

SOCIAL WELFARE MEASUREMENT IN PAKISTAN An Ordinal and Cardinal Approach

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Abstract. Pakistan concentrated all development efforts aiming at tracking the economy on a higher and sustainable economic growth reducing unemployment, but these efforts resulted in high fluctuations in population falling under poverty line overtime. This indicated that not only the growth but also income distribution pattern associated with other socio and demographic factors constitute phenomenon to achieve the objectives having concern with welfare of the poor and non-poor. The present study addressed the measurement of social welfare of the country using the Ordinal and the Cardinal Approach on the basis of efficiency (economic growth) and inequality (income distribution pattern). The Lorenz curve closet to egalitarian line was of 2001-02, which reflected the highest social welfare gaining in this year. There emerged a merged line of the curves for 1990-91 and 1998-99. However this comparison gave ambiguous results due to intersection pattern. Gini-coefficients showed instability and remained fluctuating in the country as well as in rural and urban areas during the considered years. In 2001-02 a drastic decline to the extent of 0.29 in Gini-coefficient in Pakistan and the lowest one (0.16) in the history of the country in rural area was registered. There occurred always positive changes in social welfare due to increase in mean income, while inequality pattern contributed negative or nil during the considered period except 1998-2001. For this period the income growth and decrease in income inequality contributed positively in welfare of the population. By ignoring inequality and adjusting efficiency with the variable values of B , it was found that neglecting the effect of growth would not be beneficial for the society. In 2001-02 the highest changes in social welfare was estimated at considered values of B as the inequality declined during this period. Consequently efficiency and equality were both essential ingredients to increase welfare of population. Neglecting any might cause failure in consideration of welfare-oriented policy objectives.

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I. INTRODUCTION

The most serious challenge confronting the world today is widespread poverty. It is an inescapable fact that almost 20 percent of humanity or 1.20 billion people subsist on less than \$ 1.0 a day. The gap between the rich and the poor has widened over the years as 80 percent of global GDP of \$ 30 trillion accrues to only 20 percent of the world population (living in OECD countries) and the remaining 80.0 percent of the people have only 20.0 percent share of the world income. The average income in the richest 20 countries is 37 times the average of the poorest countries. According to the definition developed over time poverty is a complex and multi dimensional phenomenon, which goes beyond the notion of income and encompasses social economic and political deprivations.

Pakistan like other developing countries of the world is dependent on agrarian economy. Due to low productivity and alarming increase in population, per capita income is low and it has been ranked at 107 out of 134 countries (*World Development Report, 2005*). The country after 58 years of its life was still facing the problems of weak socio-infrastructure. Even now most of the indicators belonging to well-being such as literacy, education, health, nutrition, safe drinking water and sanitation, access to family services are comparatively low relative to other countries with same level of per capita income. As far as economic environment is concerned, it is truly complicated to measure economic performance of Pakistan, since various dimensional approaches accepted at global level in this context had not proved viable to give the expected results. During the overall period of 1960 to 1990 Pakistan would be placed in the top ten countries of the world. This made an eminent economist Professor Richard Eckaus remark, "Pakistan is a puzzle," a miracle of levitation. With one of the lowest domestic saving rate in Asia, its economy has performed quite creditably (Amjad, 2003). In such unexpected environment there emerge complexities with respect to development process specifically to determine priorities for concerned sector as well as economic indicators to achieve the stipulated objectives. Consequently, all efforts having concerned with development activities adopted in successive Five Year Plans proved abortive leading towards instability of economic growth of the country.

Kuznets (1963) identified that though relatively higher income disparity was regarded as the characteristics phenomenon of the less developed countries, yet in general the more rapid the growth during early stages, the more intense the development of income inequality. Underlying reasons for development of such situation were as follows:

- The development conscious government of the less developed countries, in order to raise investment, allow income disparities to widen.
- The resource mobilization policies often lag behind and fail to cope with the continuing growth process and the resources tend to concentrate among resource owners.

Thus, income concentration increases with economic growth during early stage of development. This gave indication that aggregate income alone is not welfare measuring tool for a society but the income distribution pattern is regarded as an important factor in measuring its level of welfare. Contrary to that it is also argued that the overall income and its distribution may improve leaving the income of the poor and/or their distribution of income unaltered or even worsened (Chowdhury, 1982).

In 1990s Pakistan encountered a deep and protracted recession, since GDP growth declined from 6.1 percent during 1980s to 4.2 percent during 1990s. The growth of large scale manufacturing sector, which is considered employment opportunities generating activity, and equilibrating income distribution tool, declined from 8.2 percent during 1980s to 4.4 percent during 1990s. Debt servicing as a percentage of foreign exchange increased from 18 percent in 1980s to about 40 percent in the year 2000. The proportion of population below poverty line, thus, increased from 18 percent in 1987 to 34 percent in 2003 causing income disparity among different segments of the population. Lack of access to basic needs and other social needs undermines the capability, limits ability of population to secure gainful employment and results in income poverty and social exclusions.

Pakistan concentrated all development efforts aiming at tracking the economy on a higher and sustainable economic growth, reducing unemployment, raising the level of standard of living of the low income group but these efforts resulted in high fluctuations in population falling under poverty line overtime. This indicated that not only the GDP growth, but also other factors like income distribution pattern associated with other socio and demographic factors constitute phenomenon to achieve the objectives having concern with welfare of the poor and non-poor. Since all the social and demographic factors help enhancing efficiency or income growth and declining inequality in income distribution, the present study has been conducted to address the measurement of social welfare received by the population on the basis of mean income and income distribution pattern of the country considering the qualitative and quantitative approaches.

II. OBJECTIVES OF THE STUDY

The principal objectives of the study were as under:

- To estimate national output growth pattern overtime.
- To assess over time changes in income distribution pattern.
- To measure the social welfare and determine the status of changes in welfare with the passage of time.
- To propose policy measures for enhancement of welfare of the society in future.

To this end this paper is organized in the following fashion. The succeeding section, *i.e.* section III presents the methodology adopted to derive the stipulated results of the study. Results of the study based on the analysis made by applying the proposed methodology have been elaborately discussed in section IV. Whereas conclusions and policy implications are provided in the final section, *i.e.* section V.

III. METHODOLOGY

Methodology means strategic process leading towards the results required to derive from the available qualitative and quantitative information. It is developed keeping in view the nature and scope of the study. The ensuing study has been confined to measure welfare trend. Generally the welfare trend can be estimated by assessing income distribution. The vast gap in income and income holders would deprive of the lowest income segment of the society not only from basic needs but also make the social institutions out of the reach of such households. So the changes in welfare of Pakistan were estimated by using the methodology adopted by Mukhopadhaya (2003) to measure such changes in Singapur. However, the original references were coded to elaborate the methodology. The Ordinal Approach comprises Lorenz Dominance and Generalized Lorenz Dominance Approach, whereas Cardinal Approach was the measurement of social welfare using Sen-Social Welfare Function (Sen-SWF).

LORENZ DOMINANCE APPROACH

Bergson (1938) introduced the concept of Social Welfare Function (SWF) as a real valued function, defined on a set of alternative social states, whereas Samuelson (1949) investigated various ways for which SWF can be utilized in welfare economics. The most general form of SWF, as described by Bergson-Samuelson was as under:

$$W = w(U_1(x_1), \dots, U_n(x_n))$$

Where

$$U_i(x_i) = \text{Utility obtained by the person } i \text{ from income } x_i. \quad i = 1$$

However, the form varies from person to person.

Atkinson (1970) considered the ranking of social situations with the same mean income on the basis of additive separable SWF as:

$$W = \sum_{i=1} U_i(x_i)$$

Where

$$W = \text{Welfare}$$

$$U_i(x_i) = \text{Utility of person from income } i$$

This form of the utility function might also vary from person to person. However he proved that imposing minimum restriction of concave utility function (assuming diminishing restriction of concave utility of income) it is possible to show that for a quite broad class of SWF, Lorenz ordering can rank alternative social condition. It is an intuitive measure of income inequality, which is the share of a certain percentile or deciles of a population in a sequence manner in total income. So Lorenz Curve is a devised diagram in which percentage of population are presented on the horizontal axis and percentage of income received by the respective group on the vertical axis. So a common way of describing income distribution is the Lorenz Curve, which is defined as the relationship between the cumulative proportion of the income units and the cumulative proportion of income received when units are arranged at ascending order of their income.

It has been formally presented as under:

$$LF_1(P) \geq LF_2(P) \geq LF_3(P)$$

While $0 \leq P \leq 1$

$$\sum U(u(x) F_1(x)) \geq \sum U(u(x) F_2(x)) \geq \sum U(u(x) F_3(x)) \dots$$

Thus

$$U'(x) > 0 \text{ and } U''(x) < 0$$

Where

$F_1(x)$ and $F_2(x)$ are two distribution with corresponding mass function $F_1(x)$ and $F_2(x)$ with the same mean income and $L(P)$ is the Lorenz Curve.

However, to make comparison among different periods, if the two Lorenz Curves cross each other, it is always possible to find out different concave utility function that can rank two social situations differently (Mukhopadhaya, 2003).

GENERALIZED LORENZ DOMINANCE APPROACH

It is observed that Lorenz Dominance as a criterion of welfare comparison gives only partial ordering of the income distribution. It permits comparison only when distributions have the same mean. Moreover, it ignores the economic efficiency/growth aspect of social welfare consideration. In the case of this study overtime welfare change was measured, while overtime change in income was definite. So Shorrocks (1983) extended Atkinson's formulation by introducing the concept of Generalized Lorenz Dominance Approach. This approach was estimated by scaling the ordinary Lorenz curve up by the mean income. To scrutinize the trend of welfare Generalized Lorenz Procedure was used. However, Generalized Lorenz Curve was estimated applying the procedure given below:

$$U_1 L F_1(P) \geq U_2 L F_2(P), \text{ while } 0 \leq P \leq 1$$

For strictly concave utility function

$$\Sigma U(x) F_1(x) \geq \Sigma U(x) F_2(x)$$

Where

$F_1(x)$ and $F_2(x)$ = Two income distributions

U_1 and U_2 = Two means Income for $F_1(x)$ and $F_2(x)$.

SEN-SOCIAL WELFARE FUNCTION (SEN-SWF)

Since Lorenz Dominance and the Generalized Lorenz Dominance provide only partial ordering of the social welfare considering only inequality aspect, Sen-Social Welfare Function (Sen-SWF) was applied to judge the trend in total welfare and the trend in its component (equality and efficiency). So Sen-SWF a cardinal SWF has been applied to have quantitative/numerical values of all possible social situations. So estimation of Generalized Lorenz Curve was made by using the following formula:

$$\text{Sen-SWF} = 2 \int_0^1 UL(P) dP = U(1 - G)$$

Where

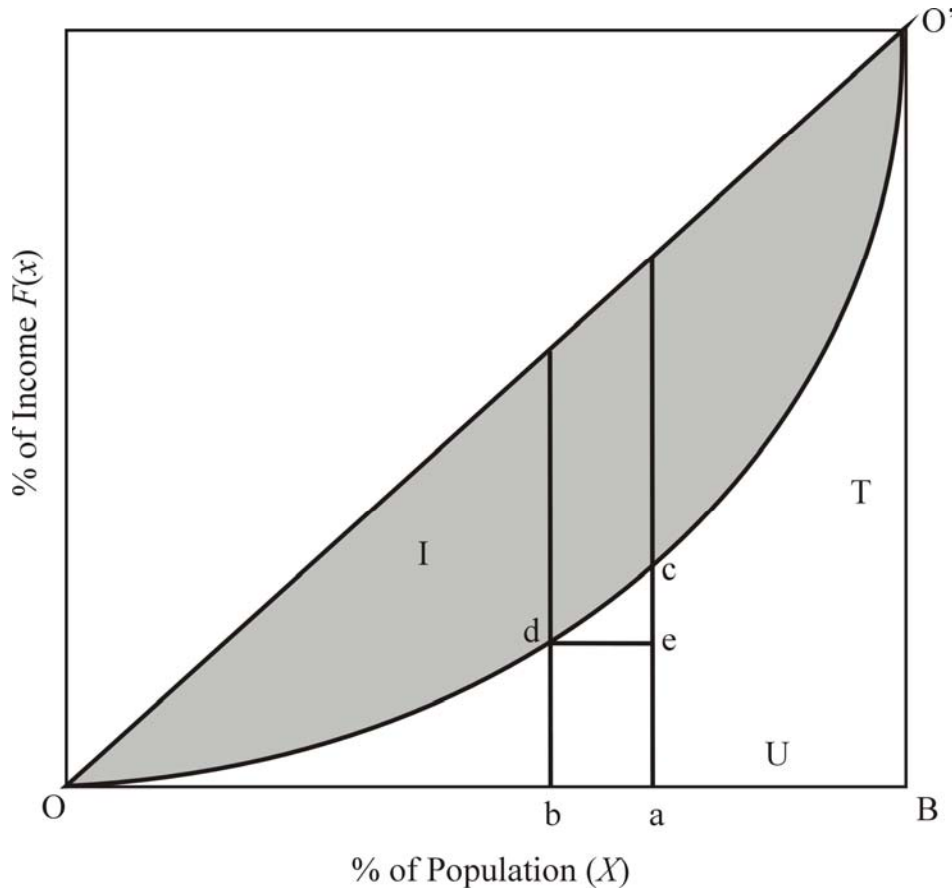
G = Gini Index, *i.e.* twice the area between the Lorenz curve and the 45 degree (egalitarian) line as is elaborated below:

GINI-COEFFICIENT

For a view of inequality with respect to all income groups, the cumulative distribution of income is usually plotted as the Lorenz curve and described by Gini-coefficient of concentration.

FIGURE 1

Cumulative Income Distribution



In Figure 1 the degree of inequality is represented by the size of shaded area I , representing the difference between the actual distribution of income described by the curve between O and O' and the line segment OO' , relative to the area, T , defined by the right angle triangle OBO' . This ratio is the Gini-coefficient. Thus if incomes are distributed equally the area of I is zero and it is the index of inequality. If one person has all the income the index of

inequality is one. By calling U the complement of I in the right triangle T it would be:

$$G = \frac{1}{T} = \left(T - \frac{U}{T} \right) = 1 - \frac{U}{T}$$

For the population group denoted as ab in the figure and using the formulas for the area of a rectangle and a triangle:

$$\begin{aligned} U &= (bd)(ab) + \frac{1}{2}(ce)(ab) \\ &= (bd)(ab) + \frac{1}{2}(ac - bd)(ab) \\ &= \frac{1}{2}(ab)(bd + ac) \end{aligned}$$

In order to calculate an over all coefficient of inequality the sum of the area under the curve 'u' for all the population groups is needed. Since T can be written as:

$$\frac{1}{2} \text{ (i.e. } \frac{1}{2} \times 1 \times 1)$$

So $G = 1 - \sum (ab)(bd + ac)$. So more generally:

$$G = \frac{\int_0^{100} [x - f(x)] dx}{\frac{1}{2}(100)^2}$$

Where

X = Cumulative percent Population

$F(x)$ = Cumulative percent Income

So

$(1 - G)$ = Twice the area below the Lorenz curve

Since the level of utility of a person may depend on his/her consumption bundle or income level, some disutility may be created due to inequity in the society as a whole. To capture this disutility due to inequality or any externalities in the society, the equity and efficiency will be assessed as under:

A common non-utilitarian form of Bergson-Samuelson SWF is as under:

$$NUBS = SWF = W(S, \emptyset)$$

Where

$NUBS$ = Nonutilitarian Bergson-Samuelson

W = Welfare

S = Total income representing efficiency

\emptyset = Inequity

While

$$\emptyset = \emptyset(x_1, x_2, \dots, x_n)$$

The satisfying condition of estimated SWF was:

$$\frac{\partial w}{\partial s} > 0 \quad \text{and} \quad \frac{\partial w}{\partial \phi} < 0$$

This would mean social welfare would increase with rising total income and would decrease with rising inequality. Obviously the set of admissible SWFs satisfying these conditions is enormous. In order to narrow down the set, Sen (1974) arrived at a specific form of the Bergson-Samuelson class of SWFs under certain restrictions, which was as follows:

$$W = U(1 - G)$$

Where the change overtime can be found out by having derivative of:

$$W = w(S, \emptyset)$$

So:

$$\frac{dW}{dt} = \frac{\partial W}{\partial S} \times \frac{dS}{dt} + \frac{\partial W}{\partial \emptyset} \times \frac{d\emptyset}{dt}$$

So the specific form indicating changes in social welfare was:

$$\frac{dw}{dt} = (1 - G) \frac{du}{dt} - U \frac{dG}{dt}$$

So for approximation of changes between two discrete points of time and to study changes in social welfare in terms of changes in equity and efficiency overtime, the equation considered was:

$$\Delta W \approx (1 - G) \Delta U - U \Delta G$$

Where

G = Gini-coefficient

$\Delta W = W_t - W_{t-1}$

$\Delta U = U_t - U_{t-1}$

$\Delta G = G_t - G_{t-1}$

To make overall determination of the welfare of a particular economic situation, various types of information was required. Information on inequality is one of the required indicators. For the Sen-SWF, the rate of substitution between inequality and efficiency at a constant welfare level could be captured by the elasticity between equality (that is $1 - G$) and mean income.

$$\frac{dG}{1-G} \times \frac{U}{du} = 1$$

In addition an underlying assumption in the Sen-SWF was as under:

$$\frac{\partial w}{\partial x} > 0 \text{ for all } i$$

This means that any addition in income of anyone (i) must result in increase in social welfare of (i) other things remaining the same. This leads towards paretianity. However, the increase in welfare due to the increase in total income must be greater than the decrease in welfare due to increase in inequality. This means

$$\left(\frac{\partial w}{\partial s} \times \frac{\partial s}{\partial x_i} \right) dx_i + \left(\frac{\partial w}{\partial \emptyset} \times \frac{\partial \emptyset}{\partial w} \right) dx_i > 0$$

This principle deals with the efficiency aspect of SWF. The more generalized and flexible form of Sen-SWF is

$$W = U^B (1 - G), 0 \leq B \leq 1$$

If one wants to give more importance to efficiency than equity he will choose a high value of ' B ', that is near one and on the contrary if equity will be preferred value of ' B ' will be set below zero. Consequently with the knowledge of the existing level of inequality in the society by varying the value of ' B ' the direction of a change in social welfare has been determined.

MARGINAL RATE OF SOCIAL WELFARE GROWTH

Marginal rate of social welfare growth has been estimated assuming unchanged inequality, which indicates that one percent increase in income would cause how much change in social welfare of population. This has been estimated by using the following formula:

$$MRS = [U_{t+1} (1 - h) - U_t (1 - h)] / \Delta U$$

Where

$$\Delta U = U_{t+1} - U_t$$

$$h = \frac{1}{2} (G_{t+1} + G_t)$$

IV. RESULTS OF THE STUDY

Initially certain information having deep concerned and may prove supportive instrument to provide comprehensive assessment for the study results was presented. Every economic concerning reform adopted overtime during the course of development of the country focused on acceleration of economic growth with specific concentration on increase in GDP and GNP pacing with population growth having concern with increase in per capita income on the average (growth in efficiency). The data reflecting over time growth rate of GNP has been presented in Table 1.

TABLE 1

Growth Performance of Gross National Product (GNP) for Selected Years

| Years | GNP (Rs. in million) | | Growth Rate (%) | |
|---------|----------------------|----------------------|---------------------|----------------------|
| | Current Factor Cost | Constant Factor Cost | Current Factor Cost | Constant Factor Cost |
| 1970-71 | 46006 | 152559 | – | – |
| 1979-80 | 210253 | 256358 | 16.4 | 5.3 |
| 1990-91 | 928406 | 453601 | 13.2 | 4.9 |
| 1998-99 | 2710396 | 620031 | 12.6 | 3.5 |
| 2001-02 | 3409083 | 691253 | 5.9 | 2.8 |

Source: *Pakistan Economic Survey*, various issues.

The data given in Table 1 reflected that gross national product (GNP) at current factor cost increased by 16 times in 2001-02 against 1979-80. The same increased by about 4 times in 2001-02, while comparison was made with the period 1990-91. The average annual growth rate at current as well as constant factor cost showed downward trend, so there emerged increase in annual average growth rate of GNP but at decreasing rate over time. At current factor cost it ranged from 5.9 percent to 16.4 percent, while in case of constant factor cost the average growth rate per annum of GNP remained ranging from 2.8 percent to 5.3 percent during the considered period.

REGIONAL GROWTH PERFORMANCE

Inner economic environment of country specifically with respect to investment pattern, product production and consumption is not only affected by the local political situation, economic conditions and social and cultural aspirations but also regional relations and economic and political stability at global level have direct or indirect bearings on country's economic growth. Certain natural occurrences also result in positive as well as negative impact on the economy at global level or certain parts of the globe, leaving no possibility for any country to be out of this hazard. However, to evaluate economic performance of a country three strategies can be used:

- Comparison of the economic growth of the current period with the economic performance of some normal year in the past.
- Assessment of potential and actual achievement with respect to economic performance of the country.
- Comparison of economic growth of the country with other countries having dealings in economic environment similar to the country concern.

Consequently the growth performance of the country has been compared not only with the developing countries, but also with the developed countries to determine its share in economic performance at global level. The data regarding the real GDP growth rate of select developed as well as developing countries have been presented in the Table 2 to assess regional growth performance. The results in the table show that the average annual growth rate of world GDP in real term was higher in developed as well as the selected developing countries in 1980-90 but it declined in 1990-2000 at global level. Even developed countries could not escape from it except that of Sri-Lanka and Malaysia. In 2000-01, improvement was observed in growth performance of GDP and that was again at global level. In Pakistan, the annual average growth rate of real GDP was lower (2.2 percent) in 2000-

01 relative to average annual growth rate of real GDP estimated in 1990-2000. The situation was not coinciding to global economic environment but this could be attributed to the effect of severe drought faced by the country concerned, which led the growth of agriculture, the main sector of the economy towards negative, *i.e.* (-)2.2 percent in 2000-01. Overall picture reflected fluctuations in growth performance of the developed as well as developing countries. However, the real GDP growth rate remained higher in Pakistan relative to overall World GDP growth rate during the whole considered period except 2000-01.

TABLE 2
Regional Growth Performance
(Real GDP Growth Rate of Selected Countries)
(Percent)

| Country/Region | 1980-90 | 1990-2000 | 2000-01 | 2001-02 |
|----------------------|---------|-----------|---------|---------|
| World GDP | 3.3 | 2.7 | 4.7 | 2.3 |
| USA | 3.5 | 3.4 | 4.1 | 1.2 |
| Japan | 4.1 | 1.3 | 2.2 | -0.4 |
| Germany | 2.3 | 1.5 | 3 | 0.6 |
| Developing Countries | | | 5.7 | 4 |
| Indonesia | 6.1 | 3.8 | 4.8 | 3.3 |
| Malaysia | 5.3 | 6.5 | 8.3 | 0.4 |
| India | 5.7 | 5.9 | 5.4 | 4.3 |
| Sri Lanka | 4 | 5 | 6 | 0.4 |
| Pakistan | 6.3 | 3.7 | 2.2 | 3.6 |

Source: World Bank Outlook (IMF), April 2003.

PER CAPITA INCOME AND ITS GROWTH

Per capita income is generally accepted indicator to assess growth performance of a country. There is a need of higher growth rate in GDP relative to growth rate in population to enhance per capita income. The data presented in Table 3 indicate that there occurred increase by 14.2 percent on the average per annum in per capita income at current factor cost in 1979-80 over 1970-71, while such increase observed in 1990-91 declined to the extant

to 8.7 percent against 1979-80. In ultimate the average growth rate in per capita income in nominal term remained unstable during the considered period.

In real term the average growth rate of per capita income was 2.4 percent in 1979-80 over 1970-71 while it registered an increase at decreasing rate during the considered period and it decreased to 1.1 percent on the average per annum in 2001-02.

TABLE 3
Per Capita Income and its Growth Rate

| Year | Per Capita Income (Rs.) | | Average Growth Rate (%) | |
|---------|-------------------------|-----------------------|-------------------------|----------------------|
| | Current Factor Cost | Constant* Factor Cost | Current Factor Cost | Constant Factor Cost |
| 1970-71 | 825 | 2762 | – | – |
| 1979-80 | 3103 | 3511 | 14.2 | 2.4 |
| 1990-91 | 8485 | 4146 | 8.7 | 1.4 |
| 1998-99 | 20377 | 4662 | 10.2 | 1.3 |
| 2001-02 | 23996 | 4866 | 4.2 | 1.1 |

Source: *Pakistan Economic Survey*, various issues.

*Base Year 1980-81

TRENDS IN INCOME INEQUALITY

The traditional concept of aggregate income or GNP growth was now not acceptable to assess the level of welfare of the society. Income distribution pattern among the members of the society has become an important factor in measuring populations' economic status. The data presented in Table 4 indicate that the share of the lowest 20 percent income group remained fluctuating ranging from 5.7 percent to 9.6 percent during the considered period. A relative better situation emerged in 2001-02, while the share of the lowest income group and middle income group in total income increased to 9.6 percent and 48.7 percent respectively, while the share of income group with the highest 20 percent decreased to 41.7 percent against 49.3 percent in 1990-91. In 1990-91, the share of the lowest 20 percent income group remained the lowest one (5.7 percent) widening the income distribution gap. Thus the share of the lowest income group remained on decline in general except 2001-02. An improvement was observed in income distribution

pattern in 2001-02 with increase in the income share of the lowest 20 percent as well as middle 60.0 percent income group, while this shift resulted the reduction to the extent to 41.7 percent in such share of the highest 20 percent income group. The ratio of the highest 20 percent to the lowest 20 percent was the lowest (4.3 percent) in 2001-02, indicating relatively better share of lowest income group.

TABLE 4
Income Inequality in Pakistan

| Year | Percentage Share of Income | | | Ratio of Highest 20% to Lowest 20% |
|-----------|----------------------------|---------------|----------------|--|
| | Lowest 20% | Middle 60% | Highest 20% | |
| 1970-1971 | 8.4 | 50.1 | 41.5 | 4.9 |
| 1979-1980 | 7.4 | 47.6 | 45 | 6.1 |
| 1990-1991 | 5.7 | 45 | 49.3 | 8.6 |
| 1998-1999 | 6.2 | 44.1 | 49.7 | 8 |
| 2001-2002 | 9.6 | 48.7 | 41.7 | 4.3 |

TRENDS IN INCOME INEQUALITY BY LOCATIONS

Pakistan population can be classified as rural and urban on the basis of location. Income distribution in rural area mainly depends upon the farm land distribution and cultivation right, which is the main source of income of rural population. The data given in Table 5 reveal that the share of 20 percent lowest income group remained higher in rural area throughout the considered period than that of urban area while the income share of the highest 20 percent income group was higher in urban area relative to rural area. This reflected relatively more income inequality in urban area than the rural area. However in 2001-02 the share of income of both groups indicated improvement in income distribution pattern to the best level in rural area while in urban area the situation emerged was quite worsened during the same period with ratio of the highest 20 percent to the lowest 20 percent estimated at 2.3 and 12.4 in rural and urban area respectively. However in the remaining period as well such ratio was relatively better in rural area as compared with urban area. In brief, it could be concluded that income distribution pattern was relatively better in rural area.

TABLE 5
Household Income Distribution by Locations for Selected Years

| Years | Rural Area | | | Urban Area | | |
|-----------|------------|-------------|----------------------------|------------|-------------|----------------------------|
| | Lowest 20% | Highest 20% | Ratio of Highest to Lowest | Lowest 20% | Highest 20% | Ratio of Highest to Lowest |
| 1970-1971 | NA | NA | | NA | NA | |
| 1979-1980 | 8.3 | 41.3 | 5 | 6.9 | 48 | 7 |
| 1990-1991 | 6 | 47.4 | 7.9 | 5.7 | 50.5 | 8.9 |
| 1998-1999 | 6.9 | 46.8 | 6.8 | 6 | 50 | 8.3 |
| 2001-2002 | 13 | 29.6 | 2.3 | 4.8 | 59.5 | 12.4 |

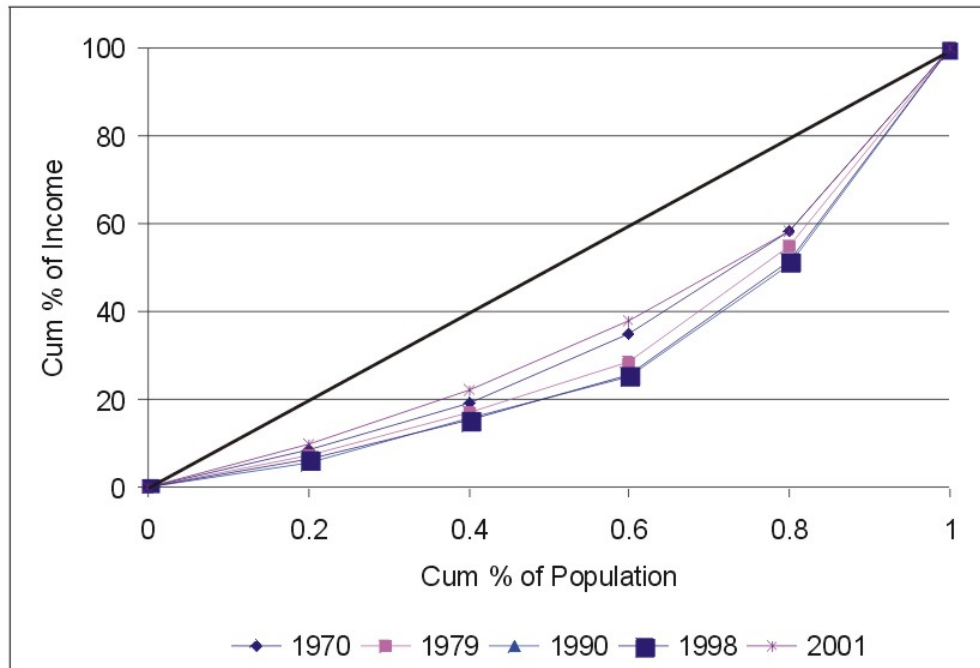
*On the basis of FBS, HIES data available for selected years.

*NA = Not Available

THE LORENZ DOMINANCE APPROACH

A common way of assessing income distribution is the Lorenz curve, which is defined as the relationship between the cumulative proportion of the population and cumulative proportion of the income received by those population proportion units, while these units are arranged in ascending order of their income. The Lorenz Dominance Approach was applied to the data at the country level. The data transformed in Figure 2 indicate that the Lorenz curve closet one to the egalitarian line was of 2001-02, while all other curves remained below it. In this year the lowest 20 percent population segment received the highest share from income for this income group. Moreover it became one line matching with the curve of 1979 in case of the highest 20 percent income group because of no change in income distribution pattern in this segment of population in this particular year. For the period 1990-91 and 1998-99 the merged lines of curves showed similarity in social gaining pattern. In brief it could be concluded that social welfare received by the society was the highest in 2001-02. But this comparison leads towards ambiguous results on Lorenz curve intersection pattern basis.

FIGURE 2
Lorenz Dominance Approach



GINI CONCENTRATION RATIO

Concentration ratio is an intuitive measure of inequality and is especially useful to determine the degree of income disparity. If incomes are distributed equally, the Gini-coefficient will be zero, and beyond zero it lead towards index of inequality. To assess income disparity the past experience of the country was also considered and the Gini-coefficients estimated during certain years on the basis of data availability in the required concern were presented in the Table 6. The data reveal that the income distribution pattern remained relatively better during 1970-71 and 1979-80. The Gini-coefficient of household income had been 0.32 and 0.37 in Pakistan, while it reached 0.41 in 1990-91 and than the situation regarding income distribution pattern continued similarity and in 1998-99, the Gini-coefficient was estimated at 0.41. However, it was abruptly declined to 0.29 in 2001-02.

Further analysis on the basis of rural and urban areas reflected that income distributed remained better in rural area relative to urban area up to 1980. The situation deteriorated in rural area but rather improved in urban

area in 1990-91 and 1998-99, since it was 0.40 in rural area and 0.33 in urban area in 1998-99.

The estimates regarding Gini-coefficients showed instability and remained fluctuating in the country as well as in rural and urban areas of the country during the considered period, but stagnation was observed in estimated Gini-coefficient in 1990 and 1998 in Pakistan. The fluctuation in income disparity remained the feature of rural and urban areas as well during the same period. However in 2001-02 a drastic decline was observed in Gini-coefficient and it was 0.29 in Pakistan while the lowest one in the history of the country, *i.e.* 0.16 in rural area. This could be attributed to policy measures developed diverting the resources towards welfare of common man to reduce poverty and inverse situation found emerged in urban area and the income disparity was at increase with the highest Gini-coefficients estimated to the extent to 0.48 in the area. This could be the result of excessive migration of population from rural to urban areas, which proved existence of factors widening the gap between the rich and the poor by waving off the effects of development process.

TABLE 6

Gini-Coefficient on Income Basis for Various Selected Years

| Year | Total | Rural | Urban |
|-----------|-------|-------|-------|
| 1970-1971 | 0.32 | 0.27 | 0.33 |
| 1979-1980 | 0.37 | 0.32 | 0.4 |
| 1990-1991 | 0.41 | 0.41 | 0.39 |
| 1998-1999 | 0.41 | 0.42 | 0.33 |
| 2001-2002 | 0.29 | 0.16 | 0.48 |

Source: Various issues of *Pakistan Economic Survey*.

GENERALIZED LORENZ DOMINANCE APPROACH (GLDA)

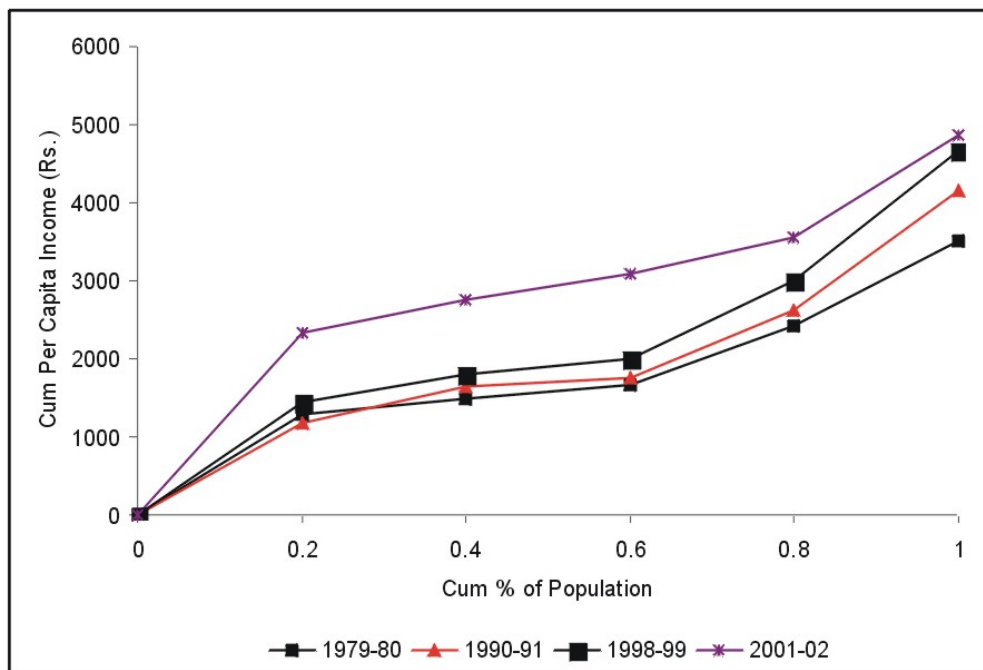
Since the study needs examining welfare changes of country overtime for which essentiality demands changes in mean income of households or per capita income distribution, in this section Generalized Lorenz Curves were constructed and presented for various selected years considering data limitations. To construct the points of GLDA, the per capita income in real terms was considered for various years and the same was presented in Table 7.

TABLE 7
Points of Generalized Lorenz Curves on Quintile Basis

| Population Proportion (%) | Cumulative Per Capita Income (Rs. Per Annum) | | | |
|---------------------------|--|---------|---------|---------|
| | 1979-80 | 1990-91 | 1998-99 | 2001-02 |
| 20 | 1299 | 1182 | 1445 | 2336 |
| 40 | 1492 | 1648 | 1795 | 2749 |
| 60 | 1673 | 1748 | 1997 | 3082 |
| 80 | 2413 | 2627 | 2990 | 3546 |
| Overall | 3511 | 4146 | 4662 | 4866 |

Source: *Pakistan Economic Survey*, various issues.

FIGURE 3
Generalized Lorenz Dominance Approach



According to the methodology the ranking of two income distributions with mean can have only an unambiguous welfare ranking if the Generalized Lorenz Curves do not intersect. Moreover, Shorrocks (1983) indicated that

even if ordinary Lorenz Curves of two distributions intersect, the condition of Generalized Lorenz Dominance may still be satisfied. The generalized Lorenz Curves of different years have been presented in Figure 3.

The data presented in this figure reflected that there emerged increase in Generalized Lorenz curves but with slow process. Points of Generalized Lorenz curve were estimated by using 1980-81 as the base year. The average per capita real income was Rs. 2,762 in 1970-71 which increased to Rs. 3,511 showing an addition in such income by 2.7 percent on the average per annum up to 1979-80. During overall considered period the average growth rate of per capita real income was 1.8 percent and it reached Rs.4866 in 2001-02. The Generalized Lorenz curve of 1990-91 intersects that of 1979-80 at the initial stage and then laid above the Generalized Lorenz Curve of 1979-80 indicating decrease in share of the lowest income group in social gaining. However the Generalized Lorenz curve of 2001-02 remained below such curve of 1990-91. This reflected that cumulative per capita income was higher in this year for all quintiles than 1990-91.

In brief this could be concluded that generalized Lorenz Dominance criterion gave partial ordering of social situation with one cross of the intersection of ordinary Lorenz curves.

SOCIAL WELFARE FUNCTION APPROACH

As is given in methodology Ordinary Lorenz Dominance and Generalized Lorenz provide partial ordering of the social welfare and for complete ordering Sen-SWF has been applied. So the estimates regarding SWF have been presented in Table 8.

The data presented in this table indicate that an increase of 1.7 percent was registered in real average per capita income per annum during the period from 1970-71 to 1998-99. There emerged increase in income inequality (quantified by Gini-coefficient) up to 1998-99, which overshadowed the increase in social welfare and it increased to the extent to 1.3 percent during the same period. However the inequality decreased to 0.29 in 2001-02 against 0.41 in 1990-91 and this increased the social welfare by 2.9 percent per annum from 1990-91 to 2001-02, while increase in real per capita income during the same period was 1.3 percent. In 2001-02 the emerged situation registered more improvement with respect to gained social welfare, since an increase in social welfare was 5.9 percent on the average per year against an increase by 1.1 percent on the average per annum in real per capita income in 2001-02 relative to 1998-99. Consequently the results reflected that income distribution pattern has direct bearings on social welfare of the population.

TABLE 8
Social Welfare Gaining in Pakistan

| Year | Average Income (Rs.) | Gini-coefficient | Social Welfare (Rs.) |
|---------|-------------------------|------------------|-------------------------|
| 1970-71 | 2762 (-) | 0.32 | 1878.16 (-) |
| 1979-80 | 3511 (2.4) | 0.37 | 2211.93 (1.6) |
| 1990-91 | 4146 (1.4) | 0.41 | 2446.14 (0.8) |
| 1998-99 | 4662 (1.3) | 0.41 | 2750.58 (1.3) |
| 2001-02 | 4866 (1.1) | 0.29 | 3454.86 (5.9) |

Figures in parentheses indicate average annual growth rate in percentage.

As far as the welfare measurement by location is concerned, there was found more income inequality in urban area with more mean income relative to rural area. Consequently, the income inequality effect to overshadow the welfare of income was relatively more in urban area, but the welfare estimated in urban area was relatively higher than rural area except 2001-02 due to vast difference in per capita mean income during the whole considered period. In 2001-02, though the per capita average income was less than the urban area of respective period, yet the income inequality reduced and the estimated Gini-coefficient was 0.16, which was accompanied by 5.9 percent average annual growth rate of per capita mean income. So increase in mean income and reduced income inequality resulted in an increase by 16.1 percent in welfare of rural area. This was the highest one in rural as well as in urban area during the considered period. This gave obvious implications that not only the increase in income but also income distribution pattern affects the welfare of the society of a country. The results regarding measurement of social welfare in Pakistan in urban and rural areas have been presented in Table 9.

TABLE 9
Welfare Measurement in Pakistan by Locations

| Year | Urban Area | | | Rural Area | | |
|---------|----------------------|------------------|-------------------|----------------------|------------------|-------------------|
| | Average Income (Rs.) | Gini-Coefficient | Welfare (Rs.) | Average Income (Rs.) | Gini-Coefficient | Welfare (Rs.) |
| 1970-71 | 3724 (-) | 0.33 | 2495.08 (-) | 2455 (-) | 0.27 | 1792.15 (-) |
| 1979-80 | 4581 (2.1) | 0.4 | 2748.60 (1.0) | 2845 (1.5) | 0.32 | 1934.60 (0.8) |
| 1990-91 | 4988 (0.7) | 0.39 | 3042.68 (0.8) | 3837 (2.5) | 0.41 | 2263.83 (1.3) |
| 1998-99 | 6444 (2.9) | 0.33 | 4317.48 (3.9) | 3902 (0.2) | 0.42 | 2263.16 (0) |
| 2001-02 | 6722 (1.1) | 0.48 | 3495.44 (-5.1) | 4903 (5.9) | 0.16 | 4118.52 (16.1) |

Source: Various Issues of Pakistan Economic Survey

Figures in parentheses indicate percentage growth per annum.

CHANGES IN WELFARE BY COMPONENTS

Welfare changes can be attributed to increase in income and distribution of income in a society. The estimates quantified in term of Gini-coefficients revealed that there were not many changes in income distribution pattern despite of development activities implemented over time to increase income spread to alleviate poverty. The data presented in the Table-10 show that there observed an upward change in mean per capita income during the considered period. The changes occurred in inequality of income distribution were quite nominal or no change in certain years. However an improvement was registered in income distribution pattern during 1998-99 to 2001-02 with downward change in estimated Gini-coefficient to the extent of 0.12 during this period. So the change in social welfare was the highest in this period relative to other considered period.

An increase in income affects overall welfare by two ways:

- It raises average income which generally has a positive effect on welfare.

- It alters income distribution pattern which has positive or negative effect depending on direction (positive or negative) of inequality.

So to decompose the changes in social welfare income and inequality in income distribution was taken into account and it was found that there existed positive correlation between income and welfare, whereas an inverse relationship was observed in welfare and income inequality. Generally the experience of income distribution pattern as was estimated by Gini-coefficient gave indication regarding negative contribution of it in social welfare of population in the country except the period 1998-99 to 2001-02. In 2001-02 with government's equity-enhancing policies the estimated Gini-coefficient declined to 0.29 the lowest one during the whole considered period, which resulted in addition of Rs.571.68 in social welfare change. (Table 10) In brief it could be concluded that increase in mean per capita income as well as the equality in income distribution both are essential to increase social welfare of the society in the country.

TABLE 10
Changes in Welfare by Components

| Items | 1970-71 to 1979-80 | 1979-80 to 1990-91 | 1990-91 to 1998-99 | 1998-99 to 2001-02 |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| Change in Average Income (Rs.) | 749 | 635 | 516 | 204 |
| Inequality Change | (-)0.05 | (-)0.04 | Nil | 0.12 |
| Change in Social Welfare (Rs.) | 333.77 | 234.21 | 304.44 | 704.28 |
| • Due to Income: (1 - G) Δu (Rs.) | 490.595 | 387.35 | 304.44 | 132.60 |
| • Due to Inequality: $u\Delta G$ (Rs.) | (-)156.825 | (-)153.14 | Nil | 571.68 |

Change in average income in Pakistan registered increase with decreasing trend during the considered period while considering the rural and urban locations it was found that changes in mean per capita income remained fluctuating in both the areas in that period. Similar situation was observed with respect to income inequality which showed plus as well as minus changes in both the areas but such fluctuations were relatively more in urban area as compared with rural area due to availability of more employment opportunities and employment shifting to higher wage rate in

this area. In urban area negative change in social welfare was estimated during 1970-71 to 1979-80 and 1998-99 to 2001-02. In case of rural area an improvement was observed in income distribution pattern during 1998-99 to 2001-02 with positive change in income distribution leading the estimated Gini-coefficient downwards to the extent to 0.16 in this period. This increased the share of change in income inequality in total social welfare by 61.7 per cent in 2001-02. During the remaining period the income spread pattern contributed negatively in social welfare changes occurred due to changes in per capita mean income (Table 11).

TABLE 11
Change in Welfare by Location

| Items | 1970-71 to 1979-80 | 1979-80 to 1990-91 | 1990-91 to 1998-99 | 1998-99 to 2001-02 |
|--------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1. Urban Area | | | | |
| Change in Average Income (Rs.) | 857 | 407 | 1456 | 278 |
| Change in Inequality | -0.07 | 0.01 | 0.06 | -0.15 |
| Change in Welfare (Rs.) | 253.52 | 294.08 | 1274.8 | -822.04 |
| → by change in Income | 544.2 | 246.24 | 931.84 | 165.41 |
| → by change in Inequality | -290.68 | 47.84 | 342.96 | -987.45 |
| 2. Rural Area | | | | |
| Change in Average Income (Rs.) | 390 | 992 | 65 | 1001 |
| Change in Inequality | -0.05 | -0.09 | -0.01 | 0.26 |
| Change in Welfare (Rs.) | 142.45 | 329.23 | -0.67 | 1855.36 |
| → by change in Income | 274.95 | 629.92 | 38.02 | 710.71 |
| → by change in Inequality | -132.5 | -300.69 | -38.69 | 1144.65 |

SOCIAL WELFARE CHANGES BY VARYING JUDGMENT TOOLS

To make overall determination of the welfare of a particular economic situation various types of information are required. Lorenz ranking and Generalized Lorenz Dominance need information regarding mean income and income distribution pattern or inequality status. Though Lorenz Domi-

nance was an approach, used widely to rank social situations in a society, yet it gave incomplete ranking in this context. Similar problem of partial ranking has been identified in available literature by adopting Generalized Lorenz Dominance Approach. So Sen-Social Welfare Function (Sen-SFW) was applied to judge the trend in total welfare and the trend in its components (Inequality and Efficiency) Sen-SWF Approach was modified to make it more general and flexible with adjusting the mean income by variable values of ' β '. The value of ' β ' would give more importance to efficiency than equity or vice versa, since the value of ' β ' would indicate the effect of growth in the society. Thus changes in social welfare estimated by using different values of ' β ' have been presented in Table 12.

TABLE 12
Social Welfare by Varying Judgment Tools

| Year | $\beta = 0.00$ | $\beta = 0.01$ | $\beta = 0.05$ | $\beta = 0.10$ | $\beta = 0.50$ | $\beta = 1.00$ |
|---------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 1970-71 | 0.680 | 0.736 | 1.010 | 1.502 | 35.737 | 1878.16 |
| 1979-80 | 0.630 | 0.683 | 0.948 | 1.425 | 37.330 | 2211.93 |
| 1990-91 | 0.590 | 0.641 | 0.895 | 1.357 | 37.990 | 2446.14 |
| 1998-99 | 0.590 | 0.642 | 0.900 | 1.373 | 40.284 | 2750.58 |
| 2001-02 | 0.710 | 0.773 | 1.086 | 1.659 | 49.527 | 3454.86 |
| Changes in Social Welfare | | | | | | |
| 1970 to 1979 | (-)0.05 | (-)0.053 | (-)0.062 | (-)0.077 | 1.593 | 333.77 |
| 1979 to 1990 | (-)0.04 | (-)0.042 | (-)0.053 | (-)0.068 | 0.66 | 234.21 |
| 1990 to 1998 | – | 0.001 | 0.005 | 0.016 | 2.294 | 304.44 |
| 1998 to 2001 | 0.120 | 0.131 | 0.186 | 0.286 | 9.243 | 704.28 |

By considering social welfare only on the basis of equality ($1 - G$) was too extreme, whereas using the value $\beta = 0.01$ reflected neglecting the growth in the society. The data in this table reveal that welfare remained fluctuating at all values of ' β ' except $\beta = 0.5$, for which an increase over the years was observed. This led towards indication that neglecting the effect of growth would not be beneficial for the society, since an increase in mean

income not only increase the welfare but might also change Gini-coefficient depending upon the income distribution pattern and by this some segment of the society gets the fruit of this growth. However positive impact emerged over time by considering the value ' β ' = 0.5. In 2001-02 the highest change in social welfare was registered at all considered values of ' β '. This indicated that efficiency as well as equality was essential ingredients to measure social welfare of society. Neglecting any might cause failure in consideration of welfare-oriented policy objectives.

The estimates regarding social welfare gaining by varying judgment tools by locations, *i.e.* rural and urban areas have been presented in Table 13.

TABLE 13
Social Welfare by Varying Judgment Tools by Locations

| Year | $\beta = 0.00$ | $\beta = 0.01$ | $\beta = 0.05$ | $\beta = 0.10$ | $\beta = 0.50$ | $\beta = 1.00$ |
|-------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Urban Area | | | | | | |
| 1970-71 | 0.670 | 0.727 | 1.011 | 1.525 | 40.886 | 2495.08 |
| 1979-80 | 0.600 | 0.653 | 0.914 | 1.394 | 40.610 | 2748.60 |
| 1990-91 | 0.610 | 0.664 | 0.934 | 1.429 | 43.082 | 3042.68 |
| 1998-99 | 0.670 | 0.731 | 1.039 | 1.611 | 53.784 | 4317.48 |
| 2001-02 | 0.520 | 0.568 | 0.808 | 1.255 | 42.634 | 3495.44 |
| Rural Area | | | | | | |
| 1970-71 | 0.730 | 0.789 | 1.078 | 1.593 | 36.170 | 1792.15 |
| 1979-80 | 0.680 | 0.736 | 1.012 | 1.507 | 36.270 | 1934.60 |
| 1990-91 | 0.590 | 0.641 | 0.891 | 1.347 | 36.547 | 2263.83 |
| 1998-99 | 0.580 | 0.630 | 0.877 | 1.326 | 36.230 | 2263.16 |
| 2001-02 | 0.840 | 0.914 | 1.285 | 1.965 | 58.818 | 4118.52 |

The results given in the Table 14 regarding the changes in social welfare derived by changing the value of β reflected the similar situation in case of various locations such as urban and rural as it was in case of over all situations. By neglecting the growth in income the social welfare achieved was the lowest, *e.g.*, 0.520 from 0.670 during the considered period considering the value of β 0.00. Though welfare remained fluctuating on the basis of income distribution pattern every year, yet with increase in value of

β resulted in increase in such welfare of the society. The situation was observed in case of both in rural and urban areas. This gave indication that growth in income is the most essential ingredient to increase the social welfare. However the equity concept determined the sharing pattern of welfare among various segments of the society. If the changes in welfare are considered, there occurred increase in efficiency and decrease in inequality in rural area and this resulted in the highest growth rate in social welfare in 2001-02. In contrast to that in urban area there emerged a small positive increase in efficiency, but the sufficient increase in income inequality caused declined in social welfare in this area (Table 14). Consequently with the changes in value of indicating the efficiency pattern affected the welfare positively due to relatively better income distribution pattern during the same period in rural area, while in the urban area the efficiency was offset by the wide variations in income distribution pattern in this area. This again leads towards the situation that both the efficiency and the equality up to a relevant ratio would help in increasing the welfare in the concerned society.

TABLE 14
Changes in Welfare Overtime by Locations

| Year | $\beta = 0.00$ | $\beta = 0.01$ | $\beta = 0.05$ | $\beta = 0.10$ | $\beta = 0.50$ | $\beta = 1.00$ |
|-------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Urban Area | | | | | | |
| 1970-1979 | (-)0.07 | (-)0.074 | (-)0.097 | (-)0.131 | (-)0.276 | (-)253.52 |
| 1979-1990 | 0.010 | 0.011 | 0.20 | 0.035 | 2.472 | 294.08 |
| 1990-1998 | 0.06 | 0.067 | 0.104 | 0.182 | 10.702 | 1274.80 |
| 1998-2001 | (-)0.150 | (-)0.163 | (-)0.231 | (-)0.356 | (-)11.15 | (-)822.04 |
| Rural Area | | | | | | |
| 1970-1979 | (-)0.05 | (-)0.053 | (-)0.066 | (-)0.086 | 0.100 | 142.45 |
| 1979-1990 | (-)0.09 | (-)0.095 | (-)0.121 | (-)0.160 | 0.277 | 329.23 |
| 1990-1998 | (-)0.010 | (-)0.011 | (-)0.014 | (-)0.021 | (-)0.317 | (-)0.67 |
| 1998-2001 | 0.26 | 0.284 | 0.408 | 0.639 | 22.818 | 1855.56 |

MARGINAL RATE OF GROWTH IN SOCIAL WELFARE

Marginal rate of growth in social welfare is the result of change in one percent change in income assuming unchanged equality. If there is an increase in the richest person's income, it will increase inequality as well as total income. In this case any type of situation might be for income

distribution, it has been assumed constant. The data presented in the Table 15 revealed overtime decrease in marginal rate of efficiency at all the values of β . The same situation emerged even considering the maximum value of $\beta = 1$. This indicated that the overtime growth in real income was not so as to yield the positive marginal rate of growth. However the changes in income inequality overtime resulted in positive contribution in attaining the increased welfare with the passage of time during the considered period.

TABLE 15

Marginal rate of Growth in term of Social Welfare
(Assuming Unchanged Inequality)

| Year | $\beta = 0.00$ | $\beta = 0.01$ | $\beta = 0.05$ | $\beta = 0.10$ | $\beta = 0.5$ | $\beta = 1.0$ |
|--------------|----------------|----------------|----------------|----------------|---------------|---------------|
| 1970 to 1979 | 0 | 2.274E-06 | 1.569E-05 | 4.690E-05 | 0.00586 | 0.655 |
| 1979 to 1990 | 0 | 1.734E-06 | 1.206E-05 | 3.643E-05 | 0.00493 | 0.610 |
| 1990 to 1998 | 0 | 1.459E-06 | 1.020E-05 | 3.103E-05 | 0.00445 | 0.590 |
| 1998 to 2001 | 0 | 1.485E-06 | 1.042E-05 | 3.183E-05 | 0.00471 | 0.650 |

TABLE 16

Marginal Rate of Growth in Term of Social Welfare by Locations
(Assuming Unchanged Inequality)

| Year | $\beta = 0.00$ | $\beta = 0.01$ | $\beta = 0.05$ | $\beta = 0.10$ | $\beta = 0.50$ | $\beta = 1.00$ |
|-------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Urban Area | | | | | | |
| 1970-1979 | 0 | 1.668E-06 | 1.164E-05 | 3.529E-05 | 0.00493 | .635 |
| 1979-1990 | 0 | 1.377E-06 | 9.663E-06 | 2.952E-05 | 0.00437 | .605 |
| 1990-1998 | 0 | 1.227E-06 | 8.672E-06 | 2.672E-05 | 0.00424 | 0.640 |
| 1998-2001 | 0 | 9.870E-07 | 7.015E-06 | 2.178E-05 | 0.00366 | 0.595 |
| Rural Area | | | | | | |
| 1970-1979 | – | 2.288E-06 | 1.976E-05 | 5.890E-05 | 0.00685 | 0.705 |
| 1979-1990 | – | 2.076E-06 | 1.436E-05 | 4.306E-05 | 0.000551 | 0.705 |
| 1990-1998 | – | 1.642E-06 | 1.142E-05 | 3.454E-05 | 0.000470 | 0.585 |
| 1998-2001 | – | 1.761E-06 | 1.232E-05 | 3.746E-05 | 0.00536 | 0.710 |

In case of various locations the observed situation was similar to overall and marginal rate of growth in efficiency, considering income equality the

constant, caused decrease in marginal rate of efficiency growth overtime at all values of β even while β value was considered equal one except the period 1998-2001 in rural area for which the marginal rate of growth efficiency increased over the past period at all values of β . This could be attributed to increase in income's share of the lowest group and decrease in the share of the highest group bringing the ratio of the highest to the lowest to the extent to 2.3 percent the lowest one during the considered period. However this situation resulted in increase in growth efficiency to the extent to affect the marginal rate of growth of efficiency in this area.

V. CONCLUSION AND POLICY IMPLICATIONS

Pakistan concentrated all development efforts aiming at tracking the economy on a higher and sustainable economic growth, reducing unemployment, raising the level of standard of living of the low income group but these efforts resulted in high fluctuations in population falling under poverty line overtime. This indicated that that not only the GDP growth, but also income distribution pattern associated with other socio and demographic factors constitute phenomenon to achieve the objectives having concern with welfare of the poor and non-poor. Since all the associated social and demographic factors have direct or indirect bearings on income and income distribution pattern, the present study addressed the measurement of social welfare of the country using the Ordinal (Lorenz Dominance and Generalized Lorenz Dominance) Approach and Cardinal (Sen-SWF) Approach on the basis of efficiency (Economic growth) and inequality (income distribution pattern).

The Lorenz curve closet to egalitarian line was of 2001-02, which reflected the highest social welfare gaining in this year. All such curves of other considered years were out side of it. Moreover the lowest 20 percent population segment received the highest share from income for this income group in this year. It became one line matching with curve of 1979 in case of the highest 20 percent income group because of similarity in income distribution pattern in this segment of population. Again there emerged merged line of the curves for 1990-91 and 1998-99. However this comparison gave ambiguous results due to intersection pattern.

Gini-coefficients showed instability and remained fluctuating in the country as well as in rural and urban areas during the considered years. Disparity remained the feature of the rural and urban population through out the considered period. In 2001-02 a drastic decline to the extent to 0.29 in Gini-coefficient in Pakistan and the lowest one (0.16) in the history of the country in the rural area was registered.

Generalized Lorenz curve of 1990-91 intersects the curve of 1979-80 indicating decrease in share of the lowest income group in social gaining. Generalized Lorenz curve for the year 2001-02 remained inside of all the considered years which reflected that cumulative real per capita income was higher in this year for all quintiles.

An increase of 1.7 percent was registered in real per capita income per annum but increase in income inequality overshadowed the increase in social welfare and so it increased to 1.3 percent during the period 1970-71 to 1998-99. In 2001-02 the emerged situation reflected improvement with respect to gained social welfare, *i.e.* 5.9 percent against an increase by 1.1 percent on the average in real per capita income relative to 1998-99. The income inequality effect to overshadow the welfare of income was relatively more in urban area than the rural area, as the income inequality reduced to 0.16 and with the result increase in income was 5.9 percent while increase in social welfare was 16.1 percent.

There occurred always positive changes in social welfare due to economic growth or increase in mean income, while inequality pattern contributed negative or nil during the considered period except 1998-99 to 2001-02. For this period the income growth as well as the decrease in inequality contributed positively in social welfare. This reflected that not only the increase in income but also income distribution pattern affect the welfare of the population.

By ignoring inequality and giving weightage to efficiency by adjusting with the variable values of β , it was found that an increase in mean income not only increase the welfare but also change Gini-coefficient depending upon the income distribution pattern and by this some segment of the society gets the fruit of the growth. Thus neglecting the effect of growth would not be beneficial for the society. Moreover in 2001-02 the highest change in social welfare was estimated at all considered values of β , as the inequality declined during this period. Consequently efficiency and equality were both the essential ingredients to increase welfare of the population. Neglecting any might cause failure in consideration of welfare-oriented policy objectives.

POLICY IMPLICATIONS

The conclusion derived from the above discussion leads towards the options that GDP growth associated with relevant income distribution pattern need to be made the main focus of the Policy measures. There is thus a need to divert the resources towards the welfare of a common man to reduce income

disparity and raise the level of standard of living of the low income group. Proposed measures in this context are as follows:

- Provision of employment opportunities and reducing the discriminatory factors governing the public sector employment preferences.
- Reducing unemployment through establishment of technical and vocational training institutes in rural areas with specific self-employment orientations.
- Expansion of education and establishment of education network attractive for poor parents to win their preference to send the children to school.
- Development of other socio and demographic factors constituting phenomenon to achieve the development objectives having concern with welfare of the poor and non-poor.
- Development of market infrastructure suitable for enhancing productivity under labor intensive production technique specifically for locally consumed commodities.
- Adoption of other economically suitable associated measures to spread income flows.
- Evaluation of development measures implemented overtime for poverty alleviation by indifferent third party to assess their impact on welfare of the different segments of the population.

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