

An Assessment Of Poverty Equivalent Growth Rate In Agro-Climatic Zones Of Punjab From 2011-12 To 2015-16

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ABSTRACT

Reducing poverty has become the basic agenda of development policy makers in a recent decades and growth is considered as a pillar to explore it. Therefore to explore the extent of problem, in a current study PEGR has been estimated in five major agro-climatic zones of Punjab through well-known index of Kawani and Son (2008) for latest three HIES data sets from 2011-12 to 2015-16. Results of the study concludes that in year 2011-12 to 2013-14 2011-12 to 2013-14 also reveal that growth is only pro-poor for II and III zone while anti-poor for all other zones along with poverty reducing impact. Final estimates of year 2013-14 to 2015-16 reveal that growth is pro-poor for zone III, IV and V while anti-poor for I and II. Overall discussion sum up that over the period of time poverty reduce in all agro climatic zone of the Punjab which shows that growth benefits are trickledown toward lower income quintile and also poor enjoys more benefits of growth as compared to non-poor.

INTRODUCTION

A pivoted aspiration of the economic policy since some decades has been lessening of poverty. An economically strong country is supposed to be one least afflicted by poverty, but in turn is dependent upon growth of economy and a judicious apportionment of income (Kakwaniet al., 2003; Kamal, 2006 and Asad and Ahmed, 2011). In a broader views economic advancement and poverty reduction can be seen through pro-poor growth which explains how poor are influenced by this advancement, how its boons are delivered to the poor and how much vantage poor gain from them (Chenery et al., 1974; Ravallion, 2004 and Kakwani and Son, 2008).

In order to examine the utility of growth performance in lessening poverty, one of the key factors is the study of trilateral association between growth poverty and inequality (Kakwani, 1997 and Bourguignon, 2004). Some studies claim to have examined this relation and discovered strong link among particular variables (Heshmati, 2004 and Anwar, 2005). Nevertheless, Zaman et al. (2012) studies claimed that this association between growth poverty and inequality is intricate one and experimental outcomes of their investigations forcefully suggested that economic progress unaccompanied is a feeble criterion for checking decline in poverty. Moreover, study of Zaman and Ahmed (2008) claimed that though economic growth is inevitable for poverty reduction, it must not be considered be a sole standard.

After Bourguignon (2004) explanation of the trilateral relation among growth, poverty and inequality, Kakwani and Son (2008) also discuss this phenomenon through the notion of pro-poor growth. His study evaluates the degree to which poor gain advantage from economic growth. They also establish a new demonstrator for the evaluation of growth rate christened as poverty equivalent growth rate (PEGR). Particular index not only tells the degree to which poor benefit from growth but also its multifarious boons. In the meantime, calculation of index shows that larger the value of PEGER greater will be the reduction of poverty.

A stream of literature portrays a broader view of poverty reduction capacity of economic growth. Primarily, Ravallion and Chen (2003) elaborated a pro-poor growth is the one which play an effective role in declining poverty. Dollar and Kraay (2002) in his paper "Growth is good for the poor" pronounced that positive economic growth is not only advantageous for the economy; it is also beneficial for the poor in a similar fashion. Similarly study of Kakwani and Pernia (2000) emphatically explained that growth is pro-poor if poor stake holder of economy comparatively enjoy more boons of growth than their rich fellow whereas they also stated that in a negative reference, growth is taken as pro-poor if poor are comparatively less harmed than non-poor member of society. Furthermore, study of Ravallion and Chen (1997) explained the role growth plays with reference to poor through growth elasticity of poverty. They stated in mathematically term that if calculated elasticity of poverty growth rate is 3, it simply means that 1% rise in economic growth decline poverty by 3 %. Similarly Foster and Szekely (2000) illuminated that positive growth elasticity of poverty is advantageous for poor. Precise views are also shared by White and Anderson (2001) and Christiaensen et al. (2002).

The main aim of the current study is to explore growth, poverty and inequality trend in agro-climatic zones of Punjab; which is an area left unexplored after Ali et al. (2015) study (which did this explanation from 1998 to 2011). Therefore current study makes special effort to bridge up such gap by exploring the dynamic trend of growth, poverty, and inequality in agro-climatic zones of Punjab from 2012 to 2016 using HIES data sets.

Literature Review

For every research problem importance of review of literature can never be ignored because it not only provides detailed background knowledge regarding current issue but also explore the strength and weakness of the researcher views that has previously done. Therefore this section of the study explains that how strongly growth, poverty and inequality are interlinked. It also explains the concept of pro-poor growth in detail by following preceding notion of national and international researchers.

McCulloch and Baulch (1999) examined pro-poor growth in two widely known cities (Andhra Pradesh and Uttar Pradesh) of India (Asian Second Largest Populated State). A well-accepted method of Poverty Bias Growth (PBG) is applied for the calculation of outcomes of the study. Estimated outcomes revealed that since 1973 to 1989 growth showed pro-poor pattern in Andhra Pradesh while anti-poor pattern in Uttar Pradesh. Correspondingly Kakwani and Pernia (2000) estimated growth pro-poorness in three different countries and their urban and rural regions like Lao PDR, Thailand and Korea by using survey data of these countries from 1988 to 1998. A well-establish method of pro-poor growth index (PPGI) was used for overall calculation of outcomes. Results of the study concluded that in first country i.e. Lao PDR at national level growth is noted feebly pro-poor

because PPGI index value is less than 1 which suggested that trickle down of benefits of growth were smaller toward poor households. At regional level value of PPGI in urban areas was smaller than rural areas which suggested that rural areas household gain higher benefits to growth as associated to urban areas. Similarly, in case of Thailand growth remained mostly pro-poor in initial years but discussed county pro-poor growth index value in most of the years was also less than 1 which showed the poor trickle down of growth benefits towards poor. However, since 1996 to 1998 due to financial crises pro-poor index showed negative value which explained in these years poor was proportionally hurt more than non-poor. Finally, in case of Korea economic growth remained totally in favored of poor since 1990 to 1998 because due to higher economic growth consistence trickle down of growth benefits toward poor had been done which lead to significant declined in poverty in a study period for discussed country.

Duclos and Chouchane (2010) figured out pro poor growth in two different countries South Africa and Mauritius through Ravallion and Chen (2003) and Kakwani and Son (2008) methodology. Two different households' server data 1995-2005 and 2001-2006 were used for the measurement of extent of problem. Estimated results evaluated that growth pattern in South Africa was totally anti poor because of poor redistribution effect while in Mauritius growth was strongly pro-poor in discussed time period.

Araar (2012) computed absolute and relative pro poor growth in five Latino American Andean (Ecuador, Peru, Colombia, Bolivia and Venezuela) Countries from 2005-2010 through well-known methodology of Duclos and Wodon (2004). Results of the study concluded that in most of the study period's growth was pro poor

in all above discussed countries. However, due too little bit fluctuations in business cycle and few economic crises in 2008, absolute pro poor growth was pretentious momentarily but it was recovered through plenteous economic growth in start of 2009.

Cheema and Sial (2012) assessed PPG in Pakistan through three basic indices Poverty Bias of Growth (PBG), Pro-poor growth index (PPGI) and Poverty Equivalent Growth Rate (PEGR). For given estimation eight HIES (Households Integrated Economic Survey) data sets collected from Pakistan Bureau of Statistics since (1993 to 2008) were used. Calculated outcomes of the study concluded that there was only two periods (1994 to 1997 and 2006 to 2008) during which growth was pro poor for all three poverty measures because in these period plenteous growth improved income distribution pattern which leads to reduction in poverty while all other periods pro-poorness of growth had not been observed which means poor receive lower benefits from growth as compared to non-poor.

Zamanet al. (2014) measured pro-poor growth in Pakistan across different sectors (agriculture, industrial, manufacturing, commodity producing and service sector) using HIES data set from 1964 to 2014 and poverty equivalent growth rate (PEGR) index. General estimates of the study concluded that sectoral growth is beneficial for poor more than non-poor Ali et al. (2017) measured pro poor growth in relative and absolute term at national, provincial and regional level in Pakistan through Kakwani and Pernia (2008) poverty equivalent growth rate index. They used HIES (Household integrated Survey) data of last 10 years from 2001-02 to 2011-12. Results of the study concluded that in relative (absolute) term growth was pro poo (anti-poor) in urban area of Pakistan across all poverty assessable measures while in rural area both measures present anti-poor pattern of growth.

Similarly provincial estimates stated that growth was anti-poor for Punjab and KPK while poor for Sindh and Baluchistan.

MATERIALS AND METHODS

It is globally acknowledged that amplification of the precise methodology and application of the appropriate techniques form the core of any study. A most appropriate measure is required to demonstrate the judgments and significant of any research. For assessing comprehensive and appropriate results current study is disintegrated into three different Segments. Segment one explores the extent of poverty. Second section deals with inequality and third most important section measures poverty equivalent growth rate. The approaches discussed above are well recognized and have strong theoretical background for primary and secondary data research.

Collection and Description of the Data

In order to explain poverty inequality and growth nexus in wider range cross-sectional data of Household Integrated Economic Survey (HIES) and Pakistan Social and Living standard Measurement (PSLM) for latest two years has been taken for current study. Given data set has

$$FGT = \frac{1}{n} \sum_{j=1}^q \left[\left(\frac{z_j - y_i}{z_j} \right) \right]^\alpha$$

Here 'n' describes the total population, 'q' represents the number of poor adults, 'z' is the suggested cut off which is commonly known as poverty line and 'y' is the consumption expenditure of adult households. However, parameter 'α' ranges from 0 to 2 by showing headcount ratio or extent of poverty when its value is 0 while it shows the intensity of poverty or poverty gap ratio when its value is 1 and it shows inequality among poor or squared poverty

been collected periodically by PBS (Pakistan Bureau of Statistics) and prescribed it in diverse (PSU's) primary sampling unit's and (SSU's) Secondary Sampling Unit's.

Basic Indexing Approach for the Calculation of Poverty

Basic definition of poverty expresses that it is the lack of command over resources to meet the basis needs for sustain a contented life. Uni-dimensional approach for the assessment of poverty is considered as a simple approach because it takes only income or consumption expenditure for the identification of poor .In a developing country uni-dimensional poverty is assessed through consumption expenditure of adult household because such measure is more reliable as compared to household's income (Rao, 2006). Under the views of different studies, numbers of indexes are used for the measurement of poverty. However, most extensively and broadly used class for the estimation of uni- dimensional poverty is FGT (Foster, Greer and Thorbecke, 1984) which satisfy the wide range of axioms. General class of current index is as follow.

gap ratio when its value is 2.

Estimation of Gini-coefficient

Current index is extensively used measure for the calculation of income/consumption inequality. It is defined as "the ratio of between Lorenz Curve and line of equality to the area of triangle under the line". General form along with mathematical form of such index is follow:

$$Gini - coeffericeint = \frac{Area\ between\ Lorenze\ Curve\ Diagonal}{Total\ Area\ Under\ Diagonal}$$

It is also mathematically derived from Lorenz Curve the general form of above discussed index is as follow:

$$Gini - coefficient = 1 - \sum_{i=0}^{n-1} (F_{i+1} - F_i)(\phi_{i+1} + \phi_i)$$

Her F_i is the cumulative population share and Φ_i is the cumulative income/consumption share. The value of Gini-coefficient varies from 0 to 1.

If the value of such index is zero mean perfect equality and 1 mean perfect inequality. Given measure is specified as.

$$Gini - coefficient\ range = 0 \leq G \leq 1$$

1 represents growth is highly pro-poor

poverty due to growth effect. Therefore current study uses another index known as poverty equivalent growth rate developed by Kakwani and Son (2008). The major property of given index is that it takes into account both growth rate in average income and distribution of benefits from growth. Thus given index is written as

3.11 Assessment of PEGR

For assessing the extent of problem under study in broader way two above discuss indices about pro-poor growth presented by Ravallion and Chen (2003) and Kakwani and Pernia (2000) are not satisfactory to determine any change in

$$\gamma^* = (\delta / \eta)\gamma = \varphi\gamma$$

Given measure is also presented as

$$\gamma^* = \frac{\int_0^H \frac{\partial p}{\partial x} x(p) g(p) dp}{\int_0^H \frac{\partial p}{\partial x} x(p) dp}$$

Given equation for Poverty Equivalent Growth Rate (PEGR) demonstrate the weighted mean of the growth rates of income at each percentile point while the weights of above equation depends upon the poverty measure under study.

reduces poverty because both measures are greater than zero. Similarly, in case of PGR and SPGR growth is anti-poor for 1st zone while those poor who are just below the poverty line enjoy greater growth benefits as compared to ultra-poor. For forth zone growth is anti-poor in case of PGR while for SPGR due to higher increase in inequality immiserising growth take place in both absolute and relative sense which means positive growth increase inequality which harms the ultra-poor more. In case of 5th zones growth is anti-poor for PGR and strongly pro-poor for SPGR in both absolute and relative

Results and Discussion

Table 1 presents that since 2011-12 to 2013-14 growth is anti-poor in 1st, 4th and 5th zones in both absolute and relative sense because actual growth rate is greater than PEGR and poor get proportionally less benefits from growth as compared to non-poor. However such growth

sense. In such scenario growth reduce both poverty and inequality which leads to improve standard of living of ultra-poor.

Like above discussion, estimates of 2nd and 3rd zones show pro-poor pattern of growth in because during a growth process both poverty and inequality decline and PEGR is greater than actual growth rate in relative sense which means poor enjoy significant higher growth benefits as compared to non-poor. While in case of absolute measure growth is anti-poor. However, in case of 2nd zone PGR measure demonstrates pro-poor growth pattern in relative and absolute sense while SPGR measure reveals pro-poor pattern of growth in relative sense and anti-poor pattern in absolute sense which reveals that during

trickledown process ultra-poor get smaller benefits in absolute sense as compared to those who are just below the poverty line.

Collective estimates of all the zones show that there exist significant decline in poverty while increase in inequality from 2011-12 to 2013-14 which leads to anti-poor pattern of growth in both absolute and relative sense which means during a trickledown process poor get significant smaller benefits from growth as compared to non-poor. Similar pattern has been present by estimates of PGR and SPGR in both absolute and relative sense while in detail discussion it is observed that those poor who are just below the poverty line enjoys more growth benefits as compared to ultra-poor.

Table 1 Growth Distribution in Agro climatic Zones of Punjab for Year 2011-12 to 2013-14

Headcount Ratio									
Region	ΔP_o	ΔI	γ	δ	η	ζ	η^*	(R) γ^*	(A) γ^*
I	-3.14	0.0173	15.81	-0.198	-0.294	0.09	-0.475	10.74	6.59
II	-1.79	-0.0104	1.98	-0.904	-0.675	-0.229	-1.50	2.65	1.19
III	-1.84	-0.0087	1.07	-1.72	-0.744	-0.98	-2.56	2.48	0.72
IV	-2.31	0.0338	10.99	-0.210	-0.826	0.62	-1.06	2.80	2.17
V	-1.69	0.0365	15.06	-0.112	-0.153	0.04	-0.284	11.06	5.93
Punjab	-2.02	0.012	7.78	-0.259	-0.504	0.245	-0.760	3.99	2.65
Poverty Gap Ratio									
I	-0.418	0.0173	15.81	-0.026	-0.043	0.017	-0.067	9.71	6.13
II	-0.238	-0.0104	1.98	-0.120	-0.075	-0.045	-0.092	3.18	2.58
III	-0.221	-0.0087	1.07	-0.207	-0.178	-0.029	-0.353	1.25	0.627
IV	-0.235	0.0338	10.99	-0.021	-0.216	0.195	-0.234	1.09	0.98
V	-0.243	0.0365	15.06	-0.016	-0.019	0.003	-0.039	12.82	6.17
Punjab	-0.243	0.018	7.78	-0.031	-0.103	0.072	-0.130	2.36	1.85
Squared Poverty Gap Ratio									
I	-0.066	0.0173	15.81	-0.004	-0.009	0.005	-0.014	7.52	4.51
II	-0.055	-0.0104	1.98	-0.028	-0.018	-0.010	-0.041	3.10	1.35
III	-0.026	-0.0087	1.07	-0.024	-0.055	0.031	-0.070	0.473	0.367
IV	0.019	0.0338	10.99	0.002	-0.070	0.072	-0.140	-0.275	-0.157
V	-0.076	0.0365	15.06	-0.005	-0.004	-0.001	-0.009	17.47	8.36
Punjab	-0.032	0.018	7.78	-0.004	-0.030	0.026	-0.032	1.09	0.972

Source: Author's Citations

Calculated outcomes of table 2 explore the poverty equivalent growth rate in agro climatic zones of Punjab for year 2013-14 and 2015-16. Estimated outcomes of first zone shows the pro-poor pattern of growth because PEGR in absolute and relative term is greater than actual growth rate which means recession hurts the poor less than the non-poor in wheat rice zone of Punjab however, in case of PGR and SPGR outcomes reveals that growth is strongly pro-poor because poverty and inequality both decline which confirms that recession only hurts the non-poor and both those poor who are just below the poverty line and those who are ultra-poor are save from harsh impact of recession in both absolute and relative term.

In a 2nd zone that is mixed Punjab both poverty and inequality increase which offset the positive impact of growth therefore growth is strongly anti-poor in that zone or regarded as immiserising growth because poor suffer harshly due to rise in growth as compared to non-poor in both absolute and relative sense. Similarly, in case of PGR and SPGR similar pattern has been notice while rise in poverty and inequality hurts ultra-poor more than those poor who are just below the poverty line.

Estimates of zone 3rd and 4th show a strongly pro-poor pattern of growth in both absolute and relative sense because higher growth significantly decline poverty and inequality which benefits poor more than their counterpart.

Similarly, measurement of PGR and SPGR also showing pro-poor pattern of growth in both absolute and relative sense however, those poor who are just below the poverty line are enjoying more growth benefits as compared to ultra-poor in both absolute and relative sense.

Finally measurement of Barani Punjab reveals the pro-poor pattern of growth in relative sense while anti-poor pattern of growth in absolute sense which means growth reduce poverty but poor get absolute benefits lower than non-poor while PGR measure is showing anti-poor pattern of growth in both absolute and relative sense because due to increase in equality positive impact of growth is neutralized however due to trickledown process poverty decline. Finally, SPGR measure shows strongly anti-poor pattern of growth (immiserising growth) because with improvement in growth both poverty and inequality increase which out weight the beneficial impact of growth and hurts ultra-poor more than those who are just below the poverty line. Last estimates of overall Punjab presents a strongly pro-poor pattern of growth in relative sense for all three measure of poverty while anti-poor pattern of growth along with trickledown effect in absolute sense for all three measure of poverty which means in absolute sense due to increase in inequality positive impact of growth rate in neutralized.

Table 2 Growth Distribution in Agro climatic Zones of Punjab for Year 2013-14 to 2015-16

Headcount Ratio									
Region	ΔP_o	ΔI	γ	δ	η	ζ	η^*	(R) γ^*	(A) γ^*
I	0.028	-0.003	-3.48	-0.0001	-0.079	-0.0789	-0.137	-0.36	-0.002
II	0.490	0.039	3.12	0.157	-0.594	0.751	-0.743	-0.824	-0.659
III	-10.41	0.007	15.63	-0.667	-0.524	-0.143	-1.243	19.88	8.40
IV	-14.74	-0.017	9.54	-1.545	-0.837	-0.708	-2.303	17.61	6.40
V	-1.38	0.0130	6.29	-0.219	-0.176	-0.043	-0.380	7.83	3.63
Punjab	-5.18	0.0021	4.99	-1.038	-0.461	-0.577	-1.52	11.25	3.40

Poverty Gap Ratio									
I	-0.080	-0.003	-3.48	0.023	-0.040	0.063	-0.055	2.00	1.45
II	0.322	0.039	3.12	0.103	-0.051	0.154	-0.070	-6.22	-4.59
III	-1.99	0.007	15.63	-0.127	-0.106	-0.021	-0.210	18.82	9.45
IV	-3.22	-0.017	9.54	-0.338	-0.208	-0.130	-0.488	15.43	6.61
V	-0.042	0.0130	6.29	-0.007	-0.016	0.009	-0.019	2.57	2.31
Punjab	-1.01	0.0021	4.99	-0.202	-0.094	-0.108	-0.273	10.67	3.70
Squared Poverty Gap Ratio									
I	-0.030	-0.003	-3.48	0.008	-0.012	0.020	-0.015	2.58	1.05
II	0.111	0.039	3.12	0.035	-0.012	0.047	-0.024	-8.93	-4.55
III	-0.547	0.007	15.63	-0.035	-0.029	-0.006	-0.056	18.36	9.77
IV	-0.989	-0.017	9.54	-0.104	-0.070	-0.034	-0.148	14.24	6.70
V	0.013	0.0130	6.29	0.002	-0.002	0.004	-0.004	-5.91	-3.14
Punjab	-0.289	0.0021	4.99	-0.058	-0.029	-0.029	-0.076	9.91	3.80

Source: Author's Citations

Conclusion

In a current study, a wide series of results are presented to measure the extent of poverty, inequality and growth in a wide range. Since 2011-12 to 2015-16, 3 HIES /PSLM data set are taken to measure extent of current problem in all major agro climatic zones of Punjab. Similarly, outcomes of year 2011-12 to 2013-14 also reveal that growth is only pro-poor for II and III zone while anti-poor for all other zones along with poverty reducing impact. Final estimates of year 2013-14 to 2015-16 reveal that growth is pro-poor for zone III, IV and V while anti-poor for I and II. Overall discussion sum up that over the period of time poverty reduce in all agro climatic zone of the Punjab which shows that growth benefits are trickledown toward lower income quintile and also poor enjoys more benefits of growth as compared to non-poor. On the side it is noted that during the growth process across all the zones in most of the time period growth is regarded as anti-poor with poverty reducing impact for farming community of Pakistan while due to higher income/consumption expenditure with appropriate employment ratio it is noted that growth is regarded as strongly pro-poor for non-

farming community of different agro climatic zones.

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