The Analysis Of Multidimensional Children Poverty Of Punjab, Pakistan

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Abstract:

Poverty is a global issue hence children are living in dire poverty conditions than adults. It has vulnerable effects on children's nourishment. The sustainable development goals (SDGs) measure child poverty by Multidimensional technique instead of the income method. Children living in poverty are facing financial limitations, which impede to their access to education and health facilities, acquiring housing, sufficient nutrition food, and safe drinking water. The fundamental concept of this study is to measure and estimate the child poverty of two age groups. For this purpose, developed the child age specific index, deprivation cutoff and assign the weight to each indicator. The significant part of the research is to calculate the child MPI poverty especially for Punjab. The distinctive part of the current MPI methodology is that the indicators are different from national MPI and all indicators are related to child-specific and have geographical aspects of Punjab. The data had been acquired from the current MICS 2018 that consist of 37052 for middle age children and 24028 for young age children. The first part of methodology is based on the calculation of children MPI poverty by applying Alkaire Foster methodology. The second part is based on logistic regression to calculate the marginal effect of each indicator. Young children are more in the trap of MPI poverty (0.21) than middle age group children (0.16). The causes of the deprivation of young children are the lack of daily calorie intake, childhood learning development, safe and maintained shelter, and health functioning problems. The concept of marginal effect is more accurate for policy making purpose and provides more informative statistics than Odds ratios. The marginal effect shows that child poverty of both age brackets is a corrosive situation for vulnerability of society with many harsh consequences on children's growth, children's educational development, children's nourishment due to poor health and living standard indicators. The conclusion of the study provides a comprehensive outline how our policy makers can reduce children's deprivation and why it is important to protect children from the minor and major vulnerabilities.

Key Words: Alkire Foster Methodology, MPI, Child poverty, Socio economic indicators, MICS

1. Introduction:

Society has been divided in a hierarchy due to the socio economic indicators. In the stratification system, a certain group is unable to get basic necessities of life and live below the poverty line. Today women and child poverty has become a global issue because of high number of children

and women are affected by the poor health, lack of basic education and malnutrition which have a harmful impact on the progress and wellbeing of society. Childhood poverty may lead to poorer outcomes in terms of physical health, cognitive ability, and educational attainment. Furthermore, it has deleterious effects on societal well-being. The prospects of overall human development desolate due to high proportion of the child population is living in poverty (Alkire et al., 2019, World Bank, 2020). Thus, it is the moral value of society to give each child a good start of life because due to poverty many parents are not able to provide their children good food, clean drinking water, safe and healthy lifestyle, and quality of education. The fundamental right of children is to live out of poverty because poverty makes impossible to satisfy their basic needs. Poor children are facing the deprivation of the material, spiritual and emotional resources that's why they are unable to enjoy childhood and middle age rights. The World Bank Organization describes that Poverty is hunger, lack of shelter, lack of access to school and health facilities. Childhood Poverty Research and Policy Center (CHIP) stated that around 600 million children are living in absolute poverty worldwide and around 10 million children die every year due to food insecurity, disease and malnutrition.

Poverty is a broader concept and cannot be measured by single indicator because it is the deprivation of basic right such as education, health housing facilities and assets. There is poor correlation between poverty headcount by using multidimensional poverty index and $ppp threshold among poorest countries due to difference in conceptual and methodological approach (Evan et al., 2020). Poverty should be measured in context of socio-economic indicators by developing the multidimensional poverty index. There are various factors of deprivation that can affect well-being of children such as the inability to attain a good education, a lack of

access to healthcare facilities, poor housing and an insecure environment. Money as an indicator is not sufficient to fulfil the extent and depth of child poverty (Chzhen et al., 2018).

Health is being considered the most deprived dimension to measure the child poverty because disable children, children influenced by HIV/AIDS, and ethnic minority children were severely deprived. The headcount ratio of child multidimensional poverty in rural china is 14.29 percent and 37.62 percent (Wang et, al, 2015). The global multidimensional poverty index states that children are the most vulnerable group because half of the world's poor population is children. Grobally, 35.7 percent of world's extremely poor children live in rural areas of South Asia. Overall 45 percent children under the age 5 years are MPI poor in South Asia Result shows that 11.1 percent children are out of school and 52.6 percent are girls. At least one child in each household face the problem of being undernourished because 42.8 percent children are under weight in South Asia. The gender inequality in child nutrition is less severe than education. (Alkire and Haq, 2019). The dietary diversity of children has strong correlation with stunting and underweight in India by using the household data (Menon et al. 2015). On the other hand, the 37.5 million children under the age of 10-17 years are MPI poor in South Asia, (Dirksen and Alkire, 2021)

In developing world, 20 percent of children below the age of five are living in extremely poor household condition without the basic facilities. The MPI poverty in Afghanistan is higher among children because 56.4% of children aged 0–17 are poor, while less than 49% of people aged 18 and above are MPI poor in Afghanistan (Afghanistan Multidimensional Poverty Index and UNICEF, 2017). In Bhuttan, 7.1 percent children are MPI poor and living in vulnerable condition than adults (Bhutan Multidimensional Poverty Index

and OPHI, 2017). In Nepal, The MPI below the age group of 10 years is 0.19 percent due to the deprivation in years of schooling, nutrition, floor and roof materials (Nepal Multidimensional Poverty Index and OPHI, 2018).

The intensity of poverty has been increased in Pakistan due to multiple factors including lack of education, massive corruption, mismanagement, unemployment, natural shocks and terrorism that's why more than one third of country's population is living in poverty and a large number of children are adversely affected due to poverty. Education is a basic right of every child because of the development of human capital and considered as an engine of economic growth. Early hood child education has positive impact on the intellectual approach of young children (Garcia et al, 2020). In Pakistan, especially in the rural areas, poverty is the main hurdle to attain basic and quality education. The inadequacy of financial resources, an insufficient supply of government schools, lack of basic infrastructure, high inflation, low spending on education, gender disparity, poor conditions of public and poor educational policies for poor children are the main factors to keep away the children from school (Ahmad et al., 2013). Out of every 1,000 babies born in Pakistan, 42 die before completing the first month of life, and 74 will not live to see their fifth birthday. Over 1.67 million children become the victims of pneumonia and diarrhoea in 2020. Unfortunately, sixty-one percent children of different districts are facing food insecurity due to which they die. Poor people are unable to purchase the nutrition diet with critical vitamins and minerals. About 40.2 per cent of children in Pakistan are stunted while 28.9 per cent are underweight and 17.7% are thin for their age. Nearly, 3.3 million Pakistani children are forced into child labor due to unfavorable socio-economic circumstances (UNICEF, 2020).

The multidimensional poor people in Punjab are 12.3 percent with 26.1 percent headcount ratio. The proportion of poor people in rural areas is higher than urban with 12.3 percent and 33.3 percent respectively. In addition, some studies measure the child MPI at household level by using the indicators across childhood or divide the indicators between age ranges (Hjelm et al., 2016). The basic purpose of current study is to measure the child poverty of two different age group on the basis of different socio-economic indicators instead of traditional indicators of Alkaire-Foster methodology. This study proposes the child poverty Multidimensional index and estimate the causes, which factor is more contributing in child poverty. This research will identify the most deprived age group of children with causes of children deprivation such as child labor and lack of nutrition. Thus, the child MPI will provide strong evidence for policy makers to address the deprived indicators and prepare the policies related to each dimension and arrange multiple programs to highlight the importance of education, reduce the child labor and improve health services for poors.

The future of nation is depending on our healthy and educated youth but low level of education, poor health services and hazardous environment desolate the prosperity of nation. It is an urgent need to take suitable measures to rectify and assess these problems which are basic reasons for child poverty. This paper will contribute in literature about child poverty especially multidimensional child poverty on the basis of different age groups of children. Moreover, current multidimensional approach introduces new frame work of socio economic indicators which are more relevant to child poverty in Punjab. The significance of this research is to develop the MPI index for two age brackets, 5 years to 17 years and 0 to 4 years. Today, MPI is mostly used in official statistics and as policy tools that's why the result of child MPI and its

causes will increase the incentive for policy makers to analyse children's deprivations in education, early childhood development, health, nutrition, and living environment. This paper has its own significance due to the child-specific indicators rather than traditional indicators of MPI poverty because with the passage of time, lots of enviormnetal, health, and educational changes have accurred.

In addition, this paper interprets the result in context of marginal effect of each independent variable because marginal effect states how many poor children are actually affected by the socio-economic indicators because odds ratio misleads the results and has little economic meaning. Economists generally prefer to compute marginal effects due to ease of understanding. The main significance of this paper is to calculate the poverty rate of children by applying the MPI methodology and then estimate the marginal effect.

Our paper proceeds as follows. In Section 2, describe the objectives of study relevant to Multidimensional poverty index and about the causes of child poverty. In section 3, highlights the important study related to child poverty and MPI methodology and also describe the importance of current study. In Section 4, describes the data collection procedure and sample size of study. This section presents the methodology of Multidimensional child poverty and develops the deprivation score of children. In Section 5, presents the statistical, graphical and econometric analysis of child poverty and explores the causes of child poverty in Punjab. In Section 6, discuss the findings with the policy implications.

2. Objective of the study:

1. To develop the child MPI index for two different age brackets.

2. To measures the child poverty by applying the Alkaire-Foster approach.
3. To analysis the causes of child deprivation by computing Marginal Effects.

3. Literature Review:

Mustafa et al., (2021) This study calculated multidimensional health poverty by using the data of 2014 and 2018 of HIES and PSLM. The study used the Alkire- Foster methodology to measure the health dimension and identify the poor. The finding shows that there is a decline rate in health poverty at provisional and regional level in Pakistan but exist in rural areas. Baluchistan has a highest rate of deprivation score in health dimension and multidimensional health poverty as compared to other province. The result shows that there are five main indicators to contribute in health poverty including, health service, quality of service, maternal health, malnutrition and child health. Punjab and Sindh demonstrate high number individual victim the health poverty in relation to population decomposition.

Jamil and Satti, (2021) this paper measured the factors of children's drop out of school in Pakistan on the basis of PSLM data by applying logistic techniques. The purpose is to calculate the marginal effects of different attributes which are responsible for children dropped out of school. The analysis depicts that gender is an important factor for children to drop out the school because girls are more likely to drop out the school than boys due to poverty. The education indicators in terms of head of household and mother's education are also a significant contributor to children's dropout of school because the educated mother focuses more positively on their children's education and reduces the chances of children drop out of school. There are multiple other factors which have a positive relation to children drop out of

school such as gender of head of household, occupation of the head of household, school distance, and household income. This study concluded that a major indicator of children drop out of school is the financial consideration of the household, due to the financial problem, children are facing the issue of illiteracy. Another study suggested that government should provide free education and monetary incentive to poor households (Zaib et al.,2021).

Ahmad et al., (2020) this study found the effect of socioeconomic factors on malnutrition of children in Multan district. For this purpose, used the data of 2497 children by Multiple Indicators Cluster Sampling (MICS) 2018 with binary logistic regression. The result specified the higher frequency of stunning, wasting and underweight of children especially in rural areas of Multan. There is positive relationship between low socio economic status with high level of malnutrition, underweight, and access of water. The Government try to introduce the economic opportunity for poor parents so that they will uplift socio economic status and increase the nutrition values among the children. It would be helpful for the improving of child health

Fonta, et al., (2020) this paper analysis the condition of child poverty age 5 – 18 years by using the primary data of Mouhoun region of Burkina Faso. The article employed the Alkire-Foster technique and decompose the child poverty with seven socio economic and environmental dimensions. The study estimates the binary logistic regression to identify the causes of Multidimensional poverty. The highest number of children deprivation recorded in sanitation and education. The study revealed that 97 percent children are deprived in three of the seven dimension at 33 percent while 88.7 percent children are suffering in Multidimensional poverty at k = 4. The current study will measure the child poverty and estimate its causes by using binary logistic regression by using health and

other child related indicators which was not included in it.

Oldiges, (2017) This paper construct the nutritional deprivation index (NDI) by using household survey data in india. This study extended the Alkire-Foster methodology and measures the intensity and incidence of nutritional deprivation. The finding shows that northern states of India have highest incidence of inadequately nourished households and deprived in five of eight food groups based on the food consumption data. There is direct relationship between socioeconomic condition of household and malnutrition. This study suggested that NDI can be used about children malnutrition analysis in low income countries and government should start the awareness campaign about the healthy and diverse diet. The current study overcome the research gap by including the child calories indicator in new multidimensional index for under the 5 years age group and measure the deprivation score.

Alkire and Vaz, (2017) this paper assessed the change in multidimensional poverty and related destitute by using three techniques in 34 countries and 338 sub-national regions. The study examined the change in poverty and its intensity and compare it with income based poverty. It also examined changes in MPI poverty across urban–rural regions, sub-national regions and ethnic groups. The results shows that 31 out of the 34 countries reduced multidimensional poverty significantly and 28 countries reduce the destitution level. In Ethiopia and Niger, the MPI was reduced with the decrease in the intensity of deprivation among the poor. The results observed the change in dimensional reduction across the countries. The Deprivation in nutrition of children reduced in Sub-Saharan Africa and Latin America regions. In terms of subnational regional analysis, 78 percent of sample has significant reduction in MPI poverty while the poorest region experienced the fastest reduction.

4. Research Methodology

The data and unit of analysis are the fundamental part of research. For this purpose, required the data from MICS 2018 and unit of analysis are two different age groups of children under five year age group and 6-17 years age group. In the Current MICS collected the data of socio economic indicators related to women and children. mostly focus groups are children and monitor socio-economic indicators related to children and women. The total number of households are 53000 including the data of 37052 children the ages of 5-17 and 24712 children age 0-4 years. In Punjab, an increase number of children are suffering in poverty due to lack of education, clean drinking water, sanitation, nutrition's, functional and behavior issues. The traditional MPI measure the poverty by using 15 indicators of three dimensions and each dimension carries an equal weight. The present study calculates the children's multidimensional poverty by using the AF methodology. The multidimensional poverty index MPI is the composite of intensity and incidence. Incidence (H) measures the percentage of poor population while intensity (A) calculates the number of deprivation suffered by each household.

$$H = q/n \qquad A = \sum_{i=1}^{n} c_i(k)/q$$ where $c_i(k)$ is the censored deprivation score of individual i and q is the number of people who are multidimensional poor.

$$M_0 = H * A$$

The inclusion of indicators is based on children age groups because the children's deprivations in indicators change across the period of childhood. The table 1 depicts the picture of dimension and indictors of children under the age of 5 years and each dimension has distinctive indicators related to child development. The children education environment indicator (childhood development) has two indicators including child learning (Child identifies at least ten letters of the alphabet/Child knows name and recognizes symbol of all numbers from 1-10) and activity indicator (involvement of parents in reading books telling stories and playing). Health dimension has four indicators including child immunization (child vaccination) and illness indicator (diarrhea and cough, etc). the calorie intake indicator of under 5 years of children with a number of food indicators measure (child drank milk yesterday or ate yogurt, times child drank infant formula, child ever been breastfed, child ate eggs yesterday, child ate other fruits or vegetables yesterday) on the basis of daily child calories requirement threshold. The child functioning and behavior indicators include to measure the child poverty assess its effect on the intensity of poverty. The basic purpose to incorporate these indicators is to measure the current issues of children's poverty and address the problem of well-being of children under the age of five.
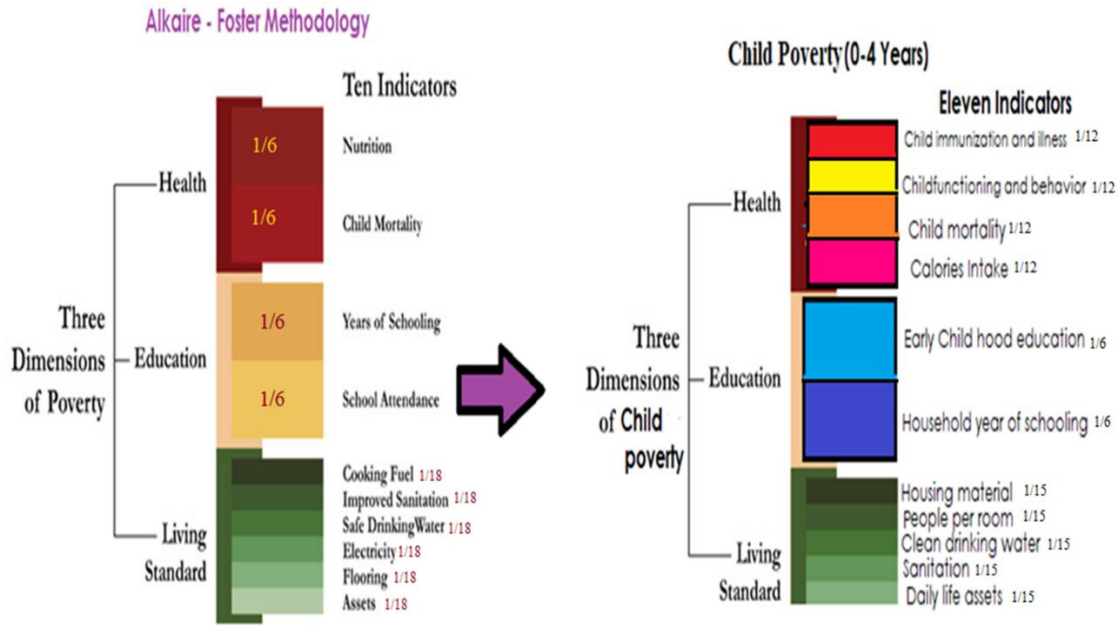
Table: 1 dimension, indicators and weight of Child MPI (0-4 years)

Dimension	Indicators	Deprive if (non-deprived, 0 and deprived, 1)	Weight
children education environment	Early Child hood education	Deprived if, No one was engaged with activities(read books, told stories, play with toys, outdoor activity) and child did not recognize at least ten letters of alphabet and know symbol from 1-10.	1/6= 0.167
	Household year of schooling	Deprived if, father and mother did not complete five years of schooling	1/6 = 0.167
children health environment	Child immunization and illness	Deprived if, child did not receive any vaccinations to prevent from getting diseases. (BCG, Polio, Measles) and child had diarrhea in last two weeks and frequent symptoms of blocked chest and bleeding from nose	1/12 = 0.08
	Child functioning and behavior	Deprived if, child has **a lot of difficulty** in hearing the sound, use assistance for walking, in seeing and difficulty in learning. in seeing and Hit child on the bottom or elsewhere with belt, brush, stick, etc.due to bad behavior.	1/12 = 0.08
	Child mortality	Deprived if, any child had died due to health issue	1/12 = 0.08
	Calories intake	Deprived if child intake **calcium less than threshold** **0-6 months = 170 mg daily, 6-12 months = 210 mg daily and 1-4 years 600 mg daily**.	1/12 = 0.08

Children Living standard environment	Housing material	Deprived If, household has adobe, wooden, quinch, plam, cane , bamboo, stick or other material or has no wall and if the roof is made of wood, palm, straw, palm, or other material or floor is made of wood sand, dirt or other material	1/15 = 0.067
	People per room or overcrowding	Deprived if, bedroom shared by 3 or more people	1/15 = 0.067
	Sanitation	Deprived if, the household use pit latrine or services is connected with sewerage system or septic tank but shared with other household or it has no sanitation system.	1/15= 0.067
	Drinking water	The main drinking water source is, unprotected well, shallow well, tank, rain water, river, lake, pond, stream or other non-protective source.	1/15 = 0.067
	Daily life assets	the household does not have more than two small assets (radio, tv, iron, fan,sewing machine, chair, watch, air cooler, bicycle) or no large asset (refrigerator, air conditioner, tractor, computer, motorcycle, and has no car)	1/15 = 0.067

The table 2 analysis the dimension and indicators of children with equal weight analysis procedure of the age group of 5-17 years. The children's education environment classified the indictor of children attended school and household year of schooling. The important indicator of children education environment is child labor and work environment because the rate of children out of school and drop out of school is increasing due to child labor.
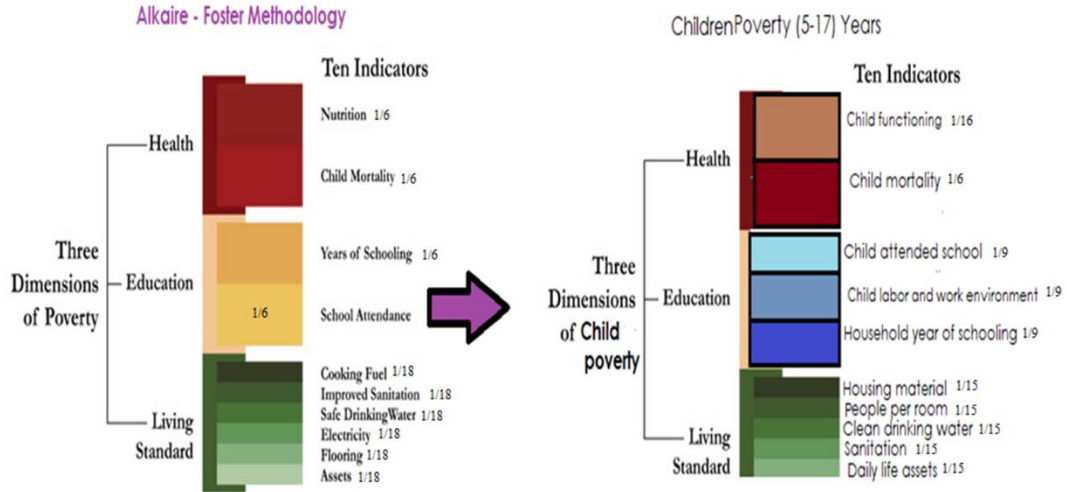
Table 2: Dimensions, Indictors and Weight Analysis for the children's MPI (5-17 years)

Dimension	Indicators	Deprive if, (non-deprived, 0 and deprived, 1)	Weight
Children Education environment	Child Attended school (5-17)	Deprived if, the child between the ages of 5-11 has never attended school and child between the age of 12-13 never completed primary education and child between the age of 14-17 never completed middle level of education	1/9 = 0.111
	Household year of schooling	Deprived if, the father and mother did not complete five years of schooling	1/9= 0.111
	child labor and work environment	Deprived if, engaged in any other activity in return for income in cash or in any kind instead of education and work environment is full of risky and hazard for children's health	1/9 = 0.111
children health environment	Child mortality	Deprived if, any child has died from the six month of interview from any disease	1/6 = 0.1666
	Child functioning	Deprived if, the child has a **lot of difficulty** and uses a hearing aid, assistance for walking, glasses or contact lenses, and self-care such as feeding or dressing	1/6= 0.1666
Children Living standard environment	Housing material	Deprived If, the household has adobe, wooden, quinch, palm, cane , bamboo, stick, or other material or has no wall and if the roof is made of wood, palm, straw, palm, or other material or floor is made of sand, dirt or other material	1/15 = 0.066
	People per room or overcrowding	Deprived if, bedroom shared by 3 or more people	1/15 = 0.066
	Sanitation	Deprived if, household use pit latrine or services is connected with sewerage system or septic	1/15= 0.066

		tank but shared with other household or it has no sanitation system.	
	Drinking water	The main drinking water source is, unprotected well, shallow well, tank, rain water lake, pond, stream or other non-protective source.	1/15 = 0.0666
	Daily life assets	The household does not have more than two small assets (radio, TV, iron, fan, sewing machine, chair, watch, air cooler, bicycle) OR no large asset (refrigerator, air conditioner, tractor, computer, motorcycle, and has no car)	1/15= 0.0666

The second objective of this paper is to quantify the relationship between the MPI poor children and socioeconomic indicators. For this purpose, used the Logistics regression to measures the odd ratio and marginal effects. Following the earlier literature on the relationship between MPI poverty and socio economic indicators, we have specified the two following models in case of Punjab. Equation 1 is related to the variables of 5 to 17 years age group of children. The equation 2 is considered the variables related to the age group of under 5 years (0-4). The dependent variable is in a binary number (0, 1) of MPI index.

Model 1:

$$Y_{iJ}=\propto + \beta_1 X_{Child\ attend} + \beta_2 X_{year\ of\ schooling} + \beta_3 X_{child\ labor} + \beta_4 X_{child\ functionaning} + \beta_5 X_{water\ facility} + \beta_6 X_{sanitation\ facility} + \beta_7 X_{housin\ material} + \beta_8 X_{assets} + \mu_i \ldots\ldots.. (1)$$

Model 2:

$$Y_{iJ}=\propto + \beta_1 X_{Childhood\ development} + \beta_2 X_{year\ of\ schooling} + \beta_3 X_{child\ calories} + \beta_4 X_{child\ functionaning} + \beta_5 X_{immunization\ and\ illness} + \beta_6 X_{sanitation\ facility} + \beta_7 X_{housin\ material} - \beta_8 X_{assets} + \beta_9 X_{child\ water\ facility} + \mu_i \ldots.. (2)$$

5. Analysis:

This section shows the statistical, graphical and econometric analysis. The child multidimensional poverty index of Punjab measures in relation of different indicators which examine children deprivation and develop the effective policy to combat the child poverty.
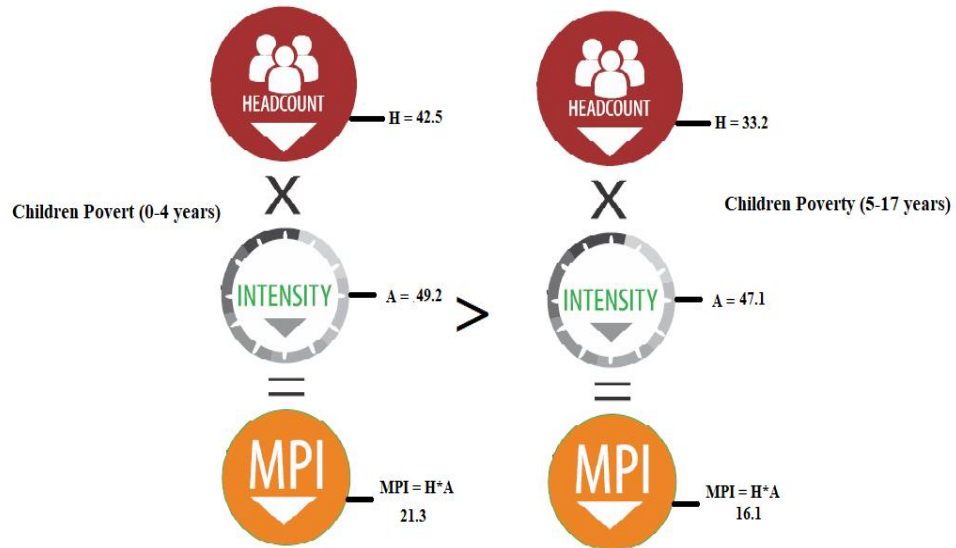
Fgure:1 Analysis of children MPI of Punjab province

The figure 1 shows the Multidimensional poverty analysis of children with the percentage of children who are poor and the intensity of children's poverty. The percentage of poor child (H) is higher for younger children (0.42) as compared to middle age children. The intensity of poverty among younger children (0-4) is also higher than middle-age children. The child MPI (0-4) is 0.21% which is higher than the middle age child MPI (5-17). The result of child MPI shows that younger children are more MPI poor than middle age children. Below graph depicts the comparison of Child MPI and national MPI. The value of national MPI at 33 percent cutoff point is 0.1 by using ten socio indicators and it is lower than child MPI. It highlights the issues of children deprivation in health, sanitation and clean drinking water and education and malnutrition has become the cause of higher child MPI poverty.

$$MPI_{child\ MPI} > MPI_{National\ MPI}$$

Figure 2: Comparison of Child and National MPI
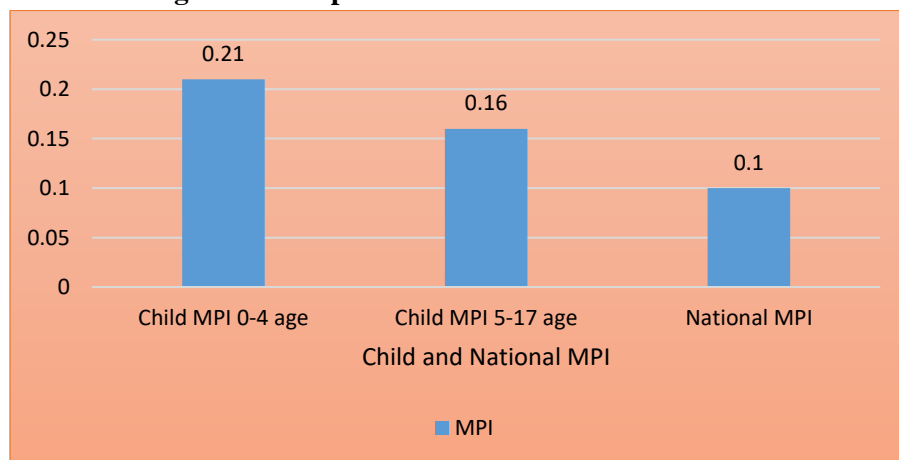
The graphical analysis of children deprivation is significant because it will help to formulate the policies related to more deprived indicators of children. Moreover, The 46% children are deprived in daily basis calories intake basis and face the severe problem of malnutrition. Out of the 24028, the 11585 children are destitute and raise the problem of food insecurity, especially in rural areas. Furthermore, malnutrition is the basic reason for poverty and raises the problem of food insecurity (Siddiqui, et, al, 2020) Secondly, the deprivation score of functional and behavioral attitudes contribute 41 percent in child MPI poverty. The finding of paper will contribute in social science field that psychological and health indicators are more contributing in child poverty. In Punjab, children have functional disability due to no vaccination in childhood, family history, attack of disease, illiteracy of parents, cousin marriage and lack of medical facilities. Child

hood poverty and its consequences determine the path of society because early childhood nutritional deficiency and learning disability have serious consequences on school achievement and development potential. All these minor and major functional disabilities have severe impact on their education, and growth. The graphical analysis shows that 42 percent of children are living in poor household conditions with no walls, inappropriate and dangerous roof and floor conditions. The indicator of year of schooling of father and mother contribute a lot to children deprivation because out of 24028, 9921 parents are deprived to attain more than primary education. Child poverty is multidimensional issue because it affect the children and young people to access the school education and escalate the drop out ratio from school and need of government interventions to enhance the education opportunity for deprived children.

**Figure 3:   Child deprivation Level socio economic indicator**
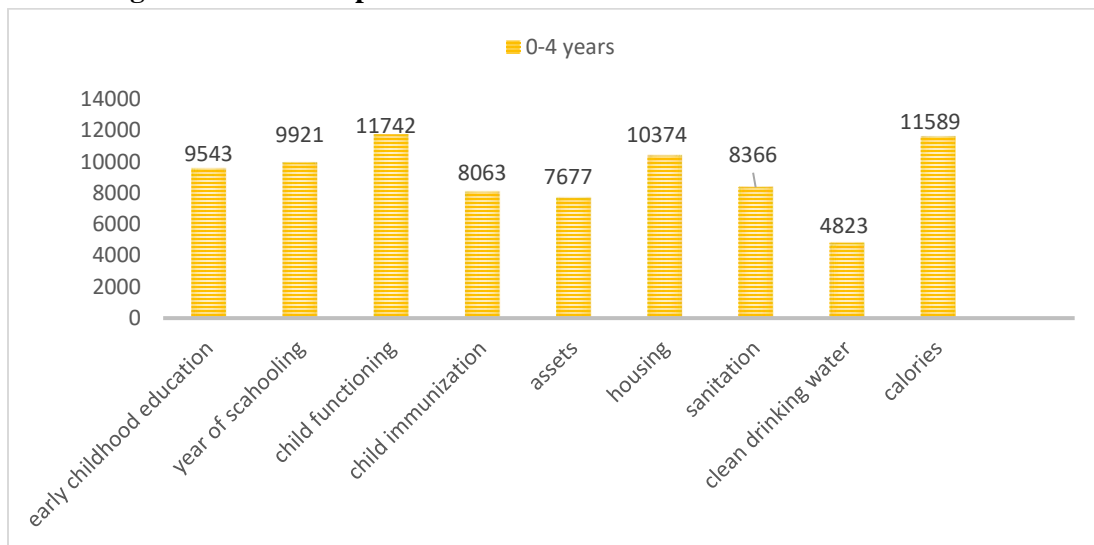
The figure 3 presents the indicators wise deprivation analysis of middle age children. Around 13020 children are deprived to attend the school. While 29 percent parents did not complete the primary level of education that's why lack of education of household is considered the main factor of children poverty. There is dire

need of society to work on functional and behavior problems of children and the educationalist, and policy makers take crucial steps regarding the functional disability and behavior issues among the children. The 35 percent children has functional and behavior difficulty due to number of factors including no

immunization in childhood, diarrhea, lack of health awareness, family history, parents education, family size and parents's attitude. On the other hand, the living standard indicators, the structure of wall, and floor are one of the main indicators to contribute in child poverty. However, 29% of children are deprived of basic shelter facilities and are living in bad housing condition which is the result of poor childhood development and raises many health problems.

Overall, there are multiple indicators and causes those are interconnected with children poverty but policy makers can reduce the intensity of it with the quality of education and income generating activities. The indicator of asset shows that 28% of children live in poor households who are not able to buy the essential articles of life. Theliving standard environment of household is directly related to child poverty (Basell, 2021)

Figure 4:   Child deprivation in socio economic indicators
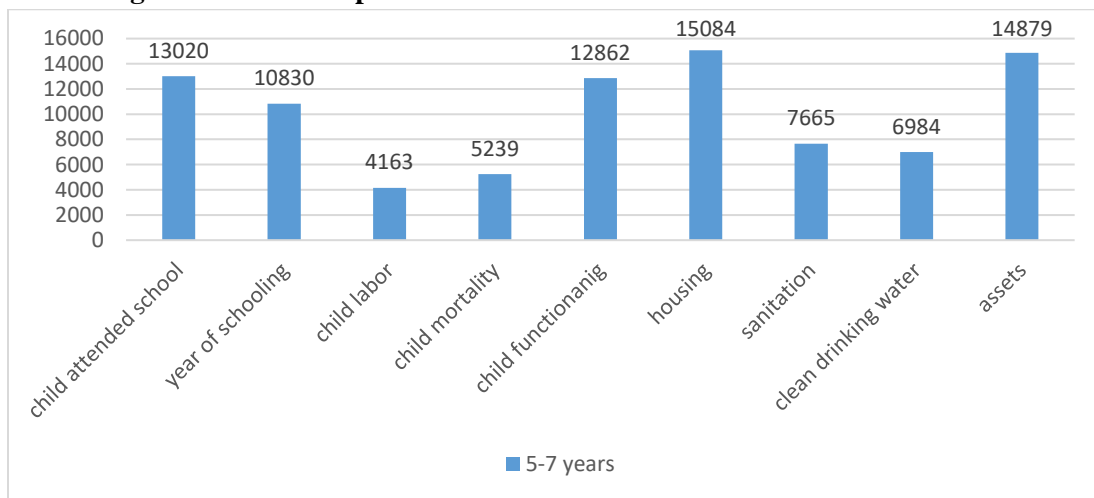
This objective is to estimate marginal effect for two age brackets of children. The dependent variable is coded 1 for outcome of interest (MPI Poor children), and 0 (non poor children) otherwise. The important thing of logistic regression is odd ratio which is exponential transformation of coefficient of independent variables. The marginal effects show the impact

(influence) of independent variables on dependent variables. The marginal effect is more comprehensive because it estimates in probability scale while odds ratios are misinterpreted because marginal effect tells us the effect of an independent variable on the probability of the outcome of dependent variable. (Norton and Dowd, 2018).

Table 4: Odds Ratios and Marginal Effect Analysis of Middle age children (5-17)

Indicators	Odds ratios	Coefficients	P values	Marginal effects dydx
Year of schooling	3.21	1.80	0.00	0.19
Child attended	4.90	1.60	0.00	0.21
Child labor	4.67	1.73	0.00	0.24
Children functioning	2.31	1.11	0.00	0.16
Housing material	3.07	1.12	0.00	0.13
Clean water	3.66	1.29	0.00	0.15

Sanitation	3.22	1.17	0.00	0.14
Assets	3.85	1.34	0.00	0.16
constant	0.018	-3.97	0.00	
observations	37052			
Pseudo R2	0.3798			
Log likelihood	-14135.271			

As table 4 shows the odds ratios and marginal effects of independent variables and all are significant. Low level of year of schooling of parents increases the probability of MPI poverty by almost 19 % point. On the other hand, children never attended the school according to age limitation increases the probability of MPI poverty by average 21 percent. Unfortunately, education is basic human right while due to lack of household income, 36 percent of children are not attending school in Punjab. According to the sustainable development goal (2030) agenda, we should invest in education for all, especially for those who are not able to afford the quality of education and improve the lives of children. In the current research, education indicator shows that lack of access to education is a major predictor of transient poverty from one generation to the next.

The indicator of child labor and work environment shows that children are engaged in any other labor market activity instead of getting an education increases the probability of poverty by 24 percent. The probability is very high because the work environment is full of risks and hazard for children's health. The results of the previous study show that school enrolment reduced as a substitute for child labor in Punjab and poor family children have more proportionate to work as child labor instead to enroll in school (Ahmed, 2012). In health dimension, child functioning and behavior is a very imperative indicator and new in the methodology to measure child poverty. The children have a lot of difficulties to listen, speaking, and using the hearing aid increase the probability of MPI poverty by almost 16 percent because children are unable to feed or change the dresses themselves. The indicators of living standard environment suggest that poor housing condition in context of roof, floor, or wall increases the probability of children MPI poverty by 13 percent. The same condition is with clean drinking water and sanitation because there is 15 and 14 percent of probability to raise the poverty level of children under the age of 5-17. The marginal effect of daily life assets shows that those household does not have basic assets of life and has no refrigerator, air conditioner, tractor, computer, motorcycle, and has no car surges the probability of MPI poverty by 16 percent. Moreover, all socio economic factors contribute to children poverty including household head education, household wealth, per capita household income, and household characteristics.

Table 5: Odds Ratios and Marginal Effect Analysis of Younger Children (0-4)

Indicators	Odds Ratios	Coefficients	P values	Marginal Effects dydx
Year of schooling	2.04	2.33	0.00	0.23
Childhood education	1.9	1.13	0.00	0.18
Children functioning	1.10	1.91	0.00	0.26
Mortality	2.96	1.08	0.00	0.16

Calories	3.67	1.67	0.00	0.19
Immunization/ illness	2.78	1.01	0.00	0.15
Housing material	2.58	0.948	0.00	0.14
Clean water	2.49	0.91	0.00	0.13
Sanitation	3.74	1.32	0.00	0.19
Assets	4.25	1.44	0.00	0.21
constant	0.029	-3.53	0.00	
observations	24857			
Pseudo R2	0.3275			
Logliklihood	-11526.861			

Table 5 presents the results of odd ratios, coefficients and marginal effects of younger children (0-4). The study used the marginal effect for the interpretation because it shows the direct influence of independent variables on the dependent outcome through a probability scale. The education dimension has two indicators (childhood education and years of education of the household), thus increasing the probability of poverty by 18 percent, if no one engaged with children in learning activities (reading books, telling stories, playing with toys, outdoor activity). However, all these barriers damage the learning development of children and children did not recognize at least ten letters of the alphabet and symbols from 1-10. More specifically, when households have a lesser amount of interest to teach them how to acquire, organize the knowledge and behavioral skill in childhood, it would damage the listening and problem solving skills of children. In nutshell, the early education is an essential factor of children brain development.

While the mother or father has less than primary education rise the poverty level by an average of 23 percent. The probability of household education is very high and significant (p < 0.01), indicating that household education mediates childhood education performance. The health dimension of this age group is very inclusive with four sub-indicators including child mortality, child functioning, child calorie intake, and immunization and illness. The children did not receive any vaccinations (BCG, Polio, Measles) increases the probability of children's MPI poverty by almost 15 percent and become the severe causes of diseases like diarrhea, blocked chest, bleeding from the nose, and issues of functioning disability. The children functioning is associated with the indicator of immunization that's why 26 percent chances to influence children's poverty due to the lots of functional difficulties in children. The disabled child is more likely to grow up in poverty and face more destitute in food, education, housing, and basic toilet facility (MacInnes, et al. 2014).

The calories intake indicator measures children MPI poverty and graphically analysis also shows that the number of children face the problem of malnutrition in Punjab. The children's intake of calcium less than the threshold (0-6 months = 170 mg daily, 6-12 months = 210 mg daily and 1-4 years 600 mg daily) increase by 1.6 point it has 19 percent influence to increase children poverty in Punjab. The living standard dimension contributes to children's poverty with the deprivation in well housing materials, access to clean drinking water, clean sanitation facilities, and basic assets of daily life. The marginal effect of sanitation facilities and daily life assets is high and more influences the children's MPI poverty by 19 percent and 21 percent respectively.

6. Conclusion:

Child poverty is a global issue because 700 million children are still living in extreme poverty and 1 billion children are considered multidimensional poor and grow up with a lack of food, shelter, water and sanitation facility, health, and educational opportunities. The purpose of the current study is to measure child poverty and examine its socio-economic causes by applying a multidimensional poverty methodology. In Punjab, there are heterogeneous factors that negatively affect childhood development, educational learning, health facilities, and household characteristics. That's why it is need of time to calculate the incidence and intensity of children's poverty in two age brackets and calculate the marginal effect of socio-economic indicators. In Punjab, young children (0-4) are more Multidimensional poor than middle age children (5-17) and reasons are children's daily based inadequate calorie intake, child functioning problems, and lack of vaccination and childhood education. similarly, child functioning weakens the child's brain development in both age brackets because disabled children are more likely to live in poverty and it may increase the risk of health problems. This study has highlighted the importance to measure child poverty and its causes for its drastic consequences on human capital growth and economic well-being overall. The destitute in socio-economic indicators profoundly impact on poverty. As skill-based education, good health and a healthy household environment are essential to increase the brain productivity of children, contribute to economic growth and improve the country's welfare condition. The human capital has declined trend without adequate health, living resources and elementary education because the insufficient health, education, and household facilities have a positive impact on the poor physical and mental development of children, especially in the age of 0-4 year's children, and meager intellectual capacity for both ages brackets of children. As a

result, economic stability is threatened and makes the children more vulnerable to poverty.

The findings will have strong impact in social science field to alleviate the child deprivation by working on health indicators, improve the education of head of household and provide maximum financial opportunity. The addition in literature through the findings of this research is very valuable for provincial, district and tehsil level government because government should take influential step to increase the enrollment of children, reduce the dropout rate of children and child labor.

In nutshell, policymakers need to make effective policies to increase the education of the head of household/mother and surge the campaign regarding vaccination and daily nutrition value of children because both indicators directly stimulate the child's functioning, behavior, and childhood development. The finding indicates that the deprivation of daily life assets is a basic hurdle to children's growth and poverty. For this purpose, policy makers should launch multiple projects aimed to increase the income of households so that they can afford the basic necessities of life and improve the sanitation facility, which is reason of environmental hazard and various infectious diseases. This study will guide the policy makers that strengthen the financial condition of households with the help of multiple projects like health card, ration card, employment opportunity, rise in daily wage, prohibition of the child labor, multiple scholarships for poor children, facilitate the access to education for poor children. The method of subsidy should be cash amount to poor parents that may compensate the income of child labor and enable parents to send their children to school.

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