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The Role of Borrowers' Living Area and its Moderation Effect on Relationship between Microfinance and Poverty Alleviation in Sri Lanka: Multi – Group CFA

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Abstract- This article highlights the moderating effect of living areas of the borrowers on the impact of microfinance programs on poverty alleviation. The study has utilized the data from 497 borrowers of Samurdhi microfinance in five disaster-affected districts in the country to examines that two different living areas (disaster-affected and non-disaster affected area) of borrowers moderate the relationship between microfinance services and poverty alleviation. The Multi- Group CFA analysis was performed to identify the moderating effect using AMOS 21. Quantitative results were finding revealed that the moderation tests were significant for all the three microfinance services on poverty alleviation. The effect of microfinance services of borrowers in the disaster-affected area higher than the borrowers in non-disaster area.

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I. Introduction

Microfinance is referred as the provision of financial services such as credit, savings, insurance, payment services to poor earning less than $2 per day. Microloan of $50-$1000 to poor for their business has identified as the significant tool for combat poverty among the poor. (David, 2019; CGAP, 2003, Robinson, 2001, Yunus, 2007) Microfinance services are increasing the income, micro-entrepreneurship, and economic wellbeing of the poor. As well as microfinance has enhanced the other financial performance such as savings and accumulation of assets. Nonfinancial Services and social intermediation service increases the non-financial outcomes of poor such as a health and nutrition, financial literacy, education, women's empowerment, and social cohesion (Bent,2019; UNICEF, 1997; Schuler et al., 1997)

The modern concepts of microfinance rapidly spread after the Nobel Prize for microcredit program for Grameen microcredit program in Bangladesh. In 1990 decades microfinance played a significant role in eradication poverty, particularly in developing countries in South Africa and South Asia. The history of the microfinance industry in Sri Lanka goes back to the British colonial period with the implemented of Thrift and Credit Co-operative Societies (TCCSs) in 1906. TCCSs was the first credit co-operative in Sri Lanka in early 20 decades (Microfinance Industry Report Sri Lanka, 2010). Early credit society has provided input procurement and products distribution service initially, the service gradually developed as multipurpose Comparative Societies (MPCSs). The microfinance industry eventually increased in the country late 1980 decades. There were several local and international organization engaged in microfinance with community development activities. Sri Lankan government is also playing a role in providing microfinance to the poor in the country. The Samurdhi Development Program was the national poverty alleviation program, which was introduced in 1994, replacing the previous poverty alleviation program (Janasaviya). 1,070 Samurdhi Bank Societies (SBSs) has provided 65% from total microcredit the end of 2016 (Samurdhi Performance Report, 2017).Microfinance played a vibrant role in the economy over the past few years. It is a significant tool to alleviating poverty and empower the poor economically and socially vulnerable segments of society.

Majority of the study revealed that the positive impact of microfinance servicers reduction of poverty and empowering the poor in the country. Some studies have questioned these positive impacts. Others indicate mixed outcomes, such as positive effects for the poor but not for the poorest people (Copestake et al, 2001; Hulme & Mosley, 1996; Morduch, 1998). The current poverty level in Sri Lanka seen as a spatial characteristic. The natural disasters have been identified as a key phenomenon for the high poverty level in several districts in the past few years (Department of Censuses Statistics, 2017). No specific studies were undertaken in Sri Lanka identifying the impact microfinance services on reducing the spatial disparities in the country by analyzing the moderate impact of the

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living area of beneficiaries to poverty alleviation while concerning micro-insurance service for risk management of life and business etc. This study mainly focused on the impact of living areas of respondents to control the impact of microfinance on poverty in the country.

II. Problem Statement

Poverty identified as a socio-economic issue which was experienced for a period of a long time in Sri Lanka. Overall country Poverty Headcount Ratio (HCR) has been decreasing during the last few years. However, the highest poverty Head Count Ratio reported in rural areas and natural disaster-affected areas in the same years. Hence, poverty identified as a spatial characteristic of the country as the reasons for natural disaster and other spatial issues. Microfinance is a most effective tool in fighting poverty have drawn the attention by governments after 1990 decades. Despite the availability of microfinance service to the poor; the disparities of poverty levels remain unchanged (Department of Statistics, 2017). There were many studies to identify the impact of microfinance on poverty alleviation in the country and most of them (Masuda, 2018; Kaluarachchi & Jahfer, 2014) emphasized the people-based' approaches to evaluating the effects. It is not enough to estimate the impact of microfinance on poverty. The disparities a much stronger focus on living area, in particular on place-based approach, could do much for evaluating microfinance on poverty. Hence, this study identified a valid gap in knowledge towards the element of government microfinance finance and its impact on spatial poverty alleviation by identifying the moderating effect of living area to the relationship between microfinance and spatial poverty alleviation.

III. Objectives of the Study

There are three objectives of the study as follows;

1. To investigate whether the living area of borrowers moderates the relationship between microcredit and poverty alleviation
2. To identify that living area of borrowers moderates the relationship between nonfinancial service and poverty alleviation
3. To investigate whether the living area of borrowers moderates the relationship between insurance service and poverty alleviation

IV. Research Method

The study based on primary and secondary data. Primary data were collected from Likert scale questionnaire using 497 borrowers of Samurdhi microfinance programs in five disaster-affected districts in Sri Lanka namely, Kandy, Kegalle, Rathnapura, Gampaha, and Colombo. Simple Random Sample technique was used to collect the data from clients of Samurdhi banking society in the areas. Collected data were analyzed using multi-group CFA analysis for identifying the moderation effect of living area to the relationship of microfinance services and poverty alleviation using AMOS 21and SPSS 21 version. There were 328 borrowers represent from the disaster-affected area and 169 borrowers in non-affected- area.

V. Conceptual Framework

The conceptual framework has been developed to identify the moderate effect living area to the relationship between Samurdhi microfinance and poverty. Previous empirical and theoretical literature was used to determine the variables in the study. It has consisted of four independent constructs as Microcredit, Nonfinancial Service, Insurance Service, and one dependent constructs as Poverty Alleviation. Living area used as the moderation variable to identifying the moderation effects among the relationship between independent and dependent variables.

Microcredit identified as the main service of the microfinance industry. It refers to a small amount of credit provided to the poor at a low-interest rate for creating new income through small scale business activities. This types of small loan facilities are significantly affecting for reducing poverty (Bent2019; Rashid& Ejaz, 2019; Ali, 2014). The concept of the Nonfinancial Service is another important service provided by microfinance institutions to the poor. It consists the different training programs and business advisory services for effective use to microcredit and advances the living stand of the poor. Insurance service is one of the key tools provided by microfinance programs to manage the risk of properties and lives of their borrowers (Mosley & Hulme, 2009). There are two types of insurance, namely life insurance and business insurance. Health and property are a significant source for coverage of the risk of poor to alleviate poverty.(Li,2019; Banerjeeet al, 2014; Hamidet al, 2011; Gertler & Gruber, 2002).The living area significantly determined the poverty level of the country. Majority of previous research explores that there was moderate impact by living area for the relationship between microfinance and poverty. Hence the study identified the living area as a moderator variable. Based on those independent, dependent, and moderate variables. The conceptual framework developed as following figure 1

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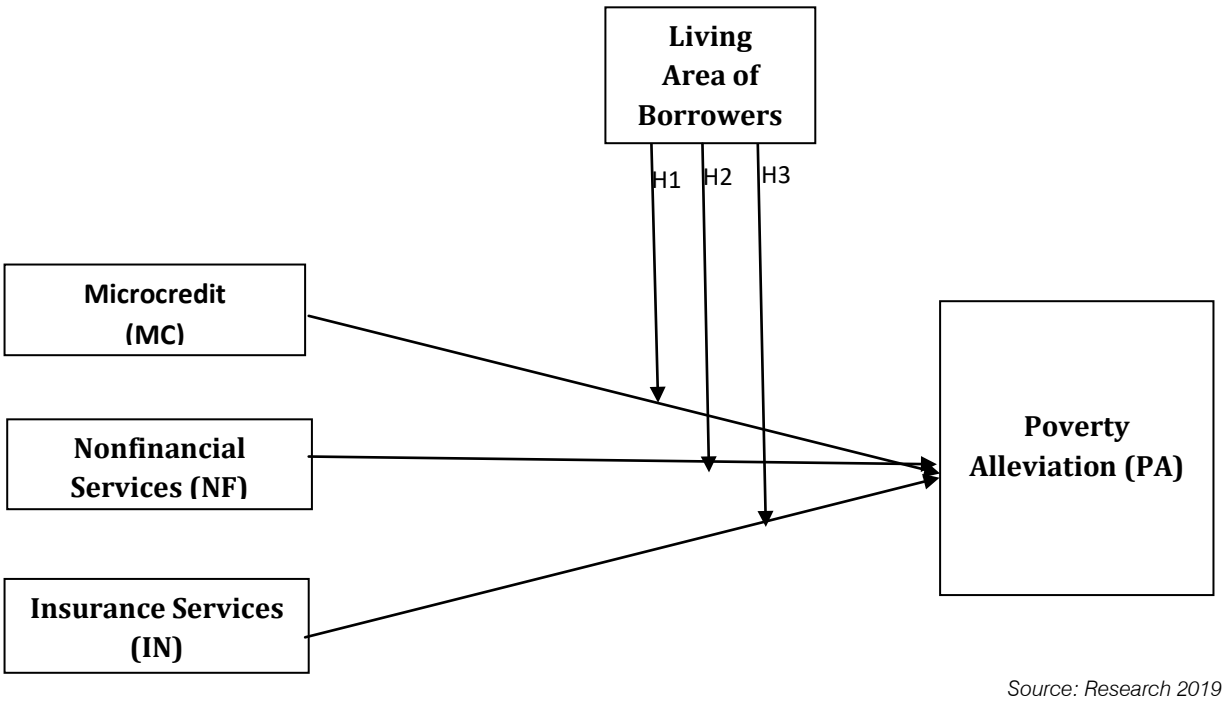

Figure 1: Conceptual Framework

VI. The Hypothesis of the Study

Based on the previous studies and conceptual framework three main hypotheses were developed to analyses the moderate impact as indicated bellow

H1: Living area of borrowers moderating the relationship between microcredit and poverty alleviation

H2: Living area of borrowers moderating the relationship between nonfinancial service and poverty alleviation

H3: Living area of borrowers moderating the relationship between insurance services and poverty alleviation

VII. Multi-Group CFA Analysis for Moderating Effect

Multi-group CFA Analysis is one of the analysis methods for estimating the effect of moderator variable in the studies (Hoque & Awang, 2019; Salam & Hoque 2019; Zainudin, 2012). There are few steps were followed. This analysis builds the constrained model and unconstrained model and identifies the path which interest in assessing the moderation impact. The selected path was put parameter 1 and called a constrained model; other model remains an unconstrained model. Both models run separately for estimating Chi- Squares. The next step Identify the difference of Chi-Square values between two constrained and unconstrained models. If the difference obtains by more than 3.84 with one degree of freedom, moderation occurs in the selected path (Zainudin, 2012). The study has followed this method for identifying the moderating impact of all three paths separately. The moderation effect of living area to the relationship between microcredit and poverty alleviation.

The moderation test was significant for the relationship between microcredit and poverty alleviation since the Chi-Square difference between the constrained and unconstrained model for the above path was higher than 3.84 with 1 degree of freedom for each group. Therefore, hypothesis 1 statement was supported.

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Table 1: Moderation effect of micro credit to poverty alleviation

Path	Living Area	Constrained Model (χ2)	df	Unconstrained model (χ2)	DF	Δχ2	Δ df	Result on Moderation	Result on Hypothesis
MC To PA	Disaster	647.9	270	602.5	271	72.5	1	Significant	Supported
	Non – affected area	420.6	270	393.3	271	27.3	1	Significant	Supported
H2: There is a moderating effect of gender for impact of Non-Finance Servicers on spatial poverty alleviation									Supported

Source: Research Data Analysis, 2019

Table 1 indicates the Chi-Square difference between the constrained and unconstrained model. Chi-square for the constrained model of disaster-affected was 647.9 and unconstrained model illustrates as 602.5. The Chi-Square difference (between the two models) was 45.4, which is greater than 3.84. Hence the result on moderation was significant. The second raw presents the Chi-Square values for constrained and constrained models of the non-affected area. The test for the second group is also significant as the Chi-Square difference between constrained and unconstrained model greater than 3.84 with one degree of Freedom.

Table 2: The model fit summary table for disaster-affected and non-affected-areaof MC to PA

Group		Normed χ2	CFI	TLI	IFI	NFI	RAMSEA	Comment
		>5	>0.9	>0.9	>0.9	>0.9	>0.8	The required level achieved in the models
Disaster Area	Constrained	2.382	.953	.944	.953	.922	.065	
	Unconstrained	2.223	.959	..950	.959	.928	.061	
Non Affected area	Constrained	1.546	.950	.940	.938	.873	.057	
	Unconstrained	1.451	.959	.951	.960	.881	.052	

Source: Research Data Analysis, 2019

The model fit summary table indicates the model fit indices for constrained models of both groups as indicates table 2.The model fit for the disaster-affected area yields a normed χ2 (chi-square) 2.382, which was lower than 3indicates a good model fit. Comparative Fit Index (CFI), Tucker-Lewis Index TLI), Normed Fit Index (NFI) were higher than .9 which indicate the required level for goodness of fit Root Mean-Square Error of Approximation (RMSEA) (Holmes-Smith 2000) for both models were lower than cut- off value 0.08 which indicate the perfect model fit.

a) The moderation effect of living area to the relationship between nonfinancial services and poverty alleviation

There is a significant moderation effect on the relationship between nonfinancial service and poverty alleviation. Table 3 indicates the Chi-Square values for both disaster-affected and non- area for the constrained and unconstrained models

Table 3: Moderation effect of non-financial service to poverty alleviation

Path	Living Arear	Constrained Model (χ2)	df	Unconstrained model (χ2)	DF	Δχ2	Δ df	Result on Moderation	Result on Hypothesis
NF To PA	Disaster	666.5	590	602.5	271	64	1	Significant	Supported
	Non affected area	429.6	590	393.3	271	36.3	1	Significant	Supported
H2: There is a moderating effect of gender for impact of Non-Finance Servicers on spatial poverty alleviation									Supported

Source: Research Data Analysis, 2019

The Chi-Square values of the constrained model disaster-affected area estimated as 666.5 while unconstrained model estimated as 602.5 with a difference of 64. The Chi-Square values for non- area indicated as 429.6 for constrained model and 393.3 for an unconstrained model with a difference of 36.3. There is a significant moderation effect hence the value difference greater than 3.84 with one degree of freedom.

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Table 4: The model fit summary table for disaster affected and non-area of NF to PA

Group		Normed χ2	CFI	TLI	IFI	NFI	RAMSEA	Comment
		>5	>0.9	>0.9	>0.9	>0.9	>0.8	The required level achieved in the models
Disaster Area	Constrained	2.450	.951	.941	.951	.919	.067	
	Unconstrained	2.223	.959	..950	.959	.928	.061	
Non affected area	Constrained	1.579	.947	.937	.948	.870	.059	
	Unconstrained	1.451	.959	.951	.960	.881	.052	

Source: Research Data Analysis, 2019

The overall fit measured for the constrained and unconstrained models (disaster-affected and non-areas) full models in the SEM indicates the acceptable model fit. All the estimates of the goodness of fit were at the required level.

b) The moderation effect of living area to the relationship between insurance services and poverty alleviation

The table illustrates the Chi-Square values for the both unstrained and unconstrained model of the disaster-affected and non-affected- area. The difference of Chi-Square values for both group estimates indicated that the significant moderation impact on the relationship between insurance service and poverty alleviation. Table 4 presents the Chi-Square values for both groups.

Table 5: Moderation effect of insurance service to poverty alleviation

Path	Living Area	Constrained Model (χ2)	df	Unconstrained model (χ2)	DF	Δχ2	Δ df	Result on Moderation	Result on Hypothesis
IN To PA	disaster	675	270	602.5	271	72.5	1	Significant	Supported
	Non affected	461.3	270	393.3	271	68	1	Significant	Supported
H2: There is a moderating effect of gender for impact of Non-Finance Servicers on spatial poverty alleviation									Supported

Source: Research Data Analysis, 2019

Table 5 indicates the Chi-Square values of both constrained and unconstrained model for the two different groups. The estimates value differences of Chi-Square illustrated the significant moderation effect between the insurance service and poverty alleviation. The table presents the model fit a summary table for both groups of the constrained model.

Table 6: The model fit summary table for disaster affected and non-affected-area of IN to PA

Group	Model	Normed χ2	CFI	TLI	IFI	NFI	RAMSEA	Comment
		>5	>0.9	>0.9	>0.9	>0.9	>0.08	The required level achieved in the constrained and unconstrained model
Disaster Area	Constrained	2.482	.950	.940	.950	.919	.067	
	Unconstrained	2.223	.959	.950	.959	.928	.061	
Non affected area	Constrained	1.696	.937	.924	.938	.861	.064	
	Unconstrained	1.451	.959	.951	.960	.881	.052	

Source: Research Data Analysis, 2019

Table 7 indicates the model fit estimates for both Unconstrained and constrained full models in the SEM of Disaster affect area and non-area. The mode fit indices of both constrained and unconstrained models of disaster-affected area were above cut off value, respectively Normed χ2= 2.482, 2.223; CFI= .950, 959; TLI= .940, 950; IFI=.950,959; NFI=.919, .928 and RMSEA= .067, 061. The estimate model fit indices for non-area also achieved the required level, respectively Normed χ2= 1696, 1.451; CFI= .937, 959; TLI= .924, 951; IFI=.938, 960 and RMSEA= .064, 052. Only NFI value was around less than .9 as .861, .881.

c) *Comparing the Group Effect (Living Area) for a Moderating Variable*

The study paid attention to identifying which group effect is more powerful to the relationship between independent and dependent as a moderator variable. Hence, estimated the standardized values of all paths for both the disaster-affected area and non-affected area. The standardized regression weight of the default model of the path coefficient (Beta) should be greater than >.20 (Ramayah& Lee, 2012), and it was considered this requirement to identify the moderation effect.

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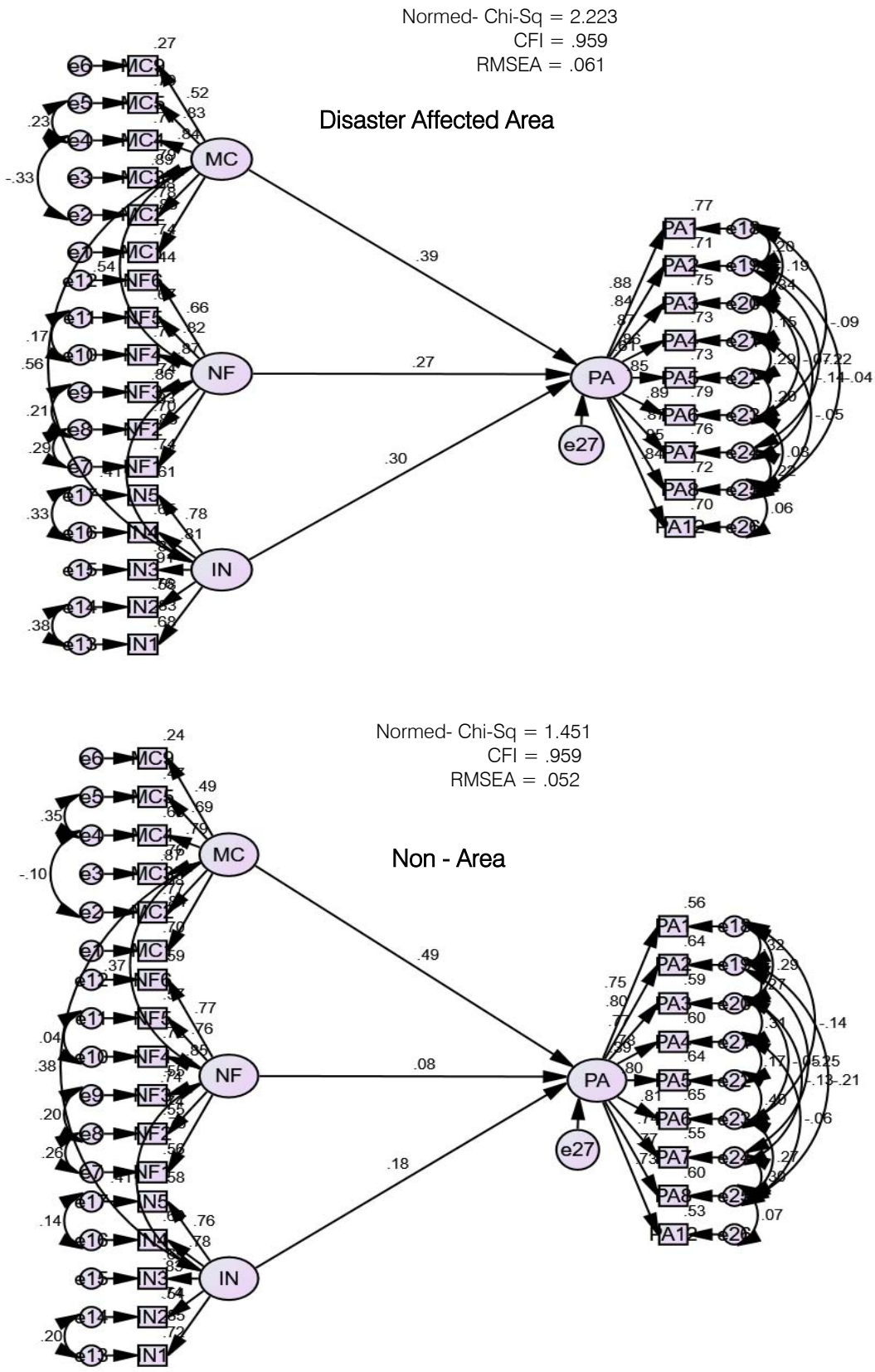

Figure 2: Structural Equation Model for Disaster affected area and non disaster area

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As indicates in figure (2) of structural equation models, the standardized parameter estimate (MC to PA) of the disaster-affected area is 0.39 while the same estimate of non-area is 0.49. Thus, the effect of Microcredit on spatial poverty alleviation is more pronounced in non-area compared to disaster-affected area, since both values are significant then partial moderation occurs. The standardized parameter estimate for the disaster-affected area is .27 while non-area indicates as .08 for the relationship between nonfinancial Service and poverty alleviation. Since only one estimate is significant full moderation occurs for this relationship. The standardized parameter estimate for insurance service to poverty alleviation shows a full moderation as standardized parameter estimate for the disaster-affected area is .30 while .18 for non-area. The study identified two full moderation effects and one partial impact. The summary of the group effect presents in table 7 below.

Table 7: The summary of the group effect

Path	Living area	Standardized beta Estimate	P	Result	Moderation effect
PA<>Micro credit	Disaster	.39	***	Significant	Partial moderation
	Non affected	.49	***	Significant	
PA<> Non-financial services	Disaster	.27	***	Not significant	Full moderation
	Non affected	.08	.318	Not significant	
PA<> insurance	Disaster	.30	***	Significant	Full Moderation
	Non affected	.18	.029		

Source: Research Data Analysis, 2019

VIII. Conclusion

The poverty of Sri Lanka identified as a spatial and natural disaster was one of the key reason behind the development level and poverty level in some districts in the country. Microfinance plays a major role in reducing poverty in those areas. The study investigated whether what is the moderating effect of a disaster and non-affected area for the relationship between microfinance and spatial poverty. The multi-group analysis conducted for identifying the significance of the moderating impact of the disaster-affected area and non-disaster area. The moderation test was significant for all path relationship since the Chi-Square difference between the constrained and unconstrained model was higher than 3.84 with 1 degree of freedom. Therefore, there is a living area moderated the effects between microfinance servicers and poverty alleviation.

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