

Impact of Economic Growth and Agriculture on Rural Poverty in Sri Lanka: Logarithmic Mean Divisia Index (LMDI) Method

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ABSTRACT

Sri Lanka still has significant challenges in terms of poverty, particularly in rural areas. Poverty alleviation has been one of the major concerns in the country for years and it has not been successfully addressed as per the findings of the study. This research was conducted to determine the extent of poverty by looking at it from several different angles utilizing innovative methods such as the Logarithmic Mean Divisia Index (LMDI) method and the grey relational analysis method. By bringing the LMDI method into the realm of rural poverty, this study achieves a secondary goal of providing some more insights to future researchers in the sector. The findings show that rural poverty in Sri Lanka has not been relieved by the country's overall economic growth. The number of individuals who live in poverty in rural regions has decreased, yet there are still a number of key factors that contribute to poverty in rural areas. However, the reciprocal of rural agricultural outcomes influences the level of rural poverty unpredictably, with positive and negative waves occurring in irregular patterns. The incidence of poverty takes a turn for the worse. The results of agricultural endeavors, on the other hand, have been shown to contribute to the reduction of poverty in rural areas. In light of this, it is suggested that ultimate poverty alleviation could be achieved by focusing on the most appropriate segment for the rural sector.

KEYWORDS: Grey relational analysis, LMDI method, Poverty alleviation

Introduction

Sri Lanka is a developing country in South Asia and it is home to little more than 21 million people. Through a series of anti-poverty measures and policies, Sri Lanka has achieved great success in poverty alleviation in the past two decades. Even though poverty has declined to a greater extent at the national level in the last few decades, poverty disparities still exist across the provinces and districts (Figure 1). The official poverty figures in Sri Lanka refer to the share of individuals whose household per capita consumption falls below the official poverty line. This indicator is referred to as the poverty headcount index and is the standard measure of the incidence of poverty.

According to the department of census and statistics the Official Poverty Line (OPL) in Sri Lanka was Rs. 4,166 per person per month and the poverty headcount Index was 4.1 percent at the national level. Further 3.1 percent of households that accounts 843,913 persons were in poverty in 2016 and the highest was recorded from Kilinochchi district (15.0 percent) while the lowest percentage was reported from Colombo district (0.6 percent).

The poverty headcount index in the estate sector is generally higher than those of urban and rural sectors and as a district the lowest poverty headcount index was reported in Colombo while the highest was reported from Kilinochchi. The geographical areas which have been reported with the highest headcount indices do not necessarily contain a large number of poor people i.e., Gampaha (HCI 2.0) and Kandy (HCI 5.5) shows low poverty rate but a large number of poor people (Census and Statistics, 2016).

Poverty alleviation and overall improvement of welfare level depend on the identification of the causes of poverty. Poverty and its relationship with the economic growth, income inequality and agricultural production are the most studied forcing factors in literature with evidence (World Bank 2000; Dollar and Kraay, 2004; Ravallion and Chen, 2003). The empirical results show that economic growth helps to increase the income of the poor and thus contributes to poverty reduction. Further income inequality had become the focus of poverty reduction and the higher the inequality, the more difficult it is to alleviate poverty (Ravallion and Chen, 2003). Therefore, while promoting steady economic development, the country should constantly work to narrow the income gap between urban and rural areas to improve the income level of poor rural groups. The impact of agriculture on poverty was explained by World Bank, (2000) claimed that the imbalance in agricultural development directly affects the incidence of poverty as the income of the rural poor comes mainly from agriculture.

Sri Lanka is still in front of severe poverty problems, especially in rural areas, that urgently need to be solved while the effects of economic growth and agriculture on poverty should be further studied. Therefore, it is required to incorporate more factors to assess poverty vulnerability and account for the multi-dimensional nature of poverty. This study aimed to assess the impact of economic growth and agriculture on rural poverty through a novel approach; Logarithmic Mean Divisia index (LMDI) method and the grey relational analysis method. As a secondary objective, it is expected to provide some further insights into future research by incorporating the LMDI method into the field of rural poverty.

Literature Review

Poverty is a multi-dimensional phenomenon, that should be alleviated through eliminating causes of them. Poverty vulnerability is the probability of being poor or poorer, higher the degree, the greater the probability individuals who had risen out of poverty will fall back into it when exposed to external shocks or risks. Thus, to break the poverty circle, it is essential to solve the problem of poverty vulnerability. Chen et al. (2020), summarizes three main theoretical methods for assessing poverty vulnerability as: low expected utility, expected poverty and as uninsured exposure to risk.

Poverty alleviation strategies may be categorized into four types including community organizations based micro financing, capability and social security, market-based, and good governance (Singh and Chudasama, 2020).

There have also been numerous recent studies on rural poverty in different regions and countries (Fan et al. 2000). Economic growth, impact of agriculture, income inequality, shortage of natural resources and natural disasters are the most outstanding factors, those were identified as the causes of rural poverty as offered in recent literature (Chen et al., 2020). There is much controversy regarding the relationship between rural poverty, agriculture and economic growth, a phenomenon that was taken as the epicenter of the study to be assessed.

The poor in general, and the rural poor in particular, are poor because of the meagerness of the quantity of quality of the productive assets they own (Lo'pez and Valde's, 2000). Dao (2004) has used agricultural value added per agricultural worker as a proxy variable for the productivity to assess the effect of the growth of per capita agricultural output on rural poverty. World Bank report claimed that the imbalance in agricultural development directly affects the incidence of poverty as the income of the rural poor comes mainly from agriculture. Yet, a study conducted by the Centre for the Study of Living Standards (2003) showed that the reduction of labor productivity in the industrial sector was the main driving force of poverty but not the labor productivity in the agricultural sector which was only slightly positively correlated with poverty reduction. Chen et al. (2020) showcase that, from 2008 to 2017, rural agricultural outcomes per capita, GDP per capita, and total population did not alleviate rural poverty in China, but the proportion of agricultural outcomes did contribute to a reduction in the number of rural poor.

Further results show that, in addition to the low contribution of the total population to rural poverty, the incidence of rural poverty, rural agricultural outcomes per capita, the proportion of agricultural outcomes, and GDP per capita contributed more than 80% to rural poverty. Agriculture and allied farm activities have been the focus of poverty alleviation strategies in rural areas (Singh and Chudasama, 2020) and then much of the focus has shifted to livelihood diversification on the part of researchers and policy-makers too.

Promoting non-farm livelihoods, along with farm activities, can offer pathways for economic growth and poverty alleviation in developing countries the world over. Further the development of comprehensive value chains and market systems emerged as viable alternatives for poverty alleviation in developing countries.

Early studies emphasized that economic growth was the main driving force for poverty reduction (World Bank 2000; Dollar and Kraay 2004). Ravallion and Chen (2003) analyzed the effect of economic growth poverty incidence curve which shows that economic growth helps increase the income of the poor and thus contribute to poverty reduction in China. Thus, the economic growth is one of the principal instruments for poverty alleviation and for pulling the poor out of poverty through productive employment.

Further, economic growth generates revenues required for expanding poverty alleviation programs while enabling governments to spend on the basic necessities of the poor including healthcare, education, and housing. Economic growth might throw some light on the financial aspects of poverty, yet they do not reflect its cultural, social, and psychological dimensions. Therefore, economic growth is vital for enhancing the living conditions of the poor, it does not necessarily help the poor exclusively tilting in favor of the non-poor and privileged sections of society (Singh and Chudasama, 2020).

Chen et al. (2020) is the only incidence that have used the logarithmic mean Divisia index (LMDI) method and the grey relational analysis method to explore the causes of rural poverty and the vulnerability of rural poverty. The study incorporates the LMDI method into the field of rural poverty for the first time to study the incidence of rural poverty, rural agricultural outcomes per capita, proportion of agricultural outcomes, and impact of gross domestic product (GDP) per capita and total population on rural poverty.

Methodology

LMDI decomposition method

LMDI decomposition method, which has the advantages of complete decomposition, no residuals, ease of use, consistency between multiplication and addition decomposition, and consistency of results (Ang et al., 1998) successfully solved the problem of zero and negative values by using the “analytical limit” technique (Ang, 2005). Considering the few literatures (Chen et al., 2020) LMDI method can decompose rural poverty into factors such as GDP per capita, rural agricultural outcomes per capita and total population, which can be used to understand the relationship of economic development and agricultural development with the rural poverty in Sri Lanka.

The grey relational analysis method (GRA)

GRA is a multi-factor statistical analysis method that uses the grey relational degree to describe the relationships of intensity, size, and order between factors based on the sample data of each factor which requires only low data requirements and little calculation work compared to traditional multi-factor analysis method (Chen et al., 2020).

Theoretical framework

LMDI method was used to decompose rural poverty into GDP per capita, rural agricultural outcomes per capita and total population as follows;

$$P_{rp} = \frac{P_{rp}}{P_r} \times \frac{P_r}{AGR} \times \frac{AGR}{GDP} \times \frac{GDP}{P} \times P \quad [1]$$

- P_{rp} : Number of rural poor
- P_r : Rural population
- AGR : Agricultural outcomes
- GDP : Gross domestic product
- P : Population

$\frac{P_{rp}}{P_r}$: Incidence of rural poverty

Then, according to the additive decomposition method of the LMDI model, we assume that T is the current period and B is the base period. The change in the current period and the base period of rural poverty can be expressed as;

$$\Delta P_{rp} = P_{rp}^T - P_{rp}^B \tag{2}$$

Can be transformed as follows;

$$\Delta P_{rp} = \Delta PR + \Delta IPAGR + \Delta PAGR + \Delta PGDP + \Delta P \tag{3}$$

Finally, according to the LMDI addition decomposition principle, we can determine the effect of various decomposition factors on the change in rural poverty as follows:

$$\Delta PR = L(P_{rp}^T, P_{rp}^B) \times \ln \frac{PR^T}{PR^B} \tag{4}$$

$$\Delta IPAGR = L(P_{rp}^T, P_{rp}^B) \times \ln \left(\frac{IPAGR^T}{IPAGR^B} \right) \tag{5}$$

$$\Delta PAGR = L(P_{rp}^T, P_{rp}^B) \times \ln \frac{PAGR^T}{PAGR^B} \tag{6}$$

$$\Delta PGDP = L(P_{rp}^T, P_{rp}^B) \times \ln \frac{PGDP^T}{PGDP^B} \tag{7}$$

$$\Delta P = L(P_{rp}^T, P_{rp}^B) \times \ln \frac{P^T}{P^B} \tag{8}$$

Data Collection and Analysis

The data on the total rural population, agricultural production, GDP, and total population from 2005 to 2019 were taken from the statistical reports published by the department of census and statistics. Then those data were used to derive the LMDI decomposition factors which resulted as an outcome of the numeric computing using MATLAB. The given algorithms were employed via MATLAB to obtain the decomposition factors under each category.

Results and Discussion

Empirical Results Using the LMDI Method

When identifying the poverty vulnerability causes in Sri Lanka, the LMDI method has been employed in this paper. The LMDI method reduces the issues entailed in econometric methods and results in a better objective outcome.

Table 1: Logarithmic Mean Divisia Index (LMDI) Decomposition Results

Year	ΔPR	$\Delta IPAGR$	$\Delta PAGR$	$\Delta PGDP$	ΔP	ΔP_{rp}
2005-2006	-3722.82	1343.47	-5147.50	3796.51	214.55	-3515.79
2006-2007	-4003.07	-582.20	-2781.94	3377.48	201.11	-3788.62
2007-2008	-6238.07	-3916.31	-2865.54	6790.37	222.71	-6006.83
2008-2009	-3165.83	1210.21	-1724.34	517.32	143.83	-3018.81
2009-2010	-1175.03	4761.01	-8170.42	3410.66	82.21	-1091.58
2010-2011	-398.37	-204.82	-673.19	878.22	45.46	-352.70
2011-2012	-300.28	1003.50	-1269.86	269.25	8.63	-288.76
2012-2013	-10.37	-16.69	-41.86	58.53	6.09	-4.30
2013-2014	-8017.10	-886.26	-574.88	1446.06	234.90	-7797.29
2014-2015	-656.20	-84.46	37.85	44.08	60.13	-598.61
2015-2016	-2450.99	1315.87	-1460.50	138.06	128.16	-2329.40
2016-2017	-1343.91	-356.98	-57.90	407.67	88.40	-1262.72
2017-2018	-1124.30	-15.12	0.41	5.12	68.24	-1065.64
2018-2019	-1383.15	530.99	-105.73	-435.41	36.27	-1357.03
2005-2019	-33989.49	4102.20	-4835.39	20703.92	1540.69	-32478.06

Data Source : Author's work

Note : PR- rural poverty incidence, IPAGR- reciprocal of rural agriculture outcomes per capita, PAGR – proportion of agricultural outcomes, PGDP- gross domestic product per capita, P- total population, P_{rp} – number of rural poor

LMDI Decomposition Results

As indicated in Table 1, the effects of the incidence of rural poverty reciprocal of rural agricultural outcomes per capita, the proportion of agricultural outcomes, GDP per capita, and total population on the number of poor people in rural areas can be derived from the LMDI. The number of rural poor people has a decreasing behavior, the decreasing pattern keeps rising and falling irregularly, from 2005 up-to 2019 throughout the period. The number has a general and gradual drop from 2005 to 2007, but from 2008 the dropping rate has become less. Though the poor population decreased with time the reduction is quite uneven. A drastic change can be observed from 2009 to 2012. Then up-to 2019, the decreasing range showed a much fluctuating trend. As per the indications on the national poverty line the and number of people living in the poverty in rural areas came to a peak in 2005 at a level of 2.8 million of the rural population and luckily kept dropping from that year onwards. In 2019 the recorded rural population who lived in poverty came to a minimum of 0.4 million which is 6.5 times less than the rural poverty recorded in 2005. As per the previous records the rural poverty of Sri Lanka has been reduced from 15.7% to 9.5% from 2006 onwards and the nation has made significant progress towards achieving millennium development goals.

This brings to attention that Sri Lanka's poverty alleviation has been a success and those measures have made significant progress. So, the future research could be encouraged on identifying the factors of positive impact in poverty alleviation of rural areas in Sri Lanka.

When considering the overall effect of the incidence of rural poverty on rural poverty from 2005 to 2019, it came to a negative value of -33989.49. So, in general that implies from 2005 to 2019 the incidence of rural poverty had a negative impact on rural poverty population year by year, and if focused specifically it came to a significant point when considering the overall values implying that the rural poverty had come to a drastic drop between the years considered for this study. Actually, the from 2013-2014 the incidence of rural poverty gives a significant value of -8017.10 marking the least contribution in consecutive years to the rural poverty population. When considering the highest contribution in terms of poverty incidence it was recorded as 10.37, from 2012 to 2013. Given these two extreme points, the rural poverty in terms of number of rural poor, the number kept dropping over the years. But when specifically considering the years from 2012 to 2013, the number reduced only by 6923 people, but rapidly over the next two years from 2013 to 2014 the rural poor population decreased by 0.32 million. The incidence of rural poverty was calculated by dividing the number of rural poor by the total rural population. So, with the development projects, urbanization, rising job opportunities in urban areas, the subjected population keeps decreasing, resulting a higher value in the rural poverty incidence. However, the incidence rate of rural poverty in Sri Lanka keeps decreasing from 2005 to 2019 giving each and every point a negative rate. Thereby it means that the incidence rate of rural poverty had a negative effect on rural poverty, which implies that the rate of rural poverty reduction of these rural areas was greater than the rate of fluctuations in the total rural population. If taken generally as an overall view the incidence of rural poverty had a negative effect on rural poverty.

From 2005 to 2019, the reciprocal of rural agricultural outcomes per capita had fluctuating effect on the number of rural poor. The effect has both positive and negative impacts on the number of rural poor, with regards to the reciprocal of rural agricultural outcomes per capita. The largest value recorded was 530.99 from the years 2018 to 2019, which indicates that the rural agricultural outcomes per capita led to a decrease of 5.3099 million people living in poverty in the rural areas.

From 2013 to 2014, there was a large negative effect of -886.26, which brought into light the fact that rural agricultural outcomes per capita increased the number of rural poor by 8.8626 million. When considering the period subjected to the study as a whole from 2005 to 2019, the total effect was identified as 4102.20, and the finding implies that the rural agricultural outcomes per capita decreased the number of rural poor by 41.0220 million/ a greater portion.

Given the Sri Lankan context the rural agricultural outcomes per capita had a negative overall effect on the degree of rural poverty from 2005 to 2019. Majorly it could be because the majority of the rural population are engaged in agricultural aspects as the basic source of income. With the associated economic growth and the increasing population agriculture may have been the best source of income generation for the rural poor resulting in having negative contribution towards the rural poverty.

The income associated with the agricultural activities have been fulfilling the rural population needs for decades and it seems to continue further given the background. However, as per the findings of Bhutto and Bazum (2007), agriculture will be considered as one of the most important sectors of a country's economy for years to come and in order to alleviate poverty, it is suggested that productivity of the agriculture sector should be enhanced. Given the condition regarding the high rate of population growth needs to be curbed for increased agricultural productivity to have any significant effect on poverty in rural areas. Agriculture being a part and partial of the rural livelihood several plausible and strong arguments apply that including the creation of jobs on the land, linkages from farming to the rest of the rural economy, and a decline in the real cost of food for the whole economy (Irz et al., 2001). Fan et al. (2000) suggested that in order to reduce rural poverty, highest priority should be given to additional investments in rural roads and agricultural aspects given the importance of it with regards to rural poverty. These types of investment not only have much larger poverty impacts per rupee spent than any other government investment, but also generate higher productivity growth.

Therefore, to address the major reason behind the rural poverty the government should enhance the agricultural employability and implement diverse opportunities in the rural poverty-stricken areas. At the point of formulating the strategies and initiating the policies comprehensive quality abilities of the rural poor should be taken into account.

From 2005 to 2019, the portion of agricultural outcomes showed a mostly negative impact on the number of rural poor except for two minor points in particular years. When considering the whole period as a whole, the total effect rounds up to -24835.39 meaning that the proportion of agricultural outcomes had reduced the number of rural poor by a massive proportion comparatively.

The negative trend kept fluctuating through-out the years giving irregular drops and in between rises but generally giving a negative trend as an overall picture.

From 2005 up until it was 2009 and 2010 period the trend kept a downward trend until the decomposition value was recorded at a drastic drop as -8170.42.

Then onwards along the years, the values kept falling and rising until it came to a positive point of 37.85 in 2014/15 implying that the agricultural outcomes have actually positively impacted on the number of rural poor. Then once again the usual fluctuation of negative impact prevailed until 2017/18 when the value implies a positive impact of 0.41 on the rural poor population resulted by the agricultural outcomes. But when considering the whole situation, the agricultural advancements come in real advantage in enhancing the rural poverty alleviation and it entails the fact that given the Sri Lankan Condition, agricultural projects should be funded and initiated to reduce rural poverty. Basically, it shows how much the rural economy is dependent on the agricultural outcomes. However, the result is partially consistent with the findings of Chen et al., (2020) with regards to the impact of agricultural outcomes on the number of rural poor. However, in rural development-based projects agriculture should be a given with priority given that it has a higher capacity to reduce rural poverty.

As per the findings of Biggs (2008) in recent years, there has been a growing interest in making agricultural and natural resources projects and programs more effective in reducing rural poverty therefore he has suggested in strengthening social science research on understanding change in agricultural and natural resources systems. Agricultural growth has long been recognized as an important instrument for poverty reduction. As identified by studies on the matter it has been reflected that rural poverty reduction has been associated with growth in yields and in agricultural labor productivity, but that this relation varies sharply across regional contexts. The power of agriculture comes not only from its direct poverty reduction effect but also from its potentially strong growth linkage effects on the rest of the economy. The authors show that rapid growth in agriculture has opened pathways out of poverty for farming households. While the effectiveness of agricultural growth in reducing poverty is well established, the effectiveness of public investment in inducing agricultural growth is still incomplete and conditional on context (Janvry and Sadoulet, 2010). Oyakhilomen and Zibah (2014) stated that agricultural production was significant in influencing the favorable trend of economic growth in a country while overcoming the rural poverty. The authors suggest an economy with more plural aspects and one with agriculture being the lead sector. It was recommended that pro poor policies should be designed for alleviating rural poverty through increased investments in agricultural development by the public and private sector. Given the background it is highly recommended that government needs to pay more attention on funding agriculture related issues in reducing poverty in rural areas. Therefore, agricultural industries should be taken into serious consideration when funding are allocated by the government because an investment in agriculture could lead to steady and sustainable reducing in rural poverty.

From 2005 to 2019, when the GDP per capita is taken into consideration, it showed a positive effect on the number of rural poor with a total of 20703.92 which reflects the fact that the economic growth gradually increases the number of poor in the rural community.

From 2007 to 2008 the effect was at the largest, giving a number of 6790.37 which indicates that the economic growth has resulted in increasing the number of people living in poverty in the rural areas by 67.9037 million. The effect was at the least from 2018 to 2019, basically giving a negative value of -435.41 indicating that the economic growth has basically decreased the number of people who live in poverty in the rural areas by 4.3541 million.

Therefore, when considering the result as a whole it comes to the point where the overall idea means that the economic growth is actually leading towards increasing the number of people who live in poverty except for one single point where there is actually a simple tendency towards reducing rural poverty with the economic growth. Different authors have reviewed the matter of relationship between economic growth and poverty alleviation in different studies and have come up with different contradictory findings. However, some scholars have identified that GDP growth originating in agriculture induces income growth among the poorest, which is greater than growth originating in the rest of the economy (Janvry and Sadoulet, 2010).

Some findings interpret this as, that an increase in the rate of GDP growth translates into a direct one-for-one increase in the rate of growth of average incomes of the poorest 40%. GDP growth of ten percent per year is associated with income growth of ten percent for the poorest 40% of the population. For the poorest 20% the elasticity of response is 0.921; GDP growth of 10% is associated with income growth of 9.21%. These results give strong support to the proposition that growth in per capita GDP can be and usually is a powerful force in reducing poverty (Roemer and Gugerty, 1997). If deeper analyzed into the literature it highlights the need of agriculture for the reduction of the poverty however given that Sri Lanka has a trend of moving towards lessening the number of rural poor with the economic growth, some parallel findings may support the idea. Some findings provide with evidence that not only the size of economic growth but also its composition matters for poverty alleviation, with the largest contributions from unskilled labor-intensive sectors (agriculture, construction, and manufacturing). The results of such studies are robust to the influence of outliers, endogeneity concerns, alternative explanations, and various poverty measures (Loayza and Raddatz, 2010). Thereby when given with adequate importance to the economic growth in the Sri Lankan context, the much-prevailed pattern could be altered. The data supports the situation that the Sri Lankan economic growth did not alleviate the rural poverty. But actually, it had a tendency of being otherwise, so it leaves room for further explorations and research on the subject.

From 2005 to 2019, the total population had a positive impact on the number of the rural poor and it came to a total of 1540.69, indicating that the increase of the total population had caused an increase of the people in rural poverty by 15.4069 million. The effect of the total population was at its largest by 2013/14 which came to value of 234.90 meaning that the total population has led to an increase of 2.3490 million in rural poverty. Then the effect of the total population came to the least value of 6.09, indicating that the total population resulted in increasing the number of people in rural poverty by 0.609 million.

The population size should be evaluated and measures should be taken to increase the population quality given that increasing population size would not give any positive impact in reducing rural poverty. Actually, when considering the total population and the effect of it on the rural poverty it contributes in significant amounts to the increase of rural poverty. So, it is a significant factor which should be addressed to in alleviating process of rural poverty.

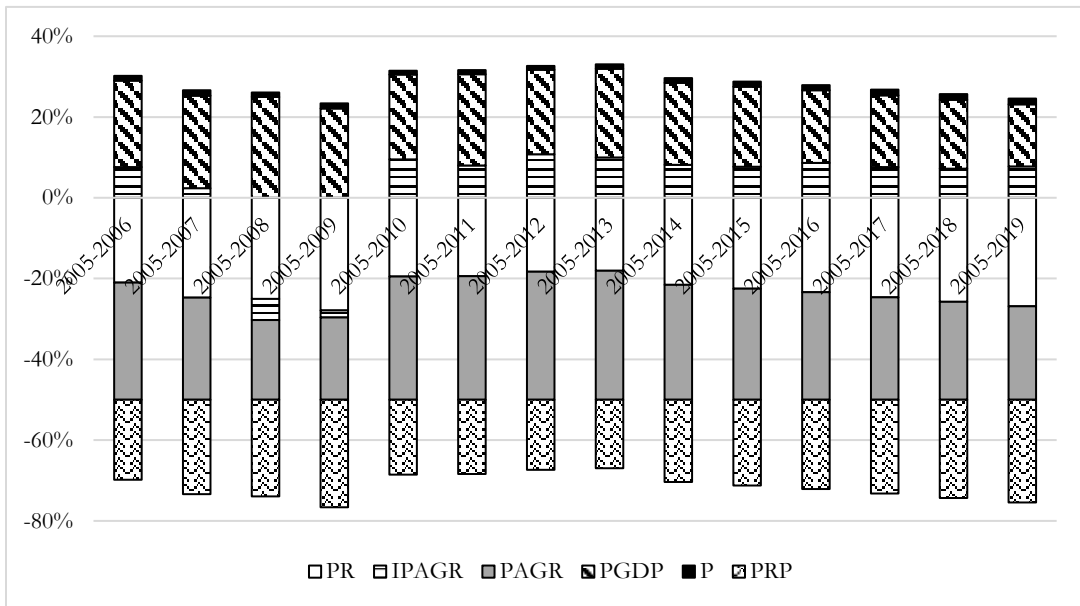


Figure 3: Percentage Effects of Various Decomposition Factors on The Number of Rural Poor from 2005 to 2019

Figure 1 can be used to compare the effects of different factors in different years on the number of rural poor. First, from 2005 to 2019, the incidence of rural poverty and the proportion of agricultural outcomes had a negative impact on the rural poor population through-out. As well the GDP per capita, and the total population had a consistent positive impact on the number of rural poor. Except for several years in between (2006, 2007,2010,2012,2013,2015,2016,2017) the reciprocal of the rural agricultural outcomes per capita had not contributed to the growth of the number of rural poverties in Sri Lanka.

However, when considering the causes for rural poverty the incidence of rural poverty actually implies that the Sri Lankan population who live in rural poverty keeps dropping and the amount keeps fluctuating but the highest drop can be seen 9 and 13. The GDP can be a leading cause for the rural poverty as per the results obtained, actually continuously the GDP had been a positive driver of rural poverty only except for one year. So, despite of the economic growth insufficiency for the alleviation of rural poverty, the proportion of agricultural outcomes had been a great source of poverty alleviation in the Sri Lankan context.

Grey Relational Analysis Results

As illuminated by the LMDI decomposition values the analysis brought into attention the impact of the poverty incidence, rural agricultural outcomes per capita, the proportion of agricultural outcomes, GDP per capita and total population on the fluctuations in rural poverty from 2005 to 2019.

Even though it reveals the impact of each factor the magnitude of each factor contribution to the changes in rural poverty should be evaluated further. By identifying these factors, it helps the government to concentrate more on the issues that contribute more to the rural poverty and take action to lessen their impact when regulating the poverty alleviation policies in the country.

Table 2 indicates that, relative to the other four areas under which the decomposition values were taken the poverty incidence contributes less to rural poverty. The result is complementary with the LMDI decomposition results. Even though the situation is as such the contribution of the other factors such as the reciprocal of the agricultural outcomes per capita, gross domestic product per capita and even total population play a significant role in deepening the rural poverty in Sri Lanka. However, the total contributions of the other the reciprocal of the agricultural outcomes per capita and the GDP per capita is 1, indicating that they play a direct contributing role in rural poverty. Actually, the proportion of agricultural outcomes, even though not as much as the high contributors, however seemingly has been a moderately effective factor causing poverty in rural areas. If taken both the LMDI decomposition and grey correlation analyses, it can be stated that mere economic development in Sri Lanka has not been a great support to alleviate the poverty from the country. Instead, even though the economy has grown it has not been a force to alleviate poverty instead it has actually deepened the reasons for rural poverty. In Sri Lanka poverty has been gradually minimized but not via the developments in the economy as per the results obtained. When considering the finding by Chen et al. (2020) the same fact has been brought out regarding poverty of China. The ultimate focus of the study has highlighted the importance bridging the income gaps so that it poverty will not be an issue with the economic expansion. As per the findings it reveals that it is pointless to have a growing economy if it results in unequal income distribution. So, this leaves room for the government to identify the steps to further alleviate poverty while developing the economy. If simultaneously both these aims could be fulfilled it has a probability of marking a significant milestone in alleviating rural poverty from Sri Lanka. These results actually are partially consistent with Chen et al. (2020).

Table 2: The Contribution of Various Decomposition Factors to Rural Poverty

Influencing factor	PR	IPAGR	PAGR	PGDP	P
Relational	0.3912	1	0.585676	1	0.9037

Data Source: Author's work

PR -rural poverty incidence, IPAGR - reciprocal of rural agricultural outcomes per capita, PAGR - the proportion of agricultural outcomes, PGDP - gross domestic product per capita, P -total population

Conclusions

The reciprocal of rural agricultural outcomes influences the level of rural poverty unpredictably, with positive and negative waves occurring in irregular patterns. The incidence of poverty takes a turn for the worse.

The results of agricultural endeavors, on the other hand, have been shown to contribute to the reduction of poverty in rural areas. In light of this, it is suggested that ultimate poverty alleviation could be achieved by focusing on the most appropriate segment for the rural sector.

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