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# Poverty and Labour Market Correlates in the Nepalese Economy

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*This paper investigates poverty trends in Nepal using three sets of national survey data. It covers the period 1976/77-1996/97, divided between 1976/77-1984/85 and 1984/85-1996/97. We have made a decomposition analysis of poverty in terms of the Foster-Greer-Thorbecke indices. Using a common poverty line to cover all the income distribution data available from the national surveys, we have reached the firm conclusion that poverty declined in Nepal during 1976/77-1984/85 but increased during 1984/85-1996/97. Tracing the changes in labour productivity for the same periods, we found that the level of poverty correlated highly with changes in labour productivity, especially in the agricultural sector.*

*JEL Classification Numbers:* D63, I31, I32, J21, J24, J38

*Key Words:* Poverty, Per Capita Income, Labour Market, Labour Productivity

## 1. Introduction

In an economic sense, poverty is the situation when deprivation prevents human beings from living a decent life. Although many studies during the past three decades have estimated the incidence of poverty and its different dimensions in Nepal, they have lacked uniformity in deriving the poverty line. Consequently, the estimated poverty indices vary greatly and are hardly comparable to each other. This paper attempts to fulfil this need. After a careful review of all the poverty lines used by previous studies, this paper chooses one of them, adjusts it to all the survey years using the consumer's price index (CPI), and calculates the Foster-Greer-Thorbecke (FGT) class poverty indices to cover all the available data. This approach has helped us to reach a robust conclusion regarding the trends of Nepalese poverty over the last two decades.

So far, a quantitative estimation of poverty indices and a qualitative analysis of the characteristics of the poor have dominated studies on poverty. This paper intends to offer a slightly new perspective by incorporating labour productivity in poverty analysis. Although, till now, the literature on both poverty and labour market is substantial, those that relate these two disciplines are very rare. This study relates these two aspects of welfare economics with reference to the Nepalese economy. The labour market is an important transmission mechanism which links overall economic performance to conditions of poverty. For instance, it is widely recognized that, to a large extent, the labour market channels the effects of economic restructuring and stabilisation pro-

grammes to the livelihoods of the poor (*ILO, 1995, 12*). The employment structure is not only a simple product of macroeconomic mechanisms but also the iron link between economic development and poverty.

While two basic approaches, income vs. human, are in common use for poverty measurement, the measurement of human poverty is a relatively new approach that took a distinct form only after 1990. In this paper, we only use the income approach for the sake of a better trend analysis because data to calculate standard human poverty indices in Nepal are not available for the 1970s and 1980s.

The study of poverty requires the initial specification of a poverty line. Seebohm Rowntree in Britain was the pioneer who first developed a concept of absolute poverty during the 1890s. He defined absolute poverty in terms of a lack of 'means' in relation to the 'needs' of an individual or household; from this, he calculated the number of people below a specified minimum income level. Basically, this concept for defining the poor has never been changed (*New ERA, 1997, 7*). Although in theory a utilitarian approach is considered sufficient to estimate the poverty line based on a minimum utility level or an indifference curve, which separates the welfare level of the poor from that of the non-poor, the determination of the poverty line is rarely formulated in utilitarian terms (*Bibi, 1998, 181*). Rather, the compensated expenditure function is able to fix, for any given price system, the minimum expenditure required to reach this indifference curve. If the household expenditure data are not available, household income data are considered the next best alternative in deriving the poverty line.

Based on the nature of the poverty line, poverty measurement techniques can be broadly classified into two categories: the objective or quantitative approach and the subjective or qualitative approach. The former refers to the income (or expenditure) approach whereas the latter applies to the functional/capabilities approach, as explained by Sen (1988). An intermediate technique has also recently emerged in the poverty literature. This technique, based on "Subjective poverty lines", estimates the number of poor through the use of the "minimum income question" (MIQ) (*Pradhan, 1998, 3; Kapteyn, 1988, 222-242*) that is asked to respondents in a survey. In essence, this technique accepts the fact of different poverty lines at different locations based on the different minimum living requirements set by the people themselves in their respective locations. However, this third technique is very rarely used in poverty analysis because of the lack of substantial data consequent upon the variations in prices and basic minimum requirements in different locations operative while implementing it.

In this paper, we have adopted a comparative static approach for studying trends of Nepalese poverty during 1976-1996, disaggregated into 1976/77-1984/85 and 1984/85-1996/97, because of the lack of time series data nec-

essary to estimate annual poverty indices. The bulk of this paper is organized as follows. Section 2 sheds some light on the theoretical issues raised in establishing the poverty line. In Section 3, we calculate three major poverty indices for Nepal, along with a GINI inequality coefficient for all the survey years using a common poverty line in real terms. This section also reviews the sampling methodologies of different national surveys and the poverty lines established by them. Section 4 deals with the theoretical and empirical aspects of measuring Nepalese labour productivity. Section 5 presents an assessment of labour and related policies of Nepal with reference to labour productivities. Section 6 concludes the paper.

## 2. Measuring Poverty: Some Theoretical Issues

Since the influential work of Atkinson (1970), remarkable efforts have been made in assessing the welfare and redistribution impacts of macroeconomic policies. Since researchers have developed various inequality measures, it has become possible to use a wide class of inequality indices or social welfare functions that may lead one to reach a robust conclusion in an income distribution analysis. Foster and Shorrocks (1988) and Howes (1996) have pointed out that a similar multiplicity of approaches is also necessary for measuring other poverty indices as well (*Davidson, 1998*).

Economists use two main methods to measure poverty. One is the “relative method”, which defines the poverty line with reference to the average (mean or median) standard of living of the people. This approach, based on the concept of relative deprivation, is not appropriate for developing countries because the fulfilment of absolute basic needs of poor people becomes the major focus of attention of the policy makers in these economies. The second, which is widely used in developing countries, is the “absolute method”. This method seeks to ensure, in the first instance, that nobody in the society has a standard of living below the socially accepted minimum standard, which is called the “absolute poverty line”. This method also implies that the real poverty line is fixed over time unless changed explicitly. But the poverty lines set in many countries do not generally meet this basic requirement as they frequently vary across regions and over time. Thus, we may come across anomalous situations in which wealthier regions may show higher poverty than poorer regions, which may result in agencies giving greater benefits to the non-poor than to the poor, thus causing misallocation of scarce government resources (*Kakwani, 2003, 2*).

Theoretically, the absolute poverty line can vary over time only because of price changes. This property implies that the poverty line needs to be adjusted over time to match consumer’s price indices in order to arrive at an identical poverty line living standard (*Ibid, 3*). To start with, food, according to Lipton (1988), is a good indicator of the quality of life. Health, shelter, education, and even mobility are all reflected in nutritional status, although not in a linear or

other simple way. Here are some techniques for the specification of an absolute poverty line:

#### *Direct Calorie Intake (DCI) Method*

Sukhatme (1977) has conventionally divided nutrients into six categories: calories, proteins, carbohydrates, fats, vitamins, and minerals. A diet is balanced if the various nutrients appear in it in their required quantities. Ideally, the construction of a food poverty line must take into account all six nutrients. Since this is an almost impossible task, however, many studies focus on calorie (energy) deficiency among the poor when differentiating them from the non-poor.

The DCI method, though simple, suffers from a serious inconsistency problem. Two households consuming the same amount of calories may have vastly different standards of living in terms of per capita income or expenditure. This is the case in Bangladesh: the DCI method has underestimated poverty in rural areas and overestimated it in urban areas (Kakwani, 2003). This example shows that an inconsistent method of setting a poverty line may lead one to derive wrong policy prescriptions to reduce poverty. Therefore, the DCI method is rarely recommended for measuring poverty.

#### *Food Energy Intake (FEI) Method*

The FEI method is simple and its data requirements are also modest. The separate poverty line estimated for each group or region reflects the differences in regional costs of living as well as in food preferences. Generally, people living in richer regions have more expensive tastes and, therefore, will buy fewer calories per unit of currency than do people living in poorer regions. Thus, the food poverty line for the richer regions will be higher than that for the poorer regions. This method violates the consistency requirement of a poverty line, which may lead to a situation where richer regions are reported to have a higher incidence of poverty than poorer regions. The FEI method cannot separate the effect on the level of poverty from the differences in regional costs of living and regional differences in food preferences (*Ibid*).

#### *Cost of Basic Needs (CBN) Method*

This method of specifying a poverty line is based on the concept of “physical efficiency”, as used by Rowntree (*Rowntree, 1902*) in Britain. This approach measures poverty in terms of the lack of command over basic consumption items that are essential for maintaining physical efficiency. This approach is now called the cost of basic needs (CBN) method of setting a poverty line (*Ravallion and Bidani, 1994*). The poverty line is the sum of food and non-food costs in a basic consumption basket.

All three national level surveys on income/expenditure and employment carried out in Nepal, which are the bases for all Nepalese poverty analyses so far, have been conducted according to the CBN method of estimating the pov-

erty line. We will discuss these surveys in Section 3.2.

### 3. Poverty in Nepal: A Decomposition Analysis

#### 3.1 Poverty indices

People whose per capita income does not cover the cost of minimum basic requirements within the family are considered to fall below the poverty line (PL). This gives the well-known Head-Count Ratio (HCR) of poverty measurement. Till the mid-1980s, the HCR was the single poverty index most frequently used in welfare economics; thereafter, however, many studies have been developing various poverty indices basically using the techniques of decomposition analysis. This sort of analysis helps us discover more fully the nature and degree of poverty. The two new concepts introduced in the mid-1980s were the Poverty Gap (PG) and the Squared Poverty Gap (SPG) indices devised by Foster, Greer, and Thorbecke (1984). The level of per capita income that needs to be raised in order to bring all poor people in a country out of absolute poverty is called the Poverty Gap (PG). It, therefore, measures how far the poor are below the poverty line. The SPG, also called the severity of poverty index, measures the distribution of income among the poor. Moreover, the inequality of income distribution, generally measured by the GINI coefficient, is one of the most frequently used measures of relative poverty. Mathematically, the first three poverty indices (the HCR, the PG, and the SPG) could be derived from the following formulation (Foster, Greer, and Thorbecke, 1984):

$$P_\alpha = \frac{1}{N} \sum_{i=1}^Q (\bar{y} - y_i)^\alpha \dots\dots\dots(1)$$

where  $N$  = total population,  $\bar{y}$  = the poverty line,  $y_i$  = income of individual  $i$  who is below the poverty line, and  $Q$  = total population below the poverty line. When  $\alpha=0$ , it measures the HCR; when  $\alpha=1$ , we get the PG; and when  $\alpha=2$ , we get the SPG index. The World Bank has also been using this method for calculating the three basic poverty indices (World Bank, 2000, p. 207).

One approach for measuring inequality, without imposing a functional form of statistical distribution on the income graduation, is by using the Lorenz-based inequality measure. The GINI inequality index was developed rather earlier than the HCR index. It measures the average difference between income shares and the population shares of all pair-wise comparisons, such as  $q_i$ , where  $i = 1, 2, \dots, n$ , represents the  $i$ th income earner share in such a way that (Gini, 1921):

$$0 \leq q_1 \leq q_2, \dots, \leq q_n \leq 1.$$

From this simple ordering, the GINI coefficient can be calculated as:

$$\text{GINI} = 1 + 1/n - 2/n(q_n + 2q_{n-1} + 3q_{n-2} + \dots + nq_1) \dots\dots\dots(2)$$

where  $n$  is the number of quintiles and  $q_i$  is the  $i$ th quintile share. Thus the GINI coefficient is bounded by 0 for perfect equality and 1 (or 100 in percentage term) for perfect inequality. Although this method is frequently criticized for putting more weight on a transfer between middle-income earners than on lower-end earners, it is at present still the most widely used inequality coefficient (Slottje and Raj, 1998, pp. 6-8, and Kakwani, 1980).

### 3.2 Data base for estimating Nepalese poverty

In Nepal, three major national survey sets of data are being used to calculate the level of poverty from 1976 to 1996. All studies on Nepalese poverty at the national level for the last three decades have been based on the density functions obtained by these surveys (UNDP/Nepal, 2001, 112). The surveys covered Employment, Income Distribution, and the Consumption Pattern in Nepal by the National Planning Commission (NPC) in 1976/77; the Multi-Purpose Household Budget Survey (MPHBS) by Nepal Rastra Bank (NRB) – the Nepalese Central Bank – in 1984/85; and the Nepal Living Standard Survey (NLSS) by the Central Bureau of Statistics (CBS) in 1996. But since the poverty lines used by these three surveys are all different, direct comparisons among the estimated poverty indices may lead to some misleading conclusions. In this study, we, too, have used these three sets of national data in studying poverty indices for Nepal, but we have fixed the real poverty line and adjusted it to all the survey years in nominal terms. The results obtained in our analysis of trends in the poverty indices are, therefore, comparable to each other.

The first-ever national survey of income/consumption in Nepal by the NPC in 1976/77 sampled 4969 households (4,037 rural households and 932 urban households), covering 37 of the total 75 districts of the country. This survey was stratified into rural and urban populations as well as according to the ecological and regional distribution of the population. The stratified random sampling was at three levels. The first stage consisted of districts representing different ecological regions within one development region. The second stage selected rural and urban areas. The third stage selected households from each of the urban and rural samples based on the different occupational patterns of the households (NPC, 1983, 3). The standard deviation of the sample was between 0.45 and 2.95, indicating an insignificant variation of the variables in the sample (*Ibid*, xiv).

The MPHBS 1984/85 Survey also selected samples from all five of the country's development regions (from eastern to western) and three ecological regions (mountain, hills, and the *Terai*). Nine basic strata of development and ecological regions were established at the beginning. The seventy-five districts of the country were the primary sampling units. From each stratum at least two districts (about 25%) were selected. The districts selected were then divided into rural and urban areas; 10% of the Village/Town Panchayats (the second lowest administrative units in Nepal) were selected in this second stage.

In the third stage, 30% of the wards (the lowest administrative unit in Nepal), or at least four wards from each sample *Panchayat*, were selected. The number of households covered by the survey totalled 5323 (NRB, 1988).

The Nepal Living Standard Survey of 1996 looked at 3388 sample households. Four ecological/geographical strata (mountains, urban hills, rural hills, and the *Terai*) were distinguished for proportional sampling. The number of households selected from these four strata were respectively 424, 604, 1136 and 1224. A two stage stratified random sampling was used and wards were made the secondary sampling unit. Altogether, 275 wards were selected with at least 12 sample households (primary sampling unit) from each ward. In some bigger wards, 13 households were selected.

In this paper, we have regarded these three sets of data as representative national surveys. The income distribution patterns in Nepal as revealed by these three surveys are given in the Appendix (Table A1). Instead of relying on household income, we have used the per capita income approach in the decomposition analysis. Many studies on poverty also follow this approach (Cameron, 2000, 154). Consequently, household income is divided by the average household size, with the assumption that it is equally distributed among all household members. This study applies the same poverty line to all the members of the household irrespective of their differences in personal needs.

### 3.3 The trend analysis from previous studies

The NPC 1976/77 survey specified the annual per capita income poverty line at Rs. 720<sup>1)</sup> per annum (Rs. 540 for food and Rs. 180 for non-food). Likewise, the NRB MPHBS Survey in 1984/85 estimated Rs. 1971 as the poverty line. Although the CBS Survey in 1996 did not specify any particular poverty line, the World Bank (1999), which made a study based on this survey data, specified this line at Rs. 4404.

The NPC (1983) estimate had regarded 2256 calorie per capita per day as the average minimum food energy requirement on the basis of the recommendations of Food and Agriculture Organization (FAO) and the World Health Organization (WHO). This amounted to 605 grams of cereals (rice, maize, millet, or wheat) and 60 grams of pulses. These quantities were multiplied by the average prices prevailing in four development regions (eastern, central, western, and far-western). The average daily minimum consumption expenditure required for rural and urban households was calculated by adding the necessary expenditures on cereals and pulses to other bare necessities like cooking oil, salt, firewood/kerosene, clothing and other non-food expenditure. Most importantly, this minimum consumption requirement included the housing services consumed, but only for those who had rented their dwellings. This estimated Rs. 1.5 per capita as the daily bare subsistence food expenditure requirement.

<sup>1)</sup>Rs. signifies Rupees (Nepalese currency). US \$ 1 = Rs. 71 (approximately) in 2004.

Moreover, the study added one third of the minimum food energy cost and calculated the overall minimum subsistence per capita daily income requirement of Rs. 2 (Rs. 720 yearly) to form the cut-off point for defining the poor.

The NRB (1988) study based on the MPHBS (1984/85) survey had regarded 2250 calories to be the per capita minimum average daily food energy requirement, and it had added 35% to the food poverty line to specify the overall cost of minimum subsistence. Thus, the estimated poverty line became Rs. 1971 per capita per year.

Though CBS itself did not estimate the incidence of poverty based on the NLSS 1996 survey, it had recommended a minimum representative food basket for this purpose. Numerous studies have used this data for studying Nepalese poverty. The most prominent is by Prenzushi (1999) from the World Bank. This study followed the minimum ideal food basket recommended by the survey, and calculated the energy equivalent of the basket based on Gopalan (1976) for Indian foods. The Indian territories used to require 2124 per capita daily calorie requirement, whereas the NLSS basket only yielded 1805 calories. However, this being almost 85% of the Indian estimated requirements, the basket specified by the NLSS was accepted by the Prenzushi study. Even so, the derivation of the final poverty line, food plus non-food, was rather complex. It recorded the expenditure on 35 selected food items recommended by the NLSS, and calculated the average household food expenditure spent on them. The food and non-food expenditure shares were estimated for five different sample strata. The average food and non-food minimum consumption levels were thus estimated to be Rs. 2637 and 1767, respectively, with a total per capita annual poverty line Rs. 4404.

Using the three different poverty lines and the income distribution patterns shown in Table A1 (Appendix) for 1976/77, 1984/85, and 1996/97, previous studies estimated the level of poverty in Nepal as shown in Table 1.

Table 1 . Poverty in Nepal Estimated by Different Studies (1976-1996)

Survey	Population below the poverty line	% of total population below the poverty line	Poverty line (per capita minimum income /consumption) (in Rs. )	Per capita poverty line income (US \$ ) <sup>2</sup>
NPC, 1976/77	4, 897, 000	36	720	57.6
NRB, 1984/85	6, 852, 000	41	1, 971	110.7
NLSS, 1996/97	8, 608, 258	42	4, 404	77.55

Note: Poverty line incomes are in respective year's prices.

Sources: NPC (1983), NRB (1988), and World Bank (1999). Population figures are the author's own calculations.

The table shows a virtual increase of poverty between 1976/77 and 1984/85 but it remained almost constant during 1984/85-1996/97. However,

<sup>2</sup>Suman K. Sharma, *Nepal Country Report-South Asia Poverty Monitor*, ACTIONAID/Nepal, 1998.

the number of absolute poor is constantly increasing.

The trends in poverty as traced by these three studies are not comparable to each other for four reasons. First, the Prensushi (1999) estimate using NLSS 1996/97 data was based on minimum consumption expenditure requirements, whereas the NPC (1983) and NRB (1988) estimates were based on the minimum income requirements. Second, the minimum levels of food energy included in those poverty lines were respectively 2256, 2250, and 1805 calories per capita per day. Third, the shares of food and non-food expenditures differed. NPC (1983) took non-food expenditure to be one-third of the food expenditure, NRB (1988) set it at 35%, and the World Bank (1999) decided on 40%. Fourth, the definition of household income differed in the NPC (1983) study as compared to the other two. It did not take into account the income from owner occupied house rental and consumption from own agriculture/livestock products and household services. Consequently, direct comparisons among these estimates could lead to a misleading conclusion. We need to stick to a particular poverty line, either to the 1976/77 or to the 1984/85 or to the 1996/97 standard, and apply it to the data of all these survey years if we hope to make a reliable trend analysis of poverty in Nepal. This property implies that the poverty line would need to be adjusted over time with respect to the true cost of living index (Kakwani, 2003, 3). Since, in terms of calorie intake and non-food expenditure, NRB's (1988) poverty line lies midway between the NPC (1983) and Prensushi (1999) poverty lines, we have, therefore, chosen the NRB (1988) poverty line; and using the consumer's price index (CPI) (Table A2 in the Appendix), we have adjusted this to the rest of the survey years as well (Table A3 in the Appendix). The CPI used for this purpose is taken from the urban area only because the price index for the rural area is not available in Nepal. Even if poverty is mainly rural based, the urban CPI (or some components of it) may correctly capture changes in rural prices as well, although actual price levels may be different in urban and rural areas. Likewise, we have scaled-up the per capita household income derived from the 1976/77 survey by 25% to make it consistent with the NRB (1988) definition. The definitions of household income in these surveys are given in Appendix A 4.

### 3.4 Common poverty line and robustness of the results

In many developing countries, expenditure is better reported than income in household surveys. Previous studies also admit that, theoretically, consumption expenditure is the better welfare measure as compared to the income measure (Yitzhaki, 2002, 73). But, in our data set, the 1984/85 MPHBS survey was not able to provide a level of per capita subsistence consumption expenditure, which the other two surveys managed to do. Therefore, though the basic minimum income criterion is only the second best approach in specifying the poverty line, we are using it in this paper for the sake of consistency.

Using POVCAL (a computer software developed by the World Bank to cal-

culate FGT poverty indices along with the GINI coefficient, and see Appendix A5 for the pros and cons of this software), we calculated poverty indices for all the survey years using a common poverty line as follows:

Table 2 . Trend of Poverty (1976–1996) with 1984/85 Poverty Line

Year	1984/85 poverty line adjusted to all the survey years (in Rs.)	Poverty indices			
		HCR	PG	FGT index	GINI
1976/77	982	60	35	25	59
1984/85	1971	41	14	6	31
1996/97	6874	63	27	15	44

Source: Author's own calculations.

Analysis of the figures in Table 2 has led us to a robust conclusion that all the indices of poverty (incidence, gap, severity, and GINI) declined during 1976/77-1984/85, but increased during 1984/85-1996/97.

Although income distribution data specific to economic sectors are not available in these surveys, we can make a broad disaggregation between agriculture and non-agriculture household poverty based on urban and rural poverty estimates. Nepalese agriculture is basically a rural activity, whereas industrial and service sectors are urban economic activities.

Table 3 . Poverty Incidence by Urban and Rural Areas

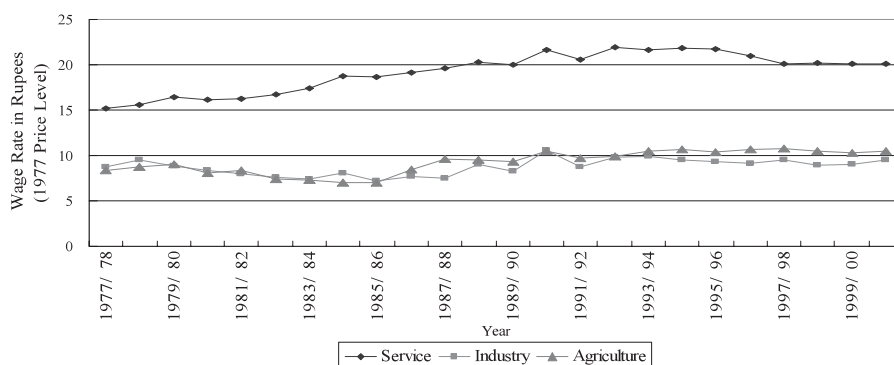
Areas	Incidence of Poverty (in%)		
	1976/77	1984/85	1996/97
Urban	31	23	46
Rural	62	43	66
Total	60	41	63

Source: Author's own calculations.

Table 3 reveals that poverty in Nepal is basically a rural phenomenon. As more than 85% of the total population lives in the rural area with agriculture as the major economic activity, poverty in Nepal is basically concentrated among rural-agricultural households.

According to the Lewis(1954) dual sector model, employment and the wage rate in traditional agriculture in developing economies also depend on urban economic activities, especially those of the industrial sector. As long as the wage rate in the industrial sector is significantly above than that of rural agriculture, transfer of labour from the latter to former continues until the wage rates in both of the sectors are equalized. However, the lack of any wage differential between agriculture and industrial labour(Figure 1) in Nepal

might be the basic reason behind the excessive labour pressure in agriculture, which has kept the productivity of agriculture labour low (Section 4). In this case, an excessive farm labour force hinders a rise in the agricultural wage rate as well as in increased labour productivity. Although, during 1976/77-1996/97, the wage rate in the urban service sector was remarkably higher than in other sectors, it was unable to absorb excess labour from agriculture because it uses a relatively educated and skilled labour force, something which is lacking in agriculture. Moreover, after 1990, the service sector itself seems to have reached saturation in terms of the rising real wage rate. Consequently, the lack of a strong pull factor to seek work in urban activities, especially in the industrial sector, has caused high disguised unemployment in rural agriculture, which has pressed the real wage rate downward, thus causing a high incidence of poverty among rural households.



**Figure 1** Trends in Real Wage Rates in Nepal (1977-99)

Data source: Research Department, Nepal Rastra Bank, 2003 and 2004.

Note: Conversion to a constant price level has been made using the CPI index (see Appendix Table A 2).

Stagnant real wage rates in Nepalese agricultural and industrial sectors must be the basic reason for both rural and urban poverty. The low and stagnant real wage rates prevalent in these sectors are the result of the virtual absence of labour productivity growth, as calculated in Section 4 below.

#### 4. Measuring Growth in Labour Productivity

This section attempts to seek for signs of any possible co-linearity between the level of poverty indices and the growth in labour productivity in the Nepalese economy. Following Taylor et al. (1999), one can decompose the growth of overall labour productivity as follows:

Labour productivity is defined as:  $\rho = X/L = \sum X_i / \sum L_i$ , where  $X$  is output and  $L$  is labour. The first difference version is:

$$\hat{\rho} = \sum \left[ (X_i / X) \hat{X}_i - (L_i / L) \hat{L}_i \right] \dots\dots\dots(3)$$

$$\begin{aligned}
&= \Sigma (Li/L) \hat{\rho}_i + \Sigma [(Xi/X) - (Li/L)] \hat{X}_i \\
&= (Xi/X) \hat{\rho}_i + \Sigma [(Xi/X) - (Li/L)] \hat{L}_i
\end{aligned}$$

where the hats indicate growth rates.

The first line decomposes overall productivity growth into movements in output and employment, weighted by the sectoral shares of these two variables. The second and third lines show how overall productivity growth can be written as a weighted average of sectoral productivity shifts, plus a “correction” term involving weighted reallocations of output or employment across sectors. The reallocation weights  $[(Xi/X) - (Li/L)]$  reflect differing productivity levels in different sectors. An output or employment loss in a low productivity sector [agriculture, for example, with a negative value of  $(Xi/X - Li/L)$ ] will reduce overall productivity growth, whereas employment or output gain in a sector with a relatively high output/labour ratio will raise the overall productivity.

Using this relation, we estimated growth in labour productivities in different sectors as follows (for data, please see the Appendix Table A6):

Table 4 . Annual Rate of Labour Productivity Growth during 1976/77-1996/97

Sectors	Years		
	1976/77	1984/85	1996/97
Agriculture	-0.041	0.021	-0.006
Industry	0.001	0.007	0.006
Commercial Service	0.041	0.018	0.011
Public Service	0.004	0.006	0.002
Total	-0.012	0.048	0.015

Source: author's own estimate.

Note : Total productivity growth rate is not the average or total of sectoral productivity growth rates. These two indices are calculated in slightly different ways (See equation (3) and Table A6.).

Overall, growth in labour productivity declined during 1984/85-1996/97, as compared to 1976/77-1984/85. Moreover, the growth rates turned negative during the 1984/85-1996/97 period in the agricultural sector.

The trend towards poverty, seen in all four indices, is quite similar to the trend of labour productivity growth. The decline in poverty for the period 1976/77-1984/85 and its rise during 1984/85-1996/97 are consistent with the relatively higher labour productivity growth during the former than during the later periods.

One important question stems from this result. Why was there higher labour productivity growth during 1976/77-1984/85 and lower growth during

1984/85-1996/97? This requires a review of the Nepalese labour market policy and related issues.

## 5. Labour Market/Employment Policies

A review of all existing Nepalese labour laws and policies (see Appendix A7 for the list) published in three consecutive national development plans (the 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup>) shows that they share many commonalities. Each of them has disaggregated the labour market into rural and urban categories. The agricultural and the development infrastructure sectors gave primary attention to the employment of rural labour, whereas the industrial and commercial service sectors did the same for urban employment. All these plans emphasized higher labour intensity coupled with improving labour productivity in the development of the rural infrastructure (*NPC, 1992, 1998, and 2002*).

From 1987, when the country entered the Structural Adjustment Programme of the International Monetary Fund (IMF) and the World Bank, state initiative to promote employment weakened. Nowadays, the public provision for rural employment is limited to specific infrastructure development only. The rest of the rural economy has to survive on subsistence agriculture. Moreover, Nepalese Labour Policy does not address the problem of under-employment and the disguised unemployment of agricultural labour. At the end of the Eighth Plan (1997), 47% of the total labour force was estimated to be under-employed (*NPC, 1998, 211*). Nevertheless, the coping mechanism to address this problem was virtually absent from the country's labour policy.

Employment/labour policies in Nepal tend to be supply sided and are inclined towards ensuring the social welfare of labour. The state is almost fully dependent on private/semi-government institutions in generating a skilled labour force but is careful to protect labour rights. At the same time, these policies emphasize social security, promotion of self-employment, the abolition of bonded and child labour, and the promotion of foreign employment. Yet they are quite silent on the demand side, i.e. how to absorb the increasing labour force in gainful employment. While some provisions, like that of Section 3, Article 12 of the National Labour Policy 1999, seem to promote labour intensity in specific industrial activities, the strategies of promoting them are not clear. Likewise, neither the labour act nor the regulations explain the mode of promotion to the enterprises/establishments for employing more women and the handicapped, though this provision has been stated in Section 1, Article 4 of the current labour policy. Moreover, both lack any co-ordination mechanism to harmonize investment and employment policies. A review of the employment policy gives one the feeling that it is trying to escape from the role of generating more employment opportunity in the domestic economy; rather, it is emphasizing the employment of skilled labour in foreign countries instead.

According to certain industrialist groups, Nepalese Labour Policy protects

the interest of labour more and the interest of employers less, particularly in the case of the manufacturing sector and the various socio-political provisions for labour; therefore, induce the employers to substitute capital for labour in production activities. It is evident from Table A8 in the Appendix that despite 2% annual growth of the value added to large scale manufacturing products during 1991-2001, employment has declined by about 1.5% annually. Likewise, employment in the organized small scale manufacturing sector has also declined annually by about 2% despite the annual growth of the value added by about 13% during 1990s (Table A9).<sup>3</sup>

The question now arises as to whether industries in Nepal are becoming more capital intensive over the years. The answer, to a large extent, is 'yes.' In the large-scale manufacturing sector, capital intensity (represented by capital labour ratio) has increased significantly (by 28%) during 1986/87-2001/02 (Table 5). Although there is marginal decline in the capital intensity in small scale industries, the overall trend is dominated by the large scale manufacturing sector because large-scale industrial value added shared about 55% of the total industrial value added in 1991/92 and increased to 75% in 2001/02 (*Ministry of Finance, 2002*).

Table 5 . Capital Labour Ratio in Nepalese Manufacturing Sector

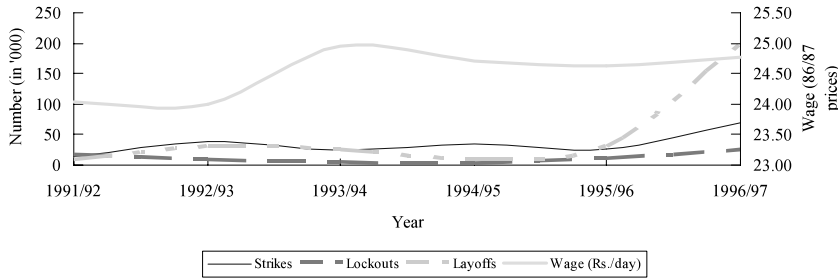
Manufacturing sector	Capital labour ratio (in monetary term)				
	Fiscal Year				
	1986/87	1991/92	1996/96	1999/00	2001/02
Small scale	—	7.6	—	7.4	—
Large scale	4.95	5.99	6.53	—	6.32

Source: *Census of Manufacturing Establishments* of respective years, CBS, Kathmandu.

Nepalese Labour Policy and concomitant acts have focused more on the rights-based issues of labours, and employers in the industrial sector are facing various difficulties because of frequent strikes and lockouts by labour unions. After the restoration of a multi-party democratic system in 1990, trade unions, which are directly influenced by the political parties, have become much stronger on the country's socio-political fronts. In recent years, frequent disputes among employers and labour in the organized sectors have mostly resulted in strikes, lock-outs, lay-offs, and the consequent loss of many mandays (Figure 2).

Such are the basic reasons why producers/employers are moving towards a capital intensive mode of production in Nepal's industrial sector; conse-

<sup>3</sup>Although employment in industrial sector seems increasing in successive population censuses, it must be because of the increase in informal/unorganized small scale industries. The censuses of large-scale industries and surveys of small-scale industries both reveal decline in industrial employment.



**Figure 2.** Trends in Mandays Lost for Various Reasons and Wage Level in Nepalese Industries (1991-96)

Data source: Department of Labour, 2003, Kathmandu as quoted by Pushkar Bajracharya in The Telegraph, 22 January 2003, Kathmandu.

quently, they are not investing in order to enhance labour productivity. The decline in labour productivity, wage rates, and employment in the organized industrial sector are the reasons for retaining an excessive labour force in agriculture, which holds almost three-fourths of the total workforce of the country but in recent years has yielded approximately only 40% of the GDP.

## 6. Conclusion

This paper concludes that income poverty in Nepal declined during 1976/77-1984/85 but increased during 1984/85-1996/97. The level of poverty has borne a negative co-linearity with the growth rate of labour productivity. In agriculture sector, the growth rate of labour productivity became even negative during the second period as compared to the first period. Nepalese labour policies for the last 25 years show a gradual inclination towards a rights-based approach in protecting labour welfare rather than in promoting labour productivity. Labour welfare has been addressed mainly in social rather than in its economic aspects. If in the liberal economic environment, there had been an improvement in labour productivity, it would have definitely translated itself into an increase in the wage rate. But for the last two decades, both have been virtually absent from Nepalese manufacturing activity. An unstable political environment and frequent strikes and lockouts provoked by labour associations have compelled employers to substitute capital for labour to the greatest extent possible. This capital-labour relationship in the urban industrial sector has had a ripple effect on rural agriculture employment. The deterioration of labour's marginal productivity in agriculture is because of undue labour pressure in this sector caused by the lack of employment opportunities in the urban industrial sector. It has resulted in low wage rates for agricultural labour and the high incidence of poverty among rural agricultural households. As rural agricultural households constitute approximately 85% of the total population of the country, the high incidence of poverty in these households explains the high incidence of Nepalese poverty overall.

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## References

- Atkinson, Anthony B. (1970), "On the Measurement of Inequality", *Journal of Economic Theory*, 2(3), pp. 244-263.
- Atkinson, Anthony B. and Francois Bourguignon (1987), "Income Distribution and Differences in Needs", *Arrow and the Foundation of the Theory of Economic Policy*, Chapter 12, G. R. Feiwel (ed.), Macmillan, New York.
- Bibi, Sami (1998), "A Welfare Analysis of the Price System Reforms' Effects on Poverty in Tunisia", *Public Spending and the Targeting Problem of Poor Population Inequality*, pp. 179-207, University of Laval, Canada.
- Cameron, Lisa A. (2000), "Poverty and Inequality in Java: Examining the Impact of Changing Age, Educational and Industrial Structure", *Journal of Development Economics*, 62, pp. 149-180, Elsevier Science Publishers.
- CBS (1997), *Nepal Living Standard Survey (NLSS)*, Kathmandu.
- CBS, *Census of Manufacturing Establishments 1976/77, 1981/82, 1986/87, 1991/92, 1996/97, and 2001/02*, CBS, Kathmandu.
- CBS, *Survey of Small Scale Manufacturing Sector 1972/73, 1991/92 and 1999/2000*, CBS, Kathmandu.
- Davidson, Russell (1998), *Statistical Inference for Stochastic Dominance and for the Measurement of Poverty and Distribution, Poverty and Growth*, UNDP/IDB/World Bank/CEPAL project methodology, New York.
- Foster, James and Antony Shorrocks (1988), "Poverty Orderings and Welfare Dominance", *Social Choice and Welfare*, 5(2/3), pp. 179-198.
- Foster, James, Joel Greer, and Eric Thorbecke (1984), "A Class of Decomposable Poverty Measures", *Econometrica*, 52(3), pp. 761-766.
- Gini, Corrado (1921), "Measurement of Inequality of Income", *Economic Journal*, 31, pp. 124-126.
- Gopalan, C., BV Rama Sastri, and SC Lalasubramanian (1976), *Nutritive Values of Indian Foods*, National Institute of Nutrition, Indian Council of Medical Research, Hyderabad.
- Howes, Stephen (1996), "The Influence of Aggregation on the Ordering of Distributions", *Economica*, 63(250), pp. 253-272.
- ILO (1995), *New Approaches to Poverty Analysis-II: Reducing Poverty through Labour Market Policies*, J. B. Figueiredo and Z. Shaheed (eds.), A contribution to the world summit for social development.
- Kakwani, Nanak (2003), "Issues in Setting Absolute Poverty Lines", *Poverty and Social Development Paper*, 3, pp. 1-37, Asian Development Bank.
- Kakwani, Nanak (1980), *Income Inequality and Poverty*, Oxford University Press, London.
- Kapteyn, Arie, Peter Kooreman and Rob Willems (1988), "Some Methodological Issues in the Implementation of Subjective Poverty Definitions", *The Journal of Human Resources*, 23(2), pp. 222-242.
- Lewis, Arthur W. (1954), "Economic Development with Unlimited Supplies of Labour", *Manchester School of Economics and Social Studies*, 22, pp. 139-81.

- Lipton, Michael (1988), "The Poor and Poorest: Some Interim Findings", *Discussion Paper*, 25, pp. 1-68, World Bank, Washington DC.
- Ministry of Finance (2002), *Economic Survey 2001/02*, Kathmandu.
- New ERA (1997), *Poverty-The Nemesis of Development*, Kathmandu.
- NPC (1983), *A Survey of Employment, Income Distribution and Consumption Patterns in Nepal*, Kathmandu.
- NPC (1992), *Eighth Five Year Plan*, NPC Secretariat, Kathmandu.
- NPC (1998), *Ninth Five Year Plan*, NPC Secretariat, Kathmandu.
- NPC (2002), *Tenth Five Year Plan*, NPC Secretariat, Kathmandu
- NRB (1988), *Multi-purpose Household Budget Survey 1984/85*, Kathmandu.
- NRB (1992), *Nepal Rural Credit Survey*, Nepal Rastra Bank, Kathmandu.
- O'Neil, Donal (1995), "Education and Income Growth: Implications for Cross-country Inequality", *Journal of Political Economy*, 103(6), pp. 1289-1301, The University of Chicago.
- Pradhan, Menno and Martin Ravallion (1998), *Measuring Poverty Using Qualitative Perceptions of Welfare*, Policy Research Working Paper WPS 2011, World Bank, Washington DC.
- Prennushi, Giovanna (1999), *Nepal: Poverty at the Turn of the Twenty-first Century*, The Background Studies, Internal Discussion Paper, 174, The World Bank.
- Ravallion, Martin and M. Lokshin (2003), *On the Utility Consistency of Poverty Lines*, Policy Research Working Paper WPS 3157, Department of Research Groups, World Bank, Washington DC.
- Ravallion, Martin and Benu Bidani, (1994), "How Robust is a Poverty Profile?" *The World Bank Economic Review*, 8(1), pp. 75-102.
- Rowntree, Seebohm B. (1902), *Poverty: A Study of Town Life*. Joseph Rowntree Charitable Trust, UK.
- Sen, Amartya K. (1988), "The Concept of Development," *Handbook of Development Economics*, 1, H. Chenery, et al. (eds.), Elsevier Science Publishers.
- Sharma, Suman (1998), *Nepal Country Report-South Asia Poverty Monitor*, ACTIONAID/Nepal.
- Slottje, Daniel J. and Baldev Raj (eds.) (1998), "Income Inequality, Poverty, and Economic Welfare", *Studies in Empirical Economics*, Physica-Verlag (A Springer-Verlag Company).
- Sukhatme, PV. (1977), *Malnutrition and Poverty*, Ninth Lal Bahadur Shastri Memorial Lecture, Agricultural Research Institute, New Delhi: India.
- Taylor, Lance, S Morley, and Rob Vos (2002), "Balance of Payments Liberalization in Latin America: Effects on Growth, Distribution and Poverty" in R.P. Vos, L. Taylor and R.P. de Barros (eds.) *Economic Liberalization, Distribution and Poverty: Latin America in the 1990s*, pp. 1-53 Cheltenham: Edward Elgar.
- UNDP (2001), *Nepal Human Development Report 2001: Poverty Reduction and Governance*, Kathmandu.
- World Bank (1999), *Nepal: Poverty at the Turn of the Twenty-First Century*, Poverty Reduction and Economic Management Division of South Asia Region, World Bank, Washington DC.
- World Bank (2000), *World Development Report 2000/01*, World Bank, Washington DC.
- Yitzhaki, Shlomo (2002), "Do We Need a Separate Poverty Measurement?" *European Journal of Political Economy*, 18(1), pp. 61-85, Elsevier Science Publisher.

**Appendix**

Table A 1 . Income Distribution Pattern in Nepal (1976/77-1996/97)

Share in Population	Income distribution (% of total)		
	1976/77	1984/85	1996/97
Bottom 10%	0.9	4.3	1.7
Next 10%	1.9	5.8	3.6
Next 10%	2.4	7.1	4.5
Next 10%	3.5	7.9	5.5
Next 10%	4.0	8.6	6.4
Next 10%	5.1	9.6	7.6
Next 10%	10.9	10.2	9.1
Next 10%	11.5	11.9	11.3
Next 10%	12.8	14.5	15.3
Top 10%	47.1	20.1	34.9
Total 100%	100.0	100.0	100.0

Sources: NPC (1983), NRB (1988), and CBS (1997).

Table A 2 . National Urban Consumer Price Index

Fiscal Year	Food	Non-food	Total
1976/77	14.8	17.6	15.8
1977/78	17.1	18.3	17.6
1978/79	17.3	19.7	18.2
1979/80	19.2	21.2	19.9
1980/81	21.8	24.1	22.6
1981/82	24.2	26.3	25.0
1982/83	28.1	29.1	28.5
1983/84	29.6	31.6	30.3
1984/85	29.9	34.7	31.5
1985/86	35.5	38.4	36.5
1986/87	40.9	42.1	41.4
1987/88	45.8	45.9	45.9
1988/89	48.5	51.8	49.7
1989/90	53.8	55.9	54.5
1990/91	59.2	61.1	59.8
1991/92	73.7	70.2	72.4
1992/93	78.4	79.7	78.8
1993/94	85.5	86.8	85.9
1994/95	91.8	93.7	92.5
1996/97	100.0	100.0	100.0
1996/97	108.2	108.0	108.1

Source : Research Department, Nepal Rastra Bank, Kathmandu, 2004.

Table A3. 1984/85 Poverty Line Adjusted to all the Survey Years

Fiscal Year	Poverty lines after adjustment (1984/85 standard)		
	Food	Non-food	Total
1976/77	722.7	259.2	982
1984/85	1460.0	511.0	1971
1996/97	5283.3	1590.4	6874

#### **Appendix A4: A Definition of Household Income in the Three Surveys**

1976/77 Survey: The income of a family was defined as the earnings in cash and kind as well as transferred income accruing to present members of the family during a reference period of twelve months. To be specific, this includes income from agriculture and allied pursuits, self-employment in business, professions and services, salaries, wages, bonuses, tips, etc. Moreover, it also comprises income from land and house property rental, interest and dividends, miscellaneous sources like transfers in the form of pensions and other regular contributions received by households. The purview of this survey, however, did not include imputed income from owner-occupied houses; family labour used in construction, repair and maintenance of owned houses; collection of materials for domestic/household use; and accrued but unrealized interest income.

1984/85 Survey: This survey covered all cash and kind income of households. Cash income included wages and salaries of employees, net profits from self employment, rent and royalties, interest and dividends, pensions, annuities and related benefits, remittances and assistance payments. At the same time, it included such other cash incomes as those from operating boarding and lodging, inheritances, lottery prizes, windfall gains, payment on insurance, compensation for loss or legal damages and other income from non-regular sources. Income in kind came from family enterprises, the value of home-produced goods, the value of crops and other goods received as rental payments, the value of goods received free or as part of wage income and the rental value of owner-occupied and free housing.

1996/97 Survey: This survey defined the household income as including seven different components: farm income, wage income, non-farm enterprise income, non-agriculture rental income, transfer earnings, the opportunity cost of an owner-occupied house, and others including income from bank deposits and dividends from invested financial capital. The farm income included the value of crop production, farm by-products, income from farm assets such as tractors and other tools, sales of livestock or their by-products, the value of home produced and consumed farm/livestock production, and land rental income. Likewise, the wage income consisted of cash or in kind daily/piece-rate/permanent wage income from agricultural and non-agricultural income. Gross revenue from home enterprises and self-employment outside agriculture was included within the non-farm enterprise income. On the other hand, rental income included income from both agricultural and non-agricultural sources.

#### **Appendix A5: Pros and Cons of POVCAL Method in Calculating Poverty Indices**

The most useful data for the calculation of poverty indices is the household level (“unit record”) panel data because of the high possibility of being able to apply accurate computational methods to them using standard econometric/statistical packages. But such sorts of data are rarely available at the national level and this is also so in the case of Nepal. The next alternative is to use grouped data that includes the per capita income and the poverty line taken from the national representative surveys. Income, expenditure, and consumption surveys in Nepal for the years 1976/77, 1984/85, and 1996/97 all belonged to this category. POVCAL, an econometric software developed by the World Bank, is a very useful tool for the calculation of basic poverty indices. It uses these grouped data to calculate the headcount index, the poverty gap index, the squared poverty gap index, and the GINI inequality index.

This technique also enables us to get two alternative specifications of the Lorenz curve—the General Quadratic (Villasenor and Arnold) type and the Beta (Kakwani) type. It performs various

checks on the results and tells which specification is better for the given data. Other benefits in using this technique are the convenient simulation procedure for different poverty lines, the estimation of poverty under distributionally neutral growth, and the decomposition of changes in poverty into growth and redistribution components.

Some typical weaknesses of this method are also worth noting, however, if the grouping levels are few, they distort the poverty measures which are very sensitive to the density function around the real poverty line. The quadratic interpolation, which POVCAL applies, can sometimes give rise to negative densities (when the slope of the distribution function becomes negative), in which case the estimated poverty indices are not reliable. In our case, however, we have used the grouped data in a deciles group so that the income distribution function is considered fully spread and is not concentrated around the real poverty line alone. Likewise, in choosing the poverty indices either from the general quadratic distribution function or from the beta distribution function based on which distribution best fits the given data, we are able to avoid the possibility of the emergence of a negative density function; otherwise it would have fully shaken the reliability of the estimations.

Table A6. Growth and Labour Distributions in Major Economic Sectors

Sectors	Distribution of labour ( $L/\Sigma L$ )			Sectoral shares of value added ( $X_i/\Sigma X$ )			Growth rate of economy ( $\dot{X}$ )			Growth rate of labour ( $\dot{L}$ )		
	Fiscal Year			Fiscal Year			Annual growth rate during			Annual growth rate during		
	1976/77	1984/85	1996/97	1976/77	1984/85	1996/97	1975-80	1980-90	1990-00	1971-81	1981-91	1991-01
Agriculture	0.929	0.890	0.791	0.628	0.512	0.41	-0.011	0.037	0.025	0.037	-0.002	0.021
Industry	0.026	0.035	0.049	0.048	0.061	0.094	0.083	0.142	0.109	0.102	0.045	0.079
Com. Service	0.036	0.092	0.140	0.251	0.341	0.396	0.186	0.092	0.068	0.169	0.149	0.111
Pub. Service	0.009	0.010	0.020	0.073	0.086	0.1	0.058	0.082	0.05	0.016	0.080	0.159
Total	1	1	1	1	1	1	0.029	0.055	0.05	0.041	0.007	0.035

Note: Com. and Pub. refer to commercial and public services, respectively.

Sources: Author's own calculations based on:

- i) Economic Surveys, various issues, Ministry of Finance, and
- ii) Population Census 1971, 1981, 1991, and 2001, Central Bureau of Statistics.

#### **Appendix A7: Existing Labour Laws and Policies**

1. Bonus Act 1973
2. Bonus Regulations 1993
3. Civil Rights Act 1955
4. Factory and Factory Worker's Act 1959 (Repealed)
5. Factory and Factory Workers Rules 1962 (Repealed)
6. Foreign Employment Act 1985
7. Labour Act 1992
8. Labour Court (Procedural) Regulations 1995
9. Labour Regulations 1993
10. Labour Rules Concerning Tea Estates 1993
11. Trade Unions Acts 1992
12. Trade Unions Regulations 1992

Table A8. Employment and Value Added in Large Scale Manufacturing Sector (1976/77-2001/02)

Year	Employment (in number)	Total value added in Rs. '000 (at 1986/87 price level)
1976/77	59037	756378.3
1981/82	80153	2572071.0
1986/87	127288	3154677.0
1991/92	211265	7426030.0
1996/97	186598	7997093.5
2001/02	181943	9123232.0

Sources: Census of Manufacturing Establishments, 1976/77, 1981/82, 1986/87, 1991/92, 1996/97, and 2001/02, CBS, Kathmandu.

Table A9. Employment and Value Added in Small Scale Manufacturing Sector (1972/73-1999/2000)

Year	Employment (in number)	Total value added in Rs. '000 (at 1986/87 price level)
1972/73	16265	959922.9
1991/92	54081	4099911.2
1999/00	46052	8209921.5

Source: Survey on Small Scale Manufacturing Sector 1972/73, 1991/92 and 1999/2000, CBS, Kathmandu.