

WELFARE INDEX IN NEPAL : AN EMPIRICAL STUDY

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Introduction

Economic development is generally taken to mean rising incomes. Though different economists have expressed their views differently in their efforts to define development, there is still a common view that development is growth in average income. But there has been a shift in emphasis since the 1970s to the distribution of income. That is if unequal distribution is growing, then the process of economic change cannot be regarded as development even if the average incomes are rising. The goals of development, therefore, now emphasize the alleviation of poverty rather than raising average incomes (Anand and Ravallion, 1993). Economists are thus primarily focusing on distribution of incomes which is the best measure of poverty alleviation.

The economic growth by itself can not generate social justice unless it is accompanied by re-distributive measures designed to narrow down the gap between the incomes of the rich and the poor. Therefore, there has recently been a revival of interest in the studies of inequality and social welfare (Datta and Meerman, 1980).

The current emphasis on 'Inequality and social welfare' is a logical step along the path of development thinking. The important problem of economics has always been how to promote economic welfare or social welfare.

Inequality and welfare approach have a broad appeal, politically and socially. Because of the political appeal, they are capable of mobilizing resources and there will be political stability. Socially there will be social justice to the citizens, and it results in the reduction of crimes. Then the inequality and welfare approach may be presented as an

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improvement on the earlier approaches which advocated raising productivity, incomes, and earning power of the poor (World Bank, 1980).

Importance of the Study

Nepal is one of the five poorest countries of the world (World Bank, 1993). Most of the studies agree that poverty is widespread and there is vast income inequality (National Planning Commission, 1993). There is no debate in this issue among economists, and all agree that Nepal must reduce income inequality to achieve economic development. It is not easy to devise poverty alleviation strategy for Nepal. The problem is to develop a model which should be used in the future for poverty alleviation. The successive development effort and acceleration of economic growth can help reduce poverty. But economic development is subject to income inequality of the society and an equally difficult for policy makers.

In Nepal, many studies have been undertaken on income inequality but unfortunately, there has been no study in the field of welfare function. The problems with income inequality have been very grave. Although many studies are related to income inequality but none have been very effective in giving real solution to the problem. This study seeks to find a necessary solution for such problem. Therefore, the primary concern of this study is to try to devise methods for poverty alleviation programmes and see how such methods can be translated into genuine action plans which are lacking very much in the present world. For this purpose this study will construct welfare index for the comparison of different types of Village Development Committees (VDCs). Welfare function has twin objectives of faster growth rate and more equal distribution of income. It is hoped that it would be useful in formulating a suitable model for economic development, especially in developing economies.

Introduction to the Study Area

The present study covers four VDCs. They are: Garamani of Jhapa district, Sharadanagar of Chitwan district, Changunarayan, of Bhaktapur district Chidipani of Palpa district and they represent eastern rural Terai, central rural Terai, Kathmandu valley and western rural hill area of Nepal respectively. some characteristics of these VDCs are given below.

1. **Garamani VDC**

Locational Characteristics: This village is situated in the middle part of Jhapa district. The East - West highway passes through this village development committee.

Demographic Characteristics: According to the 1991 population census the total population of this VDC was 15,612, out of which 7904 were male and 7708 are female. Total number of households of this VDC was 2755. Thus 50.61 per cent of the total population consisted of males and the rest (i.e 49.39 per cent) females. The average household size was 5.66. The major inhabitants of this VDC were Brahman, Chhetri, Satar, Rajbansi, Tharu, Rai, Limbu, Magar and others.

2. **Sharadanagar VDC**

Locational Characteristics: Sharadanagar VDC lies in Chitwan district. This VDC is situated only 12 Kilometer west from the Bharatpur municipality.

Demographic Characteristics: According to the 1991 population census total population of this VDC was 7133. About 46.32 per cent of the total population was male and 53.68 per cent female. The total households of the VDC was 1334, and average household size was 5.34. The major inhabitants of this VDC were Brahman, Chhetri, Newar, Tharu, Tamang, Magar, Gurung and others.

3. **Changunarayan VDC**

Locational Characteristics: Changunarayan VDC is one of the 20 VDCs of Bhaktapur district. It lies only 2 miles north from Bhaktapur municipality. The major part of this VDC is hills and only a small part is plains.

Demographic Characteristics: According to 1991 population census the total population of Changunarayan VDC was 4909 out of which 2434 were males and 2,475 females. The total number of household of this VDC was 877, and therefore the average household size was 5.59. The major inhabitants of this VDC were Brahman, Chhetri, Newar, Gurung, Magar, Tamang and others.

4. **Chidipani VDC**

Locational Characteristics: Chidipani VDC is situated in Palpa district. This VDC lies in the Mahabharat range (Iekh) and 8 miles east from Tansen municipality. Its height ranges from 2,200 ft to 4500 ft. from the sea level.

Demographic Characteristics :- According to the 1991 population census total population of this VDC was 4903 out of which 1630 were males and 3272 females. The number of households in this VDC is 891 and the average household size was 5.5. The major inhabitants of this VDC were Brahman, Chhetri, Magar, Kami and others.

There are certain common characteristics among these four VDCs they are:

Assets: The income of individual or household depends on his or her assets and the return on the assets. The most important asset is land in all the study areas. Land distribution does not seem to be equal among the households in the study areas. Some of the households have their own land while some other households have rented land also. The characteristics of land also varies. Some of the lands are fertile, productive and with irrigated facility but most of the lands are less fertile, less productive and un-irrigated. So same amount of lands (or assets) may yield different level of returns. Sheds for livestock, the property of business etc are some other assets of the study areas. But in this study, rental value of owner occupied is not included as a source of income.

Sources of Income: Agriculture is the most important source of earnings for a household or an individual. Other most important sources of income are wages and salaries. It has been found that at least one person from each household has got a job either in Nepal or in foreign countries, specially in India. Other sources of income are livestock, pension, cottage and small industries, and business etc.

Poverty Characteristics: Income may be temporarily reduced due to ill health, unemployment, a wage cut or a bad harvest. Social as well as economic activities and environment of the area play a vital role to determine an increase or a decrease in income of household or an individual. Income may be a dynamic as well as transitory phenomenon. Therefore, there is permanent as well as transitory poverty in the study areas.

The transitory poverty can occur due to ill health, unemployment, a wage cut or bad harvest. There is lack of enough insurance facilities perfect and capital market in the study areas. It may also lead to temporary poverty. There are permanent poverty situations in the study areas. Those under permanent poverty are either because of lack of assets or lack of employable skills.

Other Characteristics: There are some additional characteristics common to all study areas. There is also a strong correlation between caste and different sources of

income. Most of the Brahmans and Chhetris have comparatively more land than other castes i.e Magar, Damai, Kami, Sarki. Among Magars, Tharu, Tamang, more people earn income from wages and go to neighboring India to get employment in comparison with Brahmans and Chhetris. Most of the Newar people are involved in business in comparison to other castes.

Objectives and Methodology of the Study

The main objectives of this study are : To develop and examine the welfare index for the study area. To analyse income inequality and welfare index with an inter-VDC comparison. To investigate the empirical pattern of inter-VDC co-variation between welfare index and its two components viz average income and income inequality. To test the significance of inter-VDC co-variation between welfare index and its two components.

To fulfil the objectives of the present study, secondary cross-sectional data are used. These data were taken from the previous M.A. dissertations submitted to Tribhuvan University. The reasons for taking secondary data from M.A. dissertations are: (a) income data are not easily available (b) these data differ from place to place, (c) it is expensive as well as time consuming to collect data from large areas, (d) concept of income used in all the case was the same.

Khanal (1988) used two households were randomly selected (without replacement) from a population of 712 households in his work. Here he has presented average monthly income (per capita household income) data and household size. To get annual income (per capita household income data for the presentd study average monthly income was multiplied by 12.

Nepal (1989) took samples of 80 households randomly drawn without replacement from a population 2001 households. He has presented annual total income data and household size in his work.

Similarly Joshi (1980) has taken a sample of 81 households which were drawn randomly without replacement from a population of 1052 households. For the present study, necessary information (i.e. annual total household income and household size and per capita household income) are taken from that thesis.

Adhikari (1994) has presented annual total income data, household size and per capita household income, 89 households randomly drawn without replacement from a population of 891 households.

Collected income data were nominal. To convert these data into real value, GDP deflator was used which is regularly published in the economic surveys of His Majesty's Government of Nepal. The GDP deflator is assumed to be a good proxy for the overall price index. Khanal has used 1988 income data and Nepal and Joshi have used 1989 income data. The income data in Adhikari's work were collected in 1993. These income data are converted to real income at 1974/75 constant price.

Amartya Sen's popular welfare index has been used to measure the welfare of the society. This index has two components average income and distribution of income. It is defined as (Kakwari, 1980).

$$W = \mu (1 - G)$$

Where,

W = Welfare index

μ = average income

G = Gini index

$$0 \leq W \leq \mu$$

For the Gini index, (Sen, 1972)

For Individual data.

$$G = 1 + \frac{1}{n} - \frac{2}{n^2} \mu [ny_1 + (n-1)y_2 + \dots + 2y_{n-1} + y_n]$$

$$y_1 \leq y_2 \leq \dots \leq y_n$$

Where, $0 \leq G \leq 1$

μ = average income

n = number of observations

G = Gini index.

To investigate the conversion between welfare index and its two components, Spearman's rank correlation coefficient is used. Spearman's rank correlation coefficient is defined as (Yamane, 1973).

$$r^* = \frac{1 - 6 \sum_{i=1}^n d_i^2}{n(n^2 - 1)}$$

$$0 \leq r^* \leq 1$$

Where,

r^* = rank correlation coefficient,

d = difference between the rank of two variables,

n = number of observations.

Testing the null hypothesis that the rank correlation in the population is zero or the observation in the population are independent. For this, the t - distribution can be used and defined as,

$$t = \frac{r^*}{\frac{1 - r^{*2}}{n - 2}} \sim t_{n-2}$$

(or follows t - distribution with $(n-2)$ degree of freedom)

Where,

t = t - distribution

r^* = rank correlation coefficient

n = number of observation

Presentation and Analysis

Composition of Level of Income and Household Size

The level of income is influenced by household size because household members are the earners of income. The relation between average household size and average household income, average household size and average household income per capita are shown in table no. 1.

The average household income as the table shows, is the lowest for the smallest average household size for all VDCs. As the average household size increases, the average household income increases. But average household income per capita may decrease when average household size increases.

There is strong correlation between average household income and average household size. The Spearman's rank correlation coefficient for the average household income and average household size of every VDCs is perfect (i.e $r^* = 1$). In almost all the villages, there is negative relation between average household and average household income per capita. The Spearman rank correlation coefficient are -0.3, 0.7,-0.8, and -0.6 for

the average household size and average household income per capita in Garamani, Sharadanagar, Changanarayan and Chidipani VDCs respectively.

From the above results it may be concluded that household income is usually an increasing function of average household size. But household income per capita is a decreasing function of average household size. In functional notation, (Datta and Meerman, 1980) it can be written as;

$$Y = f(H^s), f' > 0, \text{ and}$$

$$Y/n = g(H^s), g' < 0$$

Where,

Y = Household income

n = Number in the household

H^s = average household size.

That is why to analyse income distribution, it is more appropriate to use household income per capita as using total household income to study inequality in the income distribution will be misleading (New Era, 1989). Most of such work is based on household income, although household income per capita is a better measure.

The Extent of Inequality

The extent of inequality in the size distribution of income has been measured by computing Gini coefficient. The study of income inequality will be more meaningful when we compare different Gini coefficients with different VDCs. This is reported in the following table.

Table 2
DEGREE OF INCOME INEQUALITY IN DIFFERENT SELECTED VDCS

VDCs	Gini Coefficient
Garamani	0.3086
Sharadanagar	0.2183
Changanarayan	0.1730
Chidipani	0.4564

The results show considerable differences among VDCs with respect to the degree of inequality. The degree of inequality or Gini coefficient is found higher in the VDCs

reported for Chidipani and Garamani than elsewhere. Among these VDCs the income inequality is found lowest in Changunarayan and highest in Chidipani.

Welfare Index

Study on welfare index is very useful to know the living standard of the people. It also helps to know whether the policy of the government has been successful or not to give the fruit of development to the target people. Welfare indices of the studied VDCs namely Garamani, Sharadanagar, Changunarayan, and Chidipani are shown in the following table:

Table 3
WELFARE INDEX IN DIFFERENT SELECTED VDCS

VDCs	Mean income	Income inequality	Welfare Index.
Garamani	1370.90	0.3085	947.8468
Sharadanagar	1101.47	0.2182	861.0252
Changunarayan	1679.28	0.1730	1388.7004
Chidipani	1373.26	0.4564	746.4579

Table 3 concerns the decomposition of welfare index according to mean income and income inequality. The results reveal that Changunarayan VDC has relatively better welfare and Chidipani VDC has relatively lower welfare. Chidipani has higher mean income and income inequality than Sharadanagar VDC but Sharadanagar VDC has better welfare than Chidipani. Garamani and Chidipani VDCs have almost equal mean income but Chidipani has greater income inequality than Garamani VDC. Therefore, Garamani VDC has better welfare than Chidipani VDC. It is obvious that mean income and income inequality both play important role to determine welfare of the society.

Co-variation between Welfare Index and Its Components

The present study aims to determine whether average income or income inequality shows a stronger covariation with welfare. To measure the covariation between the welfare index and the mean income and the distribution of income, Spearman's rank correlation coefficient is used. The empirical pattern of inter-VDC covariation between

Sen's welfare index and its two components have been calculated and shown in the following table.

Table 4
CORRELATION OF WELFARE INDEX AND ITS TWO COMPONENTS

Rank correlation of Welfare index (W) with	
Average income (μ)	Income distribution (G)
0.4	-0.8

The results show that the rank of W and μ is in the same direction whereas W and G has opposite direction. There is positive correlation between μ and W. These results are also theoretically proved.

Testing of the Significance

The objective here, is to test the hypothesis that if the rank correlation coefficients of welfare index with average income and income distribution are significant or not. In other words rank correlation coefficient in the population is Zero (i.e. $\rho = 0$) or the observations in the population are independent. And alternative hypothesis, $H_a: \rho \neq 0$.

Given the form of the alternate hypothesis two tail test can be applied. The t-distribution can be used in the test provided that the sample is small.

The statistical significance of Spearman's rank correlation coefficients between welfare index and average income and welfare index and inequality may be tested by the comparison of calculated t-value (t^*) and tabulated t-value at 5 per cent level of significance with (n-2) degrees of freedom which is given in the following table.

Table 5
TABULATED T-VALUE AND CALCULATED T-VALUE

Rank correlation coefficient of welfare index (W) with	Tabulated t-value at 5% level of significance with 2 degrees of freedom	Calculation of t = statistics i.e $t^* = r^*$ ----- $(1-r^2)^{1/2}$ ----- n-2
Average income (μ)	$t_{0.05} = t_{\alpha} = 4.303$	$t^* = 0.6172$
Income distribution (G)	$t_{0.05} = t_{\alpha} = 4.303$	$t^* = 1.8856$

The results reveal that tabulated t-value is greater than the calculated t-value in both the correlation coefficients. So we can not reject the null hypothesis that the observations in the population are independent.

Conclusion and Recommendations

Identification of problems may be a futile exercise unless we find the ways to solve them. But identification of problems is important because solutions are impossible without it.

A strong relationship has been observed between average household income and average household size. In almost all studied VDCs there is negative relation between average household size and average per capita income.

In this study income inequality has been found to be less than one half. So the welfare function is more sensitive to mean income to the income inequality (Kakwani, 1980). There is a need for economic growth in the studied VDCs. So it may be concluded that economic growth is necessary condition and more equal distribution of income sufficient condition for the maximization of the economic welfare of the Nepalese households.

That means there are certain ways which help to increase economic growth and reduce of income inequality i.e increasing welfare of the society. Following recommendations can be made so as to guide the policy goals for the betterment of the economy, especially developing economies like Nepal or more especially, like the economies of the studied VDCs.

- (1) If people find proper jobs, they can earn more and their income will increase. Therefore creation of employment opportunities for the lower income groups is necessary to reduce income inequality. Therefore, agro-based cottage and small industries should be established together with advancing the skills and knowledges of the poorer people.
- (2) If the ceiling of the landholding fixed by the prevailing land reform act is lowered to some extent, then poorer people may receive some land and it will increase their income as well as productivity.
- (3) People from the lower income group generally appear to have been unable to get jobs in the non-agricultural sector in our economy. One of the major reasons for such condition is their weak position to compete with the people coming up from the high income groups. Because people belonging to the poor and backward group do not get opportunities to get proper education on the one hand and on the other, such people generally do not find example of their group members engaged in non-agriculture sectors. Therefore government should provide certain privileges of education and employment opportunities in non-agricultural sectors to the weaker and backward section of the people.
- (4) Lack of education has remained one of the major reason lying behind the poverty and backwardness of majority of the people. Due to the lack of specific skills and knowledge, they are guided by the rigid and unproductive social values and institutions. Attempts should be made to devise the proper educational system which opens the ways for productive works and styles. Such education should train the people not only to get skills for doing work but also make them able to use the available resources to get optimum benefit.
- (5) Lower income groups are generally found to have engaged in agriculture. Therefore, steps should be taken to increase the productivity of the land, because it may help to increase the income level of the poor. Irrigation facilities should be increased and agricultural extension services should be promoted. Similarly the credit facilities

for the selective and productive areas should be increased. The simplification of the procedure for providing agriculture credit also is equally important because poorer people generally appear unable to take benefit from agricultural credit.

- (6) Those who are under transitory poverty may be helped through income transfer or other programmes like package of relief or perhaps by government (public) interventions to remove the market imperfections (like in insurance market, and credit market). Those who are under permanent poverty will not be helped by the possible redressal of market imperfections and by more income transformations. They will need more assets. So far the poverty alleviation is concerned there is a need for a targeted policy of asset transfers (Quibraia, 1991).
- (7) One of the most lively debates undergoing is on the relationship between economic growth and poverty alleviation or income equality. According to 'trickle down' approach, rapid economic growth is both a necessary and sufficient condition for poverty reduction. But 'inequality and welfare approach' or 'basic needs approach' argues that while growth may be necessary but it is by itself not sufficient condition. There is a need for some intervention in favor of the poor or reduction of income inequality. But it does not mean that the relationship between 'inequality and welfare approach' and economic growth need necessarily be competitive but it can be complementary (Quibraia, 1991).

Fast growth and economic dynamism can help to solve the transitory poverty. Fast economic growth and economic dynamism can help permanent poverty in the long run, but in the short run, there is a need for a direct intervention in the form of asset transfers as well as investment in human capital formation through education and training (Quibraia, 1991).

All individuals are members of the society, therefore all their social and economic activities are inter-related to determine their poverty status. If the quality and character of the social and economic relations change for the better (Quibraia, 1991), then poverty will decrease reducing income inequality and welfare of the society will be enhanced.

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