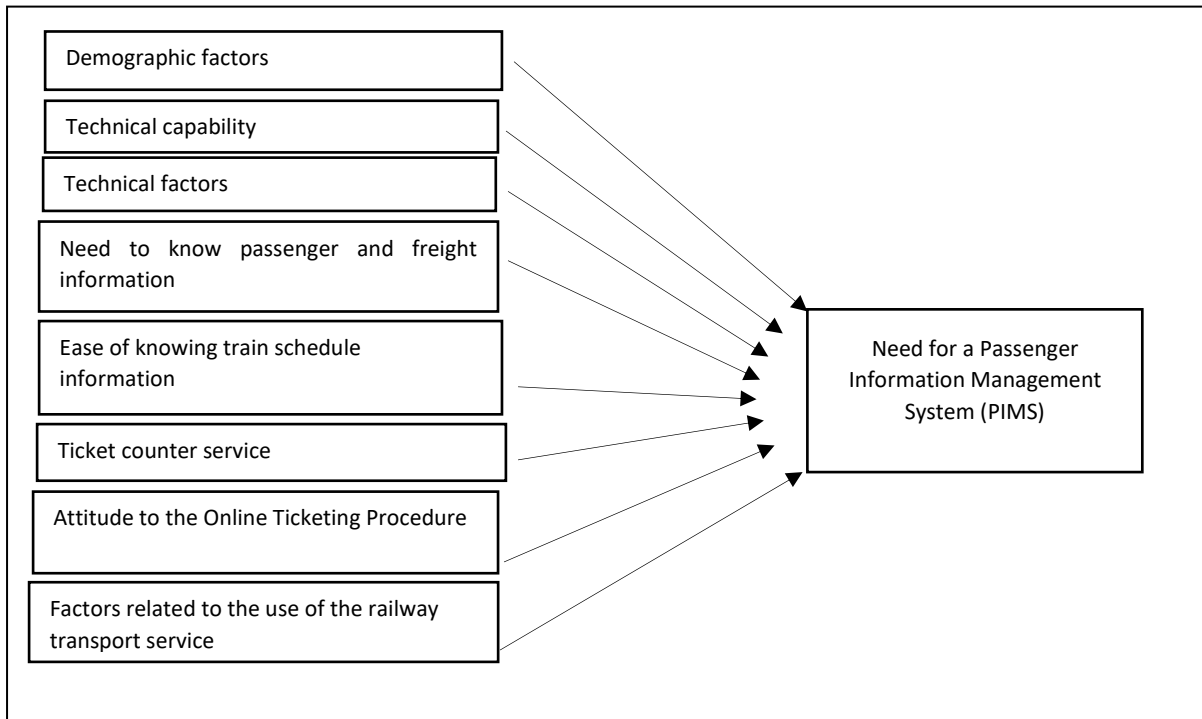
Note: Developed the analytical framework by using theoretical models (Abugabah et al., 2009; Beul-Leusmann et al., 2014).

RESULTS AND DISCUSSION

Here the data collected concurrently with the study is analyzed and presented according to the objectives of the study. The data analysis was done in three parts. The first part analyzes the sample composition using descriptive statistics, and the second part analyzes the data using bivariate analysis. Part three builds a multivariate regression model for estimating the need for a Passenger Information Management System (PIMS). The response rate in this study was eighty-five percent.

Using descriptive statistical methods, the composition of the sample can be described from different angles. There was a 51 percent female response rate. However, it is evident that there is no huge difference in the use of railways in terms of gender.

The response rate of train passengers according to the occupations of the participants is shown in Figure 02. Most of the passengers are public and private sector employees and students. Thirty-one percent of passengers work in the government sector. Very few respondents of the sample who are retirees and businessmen used railways.

Figure 02: Percentage of respondents' occupation
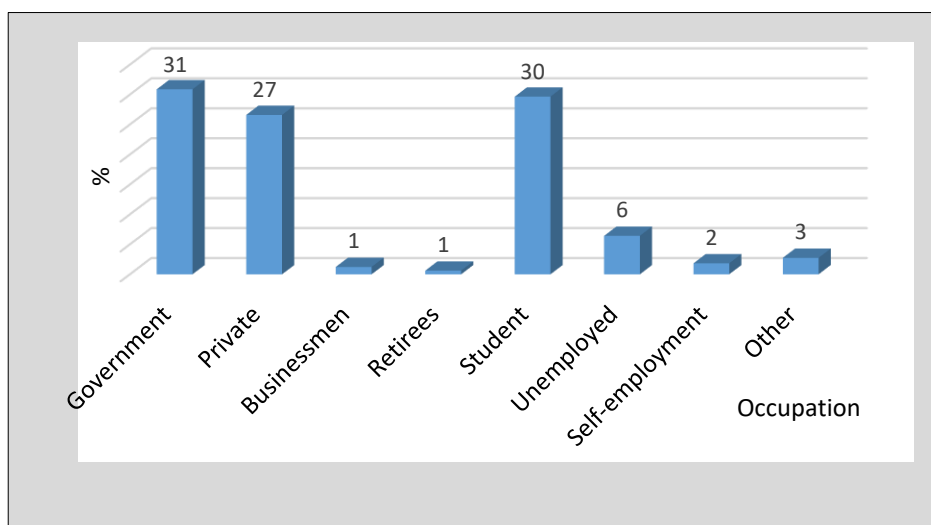
Source: Field Survey, 2020

Most train passengers live in suburban areas. According to the descriptive analysis, the lowest number of train users live in urban areas, which is 20 percent while 36 percent of train passengers are from rural areas and the remaining 44 percent are from suburban areas. Furthermore, most

respondents of the sample (around 33 percent) use the train to travel to their employment destinations. Ticketing service is one of the important variables of the study. Although the mobile ticketing service is available at the railway department, more than three fourth (77 percent) of

passengers purchase their tickets at the ticket counters. It is clearly shown in the following figure.

Figure 03: Descriptive analysis for the method of purchasing tickets
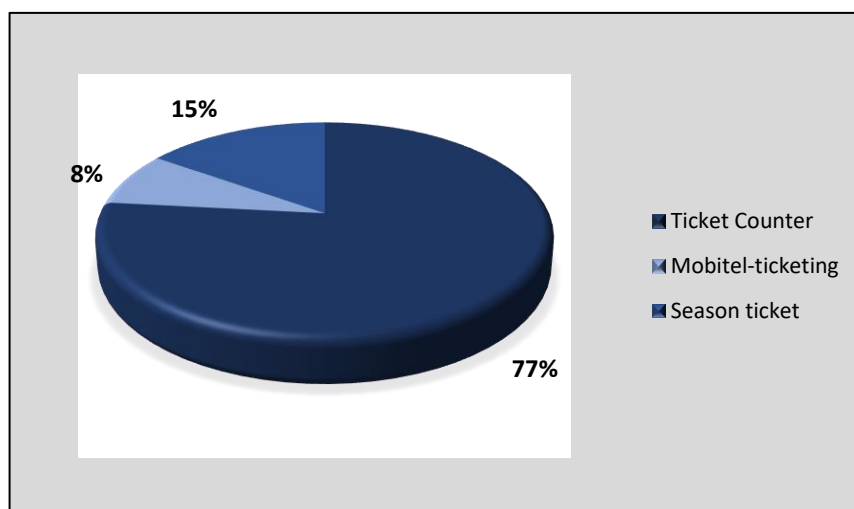
Source: Field Survey, 2020.

The findings of the reliability and validity tests revealed the suitability of variables for advanced analytical methods. The following table No. 01, Cronbach's alpha value is greater than 0.7, it can be concluded that the data is reliable. Also, if the KMO value is greater than 0.6 and the test frequency ($\chi^2 = 676.293, p = 0.000$) for Bartlett's test is significant, then it can be concluded that the data must be consolidated. Accordingly, it can be said with 95% reliability that the sample correlation matrix related to the data varies from unit to unit. This means that the data is suitable for analysis.

Table 01: Findings of the reliability and validity Tests

Cronbach's Alpha	KMO	*Bartlett's* Test Chi-Square	df	P Value
0.741	0.828	676.293	28	0.000

Source: Field Survey, 2020

Since the data meets the above requirements, the composite index built into the need for a PIMS can be described in detail as follows:

Table 02 and figure 04 show the summary measurements and condition of the normality test of the study. These results help to construct a composite index value relevant to the need for a Passenger Information Management System (PIMS) for the sample. According to Table 02, the median value of the composite index corresponding to the need for a Passenger Information Management System (PIMS) in the sample is 39.1835 units. Its maximum value is in the range of 98.4560 units and its minimum value is in the range of 3.3543 units. Accordingly, the needfulness varies by 20.6583 (standard deviation) units. Since the skewness is 0.1431, it can be seen that the distribution of the composite index value of the needfulness is approximately symmetrically distributed.

Table 02: Summary measurements

Variable	Mean	St.Dev	Minimum	Median	Maximum	Skewness	Kurtosis
Needfulness	39.1835	20.6583	3.3543	40.0419	98.456	0.1431	2.1874

Source: Compiled by the researcher based on Field Survey data, 2020

Figure 04: Distribution of Need for a Passenger Information Management System (PIMS)
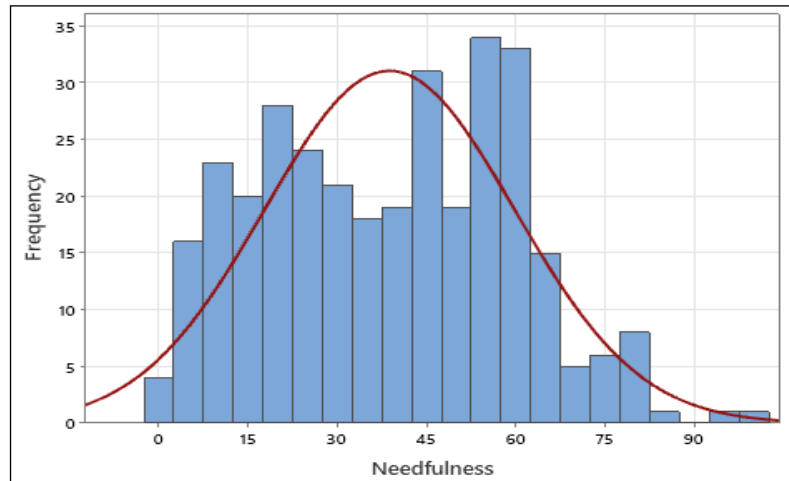
Source: Field Survey, 2020

According to Table 03, significant differences can be identified among computer knowledge, online knowledge level, knowledge of electronic card usage, the primary purpose of using the train service, train service usage frequency, satisfaction with the M-ticketing service, and the need of Passenger Information Management System (PIMS). That is, the factors mentioned above have an impact on the need for a management system.

Table 03: Results of one-way ANOVA

Variable	F- value	p-value
Age	1.894	0.095
Living Area	2.236	0.099
Educational Level	1.081	0.357
Job-status	1.137	0.339
Monthly income	2.274	0.061
Computer Knowledge	5.364	0.000
Online knowledge level	5.098	0.001
Knowledge of electronic card usage	4.868	0.001
The primary purpose of using the train service	7.383	0.000
Train service usage frequency	38.738	0.000
Train class	0.240	0.787
Satisfaction of M-ticketing service	3.657	0.009

Source: Field Survey, 2020

The results of the multiple regression analysis in Table 04 show that the F value (F = 46.2576, p = 0.0000) is significant. It can be concluded that the overall model is significant with 95% reliability. This means that at least one variable has a specific impact on the need for a PIMS. Accordingly, the attitude towards an online ticketing procedure (t = 5.5794, p = 0.000), the ticket counter service (t = -5.8093, p = 0.000), and the ease of knowing the train schedule (t = -3.7856, p = 0.0002) when examining the effect of each variable separately, the variables have a significant impact on the need for a Passenger Information Management System (PIMS). Furthermore, it can be stated with 95% confidence that the variables of need for passenger and freight information (t = 0.2324, p = 0.8163) and technical capability (t = 0.2979, p = 0.7659) do not have a specific effect on the need for a PIMS. It can also be concluded that the proposed model describes 40.97% of the total variation in the need for a Passenger Information Management System (PIMS).

Table 04: Results of Regression analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ONLINE_TICKET	0.207571	0.037203	5.579373	0.0000
P_AND_G_INFO	0.300462	1.292465	0.232472	0.8163
T_COUNTER	-0.272051	0.046830	-5.809339	0.0000
TECH_SKILL	0.359944	1.208126	0.297936	0.7659
TRAIN_INFO	-0.848328	0.224092	-3.785625	0.0002
C	126.3975	22.98549	5.499011	0.0000
R-squared	0.418782	Mean dependent var		39.18385
Adjusted R-squared	0.409728	S.D. dependent var		20.65826
S.E. of regression	15.87156	Akaike info criterion		8.385114

Sum squared resid	80862.01	Schwarz criterion	8.454654
Log-likelihood	-1364.966	Hannan-Quinn criter.	8.412861
F-statistic	46.25761	Durbin-Watson stat	1.908629
Prob(F-statistic)	0.000000		

Accordingly, a model for estimating the need for a Passenger Information Management System (PIMS) from these variables can be developed as follows:

Need for a PIMS = 126.3975+ 0.2076 Attitude towards an Online Ticket Procedure -0.2721 Ticket counter service - 0.8483 Ease of getting information about train schedules

According to the above equation, the intersection is 126.3975. Therefore, the need for Passenger Information Management System (PIMS) can be expected to be 126.3975 units without independent variables. The coefficients for the variance of the online ticketing procedure, ticket counter service, and train schedule information are 0.2076, -0.2721, and -0.8483 respectively. Therefore, it can be expected that the need for the Passenger Information Management System (PIMS) will increase by an average of 0.2076 units as the attitude towards the online ticketing process increases by one unit while the other variables remain constant. It can also be expected that the Passenger Information Management System (PIMS) requirement will decrease by an average of 0.2721 units as the service of the ticket counter increases by one unit while the other variables remain constant. It can also be expected that the need for a Passenger Information Management System (PIMS) will decrease by an average of 0.8483 units as the ease of knowing train schedules increases by one unit while the other variables remain constant.

CONCLUSIONS

Conclusions of the study are made based on the analytical findings. According to the first objective of the study, the average value of the index related to the need for a Passenger Information Management System (PIMS) is 39.18. Most passengers' need for a Passenger Information Management System (PIMS) index value is higher than the average value. That is, it can be identified that there is a need for a Passenger Information Management System (PIMS) for the majority of railway passengers. The study conducted by (De Silva, 2010), it has been found that there is a need for an efficient ticketing system for Sri Lanka's bus and railway services. It has also been mentioned that it can be reduced the revenue loss of public transport. A contactless card and a mobile phone-based application have been proposed for that.

Several factors could be identified when focusing on the factors affecting the need for a Passenger Information Management System (PIMS) for the Sri Lanka Railway Department. The factors are computer knowledge, online knowledge level, knowledge of electronic card usage, the primary purpose of using the train service, train service usage frequency, and satisfaction with the M-ticketing service. Moreover, it can be identified that factors such as the age of railway passengers, living area, education level, employment status, monthly income, and the class of train traveled in do not affect the need for a Passenger Information Management System (PIMS).

According to the regression analysis, it can be concluded that the attitude towards an online ticketing procedure, the service at the ticket counter, and the ease of knowing about the train schedule have a significant effect on the need for a Passenger Information Management System (PIMS). Accordingly, when the service at the ticket counter is more efficient, the need for a Passenger Information Management System (PIMS) decreases; and when the attitude of railway passengers toward an online ticketing procedure increase, the need for a Passenger Information Management System (PIMS) also increases.

It can also be further concluded that if the ease of knowing information about the train schedule increases, the need for a Passenger Information Management System (PIMS) will decrease. The study conducted by Yaparathna & Ratnajeewa, (2018) also confirmed the finding recognizing the availability of online ticketing facilities and the display of correct information as key determinants of rail passenger satisfaction. These conclusions imply that the need for a Passenger Information Management System (PIMS) will decrease if the service at the ticket counter is more efficient and if there is an easy way for train passengers to get information about the train schedule quickly. It can be concluded that there is a need for a Passenger Information Management System (PIMS) for the Railway Department. Therefore, it was clear that the Department of Railways should establish an easy-to-use, secure Passenger Information Management System (PIMS) covering all sectors, using a simple interface that is tailored to the individual at all levels. It was further demonstrated that the government and the Railway Department should pay special attention to this.

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A Review of Literature on Sustainable Cities and Urban Ageing: Challenges and Opportunities for Developing Countries

SLJSSH

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Abstract

The proportion of the elderly population is increasing rapidly. This trend demands measures and actions that enable elderly people to stay active and self-sufficient as long as possible. However, in cities, elderly people are more vulnerable to climate change, and socioeconomic changes since most city environments are designed to support the working population. Therefore age-friendly living environments and facilities are necessary to promote active ageing. Sustainable cities and ageing populations have been researched widely as separate concepts, but these two have not been researched together. The paper provides a review of empirical research on sustainable cities and urban ageing by giving a special focus on challenges and opportunities for developing countries. The review identifies eight domains in age-friendly cities: (1) outdoor spaces and buildings; (2) transportation; (3) housing; (4) social participation; (5) respect and social inclusion; (6) civic participation and employment; (7) communication and information; and (8) community support and health services. Challenging areas include elderly labour force participation, elderly caring, social security, inclusive urban infrastructure, urban poverty, and peace and security. As a policy implication, collective efforts should be made to formulate policies and programmes to keep the active and productive elderly in the labour market, community development, and decision-making process.

Keywords: Challenges and opportunities, Developing countries Sustainable cities, Urban ageing.

INTRODUCTION

Urbanization and ageing are two key demographic trends and issues faced by many developing countries today (Plouffe & Kalache 2010) and these two are the culmination of successful human development (Plouffe & Kalache 2010, van Hoof et al., 2018). These two trends are having a major impact on sustainable development (Han et al., 2021). According to the United Nations (UN, 2015), the population share of those 65 years old and over is expected to climb to 16.5 per cent in 2030 and 21.5 per cent in 2050 in the world. The share will be 29.2 per cent in more developed regions and 14.2 per cent in less developed regions by 2030. Interestingly, cities in particular are home to 43.2 per cent of this older population today. By 2030, about 60 per cent of the world's population is expected to settle in cities, and about 67.2 % of the world's population by 2050 (UN 2013). According to Gentilini (2015), by 2025, the global urban economy will have grown over 20 times its level of 1950, representing 75 per cent of the world's economy. These trends put more pressure on policymakers and planners to redesign urban development plans and social protection strategies in line with sustainable development. Cities face many challenges in achieving sustainable development: social, economic, environmental, and governance challenges. Despite the challenging nature of this demographic trend, it also produces many development opportunities. Empirical literature (Bahraini 2001, Conelly 2007, Larijani 2016, Varol et al., 2010) highlighted that on the one hand cities are considered centres of social, economic, and environmental development and, on the other hand, the cities are the most appropriate places where the problems of economic, social and environmental arise from them. The purpose of the paper is to identify challenges and opportunities for sustainable cities and urban ageing that are faced by developing countries. The two concepts together have not been researched and very few researchers have even studied these two separately although urbanization and the well-being of rural elderly are separately, widely researched. The rest of the paper will be organized under five sections: a) sustainable development, b) sustainable cities, c) urban ageing in developed and developing countries, d) challenges and opportunities in urban ageing, and e) conclusion.

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SUSTAINABLE DEVELOPMENT

Sustainability has been defined as the development (WCED, 1987) that meets the needs of the present without compromising the ability of future generations to meet their own needs. This definition tries to justify capturing basic ideas of interring and intergenerational justice. Meanwhile, most of them require that the "quality of life" should not decline over the long–term future. All the definitions of sustainable development highlight social, economic and environmental aspects of development. For example, according to Bali Declaration (1992), sustainable development objectives 'are to balance human needs and aspirations with population, resources and the environment and to enhance the quality of life today and in the future. UN 1992: 4).

Sustainable development means combining the economic, social and environmental objectives to maximize the present human well-being without damaging the ability of future generations to meet their needs (OECD, 2001:11). The World Bank had committed to promoting sustainable development and to the proposition that "economic growth, the elevation of poverty and sound environmental management in many cases mutually consistent objectives." (Pezzey 1992: 23). The 2030 Agenda for Sustainable Development that was adopted by 193 Member States at the UN General Assembly Summit in 2015 committed to achieving sustainable development by 2030.

In the last decades (Mulder, Jeroen and Bergh, 2001), there has been an increasing worldwide interest in the goal of sustainable development. The concept of sustainable development emerged when the economic development path focused on economic aspects more than environmental and social aspects (Shoja & Heidari 2015). The economic view on sustainable development (Munasinghe, 2002) is geared towards improving human welfare, primarily through increasing the consumption of goods and services. Economists look at the environment only from the point of view of externalities (Baumal & Oates 1988, Van de Bergh 2010). The environmental domain focuses on the protection of the integrity and resilience of ecological systems. The social domain emphasizes the enrichment of human relationships and the achievement of individual and group aspirations, '*human-centred development*' (Shoja & Heidari 2015). The interactions among these domains are also important to ensure a balanced assessment of trade-offs and synergies that might exist among the three dimensions.

The concept of sustainable development (Abazi, et al, 2017, Wang 2010) has become one of the most contested concepts and is indispensable at present time. Sustainable development consists of three main components: (1) economic freedom, (2) environmental protection and (3) social inclusion. An economically viable system should be able to produce goods and services and continue to maintain manageable levels of government and external debt. Finally, this will be able to avoid extreme sectoral imbalances that cause damage to the environment. A sustainable environmental system should maintain a sustainable resource base, avoiding the over-exploitation of renewable resources. In terms of the social domain, a sustainable social system should achieve equality of distribution, provision of social services including health and education, gender equality, and political and participation responsibilities.

Achieving sustainable development (UNO, 2013) will require global actions to be delivered on the legitimate aspiration towards further economic and social progress, requiring growth and employment, and at the same time strengthening environmental protection. According to Abazi et al (2017), sustainable development requires economic growth, which leads to increased productivity, increased employment, reduced poverty, inflation stability, the boost of human capital, and rapid technological progress (Abazi et al 2017). Poverty eradication, changing unsustainable and promoting sustainable patterns of consumption and production, and protecting and managing the natural resource base of economic and social development are the overarching objectives of and essential requirements for sustainable development (UNO, 2013). In this broader context, the protection of climate and the environment will need to be pursued as a universally shared goal.

The concept of social sustainability is about more than just providing for our social well-being – it is about sustaining a high level of social well-being in the long term (Brain, 2019). Equity, understanding diversity inclusion, quality of life, opportunity and individual empowerment have been identified as social factors that are key to sustaining social well-being in the long–term (Brain 2019).

Economic freedom has also been an influential factor towards sustainable development. Economic freedom provides choice for selecting business opportunities and secures property rights (Mushtaq & Khan, 2018). Trade, financial and labour freedom are components of economic freedom and the government should encourage civil and political freedom, improving investors' confidence and sustainable development. The study by Mushtaq & Khan (2018) analyzed economic freedom and sustainable development for a panel of 58 countries and observed that economic freedom has been found positively influence sustainable development. Economic freedom provides choice for selecting business opportunities and secures property rights.

Sustainable Cities: The concept of sustainable cities has been discussed since the 1990s (Satterhwaite, 1992). Sustainable city development involves economic, social and environmental development (Albayrak & Eryilmaz 2017, Albayrak & Senlier, 2015). However, the idea of "urban sustainable development" is mainly coming from environmentalists through their discussions about environmental issues, especially through the discussion about issues in the urban environment (Shoja & Heidari 2015). The urban sustainable theory also investigates the sustainability of the city, the sustainable model of settlements, and the effective transport model since it considers urban development for the joy of the urban settlers (Ziari, 1999). The concept of sustainable city development is a very broad aspect of studies in development. The concept is not only considered historical developments but also in this regard the rational development of various sciences and social knowledge are considered (Larijani 2016). This focuses on better living and working conditions for the inclusive groups (UN 2013). United Nations in its Rio de Janeiro Conference on Environment and Development in 1992 gave the highest priority to sustainable development. However, urban sustainability was discussed as a vital component of the sustainable development agenda in 1996 at the United Nations Conference on Human Settlements, held in Istanbul (UN 1997). It addressed urban sustainability as an integration of economic, social and environmental issues.

An in-depth discussion on sustainable cities was done in 2002 at the World Urban Forum. In addition to the three aspects of sustainable development, governance issues were also addressed at the World Urban Forum in 2002. These four issues were again discussed at the World Summit on Sustainable Development, held in Johannesburg in 2002 and governance issues were addressed under the broader theme of peace and security. Therefore, sustainable cities can be seen as an integration of four pillars; (1) economic development, (2) social development, (3) environmental management, and (4) urban governance (UN 2013). The economic development pillar is built upon green productive growth, decent employment, renewable energy, and technology and innovation. Education and health, food and nutrition, green housing and building, water and sanitation, green public transportation, green energy, and social capital are taken under the social development pillar (Figure 1).

Figure 1: Pillars of sustainable cities
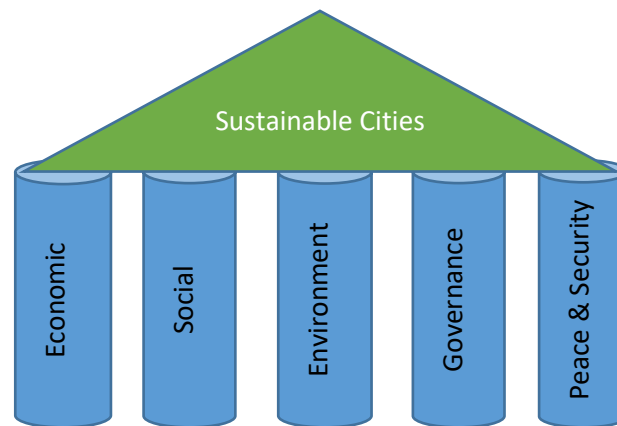
The environmental management pillar consists of forest and soil management, waste and recycling management, energy usage efficacy, water management, air quality, and adaptation to and mitigation of climate change. Environmental-ecologic values hold priority in the environmental pillar (Albayrak & Eryilmaz 2017). The urban governance pillar includes planning and decentralization, reduction of inequalities, strengthening of civil and political rights, and support of local, national, regional and global links (Shoja & Heidari 2015, UN 2013). According to the definition provided by the United Nations Development Programme (UNDP) governance is "the exercise of political, economic and administrative authority in the management of a country's affairs at all levels" (UNDP 1997: 5). However, the current global security situation heavily puts pressure on city planners. Cities all over the world are facing security challenges because, over the years, the incidences of crime and terrorist acts and the degree of violence have increased terrifically (Hove et al., 2013, Savitch, 2000). Insecurity is a widespread threat to sustainable city development. Cities are investing a significant amount of resources for security purposes. Therefore, peace and security can also be considered the fifth pillar for sustainable cities.

Table 1: International attempts for sustainable city development

Year	Event-activity
1992	Agenda 21 / Local Agenda 21 / UN Conference on Environment and Development, Rio (Brazil)
1992	European Urban Charter I
1994	European Conference on Sustainable Cities & Towns, Denmark
1999	ESDP-European Spatial Development Perspective, Postdam
2000	Guiding Principles for Sustainable Spatial Development of the European Continent CEMAT
2001-2007	Sustainable Cities Program UNEP-UN Habitat
2004	Charter of European Cities & Towns Towards Sustainability - Aalborg Charter, Aalborg, Denmark
2006	European Sustainable Development Network (ESDN)
2007	Leipzig Charter on Sustainable European Cities, Leipzig
2008	European Urban Charter II
2016	UN-Habitat III Conference on Housing and Sustainable Urban Development, Quitom Ecuador
2000, 2002, 2004, 2006, 2008, 2010, 2012, 2013, 2014, 2015, 2016, 2017, 2019	International Conferences on Sustainable City: Rio (2000), followed by Segovia (2002), Siena (2004), Tallinn (2006), Skiathos (2008), A Coruña (2010), Ancona (2012), Kuala Lumpur (2013), Siena (2014), Medellin (2015), Alicante (2016), Seville (2017), and Valencia (2019)

Source: Adapted from Albayrak & Eryilmaz (2017).

Recently, sustainable city development has been recognized in the Sustainable Development Goals (SDGs) in the 2030 Agenda for Sustainable Development. While several SDGs relate to sustainable cities, Goal 11 directly addresses sustainable cities: *"make cities and human settlements inclusive, safe, resilient and sustainable."* The following targets were set for achieving sustainable cities: Target 11.2- By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons; target 11.3- By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries; target 11.4- Strengthen efforts to protect and safeguard the world's cultural and natural heritage; target 11.5- By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations; target 11.6- By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management; target 11.7- By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities; target 11.a- Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning; and target 11.b- By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels (UN 2015).

Urban Aging: Today ageing is a major policy issue in the developing world (UN, 1991). Every country in the world is facing growth in the number and proportion of elderly persons in their population which makes changes in social investment, production, health care services, public utilities, transportation, social protection, savings and consumption structure enormously. In Asia, the crisis is an immediate one (World Bank, 1994). In Africa, ageing is a crisis that is just beginning to reveal its shape (Apt, 1995). In the Latin American region, it takes as a potential cause for concern. It is poised to become one of the most significant social transformations of the twenty-first century, with implications for nearly all sectors of society (United Nations, 2015). The socioeconomic consequences of ageing are significant areas for policymakers all over the world. Meanwhile, ageing leads to the burden of dependency. Growth in the numbers and proportions of the elderly population can be expected to have far-reaching economic, social and political implications including labour and financial markets, the demand for goods and services, such as housing, health care, transportation and social protection, as well as increasing the demand for care, and technologies to prevent and treat non-communicable diseases and chronic conditions associated with old age. Demographers demonstrate population ageing as increasing the median age of a population or an alteration in the age structure of a population, so that elderly persons are increasingly represented within a country's overall age structure. Meanwhile, population ageing is a natural, mostly irreversible consequence of the demographic transitions that all countries are going through or have completed (Bloom, 2012).

Population ageing is no longer a phenomenon in developed countries. The pace of population ageing is progressing most quickly in developing countries. Developed countries such as Australia, Georgia, Hong Kong, China, Japan, New Zealand, and Russian Federation have already experienced increasing ageing of their populations. Meantime, many countries including China, the Republic of Korea, Macao, Singapore; Sri Lanka and Thailand are facing the pressures of the ageing population. In recent years, fertility has declined in nearly all regions of the world. Even in Africa, where fertility levels are the highest among all the regions, total fertility has fallen from 5.1 births per woman in 2000-2005 to 4.7 in 2010-2015 (United Nations 2017). Therefore, in the current world, many middle and lower-income countries are presently experiencing rapid growth in their older populations as a result of socioeconomic and demographic factors. The dynamics of population ageing vary from country to country depending on their level of social, economic and demographic development.

Ageing population and urbanization have become major underlying demographic shifts taking place in nearly all the countries of the world (United Nations, 2013). Urban ageing is an emerging main factor that contracts with the population of elder people living in cities. The ageing population of urban areas is a positive and challenging phenomenon in developing countries because population ageing and urbanization are the culmination of successful human as well as economic development. The elderly population is rising faster in urban areas than in rural areas. The number of people aged 60 years or over increased by 68% in urban areas, compared to a 25% increase in rural areas during the period between 2000 and 2015 (See figure 2). As an outcome, older persons are increasingly concentrated in urban areas. In 2015, 58% of the world's people aged 60 years or over resided in urban areas, up from 51% in 2000 (United Nations, 2015).

Figure 2: Percentage change in the population aged 60 years or over between 2000 and 2015 for the developing regions, by urban/rural area
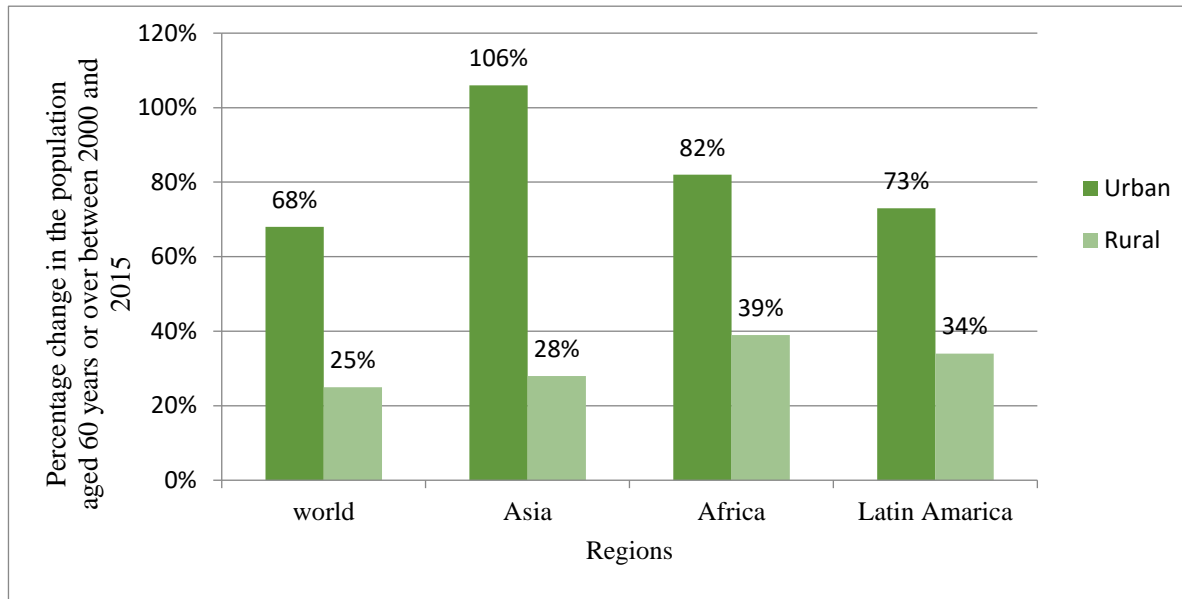
Source: United Nations, 2015.

There is a significant increase in the number of elderly people in Asia, Africa and Latin American countries. The number of people aged 60 years or over in urban areas in 2015 was more than double (106%) the number in 2000 in Asia. Meantime, the regions that are urbanizing the fastest in Latin America and the Caribbean, Asia and Africa saw major differentials in the growth of the number of older persons between urban and rural areas. Due to this phenomenon, urban areas in developing countries must make sure of their inclusion and total access to urban spaces, structures, and services. Therefore, urban areas are called upon to complement the efforts of governments to address the consequences of the unprecedented demographic shift.

Population ageing and urbanization are some of the direct results of successful human development during the last century. This takes place in the context of processes of modernization, democratization, complex migration flows and patterns, emerging technologies, economic globalization, fiscal constraints and climatic change (Makore, 2018). Further, with the urbanization in developing countries, there is an increasing trend towards nuclear families coupled with declining fertility and increasing longevity, and the ability of families to take care of old aged people is gradually declining. Besides, the changing family structure and composition in the face of urbanization would have a negative impact on social and economic norms in familial care imposing pressure on the provision of formal residential care for the elderly. As a result, the challenges faced by ageing developing economies in the world in the years to come would be more complex than those faced by ageing developed economies.

It is estimated that within the next five decades, over 80% of the world's older people will be residing in developing countries. Meanwhile, urbanization is pushing an ever-increasing number of people to urban areas. China has experienced a huge wave of internal migration from rural areas and from small- and medium-sized cities to large cities. The elderly percentage in urban areas increased by 0.6% between 1982 and 1990 and 1.78% between 1990 and 2000 (Gan and Fong 2018). To reduce the burden, China's 12th

"Five Year Development Plan on Ageing" includes developing a nationwide system of older persons' homes with 3.42 million more beds for the elderly and encourages all grassroots medical institutions to provide health services and monitor the conditions of people aged 65 and older (Du & Wang, 2016).

On the other hand, India will be the youngest country in the world by 2020, but 20 per cent of its population will be 60 years and above by 2050, up from 8% in 2011. India's total urban population in 2011 was 377.11 million. According to the United Nations projections, India will add another 416 million urbanites by 2050, making the total urban population around 793 million. 20 per cent of this population (approximately 160 million) will be the old, comprising the young-old (60-70 years), the middle-old (70-80 years) and the very old (above 80 years). The very old among these would be the fastest-growing segment (Jha, 2019). To overcome the above situation, the policymakers in India make efforts to create geriatric wards in hospitals and exempt the elderly from queues, introduce training and orientation to medical and para-medical personnel in healthcare of the elderly, and mobile health services, special camps and ambulance services for the old by charitable institutions and not-for-profit healthcare organizations. India also works in elder-friendly layouts of housing colonies, and ease of access to public and other private services for elderly people.

Further, South Korea is one of the fastest-ageing countries and is expected to become a super-aged society within 12 years (Lee et al., 2014). The country has experienced both sharp declines in fertility and substantial gains in longevity (United Nations, 2015). As well as the unemployed elderly or the elderly who live with their children are most likely to move to urban areas (Pak & Kim, 2016). To address the situation, the city of Seoul has made the subway system more accessible to seniors; the city introduced several age-friendly adaptations to accommodate elderly people.

The oldest population of the Latin American region in 2050 is expected to be around 40% of its population aged 60 years and over. Many older people are moving to cities like Bolivia. Meanwhile, the demographic window remains open for

another 20 years to address ageing populations in Latin America. Therefore, the region should establish appropriate policies to overcome this situation. The presence and the growing numbers of elderly people in urban areas call for a better understanding of the context of ageing in sub-Saharan Africa as well as the situation of older people living in urban areas in the region. These urban areas are characterized by worsening economic and social conditions, especially in the sprawling, informal settlements of cities across sub-Saharan Africa (Ezeh et al., 2006).

Challenges and opportunities in urban ageing

This section identifies the man economic, social, environmental, governance and peace and security connected to building sustainable cities with special attention to urban ageing in developing countries. The demographic shift toward urban ageing has significant implications for sustainable city development. In developing countries, low quality and lack of urban infrastructures such as power generating system failures, congested motor traffic, inadequate public transport, inefficient ports, and inadequate competitive and equipped schools have hindered urban competitiveness and sustainable economic development. Van Hoof et al. (2018), based on their studies in European settings, highlighted that the features of age-friendly cities were determined in eight domains of urban life: (1) outdoor spaces and buildings; (2) transportation; (3) housing; (4) social participation; (5) respect and social inclusion; (6) civic participation and employment; (7) communication and information; and (8) community support and health services.

Elderly 'silver' labour: Older people become a very significant resource group in the labour market since they are skilful, experienced, and healthy. Employing the elderly 'silver' labour is a real challenge in city areas and a wonderful opportunity for the labour market. '*A group of healthy old people with knowledge and skills is the precious wealth of the entire society* (Wang, 2010: 207). However, a flexible work environment and lifelong learning possibilities must be offered. Retaining older city employees and promoting entrepreneurship among older people are important. Increasing the labour force participation of older people improves their quality of life and minimises their health hazards and risks of isolation. According to United Nations (2017b), labour force participation of men aged 65 years or over has increased gradually from 1990 to 2015 in developed countries including Europe, Oceania and Northern America, but it declined gradually in Asia, Africa and Latin America and the Caribbean. Older women's labour force participation increased in all regions between 1990 and 2015. Many countries have changed their retirement policies to keep the valuable elderly group in the labour force. Countries should gradually increase the age of retirement. For instance, Germany has increased the age of retirement to 67 to cut down on the retirement pension budget. This may also help to improve their quality of life.

There are two main challenges in employing elderly people: (1) their knowledge of new technology in the case of smart industries, and (2) their physical strength, energy and adaptability in the case of labour-intensive industries. Governments in developing countries should support the life-long learning and employment of the older population.

Elderly caring: Current demographic trends show that the elderly population becomes bigger and bigger, and they live longer. It has also been predicted that the majority of elderly persons live in urban areas. In many developing countries, working-age family members look after their elderly family members. Thus burden mainly goes to female family members, which directly and negatively affects female labour force participation. In city areas, working-age family members have limited capabilities and capacities to look after elderly persons since city dwellers have to face a tremendous amount of economic pressure. In 2015, there were 7 people in the traditional working ages, 20-64 years, for each older person aged 65 years or over in the world. By 2050, there will be 3.5 working-aged people for each older person in the world. In Japan, the elderly dependency ratio will be 1 to 1 by 2050. Family base caring is not practical for city elders. Many countries are currently unable to provide sufficient long-term care solutions. Elderly caring, therefore, becomes one of the key challenges as well as it would be a good opportunity for sustainable cities. This trend will create new job opportunities for caregivers, and emerge new products and facilities with the support of new technologies. New smart elderly care residents will also promote more social and community nitration among older persons by replacing in-home family-only caring and interaction to visits-to nursing residents, which further enhance the health conditions of elderly groups.

Social Security: In response to recent trends in population ageing, many developing countries have expanded the coverage of their contributory pension schemes and initiated non-contributory social pensions. Since there is no proper policy or mechanism to keep elderly people in the labour force in developing countries, social security pressure on GDP becomes very high in these countries. For example, in China, Wang (2010: 208), according to statistics of the subject report of "Establishment and Perfection of China Social Security System" by the Ministry of Labour in 1994, states that the total amount of insurance benefits of all retired people all over the country was 10.61 billion Yuan in 1984, 47.24 billion Yuan in 1990, 206.83 billion Yuan in 1997, and will respectively reach 7321.95 billion Yuan in 2030 and 18219.52 billion Yuan in 2050. In most countries of Latin America and the Caribbean, public spending on pensions varied from 1 per cent to 8 per cent of GDP but European countries spend in pensions about 8% on average.

Many cities in developing countries have not been developed with proper plans. The uncontrolled and unplanned urbanization has brought about severe socio-economic, cultural and environmental problems. (Daramola & Ibem, 2011, Jiboye, 2011, UNCHS, 2007). The working-age population has to generate more income and production to provide the elderly population with a good and healthy social security package, but the proportion of the working-age population to the population of the elderly is gradually narrowed down. In a country like China, it approaches 2:1 (Wang, 2010). However, one major concern is that pension coverage is usually lower among women than among men because of women's lower rates of participation in the labour market, their over-engagement in the informal sector, and their work as self-employed or unpaid family workers. Rural elderly people are almost totally dependent on their children, which will increase the economic burden on the family. But urban elderly people are mostly isolated and self-dependent. Therefore, it is very important to *establish and make perfect the old-age security system.* Such a system not only should guarantee the economic and healthy life of the elderly, but also encourage young people to become entrepreneurs. Such social protection systems must be free from high transaction costs. For example, India has a comprehensive social pension system, but transaction

cost is very high (Gentilini, 2015). Social protection for all is a key goal of the 2030 Agenda for Sustainable Development (Goal, 11).

Green and inclusive infrastructure: The demographic structure in urban ageing may require cities to revisit their urban design and plans to be attractive and competitive. Providing infrastructure facilities to keep elderly citizens mobile, connect, and inclusive while maintaining sustainable cities is a big challenge for city planners. These are good opportunities as well on the other hand. For example, investment in green and inclusive infrastructure can help the 'silver' citizens live longer and engage in some economic activities, which together promote sustainable development. Use of smart technology is increasingly used by many developed countries as a possible solution for dealing with some of the challenges related to urban ageing (Van Hoof, 2018).

Accessibility for older people to employment, healthcare, social care services, housing and the community is a major concern since many cities lack older people-friendly infrastructure. Many cities in developing countries have been not planned properly and lack proper and suitable facilities and services for the elderly. Therefore, the housing and services adapted to older residents should encourage the development of new types of housing, facilities, information and telecommunication technologies that improve access to health and social services.

Being healthy and staying healthy are important objectives for societies. Health services, preventative measures, and healthcare are some of the challenges of urban ageing societies. Walking is one of the preventive measures. Eco-friendly walking tracks are the most effective measures of preventative care (Cocchia, 2014, Righi, 2015, van Hoof et al., 2018). It is very important to redesign the urban area to increase attractiveness, well-being, and green. Cities must provide infrastructure for transport, communication, and other essential utilities including supplying electricity, water, sewage and other waste disposals. There is numerous such age- and eco-friendly cities in the Netherlands and Poland (van Hoof et al., 2018). Yokohama built new town districts to accommodate urban ageing and sustainable cities.

Urban poverty and ageing: Urban poverty is significantly higher and more complex than that of rural. Many developing countries have underestimated urban poverty and urban ageing, and are more focused on rural poverty. For example, according to Gentilini (2015), the coverage of safety nets among the urban poor is significantly lower in urban areas relative to rural areas. About 16.6 per cent of the urban household in the poorest quintile are covered by some form of safety net program, as opposed to 23.4% of the poorest rural quintile (Gentilini, 2015: 27). Cost of living in urban areas is considerably higher than in rural settings. Things in urban areas come through the market- transactions. Things are relatively expensive in urban areas. For example, in urban Nepal households spend about 28 per cent of their income on housing but in rural households about 7 per cent (Garrett & Ersado, 2003).

Good and effective urban governance: According to the UNDP (1997), good governance is a necessary condition to achieve equitable and sustainable development. At the UN-Inter-Agency meeting in 2001, five principles of good urban governance were adopted, namely (1) effectiveness, (2) equity, (3) participation, (4) accountability and (5) security (UN-HABITAT, 2004). Good urban governance must be free from corruption. In most developing regions including Africa, Asia and Latin America, cities emerged as trading points and gateways for export and import. They have not been properly planned. Many developing countries use the top-down approach to policy formulation and implementation. However, effective and good governance must be characterized by greater involvement of NGOs and community organizations, greater transparency and accountability in both planning and implementation of local policy and the devolution of responsibility for urban affairs from the state or national level to the local level. Development policies, plans and programmes should be based on the real needs of the people. They must use the participatory development approach

Peace and security: Cities all over the world are affected by both random and organised criminal operations, and terrorist activities. Ensuring public security and enforcing peace is one of the key urban governance challenges facing developing countries. Over the years, the incidences of crime and the degree of violence have increased tremendously in many cities in developing countries. Women, the elderly and children are key victims of all kinds of crime. City businesses are also heavily affected by such crimes, violence and terrorism. Urban insecurity becomes a major challenge for urban governance. Reduction of disaster risk, crime and all other natural and human-made hazards for urban environments is closely connected to sustainable development, which aims to protect the environment and address human development and well-being.

CONCLUSION

Demographic structure in the world has already changed profoundly. The elderly proportion of the demographic structure is rapidly increasing. Urbanization is also a key concern in the world. Urban females more and more participate in the labour force. These trends have significantly altered family relations and family demographic structure. A new social protection approach that can minimize government budgetary burden, optimize social values, and protect ecological resources, needs to be developed. Labour market and infrastructure facilities should change and adjust to accommodate the older population.

Further research studies need to be conducted to examine the complex nexus among the five components of sustainable city development: social, economic, environmental, governance and peace and security. Indexes related to sustainable cities and urban ageing need to be developed to support planning, implementation and monitoring and evaluation of, as well as research on, urban ageing population and sustainable cities. More attention should be given to formulating urban policies to cope with the socio-economic and environmental consequences of urban ageing in fields such as social protection, education, employment, health, food security, housing, elderly care, and welfare services. Collective efforts should be made to formulate policies and programmes to keep the active and productive elderly in the labour market, community development, and decision-making process. Countries should take full advantage of this wonderful window of opportunity.

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Colonialism, Migration and the Emergence of Urban Spaces in Colonial Nigeria

SLJSSH

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Abstract

Arguably, urbanisation, which entails spatial, social, and temporal phenomena, is a social process describing how cities grow and societies become more complex. From this point of view, urbanisation is not a new phenomenon in Nigeria in particular and Africa in general. The process of urbanisation in Nigeria began in the pre-colonial period and continued during the colonial and post-colonial periods. However, the factors or conditions that facilitated urbanisation in each historical epoch of urbanisation in Nigeria have changed over time. This paper interrogates the effect of colonialism on the emergence of urban spaces in Nigeria between 1900 and 1960. It argues that migration, which constituted one of the main drivers of the emergence of urban spaces in Nigeria during this period, was promoted by the introduction of the British colonial policy of the administration. The main trend of internal migration during colonial Nigeria examined in the paper involves a drift from the rural areas and the lesser towns to the new urban centres of commerce and administration which developed in response to the establishment of formal colonial rule. This trend of internal migration was witnessed in different parts of Nigeria such as Lagos, Ibadan, Ogbomoso, Osogbo, Benin City (all in Western Nigeria); Onitsha, Enugu, Calabar, Port Harcourt (all in Eastern Nigeria); Kano, Jos, Makurdi, Zaria, Sokoto and Kaduna (all in Northern Nigeria) between 1900 and 1960. It concludes that the physical spaces in these cities have had a fundamental significance for the host communities, migrants and for host/migrant relations.

Keywords: British, Colonialism, Migration, Nigeria, Urbanisation

INTRODUCTION

Existing studies have revealed that the socioeconomic relations in different parts of Nigeria and Africa are shaped by trans-local patterns of migration, exchange and identity (Otite, 1979; Ogen, 2003 & Olaniyi, 2008). The dynamic nature of migration constitutes a major factor responsible for the geographical distribution of population in every human settlement. Fundamentally, the history of the human race is rooted in migration. In other words, the emergence of every society is a product of migration. This is why migration is generally referred to as a global phenomenon. By nature, man is designed to be mobile. He moves, as the need arises, from one location to another in search of a variety of things (Akai, 2010), which could be socio-economic opportunities available in the place of destination.

Nigeria, like other countries of the world, has a long history of population mobility. From a historical perspective, the study of migration patterns in Nigeria falls into three distinct periods: pre-colonial, colonial and post-colonial. Meanwhile, each of these periods reflects the people's response to widely divergent social, political and economic conditions (Adesote, 2016:19). The movement of people in these historical epochs of migration took forms of regional, occupational and seasonal rural-rural, rural-urban, urban-urban and urban-rural patterns of internal migration.

Importantly, the decision to migrate, migration stream/wave and paths which are major processes involved in internal migration based on place utility in terms of the environment and the information received from previous migrants.

Arguably, migration constitutes one of the main drivers of city building in any society. Although the process towards this development has begun in Nigeria during the pre-colonial period, it became unprecedented and took different dimensions during colonial and post-colonial periods. In fact, it was during the last two periods that rural-urban and urban-urban patterns of migration were more pronounced. The dynamic nature of urbanization during these periods was hinged on the socioeconomic development that attended colonialism. In other words, economic opportunities and the availability of social infrastructure prevalent in many cities and towns in Nigeria during the colonial period stimulated rural-urban and urban-urban migration. As argued in the literature, one of the consequences of colonialism in Nigeria was the growth and transformation of some cities and towns between 1900 and 1960 (Muritala, 2011; Sean, 2012:283 and Uji, 2015). Notable among them were Ibadan, Ogbomoso, Osogbo, and

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Benin City (all in Western Nigeria); Onitsha, Enugu, Calabar, Port Harcourt (all in Eastern Nigeria); Kano, Jos, Makurdi, Zaria, Sokoto and Kaduna (all in Northern Nigeria). However, it is imperative to point out here that, the physical spaces in these cities and towns had a fundamental significance for the host communities, migrants and host/migrant relations.

It is against this background that this paper interrogates the relationship between colonialism, migration and urbanization in Nigeria between 1900 and 1960. This paper is divided into six sections. The first section is an introduction; the second section deals with a literature review; the third discusses materials and methods used for the study; the fourth is results and discussions of colonialism, migration and the emergence of urban spaces in colonial Nigeria; and the fifth section is the conclusion.

THEORETICAL FRAMEWORK

Colonialism: Colonialism can be viewed from different perspectives. Generally, it refers to the domination of one country by another, which is mainly achieved through aggressive and military actions or means. From the African experience, it deals with the practice of invading African lands & territories by the Europeans for the purpose of settlement and/or resource exploitation (Kaniki, 1985:382).

Migration: Generally, migration refers to the movement of people from one geographical location to another, either on a temporary or permanent basis. Migration could either be voluntary or involuntary or forced migration. While voluntary migration centres mainly on the movement of people based on willingness and desire, forced migration refers to as the mass movement of people caused principally by social and political problems such as armed conflicts, human rights violations, natural or environmental disasters, chemical or nuclear disasters, famine, or development projects (Adesote, 2016:20). There are two main categories of migration, namely, internal and external. While internal migration involves movement between one community and another, external migration refers to the movement between countries. For the purpose of this paper, our major focus is internal migration which according to Osoba is categorised into three main trends in Nigeria (Osoba, 1969:515). The first trend deals with the movement of people from rural areas of less economic activity to those of greater economic activity within the same region. A good example of this was the movement of people from their places in Abeokuta, Ijebu and Oyo Provinces to Ondo Province within the Western Region in search of suitable land and employment on farms. The second trend deals with the movement of people, whether on a seasonal, temporary or permanent basis across regional frontiers. A good example of this was the movement of people from the Northern and Eastern Regions to the Western Region and, vice versa. The third trend involved a drift from the rural areas and the lesser towns to the new urban centres of commerce and industrialisation caused by colonial policy of administration. A good example of this was the movement of people from different areas within Nigerian territory into places like Lagos, Ibadan, Kano, Jos, Port Harcourt, Onitsha and so on in search of employment, education, better conditions of living and so on. Of these trends of internal migration, our main focus is the third.

Urbanisation: The concept has been viewed from different perspectives by historians, social anthropologists, geographers, sociologists, demographers and other social scientists. According to Fadayomi, urbanization is a process that brings with it rapid social change and new behavioural patterns that effects social institutions like marriage and the family (Fadayomi, 1998:5). Lious Worth observes that urbanization is simply "an urban centre. And that a town that has a population that is below the minimum of 4000 inhabitants cannot be classified as urbanized" (Lious, 1968:37) Also, Sackville sees urbanization from the perspective of population density and thus argues that a town with more than 5,000 people is an urban area (Ahokegh, 2011:6). In all, urbanisation means the physical growth of an area in terms of population and socio-economic infrastructure such as transportation, communication and so on.

The theoretical framework for the Study: It is imperative to point out here that a theoretical framework is a guide to perception. Besides, it is useful in ensuring that analyses of a more qualitative nature (like this paper) can be better organised within a framework in order to add conceptual richness to the work. The two main theories require in this paper centre on migration and urbanization. Basically, migration theories present two main perspectives, economic and non-economic as the determinants of migration. According to the economic perspective, individual migrants are viewed as rationally optimising the costs and benefits of their decision to migrate. Economists generally regard the decision to migrate as one which invariably leads migrants from rural, low-income areas with job prospects to urban areas where they can improve their economic standing by employment in the formal salary sector (Makinwa, 1981:6). The non-economic perspective consists of other social scientists like geographers, sociologists, anthropologists among others and thus pose that migration decision consists of two stages. The first decision to migrate precedes a second decision regarding the choice of destination. The former, though usually heavily predicated on economic factors, is seen as necessarily moderated by various non-economic considerations such as means of transport, presence of relatives, friends and/co-villagers at the destination, ethnic compatibility and residual environmental factors at both places of origin and destination (Makinwa, 1981:6). These two perspectives of migration are represented in various theories of migration. Notable among these migration theories are Ravenstein's Laws of Migration (1885); Everett Lee's push and pull" theory of migration (1966); Charles Tilly's three determinants of migration (1974); Mabogunje's (1970) systems approach to rural-urban migration among others. The paper adopts Everett Lee's push and pulls theory of migration, which mainly emphasises rural-urban migration. The theory is constructed around some fundamental factors (economic, social and political hardships in the sending regions) and factors of attraction (comparative economic and social advantages in the receiving regions).

Also, there are socio-economic and demographic theories of urbanisation. The traditional economic theory of urbanization, which has dominated in both academic and policy circles since the 1950s, revolves around the relationship between structural economic change and the spatial dynamics of the labour market. In other words, as the modern urban sector (i.e., manufacturing and services) expands, surplus labour from the "backward rural economy" (i.e., agriculture) is drawn to towns and cities, attracted by higher wages (Sean, 2012:287). This is illustrated in the Lewis theory of dualistic economic model of urbanization which explains that surplus labour from the traditional agricultural

sector is transferred to the modern industrial sector whose growth over time absorbs surplus labour, promotes industrialisation and stimulates sustained development (Lewis, 1954: 139). In other words, the economic model suggests that urbanisation is fundamentally driven by rural-urban labour migration (that is labour transition between two sectors, namely the capitalist sector and the subsistence sector) stimulated by a wage gap between rural and urban areas due to industrialisation. The demographers see urbanization from the perspective of population growth caused by either a natural increase in urban areas or rural-urban migration (Cohen, 2003: 23-24). They explain that the onset of mortality decline ahead of fertility decline in urban areas raises the rate of urban natural increase, and urban populations expand regardless of whether they are net recipients of rural migrants. The content is that population growth could occur in a place without rural-urban migration if urban natural increase exceeded rural natural increase over a sustained period (Sean, 2012:290). From these above perspectives, the paper argues that urbanization during colonial rule was mainly caused by rural-urban migration.

MATERIALS AND METHODS

The methodological approach adopted in this paper is historical, thematic and analytical. The study historicises the evolution and development of urban spaces in the pre-colonial and colonial periods. The study relied heavily on materials from secondary sources. The main secondary sources used for the study included books (both single-authored and edited), journal articles, theses and dissertations. These secondary materials were obtained from University Libraries at Ibadan, Lagos, Ile-Ife and Ago-Iwoye as well as research websites online such as www.jstor.org. Data collected were subjected to historical analysis.

RESULTS AND DISCUSSIONS

Historicising Urbanisation in the Pre-colonial Nigeria

Generally, city building or urbanisation is viewed as a global historical process mostly driven by population dynamics associated with technological and institutional change (Sean, 2012:290. In other words, the emergence of urban spaces in Nigeria is a product of historical phases, which comprised pre-colonial, colonial and post-colonial periods. Each historical phase was shaped by different factors. With respect to the pre-colonial period, evidence from the existing studies revealed that the origin of city building or urbanization in Nigeria in particular and Africa, in general, began during the pre-colonial period. While Sesan 2012 observes that urban settlements emerged in many regions in the nineteenth century, Southall 1974, submits that development predated the 19th century and started with the process of state formation.

The pre-colonial urban or physical structure in Nigeria has been attributed to the factors of migration, politics and trade. Politically, the development actually began with the process of state formation, which is made up of the origin of a state and the emergence of dynasties in that state (occasioned by conquest, migration, assimilation and integration) (Southall, 1974:153). This was witnessed in different parts of Nigeria in the pre-colonial period. Here, we will only restrict ourselves to a few of these developments. For example, in Yorubaland, there was the existence of pre-Oduduwa societies in Ondo, Egba, Ijebu-Ode, Ilesa, Akure and so on (Akinjogbin, 1993). For instance, in Ondo, there

was the presence of three aborigines namely the Oka, Ifore and Idoko. These were autochthonous people that initially settled in the place that is now known as "Ondo". They were later conquered by the coming of Oduduwa's group led by *Pupupu* (the first and only female *Osemawe* of Ondo) who came from Ife/Oyo) to Epe, Ile-Oluji and Ode-Ondo. The conquest led to the establishment of a new dynasty (known as *Osemawe* Dynasty) in Ondo (Ogunsakin, 1967:2-3) as well as successful integration between the aborigines and the newly migrated groups, which took forms of either absorption or assimilation. This was further followed by the emergence of different quarters (streets) such as Oke Lisa, Odo Jomu, Oke Odunwo, Odotu, Oke Dibo, Oreretu, Oke Otunba, Okerowo and so on (Adeyemi, M.C. 1993:46-47). Also, in the 19th century, generally described as "a century of revolution in Yorubaland", there were a series of political crises, which ended in the fall of the Old Oyo Empire. The fall of the empire resulted in the outbreak of other civil wars such as the Owu war, the Egba-Dahomey war and the Ekiti-Parapo war by other Yoruba states for political ascendancy. We are not interested in the factors responsible for the outbreak of these wars as they had been thoroughly examined in the literature (Ajayi, and Smith, 1964 Akintoye, S.A. 1971). Our main focus is the impact of the wars on city buildings in Yorubaland. Thus, the immediate consequences of the wars were forced migration or mass movement of people (which altered the demographic pattern of Yorubaland) leading to the establishment of new towns and cities like Ibadan, Aiyede, New Oyo and Ijaye; and the expansion of old ones (which became homes of large scale mixture of Yoruba peoples) (Falola, et al, 1991:69).

Also, in Northern Nigeria, there was the evidence of state formation process which initially began with the Bayajidda legend. Although there are versions with regards to Bayajidda legend, there is a general consensus among scholars that societies existed in Hausaland with a distinctive form of government [known as *Sarauta* (kinship) system] prior to the 1804 Uthman dan Fodio Jihad Notable among societies that emerged in Hausaland in the pre-jihad period were Daura, Kano, Zauzau, Gobir, Rano, Biram, Kastina, Zamfara, Kwararafa, Gwari and so on (Adeleye, 1971:6). The expansion of Northern part of Nigeria during this period was later facilitated by the 1804 jihad. Aside from political changes leading to the emergence of a new dynasty, the jihad had a tremendous effect on the demography of the area in particular. It resulted in the emergence of new settlements, towns and cities and the expansion of the old ones. For example, the emergence of towns like Gombe, Yola, Bauchi, Kontagora and Sokoto was a result of the jihad (Falola, et al, 1991:15).

The second factor responsible for the pre-colonial urban structure in Nigeria was trade. Trade was a major factor that facilitated inter-group relations among Nigerian peoples during this period. Both internal and external trade developed in different parts of pre-colonial Nigeria. The first major form of external trade in the pre-colonial period in West Africa (Nigeria inclusive) was trans-Saharan trade. The trade flourished in Northern Nigeria during this period. A number of cities were said to have developed for the purpose of supporting Saharan and trans-Saharan trade routes. The main trans-Saharan trade route in Northern Nigeria had its centre in Bornu. It connected Tripoli, Cairo and the Kingdoms South of Egypt. The development of the trade attracted a large number of traders and migrants from outside (mostly Arabs) and surrounding areas, who later settled in different areas like Kano, and Katsina, which

eventually acted as central citadels and political capitals and Kukawa (Ogunsola, 1971:44). The areas were exposed to international trade as early as the 14th century and resulted in the growth of cities and towns in other parts of Northern Region. Inter-regional trade relations between traders from Northern Nigeria and those of the Southern part during this period equally facilitated urbanization.

Another major external trade that contributed to urban spaces prior to the establishment of colonial rule was contact with Europe, which began during the Atlantic Slave trade in the 15th century. It was after the abolition of the slave trade and the transition to legitimate trade and commerce in the 19th century that external trade relations between the peoples of Nigeria were well developed. A number of trade routes emerged in different parts of Nigeria. For instance, in Yorubaland, there was a trade route from Egbado (in Western Yorubaland) through Igan or Ilogun to Iseyin, Shaki, Igboho, Kishi and to Oyo (all in Northern Yorubaland). From Oyo, this same route continued through Raba on the Niger to Kano. This development enabled Egbado to trade with Hausaland and Bornu. There was also the trade route, which linked Central and Northern Egbado with Abeokuta to the east and Ketu to the West. In the Ketu market, there were usually found some 4,000 traders from Shaki, Kishi, Igboho, bariba, Dahomey and Porto Novo. This led to the rise of the Egba state (Folayan,1980:83-87). The development of legitimate trade in the 19th century promoted effective trade relations between the Northern and Southern parts of Nigeria, which resulted in the emergence of new settlements and the growth of towns in both areas. In both areas, separate quarters emerged to host stranger migrant traders. While in the south, the new quarters were referred to as '*Sabo*' (stranger settlement) and hosted the Hausa population, in the north, new quarters were referred to as '*Sabon Gari*' (literally, new town) and hosted inhabitants who were not from the north such as the Yoruba (Olaniyi, 2008:5). The most commodities that promoted trade relations between Hausa traders and Yoruba traders were kolanuts, textiles and leather. Yoruba traders exchanged kolanuts for textiles and leather. During this period, some Northern cities had specific quarters for each group of specialised craft manufacturers. Also, in the Niger Delta area, a number of places like Bonny, Nembe, Brass, Warri, Duke town, Ebrohimi among others became not only major commercial centres but also emerged as cities during legitimate trade (Dike, 1956:10). Okpeh later argues that it was in these towns that besides trade, other forms of interaction took place all of which generated the sense of awareness in among these diverse groups (Okpeh, 2007/2008:129).

The above analysis shows that the process towards city building in Nigeria actually began in the pre-colonial or pre-industrial era. The development was mostly facilitated by migration, politics and trade. This was later popularised by the establishment of colonial rule in 1900. This will be the focus of the next section.

Colonialism, migration and the emergence of Urban Spaces in Nigeria

The British occupation of Nigeria was a product of two major phases, namely the first (1851-1900) and the second (1900-1914). While the first phase was characterised by the aggressive acquisition of territories through the adoption of military conquest, signing of treaties and gunboat diplomacy (which could be grouped into two measures-violent and non-violent), which lasted till 1900 (Barkindo, Omolewa, and

Babalola, 1994:28), the efforts of the British during the second phase were geared towards bringing different parts of Nigeria together under a single political entity for easy administration. According to Tamuno, the desire to achieve total and effective control over the Nigeria area constituted the prime objective of British colonial administrators between 1900 and 1914 (Tamuno, 1980:393). Meanwhile, by 1900, Nigeria had been recognised as "a British colony" by other European colonialists (Falola, Mahadi, Uhomoibhi, and Anyanwu, 1991:1). However, in spite of this, it was not until 1914 that a formal establishment of colonial rule was imposed on the whole of Nigeria. Thus, having successfully conquered Nigeria during this phase, the desire of the British was to open markets for the products of British industries and as well to control the important raw materials available in the country (Ajayi, 2005:5). There were two main conflicting arguments with respect to the British interests in Nigeria. They were Eurocentric and Afrocentric scholars. While Eurocentric scholars such as D.K. Fieldhouse and Arthur Norton Cook argue that the British colonial interests in Nigeria were motivated mainly by social and political intentions, Afrocentric scholars such as Toyin Falola, Walter Rodney, Kwame Nkrumah and Aime Cesaire posit that British enterprise was motivated to a large degree by the economic factors (Adesote, 2016). For example, Fieldhouse while criticizing Marxist explanations of colonial expansion and exploration argues that it was colonialism, not an economic enterprise that precipitated Europe's political impulses and military rivalries. Fieldhouse further explains that the missionaries, explorers and adventurers who had exerted pressure on European countries to search for colonies had no economic interests as such at heart. The economic interests of the merchants were merely accidental (Fieldhouse, 1983:3) His argument was later challenged by African scholars. For example, Ihonvbere and Falola, 1987, argue that British enterprise in Nigeria was majorly motivated by economic forces. He posits that the British managed the Nigerian economy to the advantage of the metropolis through a variety of direct and indirect means among which were the creation of modern transport, the incorporation of Nigeria into the British monetary system (Ihonvbere, and Falola, 1987:8). The various colonial policies of administration introduced by the British justified the various arguments of the African scholars that Nigerian society was governed for the benefit of the metropolis. Here, we will restrict ourselves to just a few of the policies that facilitated migration and urbanization.

The colonial agricultural policy was one of the main colonial economic policies introduced by the British which facilitated migration and the emergence of urban spaces in Nigeria. The colonial agricultural policy emphasised the cultivation of "cash crops" at the expense of food crops (the traditional economy of the Nigerian people). Emphasis on the new colonial economy led to the search for suitable fertile land and the emergence of wage labour, which invariably resulted in forced migration. As pointed out elsewhere in this paper, the movement of people from rural areas of less economic activity to those of greater economic activity within the same region, which occurred in different parts of Nigeria during this period, was mostly caused by emphasis on the production of cash crops. Both migrant farmers and labourers were affected by this development. While migrant farmers were searching for suitable fertile land for the cultivation of newly introduced export crops such as cocoa, migrant labours sought for work on the plantations. Between the 1920s and 1950s, there was the aggressive

colonial campaign for expansion in cash crop production (Faluyi, 1994:40-55). The demand for cocoa, rubber and palm oil increased during this period. This led to the search for land by Nigerian farmers. In Ondo Division, for instance, there was an influx of Yoruba Cocoa migrant farmers from Oyo, Ilorin and Abeokuta Provinces into the division. They penetrated the interior parts of the Ondo Division and acquired a large tract of land from the indigenes through their traditional rulers such *Osemawe* of Ondo and *Jegun* of Ile-Oluji (Adesote, 2017) for the establishment of cocoa farmers. Berry observes that the genesis of the influx of cocoa migrant farmers in the division was traced to the 1930s (Berry, 1974:86). The availability of suitable fertile land and its easy accessibility in the division coupled with colonial land policy, which encouraged commercialisation of rural land facilitated the influx of migrant farmers to the area (Adesote and Olaniyi, 2016:107). The same experience was witnessed in West Niger Igbolaland. Onyekpe 2012, argues that migrant capitalist farmers, who were mostly Urhobo and Ukwuani planters penetrated West Niger Igboland and acquired expansive virgin lands from both individual peasants and communities for the purpose of setting up rubber plantations (Onyekpe, 2012:188). This further led to the influx of migrant labourers into the two areas. While cocoa migrant farmers in Ondo Division drew their migrant labourers from the places of origin of the farmers and middle belt such as *Agatu*, *Igede*, *Ebira* (Adesote and Olaniyi, 2016:108-110). and so on, the Urhobo rubber planters in West Niger Igboland depended on the wage labour of migrants from Urhoboland and the East Niger Igbo districts (a good number of them were Efik (Onyekpe, 2012:190). The effect of the establishment of rubber plantations on labour migration was put by I. An Asiwaju in this way:

> The establishment of rubber plantations led to the popularisation of wage labour. It was a gigantic concern employing hundreds of labourers in its various services. Apart from the clearing, planting, watering and later the tapping of the rubber plants, such labourers were employed in erecting the various buildings of both the factory and residential quarters adjoined to the plantation (Asiwaju, 1976:168).

In Ondo Division, for example, paid labourers in the cocoa, rubber and timber industry included the Ebira, Agatu, Ibo, Urhobo, Edo and Osun people. This could be corroborated by the Annual Report on the Ondo Division of 1946 which states that:

> Ibo labourers still continue to provide most of the manual labour for timber, cocoa and public works. Indeed, it is difficult to know how trade and industry could possibly carry on without them (NAI Ondo Prof. 1/120C, 1946:12).

The place of infrastructural development on migration and urbanisation during colonial rule cannot be overemphasized. Infrastructure can be classified into two groups of services, namely economic infrastructure and social infrastructure. While social infrastructure embraces health, education and water supply, economic infrastructure includes transportation (roads, railways and seaports) and communication. With respect to the economic infrastructure, the period between 1900 and 1960 witnessed a considerable investment of resources in the development of modern transport infrastructure. Before we interrogate the impact of infrastructure on migration and urbanisation, it is imperative to have a glimpse of the evolution and development of each economic infrastructure. During this period, there was a rapid transformation of transport facilities especially railways, roads and seaports (Ogundana, 1980:159). Improvement of economic infrastructure in the colonial period was in line with the prevailing philosophy of the European imperialist power, which saw transport development as the key to colonial exploitation. Oluwasanmi, 1966, observes that the expansion in the production of agricultural materials for the export market was facilitated by the building of a modern transport system. All three means of transportation railway, road and seaport transport were developed during this period. Fundamentally, two main reasons facilitated the early development of the transportation system in Nigeria. First was the need to establish effective territorial administrative machinery. The colonial government held the view that in a vast territory like Nigeria without adequate transport facilities easy movement in the territory would be difficult. Second, the vast interior of the country could not be fully exploited without putting in place an efficient system of transportation (Oluwasanmi, 1966:13). Railway was the first to be developed. Following the establishment and consolidation of British administrative control in Nigeria, the British began to embark on the construction of the railway system. Although the official history of the Nigerian Railway was concentrated on the period after 1901 when the Iddo-Ibadan line was opened and when Railway policy was adopted, efforts to construct them began in the late 19th century (Omosini, 1980:10). The railway received the most important and urgent consideration. The demand for the railway to link Lagos with the hinterland antedated the imposition of colonial rule (Falola, 1984:167). As early as 1875, a European traveller, John Whitford had suggested the construction of a line from Lagos to Lokoja, romanticising the political economic and religious advantages derivable from it. Similar calls were also made by many other European and Africans. Despite all these calls, nothing was done before the 1890s (Olubomehin, 2011) The actual construction railway line did not commence until March 1896 (Oyemakinde, 1970). It was designed as an arrow standard colonial gauge of 3'6 (Omosini, 1980:157), which was to pass through the region where cash crops were available for quick transportation to Lagos (Falola, 1984:167). The approved line from Iddo to Ibadan was not completed until the end of 1900. This completed railway line was formally opened on March 4, 1901 (Olaniyan, 1980:86). It was later extended to the Northern and Eastern Regions (Agboola, 1980:142). For example, the Bauchi Light Railway reached Bukuru in 1915 (Freund, 1981:73-74).

The advent of motor transport created a greater economic revolution than that of the railroads because the motor vehicle as a means of conveyance has a range that far exceeds that commanded by the railways (Olaniyan, 1980:86). The colonial government designed the building of trunk roads to run horizontally across the country so as to link the regional capitals to facilitate the movement of commodities (Olubomehin, 2012:39). The first motorable road in Nigeria was built in 1906 from Ibadan to Oyo and it was linked to the railways by a railway-operated road transport service (Olaniyan, 1980:87). Before the outbreak of the First World War in 1914, over 2000 miles of roads had been built (Helleiner, 1966:14) . In the 1920s, the colonial government took frantic effort towards road construction on the fact the railway was inadequate for the economic needs of Nigeria. The railway network tapped comparatively small areas in the vast territory. Roads were required to

carry the agricultural produce from areas not reached by railways to the coast and consuming areas (Oluwasanmi, 1966:15). Although the construction of roads was interrupted by the First World War, it resumed in 1922 (Olubomehin, 2012:39). In Southwestern Nigeria for example, roads were constructed between Ibadan and Lagos; Ibadan and Ijebu-Ode; Ilesa and Akure to Ondo among others (Olubomehin, 2011). While Olaniyan, 1980 argues that by 1926, the construction and maintenance of roads were the joint responsibility of the Native Administrations and the Public Works Department, Olubomehin, 2012, posits that with respect to Western Nigeria, road development in the region from 1920 involved the government, the people and the missionaries. With respect to seaport transport, the years 1914 to 1954 could be described as the colonial phase in seaport development in Nigeria. Port concentration was centred on Lagos (the leading port in Nigeria), Port Harcourt, Sapele, Warri, Calabar, Bonny, Opopo, Burutu and so on. Lagos and Port Harcourt ports were the main ports actually financed by the government. Others were managed by private European firms (Ogundana, 1980:1960). In the period between 1907 and 1938, while a total capital expenditure of £4.8 million was incurred by the government on port facilities in Lagos and Port Harcourt, the public expenditure in facilities during the same period in all other Nigerian ports combined was under £20,000 (Adesote, 2016:42)

The impact of infrastructural development on migration and urbanization in Nigeria was significant. Although the railway was mainly constructed to facilitate the effective transformation of goods from the hinterland to the coastal areas, it enhanced an influx of migrant labourers from the hinterland, particularly from the Northern, Eastern and Western parts of Nigeria. The genesis of labour migration occasioned by the development of the railway system started with its construction. Generally, railway construction in Nigeria involved the conscription of massive amounts of peasant labour (forced labour) minimally paid. The widespread use of forced labour was deployed for the construction of roads, rail and harbour as well as mining works in all British colonies in West Africa (Britwum, n.d: 22) The great impact of forced railway labour was much appreciated by mining firms: 'The system under which the Government has found labour for the building of railways has a strong influence towards developing the native. The construction of the railway from the Northern part to the Western and Eastern parts of Nigeria led to the influx of migrant labourers from the regions into Jos and Kano(Freund,1981:73-77). The connection of the railway line from Lagos to Kano and other areas in Northern Nigeria led to the mass movement of labour migrants from the latter to the former. As observed by Edo and Muritala, 2014, the railway facilitated the movement of people to Lagos more than the goods it was meant to convey. They further explain that passengers carried on board railway rose from 7,015,000 in 1959 to 7, 881,000 in 1960. Olaniyi, 2014 argues that with the emergence of the railway, the movement of Hausa migrants into Ibadan basically for trade in kolanut and cattle increased dramatically. He also explained that the presence of the railway in Ibadan accounted for the massive settlements of migrants in different parts of the city. For example, while the Ijebu largely settled around Oke-Ado, migrants from Lagos settled around Ekotedo and Mokola.

The creation of administrative headquarters in some areas also facilitated migration and urbanisation. These administrative headquarters attracted the establishment of social infrastructures such as telegraph and telephone services, health, education and water supply. Most of the headquarters of the European private firms such as United African Company (UAC), and John Holts among others were equally set up in the administrative headquarters of the colonial administration. This development facilitated the growth of rural-urban migration. While some came in search of jobs, others came purposely for the acquisition of western education. Osoba observes that the phenomenon of labour migration from rural areas and lesser towns to new urban centres of commerce and administration such as Lagos, Port Harcourt, Ibadan, Onitsha, Kano, Kastina, Jos, Enugu, Benin City among others between 1911 and 1963 became unprecedented (Osoba, 1969:515-516). This could be corroborated by the submission of Ahokegh that rural-urban migration in the 1940s and 1950s was exacerbated as there was a strong desire by migrants for the acquisition of western education in the new areas designated as commercial and administrative centres. He identified areas like Makurdi, Gboko, Katsina-Ala and Adikpo in Tivland of Central Nigeria which grew into urban centres due to the influx of migrants occasioned by the above-mentioned factor (Ahokegh, 2011:232-233). Other areas that were designated as administrative headquarters by the colonial authorities were Warri, Ondo town, Ijebu-Ode, Ogbomoso and so on.

The Impact of physical spaces in new urban centres on host communities, migrants and host/migrant relations

The emergence of physical spaces in the new urban centres caused by colonialism was not without its socio-economic impact (which was both positive and negative) on the host communities, migrants and host/migrant relations. It is practically impossible to exhaust all the socio-economic effects of this phenomenon in a discourse of this nature. Therefore, efforts would be made to interrogate just a few of them.

The population explosion was a major impact on physical spaces in new urban centres caused by colonialism. The colonial economic policy and the development of social and economic infrastructure stimulated migration. It is true that a high rate of fertility and a decline in mortality can contribute to population increase as argued by demographers. During this period, the high density of population in new urban centres in Nigeria like Lagos, Makurdi, Gboko, Ibadan, Jos, Warri, Enugu, Calabar, Port Harcourt and Kano was mainly caused by the influx of migrants occasioned by colonialism. For example, Ahokegh observes that while the population of Makurdi rose from 7,500 in 1939 to 10,000 in 1948 and to 16,270 in 1952 (Ahokegh, 2011:232-233). As pointed out elsewhere in the paper, Edo and Muritala, 2014, reveal those passengers carried by railway to Lagos from the Northern part rose from 7,015,000 in 1959 to 7,881,000 in 1960. As opined by Ake, 1981, the phenomenon of urbanization during colonial rule was born out of the contradictions created by capital accumulation, which encouraged the socialisation of production and the spatial and social concentration of producers caused colonialism (Ake, C. 1981:78).

The attendant problems associated with the population explosion in these colonial urban centres such as overcrowding or congestion, the outbreak of diseases, enormous pressure on land, poor sanitation and housing arrangement were other negative consequences of urbanization caused by colonialism. With respect to Lagos, Olukoju, 2004, observes that the high density of the

population that resided in the indigenous part of Lagos Island and the congestion associated with it had negative effects on the living conditions of the people. Edo and Muritala, 2014, corroborate the effect of population explosion on the livelihood of the people living in Lagos during this period in this way:

> "the enormous pressure on land occasioned by the rapid growth of population forced many people to resort to erecting buildings in swampy areas such as Elegbata, Alakoro, Anikantanmo, Oko Awo and Sangrouse, which were ordinarily inhabitable" (Edo and Muritala, 2014:181)

The above new settlements experienced outbreaks of epidemics such as tuberculosis from 1919. Olukoju, 2004, explains that the high incidence of the epidemic in the city of Lagos caused a steady rise in death and infant mortality rate between 1912 and 1922 (Olukoju, 2004:37). Edo and Muritala, 2014, reveal that while total death in 1912 was 29, it increased to 42 in 1913 and to 78 in 1922. They further explain that the incident attracted negative reactions and protests of the elite in the city (Edo and Muritala, 2014:181). Ahokegh, 2011 argues that congestion in colonial urban areas caused the spread of European diseases such as gonorrhoea, syphilis, and influenza; and the emergence of social vices such as stealing and theft, prostitution and other crimes in Tivland of Central Nigeria (Ahokegh, 2011:238).

There was the emergence of inter-communal disputes over land between the host and migrants. Although the inter-communal dispute was not a new phenomenon in the history of inter-group relations in Nigeria, it took a new dimension during the colonial period. In pre-colonial, inter-communal disputes mainly occurred as a result of the process of state formation. Colonial agricultural policy (which emphasised cash crop production) and the commercialization of rural land [occasioned by the Public Lands Acquisition Ordinance of 1917 (formerly known as the Public Lands Ordinance of 1876 and which was initially restricted to the Colony of Lagos)], (Elias, 1971:51) accelerated Intra and inter-communal disputes over land. With respect to the West Niger Igboland, Onyekpe, 2012 argues that fierce struggles for farmlands in the area occurred at two levels. First, within the communities (that is intra-community struggles and disputes); and second between communities (that is inter-community struggles and disputes). He further explains that the phenomenon which began during the colonial period was accelerated in the post-colonial period. He observes that the disputes involved the cases between the historically stranger communities, which began to reject their status as strangers or tenant communities and their host communities, which naturally insisted on their status as owners and landlord communities. He identifies notable examples of inter-communal disputes over land in this area. For example, the loss of large areas of land to rubber and later to the production of cassava on a commercial scale in the Agbor Alidimma and Igumpe communities led to disputes between them in the 1940s-1960s. Also, the logical results of extreme scarcity of land in the aftermath of large-scale land expropriations led to disputes between Ejeme Aniogor and Ekuku Agbor in 1939-the 1960s; and Umutu and Urhonigbe in the 1950s and 1960 (Onyekpe, 2012:188-189).

The transformation of new colonial urban centres constituted one of the positive effects of colonialism. Undoubtedly, major areas that served as colonial administrative headquarters experienced a major transformation. For instance, seaports as focal points in international and national transport services became advantageous locations for secondary and tertiary economic activities like manufacturing, the assemblage of goods, wholesaling and distribution. For example, port concentration enabled Lagos, Port Harcourt, Calabar and Warri to grow as large centres of commerce and industry. In fact, in the immediate post-colonial period, Lagos and Port Harcourt in particular became the fastest-growing industrial centres in Nigeria (Ogundana, 1980). There was also the emergence of new settlements and the transformation of some hamlets into villages as well as some villages into towns. Although the influx of migrants into some areas contributed to population explosion as argued earlier, in the others, it resulted in their transformation from towns into cities. As observed by Ifediora, the history of many of Nigeria's urban centres situated along the coast is coterminous with the period of colonial rule, 1900-1960. He further explains that though these coastal states had had their origin as centres of Afro-European commerce in the period before the imposition of colonial rule, they were later popularised and grew rapidly as a result of their emergence as centres of colonial administration. He concludes that the effort of the colonial government to develop the urban centres of Nigeria through the setting up of social and economic infrastructure was the foundation of modern urban growth and spatial development in the country (Ifediora, 2011:83). The presence of these migrants resulted in the emergence of new settlements as well as the transformation of some rural settlements to urban centres. Aside from the proto settlements and their offshoots, which are the secondary settlements (described as the indigenous settlements with rightful claims of autochthonity), new settlements emerged and were classified as migrant communities in Ondo Division and West Niger Igboland (Onyekpe, 2012:189).

CONCLUSION

The foregoing examined colonialism, migration and the emergence of urban spaces in colonial Nigeria. It argued that the process of city building or urbanisation began during the pre-colonial period. However, the phenomenon assumed a new dimension during the colonial period. It analysed the effect of the colonial policy of administration on rural-urban migration, which has now become a permanent feature since the post-colonial period. The discourse is also situated within the existing socio-economic and demographic theories of urbanisation and migration. The paper submitted that while the push and pull theory of migration was the main theory of migration that facilitated rural-urban migration during this period of study; socio-economic theories of urbanization were the major urbanisation theories. It observed that the socio-economic expansion in some Nigerian communities caused by the colonial authorities stimulated rural-urban migration, which invariably resulted in their emergence as urban centres. The socio-economic effects (which were both positive and negative) of physical spaces in the new urban centres on the host communities, migrants and host/migrant relations were equally analysed. The paper concludes that every policy no matter how well thought tends to produce unintended results. Therefore, the British colonial policy in Nigeria was no exception to this general tendency. Hence, the British Administration of Nigeria was a mixed blessing to the people. This study is a major complement to existing works on the effect of colonialism on urbanisation in colonial

Nigeria. It has filled a major gap in the historiography of colonialism and urbanisation in Nigeria.

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Boosting Ensemble Machine Learning Approach for Covid-19 Death Prediction

SLJSSH

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Abstract

It is critical for physicians to correctly classify patients during a plague and determine who deserves minimal health assistance. Machine learning methods have been presented to reliably forecast the severity of COVID-19 disease. Previous research has often tested different machine learning algorithms and evaluated performance under different methods. It may be necessary to try several combinations of machine learning algorithms to discover the optimal prediction model to get the best results. This research aimed to train boosting ensemble algorithms and Artificial Neural Networks (ANN) and choose the model that best predicted how long patients would survive a Covid19 infection. The dataset for this study was obtained through kaggle.com. It contains blood samples from 4313 patients and is retrospectively evaluated to find relevant measures of overall mortality. Out of 48 parameters, only 16 selected parameters were considered using the information gain weight for each parameter. 5-fold cross-validation was employed on the training data set, and Receiver Operating Characteristic (ROC) curves were created to verify better the prediction algorithms' performance independent of the algorithm choice criteria. The models XGBoost, CatBoost, and LightBGM achieved an accuracy of 98%, AdaBoost 96%, and 93% for ANN, respectively, implying that ANN has lower accuracy than boosting approaches.

Index Terms- Artificial Neural Network, Boosting algorithms, Receiver operating characteristic, Covid19, Machine learning

INTRODUCTION

SARS-CoV-2 is a contagious infectious disease that began as a pandemic with a significant impact on global public health, resulting in mortality and severe health issues. The virus was first detected in the Chinese city of Wuhan in late 2019, where many individuals suffered pneumonia-like prodrome (Team, 2020). It has a variety of impacts on the body, including respiratory problems and multi-organ dysfunction, which leads to death in a short amount of time (Van Der Hoek et al., 2004). Till 25 February 2022, the Covid-19 pandemic has infected over 433 million people worldwide and killed over 5.94 million people, with the United States and Europe being the most impacted regions with rising fatality rates. This pandemic affects thousands of individuals worldwide, with hundreds of deaths expected daily.

Each day, thousands of new persons are claimed to be positive worldwide. Covid-19 is spread mainly through direct contact via droplets transmitted by coughing, sneezing, or speaking to an infected individual (Hu, Ge, Li, Jin, & Xiong, 2020). The investigation for transitory carriers through which the illness could have been transmitted to humans is ongoing; regardless of the initial source, the Covid-19 pandemic showed an extraordinary hematogenous spread. Its transmission is complicated because an individual might be exposed to the virus for days despite showing symptoms. Due to the apparent causes of its development and threat, practically all governments have announced total lockdowns

in the affected areas. The fundamental motivation for these efforts was predicting models demonstrating that there would be fewer deaths without isolation procedures. Medical researchers worldwide are working to find an effective vaccination and treatment for the disease. Because there is currently no licensed therapy to treat the virus, authorities worldwide are working on preventative measures to halt its spread.

Without any complete medical remedy and the likelihood of new virus strains, the average worldwide mortality rate increases each day. Even though rigorous social distance and protective measures remain, the virus's global death and prevalence curves indicate no progress (Xia et al., 2019). A greater focus on early treatment options could be beneficial in lowering mortality rates. Patients in critical condition will need to be admitted to the Intensive Care Unit (ICU) immediately, necessitating the usage of ventilators. Doctors frequently cannot precisely forecast the diagnosis of Covid-19 victims until late in the virus's course. Moreover, the prognosis of Covid-19 can take unexpected turns, with a patient's health suddenly deteriorating to a catastrophic state after appearing stable (Cascella, Rajnik, Aleem, Dulebohn, & Di Napoli, 2022; Rajnik, Cascella, Cuomo, Dulebohn, & Di Napoli, 2021), even the most experienced clinicians the surprise.

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Researchers are working on remedies to lessen the consequences of the Covid-19 pandemic as the globe grapples with the dilemma of the virus's deadly effects. Medical practices are encountering difficulty in providing proper diagnosis and treatment as the Covid-19 pandemic spreads worldwide, causing potentially fatal respiratory illnesses. Because of Covid-19's widespread distribution and severe consequences on humans, multiple study organisations have looked into the virus's epidemiological features, socioeconomic implications, and elements and parameters that aid the virus's transmission. Artificial Intelligence (AI) algorithms could be helpful to assist in enhancing patient prediction because they can recognise complicated patterns in massive datasets (Shilo, Rossman, & Segal, 2020; Yu, Beam, & Kohane, 2018), a capability that the human brain lacks.

Machine learning is a method in which computers analyse data and learn from the results. A neural network is created by simulating complicated algorithms that help systems analyse, evaluate, and understand data before applying the knowledge gained to resolve problems and make predictions. Over the last decade, machine learning algorithms have become an important research topic by addressing highly advanced and complicated real-world issues. Artificial Neural Networks (ANNs) have been widely employed to capture the uncertainties in unstructured datasets since they have been an effective tool for dealing with non-linear data (Hainaut, 2018). As a result, the usage of these ANN models in epidemiological estimates for linear, non-linear, and hybrid data has exploded in recent years.

Since the outbreak's start, experts and research organizations have been very interested in pattern analysis and forecasting of Covid-19's spread worldwide. Hospitalised individuals with Covid-19 are constantly in danger of death. Machine learning (ML) approaches could predict death in Covid-19 patients who are hospitalised. As a result, our research aimed to utilise machine learning algorithms for forecasting Covid-19 mortality using clinical treatment information gathered from patients at the time of their hospitalisation.

This study aims to use a machine learning-based approach to create mortality forecasting models for Covid-19 patients by considering their health checkups and classifying patients into low- and high-risk categories. These machine-learning models were so influential that they shifted the course of several countries' responses. Models for predicting morbidity and mortality and a data methodology have been critical tools for authorities.

The paper is structured as follows. Section 2 describes the Literature Review in the context of Covid-19 prediction. Section 3 clearly explains the proposed approach, while Section 4 displays the results obtained and discusses the results. Finally, Section 5 concludes the paper with future research directions.

LITERATURE REVIEW

Covid-19 death prediction design models have been the subject of many different investigations. Yadav et al. (Chou et al., 2021; Yadaw et al., 2020) used a large cohort to construct a very accurate Machine Learning based mortality forecasting model that considered the participant age and O_2 saturation during their medical contact and patient engagement. The most outstanding predicted criteria were age and minimal oxygen saturation during the interaction, which was considered in our findings. In Covid-19 locations

around the United States, individuals aged 60 and over make up about 85% of all mortality (Bhatraju et al., 2020). The degree of hypoxia at diagnosis has been widely described as a substantial predictor of illness severity, particularly in severe respiratory infections. It has an excellent rationale for being a significant predictor component in the diagnostic workup of the Covid-19 pandemic (Duca, Piva, Focà, Latronico, & Rizzi, 2020; Grasselli et al., 2020).

Even though the research and testing datasets in this investigation were more extensive, the data obtained contained a detailed list of demographics, pathologies, biochemical testing, radiology, and omics data. Furthermore, despite having big datasets, the number of participants' deaths was low. Knight et al. evaluated an 8-item points system for in-hospital mortality owing to Covid-19 in a large prospective study (Knight et al., 2020). Age, gender, number of morbidities, breathing rates, O2 saturation, state of consciousness, urea level, and CRP. However, some potentially significant comorbidities such as hypertension, prior myocardial infarction, and stroke aren't included in data collection, resulting in low distinction for mortality. Furthermore, given the 32.2 percent mortality rate and older patient group, this model may perform differently in pediatric people or populations at reduced mortality risk.

According to LASSO and multivariate data assessment, increased age, coronary artery disease, the proportion of lymphocytes, procalcitonin, creatinine, CRP, and D-dimer could be significant risk factors for Covid19 deaths according to LASSO and multivariate data assessment estimation techniques. Using a robust prediction model, these characteristics could classify Covid cases into high - and low groups (Shang et al., 2020). Covid-19 fatality prediction models show significant heterogeneity. Lactate dehydrogenase and procalcitonin are among the top death-forecasting factors in the model that Zhao et al. (2020) created. The Covid-AID study revealed that renal failure at presentation, irrespective of chronicity, strongly affects in-hospital fatalities in hospitalised patients (Hajifathalian et al., 2020). Recent research has linked Prothrombin and CRP levels to COIVD severity and death (Bannaga et al., 2020; von Meijenfeldt et al., 2021). In this investigation, we found a link between lower O2 and greater lactate, which could indicate a higher level of metabolic activities (Li et al., 2020) in Covid19 patients, which is linked to death.

A systematic study and meta-analysis published in April 2020 found that severely affected Covid 19 patients have a much greater rate of hypertension, diabetes, cardiovascular disease, and respiratory disease than non-critical patients (Zheng et al., 2020). Furthermore, a comprehensive review and meta-analysis of risk factors for Covid 19 mortality, dyspnea, chest tightness, hemoptysis, expectoration, and exhaustion were the major significant clinical variables linked to an elevated risk of Covid-19 fatalities. Non-survivors had a significantly higher leukocyte count and a substantially lower lymphocyte count in this investigation (Yang et al., 2020).

Machine Learning was effectively used to forecast the need for ICU and mechanical ventilation in patients with Covid-19 (Patel et al., 2021). The most relevant parameters that determine the requirement for ICU include PCT, DD, CRP, respiratory rate, SpO2, albumin, AST/SGOT, calcium, influenza-like symptoms, and ALT/SGPT, according to a random forest model. The most critical indicators to forecast the need for respiratory support were CRP, DD, PCT, SpO2,

respiratory rate, creatinine, total protein, albumin, calcium, and age (Patel et al., 2021). The most relevant variables for predicting Covid severity in a comparable study were SpO2/FiO2, CRP, estimated glomerular filtration rate (eGFR), age, Charlson score, lymphocyte count, and PCT (Marcos et al., 2021). Leon et al. used a machine learning approach to divide Covid patients into high, moderate, and low mortality groups. This study linked higher and lowered AST, ALT, LDH, CRP, and neutrophil counts to a higher and lower death rate, respectively (Benito-León et al., 2021). Monocyte and lymphocyte percentages were found to be adversely linked with death.

Covid19 viruses are among the most common infections that attack the human respiratory system. The review aimed to identify the most common factors and methodologies to research the virus's spread. Infection is more likely in patients with chronic conditions such as diabetes, hypertension, diabetes, stroke, heart failure, and kidney failure and older people with weakened immune systems (Raghupathi, Ren, & Raghupathi, 2020). Infection risk may be increased in enclosed spaces with poor ventilation and airflow. Like other respiratory viruses such as influenza and rhinoviruses, the virus is thought to spread via droplets in the air from sneezing and coughing. Aerosol transmission can also happen when individuals are subjected to high aerosol concentrations in enclosed areas for an extended period (Team, 2020).

Several studies have outlined characteristics regarding quarantine infrastructure, laboratory testing facilities, and healthcare capability, all of which contribute to a state's pandemic preparation. These most significant and influential elements must be investigated as a pandemic remedy as soon as possible. The provision of open data sets matching various factors aids in speeding up studies and forming collaborations. Some research took into account environmental issues such as basic sanitation. Many researchers have considered Covid-19-related mortality and other demographic data (Soyiri & Reidpath, 2013). Comorbidities have been identified as a critical determinant in the frequency of Covid-19 patients in different research and studies (Guan et al., 2020).

Casualties may be misinterpreted as just Covid-19 mortality if comorbidities are not considered. Covid-19 mortality has been successfully predicted by experts from many universities worldwide. One such research, undertaken by Columbia University and the CDC (2020), employed "death" like an exponential curve and a susceptible-exposed-infectious-removed (SEIR), meta-population model to estimate social distance parameters. As can be observed from a primary evaluation of current models, various academics have sought to create statistical models of the Covid-19 epidemic since the pandemic. The scope, assumptions, projections, impacts of interventions, and their effects on health care are different (Kotwal, Yadav, Yadav, Kotwal, & Khune, 2020).

PROPOSED APPROACH

This research aimed to train several machine learning algorithms to predict the mortality rates of Covid19 infected patients. We chose the models that accurately predicted how long patients would survive a Covid19 infection. In addition, we determined which variables (e.g., epidemiological, demographic, clinical, laboratory, and mortality results) had the most significant impact on the model's accuracy. Figure 1 shows an abstract overview of the study.
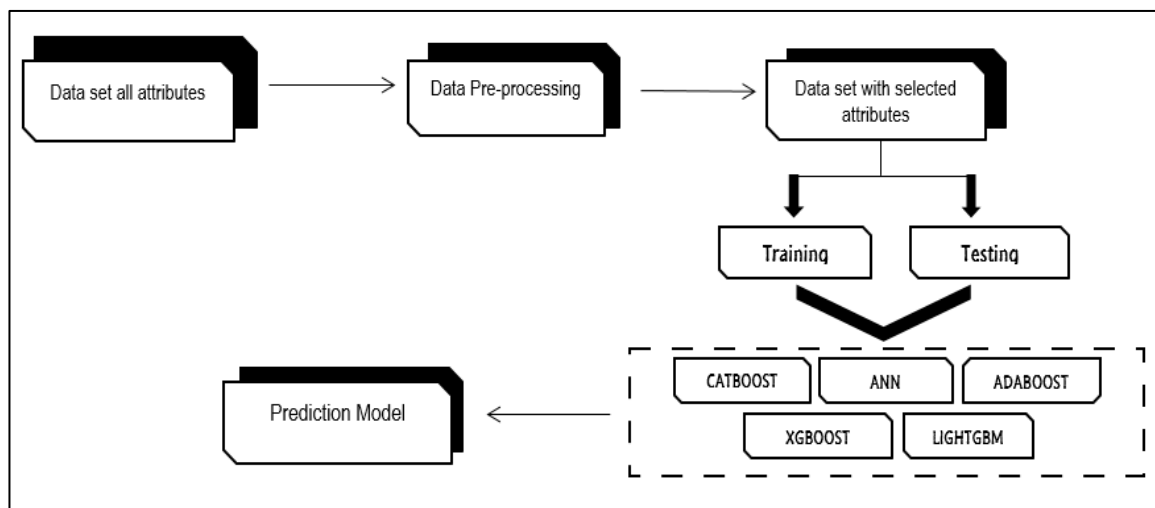
Figure 1: Methodological Approach

Dataset's Description

The dataset for this study was obtained through kaggle.com. It contains blood samples from 4313 patients and detailed laboratory reports of Covid19-affected patients and is retrospectively evaluated to find valid and relevant measures of overall mortality. Standard CSV files captured medical records, including clinical, demographic, laboratory, epidemiological, and mortality data. The dataset was published alongside the article by Ikemura et al. (2021), and the Montefiore Medical Center authorised the original work.

The data samples from patients over 18 who confirmed Covid-19 positive within 24 hours of admission were utilised in this study. We looked at 48 parameters in total and selected 16 parameters precisely considering the information gain weight of each parameter. By analysing each parameter's gain in the target attribute domain, information gain was utilised for feature selection. The criteria listed in Table 1 were used to diagnose and classify the severity of the patient.

Table 1: Detailed Description of the Attributes and Their Data Types

No	Attribute	Type
1	Age	Numeric
2	Charlson Comorbidity Index	Numeric
3	Number of ventilators used	Numeric
4	Diastolic BP	Numeric
5	Systolic blood pressure	Numeric
6	Creatine Level	Numeric
7	D-dimer	Numeric
8	Estimated glomerular filtration rate	Numeric
9	Ferritin Level	Numeric
10	Pulse Oximeter Level	Numeric
11	Respiratory rate	Numeric
12	Blood Urea Nitrogen (BUN)	Numeric
13	LDH test rate	Numeric
14	Procalcitonin test	Numeric
15	proBNP blood test	Numeric
16	Time from Covid positive to death in days	Numeric
17	Death (Outcome)	Boolean

Data Preprocessing

We investigated the feasibility of reliable mortality forecasting using clinical laboratory data based on the results of 4313 patients with Covid19 infection. Death prediction was performed utilising ANN and Boosting models to achieve this goal. All lab and clinical biomarkers were included in the ANN and Boosting models. These models are deemed optimum because all the needed biomarkers are available for prediction. The dataset was divided into training and testing to generalise the prediction model findings to an independent dataset. 5-fold cross-validation was employed on the training data set cases for algorithm training and tuning. Receiver operating characteristic (ROC) curves were created to verify better the prediction algorithms' performance independent of the algorithm choice criteria.

Data reduction is a critical step in the formation of machine learning models. When variables in a model associate with one another, they become duplicate variables. We could reduce calculation times in real-world clinical contexts by creating a model with several unique variables. Furthermore, data pre-processing allows models to handle data sparsity by using variables with more datasets. Again, by focusing on the top 16 most relevant factors, physicians may focus on requesting medical tests rather than collecting data on 48 factors.

After analysing the dataset's clinical aspect and utilising the Information gain process for feature selection, we identified the 16 most influencing factors to generate the machine learning models in this study to predict mortality. The influence of each parameter was initially prioritised based on the Information gain values in the best-performing models. Following that, we chose factors that were significant in these models. If the score of a variable differed between models, we picked variables based on clinical observations. We desired at least one distinct variable for each biological activity in clinical practice. We chose the variable with the fewest incomplete data points if more than one factor represented the same clinical physical activity.

The top 16 variables in the ANN and Boosting algorithmic models were: diastolic and systolic blood pressure, creatine level, age, Carlson comorbidity index, LDH test rate, pulse oximetry level, D-dimer, estimated glomerular filtration rate, Ferritin Level, Number of ventilators used, proBNP blood test, respiratory rate, BUN level, Procalcitonin test,

and time_from_Covid_positive_to_death_in_days. We believed these factors were an excellent depiction of the biological processes impacted by SARS-CoV-2 infection. These factors are also simple to gather in clinical settings. They also cut down on the number of missing values. The levels of BUN and Ferritin, respectively, are indications of renal and cardiac function. We picked the D-dimer level over the fibrinogen level as our coagulation marker since it scored higher and had more data points.

Furthermore, we represented comorbidities by Charlson comorbidity scores. A high-ranking variable was glucose level. This was most likely attributable to the higher risk of death in diabetic individuals. We hypothesised that the Charlson comorbidity score was a much more comprehensive prognostic indicator than glucose level because it also influences diabetes.

Charlson Comorbidity measure is a value-weighted to determine the likelihood of death within a year after being admitted to the hospital for people with various comorbid conditions. A ventilator offers respiratory support to an individual who cannot breathe by transferring sufficient oxygen in and out of the lungs. In this study, the usage of ventilators for patients and the consequence of dealing with ventilators were considered. The diastolic value measures the pressure level in the arteries whenever the heart relaxes. That's when the heart receives oxygen and refills with blood. Anything beyond a 60 to 80 mmHg diastolic pressure level is considered unhealthy. The pressure applied as the heart beats and blood is discharged into the artery is systolic blood pressure. It is the highest number in blood pressure diagnostic testing reported as a percentage. The systolic blood pressure should be less than 120 mmHg for a healthy human.

Creatine is a biological waste material whose blood level indicates how efficiently the kidneys function. By supporting muscular development, creating contributes to the continuous energy source for active muscles. It's also small in the brain, heart, and other organs. A D-dimer protein fragment is formed when a blood clot melts in the body. When we are wounded, blood clotting is a crucial procedure that keeps us from bleeding excessively blood. When our wound has recovered, our body will usually eliminate the clot.

The estimated glomerular filtration rate (eGFR) is a test that determines our kidney disease phase by measuring our

kidney functions. It can be calculated by the medical team based on the findings of our blood creatinine test, age, body size, and gender. Ferritin is a blood protein that contains iron, and a trial will tell the physician how much iron is stored in the body. If a ferritin test depicts a lesser than average ferritin rate in the blood, the body's iron levels are insufficient and would have iron deficiency. The doctor may recommend a pulse oximeter if we have a symptom of breathing problems that cause lung or heart disease. It's an electrical instrument that measures RBC oxygen saturation. The respiratory rate is a clinical indicator showing how much air enters and leaves the lungs. A change in respiratory rate is often the first sign of degradation as the body attempts to keep oxygen supply to the tissues. The blood urea nitrogen (BUN) test provides essential information regarding the health of our kidneys. A BUN test measures the number of urea nitrogen in our blood. The urea nitrogen will persist in our blood if the kidneys aren't performing correctly. Urea levels in the normal blood range from 7 to 20 mg/dl. The kidneys may not function at total capacity if the BUN is more significant than 20 mg/dL. LDH is found in the heart, muscles, kidneys, pancreas, liver, brain, blood cells, and other organs and tissues.

The LDH testing is mainly used to determine the extent and location of tissue injury in the body. It's also sometimes used to track how far particular illnesses have progressed. The amount of procalcitonin in the blood is measured by a procalcitonin test. A high level may indicate a dangerous bacterial disease like sepsis. The body's extreme response to infection is known as sepsis. The NT-proBNP blood test detects cardiac arrest by measuring brain natriuretic peptides. If the doctor prescribes a BNP test, it is most likely experiencing heart failure. BNP levels may rise due to intrinsic cardiac dysfunction and other factors such as pulmonary or renal illness.

Feature Identification and Patient Selection

The indicated features for determining fatality in Covid-19 patients were defined in this phase. The first part determined the most critical clinical parameters through an extensive literature search in digital databases. A holistic features machine learning technique is then developed using medical reports from the patient's well-being, clinical symptoms, laboratory tests, and treatment classifications.

Patients under the age of 18 were not allowed to participate. These individuals should be considered as part of the pediatric investigation. The CLG registry database identified datasets from 4313 patients. Fifteen incomplete samples with excess missing data (more than 75%) were excluded from the study. The additional missing data were imputed using each variable's mean or mode. The data was verified for noise, aberrant values, errors, duplication, and nonsensical information. We approached the relevant physicians for alternate interpretations of data preparation. The total sample size utilised for this study was 4298 admitted patients over 18.

Model Implementation

Any form of processing conducted on raw data to ready it for future processing is called data pre-processing. In the mining process, this approach was utilised as a preliminary step. On the other hand, these strategies are currently being employed in machine learning models, AI-type models, and making judgments against each other. Furthermore, this method might be applied to a wide range of datasets.

We create 5 supervised learning models using Python, including four boosting algorithms: ANN, AdaBoost, CatBoost, XGBoost, and LightBGM. As part of the model implementation process, the following methods were used.

I. Initially, the PyCharm IDE was used to create a Python project. The machine learning requirements and external libraries were loaded into the project directory. The acquired dataset was then saved in the project directory.

II. The dataset was interpreted using the "Pandas" package.

III. Examine the dataset's layout and the number of rows and columns.

IV. Assessing for duplicate and missing values

V. Missing and duplicating values may cause certain final prediction model development inconsistencies. As a result, the missing values have been substituted with the mean value to make the prediction model unbias.

VI. After the data filtering and interpretation phases were completed, the data set was separated into 70% training and 30% testing groups.

The selected features were fed into supervised learning models such as ANN, XGBoost, AdaBoost, CatBoost, and LightBGM to determine the best mortality predictions based on the underlying assessment metrics. The trained models were tested with the testing data, and the classifiers with the optimal outcomes were chosen based on Accuracy, Precision, Recall, F1-Score.and Support. We successfully examine and contrast current and prior methodologies using these basic assessment measures.

Machine Learning Classification Models
Boosting Algorithms

Boosting Machine Learning is a more advanced and complex technique for solving complicated, data-driven real-world problems. Boosting algorithms are an ensemble learning strategy that uses several Machine Learning techniques to convert weak learners into strong learners, improving the model's accuracy. The ensemble approach integrates numerous learners to enhance the performance of Machine Learning algorithms. This learning method produces more efficient and accurate models than a single model. The boosting algorithm's primary premise is to create numerous weak learners and integrate predictions to construct a single strong rule. Basic Machine Learning techniques are used to generate these weak rules, which are then applied to various data distributions. These algorithms generate weak rules with each iteration. After numerous iterations, the weak learners are joined to create a strong learner that can forecast a more reliable conclusion. This study used four boosting algorithms (XGBoost, AdaBoost, CatBoost, and LightBGM) to predict Covid infection patients' mortality.

ANN

ANNs are artificial intelligence that simulates how the human brain processes a sequence of stimuli to produce an output. Three neurons make up an ANN: an input neuron, a hidden neuron, and an output neuron. Neurons are the building blocks of an ANN, best described as a weighted directed graph, as seen in Figure 2. Directed edges with weighted values reflect the link between outputs and inputs neurons.
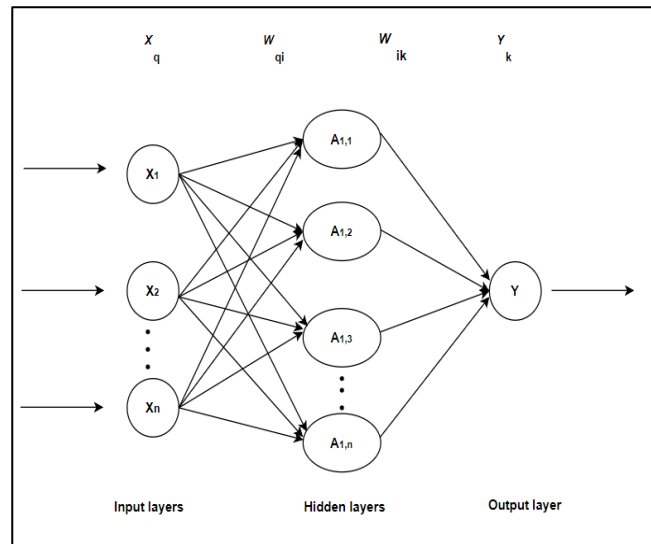
Figure 2: ANN Model

The ANN, which has a bias, computes the weighted sum of the inputs. Equation 1 uses a transfer function to express this calculation.

$$\sum_{i=1}^{n}(w_i * x_i) + b \qquad (1)$$

The weighted total creates the output as input to an activation layer. Activation functions determine if a node should fire or not. Only those who have been fired have made it to the output layer. Depending on the task at hand, we can apply various activation functions.

The ANN was created using the python programming language. The hidden layer used the hyperbolic tangent activation function, and the output layer used the ReLu activation function with a cross-entropy error function. An input layer of 16 normalised variables, a hidden layer, and an output layer made up the network. The model batch trained over 70% of the samples, using scaled conjugate gradients as the optimisation strategy, and then evaluated the remaining 30%. The five-fold cross-validation approach was used to validate the model. 70% of all samples were assigned randomly to the training process, while the remaining 30% were assigned randomly to the testing stage, and the diagnostic ability was tested ten times.

RESULTS AND DISCUSSION

Evaluation Matrices

Evaluation matrices assess the efficiency of the research study's supervised machine learning algorithms. This usually entails utilising the dataset to train a model, then using the model to make forecasts on a data set derived from the testing data, and comparing the predictions to the predicted values in the remaining dataset. We used the specific dataset for each model to compare and evaluate whether the model was more effective for our research. Precision (equation 2), recall (equation 3), F1-score (equation 4), and accuracy (equation 5) are used to assess the efficiency of the proposed classification model for ANN, LightBGM, CatBoost, AdaBoost, and XGBoost.

$$Precision = \frac{TP}{TP+FP} \qquad (2)$$

$$Recall = \frac{TP}{TP+FN} \qquad (3)$$

$$F1\ Score = \frac{2(Recall*Precision)}{(Recall+Precision)} \qquad (4)$$

$$Accuracy = \frac{TP+TN}{TP+FP+FN+TN} \qquad (5)$$

Where;

- TP = Correctly predicted positive mortality rate
- TN= Correctly predicted negative mortality rate
- FP = Incorrectly predicted positive mortality rate
- FN= Incorrectly predicted negative mortality rate

Table 2 exhibits the evaluation results of precision (%), recall (%), f1- score (%), support, and accuracy for the ANN, XGBoost, AdaBoost, CatBoost, and LightBGM models.

Table 2: Individual Classifiers' Performance against Basic Performance Metrics

Classifier	Target Variable	Evaluation Metrics				Accuracy (%)
		Precision (%)	Recall (%)	F1- Score (%)	Support	
XGBoost	Survive	91.30	92.00	91.22	958	91.56
	Death	91.28	86.55	89.78	332	
LightGBM	Survive	91.22	92.63	92.56	958	90.48
	Death	91.25	87.77	89.14	332	
AdaBoost	Survive	89.38	91.80	90.17	958	89.59
	Death	87.42	82.88	84.47	332	
CatBoost	Survive	91.41	93.73	92.55	958	90.51
	Death	92.30	86.64	89.77	332	
ANN	Survive	83.25	75.82	79.74		86.78
	Death	83.29	75.87	79.26		

Confusion Metrics and Area Under Curve

The performance of ANN, CatBoost, XGBoost, AdaBoost, and LightBGM is compared using the basic evaluation metrics in this section. The evaluation results for the abovementioned methods corresponding to the dataset are shown in Table 3.

Table 3: Confusion Metrics and Area Under Curve Results for Individual Classifiers

Classifier	TN	FP	FN	TP	AUC
XGBoost	951	7	22	310	0.92
LightGBM	950	8	19	313	0.92
AdaBoost	938	20	36	296	0.89
CatBoost	954	4	22	310	0.92
ANN	958	27	52	253	0.86

A confusion matrix is a way of summarising the classification algorithm's efficiency. If the dataset has more than two classes or has an imbalanced number of observations in each class, classification accuracy alone can be deceptive. A confusion matrix and the standard assessment metrics for validating the model can be more beneficial. Figures 3 shows the confusion matrix results for (a) ANN, (b) XGBoost, (c) CatBoost, (d) AdaBoost, and (e) LightGBM, respectively.

We generated five machine-learning models using the top 16 influential variables and ranked them in terms of AUC. The LightGBM of each machine learning algorithm family has the best performance (AUC=0.97). With an AUC of 0.90, the ANN model was the least-performing independent model. The XGBoost (AUC=0.96) and CatBoost (AUC=0.96) had similar results, while the distributed AdaBoost model (AUC=0.94) came in 4th.
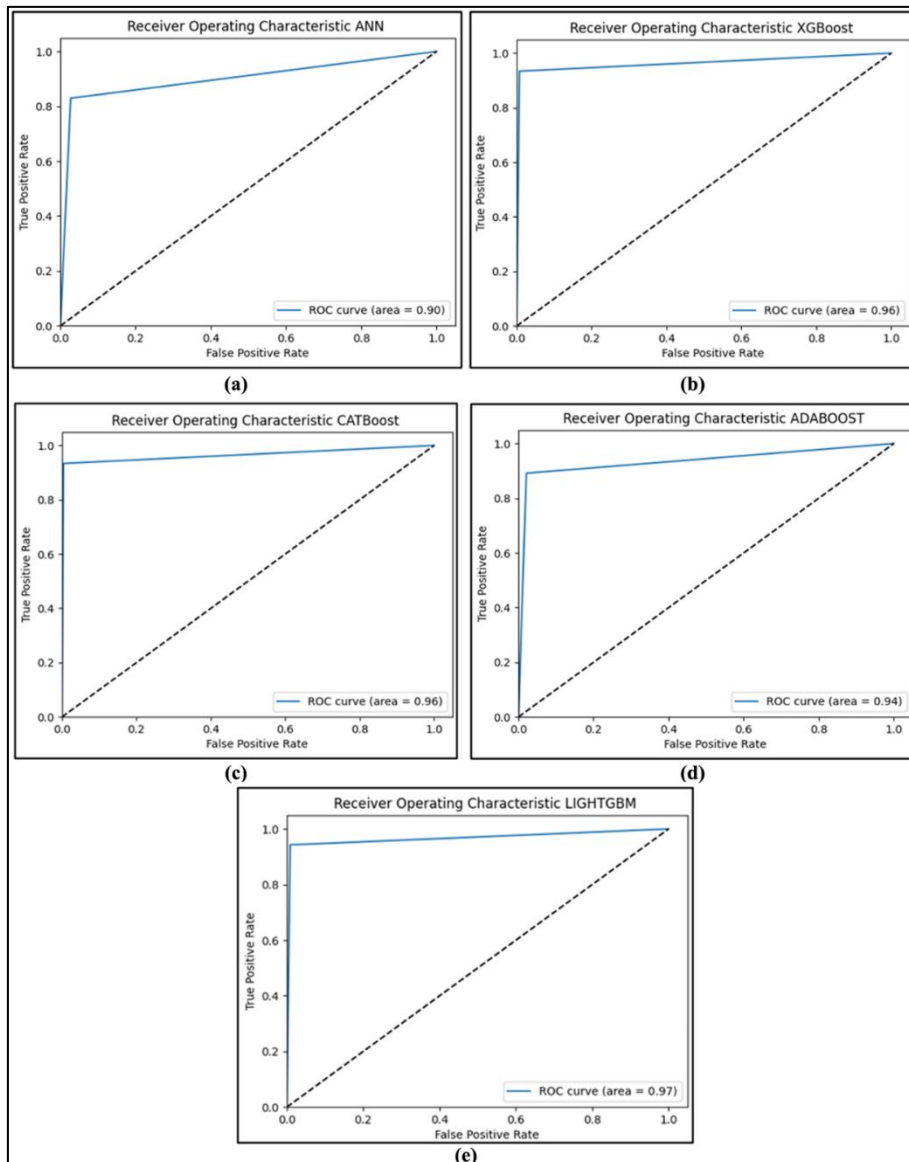

Figure. 3. ROC curve for (a) ANN, (b) XGBoost, (c) CatBoost, (d) AdaBoost and (e) LightGBM

Comparison of Performance

We effectively generated different machine learning models, evaluated their performance, and selected the best-performing models for predicting patients' odds of living after Covid 19 infection using Machine learning and clinical values (i.e., data collected early during a patient's enrollment in a hospital). Furthermore, our research shows that machine learning models based on only 16 clinical characteristics can predict survival. These models show outstanding responsiveness, specificity, and NPVs as well. As a result, ANN and Boosting models are effective, informative, and repeatable solutions.

According to our findings, the best models were LightGBM, CatBoost, and XGBoost (Shown in table 2). Their primary evaluation factors (i.e., Precision, Recall, F1- Score, and Support) indicated that they performed well. The ANN and AdaBoost models fared significantly worse than the LightGBM, CatBoost, and XGBoost models. The ANN model might have performed better if we had a larger data set. However, it took significantly longer to train than the other models. In interpreting tabular data, tree-based machine learning algorithms (e.g., LightGBM, CatBoost, XGBoost, and AdaBoost) are more efficient and probably more effective than neural network techniques. We chose the AUC as our model utility metric because it includes two critical clinical performance parameters that we were interested in: positive predictive value and False positive rate. We sought to explore which patients were most likely to die so we could intervene and rehabilitate as many as possible. On the other hand, the AUC considers model sensitivity and specificity while ignoring the impact of mortality occurrence on model performance. The model's performance depends on the prevalence of death; without such information, the model is useless.

Machine learning algorithms can improve e-medical record systems and determine patients' clinical information values. Our data pre-processing technique was successful based on the outcome of our machine learning models, and the particular 16 variables were sufficient to build high-performing models. This demonstrates that not all variables are required for computations and predictions. Physicians and hospitals should prioritise ordering medical checks as the first step in the patient review process (i.e., tests for the 16 variables shown in table 1). We cut down the number of variables we were required to evaluate and lowered the number of missing items in the dataset and the likelihood of imputation bias.

The goal of this machine learning model isn't just to forecast how long Covid-19 patients will live. These machine-learning models can be used to create models based on various clinical data for predicting multiple outcomes (e.g., forecasting models in which Covid infected patients require a ventilator). We believe our research will aid other researchers in implementing our Machine learning approach, speeding up the integration of artificially intelligent models into medical systems, and providing better medical treatment.

The proposed method is based on a performance analysis of numerous models for predicting the Mortality of Covid 19 infected patients. Because the target classes are closely related variables and have been rigorously reviewed in this comprehensive research, this type of argument has produced a consistent manner to provide a feasible option for machine learning algorithms.

The most fundamental performance metric is accuracy, simply the proportion of adequately predicted observations across all observations. As shown in Table II, our models XGBoost, CatBoost, and LightBGM achieved an accuracy of 98 percent, AdaBoost 96 percent, and 93 percent for ANN, respectively, implying that ANN has lower accuracy than boosting approaches and that the boosting algorithm, as a result of its superior accuracy, recall, and F1-Score value, outperformed ANN algorithms and has the best accuracy rate for a machine learning model. Therefore, the prediction model is built through the Boosting algorithms, a reliable mortality prediction.

Limitation of the Study

We acknowledge that our research had limitations. Patients with serious illnesses who needed admission to the hospital made up our sample. As a result, our results may not apply to all Covid-19 patients. The most critical variables in our study were systolic and diastolic BP. On the other hand, these characteristics could signal that people with severe diseases and hypotension are on the verge of dying. Our study did not take into account temporal characteristics. We didn't look at whether hypertension at arrival was a significant factor in patients who survived the first day of their stay. Furthermore, we did not investigate whether the significance of a variable decreases in populations that persist after the first 2 or 3 days. In the future study, we'd like to see if our algorithms can accurately predict death at various periods during admission.

In generalisation, more studies will be needed to see if our models apply to other institutions throughout Covid-19's waves. Because patient demographics fluctuate per institution, healthcare facilities must tailor their models to fit their specific patient groups. Models should be able to incorporate new data and adapt to the always-changing environment. We are constantly developing reinforcement learning approaches to keep our model up to date in real time.

This research was conducted in a retrospective manner. As a result, when patients were hospitalised, supervision could not improve the quality of data documentation. Furthermore, the study's data collection period coincided with the first pandemic outbreak, and health records were hurriedly logged as high patient loads. Due to a shortage of medical personnel, the medical system was compelled to prioritise patient care. As a result, many patients' medical profiles were incomplete and were sieved before the data evaluation step. The study's sample size was limited due to the considerations indicated above. Due to the pandemic state's healthcare and preventive regime limitations, no independent validation data was used. Furthermore, due to the increased missing values, limited laboratory resources, and inadequate health records caused by the pandemic, qualitative CRP, a characteristic linked to disease severity in multiple studies, was omitted from the analysis.

CONCLUSIONS

COVID-19, an infectious illness caused by the SARS-CoV-2. World-wide efforts are being made to establish a viable immunization and treatment for the illness. This study aims to train boosting ensemble algorithms and Artificial Neural Networks (ANN) and choose the model with the most accurate prediction of patients' Covid19 infection survival time. This study's dataset was collected from kaggle.com. It comprises blood samples from 4313 individuals and is analyzed retrospectively to identify pertinent metrics of

total mortality. Using the information gain weight associated with each parameter, only 16 parameters were examined out of a total of 48. The training data set was subjected to 5-fold cross-validation, and Receiver Operating Characteristic (ROC) curves were generated to validate the prediction algorithms' performance independent of the algorithm selection criteria. The models XGBoost, CatBoost, and LightBGM attained an accuracy of 98%, AdaBoost reached 96%, and ANN achieved 93%, indicating that boosting techniques are more accurate than ANN.

This model can be modified to estimate mortality for any kind of pandemic, such as covid, if the most influential characteristics of a new virus can be inputted with appropriate data. As future work, the authors intend to implement deep learning and deep ensemble techniques. Additionally, this study may be expanded to include other variables influencing covid 19 mortality.

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Psychological Capital, Work Engagement and Affective Organizational Commitment among Employees of the Handloom Industries in Sri Lanka

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Abstract

The study examined the effect of psychological capital on work engagement and employees' affective organizational commitment of employees in the weaving centre of the Handloom sector in Sri Lanka. Further, it attempts to find out the effect of psychological capital on work engagement and affective organizational commitment of employees of the Handloom industries in Sri Lanka. The study expands the literature on relevance by contextualizing it in one of Sri Lanka's indigenous sectors of the Handloom industry based on the Conservation of Resources (COR) Theory and the Job Demand-Resources (JD-R) Theory. Data was collected from 361 employees in the Handloom industry in Sri Lanka by applying the second thumb rule of Ringle et al (2012). The quantitative analytical technique was employed in this study through Smart Partial Least Square - Structural Equation Modelling. The study revealed that psychological capital has positively related to affective organizational commitment and work engagement, the association between psychological capital and affective organizational commitment was mediated by work engagement. The study contributes to the body of knowledge on both the JD-R theory and COR theory by expanding the theoretical understanding of the mediation effect of work engagement in the relationship between psychological capital and affective organizational commitment.

Keywords: Affective Organizational Commitment, Handloom Weaving Centre, Psychological Capital, Work Engagement.

INTRODUCTION

Affective Organizational Commitment has become a buzzword in today's business world. It has received a lot of attention in today's organizational context to improve key outcomes like employee efficiency and effectiveness and it has been shown to have the greatest favourable connection with positive work outcomes (Alsiewi & Agil, 2014). Many authors (Clifton, 2014; Singh & Gupta, 2015) underlined that the deep emotional attachment to the organization is the most important human component that influences organizational outcomes. organizations apply various strategies such as effective communication, effective leadership, and strong teamwork to enhance the employees' affective organizational commitment. However, gaining employee affective commitment to such strategies remains a challenge. Even though enhancing employees' affective commitment to their workplace has garnered a lot of scholarly attention recently, the problem still exists. Researchers pay more attention to perceived affective organizational commitment which reflects the antecedents which influence affective organizational commitment and

practices currently available in an organization. At present, managers and researchers worldwide (Alsiewi & Agil, 2014) investigate how to enhance the level of employees' affective organizational commitment / emotional commitment to their workplace due to the significance of this positive work outcome to reach the effectiveness of the organization.

Recently many practitioners and scholars reveal that a variety of factors influence the level of affective organizational commitment such as high-performance work practices (Karatape, 2013); Respectful Engagement (Basit, 2019); Leadership style (Bhagat et al., 2019); Employee Engagement (Paek et al., 2015). Also, many scholars (Luthans et al., 2007; Robyn & Mintonga-Monga, 2017) show that psychological capital plays a critical role among all other determinants of getting a high level (Pariate et al., 2017) of organizational commitment including affective organizational commitment. Psychological Capital (PsyCap) plays a vital role among all other capitals (human, social, cultural, and psychological) and it stems from the positive organizational behavior approach, which is based on

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Peterson and Seligman's (2004) positive psychology. The four components of psychological capital, are often known as personal resources, hope, efficacy, resilience, and optimism. PsyCap is a self-aspect frequently associated with adaptability and gives people a sense of control and influence over their situations, helping them to deal well with their circumstances (Hobfoll et al., 1989; Hobfoll et al., 2018). Furthermore, Hobfoll et al. (1989, 2018) emphasize these views through the Conservation of Resources (COR) Theory. Workers who have not acquired these resources as part of their repertoires of behaviours and, more importantly, if they notice a chronic mismatch between the demands of the work environment and their resources, can develop undesirable stress and fatigue outcomes (Halbesleben et al., 2010). As a result, personal resources are important in assisting work environment adaptation and allowing individuals to deal with high-pressure job conditions. Workers with abundant personal resources are more adaptable, sensitive to change, open to learning, and motivated to continue growing (Airila et al., 2014). Highly engaged employees show high satisfaction and an emotional and motivational commitment to their jobs (Schaufeli & Bakker, 2004). The Job Demand Resources (JD-R) model agrees with the previously stated premises. According to the JD-R paradigm, personal resources, such as psychological capital, lead to enhanced employee engagement and beneficial organizational outcomes lt, the researchers believe that employees' resources might enhance work engagement as well as good outcomes like affective organizational commitment, which fevers accepting tough work environments. Further, research has identified that numerous scholars examined the influence of psychological capital on organizational commitment including affective organizational commitment (Eteberian, 2012; Luthans et al., 2007; Yildiz., 2018). Many Scholars (Bogoni et al., 2017; De Wall & Pienaar, 2013; Herbert, 2011) pointed out the significant influence of PsyCap on work engagement. Already scholars (Alarm, 2017; Eghlidi, 2016; Karatape, 2013) revealed the influence of work engagement on organizational commitment, including affective commitment. The mediator role of work engagement in the relationship between affective organizational commitment and psychological capital has not been adequately studied. The goal of the current research is to address the knowledge gap about the relationship described above.

The Handloom industry is one of Sri Lanka's indigenous industries and it is centuries old in Sri Lanka. In numerous ways, this heritage industry contributes to improving the citizens' economic stability specifically in rural areas in Sri Lanka. There is some evidence available on the employees' affective organizational commitment to indigenous industries in Sri Lanka at a low level. For instance, Chairman of the National Craft Council (NCC) Abesekara (2020) noted that the Handloom and Batik industry faces many problems such as a lack of skilled labour, low retention of employees, upgrading of technology, inadequate ability to supply the necessary raw materials, product marketing, inability to access institutional credit, and trade barriers (Daily News, 2020). The lack of skilled workers means employees are not retained for a long time with their workplace to get the proper training on weaving, and employees do not pay emotional attachment/affective commitment to their workplace and the final result is low retention of the employees in the relevant sector.

Based on the theoretical background of the current study, the researchers argue that the process of enhancing the affective organizational commitment of employees in the Handloom weaving centres in Sri Lanka is possible by improving their psychological capital and work engagement. To our knowledge, there were a smaller number of empirical studies/no studies available to reveal the holistic relationship between the construct of PsyCap, work engagement, and affective organizational commitment. Therefore, this paper attempts to fill this deficit in extant literature by investigating the effects of psychological capital on work engagement and affective organizational commitment among employees of the Handloom industry in Sri Lanka.

THEORETICAL BACKGROUND

Using two theories of COR and JD-R model, the study problem of does psychological capital impacts employees' affective organizational commitment with mediating role of work engagement is studied. As per Hobfoll (1989, 2018), the key tenet of the COR theory is that people try to preserve and conserve particular resources that they value. These resources can be "this object, personal characteristic condition, or energies which are valued by the person" (Hobfoll, 1989, p. 514). Hobfoll (1989) described that resource gain and loss are not symmetrical because the loss is disproportionately higher than resource gain. These resources can be depleted, and they need to be invested in recovering from loss and are better able to manage profit (Hobfoll, 2018). Hobfoll (2018) also suggests that resources tend to produce each other as one may have one significant resource connected to or may replace others. For instance, when a role is demanding, job resources such as social support are related to or may even substitute personal resources such as self-efficacy or optimism. Hobfoll (2018) calls this linkage and interplay a "Resources Caravan" (Hobfoll, 2001: 349) and leading positive outcomes (Hobfoll, 2001). Bakker and Demerouti (2007, 2008) suggested that this notion is linked to the JD-R model. According to the JD-R model, work engagement is a mediator between job resources and personal resources (psychological capital) and positive organizational outcomes (Bakker & Demerouti; 2007, 2008).

Affective organizational commitment: Meyer and Allen's (1991) three-dimensional (affective, normative, and continuance) scale has been the most widely used way to examine organizational commitment for the past 20 years. Affective organizational commitment is based on a person's identification with, as well as a desire to have a relationship with, an organization (Meyer & Allen, 1991). Meyer et al. (2002) backed the importance of affective commitment by demonstrating that employees who display strong affective commitment are more determined to accomplish greater results and make more significant contributions than those who demonstrate continuity or normative commitment.

In most empirical research applying the three-component model of organizational commitment, the affective commitment component of the model was found to have the most substantial effect on various work outcomes rather than the other two commitments of normative and continuance (Paek et al., 2015; Yildiz, 2018). In addition, researchers discovered that the affective and normative commitment constructs have a lot of overlap (Mercurio, 2015; Solinger et al., 2008). Solinger et al. (2008) mentioned substantial correlations between normative and affective commitment in their meta-analysis, indicating a lack of discriminant validity. As a result, because of its high

reliability and validity as an organizational commitment component (Paek, 2015), many researchers in recent studies have concentrated entirely on affective commitment as the single indication of organizational commitment (Paek et al., 2015). The current study also, the study has paid attention to employees' affective organizational commitment.

Psychological capital: Luthans (2002) developed psychological capital as a basic construct based on the higher-order construct of Positive Organizational Behaviour (POB) with the rise of positive psychology. Positive organization behaviour is explained as "the analysis and application of positive human resource strengths and psychological abilities that can be tested, enhanced, and managed effectively to improve performance in the workplace today" (Luthans, 2002, p. 304). PsyCap differs from all other types of capital and it is concerned with the individual's potential for positive psychological growth (Luthans et al., 2007). PsyCap is characterized by "(1) persevering toward goals and when necessary, redirecting paths to goals (hope) to succeed; (2) having confidence (efficacy) to take on and put in the necessary effort to succeed at challenging tasks; (3) when beset by problems and adversity, sustaining and bouncing back and even beyond (resilience) to attain success and (4) making a positive attribution (optimism) about succeeding now and in the future" (Luthans & Youssef-Morgan, 2017, p. 340). Luthans and Youssef-Morgan (2017) described psychological capital and forwarded evidence as a positive approach. They have emphasized the significance of qualitative and mixed-method than quantitative methods, including experimental or longitudinal, to understand these mechanisms. Dawkinn et al. (2013) did an extensive analysis and evaluation of the PsyCap literary fiction and mentioned a few future directions for advanced PsyCap research; To confirm the structure of any of the PsyCap components and further examine their linkages with more trait-like conceptualizations and coping mechanisms, more theoretical underpinnings and analysis are required. According to Luthans et al. (2007), psychological capital demonstrates individual motivational predispositions that increase as a result of employee resources and is built up through investments in future gains (Anushi, Priyanath, & Tennakoon, 2022).

Work engagement: Work engagement is defined as "a positive, fulfilling, work-related state of mind characterized by vigor, dedication, and absorption" (Schaufeli & Bakker, 2003, page 4). Vigor represents energy to handle the work; dedication refers highly involved in the job and absorption refers highly attach to the work and it is difficult to separate the worker from work (Borgani et al., 2018; Schaufeli & Bakker, 2003). In addition, engagement is a more permanent and widespread affective-cognitive state that is not focused on any single object, event, individual, or behaviour (Kotze, 2017; Truss et al., 2013; Schaufeli & Bakker, 2003).

One of the main scales is Utrecht Work Engagement (UWE) which was developed by Schaufeli and Bakker (2003). This scale was developed with 17 items to evaluate an employee's level of work engagement across three subdimensions: vigour, dedication, and absorption.

Madhyvadany and Panboli (2019) conducted a literature review on employee engagement, and researchers indicated that future research needs to determine employee engagement generators. Besides, researchers suggested that the nature of a workable model incorporates the

theoretical and practical implications of employee engagement. Individual employee engagement outcomes include satisfaction with the job, the performance of the job, job involvement, and commitment to the organization (Bakker & Demerouti, 2007). Based on the empirical literature review, the researcher argues that there is less of a research study / no study tested the mediator impact of work engagement and the connection between psychological capital and affective organizational commitment (Paek et al., 2015).

HYPOTHESES

PsyCap and affective organizational commitment: Numerous scholars revealed a strong and statistically significant relationship between PsyCap and employees' commitment. Sweetmen and Luthans (2010) describe psychological capital as a resource that increased knowledge and understanding of work-related outcomes. Paek et al. (2015) conducted a research study by selecting a sample of hotel employees and revealed that psychological capital directly and positively predicts affective commitment. Yildiz (2018) has pointed out that enhancing employees' psychological capital directly affects their organizational commitment. The study results indicated that psychological capital impacts all three types of commitment (including affective organizational commitment) positively. Nefei (2015) investigated the influence of psychological capital on workers' attitudes and work outcomes at Egyptian teaching hospitals. In addition to the empirical evidence, the theoretical background of COR and the JD-R model also provides the necessary foundation to explain the effect of PsyCap on affective organizational commitment. Thus, the following hypothesis is proposed:

H_1: There is a positive impact of psychological on affective organizational commitment among employees of the handloom industry in Sri Lanka.

PsyCap and work engagement: Prior literature witnessed psychological capital was linked with positive emotions that, in turn, were related to engagement positively. De wall and Pierre (2013) investigated the causal relationship and temporal order through longitudinal data in South Africa and they revealed the positive impact of psychological capital on work engagement. Kotze (2017) found that psychological capital contributed to work engagement through two dimensions such as vigor and dedication. Movahedil et al. (2018) conducted a research study on the Luthans' psychological program's effectiveness on the engagement of nursing staff. The result revealed that psychological training programs impact increasing the level of job engagement of the nursing staff. Several scholars (Bogani et al., 2017; Luthans, 2007; Pieces & Bashaff, 2018) state that there is a substantial association between psychological capital and work engagement. Along with the actual data, the theoretical underpinnings of COR and the JD-R model offer the support needed to understand how PsyCap affects work engagement. Accordingly, the study proposes:

H_2: There is a positive impact of psychological capital on employees' work engagement among employees of the handloom industry in Sri Lanka.

Work engagement and affective organizational commitment: Prior literature witnessed work engagement predicts affective organizational commitment; Jena (2017) examined the role of employee voice on work engagement and affective organizational commitment with 301

executive employees in the service sector in India. Work engagement was found to be a strong predictor of affective organizational commitment. Alam (2017) came to the same conclusion as the previous study; work engagement was found to be a strong predictor of affective organizational commitment. According to Zhao and Zhao (2017), job engagement is inversely associated with turnover intentions with affective commitment serving as an influence. The theoretical foundations of COR and the JD-R model, along provide the support required to comprehend how work engagement affects employees 'affective organizational commitment. Accordingly, the study predicts that;

H₃: There is a positive impact of employees' work engagement on employees' affective commitment among employees of the handloom industry in Sri Lanka.

Mediator role of work engagement: The researchers established a link between the COR theory and the JD-R model and two theories used as theoretical lenses to examine contemporary research problems in the current study. At the same time, the researcher strongly argues that there is a mediator role of work engagement between job resources and personal resources (psychological capital) and affective organizational commitment, based on the JD-R model explanation and other available empirical evidence (Kim et al., 2019; Paek et al., 2015). Bakker and Leiter (2010) claim that the mediator role of work engagement shows on the outcome of job performance and personal resources of the JD-R model. Paek et al. (2015) mention that work engagement demonstrates a partial mediation role between

psychological capital and positive employee morale such as employees' work satisfaction and affective organizational commitment. According to the previous study's findings (Karatape & Karadase, 2015; Kim et al., 2019;) the study's conclusion is that work engagement can operate its role as a mediator of psychological capital and affective organizational commitment. Based on theoretical and empirical evidence, the study proposed:

H₄: Work engagement mediates the relationship between psychological capital and affective organizational commitment among employees of the handloom industry in Sri Lanka.

According to the research objectives, research is expected to find out the effect of psychological capital on work engagement and affective organizational commitment of employees of the Handloom industries in Sri Lanka. The study expands the literature on relevance by contextualizing it in one of Sri Lanka's indigenous sectors of the Handloom industry based on the Conservation of Resources (COR) Theory and the Job Demand-Resources (JD-R) Theory. Therefore, Affective Organizational Commitment is considered the dependent variable, while Work Engagement is the mediating variable between Affective Organizational Commitment and the Psychological Capital of the employees in the Handloom industry in Sri Lanka. According to the conceptual framework, four hypothetical relationships can be established between these variables, and Figure 01 depicts these associations among variables.

Figure 1: Conceptual Framework
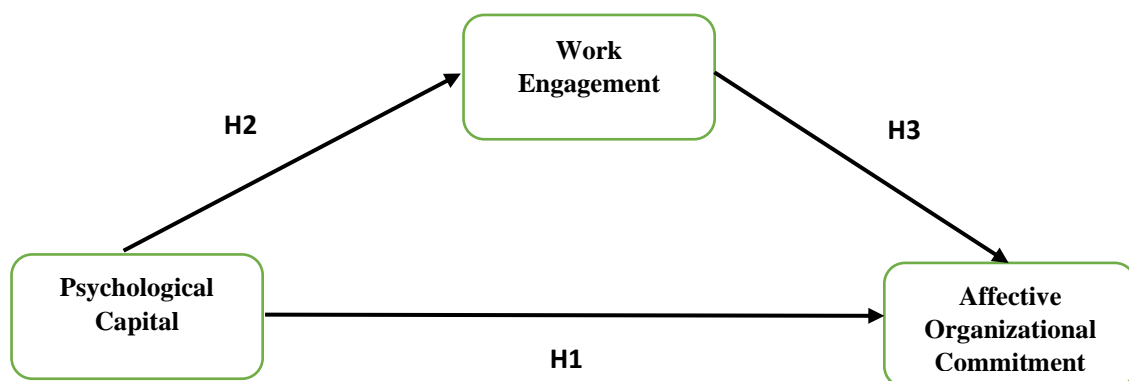
Source: Author Compilation, 2022.

METHODOLOGY

The current study used a quantitative approach to test the hypothetical relationship among variables. The unit analysis is employees in the Handloom sector and 370 employees were selected from the population of 8000 employees by following the 2nd thumb rule of Ringle et al. (2012) to satisfy the minimum sample size needed for analyzing. Self-administered questionnaire technique was used as a tool in this research to gather primary data and contact made with the handloom industry employees who were asked if they would support the research. The questionnaire included 55 elements and consisted of four sections: Demographic information of employees, Psychological Capital, Work Engagement, and Affective Organizational Commitment. Further, questionnaire items are translated into Sinhala language and a pre-test was conducted.

In this study, PsyCap is made up of a summation score of the four dimensions of hope, efficacy, resilience, and optimism (Luthans et al., 2007). Employee work engagement also includes vigor, absorption, and dedication (Schaufeli et al., 2002). The summing score of the aforementioned three dimensions is used to calculate work engagement in this study (Fouche et al., 2017). Other studies have used similar approaches for producing a composite score for PsyCap and employee work engagement (Fouche et al., 2017; Paek et al., 2015). Eight questions were taken from Allen and Mayer's (1991) affective organizational commitment measure to quantify affective organizational commitment. A sample item from the affective subscale is "the organization has a great deal of personal meaning for me". Schaufeli and Bakker (2003) used 17 questions to assess three types of work engagement. A sample item from the work engagement scale is "I am enthusiastic about my job". Luthans et al. (2007) developed a set of 24 questions to assess psychological capital's four components. All the items

were framed on a seven-point Likert scale, responses range from 1 to 7, with 1 indicating strong disagreement and 7 indicating strong agreement. A sample item from the PsyCap is "Being fairly effective at work".

Data is analyzed using the Partial Least Squares Structural Equation Model with the support of smartPLS. The author assessed reflective constructs to determine the model's reliability and validity. The indicator reliability value was determined by each of the outer loadings and outer loading should be 0.7 or above. The t-statistic should be greater than 1.96 for each indicator, the path coefficient was significant in a two-tail t-test with a 95% significance threshold. Cronbach's alpha and composite reliability should be 0.7 or above for a construct's internal consistency reliability. The average variance extracted (AVE) was used to test the convergent validity and an AVE value should be larger than 0.5 for each latent variable (Hair et al., 2014). Outer model weights were significant for formative indicators. The efficiency of the model has been examined by multicollinearity issues, R^2, effect size (f^2), and predictive relevance (Q^2).

RESULTS AND DISCUSSION

A total of 361 questionnaires were returned from 370 that were distributed (the response rate was 97%). 83 percent of the sample respondents are female and 17 percent are male. The age group was divided into four categories. The majority of the people in the sample are between the ages of 40 and 49 (42%). The minimum number of responders was 18-29 years old (7%). Tenure of 10 to 15 years was represented by 36% of the total respondents. Only 12% of responders have less than three years of experience. GCE O/L qualification can be identified as the educational level of the greatest number of respondents (36% of the sample). Diploma holders made up a smaller percentage of the respondents (4%).

SPSS 21.0 was used to calculate the mean, standard deviation, and standard error for all of the constructs. The respondents' inclination to consistently endorse the higher ends of the item was reflected in the mean values of all the constructs (values over 4.00). All of the standard deviation values were less than one, indicating that the data set was less cluttered. Smart PLS (SEM) was utilized to evaluate the suggested framework using Smart PLS 3.0 (Ringle et al., 2012) and two sub-models as Outer model (measurement model) and the inner model (structural model) were used to analyze the data. First, the measurement model was used to examine the quality of the measures, and then the structural model was utilized to test the hypotheses. The standard error and t-statistics of the path coefficients were calculated using a bootstrapping approach with 5000 resamples. At the 0.05 significance level, the crucial t-statistic for a two-tailed test is 1.96.

The author assessed reflective constructs to determine the model's reliability and validity. The indicator reliability value was determined by each of the outer loadings. The researcher has ensured indicator reliability, the outer loading 0.7 or higher except few indicators. They were two items of affective organizational commitment, one item of absorption dimension of work engagement, and three items of optimism dimension of psychological capital. After the researcher removed the indicators which have less indicator reliability value, the t-statistic is greater than 1.96 for each indicator, the path coefficient was significant in a two-tail t-test with a 95% significance threshold. Cronbach's alpha and composite reliability were 0.7 or above for a construct's internal consistency reliability. The average variance extracted (AVE) was used to test the convergent validity and an AVE value was larger than 0.5 for each latent variable (Hair et al., 2014). The result of the measurement model estimation can be presented in Table 1.

Table 1: Reliability and Validity of First-Order Constructs

		Loading	T Statistic	CR	Cro. Alpha	AVE
1	**Vigor (VIGOR)**			0.947	0.930	0.893
	At my work, I feel bursting with energy	0.930	137.78			
	At my job, I feel strong and vigorous	0.946	190.05			
	When I get up in the morning, I feel like going to work	0.702	17.52			
	I can continue working for very long periods at a time	0.903	91.91			
	At my job, I am very resilient, mentally	0.920	118.15			
	At my work I always persevere, even when things do not go well	0.920	108.23			
3.	**Dedication (DEDI)**			0.957	0.943	0.917
	I find the work that I do full of meaning and purpose	0.912	86.968			
	I am enthusiastic about my job	0.938	113.152			
	My job inspires me	0.924	108.1081			
	I am proud on the work that I do	0.908	94.545			
	To me, my job is challenging	0.833	38.533			
3	**Absorption (ABSO)**			0.958	0.946	0.881
	When I am working, I forget everything else around me	0.894	77.181			
	I feel happy when I am working intensely	0.833	44.188			
	I am immersed in my work	0.881	75.787			
	I get carried away when I'm working	0.899	83.160			
	It is difficult to detach myself from my job	0.911	95.206			

4	**Hope (HOPE)**			**0.949**	**0.935**	**0.855**
	If I should find myself in a jam at work, I think of many ways to get out of it.	0.816	35.606			
	At the present time, I am energetically pursuing my work goals.	0.860	48.555			
	There are lots of ways around any problem.	0.877	80.434			
	Right now I see myself as being pretty successful at work	0.872	61.299			
	I can think of many ways to reach my current work goals.	0.881	77.931			
	At this time, I am meeting the work goals that I have set for myself.	0.906	112.026			
5	**Efficacy (EFFI)**			**0.937**	**0.920**	**0.865**
	I feel confident analysing a long-term problem to find a solution.	0.849	58.846			
	I feel confident representing my work area in meetings with management.	0.837	34.536			
	I feel confident contributing to discussions about the company strategy.	0.782	28.221			
	I feel confident helping to set targets/goals in my work area.	0.910	118.205			
	I feel confident contacting people outside the company (suppliers, customers) to discuss problems.	0.836	46.219			
	I feel confident presenting information to a group of colleagues.	0.852	57.302			
6	**Resilience (RESI)**			**0.936**	**0.914**	**0.795**
	I usually manage difficulties one way or another at work.	0.830	34.783			
	I can be "on my own", so to speak, at work if I have to	0.823	35.103			
	I usually take stressful things at work in stride	0.885	88.288			
	I can get through difficult times at work because I've experienced difficulty before.	0.896	93.122			
	I feel I can handle many things at a time at this job	0.878	61.673			
7	**Optimism (OPTI)**			**0.929**	**0.885**	**0.813**
	I always look on the bright side of things regarding my job.	0.913	80.981			
	I'm optimistic about what will happen to me in the future as it pertains to work.	0.917	98.000			
	I approach this job as if "every cloud has a silver lining".	0.873	50.575			

Source: Survey Data, 2021.

Discriminant validity refers to how well a measure measures (or discriminates against) another construct. To achieve the criteria, each construct's AVE must be bigger than the highest square correlation with any other construct. According to Fornell and Larcker (1981), discriminant validity can be demonstrated if the square root of AVE in each latent variable is greater than other correlation values among the latent variables. Table 2 shows the correlations between the latent variables and the square root of AVE on the diagonal.

Table 2: Fornell and Larcker criterion for checking discriminate validity

	ABSO	DEDI	VIGOR	EFFI	HOPE	OPTI	RESI
ABSO	**0.938**						
DEDI	0.913	**0.957**					
VIGOR	0.899	0.934	**0.944**				
EFFI	0.823	0.804	0.825	**0.930**			
HOPE	0.884	0.893	0.912	0.818	**0.924**		
OPTI	0.841	0.807	0.834	0.760	0.831	**0.901**	
RESI	0.879	0.854	0.881	0.867	0.881	0.887	**0.891**

Source: Survey Data, 2021.

The second-order constructs were developed using the latent variable scores of the first-order constructs. Indicator reliability of three endogenous latent variables [i.e., Affective Organizational Commitment (AOC), Psychological Capital (PsyCap), and Work Engagement (WE)] at the second-order level in the hierarchical model was evaluated. All path coefficients (standardized factor loadings) were well above the threshold value of 0.7 (see table 3). All the t-statistics were significant at a 0.05 significance level. Hence, the results show strong evidence for the indicator reliability of the second-order constructs. Table 3 further displays that Cronbach's α was higher than the required value of 0.7 and composite reliability was higher than the recommended 0.7 value. With a higher level of Cronbach's α and composite reliability, the second-order constructs were developed in a reliable manner. AVE for each construct was higher than the required value of 0.5. The results confirm the convergent validity of the second-order construct. The discriminate

validity of the second-order constructs is presented in table 4 which shows that none of the inter-construct correlation values was above the square root of the AVE and satisfied the criterion of the discriminant validity of the second-order constructs.

Table 3: Analysis of the Second-Order Constructs

		Loading	T Statistic	CR	Cro. Alpha	AVE
1	**Affective Organizational Commitment (AOC)**			**0.964**	**0.956**	**0.818**
	I would be very happy to spend the rest of my career with this organization.	0.898	203.06			
	I enjoy discussing my organization with people outside it.	0.894	63.55			
	I think that I could not easily become as attached to another organization as I am to this one.	0.878	66.63			
	I feel like 'part of the family' at my organization.	0.910	58.87			
	I feel 'emotionally attached' to this organization.	0.928	84.94			
	This organization has a great deal of personal meaning for me.	0.919	114.56			
3.	**Psychological Capital (PsyCap)**			**0.967**	**0.955**	**0.881**
	Efficacy	0.915	91.33			
	Hope	0.942	145.11			
	Optimism	0.927	106.87			
	Resilience	0.969	296.54			
3	**Work Engagement (WE)**			**0.981**	**0.970**	**0.944**
	Absorption	0.965	203.06			
	Dedication	0.977	322.23			
	Vigor	0.973	329.77			

Source: Survey Data, 2021.

Table 4: Discriminate validity of Second-order constructs

	AOC	PsyCap	WE
AOC	0.905		
PsyCap	0.901	0.939	
WE	0.876	0.937	0.971

Source: Survey Data, 2021.

Assessment of the structural model: The ability of a structural equation model to forecast its dependent variable was assessed by applying the smart PLS-SEM method. PsyCap is a higher-order construct that has four dimensions: hope, efficacy, resilience, and optimism (Luthans et al., 2004). The results of the multicollinearity tests using variance inflation factors were found to be within the threshold, suggesting that multicollinearity was not an issue in the analysis. The variance inflation factors were within the threshold according to the results of the multicollinearity tests, suggesting that multicollinearity was not an issue in the analysis. Table 5 compiles the findings of the structural model evaluation. The results showed that PsyCap was a favorable predictor of employees' work engagement and affective organizational commitment. Results also showed that employees' affective organizational commitment was positively impacted by their level of work engagement. Table 5 present the path coefficient and t statistic and they're significant among constructs of the above figures.

Table 5: Path coefficient and significance among constructs

Hypothesis	Relationship	Beta	t-statistic	Decision
H$_1$	Psychological capital - Affective commitment	0.737	10.492	Supported
H$_2$	Psychological capital -Work engagement	0.937	117.366	Supported
H$_3$	Work engagement- Affective commitment	0.185	2.566	Supported

Source: Survey Data, 2021

Based on the R^2, according to the criterion of Chin (1998), the model can be considered to be moderately fit because independent variables have explanatory power above the moderate level. Work engagement represents the highest variance (R^2= 0.820 or 82 percent) followed by affective commitment (R^2 = 0. 665 or 66.5 percent).

The result in table 6 displays the mediator role of work engagement between psychological capital and affective organizational commitment -H$_4$, (β = 0.173, *p* < 0.011). Furthermore, the hypothesis' confidence ranges contained zero. This is complementary (or full) mediation, according to Zhao et al. (2010), because the results demonstrate a significant indirect effect via the mediator variable. Table 6 presents the result of the mediation analysis.

Table 6 Mediation test result

Hypothesis	Relationship	Indirect Effect (β)	SE	T -value	P – value	95% CL	Decision
H_4	PsyCap-WE-AOC	0.173	0.068	2.549	0.011	[0.038-0.304]	Complementary

Source: Survey Data, 2021

Discussion: Based on the COR theory (Hobfoll, 2018) and JD-R (Bakker & Demerouti, 2008) models, the findings showed a favourable and substantial association between PsyCap and affective organizational commitment. Numerous scholars (Cetin, 2011; Nafei, 2015; Shahoo & Sia, 2015) findings were aligned with current research findings. The presence of high psychological capital in Handloom sector employees develops positive attitudes and performs efficiently at their workplace. Psychological capital influences the emotions of employees toward their workplace. Positive emotions of the Handloom employees towards the workplace can enhance affective commitment.

Based on the COR theory (Hobfoll, 2018) and JD-R (Bakker & Demerouti, 2008) model, the findings demonstrated a significant positive association between psychological capital and employee work engagement. It aligns with prior research that psychological capital is a critical predictor of employee engagement (Kotze, 2018; Paek et al,2015; Thompson et al., 2015). Scholars (Sweetman & Luthans, 2010) theoretically propose that the relationship between PsyCap and work engagement causes positive emotion. Paek et al. (2015) evaluated work engagement as a crucial component in a work context heavily influenced by psychological capital. The result of the current study shows that work engagement is more heavily linked to psychological capital, confirming the above notions. The discussion on psychological capital for Handloom weavers was appropriate and pertinent, considering the diverse stages involved in Handloom weaving to enhance their level of work engagement. Handloom weavers with psychological capital, on the other hand, would be indispensable because they would remain enthusiastic about their work no matter how long, harsh, or stressful it was. As a result, such enthusiasm for work would be translated into engagement, displaying vigor, dedication, and absorption. As a result, the significance of psychological capital within the role of Handloom workers was demonstrated, suggesting that sustaining engagement in the area goes beyond the feeling of their resources.

The findings demonstrated a significant positive association between work engagement and affective organizational commitment, which was supported by the COR theory (Hobfoll, 2018) and JD-R model explanations (Bakker & Demerouti, 2008). To the best of the author's knowledge, scholarly empirical research on the impact of work engagement on affective organizational commitment is few, with only a few studies examining these constructs (Jena et al., 2017; Alarm, 2017) and revealing the significant positive relationship between work engagement and affective organizational commitment. Current study findings are aggreged with the above findings and results show the positive influence of employees' work engagement to affective organizational commitment to the workplace. The weaving centres can obtain many benefits from the above circumstance and employees are ready to stay in the same workplace for a long time period.

It is plausible to believe that psychological capital is more strongly linked to work engagement than affective organizational commitment based on the findings of the mediator analysis. This hypothesis result corresponds to a smaller number of studies that have identified employee work engagement as a mediator (Frtria & Ummah, 2019; Paek et al., 2015). Paek et al. (2015) examined the impact of psychological capital on employee morale through work engagement. Employee morale was explained under two components such as affective organizational commitment and job satisfaction.

These findings revealed that work engagement is defined as an employee's positive work behavior that leads to boosting their sense of attachment to their workplace. When Handloom weavers are involved in their occupation with their psychological capital, their level of work engagement rises, and their loyalty to the weaving Centre rises.

CONCLUSION

This paper attempts to examine the mediator role of work engagement between PsyCap and employees' affective organizational commitment incorporating the selected construct through the JD-R model and COR theory. The findings of the study, work engagement serves as a mediator between psychological capital and affective organizational commitment. When the Handloom workers perceive and apply their PsyCap as their resources, they will support to broaden the work engagement and build on it, consequently translating to the desired organizational outcomes such as employees' affective organizational commitment. In the context of this work, it enhanced the employee's affective commitment to their workplace through the expansion of employee work engagement. The above mediator relationship of work engagement between PsyCap and employees' affective organizational commitment has been found in a small number of research investigations. As a result, this research adds to proving the above holistic relationship among selected variables and provides new insight for organizations looking to increase their effectiveness by boosting their employees' psychological capital.

The current study's findings have wide-ranging ramifications and are hugely valuable to businesses, especially those in the industrial sector. This may lead to a better understanding of the association among PsyCap, work engagement, and affective organizational commitment. Further, an academic can reveal the applicability of the western concept of employees' PsyCap and work engagement and affective organizational commitment in a developing country such as Sri Lanka because Sri Lankan economic, business, and human resources environment are too different from western countries. The provincial councils represent the central government involved in policymaking, assisting the development process, providing training, design development, and market promotion for the Handloom industry. Therefore, the provincial councils can use this study's findings to identify the significance of psychological capital and work engagement and how they are effectively utilized to enhance the employee's affective

organizational commitment to the weaving centres of the Handloom sector in Sri Lanka.

The current study, like any other scientific endeavour, has some limitations. As a result, any interpretation of the findings of this study should be made with these limitations in consideration. The current study was focused on weaving centres of the Handloom sector in Sri Lanka, and the occupational features differ from other sectors. Due to the specific terms of the Handloom sector, less ability to generalize the research findings with other sectors of the economy. The current study collects the data at a single point in time and does not collect the employee' responses at a two-time lag. The current study examines relationships among dimensions of psychological capital, work engagement, and affective organizational commitment. Future research can identify possible mediating variables that could aid in uncovering the discrete-level linkages between psychological capital and employee affective organizational commitment.

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A Historical Study of the Matiyaganē Mayurāwathi Rajamahā Vihāraya

SLJSSH

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Abstract

Matiyagane Mayurawathi Raja Maha Viharaya is a temple in the Narammala Divisional Secretariat Division in the Kurunegala District of the North Western Province. This temple has a history of about two thousand years. However, the long history of this temple has not been examined in depth yet. Accordingly, the historical significance of this temple will be studied through this investigation. Both primary sources and secondary sources were used for this study. In addition, in-depth interviews were conducted with selected people living in the area who know the field. The field observation method also was used for this research. This temple started in the Anuradhapura era and has remained a monastery until today. This research examines how the temple was qualitatively associated with history and national history from the Anuradhapura period to the Kotte period. Accordingly, this research aims at investigating the history of the *Matiyagane Mayurawathi Raja MahaViharaya* and the adjacent area from a historical point of view. It was clear that the *Mayurawathi Rajamaha Viharaya in Matiyagane* was associated with religious history and the political and social conditions in the area.

Keywords: Buddhism, Inscriptions, *Matiyagane, Mayurawathi, Sannas*

INTRODUCTION

With the introduction of Buddhism to Sri Lanka in the 3rd century AD, it became the state religion of the country and began to spread rapidly throughout the island due to the support of the ancient rulers. Thousands of monks lived in major monasteries such as Mahavihara, Abhayagiriya, Tissamaharamaya, etc. in the 5th century. The norm that the king of Sri Lanka must be a Buddhist was fixed in the society of this country. This norm, which arose in the third century AD, continued until the demise of the local state in the 19th century AD. While the kings of this country supported Buddhism, the Buddhist monk and the temple had become the main force that decided every aspect of the society in this country. Buddhist monks were not only involved in teaching to the royal princes but in some cases, they were even involved in making decisions about the kingship of the country. Monks have even taken action to punish kings in cases where the king disobeyed the orders of the monks. The kings have arranged to perform every auspicious activity in life of the kings with the blessings of the monks. Not only the king but also the common people of this country did all the major activities of their lives in the temple and with the blessings of the Buddhist monk. Studying the history of Sri Lanka without focusing on Buddhism and its influences is impossible. The entire history of Sri Lanka was intertwined with Buddhism. Buddhist monks became the dominant force in determining the overall social, economic and political system of ancient Sri Lanka. The irreplaceable importance of Buddhism and Buddhist monks in Sri Lankan society started

to gradually decrease with the arrival of European nations in Sri Lanka. But even in those difficult stages, Buddhist monks and the Sinhala Buddhists worked with immense courage and protected Buddhism and Buddhist culture. For this reason, it is essential to examine the ancient temples where the monks lived and the historical significance associated with them.

LITERATURE REVIEW

Historians have been tempted to describe how Buddhist temples influenced the decision of the country's history. Anuradhapura Maha Vihara, which became the driving force in the religious field during the Anuradhapura kingdom period, has been the subject of a lot of research in the field of history and archaeology (Kulatunga, 2002). Also, several academic types of research have been done regarding prominent temples like Abhayagiriya, Rangiri Dambulla, Mihinthalaya, and Tissamaharamaya which were most decisively affected during that period (Kulatunga, 1998; Ilangasinghe 1987; Mallavāracci 1993; Parker, 1884). The same is the case with the Polonnaruwa period. But research on the lesser-known religious centers that had a decisive impact on national history and local history, both in the early and modern periods, remains to be done. It is important in building national history as well as local history. Mayurawathi Raja MahaViharaya is a religious center that has influenced the shaping of local history and national history for centuries. Few scholarly commentaries have

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been made on the history of the Matiyagane Temple and its associated history. In 2000, the Central Cultural Fund published a collection of articles entitled '*Vihara Vamsa Matiyagane Mayurawathi Rajamaha Viharaya*', which covered the Matiyagane Temple and the adjacent area in a documented form without conducting a comprehensive study based on historical perspectives. In 2006, Ven. *Habarakada Vajira* Thero has published a concise article entitled '*Vasara Dahas Gaṇanak Sri Vibhutiya Sangavagena Siṭi Matiyagane Mayuravati Raja Maha Vihara Parvata Lipiya Ha Sannas*'. It is primarily devoted to the study of the inscriptions of that temple. In addition to these documents, no extensive analysis of the *Mayurawathi Raja Maha Vihara* in *Matiyagane* or the adjacent area was found. Therefore, this research aims to examine the historical background of this *Rajamaha Vihara* and the impact of this temple on the formation of national and local history.

MATERIALS AND METHODS

This research mainly aims to critically evaluate the historical significance of *Mayurawathi Rajamaha Viharaya* in *Matiyagane.* As it is unable to find a broad evaluation regarding this historical event, this research would be a valuable attempt to drag out hidden historical details to the current society. This qualitative research incorporates two data collection methods: literature survey and field survey. According to the literature survey, both primary and secondary sources were used. Among that, primary sources were prominent. In the subject of that numbers of choranicals were observed. For secondary information, a certain number of books and research papers were used. Field investigations were conducted in *Mayurawathi Rajamaha Viharaya* in *Matiyagane*, *Dambadeniya*

Wijayasundaramaya, and *Asgiri Rajamaha Viharaya*. In-depth interviews were conducted with selected key informants. The researcher selected specific groups of people within the population, who had broad knowledge regarding particular research topics (data–rich cases). Twenty-one respondents participated in interviews. Collected historical data and oral communications were systematically analyzed based on the content analysis method. At the very outset, the available information was categorized in alignment with the main research questions of this study. Numerous details that were obtained during the interviews but which had no bearing on the research aims were omitted. Incomplete information was often received from interviews. When any information was incomplete and seemed less reliable, contemporary records and materials (primary sources) were used to cross–check and extract reliable information. In the end, it was possible to arrive at certain plausible conclusions, after comparing all related details with each other.

RESULTS AND DISCUSSION

The geographical location of the *Matiyagane Rajamaha Viharaya*

This temple is located in the *Matiyagane* East *Grama Niladhari* Division of the *Narammala* Divisional Secretariat Division in the *Kurunegala* District of the North Western Province. This place is located about two miles east of the ancient kingdom of *Dambadeniya*. The temple is about 100 yards from the place called *Matiyagane Gurula*Junction on the *Kurunegala*-Negombo main road (*Vihara Vamsaya Matiyagane Mayurawathi Rajamaha Viharaya*, 2000: 01)

History of the Mayurawathi Rajamaha Viharaya

There are also various theories about how the village of *Matiyagane* got its name. Some believe that the word *'Mathi Vihara'* in the *Matiyagane* inscription *'Mathi'* later became 'Mathi'and evolved into Mati (Vihara Vamsaya Matiyagane Mayurawathi Rajamaha Viharaya, 2000: 01). Various scholars have commented on the origin of the name of this temple based on the inscription in this temple. For example, Senarath Paranavithana, who read the inscription, mentions that the word 'Mathiraga' here means 'Matthika' in Sanskrit, which means 'clay', hence the name Matiyagane(IC, Vol. II, Part II, 2001: 284). According to Senarath Paranavithana, Matiyagane may have been used for this place thousands of years ago. However, Ven.

Habarakada Vajira Thero says that based on the inscription on the Matiyagane temple, this temple had not been called Matiyagane since pre-Christian times (*Vajirathero*, 2006: 338 - 339).

The villagers suggest that the area became the clay yard *(Mati Angane* in Sinhala) and later *Matiyagane*. The area was rich in clay which was used as a raw material for the pottery industry. 'There was plenty of clay in this village to make goods, as we have heard. That is why it was called Matiyagane in the sense of the area where the clay was found" (Key informant interviews: *Palitha* Thero, 2021.12.26). It is also said that this area was known as the *'MathiAnganaya'* as ministers from ancient times inhabited it.

According to a legend, Princess *Mayuravathi*, the daughter of King *Devanampiyatissa*, was married to a prince named *Suriya* from *Dambadeniya*. While he was on his way to remote work, a sculptor made a statue of Princess *Mayuravathi* out of clay near the *Matiyagane r*ock and informed the prince that the princess had arrived there. The prince who came there happy to see the princess pretended to be her call but did not receive an answer. The angry prince slapped the princess on the cheek. It is said that the prince, realizing that he had been deceived, shouted, *Mati Anganak, Mati Anganak* (a clay woman, a clay woman)

Prof. *Punchibandara Sannasgala* also states that the *Poojavaliya* was composed in this temple. The book was then taken to *Dambadeniya* along a clay road from this temple, and the area was based on that clay road (*Vihara Vamsaya Matiyagane Mayurawathi Rajamaha Viharaya*, 2000: 4)."We have heard that there was a clay road from the Matiyagane temple to the Dambadeniya Rajamaha Viharaya. I do not know more about that" (Key informant interviews: *Sumanatissa*Thero2021.12.26).

Another idea in folklore is that Princess *Mayuravathi*, the daughter of King *Devanampiyatissa*, started this temple and made a system of caves, made drips, and offered sacrifices. Therefore, the temple is named after Princess *Mayurawathi*. *Rajaratnakara* also mentions that Queen *Mayuravathi* lived in this area, confirming folklore (Rajaratnakara, 1990, p. 45).

According to the locals, the pool where Queen *Mayurawathi* bathed can still be seen in the village called *Hawuluwa,*which is close to this area. Although no remains have been found at present, the villagers speculate that the palace of Queen *Mayurawathi*may have been located in a village near *Detawa*.

However, at least from the *Kotte* period, the village was used as *Matiyagane* and the temple as *Mayuravathi.. Prominent historian Tikiri Abhayasinghe and father Perera also* pointed out that *Matiyagane* was frequently used during Portuguese rule (Abhayasinghe, 1994, 47 : Perera 1920: 199).

Nine caves with dripstones in the temple. The largest of them is the cave with an ancient shrine room. To the south of the temple is a devalaya with ancient tools in the cave. According to the locals, it was built for the god *Yapa Bandara* (*Vihara Vamsaya Matiyagane Mayurawathi Rajamaha Viharaya*, 2000: 01). Two of the nine caves have been converted into a house of idols and a shrine. Almost all the remaining seven caves are half-covered or open with soil. The remains of several caves can still be seen today.

The old *Hawuluva Viharaya* was located in the cave below the devalaya. About a hundred years ago, a group of people demolished a new shrine that was supposed to be built. There was an old Bo tree near the place where the inscription is located northeast of the Devalaya. There is also a stone slab used for the flower seat of the Bo tree.

The stone slab used for the flower seat

The ancient shrine room

There is a mound of soil on the northeast side of the inscription. Archaeologists have identified the ruins of a stupa in the late twentieth century (*Vihara Vamsaya Matiyagane Mayurawathi RajamahaViharaya*, 2000: 01). However, there is a fence on private land in the middle of

that mound. Some time ago, the mound of stupas was dug by treasure thieves. Remains of various buildings can be found around the temple premises. We found several paving stones, slabs, tiles, building materials, and stair treads during our observation tour.

The Stupa

Building Materials

The origin of this temple seems to date back to the early *Anuradhapura* period. During the reign of King *Devanampiyatissa,* Buddhism came to Sri Lanka. King *Devanampiyatissa* played a significant role in spreading the influence of Buddhism in the *Anuradhapura* Kingdom and other parts of the country (*Mahavamsa,* 2004: 19, 63: *Rohanadeera*, 1998: 02). According to the *Mahavamsa*,

during this task, various temples were built in various parts of Sri Lanka under King *Devanapathisa* (*Mahavamsa*, 2004: 19, 63). Legend has it that the *Mayuravati* temple was one such temple. Based on the inscription in the lower courtyard of the Mayurawathi temple, Ven. *Habarakada Vajira* Thero and *Senarath Paranavithana* say that this temple belongs to the *Anuradhapura* era (IC, Vol. II, Part II, 2001: 284).

Accordingly, it is possible that this temple started in the early period of *Anuradhapura* and existed as a monastery. Nine dripstones are found in this temple. They appear to have been inhabited by monks. Usually, the name of the person who sacrificed the cave is mentioned above the drip of the cave, but no such thing can be seen in this cave system. Another critical point to note here is that the *Sannas Patra* presented by the *Asgiriya MahaViharaya* to the Thero, who is usually the Chief Incumbent of this temple, also mentions '*Matiyagane Mayurawathi Rajamaha Viharaya*, which belongs to the state name of *Devanampiyatissa*.

Contemporary sources attest to the great respect for Buddhism and Buddhist monks by the King and the people during the *Anuradhapura* Kingdom. However, the kingdom of *Anuradhapura*, which lasted for several centuries, gradually ended around the tenth century in the face of Tamil invasions. Although King *Vijayabahu I* re-established a Sinhala rule after the end of the Soli rule, the second *Rajarata* rule originated in *Polonnaruwa*. It is difficult to trace the source of the *Mayurawath i*temple during the *Polonnaruwa* Kingdom. However, interviews in the area confirmed that monks may have lived in this place even during the *Polonnaruwa* Kingdom.

Nevertheless, with the invasion of *Kalinga Magha* in 1215 AD, the kingdom of *Polonnaruwa* also declined. Due to the cruel anti-Buddhist rule implemented by Kalinga *Magha*, the Sinhala elite and the Buddhist elites began to leave the *Rajarata* Kingdom (*Mahavamsa* Chapter 80, *Poojavaliya,* 1951: 791: Rajavali, 1997: 212). It appears that many of them came to *Dambadeniya* and *Yapahuwa*. At this time, a general named *Subha*, who was in *Yapahuwa*, established a monastery for the monks in the *Walasgala* area (*Rohanadheera*, 1998: 13). After the decline of the *Rajarata* Kingdom due to the *Magha* Invasion, the *Yapahuwa* Kingdom became the third kingdom of Sri Lanka in the 13th century after the migration of its inhabitants to the southwest (*Mahavamsa*, 2004: 14,15).

King *Vijayabahu III*, who made *Dambadeniya* his kingdom, brought the Tooth Relic and the relics of the bowl to *Dambadeniya*. It is also mentioned in the *Poojavaliya* that the *Vijayasundararamaya*in *Dambadeniya* was built, and the Buddhist monks were housed in the temples in the suburbs and entertained on all fours (*Poojavaliya*, 2007: 786). The King worked hard to re-publish the destroyed scriptures and restore the Sangha's unity. This temple is a short distance from the ancient kingdom of *Dambadeniya*. Interviews with the elderly in the *Matiyagane* area revealed that this temple was also a direct contributor to King *Vijayabahu*'s modernization of the *Yapahuwa* Kingdom. It was revealed in the interviews that there was an old footprint on this temple from *Dambadeniya*. *Parakramabahu II* succeeded *Vijayabahu III* in the kingdom of *Dambadeniya*. Under him, more services were rendered to Buddhism and the *Sangha Sasana*than ever before. *Upasampada* was performed, and a sangha consensus was reached (Poojavaliya, 2007: 791). New temples were built, and the monks settled in the cave temples of the forest nature and took steps to establish pure Buddhism. (Siridhamma, 1971: 12) Accordingly, the *Matiyagane* temple, where a class of caves is located, was also under the patronage of King *Parakramabahu II*. Prosperity may remain. Due to this, the *Poojavaliya also* was composed. According to Mr. *Sannasgala*, the *Matiyagane* Vihara was the residence of the author of the *Poojavali,*. Although he did not provide any evidence to support this claim, *W. Gunathilaka* points out that the painting in France depicts

(*Vihara Vamsaya Matiyagane Mayurawathi Rajamaha Viharaya*, 2000: 12). Thus, it is possible that the monks lived in this temple from the *Anuradhapura* period to the *Dambadeniya* period.

Although the *Matiyagane* temple was in excellent condition during the reign of *Dambadeniya,* it seems to have been in a dilapidated condition for about three centuries after that. Several lakes scattered throughout the area have fallen into disrepair since that period. It can be assumed that an epidemic may have caused it.

Again, information about the *Matiyagane* temple is revealed during the Kotte period. The Sannasa presented by King *Parakramabahu VI* gives information about the temple. The copper plate donated to this temple by King *Parakramabahu VI* of *Kotte* is one of the primary sources of that history. It is said that King *Parakramabahu VI* of *Kotte* renovated this temple and dedicated it to the *Devarakkitha* Thero who lived in this temple. Thus, it can be inferred that this place was in ruins after the *Dambadeniya* period. According to the Copper *Sannasa*, the renovation work of this temple was done at the invitation of Queen *Mayuravathi*.

According to the *Asgiri Thalpatha*, this temple was built by Queen *Mayurawathi* and is named assuring her services. According to the Sannasa, the temple was renovated by her and dedicated to Devarakkhita Thero in the 17th year of the reign of King *Parakramabahu VI* (*Vajira*Thero, 2006: p. 343). The King also donated about 500 acres of land to the temple through the *Sannasa*. Due to this, the area of *Matiyagane* may have belonged to the temple.

According to *Walter Wimala Chandra*, the Mayuravati queen was the queen of King *Wickramabahu III* of *Gampola* (*Wimala Chandra*, 1970: 6). *Thundeniya, H.M.S.* also admits that she was married to *Vikramabahu III*. According to him, the father of Queen *Mayurawathi* was a viceroy named Parakramabahu who lived in Senkadagala (Thundeniya, 2002: 49). Sunethra, the queen of King *Parakramabahu VI*, is considered the daughter of Queen *Mayurawathi* and *Vikramabahu III*.

Accordingly, Queen *Mayurawathi* was the grandmother of King *Parakramabahu VI* of *Kotte*. In the seventeenth year of the reign of King *Parakramabahu*, Queen *Mayurawath*i informed the King to renovate the temple and offer it. Considering these facts, it can be concluded that Queen *Mayurawathi* was in her old age. According to the *Asgiri Upatha*, Queen *Mayuravathi* started the construction of this time around the year 1477 AD. That was about five years before King *Parakramabahu* came to power. According to the above description, this temple was in a very advanced stage during the *Kotte* period, but it gradually became extinct with the Portuguese invasion. Even when the Portuguese came to Ceylon, *Matiyagane* was still the capital of *Satkorala*.

The *Matiyagane* area is important not only for religious history but also for political history. Matiyagane was chosen by the Portuguese also as the capital of *Satkorale* (Abeysinghe, 2006: 22). When King *Senarath* was the ruler of Kandy, *Matiyagane Senakotu wawatta* was the Portuguese center of Administrate of Sathkorale. Father S.G Perera, who reports on the Portuguese period, refers to the area as 'Matiyagama'. He reports that *Nikapitiya Bandara* in the area launched a revolt against the Portuguese. It is reported that *Nikapitiye Bandara* had set fire to the administrative center and the church at *the Matiyagane SenaKotuwa Watta* while Philip Oliveira, who was the *Disawe* of *Satkorale*, was on his way to duty in

Sabaragamuwa from *Matiyagane*. It states that the revolt lasted for a week with the assistance of the King of Kandy (Perera 1920: 199 -200). In the end, the Portuguese claimed victory. *SenaKotuwaWatta,* the center of the Portuguese, was close to the temple. It is not a secret that the *Matiyagane* temple may also have been affected by the Portuguese. Remains of stone structures found at various places on the temple land may be the ruins of the Portuguese ruin. However, *Rajasinghe II*, who succeeded King *Senarath*, was able to suppress the Portuguese rule at *Satkorale*. Accordingly, it appears that the Mayuravathi temple was modernized under the kings of the Kandyan kingdom. King *Rajasinghe II* renovated the *Mayurawathi* temple. This is explained by the silver *sannasa* offered to the temple in 1675AD.

At that time, the Chief Incumbent was Ven. *Gunadahe Dhammadassi* Thero. It is said that the King gifted him a set of robes, a gold ring, and many other things. It is said that a *Ganinnanse* also worked at the *Matiyagane* temple soon after. It is said that after the demise of that *Ganinnanse*, the temple was devoid of monks. The area's elite contributors gathered and travelled to Kandy. They asked the *Asgiriya Maha Nayaka* Thera to name a monk for their temple. As a result, the *Asgiriya MahaViharaya* named a monk after him, and from then on the *Matiyagane Mayurawathi Viharaya* joined the *Asgiriya MahaViharaya*.

After that period, written evidence of this temple is found during the English rule. J.M. Davis (Assistant Settlement Officer) describes the lands belonging to the temple in the document related to the land settlement dated 1910.09.12. That document is beneficial to look at the area's history at that time. These documents mention the area, population, etc., of the lands belonging to the temple at that time. One of the main points that can be deduced from the information contained therein is that the village was self-sufficient even at this time. According to it, the paintings of this cave temple have been repainted by artists in the *Matara* area. By 1891 there were only three hundred and twenty-two people living in the 1179-acre area of *Matiyagane.* Seventeen shares of temple land were given to those who played the drums for

the temple. But those lands have now become private property. "In the past, all these villages were the property of this temple. That has changed over time." (Key informant interview: *Seneviratne*, 2021.12.27)

Epigraphic

There are three main inscriptions associated with the *Matiyagane* Temple. The three epigraphics are the *Matiyagane* rock inscription, the *Matiyagane Vihara Sannasa* presented King *Parakramabahu VI,* and the *Matiyagane* Silver *Sannasa* of King *Rajasinghe II*.

Metiyagane Inscription

The inscription is located about 60 meters to the left of the main entrance to the temple cave class. This inscription is on a rock about 12 feet long. There are three lines of letters found in the inscription. *Senarath Paranavithana* made a brief note of the *Matiyagane* rock inscription in the Ceylon Journal of science in 1933 (Ceylon Journal of Science II, Part III, 1933, 191). However, the full text of the inscription has not been published. Ven. *Siyambalapitiye Jinawara Dharmakeerthi Rathanapala* thero, who was the Chief Incumbent of the temple about a century ago, had sent a copy of the inscription to the then Commissioner of Archeology. The text is checked, and the text is in Sinhala. The text is as follows from its original version in the temple.

1. ShiddhamKada (Dora) VaviMathi (Vihara) rana pataya
2. Salaviya Hiya KethiDopathi `Bikusagaha
3. Asathi

1. ශිද්ධම්කඩ(දො)රවවිමති (විහ)රණපටය
2. සලවියහියකෙතිදොපතිබිකුසගහ
3. අසති

"Good luck! Kadadora Wewa Mathi Vihara [Given]
The Bhikkhu Sangha owns two [parts] of the Salaviyahiya ''.
What is inside the brackets is suspicious

The inscription has been in a state of disrepair for some time due to neglect and various explosions by treasure thieves in the vicinity of the inscription. However, no damage was done to its characters.

Later, in 2001, the Department of Archaeology published the full text of this article and its meaning and transcripts under *Senarath Paranavithana*(IC, Vol. II, Part II, 2001: 284). According to it, *Paranavithana*, as the Acting Commissioner of Archaeology, had visited the site in 1928 and copied the letter. His research, including this one, had not been published for many years.

Habarakada Vajira Thero points out that *Senarath Paranavithana*'s reading of the *Matiyagane* inscription is incomplete. He presents the text as follows.

1. Shidama! Kadawanaka VaviMatherahi tape
2. Salaviya Hiya Kethi Dopathi Bikusagaha

3. Asati

According to the definition of Ven *HabarakadaVajira*, the income from the canals of the *Kadavanaka* tank and the two types of taxes in the *Salaviya* paddy field were sacrificed for the consumption of the Bhikku Sangha (Vajirathero, 2006: 336).

Metiyagane Copperplate of Parakramabahu VI

The history of the Copper *Sannasa* (Letters patent) temple from 1412 to 1467, which dates back to the reign of *Parakramabahu VI*, is important for study. The copper plate also bears the signature of King *Parakramabahu VI*; the sun and the moon. The authorship and legitimacy of the *Beligala Sannasa* belonging to King *Parakramabahu VI* confirmed

that the sun, moon marks, and signature are also found in the *Sannasa*. It was issued in the seventeenth year of the reign of King *Parakramabahu VI*.

King *Parakramabahu*'s copper plate is beneficial to identify the connection of Queen *Mayuravathi* with this temple. Sannasa is also useful for understanding how the temple was renovated during the *Kotte* period, the Sangha who lived there at the time, and the contemporary temple properties.

Metiyagane Silverplate of King Rajasinghe II

This Sannasa is very useful to understand the present situation of *Matiyagane* Temple. King *Rajasinghe II* dedicated the *Sannasa* to Ven. *Gunadahe.* The *Sannasa* mentions that the frescoes of the temple were painted and the offerings and lands offered to the temple. Thus, *Matiyagane* was a temple village even during the Kandyan period. According to it, the temple was built by King *Rajasinghe II* using 3,000 bricks. It also houses four seven cubits Buddha statues and statues of *Vishnu* and *Saman.* It also describes how *Jataka* stories and events in the character of the Buddha were depicted.

This Sannasa helps us understand the patronage of King *Rajasinghe II* for the advancement of the declining Buddhist Sasana and the Sangha in the face of foreign invasions and the reckless actions of the local rulers. It also seems that the security of the property offered to the temples had to be taken care of. Some contemporary sannas as show curses are also found in the *Matiyagane Sannasa*. This emphasizes that if someone misuses or steals this property, they will suffer.

CONCLUSION

Although the *Mayurawathi Raja MahaViharaya*is are located in the North-Western Province of Sri Lanka, it has been closely associated with the *Rajarata* civilization since the *Anuradhapura* Kingdom. Although archaeological evidence of a history of about two thousand years is clear, no long-term history is revealed from literary sources. Inspired by the flourishing conditions of the *Rajarata* civilization during its peaceful and prosperous period, this temple served as a shelter for the forest monks even during the declining civilizations. When the kingdoms moved southwest after the collapse of the *Rajarata* civilization, this temple was located in the vicinity of those kingdoms and may have received royal patronage in many cases.

The *Matiyagane* temple may have been important as a center of academic study, as it is widely believed that the temple provided accommodation for Ven. *Buddhaputra*, who wrote the *Poojavaliya*, and Ven. This temple which gained such importance during the *Dambadeniya* and *Kotte* kingdoms also had relations with the *Asgiriya Maha Viharaya*. Under the patronage of Parakramabahu VI of Kotte, this temple may have an increase in the service rendered for the religious upliftment of the area. The *Matiyagane* area also became the capital of Satara Korale. Accordingly, during Portuguese rule, *Matiyagane* functioned as the Portuguese center of *Satkorale*. Accordingly, an anti-Portuguese revolt broke out in the vicinity of Matiyagane. The rebellion successfully suppressed the Portuguese and sought to establish their dominance. Against this background, the *Matiyagane* temple may also have been threatened by the Portuguese. Under the patronage of King *Rajasinghe II*, the temple was revived but became a place of no monks in the face of subsequent political and Sasana crises. At the request of the *Asgiriya Viharaya*, the aristocracy of the area re-joined the

Asgiriya Maha Viharaya. It is also clear temples owned the majority of the land in the area in 1909 from the land report compiled by JM Davis (Assistant Settlement Officer) on behalf of the English Government. Therefore, archaeological evidence and literary sources confirm that the *Matiyagane Mayurawathi* temple influenced not only the religious history but also the socio-political life of the area from the *Anuradhapura* period.

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Ensemble Learning Approach for Identifying Personality Traits based on Individuals' Behavior

SLJSSH

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Abstract

Understanding human personality is essential for natural and social engagement. Arises a significant connection between users' personalities and their behavior. Our primary goal is to identify and classify individuals' personality traits based on their behaviors. Understanding personality types can help better understand preferences and potential differences between them. This study uses users' answers based on the questionnaire on personality to automatically identify the personality type based on behaviors. After pre-processing the data, we researched many classification techniques for automated recognition, including Naive Bayes, Support Vector Machine (SVM), Multilayer Perception (MLP), Random Forest, Logistic, and Decision Tree using a 10-fold cross-validation method. The second observational study combined all the algorithms using an Ensemble Learning algorithm, where by Vote algorithm. Accuracy, precision, recall, f-measure, and error values have been used to measure the systems' performance. According to the comparison analysis, SVM outperforms (85.8%) the other five personality trait detection algorithms. But after combing the five algorithms which contain the highest accuracy by Ensemble Learning algorithm obtained the highest performance (90.5%) than the SVM algorithm and obtained the highest recall, f-measure, and precision values, and the lowest error rates. It demonstrates that an ensemble learning approach that incorporates multiple distinct algorithms may yield greater accuracy than any one of its individual algorithms separately. Our findings are helpful for understanding how to manage and make a relationship with humans by predicting their personality earlier.

Keywords: Classification, Ensemble Learning, Human Personality, Machine Learning

INTRODUCTION

There are many different types of people around the world. They have different characteristics, behaviors, attitudes, etc. Based on their personality characteristics they also change with each other. There are so many characteristics in personality including honesty, brave, loyal, leadership, etc. People have demonstrated these personality traits in various ways. These personality characteristics can be used for various purposes such as being organized, various kinds of social situations getting decisions, etc. Because personality contains various types of characteristics, should be able to identify the personality type according to the purpose at that time. Therefore, identifying personality types can be an important task.

The well-known phrase "Face is a mirror of the mind" demonstrates that a person's appearance is determined by their inner qualities. Because a person's conduct and appearance describe his or her personality, an examination of appearance and behavior provides insight into personality features (Ilmini & Fernando, 2018). Some people are as transparent as a book.; friends appear to be ability to anticipate their actions by reading their thoughts and sentiments. Others persist a mystery even after years of acquaintance (Colvin et al., 1993). In the world, there are various people. They differ from each other on many factors such as behavior, attitude, feelings, external appearance, etc. Additionally, we cannot say for certain that individuals have a personality in same way. As a result, it should thoroughly study them in order to at least understand them. Because of this, personality classification is important to study people to some extent and learn their personality traits.

Every day, people connect verbally and non-verbally in a variety of ways, from casual banter to serious dialogues (Park et al., 2020) such as various social settings like kindergarten, school, college, family, work teams, etc. (Talasbek et al., 2020). Therefore, it is important to identify the personality of the people. Personality is a dynamic and organized collection of a person's traits that impact that person's cognition, motivation, and behavior. And defining traits that influence how they will respond in various situations. Here, people's personalities are determined by how they connect with other people (Katiyar et al., 2020).

Human interaction is fundamentally influenced by personality (Iacobelli & Culotta, 2013). Personality can not

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only anticipate and characterize a person's conduct but also includes their thoughts and feelings and influences their motivations, preferences, emotions, and even their physical health (Ahmad et al., 2020). Everyday interactions with others rely on our intrinsic ability to understand their behavior. By analyzing observable behavioral indicators, we can characterize others as being more talkative, assertive, social, or as being more or less susceptible to stress or rage (Lepri et al., 2016). Results from personality tests are frequently used in a variety of industries, including clinical psychology, social psychology, educational studies, Sentiment analysis, opinion mining, tailored healthcare, and personalized services (Wang et al., 2021) (Batrinca et al., 2012). And it is also useful in the areas of hiring new employees, career counseling, relationship counseling, and health counseling (Pratama & Sarno, 2016). As well as personality type has a significant impact on suitability for a certain employment, how well handle daily tasks, and even how satisfied with job as a whole.

When considering a person's personality, important to remember that some people tend to be outgoing and confident, others are oddballs and quiet, and yet others could be neither of these things at all. Some personality traits are favored by everyone, while others are despised since each personality is distinct. It possesses some traits that we either find alluring or repellent. As well as our world is one of heated competition. Having a strong personality makes you stand out to employers. On the other hand, each of the numerous models and theories relating to motivation and personality presents a unique viewpoint. However, a person's personality traits affect more than just how they perceive themselves. Therefore, it generates a problem how these various ways of feeling, thinking, and doing be measured?

Because there are so many variables involved, personality classification is become very important and complex (Keh & Cheng, 2019). But we can describe other people, attempt to predict their behavior, and modify our own behavior further

by using the form of intelligence (Lepri et al., 2016). In our study demonstrates how several categorization algorithms are used to automatically identify personality traits in various data.

Following Figure 1 shows the mapping between research questions and objectives.

The proposed approach will help to recognize one's personality type and to understand their preferences and how or why they could differ. Understanding personality types can improve our ability to lead, persuade, cooperate, negotiate, and handle stress. As well as personality classification is playing a huge role when we want to identify our strengths and weakness of own self. And also knowing your personality type might be helpful in the job in many different ways. It may help with communication, leadership style, conflict resolution, knowing how other people think, mentoring others, enhancing sales skills, etc.

In contrast to single traits, personality types that consider how qualities interact with one another paint a more complete picture of a person's character. This study examines the personality traits of each person and thereby gives an idea of what kind of personality they have.

This paper's primary contribution is a performance analysis of various categorization using six classification algorithms and combine five classification algorithms among them with highest accuracy, using ensemble learning algorithm. Additionally, we go over how to create a system that accurately predicts personality based on responses to a questionnaire that individuals fill out. Measurement of the system's performance using precision, recall and f-measure and lowest error rate additional contribution made by this research.

The following is a description of the document's format: The similar work is described in Chapter 2, the suggested research approach is described in chapter 3, the findings and discussion of the proposed research are represented in chapter 4, and the research work is concluded and future directions for research are defined in chapter 5.

Figure 1 Mapping between research questions and objectives

Problem Statement: It is critical to comprehend how to categorize various human personality types based on their behaviors.	Map to →	**Main Objective:** Classify human personality types according to the people behavior.
Retrieved from	Retrieved from ←	Achieved all
Research Questions: RQ1: What are the major personality types?	Answered by →	**Specific Objectives:** RO1: Identify the major personality types
RQ2: What are the characteristics according to each personality type?	Answered by →	RO2: Identify the characteristics according to each personality type.
RQ3: How can personality types be classified using classification methods?	Answered by →	RO3: Identify the methods that can be used for personality classification.
RQ4: How should the classification findings be assessed?	Answered by →	RO4: Determine the evaluation techniques for the classification outcomes.

LITERATURE REVIEW

Related Work

According to previous researches, personality is a combination of an individual's characteristics and behavior in dealing with various situations (Pratama & Sarno, 2016). One of the interesting traits that might be explored for adaptation is personality. A person's personality may be defined as a set of specifications that demand a pattern on the person's actions; this tendency remains constant throughout time and locations (Souri et al., 2018).

The researchers of (William, 2020) in machine learning, classification refers to the process of labeling given input transmitted data into predetermined groups. There are many popular categorization algorithms based on Bayes, trees, functions, or rules. This article examines classification techniques for identifying and forecasting personality using the HEXACO Model dataset, and it is supported by implementation performance. The process of identifying expressive, distinctive, and fascinating relationships, trends, and patterns in massive amounts of data utilizing pattern recognition technology as well as computational and analytical tools is known as data mining. Data mining encompasses data prediction and interpretation in addition to data gathering and processing. When people attempt to evaluate or create connections between various parts, errors frequently arise, making it difficult to develop answers to specific problems. Machine learning may be useful in solving these difficulties by improving the effectiveness of processes and computer designs.

The paper (Joo & Hwang, 2019) explains the involvement in the PAN 2019 shared task on author profiling, determining if the author of a tweet is a bot or a human, and identifying the author's gender in the case of a human for English and Spanish datasets. They study the complementarities of stylometry approaches and content-based methods in this research, proposing several ways for developing flexible features.

In (Karunarathna et al., 2022b), six algorithms are individually used to determine the personality types of humans. As well as in (Karunarathna et al., 2022a), the researchers have applied clustering algorithms to identify the personality behaviors.

According to this study (Ahmad et al., 2020), the daily use of digital devices with Internet access, such as tablets and smartphones, has increased dramatically in recent years, impacting Internet and social media network usage. When people use social networks, they disclose personal information that is broadcast to other users, providing organizations with useful information. Characterizing users based on their social media behavior is a new topic of study in Natural Language Processing (NLP), and this research will present an overview of how personality can be determined through online data.

The primary idea behind an ensemble methodology is to combine a series of models to fulfill the task, resulting in a better composite global model with more accurate and judgments than a single model. There are numerous methods for training an ensemble model to get a desired result. Diversity: The higher performance of ensemble models is mostly due to the employment of multiple inductive biases. Predictive performance: The individual inducer's predictive performance should be as high as feasible and at least as good as a random model (Rokch, 2019).

In (Boyd & Pennebaker, 2017) suggest a supplementary model that is based on a large data solution: word analysis. Language-based personality tests were utilized to capture/model lower-level personality processes that are more closely related to important objective organizational results. Furthermore, the growing availability of language data, as well as developments in statistical methodologies and technical capability, are rapidly opening up new possibilities.

In the study (Fallah & Khotanlou, 2015), a personality recognition system is used to automatically extract character attributes from persons handwritten writings. Their suggested method generates feature vectors by combining independent data with context information such as top margin value, word extraction, character sizes, line space, word space, word tilts, horizontal to vertical character ratio, and lie tilts. For categorization, the MLP neural network is applied.

The study (Stachl et al., 2020) looks at how well people's personality traits (measured at broad domain and narrow facet levels) may be predicted by six types of behavior: In a large sample, communication and social behavior, music consumption, app usage, mobility, overall phone activity, and day and night time activity were studied. The cross-validated results show which Big Five personality traits are predicted and which unique behaviors are associated with which characteristics, with communication and social behavior being the most predicting overall. The study (Stachl et al., 2019) demonstrates that personality trait levels can be predicted using data collected from off-the-shelf smartphones. The data set used in this study was made up of three independent datasets obtained in three separate investigations as part of the phone study research project at Ludwig Maximilians-Universität München. They present how variables may be used to predict self-assessments of the big five personality characteristics at the component and facet level using a machine learning technique (random forest, elastic net). The research (Kassarnig et al., 2018) is based on data collected from smartphones used as primary phones by the students for two years. They can directly measure the explanatory power of individual and societal factors since multi-channel data from a single population is accessible. The researchers discover that the most revealing measures of performance are based on social links, and that network indicators outperform individual traits in terms of model performance. Among individual traits, class attendance is the most important predictor in their findings show that considerable homophily and/or peer effects exist among university students.

Research Gap

Most of the existing research is considered based on the social network, usage of the internet, language, and handwriting patterns to identify personality. But in our study, we considered human personality behaviors in humans' day-to- day lives.

Furthermore, the data set we used was obtained through a questionnaire. In other recent research, the information has been obtained by observing the posts, links, and text patterns in social media networks. The information obtained from the observer may vary depending on the information seeker's state of mind, knowledge, and other factors. It may affect the information received. But through the questionnaire given to the respondent, the information can be obtained directly from the person. Therefore, the results

obtained from our study are more accurate than other study results.

Previous research used one or two classification algorithms in their approach. We increased it to six individual algorithms and also combined five algorithms using an ensemble learning algorithm to improve the results.

METHODOLOGY

The suggested automatic personality classification system applies specific data mining techniques to categorize the

personality type according to human's behavior. With the guidance of the suggested model, user personality can be determined using answers given by the people. This system evaluates user characteristics and behaviors, and then creates its own patterns that assist anticipate the user's personality and categorize all users into distinct groups.

The proposed research is useful for forecasting peoples' personalities. Following Figure 2 shows the proposed approach for the current study.

Figure 2: Proposed approach

Data Collection

Apply Classification Techniques

Performance Evaluation

Data Pre-processing

Data Splitting

DATA COLLECTION

This was done using the secondary data set, which was received from the Kaggle website (Kaggle, 2022). The proposed methodology uses the responses from the

questionnaire that the participants provided. There are 62 questions in the survey. Those are regarded as attributes. The top 34 attributes are chosen after the attributes are ranked using the information gain ranking algorithm in Waikato Environment for Knowledge Analysis (WEKA) data mining tool. Following Table 1 shows the 34 attributes.

Table 1 Attributes of personality

Attributes of Personality		
You frequently make new friends	You appreciate witnessing heated debates	You are frequently the one who makes contact with acquaintances and starts events in your social circle
You are still troubled by faults you made in the past	Your moods can vary dramatically	It's easy to feel like you want to cry when you see other people crying
Even under intense pressure, you typically maintain your calm	You frequently find yourself taking action at the very last minute	You are more in charge of your emotions than the other way around
You would rather complete one assignment entirely before beginning another	You typically choose to be with people rather being by yourself	Your own work style is more similar to random bursts of energy than deliberate, regular efforts
It is easy for you to approach someone you find fascinating and start a discussion	It's simple to relate to someone whose experiences diverge greatly from your own	If your job required you to work alone most of the time, you would adore it
You tend to follow your intellect more often than your heart	You do not frequently question your decisions	You are drawn more to noisy, energetic locations than to quiet, private ones
You hardly ever give thought to how you come across to new acquaintances	You like visiting art galleries	You frequently feel overburdened
You enjoy reading and watching books and movies that force you to conceive of your own conclusion	You enjoy making a daily to-do list	You spend a lot of your free time researching a variety of arbitrary subjects that catch your attention

You have so many interests that it can be challenging to decide what to explore next	You try to avoid making calls	Frequently, a backup plan for a backup plan is made
In group settings, you resist taking on leadership responsibilities	You find things that are regarded controversial to be incredibly intriguing	You actually rarely make an effort to introduce yourself at social gatherings; instead, you choose to converse with people you already know
You believe that if people relied more on reason and less on emotion, the world would be a better place	You find deadlines difficult	You have a sensitive nature
You could start to question your general knowledge and talents after making even a tiny error		

In the original data set, there were 16 personality types considering their behaviors. In our study, depending on their personality traits, the personality types were condensed to 5 types.

- *The Supervisor* - Extraverted, sensing, thinking, and judging are its initials This personality type is characterized by a person who feels energized by being near people (extroverted), who focuses on facts and information rather than concepts and ideas (sensing), who uses logic and reason to make decisions, and who values planning and organization over dynamic and unplanned (judging) (Owens, 2012).

- *The Commander* - Extraverted, intuitive, thinking, and judging are its initials. This kind of personality is characterized by someone who is energized by social interaction (extroverted), prefers thoughts and conceptions to facts and information (intuitive), basing judgments on reason and logic (thinking), and likes to be planned and arranged as opposed to fluid and spontaneous (Judging) (Owens, 2012)

- *The Inspector* - Its explains introverted, sensing, thinking, and judging. This personality type depicts someone who finds energy in solitude (Introverted), likes facts and details to ideas and hunches (Sensing), based their judgments on rationality and logic (Thinking), and values planning and organization above being impulsive and adaptable (Judging) (Owens, 2012)

- *The Doer* - Extraverted, sensing, thinking, and perceiving is what it stands for. This personality type is characterized by extraversion (being energized by other people), sensing (concentrating on information and specifics rather than concepts and ideas), thinking (making choices based on reason and logic), and preference for spontaneity and flexibility over planned and organized behavior (Perceiving) (Owens, 2012).

- *The Idealist* - Introversion, intuition, feeling, and perception make up this type. This is introverted, intuitive, feeling-based, and focused on ideas and concepts rather than details and facts. Additionally, they are more likely to be unplanned and flexible than organized and rigid (Perceiving)(Owens, 2012).

Following Figure 3 shows the summary of the five personality types.

Figure 3 personality types

Pre-processing

Before putting the data into model training, through data pre-processing, the initial dataset is changed. into a useful and typical dataset to improve data quality and prevent dirty data. The pre-processing procedure entails ranking the attributes. The dataset consists of responses from 59999 individuals to the questionnaire. The questionnaire included 62 questions as attributes. As well as in original data set focused on 16 target variables as personality types. From these 62 original data sets the top 34 attributes are chosen after the attributes are ranked using the information gain ranking algorithm. From the 16 personality types selected 5 personality types after studying those personality types. The 5 major and common personality types were selected here. Based on those 5 personality types, 200 data were randomly

selected for each personality type. Finally, a total of 1000 datasets were applied to the model.

Classification

Using the WEKA data mining tool, the classification process is applied to the pre-processed data set. The prediction model is constructed in order to identify personality traits. The algorithms such as Random Forest, Naive Bayes, Decision Tree (J48), Logistic, SVM, and MLP were all applied to the data set. The 5-fold and 10-fold cross-validation is used in order to validate of the classification model.

- *Random Forest* - Using their average for classification and majority vote for regression, it constructs decision trees from various data. The Random Forest technique's capacity to handle data sets with both continuous variables, as in regression, and categorical variables, as in classification, is one of its most crucial aspects. (Sruthi, 2021).

- *Naïve Bayes* - It is a classification method built on the Bayes Theorem and predictor independence. The premise behind a Naive Bayes classifier is that the presence of one feature in a class has no influence on the presence of any further features. The Naive Bayes model is a very useful tool for very large data sets and is simple to construct. Naive Bayes is well renowned for doing better than even the most sophisticated classification approaches, in addition to being simple. (Saini, 2021b).

- *Decision Tree* – A decision tree, where the internal node of the tree represents attributes and A class label relates to the leaf node.(Sharma, 2021).

- *Logistic* - Can be applied to model a class or event's probability. When the result is binary or dichotomous and the data can be separated linearly, it is used. (Saini, 2021).

- *SVM* - Each data point is represented as a point in n-dimensional space by the SVM method, and the value of each feature corresponds to the value of a certain coordinate. Simply explained, Support

vectors are each observation's coordinates. (Ray, 2017).

- *MLP* - MLP needs several parameters to accommodate multidimensional input since it aims to recall patterns in sequential data. (Pillai, 2020).

- *Ensemble Learning* - By combining the predictions from different models, it is a comprehensive meta-machine learning technique that seeks to improve predictive performance. (Brownlee, 2020)

RESULTS & DISCUSSION

The Kaggle secondary dataset (Kaggle, 2022), which contains data from 1000 people, provided the experimental data for this work. The five personality types are utilized to determine the personality. Utilizing the WEKA data mining tool, the system's performance had been assessed. It is proposed to employ accuracy, precision, recall, and f-measure as assessment metrics and the lowest error rates are calculated using MAE (Mean Absolute Error) and RMSE (Root Mean Square Error).

The processed dataset was split into 90% training and 10% test sets using 10-fold cross validation method. In addition, we obtained comparison between 5-fold cross validation with the 10- fold cross validation and compared five combination rules in ensemble learning algorithm. The test platform featured Microsoft Windows 10 on a computer with an Intel Core i5-8250U processor clocked at 1.60GHz and 4GB of RAM.

Confusion Matrix

The other evaluations were based on the confusion matrix results. The confusion matrix values for the seven machine learning techniques are shown in Table 2.

Here, *FP* is the quantity of actual negative cases that the classifier divides into positive ones and *FN* is the quantity of actual positive instances that the classifier divides into negative ones. *TP* is the number of actual positive instances in a batch of data that the classifier has identified as positive cases, *TN* is the total number of actual negative cases that the classifier has classified as negative cases, and *FP* is the quantity of actual negative cases that the classifier divides into positive ones (sensors).

Table 2 Confusion matrix values

Classification Algorithms	Confusion Matrix			
	TP	FP	FN	TN
Ensemble Learning	33	40	82	845
SVM	81	87	119	713
Naïve Bayes	84	90	134	692
Random Forest	38	34	148	780
Decision Tree	185	225	15	575
Logistic	62	109	186	643
MLP	90	98	108	704

Accuracy of Classification Algorithms

The accuracy of the classification algorithms on the identifying personality traits are observed and discussed in

this section. Equation (1) illustrates the calculation of classification accuracy

$$Accuracy = \frac{TP + TN}{TP + TN + FP + FN} \qquad (1)$$

Figure 4 lists outcomes for accuracy of the each and every classification algorithm.
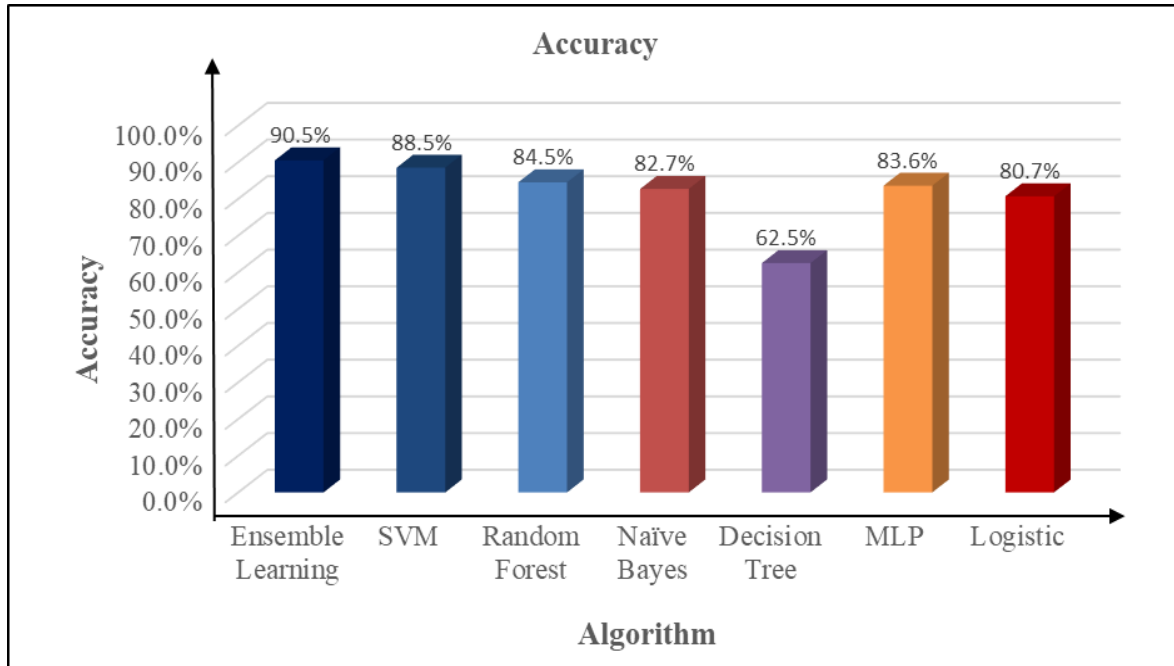
Accuracy

Figure 4 Accuracy of the algorithms

Precision, Recall & F-measure Values

The F1 score was also used to evaluate how accurate the classification model was. It took into account the classification model's precision and recall, This may be considered a harmonic average of the model's recall rate and accuracy.

The following equations (2), (3), and (4) detail the computations for the metrics of precision, recall, and F-measure for each of the seven methods.

$$Precision = \frac{P_s}{P_x} \qquad (2)$$

$$Recall = \frac{P_s}{P_{stx}} \qquad (3)$$

$$F_{measure} = \frac{2 * Precision * Recall}{Precision + Recall} \qquad (4)$$

Here, *Pstx* is the total number of relevant members that comprise the specified-cluster in the corpus, *Px* is the total number of members that comprise a specific cluster, and *Ps* is the total number of relevant members that comprise a particular cluster.

Following Table 3 shows the evaluation results for seven classification algorithms.

Table 3. Evaluation results for precision, recall & f-measure

Classification Algorithm	Precision	Recall	F-measure
Ensemble Learning	0.905	0.905	0.905
Naïve Bayes	0.830	0.827	0.827
SVM	0.885	0.885	0.885
Random Forest	0.846	0.845	0.845
Decision Tree (J48)	0.626	0.625	0.625
Logistic	0.807	0.807	0.807
MLP	0.836	0.836	0.836

MAE & RMSE Error Values

We determined the MAE and RMSE for each of the seven algorithms, as follows in (5) and (6).

$$MAE = \frac{1}{T} \sum_{x=1}^{T} | p_{vx} - M_{vx} | \qquad (5)$$

$$RMSE = \sqrt{\frac{1}{T} \sum_{x=1}^{T} \left(p_{vx} - M_{vx,} \right)^2} \qquad (6)$$

Following Figure 5 and 6 shows the values for lowest error rates for seven classification algorithms.
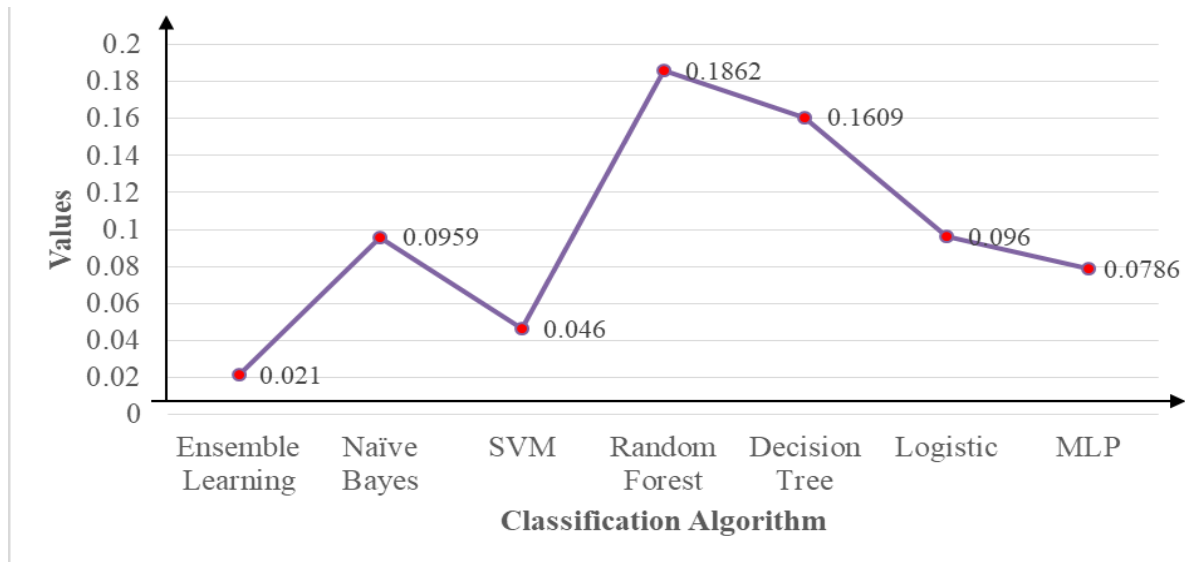
Figure 5 MAE values
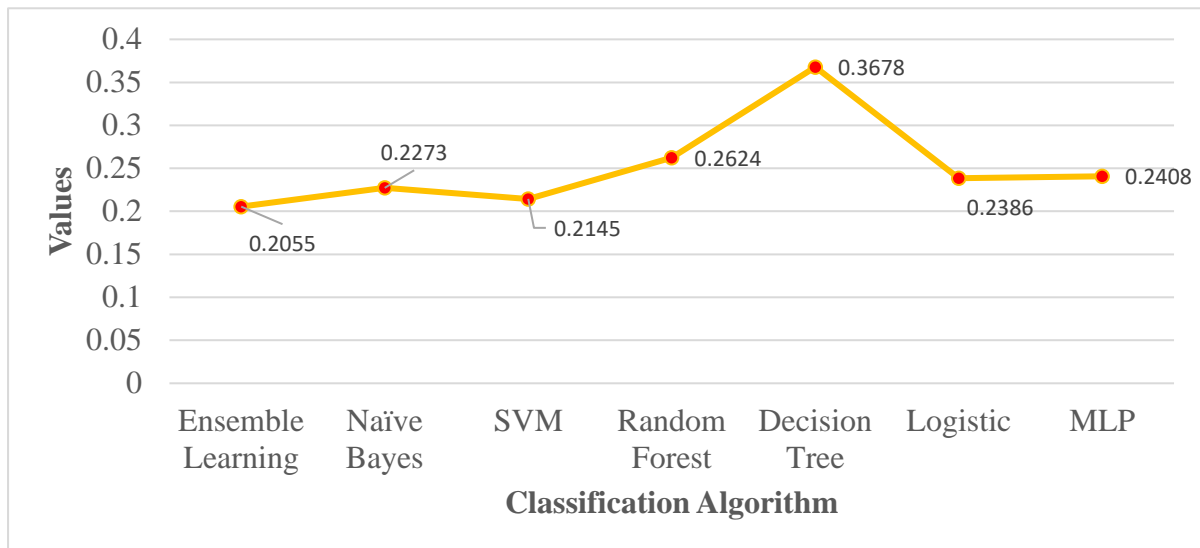
Figure 6 RMSE values

5-fold Cross Validation vs 10-fold Cross Validation

Both 5-fold cross validation and 10-fold cross validation were employed in our research experiment. Table 4 and 5 display the accuracy, precision, recall and f-measure results for both cross validations.

Table 4 Accuracy for 5-fold vs 10-fold cross validation

Fold	Ensemble Learning Algorithm		Accuracy
	Test Data	Training Data	
10	10%	90%	90.5 %
5	20%	80%	85.8 %

Table 5 Values for precision, recall & f-measure for 5-fold vs 10-fold cross validation

Fold	Ensemble Learning Algorithm		Precision	Recall	F-measure
	Test Data	Training Data			
10	10%	90%	0.905	0.905	0.905
5	20%	80%	0.858	0.858	0.858

Combination Rules of the Five Machine Learning Algorithms

The five algorithms with highest accuracy are used for the ensemble learning method. Namely. SVM, Random Forest, Naive Bayes, MLP and Logistic classification algorithms are used. The accuracy results for each combination rule used in the Ensemble Learning algorithm are shown in Table 6.

Table 6 Accuracy of combination rules

Combination Rules	Accuracy
Average of Probabilities	85.8%
Product of Probabilities	67.2%
Majority Voting	90.5%
Minimum Probability	67.2%
Maximum Probability	81.7%

DISCUSSION

We show and evaluate the classification algorithm findings on the issue of classifying personality traits. 10-fold cross-validations were used throughout testing. From the individual algorithms, SVM had the highest accuracy of the six examined algorithms in the cross-validation testing, with an average accuracy of 88.5% as shown in Figure 4. In the second experiment, after combining five classification algorithms with highest accuracy, using the ensemble learning method whereby Vote algorithm performed the highest accuracy of 90.5% than SVM.

Table 3 represented the performance metrics of the seven classification algorithms. This confirmed that the ensemble learning algorithm is the best classification algorithm, because, the precision (0.905), recall (0.905), and f-measure (0.905) values of the ensemble learning obtained the highest values. The lowest error rate (MAE – 0.021 & RMSE- 0.2055) was also obtained by the ensemble learning algorithm. Figures 5 and 6 illustrated it. Another experiment of this research is compared 10-fold cross-validation with 5-fold cross-validation. Table 4 and 5 shows the accuracy and performance matrix for cross-validation methods. From that 10-fold cross-validation showed the highest accuracy and best performance matrix.

The special feature of the Ensemble Learning algorithm is combination rules. In this study, we experimented with five combination rules in Table 6. From that majority voting combination rule performed best at 90.5%. When a model uses majority voting, it forecasts (votes), with the final forecast being the one it garnered a majority of the votes for each test case. (Demir, 2016).

CONCLUSION

This article is based on the information of personality behaviors and characteristics of the human. Our main objective is to determine and categorize people's personality traits in many sectors based on their behaviors. The main conclusion of this study is Ensemble Learning showed the best accuracy with the highest values for precision, recall, and f-measure using 10-fold cross-validation. According to the evaluation results, the Ensemble Learning algorithm is the best way for predicting human behavior. It also demonstrates that combining such algorithms and generating predictive findings for future forecasts is more effective than using individual algorithms. After collecting information about a person, we can apply the collected data to this model. Then we can get an insight into which personality type he/she belongs to. That way, they will be able to identify their personality traits and choose fields related to them. They can create the environment they need for their career path as well as their life in society. Also, after studying another person, we can find out which personality type that person belongs to.

We intend to explore this approach with deep learning techniques by increasing the size of the data set. And also, expected to enhance the personality data types and personality attributes for more evaluations.

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A Systematic Review of Sources of English Language Anxiety

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Abstract

Research on sources of language anxiety (LA) of undergraduates specifically when they engage in speaking activities has generated a plethora of discrete findings. An apparent gap is that these findings have not been used to inform a coherent framework where various sources of LA are identified and properly grouped. Such a framework is important for developing proper interventions to manage LA effectively in English as a Second Language (ESL)/English as a Foreign Language (EFL) contexts. This paper utilized a systematic review methodology to examine the key studies published from 2015 to 2020 on sources of LA in ESL/EFL contexts. When assessed against the inclusion/exclusion criteria, five of the 121 studies identified were selected to be included in the systematic review. The review revealed a number of anxiety sources that emerge specifically when students engage in oral performance. These were categorized under three main headings: (i) learner-specific, (ii) in-class, and (iii) out-of-class. It further highlighted the importance of out-of-class sources in ESL/EFL contexts and how they have been neglected and underrated in the literature specifically in defining LA. Hence, it is expected that this review will advance the understanding of LA, especially regarding LA in socio-culturally complex ESL/EFL contexts. Such a comprehensive understanding of the sources of LA is fundamental in the reconceptualisation of a coherent framework to successfully address it.

Keywords: English as a Foreign Language, English as a Second Language, Language Anxiety, Systematic Review, University Students

INTRODUCTION

Language learning generates a range of positive and negative emotions in learners (Shao et al., 2020), and these emotions are particularly evident in second and foreign language learning (Toyama & Yamazaki, 2021). The most researched emotion in the field of second language acquisition (SLA) is language anxiety (LA) (Gregersen et al., 2014), with research on LA having gained considerable momentum since the latter part of the 1980s.

Early examples of research into LA perceived it as a negative emotion that is confined to the language classroom. It was defined as "a distinct complex of self-perceptions, beliefs, feelings, and behaviours related to classroom language learning arising from the uniqueness of the language learning process" (Horwitz et al., 1986, p. 128). In line with this classroom-confined perception of LA, the sources of anxiety identified by the early studies were mostly learner-specific and originating within the classroom (Dewaele, 2002; Jackson, 2002; Young, 1991).

Learner-specific factors such as learners' negative self-perceptions of their own language ability (Young, 1991), learners' expectations of their own failure (MacIntyre, 1999, 2017), learners' self-derogatory comparisons of themselves with their peers in the classroom (Gregersen, 2003), and learners' erroneous and unrealistic beliefs about language

learning (Young, 1991) significantly contribute to their LA. Moreover, self-factors such as self-esteem and self-confidence have been found to be closely associated with LA. In addition, several studies have postulated an association between LA and learners' varying personality traits. Learners who are introverted and shy are more prone to become anxious, for they lack the willingness to engage in oral communication that is vital for their language development (MacIntyre,1999). Perfectionists experience anxiety due to their disposition to overestimate the negative effect and the seriousness of their own mistakes. They feel overly sensitive to the evaluations of others (Luo, 2012). Learners with competitive personalities experience anxiety due to their tendency to compare themselves to peers in the classroom or to an idealised self-image (Bailey, 1983).

The anxiety sources that originate within the classroom are essentially related to the teacher, the teaching pedagogy, and the in-class social context. The teachers' erroneous beliefs about language teaching (Young, 1991), their harsh manner of error correction (MacIntyre, 2017), and clashes between the learning and teaching styles of the respective learners and teachers (Oxford, 1999) are some of the key teacher-related sources of anxiety. Also, any teaching pedagogy that involves learners speaking in the FL causes

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the highest anxiety level in language learners (Horwitz et al., 1986; Koch & Terrell, 1991; Young, 1991, 1992). A classroom that is characterized by hostility, competition, and peer-ridicule also contributes to learners' LA (Zhang & Zhong, 2012). Additionally, the power dynamics in the classroom between the teacher and the learners are influential in triggering learners' LA.

In addition to learner-specific and in-class sources of anxiety, recent studies have indicated a tendency to acknowledge sources of anxiety outside the classroom context (Khan, 2015; MacIntyre, 2017). For instance, it was found that the differing cultural factors and the importance ascribed by a society to English achievement contribute to learners' nature of LA (Horwitz, 2016). English is considered as a very important language due to its potential for better career prospects in both local and international job markets. This situation is very common in ESL (e.g., Sri Lanka, India, Bangladesh, Pakistan) and EFL (e.g., China, Japan, Thailand) contexts. The awareness of this importance itself creates pressure on learners to learn English. This pressure inevitably creates learners' LA (Cheng, 2008; Liu, 2006; Mak, 2011).

However, compared to the large number of studies concerning learner-specific and in-class anxiety sources, the out-of-class anxiety sources seem to have received scant attention in the research literature. The reason for overlooking the role played by the out-of-class anxiety sources could be better explained by using Braj Kachru's (1985) three concentric circles model of the English Language (cited in Hu & Jiang, 2011). Kachru explains the diffusion of English in relation to three concentric circles: the inner circle, the outer circle, and the expanding circle. The inner circle is represented by countries such as the United States of America, the United Kingdom, Canada, Australia, and New Zealand, where speakers use English as their first or native language (ENL). The outer circle is represented by countries that were formerly colonized by the British Empire, and includes countries such as India, Sri Lanka, Pakistan, Singapore, Malaysia, Ghana, and Nigeria, where English is institutionalized and often used as a second language (ESL). The expanding circle includes countries where English does not hold any historical or institutional value but is widely in use due to its value as the world's lingua franca. China, Japan, Russia, Korea, Turkey, and Saudi Arabia are some countries in the expanding circle. While LA has mostly been related to learners in second language contexts (MacIntyre & Gardner, 1994), the majority of LA studies have been traditionally conducted in inner circle countries. Unfortunately, the former colonial masters in the inner circle may not be able to perceive how the post-colonial nations still grapple with language identity issues, or appreciate the subtle difficulties faced by ESL and EFL speakers in the outer and expanding circles, due either to lack of exposure to the various highly influential out-of-class sources or underestimation of the weight of the role these sources play in producing LA. As a result, while research in the inner circle has discussed in detail the learner-specific and in-class anxiety sources, there has been a failure to discuss the out-of-class anxiety sources in detail, and the items that recognize the influence of out-of-class sources have been ignored while developing instruments to measure LA. For instance, the popular LA measurement, the Foreign Language Classroom Anxiety Scale (FLCAS), "does not even include items eliciting anxiety triggers that people within particular cultural groups might experience" (Horwitz, 2016, p. 73). Thus, the instruments, concepts, and

definitions developed in the inner circle about the language anxiety of learners in the outer and expanding circles lack a crucial in-depth discussion of out-of-class anxiety sources. This lack of focus on out-of-class anxiety sources provides the impetus for this study. Arguably, it is when learner-specific, in-class, and out-of-class anxiety sources are viewed as interrelated and interdependent anxiety sources that one can gain a comprehensive understanding of LA. As mentioned earlier, due to the complex dynamics related to the English language and its speakers in ESL/EFL contexts, it is apparent that anxiety sources of language learners in such contexts may vary from that of other contexts (e.g., Western countries). Therefore, understanding anxiety sources specific to learners in ESL/EFL contexts is essential prior to devising and designing strategies and interventions to successfully manage it. Hence, this systematic review will provide important information to ESL/EFL practitioners, curriculum planners, and policy makers on sources of LA. This knowledge will help them devise methodologies, interventions, and strategies to manage language learners' LA and improve English language learning and teaching in ESL/EFL contexts.

Of note, LA has mostly been associated with the speaking skills of the students (King & Smith, 2017; Young, 1990) since speaking in a second/foreign language is regarded as the highest anxiety-provoking skill compared to anxiety over other language skills (Gregersen & MacIntyre, 2014; Horwitz et al., 1986). Added to that, several lines of research suggest that university students experience higher levels of anxiety compared to those who study in high or junior schools (Bailey, Onwuegbuzie and Daley, 2000; Dewaele, 2007; Donovan and MacIntyre, 2005). Hence, this systematic review aimed to answer the following research question:

> What are the main sources of language anxiety in ESL/EFL learners at universities, in particular when they engage in speaking in English?

The following sections describe the methodology used for the systematic review, report the major findings, and conclude with a reconceptualisation of LA in which all of the relevant sources of LA are represented.

METHODOLOGY

This systematic review is informed by the guidelines of Toyama and Yamazaki (2021), Siddaway et al. (2019), and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Moher et al., 2009).

Literature Search

Utilizing two online databases, Eric and Scopus, a systematic search was performed to locate studies relevant to sources of LA in undergraduates. Search parameters were developed using nested clauses, truncation, and the Boolean operators AND and OR. The parameters were developed according to the four concepts identified in the research question as follows:

1. ("English as a second language" OR ESL learn* OR "English as a foreign language" OR EFL learn* OR English) anywhere AND

2. ("language speaking anxiety" OR "communication apprehension" OR speaking anxi* OR oral language anxi* OR speech anxi* OR "willingness to communicate" OR "WTC") anywhere except full text AND

3. ("higher education students" OR "university students" OR "adult students" OR "undergraduate students") anywhere except full text AND

4. ("sources" OR "factors" OR "causes" OR "reasons") anywhere.

The keywords in the second and the third parameters were searched 'anywhere except full text' whilst the keywords in the first and the fourth parameters were searched 'anywhere' in the article. As this review mainly focused on LA of undergraduates, especially when they engage in speaking activities, it was of paramount importance that the articles selected discussed the themes in the second and the third parameters as key aspects of their studies. Assuming that the key points of any study would appear in the title and/or abstract and/or keywords, we searched for language speaking anxiety and equivalents and undergraduates and equivalents 'anywhere except full text' of the articles. Further, we did not include 'out-of-class anxiety sources' as a separate search term as we were unaware of any study that has distinguished or discussed out-of-class anxiety sources in detail. The search was performed in early March 2021 to source articles published in peer-reviewed journals in English within the last five years, that is from January 2015 to December 2020.

Inclusion and Exclusion Criteria

In order to identify studies that address the research questions (RQ), we established the following inclusion criteria as depicted in Table 1. Articles that did not meet the conditions mentioned were excluded from the review.

Table 1: Inclusion criteria for selection of journal articles

Category	Inclusion criteria
Study type	Empirical research
Study design	Qualitative or mixed methods
Study description	Related to ESL/EFL learners
	RQs are related to sources of language speaking anxiety
Participants	Undergraduates and/or university ESL/EFL teachers
Accessibility	Full text is available

Data Extraction

In the initial search of the databases, 121 studies were sourced: 112 from Eric and nine from Scopus. After removing one duplicate from Eric, 120 studies remained. To evaluate the relevance of the studies to the research question, the first screening process involved a review of their titles and the abstracts, which resulted in 83 studies being excluded: 80 from Eric and three from Scopus. The remaining 37 studies with full text were assessed against the inclusion/exclusion criteria to check the eligibility to be included in the review. In these 37 studies, 16 were found to be purely quantitative, the research questions in six were not related to language speaking anxiety, and full texts were not available in four studies. In addition, some were not related to ESL/EFL contexts and others concerned neither undergraduates nor university ESL/EFL teachers as participants. Five studies were eventually included for the review and Figure 1 illustrates the flow of data extraction via the PRISMA flow diagram (Moher et al., 2009).
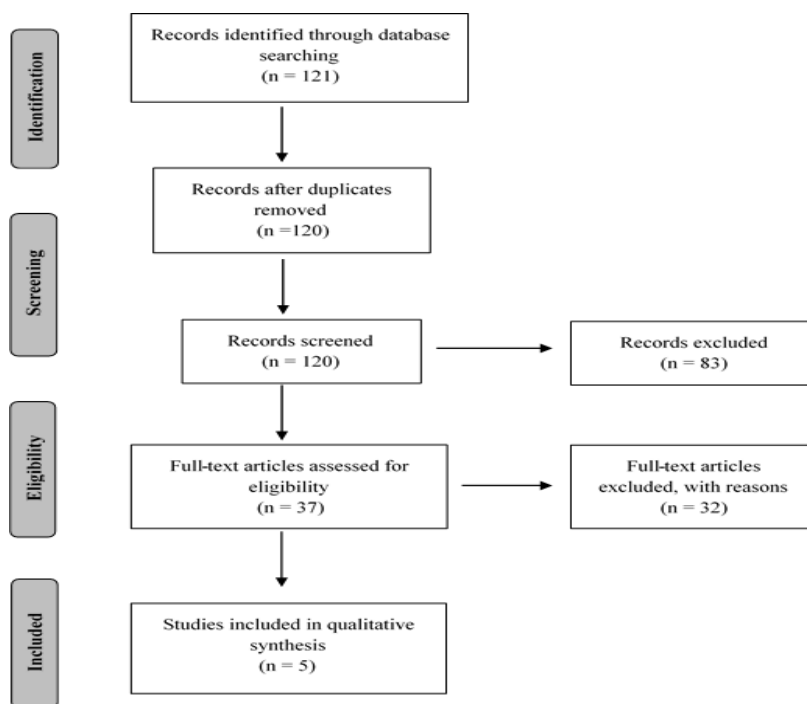

Figure 1: Selection process based on PRISMA flow diagram (Moher et al., 2009)

Extracted data were documented under the column headings of publication information, research design, research questions, participants, and major findings. The included studies, as presented in Table 2, are arranged in alphabetical order by surname of the first author.

Publication information	Research design	Research questions related to sources of LA	Participants and context	Major findings related to sources of LA
Ahmed (2016)	Qualitative	What are the factors that contribute to speaking FLA in Kurdish university students? (p. 101)	30 second and third-year students at a Kurdish university named Soran	Sources of language speaking anxiety: Fear of negative evaluation, fear of making mistakes, poor linguistic ability, lack of preparation, teacher's unsupportive nature and lack of individual attention
Akkakoson (2016)	Mixed-methods	What are the levels of speaking in-class anxiety among students in the English Conversation course? What are the students' sources of speaking-in-class anxiety? (p. 65)	282 Thai students	Level of in-class speaking anxiety is moderate Sources of language speaking anxiety : (i) Individual (limited vocabulary, self-confidence, grammar/ accuracy, attitudes towards English, fear of negative evaluation, test-anxiety); (ii) Environmental (exposure to English outside the classroom); (iii) Educational (poor English knowledge).
Alnahidh and Altalhab (2020)	Mixed-methods	To what extent do Saudi EFL university students experience FL Speaking Anxiety (FLSA)? What are the perceived sources that may contribute to Foreign Language Speaking Anxiety (FLSA) among Saudi EFL university students? (p. 58)	85 female Saudi EFL students at a university	In-class FLSA level is moderate Sources of FLSA in order: fear of making mistakes, forced participation, limited vocabulary, lack of practice, poor grammatical knowledge, unpreparedness, teacher's negative attitudes, and oral presentations
Effiong (2016)	Qualitative	How does the teacher's Appearance influence classroom atmosphere and FLA? What peer characteristics influence classroom FLA? (p. 137)	24 students from 4 Japanese universities	Sources of FLA: teacher's age, friendliness, tone of voice, and teacher's self-presentation, humor, collaboration, and competitiveness in the classroom, peer familiarity and gender
Khan (2015)	Mixed-Methods	What are the main causes of speech anxiety among these learners? How far the speech anxiety affects students' learning oral communication skills? (p. 49)	Students of HITEC University, Taxila, Pakistan QUAN-200 QUAL-10	Sources of speech anxiety: pedagogical, psychological, socioeconomic, linguistic, social and cultural Speech anxiety frightens the learners and negatively affect their self confidence which result in avoidance and less/lack of participation in English speaking activities

Table 2: Summary of the included studies for the review

RESULTS AND DISCUSSION

The present review focused on sources of LA with a special focus on undergraduates in ESL/EFL contexts. To the best of our knowledge, this is the first systematic review that concerns the sources that trigger LA in undergraduates in ESL/EFL contexts, in particular when they engage in speaking activities in the classroom.

The systematic database search identified five studies, consisting of two qualitative studies (Ahmed, 2016; Effiong, 2016) and three mixed-method research studies (Akkakoson, 2016; Alnahidh & Altalhab, 2020; Khan, 2015).

The main objectives of these five studies were to investigate the levels and sources of language speaking anxiety of ESL/EFL undergraduates in universities. The number of participants in the included studies ranged between 24 and 282. With the exception that some EFL postgraduate students and teachers were involved in Effiong's (2016) study, the participants in the other studies were studying in their first/second/third academic years at university. The participants were intermediate or advanced learners of English, as they had been learning English as a foreign language for several years prior to entering university. All the participants were from ESL/EFL contexts: Pakistan (Khan, 2015), Iraq (Ahmed, 2016), Thailand (Akkakoson,

2016), Japan (Effiong, 2016), and Saudi Arabia (Alnahidh & Altalhab, 2020).

Semi-structured interviews and questionnaires were utilised as the primary data collection instruments by four of the five included studies. Although these are commendable approaches to gathering data especially on a subtle psychological construct such as LA, it is important to bear in mind that both interviews and questionnares are self-report measures that may lead to biased responses. Only Effiong's (2016) sudy has used observations in addition to semi-structured interviews to gather data from the participants. The five studies revealed several sources of LA. The most striking finding across the studies was recognising the role played by the out-of class factors in evoking learners' LA. This finding and other major findings are presented next.

Out-of-class Anxiety Sources

Out-of-class anxiety sources mainly stem from the socio-cultural and socio-political factors in a country. These factors contribute significantly to forming the language attitudes and beliefs of a society, which, in turn, shape the attitudes and beliefs of ESL/EFL students and teachers and affect their classroom behaviour. For instance, a common feature in the majority of anxious ESL/EFL students is their unfavourable attitudes towards the English language (Akkakoson, 2016; Attanayake, 2019; Khan, 2015). These attitudes of the individual students could be attributed to the prevailing attitudes of the society towards English. On the other hand, it is the society that determines the value of a language: powerful versus powerless, prestigious versus lowly, or worthy versus worthless. The speakers of that particular language are also identified accordingly (Attanayake, 2019). This power of language can trigger LA in some students. Also, many post-colonial countries such as Pakistan and Sri Lanka consider English as a status symbol (Gunasekera, 2005; Khan, 2015). Hence, those who are fluent in English and use native-like pronunciation are considered "wealthy and talented" (Khan, 2015, p. 52), which results in the people who are not proficient in English experiencing an inferiority complex that triggers their LA (Khan, 2015). Thus, the perception of English as a status symbol rather than a tool of communication makes students anxious when speaking English. The differences in social status of the interlocutors also have a significant influence on the LA of some students (Hashemi, 2011; Pica, 1987, cited in Khan, 2015; Tanveer, 2007). The study conducted by Ahmed (2016) in Iraq showed learners with high English proficiency were considered better students and had access to better jobs in the labour market. In such a society, students are pressured to learn English to make themselves competitive candidates in the labour market. This high importance given to English achievement could significantly influence students' nature of LA (Horwitz, 2016). Therefore, the socio-cultural dynamics of power, status, and the importance of English in the specific society should be carefully considered when discussing how attitudes lead to LA, for L2 attitudinal variations exist in learners, especially in the Asian region (Effiong, 2016).

Local and international politics along with the nuances of socio-cultural practices could also be a source of students' LA. For example, in Effiong's (2016) study, Japanese students' resentment towards Chinese students negatively influenced the intragroup interactions of the former. This resentment was largely a result of international politics. Additionally, the Chinese students' purpose for learning English was found to be different from that of Japanese students. Chinese students need to be proficient in English to be competitive in the international job market; hence, they are more motivated to learn the language than Japanese students, who lack this particular focus. Consequently, while the classroom behaviour of the Chinese students was motivated, the Japanese students had "poor L2 attitude and low L2 self-concept" (Effiong, 2016, p. 148), which in consequence made them reticent, especially while engaging in intragroup activities.

In-class Anxiety Sources

This review also revealed a number of in-class anxiety sources comprising some teacher variables, the teaching pedagogy, and the in-class social context. The teacher variables of teacher's dress, age, gender, friendliness, and tone of voice have been found to be highly instrumental in arousing students' LA. The teacher's dress code was identified to have the potential to determine the nature and the strength of the relationship students have with the teacher (Effiong, 2016) and hence can directly influence students' LA. Some of the students and teachers in Effiong's (2016) study readily agreed that the more formal the dress, the higher the anxiety levels generated in students. Teachers who were formally dressed were seen as "scary, unapproachable and less friendly" (p. 141). The students further mentioned that they preferred teachers of the opposite gender, for they believed they could build better interpersonal relationships and therefore experience reduced levels of LA with opposite-gender teachers than with same-gender teachers. Further, teachers' strict, unfriendly appearance in the classrooom using a formal, "business-like tone" of voice (Effiong, 2016, p. 144) and lack of individual attention, support, and compassion for students (Ahmed, 2016; Alnahidh & Altalhab, 2020) were identified as anxiety-provoking teacher variables.

Teacher's attitudes and classroom behaviour may also contribute to making the in-class social context anxious. For example, "evaluative and stressful classroom settings" (Khan, 2015, p.51) where students are always being judged and assessed and a teacher who is unsympathetic towards students' errors and corrects them in a very rough manner inevitably generates LA (Young, 1991; Zhang & Zhong, 2012). Consistent with the literature (MacIntyre, 2017; Young, 1991), Alnahidh & Altalhab (2020) found teachers' mocking and negative attitudes towards students' errors as another major reason for LA. Not only teachers, the attitudes and behaviour of peers indubitably influence students' LA. The peers contribute to the LA of each other when they treat language mistakes as a point for humiliation (Khan, 2015), which explains the reason for the participants in Ahmed's (2016) and Alnahidh and Altalhab's (2020) studies mention the fear of making mistakes in front of the peers as their strongest source of anxiety. These results are in accord with the ideas of Gregersen (2003) and Price (1991) who reported fear of being ridiculed by others as the main anxiety trigger for their participants.

Additionally, teaching methodologies that require the implementation of different in-class speaking activities produce LA in students. In line with the literature (Price, 1991; Young, 1990; Koch & Terrell, 1991), Saudi undergraduates in Alnahidh and Altalhab's (2020) study reported oral presentations as the most anxiety-provoking in-class activity. Aggravating this, some teachers force students to participate in oral activities, which intensifies the situation. Several examples were found where students were not given enough time to prepare for such activities or

were asked to answer questions on the spot (Ahmed, 2016; Alnahidh & Altalhab, 2020; Khan, 2015). By their very nature, in-class speaking activities are anxiety-provoking, and lack of preparation and impromptu speaking tasks can rapidly elevate students' anxiety levels (Horwitz et al., 1986; Price, 1991; Young, 1990).

Collaborative activities that involve the opposite gender or unfamiliar and/or competitive partners also tend to evoke students' LA. More than half of the interviewees in Effiong's study (2016) reported they experienced high anxiety levels while sitting with unfamiliar or opposite-gender partners in pair-work activities. They also complained about the rising anxiety they experienced when they were grouped with more proficient international students.

Learner-specific Anxiety Sources

In addition to the in-class and out-of-class anxiety sources, learners' special personality traits and negative self-factors such as negative self-perception, low self-esteem, and lack of self-confidence have also been identified as anxiety triggers.
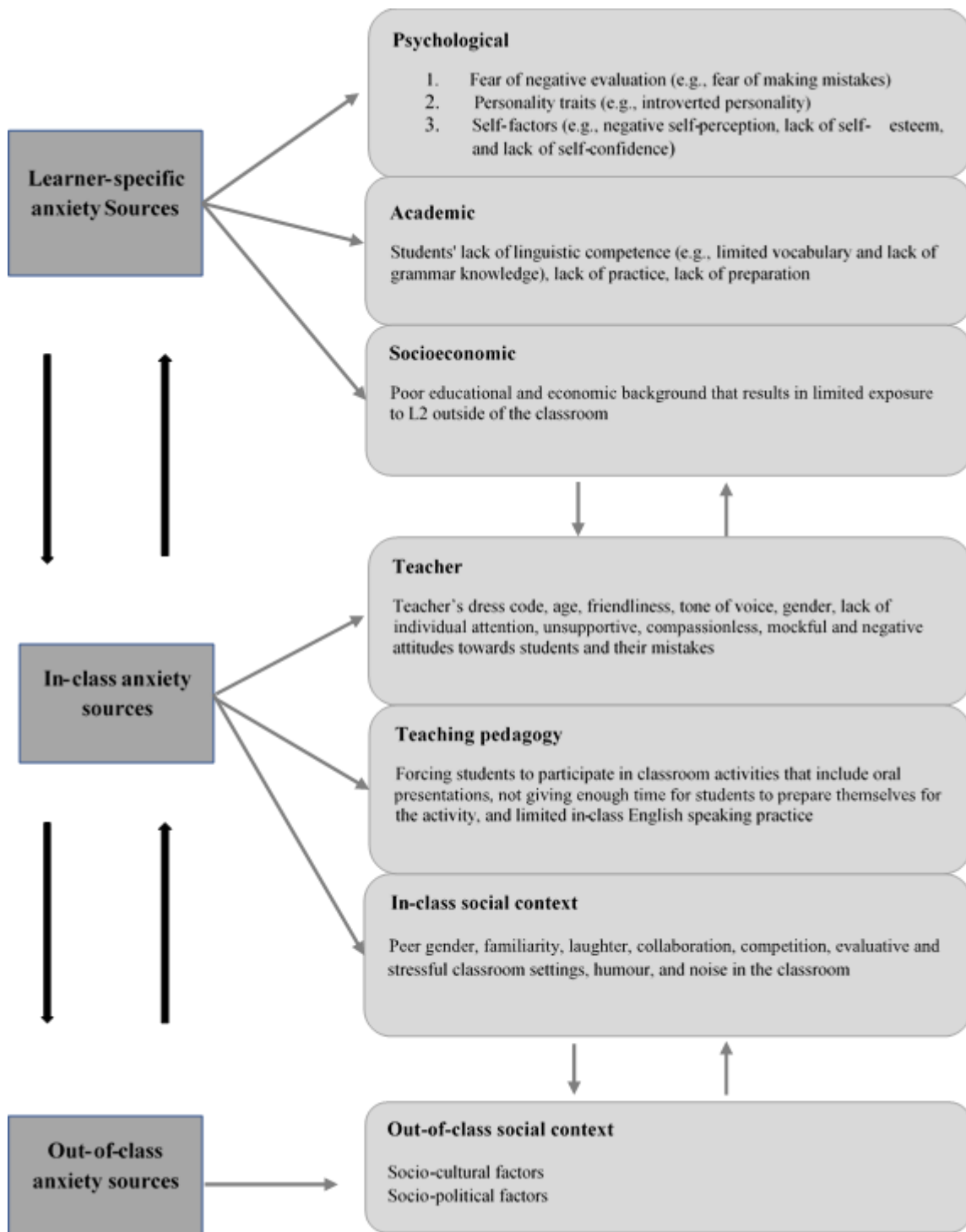
Students with introverted personalities may easily become anxious in contrast to less-anxious extroverted personality types (Khan, 2015). Further, a student's negative self-perception (Khan, 2015) and their expectation of failure contribute to LA. The tendency of anxious students to compare their performance in FL in a "self-underrated manner" (Zhang & Zhong, 2012, p. 28) with the performance of their peers increases their LA levels because comparisons essentially convince the students that they have weaker language skills compared to others in the class (Price, 1991). In Effiong's (2016) study, the Japanese students' comparison of themselves with their more proficient Chinese counterparts and consequent low self-concept and negative language attitudes triggered the LA of the Japanese students.

In accordance with the results of the previous studies that have demonstrated the influence of low self-esteem (MacIntyre, 2017; Young, 1990, 1991) and low self-confidence (Attanayake, 2019; Rubio, 2007; Tuncel, 2015)

on LA, Khan (2015) and Akkakoson (2016) also found these two self-factors to be highly influential sources of LA. Cohen and Norst (1989) claim that " [L]anguage and self are so closely bound, if not identical, that an attack on one is an attack on the other" (p. 61). MacIntyre (1999) corroborates this by stating that learning a language not only embarrasses and frustrates a learner, but also challenges their self-esteem and self-identity (MacIntyre, 1999). Self-esteem has been considered as the "single strongest and most consistent" correlate of LA (Daly, 1991, p. 8).

The economic and educational background of the student has also been identified as a reason for LA (Khan, 2015). Those who have a good economic background have access to rich educational opportunities where they are provided with an environment that is conducive to learning English. This boosted students' self-confidence while reducing their inclination to become anxious (Khan, 2015). This relates to one of the major problems that students in EFL contexts face: reduced exposure to English (Akkakoson, 2016; Khan, 2015). In the studies reviewed, English was not the dominant language in those contexts and native languages served the common purposes of everyday life and consequently these EFL/ESL students did not get enough opportunities to use English outside of the classroom. The reduced exposure to English along with their negative attitudes towards English (Akkakoson, 2016) made them highly vulnerable to anxiety, especially when they were expected to speak in English in the classroom.

All these different sources of LA may be organised as a taxonomy (Figure 2): (i) learner-specific anxiety sources, (ii) in-class anxiety sources, and (iii) out-of-class anxiety sources. First, learner-specific anxiety sources comprise psychological, academic, and socioeconomic anxiety variables. Second, some in-class anxiety sources involve the teacher, the teaching pedagogy, and the in-class social context. Third, the review identified several out-of-class anxiety sources that are shaped by the socio-cultural and socio-political features of a country.

Figure 2: Sources of LA identified from the included studies

Psychological

1. Fear of negative evaluation (e.g., fear of making mistakes)
2. Personality traits (e.g., introverted personality)
3. Self-factors (e.g., negative self-perception, lack of self-esteem, and lack of self-confidence)

Academic

Students' lack of linguistic competence (e.g., limited vocabulary and lack of grammar knowledge), lack of practice, lack of preparation

Socioeconomic

Poor educational and economic background that results in limited exposure to L2 outside of the classroom

Learner-specific anxiety Sources

Teacher

Teacher's dress code, age, friendliness, tone of voice, gender, lack of individual attention, unsupportive, compassionless, mockful and negative attitudes towards students and their mistakes

Teaching pedagogy

Forcing students to participate in classroom activities that include oral presentations, not giving enough time for students to prepare themselves for the activity, and limited in-class English speaking practice

In-class anxiety sources

In-class social context

Peer gender, familiarity, laughter, collaboration, competition, evaluative and stressful classroom settings, humour, and noise in the classroom

Out-of-class anxiety sources

Out-of-class social context

Socio-cultural factors
Socio-political factors

CONCLUSIONS

Notwithstanding the significant number of studies carried out on sources of LA over the past four decades, this systematic review is the first that has been undertaken on the sources of LA especially in undergraduates of ESL/EFL contexts. The review will make a significant contribution to the field of SLA by revealing anxiety sources specific to ESL/EFL contexts (learner-specific, in-class, and out-of-class). Contrary to the literature, it indicates that out-of-class anxiety sources are just as important as learner-specific and in-class anxiety sources and therefore should receive

appropriate consideration. In some ESL/EFL contexts, out-of-class sources can be even more influential than learner-specific and in-class anxiety sources (Khan, 2015). Understanding these potential sources of anxiety will help ESL/EFL practitioners identify students who experience LA while doing in-class speaking activities, which in turn will assist in providing solutions for effective management of learners' LA.

The systematic review points to the limitation in definitions of LA developed thus far, which fail to emphasise all the sources of students' LA. Horwitz et al. (1986) define FLA as "a distinct complex of self-perceptions, beliefs, feelings and

behaviours related to classroom language learning arising from the uniqueness of language learning process" (p. 128). This definition is restricted, for it failed to identify the social, cultural, and political dynamics that an individual brings into the class with himself/herself and viewed LA as stemming only from the uniqueness of the language learning process.

Similarly, Gregersen and MacIntyre (2014) define LA as "the worry and negative emotional reaction when learning and using a second language and is especially relevant in a classroom where self-expression takes place" (cited in Gkonou, Daubney, & Dewaele, 2017, p. 1). Although this definition has captured some important points, it is incomplete as it does not acknowledge the context-sensitive nature of LA, nor does it clarify whether the reaction was fixed or fluctuated over time. The fluctuating nature of LA over time was demonstrated by the study of Gregersen et al. (2014). A longitudinal study done by Piniel and Csizér (2015) also showed the complex dynamic quality of LA and the related variables.

To address the limitations, the systematic review provides a reconceptualization of LA by recognising the complex interactions of multiple potential sources of LA, as represented in Figure 2. We offer a definition of LA for ESL/EFL students as follows: LA is a transitory mental state that ESL/EFL learners experience when they respond to the situational demands of second/foreign language engagement amid the complex interactions of learner-specific, in-class, and out-of-class factors. This reconceptualisation of LA will convince theorists and researchers in the field of SLA to view LA from a different perspective which might result in a new line of empirical research based on ESL/EFL learners.

This review on sources of LA of undergraduates in EFL/ESL contexts has several methodological limitations. As we only selected studies published in English as journal articles, we do not claim our review is comprehensive; however, we do maintain that as the peer-reviewed articles were selected from two reputable academic research databases, our review is in a good position to address the research question and gain a state-of-the-art understanding of the sources of LA. However, given the limited number of studies synthesised in this review, a review that includes a larger number of studies and different types of literature is recommended to explore more out-of-class anxiety sources that may influence learners in different socio-cultural contexts.

Acknowledgment

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An Empirical Study of the Reasons for Client Dropouts from Contributory Pension Schemes of Sri Lanka Social Security Board

SLJSSH

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Abstract

The study attempts to explore the causes of client dropouts of the said pension schemes in the Sri Lanka Social Security Board (SLSSB) to identify the mechanisms to overcome the weaknesses in providing a successful pension scheme. The study employed the embedded mixed method from nine Grama Niladhari Divisions in Gampaha, Badulla, and Matale Districts. A purposive sampling method was used and primary data were gathered using simple observation, key-informant interviews, survey with questionnaires and in-depth interview methods; secondary data, using government reports and relevant literature; SPSS package, used in analyzing quantitative data; content analysis, used in analyzing qualitative data. The findings revealed that socio-economic factors such as gender, occupation, income, expenditure and the number of dependents significantly affect the client dropping out of the pension schemes. Furthermore, lack of proper awareness among both active and inactive members regarding the contributory pension and social security benefit schemes of SLSSB was also a key contributory factor to client dropouts; in terms of institutional inefficiency of SLSSB, lack of a proper follow-up process, incompetent record-keeping, misinformed recruitments, having inadequate staff also seen as contributing factors. The lack of proper awareness and information dissemination about the institution and its program to the general public has created a distance between the SLSSB and the contributors. Enhancing the quality of customer service and taking proper measures will reduce this distance minimizing dropouts and developing an effective pension scheme.

Keywords: Client Dropouts, Social Security, Sri Lanka Social Security Board.

1. INTRODUCTION

Social security, a basic human right, (ILO, n.d), is extended by society to its fellow members to warrant income security and attainability of welfare services, for the vulnerable sections of society (Nivedita, Hemavarneshwari, Mangala, & Subrahmanyam, 2015) International Labor Organization [ILO], 2006 has defined social security as "the set of institutions, measures, rights and obligations whose primary goal is to provide income security and medical care to individual members of the society". In simple terms the signatories agree that the society, a person lives in, should help them to develop making the most of all advantages offered to them in the country. This concept addresses the vast range of social problems like healthcare and income security protection for individual and household sector; (International Labour Conference [ILC], 2008:1). Only one in five people in the world have been covered the adequate social security coverage (Eriyagama & Rannan-Eliya, 2003).

As life expectancy rises, the population of the aged groups increases proportionally. This demographic change altered the structure of the population. In 2010, 8% of the world's population constituted the elderly population, which is expected to increase up to 19% by 2050. Despite Sri Lanka being a developing country, its older population grows fast due to its life expectancy (Vodopivec & Arunathilake, 2008). The 2012 census recorded Sri Lanka's elderly population as 12.4%, predicted to double to 24.8% in 2041. Consequently, the total dependency ratio is gradually increasing with a combination of child dependency and increased elderly dependency (United Nation, 2019), which will create an economic downturn in the future as the labor force is shrinking due to a lesser young population (Menike, 2015). However, this process is universal according to the demographic transition theory, western world underwent this scenario but implemented strong social security mechanisms to address the issues that emerged (Asian Development Bank [ADB], 2019) "In developed and undeveloped countries, older people face an array of vulnerabilities; among these is lack of income, health insecurity and the need for physical care" (Bloom & Mckinnon., 2013). In terms of Sri Lankan culture, caring for elders is family centered. However, currently, a significant collapse in old age support mechanisms is observed within

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the traditional society due to various factors resulting rise of the elderly population highlighting the need for social security for them. Reducing family support increases the state's responsibility to ensure the welfare of older persons.

Sri Lanka has introduced socio-economic and financial support—programs to address the needs rising aging population problem; the government pension scheme is the first formal scheme inaugurated in Sri Lanka to provide a security system for the aged population, representing a small percentage of the country (Menike, 2015). All government servants are required to contribute towards the "Widows" and "Orphans" pension scheme, which facilitates government servants over 60 years to enjoy a secure life without financial difficulties, which is covered a limited audience (Menike, 2015).

"*Sri Lanka provides a broad range of social security arrangements including pensions*" (Heenkenda, 2016:11). Currently, the following schemes are in place, Public Service Pension Scheme (PSPS), Public Service Provident Fund for public sector workers, Employees' Provident Fund (EPF), Employees Trust Fund for Formal Private sector workers (ETF), Farmers' Pension and Social Security Benefit Scheme (FMPS) (for farmers who eligible in the farming activities), Fisherman's Pension and Social Security Benefit (FSHPS) (for fisheries and Self-employed) and Persons Pension Scheme (for self-employed persons who have not eligible in government pension schemes) (Samarakoon & Arunatilake, 2015).

Furthermore, as a welfare state, Sri Lanka provides PinPadi, Elderly Allowances and Samurdhi for people under the poverty line especially (Menike, 2015:55). Retirement schemes within Sri Lanka were insufficient to meet the basic needs of the elderly (Gaminirathne, 2004); only 13% of the total population obtained permanent retirement plans as most Sri Lankans are self-employed Institute of Policy Studies [IPS], 2019). In both developed and developing countries, most social security programs were designed to be financed *predominantly* on the basis of contributions, in which, stable patterns of formal (regulated) employment are normally necessary for coverage. Yet, in many developing countries, stable patterns of widespread formal-sector employment have failed to materialize as was initially hoped in the middle decades of the twentieth century.

Thus, Sri Lanka Social Security Board was established by Act No.17 of 1996 to meet the needs of people unengaged in formal employment (Self- employment) informal sector, and other non-government employees – named "Samaja Arakshana Piyasa" of which sub-offices are maintained in all District Secretariats (SLSSB Annual report,2018), the primary objective being to provide social security to people without formal regulated employment and not entitled to government pensions when they are old (Eriyagama & Rannan-Eliya, 2003).

A total number of 715,013 has so far been enrolled in pension schemes at SLSSB and around 31508 people are actively receiving monthly pensions from SLSSB (SLSSB, 2020). Even in 2014, there were around 460,807 people entitled to retirement plans while 354,595 contributors remained inactive (Annual report, 2014). Sri Lanka Social Security Board tries to keep the membership active and to preserve their retirement but recently there has been significant dropping out from the pension plans.

Recently, many scholars have done research based on the insurance sector and lack of the research for contributory pension schemes. This study was conducted to investigate why people have been continuously dropping out of the pension plans of SLSBB. The findings of this study could be important for reviewing the existing pension schemes and improve them its maximum capacity.

2. LITERATURE REVIEW

2.1 Social Security

Social security is the protection that society provides to individuals and households to ensure access to healthcare and guarantees income security. It is defined in ILO conventions and UN instruments as a basic human right as one that a small proportion of the people on our planet actually enjoy. Broadly defined as a system of contribution-based health, pension and unemployment protection, along with tax-financed social benefits, social security has become a universal challenge in a globalizing world. Only 20 percent of the world's population has adequate social security coverage, while more than half lacks any kind of social security protection at all (ILO,2016). Those without coverage tend to be part of the informal economy, they are generally not protected in old age by social security and they cannot afford to pay their healthcare bill.

Social security was established as a basic human right in the ILO's Declaration of Philadelphia (1944) and its Income Security Recommendation, 1944 (No. 67). This right is upheld in the Universal Declaration of Human Rights, 1948, and the International Covenant on Economic, Social and Cultural Rights, 1966 (ILO,2016). However, only one in five people in the world has adequate social security coverage. In sub-Saharan Africa and South Asia, only an estimated 5% to 10% of the working population has some social security coverage. In countries in economic transition, Europe has the highest level of social security expenditure at nearly 25% of GDP, followed by North America at 16.6%. Africa has the lowest level at 4.3% of GDP. Covid -19 pandemic threatened the financial viability of social security systems in many developing countries. Lack of social security coverage is largely concentrated in the informal economies of the developing world, which are generally a larger source of employment for women than for men (ILO, 2016).

Social security has a powerful impact at all levels of society. It provides older people with income security in their retirement years. Children benefit from social security programs designed to help their families cope with the cost of education. For employers and enterprises, social security helps maintain stable labour relations and a productive workforce. And social security can contribute to social cohesion and to a country's overall growth and development by bolstering living standards.

2.2 Social Security and Sri Lankan Context

Sri Lanka's economy and society have experienced major structural changes in the past decades (ILO, 2016). According to International Labor Organization's country report on Sri Lanka (2016) following the transfer of power to elected governments in the 1930s, the country invested heavily in several initiatives to improve social protection and social security. Healthcare and education were made available to all through government taxation and direct provision of services. One important exception to this model of state-led financing and provision was the decision to maintain and continue with employer-provided social services for workers in the plantation sector, funded by access to plantation exports. The creation of these major social protection activities not only embedded the

democratic system in the country but also bolstered it during the various national crises, that occurred during 1971–2009.

Menike (2015) has explained that there is a long history of social security programs in Sri Lanka which runs back to the pre-independent era. Dutch and British colonizers initiated various programs to provide social service aid for orphans, helpless aged people and beggars. These rulers, who identified the significance of the said welfare services, instituted special commissions and took action with more emphasis on arriving at timely decisions.

The country faces significant challenges if it aspires to complete the development path it set itself in the late–1970s, match the economic growth of other Asian economies, and provide its people with the high living standards they desire. In particular, the economy needs to substantially deepen industrialization and the export sector (Menike, 2015). It also has to do this whilst facing the negative and insidious impacts on external competitiveness that arise from the large flow of remittances from many Sri Lankans, chosen to work and live outside the country. At the same time, declining population growth and population aging mean that the workforce is no longer expanding, placing a greater premium on improving labour productivity, reversing the export of workers, and increasing labour force participation rates in order to raise living standards (Menike, 2015).

These challenges imply that the country will need to focus on improving social conditions, and social protection in employment, and to ensure that all Sri Lankans are afforded a standard living status.

2.3 Social protection for the older person

Figure1: Social Protection Mechanism
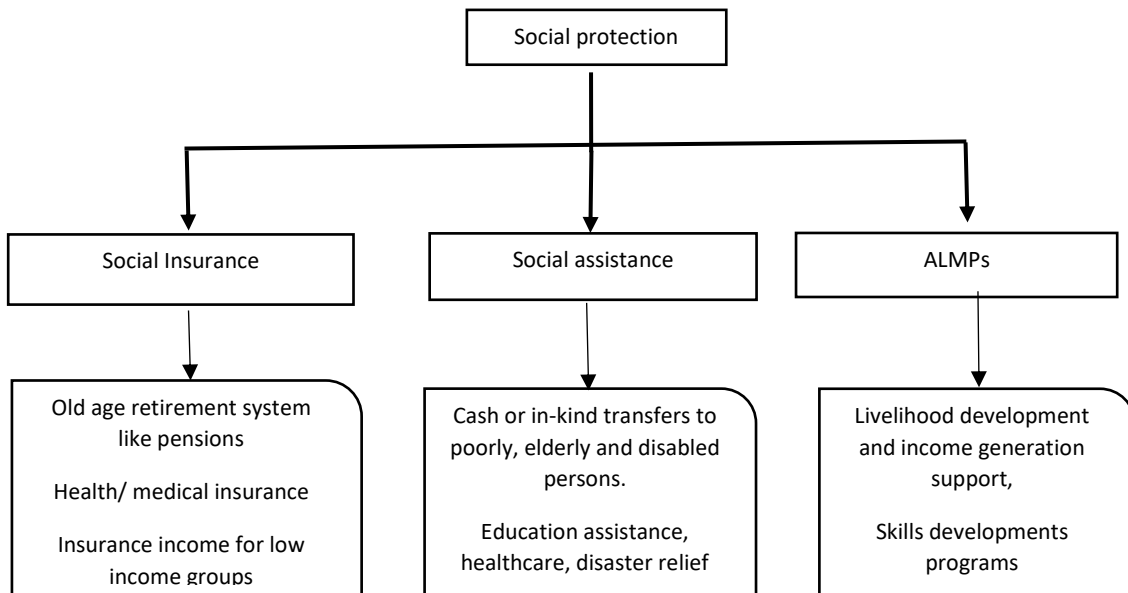
Source: Thilakaratne and Jayawardhane, 2015

Thilakaratne and Jayawardhane (2015:9) emphasized that "Sri Lankan social protection system" consists of a range of policies and programs implemented by the government specifically targeted toward various vulnerable segments of the population.

Though Sri Lankan elderly population has traditionally depended on family support, reduced family size and migration rates affect this option. As the dependency ratio grows up, only a small number is actively engaged in labour force. This generates vulnerability for older people. (Samarakoon and Arunathilake, 2015). A pension provides basic income security for economically inactive people and those unable to earn a sufficient income (ILO, 2016). According to the ILO convention C102, persons should be entitled to receive 40% of their previous earnings upon reaching the age of retirement, which may be defined according to country laws but which cannot exceed the age of 65 (ILO,2016).

Abeykoon and Elwalagedara (2008:33) state that Sri Lanka has introduced various financial and social programs against aging population's problems. Policies were formulated in 1982 with the implementation of the National Committee on Ageing in the Department of Social Service targeting to fulfill life in old age. There are many formal schemes providing for old-age income security in Sri Lanka consisting of pension schemes and provident funds or savings schemes - the former providing periodic benefits to eligible individuals, and the latter, only a fixed lump-sum benefit on reaching an eligible age. The schemes examined below are all meant to benefit those people of the labor force upon reaching old age. If a person never worked in their lifetime, he or she is not entitled to receive any old age benefit (ILO, 2016).

Table 1: Pension plans available in Sri Lanka

Name	Year Established	Administration	Financing
Public Sector Pension			
Public Servants Pension scheme	1901	Department of Pension	Treasury
Armed Forces Pension and Gratuities	1981	Department of Pension	Treasury
Widows/Widowers	1983	Department of Pension	Contributory Subsidized by Government
Public Servants Provident Fund	1942	Department of Pension	Joint contribution: worker 8%, employee 12%
Private Sector			
Employee Provident Fund	1958	EPF Department of Central Bank	Joint contribution: worker 8%, employee 12%
Employee Trust Fund	1981	Employees' Trust Fund Board	Contribution only from employer 3% of monthly gross earnings.
Informal Sector			
FMPS	1987	Agricultural and Agrarian Insurance Board (AAIB)	Contributory Subsidized by Government
FSHPS	1990	AAIB	Contributory Subsidized by Government
Migrant Worker Pension Scheme	2008	National Pension Trust Fund	Migrant Worker prior Agreed Monthly Contribution
Public Assistance Monthly Allowances (PAMA)Program	2012	Department of the Commissioner General of the Samurdhi	Treasury
Sahana	1996	SLSSB	Contributory Subsidized by Government
Thilina	1996	SLSSB	Contributory Subsidized by Government
Isuru	1996	SLSSB	Contributory Subsidized by Government
Sarana	2006	SLSSB	Contributory Subsidized by Government
Surekuma	2006	SLSSB	Contributory Subsidized by Government
Danalakshmi	2006	SLSSB	Contributory Subsidized by Government

Source: ILO, 2016.

According to ILO (2016), the largest and oldest pension scheme in place is the Civil Pension Scheme (CPS). This scheme covers public servants and is practically the only government-mandated program catering to a sector of workers with rights to a pension. Additionally, a number of government-administered schemes cover other workers, including the Farmers' and Fishermen's Pension schemes and the Self-employed Persons' Pensions Scheme. Private and non-pensionable public sector employees within the formal sector are compulsorily enrolled in provident funds. Both employers and employees contribute to such schemes. The major provident funds in the country are the Employees' Trust Fund (ETF), the Employees' Provident Fund (EPF), Approved Pension and Provident Funds (APPFs), and the Public Servants' Provident Fund (PSPF).

"The Pension and Social Security Benefits Scheme for Self-Employed Persons was established by the Social Security Board Act No 17 of 1996" (ILO, 2016:63) – considered a voluntary contributory pension scheme (DC). Initially, there were several contribution programs, which merged into a single program 'Surekuma', the main pension scheme, operated by SLSB (Samarakoon and Arunathilake, (2015:21). SLSSB aims to provide social security to self-employed people during their old age and in case of disability and aims to provide relief upon death. It also encourages current occupation and develops skills and capabilities, encouraging youth to self-employment and develops skills and

capabilities and educates self-employed on the benefits of thrift and resource management and improves living slandered self-employed (SLSSB, 2020 and ILO, 2016). People ineligible for government pension schemes are eligible for pension benefits offered through SLSB. Members can enroll in the scheme between 18-59 years and acquire monthly benefits until death.

According to the ILO (2016), this scheme basically targets low-income groups not entitled to a government pension. According to the Gazette No 948/10 in 1996, people engaged in production excluding primary produce of agriculture, fisheries and livestock, forestry and hunting, mining and quarrying, manufacturing, storage and packing, building and construction, electricity, gas and water, transport, repair and maintenance, trade and commerce, insurance and banking, real estate and business services, communications, community, social and personal services and occupation in other sector persons are eligible for this pension schemes excluding those covered in farmers' and fishermen's pension schemes. Considering the 2006 gazette, there were six different schemes Sahana, Thilina, Isuru, Sarana and Dhanalakshmi and Surekuma are the currently functioning pension schemes and Arassawa is the early pension scheme (SLSSB, 2020).

SLSSB also have several functioning specific pension and social security benefit schemes for targeted self-employed categories (ILO, 2016 & SLSSB, 2020).

Table 2: Extra Pension Schemes in Sri Lanka Social Security Board.

Scheme	Covered area	Coordinating partner
Sesatha	Migrant workers	Foreign Employment bureau of Sri Lanka
Helaweda Rakawarana	Indigenous medicine	Department of the Ayurveda Commissioner
Saraswathi	Artist	Department of cultural Affairs
Randalu	Small Tea Sector	National Craft Council
Kamdiriya	Small Industries Sector	Ministry of Traditional Industries and small Enterprise Development.
Rasiru	Employees in beauticulture	Sri Lanka Social Security Board
Ransalu	Handloom Industry	Department of Textile and Sri Lanka Social Security Board.

Source: Sri Lanka Social Security Board, 2018

Clients can make their contribution as a monthly installment or as a lump-sum payment. People can choose contributions as they wish and fit. However, according to the annual reports of SLSSB 2017/18, there is a significant number of dropouts. But there is no exact recorded number of inactive contributors due to the failure of the computer in SLSSB (Annual Report, 2018). Unlike the formal employee pension schemes due to irregular income patterns or no gain of continuous income among informal sector employees, contributors do not tend to maintain smooth continuous voluntary contributions. Even though clients try to pay their premium (installments) regularly, their irregular income patterns create difficulties in maintaining it (As cited in ILO, 2008).

Budget constraint is another factor creating a huge burden on the social protection programs in Sri Lanka restricting the expanding their coverage and improving retirement benefits. As cited in Tilakaratne et al, 2015, 80% of total benefits expenditures are allocated for formal public sector workers' benefits in their retirement age (PSPS, W&OP EPF/ ETF). Help Age International (2008:1) states that aging is rapidly increasing in Sri Lanka posing a huge challenge to the existing pension coverage at present. "Residents over 60 years of age comprise 9% of the population and will reach 25% by 2041". These existing pension plans are not adequate to supply minimum income to older people to prevent poverty, especially for those who engage in informal sector employment. Thus, it is important to identify what caused the dropping out of the existing pension schemes in order to provide better and more effective programs in the future. This study investigates the factors causing a higher level of dropping out related to pension schemes offered by the Sri Lanka Social Security Board in order to provide a successful and effective pension scheme in the future.

3. MATERIALS AND METHODS

This study was conducted in three districts; namely, Gampaha, Badulla and Matale selected as they reported the highest, middle, and lowest levels of client dropping outs, respectively. Gampaha had (91.4%) dropouts; Badulla, (70.5%), and Matale, the had lowest (62%) (SLSSB Arassawa database, 2018). Additionally, three different sectors namely urban, estate, and rural were chosen to investigate different socioeconomic factors related to client dropout based on the sector. Several Grama Nildhari divisions belonging to each district as shown in the table 3 were selected as the primary data gathering.

Table 03: Study Sample

Urban Sector	Estate Sector	Rural Sector
Gampaha District	Badulla District	Matale District
191A Ja-Ela	94A Lunugala Town,	E355 Ukuwela,
190A Weligampitiya North	94G Sumudugama	E357A Kalalpitiya
190 Weligampitiya south	94D Sooriyagoda	E357 Bowatta

The total number of inactive members in these three districts, 35762 (Sri Lanka Social Security Data Base-2020), was used as the total population. As per data in these three districts, the study identified a total sample of 130 inactive members. There were two pension schemes, currently active in SLSSB - "Surakuma" and "Arassawa". Each district had the following number of clients in these two schemes: Gampaha, 49 clients, Badulla, 30 and Matale, 21 included in questionnaire data (100) and 30 of interview data. However, the SLSSB records did not indicate whether these clients are active or inactive in both schemes. Consequently, the sample was drawn using the purposive sampling method and the study gathered data from all the registered clients in three districts, enrolled in "Surakuma" and Arassawa" schemes.

The study collected both qualitative and quantitative data. A survey method was used to collect quantitative data, while in-depth interviews were conducted for the purpose of collecting qualitative data. Quantitative data were analyzed using SPSS package 20 and the Multiple Logistic Regression Model to achieve the main objective employed in this study to identify the factors influencing for the clients' dropouts in contributory pension schemes. In addition, Chi-square and Correlations analysis were used to identify the association between variables. Qualitative data gathered through the in-depth interviews were analyzed using thematic sampling.

This research was focused on the reasons for clients' dropouts in contributory pension schemes governed by Sri Lanka Social Security Board. Basically, identified the relationship between socio-economic factors, contributors' attitudes, and institutional factors with the dropout ratio. For achieved these objectives, employed both primary and secondary data collection methods. Simple Observation method, 12 Key Informant Interviews were conducted among 3 SLSSB district officers; 9 government officers in 9 Grama Niladhari Divisions, recruited the highest number of

contributors. The survey was conducted with 100 questionnaires and 18 in-depth interviews using 9 male and 9 female respondents in nine GN Divisions. The client drop-out rate was used as the basic unit of analysis.

This study considered Status (Active/Inactive) as a dependent variable and based on three hypotheses research was designed.

1. H1: There is a relationship between Socio-Demographic factors and clients' dropouts.
2. H2: There is a relationship between contributors' attitudes toward contributory pension schemes and clients' dropouts.
3. H3: There is a relationship between institutional factors and clients' dropouts.

4. RESULTS AND DISCUSSION

All the demographics in the above table are calculated as percentages and all respondents of the sample belong to basic two pension schemes, active currently offered by SLSB - "Arassawa" and "Surekuma", the majority in all three districts belonging to the Arassawa scheme, 81% of total sample; 19%, "Surekuma" scheme. Based on the primary data, only 27% of respondents out of the entire sample actively contribute to the pension schemes; the majority (73%) remain inactive. District wise in Gampaha district 30% of members are active; 70%, are inactive; in Badulla District, 29%, are active and 71%, are inactive; in Matale District, 19% are, active while 81%, are inactive. Inactive means members do not contribute to the pension scheme by paying their regular installments. The basic socio-demographic characteristics of the study sample are depicted in table 4.

Table 04: Socio-demographic characteristics of the sample

Type	Category	Percentage (%) District Level			
		Gampaha District	Badulla District	Matale District	Total
Status	Active	30	29	19	27
	Inactive	70	71	81	73
Scheme	Surekuma	30	10	19	19
	Arassawa	70	90	81	81
Gender	Male	37	45	24	37
	Female	63	55	76	63
Age	>20	0	3	0	1
	21-30	30	29	24	29
	31-40	33	45	29	37
	41-50	33	16	29	25
	51-60	4	7	14	8
	60<	0	0	1	0
Ethnicity	Sinhala	33	32	67	42
	Tamil	4	61	10	28
	Muslims	0	7	24	09
	Burger	63	0	0	22
Marital Status	Married	89	100	100	96
	Unmarried	11	0	0	4
Education	Non-schooling	0	3	0	1
	1-5	0	19	0	8
	6-10	19	38	10	24
	O/L	48	29	43	39
	A/L	22	8	29	18
	Higher Education	11	3	19	10
Occupation	Private Sector	67	7	67	30
	Self-employed	11	0	14	12
	Estate Sector	0	87	19	42
	Government sector	22	6	0	8

Source: Survey data, 2020.

Considering the socio-economic factors affecting client dropouts of the pension schemes, there is a moderate relationship between the dropouts and active status based on gender: among the active group, 28% are female and 24%, are male. Considering the inactive group, 76% of the majority of respondents are recorded as male; 72%, are female. In both scenarios regardless of gender, inactive members depict the highest percentage.

However, the fact that the active percentage remains high among males, and the inactive percentage, high among females could be due to the higher financial earning capacity that males possess compared to females; especially, the in-depth interviews revealed that female respondents tend to leave their jobs and financial means of income due to the

family responsibilities. Consequently, since after a while, they do not possess proper stable financial means to support themselves, they tend to simply avoid contributions to pension schemes.

The employment, income and expenditure and financial stability of the respondents are crucial factors in maintaining the pension schemes. It also heavily affects the clients' dropout from the pension schemes. The pension schemes offered by SLSSB are mostly voluntary contributory programs; especially, these programs require the member to pay a monthly installment proportionate to his or her income and age. The Sri Lanka Social Security Board calculates the installments technically known as "premiums" based on the age and ability to pay premiums of the contributors. Premium installment payment methods

can be decided by the member based on his ability to contribute.

Figure 02: Employment status in a sample
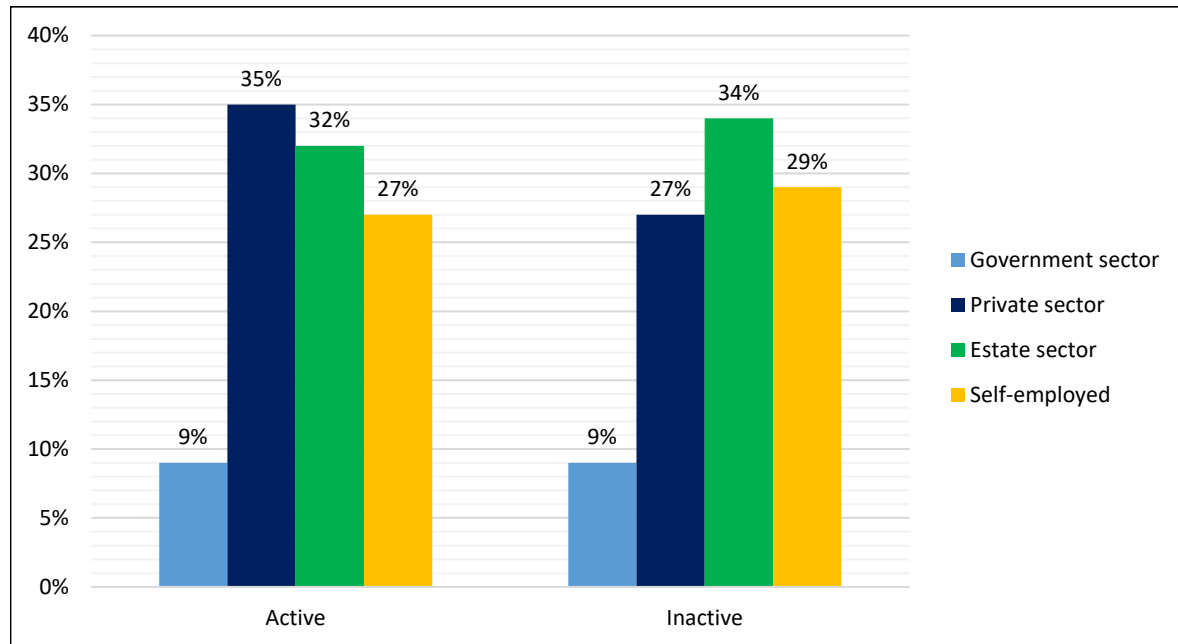
Source: Field Data-2020.

A monthly instalment plan is highly based on the employment, income and expenditure, and financial stability of the members. Considering the active and inactive status, the majority of respondents (35%) identified as private sector employees; 32% of respondents belong to the estate sector, and while (27%) are self-employed; the least number (9%) belong to the government sector. Considering the inactive group, 34% of the majority of respondents are working in the estate sector; also 29%, are self-employers; and 27%, private sector workers. It was identified from the sample survey that the nature of the employment of individuals influenced pension contributions. This is because many contributors do have not permanent jobs and earn a daily income leading to the recognition that occupation and income stability necessarily determine the dropouts in the pension schemes offered by SLSSB.

Considering the chi-square table (see table 5), the P value is 0.018 is less than the alpha value of 0.05. According to the P value, it can be concluded that there is enough evidence to reject the null (H0) hypothesis. Also, these variables are statistically significant. This shows a relationship between the number of dependents in a household and active contribution status. Considering the inactive contributors, (40%) of the highest respondents stated that they had more than 5 dependents in their household proving the number of dependents in a family affects the contribution to the pension schemes. According to the in-depth interviews, many inactive members had to drop out in the middle as they couldn't spend money in instalments due to increasing dependents in their families.

Table 5: Number of dependents in a household

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.570[a]	1	.018		
Continuity Correction	4.432	1	.035		
Likelihood Ratio	5.705	1	.017		
Fisher's Exact Test				.023	.017
Linear-by-Linear Association	5.499	1	.019		
N of Valid Cases	79				
a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 10.37.					
b. Computed only for a 2x2 table					

Source: Survey Data, 2020

I paid for a few months before the birth of my little son. But after his birth, I could not continue to pay for it with the house expenses. I also take care of both mom and dad. It is difficult for all of us to live on a single salary because only the husband has a job. So with the expenses, it's hard for me to think of a pension now (In-

depth interview, Field Data, contributor, Dropouts Female, 2020).

I previously worked in the private sector. After having three children, it became difficult to carry on the job and the children's work. I put money into this account before

I got married. After I got married, I could not pay for it with the occasional problems. Now with the cost of the three children, there is no way to put again money (In-depth interview, Field Data, contributor, Dropouts Female, 2020).

The above narratives prove the number of dependents in a family has a clear effect on the contribution for a retirement plan. Also, the increase of dependents in a family will have a huge impact on the family economy. It also affects the economic viability of the family of people – unemployed and job seekers. The following narrative explains it further:

It's been three years since my elder son finished school. He still doesn't have a job. Going from one job to another from time to time. But still not a permanent job. The two little ones are still learning. The husband also does hire work. The biggest problem we have is that our son does not have a job yet. If he gets the job, he would be free no (In-depth interview, Field Data, contributor, Dropouts Female, 2020).

Furthermore, changes occurred related to income generation sources of the respondents were also identified as a fact that affected dropping out from the pension schemes: 73% of respondents stated that there was no change in the income generation method (employment) during the payment period; 27% from total sample stated that payments were discontinued due to changes occurring in their income generation during the payment period; 8% have given-up the payment due to losing their careers and 10% have dropped out due to health issues. These respondents were seeking residential treatments due to chronic diseases and accidents. This has indirectly forced them to deactivate their accounts. In addition, 9% of respondents had to give up the pension plan as one of the income earners in the family had to leave the job. This situation clearly shows that respondents are indirectly forced to give up on the pension plans as they financially struggle due to irregular income sources. People tend to use

their money to fulfill their current needs rather than think about the distant future.

In this part was analyzed by using the multiple logistic regression model with the SPSS software. Basically, Multiple Logistic Regress Model was used to analyze the client's attitudes and awareness towards the contributory pension schemes with the purpose of establishing the relationship between clients' dropouts and the reasons behind the dropouts' ratio.

Primarily, identified the independent variables which are associated with the dependent variable namely active/inactive status among the contributors. So, after that, some variables were excluded from the data set due to not being related to the dependent variable. Totally 28 variables were studied and 17 variables were associated with the dependent variable used to identify the relationship between the dependent variable by using the correlation model and chi-square test. The set of independent variables consists of the age, income, education, number of dependents, awareness of the SLSSB, Promotion campaign of SLSSB, retirement age, adequacy of pension amount, period of premium payment, benefits, awareness of rules and regulations taken by SLSSB, reliability of the institute, convenience of payment methods, easy to access, follow-up process of SLSSB, competitiveness, and efficiency of the institute.

After that, using those 17 variables find the multi-collinearity relationship among independent variables (See table 6). Using the chi-square and correlation coefficient model excluded 11 variables due to the multi-collinearity. Throughout this test, identify the six independent variables which are not associated with each other variables. These were awareness of the SLSSB, retirement age, awareness of rules and regulations taken by SLSSB, adequacy of pension amount, follow-up process of SLSSB, competitiveness, and efficiency of the institute. Then fitted several models and used the Hosmer-Lemeshow test to check the goodness of fit of the best-fitted model.

Table 06: Model with Lack of Awareness of SLSSB, Indeterminate of Retirement age, and lack of follow-up process of the SLSSB

Parameter	B	S.E	Wald	df	Sig.	Exp(B)
Lack of Awareness of SLSSB	-1.253	0.765	2.6827	1	0.101	0.2856
Indeterminate of Retirement age	2.47	1.00	6.1009	1	0.013	0.0845
Lack of follow-up process of the SLSSB	2.17	1.26	2.9660	1	0.085	0.1142
Constant	0.223	0.671	0.1104	1	0.739	1.2498

Source: Survey Data, 2020

LogitP(x)= $\beta 0 + \beta 1 Awareness\ of\ SLSSB + \beta 2 Retirement\ age + \beta 3\ Follow\ up\ process\ of\ the\ SLSSB$

LogitP(x)= 0.223 -1.253 + 2.47 + 2.17

According to table 7, Awareness of SLSSB, Retirement age and Follow-up process of the SLSSB can be taken as significant variables for the model. Hence, the P-value of the model is less than the 0.05 significant level of the model.

Table 07: Hosmer and Lemeshow Test

Chi-Square	Df	Sig.
2.44	8	0.964

Source: Survey Data, 2020.

According to the Hosmer and Lemeshow Test, the P-value is greater than the significant value of 0.05. Hence, there is not enough evidence to reject the null hypothesis. Therefore,

the conclusion of this model can be identified as an adequate fit. Only Retirement age is significant

Hence, the best-fitted model can be written as follows,

Logit P(x)= 0.223 -1.253 $^{\text{Awareness of the SLSSB}}$ + 2.47 $^{\text{Retirement Age}}$+ 2.17 $^{\text{Follow-up process of the SLSSB}}$

Considering these findings, basically, lack of awareness towards the SLSSB, indeterminate retirement age and lack of follow-up process of SLSSB causes the clients dropouts from the voluntary contributory pension schemes.

The study also tried to examine the respondents' future retirement plans by identifying whether they are concerned about their financial security when they are old. As the table below depicts, the majority (67%) of the sample has not clearly decided about their retirement or financial security and care when they are old; 15% said that they hope to live with their children when they are old. However, in terms of Sri Lankan culture, caring for elders is a family-centered requirement and the role of the family members is also the same. Presently, the aged population is subjected to severe distressing situations due to seclusion by their children with their migration to urban areas. Urbanization causes children to leave their aged parents alone in their ancestral homes or in Elders' Homes. It is a practical difficulty for children to look after their aged parents very closely because at present in urban households, both spouses are compelled to be employed enabling them to meet this problem; yet, it becomes further critical when women in rural areas leave the country for foreign employment assigning the responsibility of looking after their small children, to their aged parents (Menike, 2015). Consequently, it is important that people focus on their social and financial security when they are young and actively participate in the labor force. However, the in-depth interviews revealed that though the respondents are aware of the importance of financial and social security, they are unable to contribute due to the financial ends they have to meet.

> *I would like to think about retirement. But it is hard to do with these expenses. My husband doesn't have a permanent job and neither am I. So, it is difficult to bear the expenses of my three children (In-depth interview, Field Data, contributor, Dropouts Female, 2020).*

> *It is difficult to think about a pension this time, because of the responsibilities to my family. I might start to save when my kids are a bit grown up. (In-depth interview, Field Data, contributor, Dropouts Male, 2020).*

11% of respondents are currently contributing to pension and life insurance plans in either private or government sectors; among them, 7% stated they already have accounts and pension plans in private sector banks. The sample survey also revealed that Muslim members are more likely to deposit and invest in the private sector. This could be due to religious restrictions on money and financial handling. Since the SLSSB does not offer any culturally sensitive customized pension plans these respondents were much reluctant to maintain the pension plans in the future. In addition, 4% and 3% of respondents stated that they hope to secure their financial stability through income from their properties and self-employments they are trying to start.

Table 8: Living Strategies in Retirement

Strategy	Percentage
Not decided yet.	67%
Living with children in their care.	15%
Referral to other pensions and life insurance	11%
Depositing money in private banks	7%
Living on property income	4%
Thinking of starting self-employment.	3%

There are a number of other important behavioral and socio-economic factors affecting participation in retirement plans. It is very important to understand the characteristics of individuals who are more or less likely to become members and how these can be included in developing better retirement plans. An important factor that influences the likelihood of an individual's saving through a voluntary program is the degree of understanding of how financial systems work and the role of long-term savings in retirement income, two issues included typically in what is more broadly termed "financial literacy". A recent study (Hinz, 2008) found that the degree of financial literacy of individuals had an effect on the probability of their participating in voluntary pension savings, equivalent to the impact of the financial incentives. The capacity to plan over the relevant time horizons for pensions seems to be an important part of this process. An earlier study (Hinz, 2008) found that the planning horizon of individuals was a significant factor in explaining their participation in employer-sponsored voluntary savings plans. Most importantly, the provision of some education and especially advice on a personal level has proven to be among the most effective means of inducing contributions to voluntary arrangements. So, it is important that SLSSB lead individual grass root level awareness programs as well as follow-up programs to encourage and explain the importance of retirement plans.

Consequently, the social security board may require a method to balance the welfare, responsibility, and economy of its clients as most of them are financially struggling due to unstable means of income. If the board can introduce a mechanism to make the state do the minimum contribution along with the clients to each pension scheme, but the individual is required to pay in installments later on when he receives monthly benefits, helping reduce the client dropout.

Currently, SLSSB is having their district offices in all 25 districts and the Head is in Rajagiriya to provide effective customer service for the contributors. According to the field survey data, all three districts faced a huge problem regarding their labor turnover due to retirement, resignation, and transfers of trained and experienced officers. And also board has faced a huge problem regarding their non-continuation of customer service due to constantly recruiting their officers and always having to be trained them. The following narrative explains it further.

> *One of the main problems we face as a board is the departure of our officers and the non-continuation of their service. Recruited officers who leave the service or resign if they get another job. Specially pensionable jobs. Therefore, we face a huge problem regarding the continuation of customer service in carrying out our work money (Key informant interview, Field Data, Coordinating Officer, Male, 2020).*

A new CO came after the former CO retired. But the new CO came here a few months after the old CO was gone. The newcomer CO was only a few months old and he was left. But haven't got a new CO yet since he left. Due to this reason, the area is not functioning properly (Key informant interview, Field Data, Management Assistant, Female, 2020).

And also another thing that became clear from the above narratives in the sample survey, was the failure to recruit a new officer as soon as an officers leave the service. What are long-term vacancies for the post. Due to this reason, customer service could not be maintained properly due to

Figure 3: Enrolments by officers.

Source: Survey data, 2020

the lack of opportunity to inform the new officer of the strategies previously implemented and taken by the previous officers in that area.

Due to this consideration, the board is unable to reach the expected accomplishments and it also affects the expanding of their arrangements and activities. So, it is very clear that there is no proper coordination between the board and contributors. It will create a high level of client dropouts from the SLSSB. According to the field survey data, there are various officers recruiting contributors to the Pension and Social Security Benefit Scheme of SLSSB. The following figure shows the recruitment by officers in three districts.
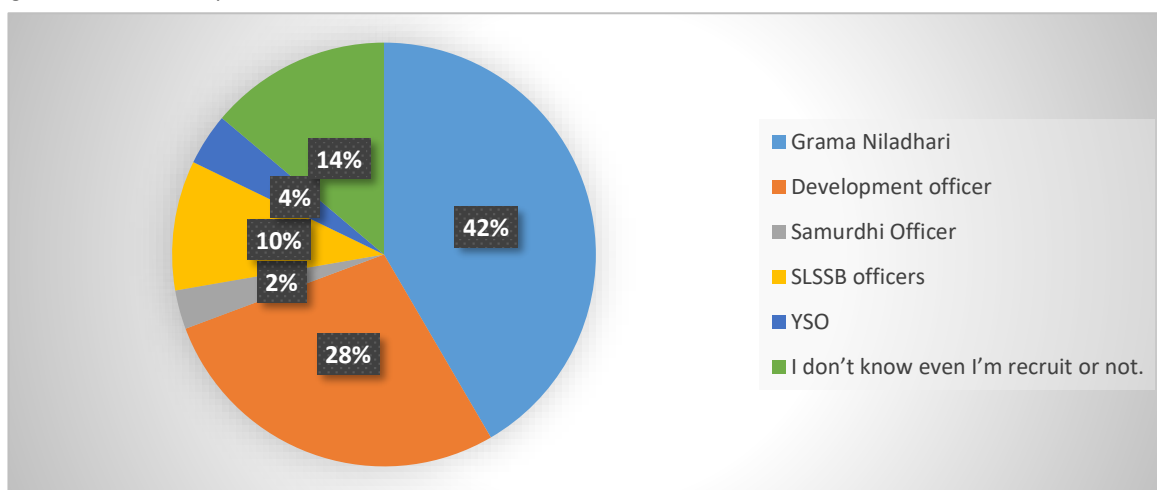
Considering the total sample, authorized government officers in that particular area recruited the contributors to the Pension and Social Security Benefit Scheme of the Sri Lanka Social Security Board. Among them, 42% of the highest respondents are enrolled by Grama Niladharis in the Pension and Social Security Benefit Scheme of Sri Lanka Social Security Board. Then 28%, 2%, and 4% of respondents are recruited by Development Officers, Samurdhi Officers, and Youth Service Officers respectively. According to officers in Sri Lanka Social Security Board, they recruited 10% of respondents directly for their Pension and Social Security Benefit Scheme. And 14% of respondents didn't know that they have contributed. Furthermore, recruitments have been made only on the basis of the purpose of recruitment, and some officers and also Recruitment of subscribers without proper knowledge of the rules and regulations of the board have had a high level of inactive. And also wrong record keeping, fake recruitments, and the distance between the contributors and the institution have caused to people be inactive in the account.

5. CONCLUSION

Providing social security for the elderly in Sri Lanka became a considerable aspect of society due. Raising elderly persons' own income, and social pensions have the potential to bring considerable benefits to the elderly. Sri Lanka Social Security Board has implemented several voluntary contributed pension schemes in order to provide social security to the elderly. However, most recent annual reports on SLSSB show that the members of the said pension scheme tend to drop out largely. This study was conducted with the intention of identifying the relevant causes for client dropouts in SLSSB. The findings of this study identified

that socio-economic factors such as gender income levels and occupation as well as dependents in a household significantly affect the contribution for voluntary pension schemes.

The lack of financial literacy among the clients has led them to ignore the importance of proper financial safety in old age. In addition, due to the lack of awareness and follow-up procedures by SLSSB many members have joined the pension programs without any proper knowledge of its mechanisms, rules, and regulations. Unlike private retirement plans, SLSSB does not have marketing or awareness. The awareness is only done through government mechanisms using public officials. As a result, proper information about retirement plans may not reach a larger group.

SLSSB gets support from other government officers at the ground level to recruit contributors for retirement plans. However, most of these people were recruited without proper knowledge sharing on the program just for the sake of documentation. Therefore, a large number of contributors recruited by the officials have become inactivated in time due to the lack of a follow-up process. These officials were targeting in receiving some extra benefits such as awards, commissions, and appreciation letters. Based on the findings of the study the following suggestions were identified as recommendations to develop a better pension scheme within the SLSSB.

Pertaining to these issues, overcome to the clients' dropouts from the SLSSB pensions schemes board can Implementing proper marketing and awareness programs to the general public about the SLSSB, Strengthening the customer follow-up process including introducing the short message service (SMS) to remind premium payments that are due and notifying the clients through a letter about premium is

missed. And also Proper training is given to ground-level government officers on information dissemination and recruiting members. Increase payment opportunities enabling the public to pay premiums to every bank (Government and Private) where people transact. Especially, Rural Development Banks and Samurdhi Banks. Furthermore, Introducing various retirement schemes in a timely manner, Providing a grace period for activating a deactivated account and properly advertising it, Recruiting the necessary employees to SLSSB to fulfill ground-level management, introducing computer database and updating members" information, Providing individual and group advise sessions for inactive members and encourage them to restart the contribution, Offering a small bonus as an incentive within 5 or 10 years to people who continue to pay a premium, Commence a new section in SLSSB to find out the inactive members, Establish the outreach section to investigate the follow-up process of the SLSSB and it should be governed by the audit under the general manager/chairman/administration branch impartially and Introduce computer software and improve the computer system so that it can identify people who give-up premium.

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AUTHOR GUIDELINES

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- Abstract and Keywords
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- Literature Review
- Materials & Methods
- Results & Discussion
- Conclusion
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