View metadata, citation and similar papers at core.ac.uk
brought to you by CORE
provided by Waseda University Repository

Graduate School of Asia-Pacific Studies, Waseda University
Journal of the Graduate School of Asia-Pacific Studies
No. 23 (2012. 3) pp. 67-85

# Does Gender Disparity in General Education Affect Technical Manpower Development?: The Case of Nepal

Pramila NEUPANE*

## 一般教育における性別格差は専門的な人的資源の開発に影響を与えるか？ —ネパールのケース—

ネウパネ　プラミラ*

**Abstract**

Gender disparity in education has significant adverse effects on many aspects of socioeconomic development in underdeveloped countries. For example, gender disparity in (general) education (GDE) leads to slow economic growth, low family literacy, poor social cohesion, a low level of trained manpower in terms of technical/vocational skills, and beyond. Specifically, a high degree of GDE is one of the key obstacles to fulfilling the increasing need for technical manpower, defined as human resource development (HRD). Thus, this study explores relevant literature and trends on GDE and HRD in the context of Least Developed Countries (LDCs) in Asia. Furthermore, it analyzes the raw data from the 2008 Nepal Labor Force Survey (NLFS) to examine the relationship between GDE and HRD.

In this study, general education is defined as the mainstream education that is generally given in schools and colleges. In most cases, such schools provide no or minimum vocational or technical training; this vocational or technical training can be obtained in specialized schools or training centers. In the case of least developed countries (LDCs), where unemployment is one of the major challenges to development, people with such training are less likely to be unemployed and are considered a high quality human resource. As general education is the foundation of such vocational/technical training, GDE can be a significant predictor of HRD, which is defined by the proportion of the labor force (working age population) with vocational/technical training.

As expected, this study finds that GDE is negatively correlated with HRD in Nepal. In other words, districts with higher levels of gender disparity in general education have a lower proportion of trained manpower to the total labor force. Thus, it is argued that reducing GDE not only promotes educational equality but also advances the overall HRD of the country, which ultimately contributes to the generation of employment in LDCs, such as Nepal.

* Graduate School of Asia-Pacific Studies, Waseda University, Doctoral Degree Program

## 1. Introduction

Gender disparity in education has significant adverse impacts on many aspects of socioeconomic development by limiting the development of trained human resources (Hill and King 1993). The consequences are critical in the Least Developed Countries (LDCs), where unemployment is rapidly increasing.[1] Thus, this article assesses the impacts of gender disparity in (general) education (GDE) on employment and technical manpower development, which is defined as human resource development (HRD), in Asia's LDCs; it specifically focuses on the case of Nepal, using raw data from the nationally representative Labor Force Survey of 2008 to show the significant, negative impact of GDE on employment creation and HRD.

In LDCs, unemployment persists because people lack the basic knowledge and skills necessary to get a job in growing manufacturing and service sectors. For companies and businesses, the shortage of skilled manpower for highly specialized jobs is a key problem. Hence, providing people with the necessary means to improve their skills through vocational education and training is extremely beneficial. This measure would not only help people obtain jobs, but would also help enable them to be self-employed. However, providing vocational education and training alone is not enough. What is critically important is enhancing the level of general education while considering gender dynamics, particularly in LDCs. Girls' education at the school level is instrumental in promoting vocational and training activities, which ultimately contribute to employment in LDCs.

This article is organized as follows. Section 2 briefly examines the existing literature on the relationships between GDE and employment, and GDE and HRD in terms of trained manpower. It also examines the trend of GDE and HRD in the Asian LDCs. Section 3 presents the data and methodology of analysis. Section 4 presents the results based on raw data from the Nepal Labor Force Survey (NLFS) 2008, and Section 5 concludes the article.

## 2. GDE and HRD in LDCs: Trends and Evidences

International development agencies, policy makers and scholars affirmed that girls' education has significant benefits for developing countries (Haveman and Wolfe 2001; UNESCO 2008). Girls' education increases family income and improves social status, leading to the higher earning and occupational mobility of women. Health-related benefits of girls' education include a reduced fertility rate, low infant mortality rate

1 According to the UN, there are three criteria for the identification of LDCs: (a) having a gross national income (GNI) per capita under $905 for inclusion, (b) having a low level of human capital status measured by the Human Asset Index, and (c) having a low level of Economic Vulnerability Index (EVI). For details, see: http://www.un.org/special-rep/ohrlls/ldc/ldc%20criteria.htm (accessed July 27, 2011).

and higher life expectancy, among others. Research has shown that the expansion of girls' education in LDCs has a stronger effect on long-term economic growth than that of boys' (Benavot 1989).

Despite improvements in educational levels in recent years, GDE still persists in many developing countries (UNESCO 2008); it is a serious problem in LDCs, where girls are less likely to attend school than boys. According to the Global Education Digest 2010, if the present trend continues, 72 countries are not likely to achieve the goal of equal access for boys and girls to primary and secondary education by 2015. Among them, 63 are far from reaching this target at the secondary level (UNESCO, 2010). Only about 87 girls start primary school for every 100 boys in South and West Asia, according to the latest report from the United Nations Educational, Scientific and Cultural Organization (UNESCO). There is a consensus among international development agencies that GDE is a major obstacle to social progress in LDCs (UNESCO, 2010).

## 2.1 Importance of Vocational Education and Training (VET) on HRD

The term HRD, defined as "organized learning over a period to enhance performance of the individual," was introduced for the first time in 1969 (Nadler and Nadler 1990). Broadly, HRD is the optimal utilization of skills, knowledge, and experience needed to increase the productivity of human beings and it can incorporate population control, health, nutrition, political participation, poverty eradication, and illiteracy (Hongladarom 1989). Recent comprehensive definitions cover all efforts, which result in better skilled and more knowledgeable workers (Low 1998). Therefore, HRD includes all activities that enhance the ability of all human beings to reach their highest potential.

However, such broad and comprehensive conceptualization is impractical for empirical purposes, as a measurable variable is needed. Therefore, this article uses the proportion of the population with any vocational (and/or professional) education and training (VET) as the proxy for HRD. The argument here is that vocational and professional training, which provide individuals with specific, job-relevant skills or self-entrepreneurship abilities, make people suitable for a given job and ultimately contribute to solving the unemployment problem.

Leading social scientists in the field of labor economics and even in education strongly support the promotion of vocational and professional education and training. In the words of Thomas Balogh (1969), "as a purposive factor for rural socio-economic prosperity and progress, education must be technical, vocational and democratic." He even emphasized that "elementary education must impart technical knowledge to rural youth in an eminently practical way..." In the context of LDCs, where people need

immediate return from education and cannot afford the resources for higher education, VET received much support, as it is believed that many educational problems could be solved by attracting people to vocational education and training; it offers a quick return on their investments while minimizing the demand for higher education.

VET can produce highly qualified middle- and low-level skilled manpower that is in high demand in LDCs as rapid advancement of modern technology continues to change production processes. It would serve to reduce unemployment through the creation of both employment and self-employment. Meanwhile, it would also boost participation into the labor force as new entrants see improved productivity toward the end of secondary schooling. More specifically, Lillis and Hogan (1983) argued that VET is believed to be an effective solution to rural problems as it helps alleviate unemployment by halting urban migration while also transmitting skills and attitudes useful in rural employment. It serves best for disadvantaged youth both in rural and urban areas by preparing them for the rapidly changing job market. ILO (2004) mentions that poor people's only asset is their labor. If poverty is to be eliminated from the developing world, these poor people should be equipped with skills they can use throughout their lives. Thus, this article takes the proportion of the labor force that has vocational education or some form of training as the proxy for HRD.

## 2.2 General Trend of GDE and Employment in Asia

This paper uses the data of the World Bank's *World Development Indicators* to highlight the GDE trends in Asian LDCs. Figure 1 shows the ratio of girls to boys in primary and secondary education. Clearly, most of the countries still show an extremely low level of girls' participation in school. For example, the ratio of girls to boys in Afghanistan's schools is below 60%, and in the Yemen Republic, the ratio is less than 70%. The figures of many other countries, such as Nepal, Cambodia and Lao PDR, hover just above 80%. In terms of the two main regions of Asia, South Asia's average is just over 90%, whereas East Asia and Pacific reached almost 100% in 2007. This difference indicates that richer regions have better gender equality than the poorer regions. Interestingly, the figure clearly shows the increasing trend of gender equality in school level educational participation.

Among the LDCs in Asia, the overall trend of employment is not encouraging. Figure 2 shows that the employment to population ratio of over 15 years ago has not increased significantly in most of the LDCs. Some countries show improvement to an extent (e.g. Bhutan, Timor-Leste, Nepal); however, many others experienced a declining employment trend (e.g. Cambodia, Lao PDR, Bangladesh). If we observe the subregional average, both South Asia and East Asia and Pacific have declining trends.

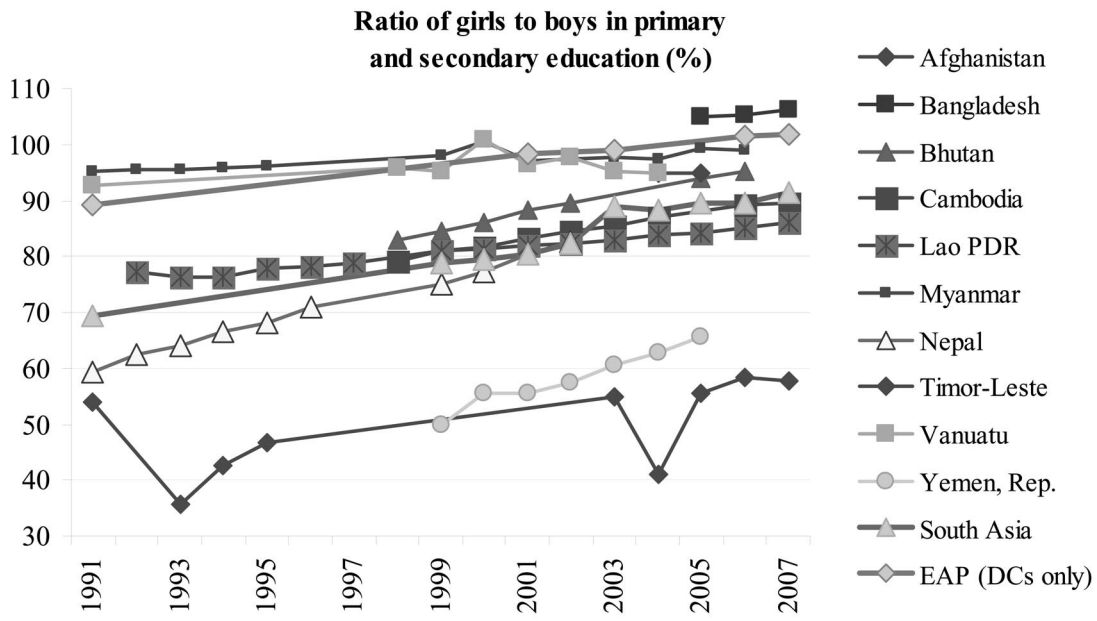


Figure 1: Gender Disparity in School Participation in Asia, 1991-2007

Note: EAP=East Asia and Pacific; DCs = Developing countries
Source: Author's calculation based on the data of the World Bank's *World Development Indicators*

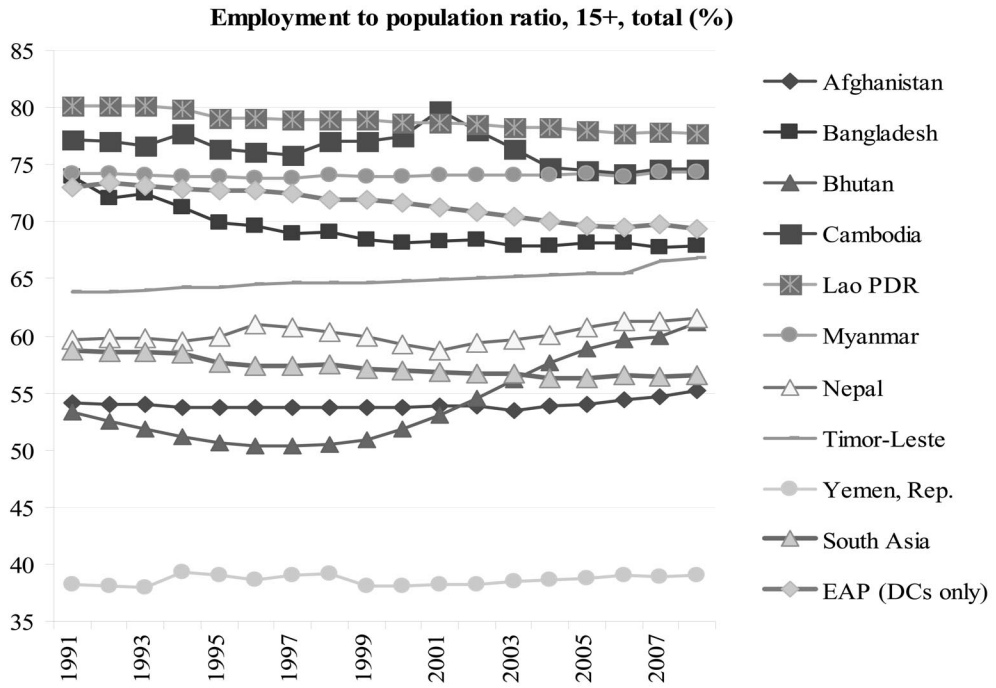


Figure 2: Employment in Asia, 1991-2008

Note: EAP=East Asia and Pacific; DCs = Developing countries
Source: Author's calculation based on the data of the World Bank's *World Development Indicators*

Comparing Figure 1 and Figure 2, it is obvious that countries with low GDEs have a higher level of employment in general. The Yemen Republic, Afghanistan and Nepal are in the lower part of both graphs. Similarly, South Asia shows a low level of both girls' participation in school and employment. On the contrary, the regional average of East Asia and Pacific and some of the countries from this region show higher levels of girls' participation in school as well as a higher overall level of employment.

Despite reduced GDE over time in Asian LDCs, female participation in the labor force is not promising. Most of the LDCs have shown little improvement in terms of the female share of their total labor force (Figure 3). For example, Bangladesh, Timor-Leste, Afghanistan and Vanuatu all showed little or no progress. Cambodia even experienced a continuous decline in the share of females in the labor force. Only Maldives and Nepal showed significant progress between 1990 and 2008. In terms of the sub-regional average, South Asia showed slight progress from 27% to 29%, whereas East Asia and Pacific maintained an almost constant level of 44% over the same period.

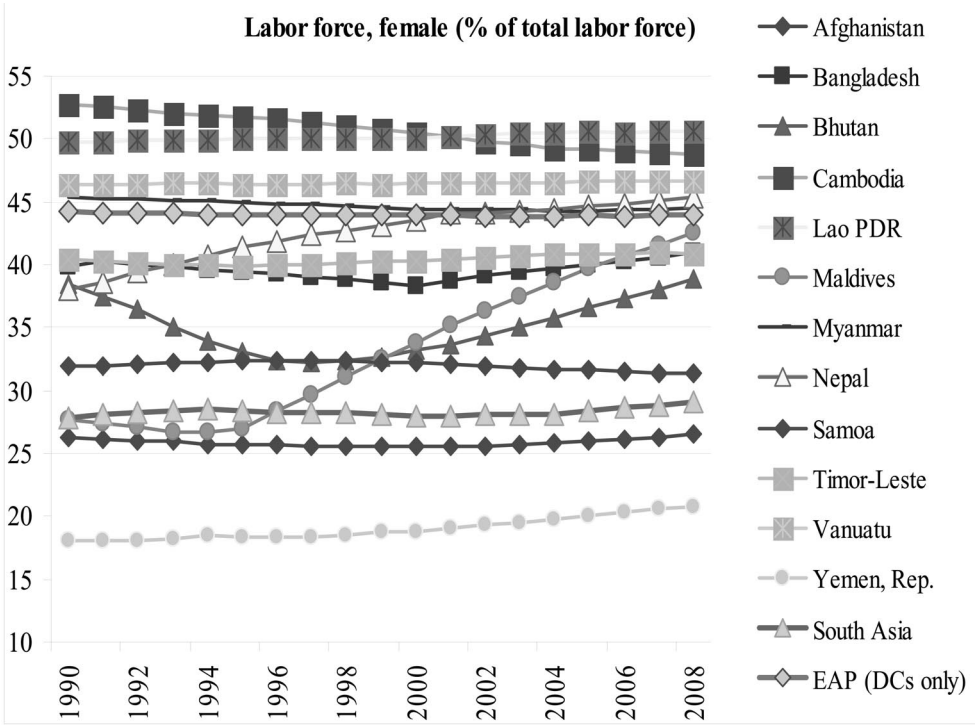


Figure 3: Gender Disparity in Labor Force Participation in Asia, 1990-2008

Note: EAP=East Asia and Pacific; DCs = Developing countries
Source: Author's calculation based on the data of the World Bank's *World Development Indicators*

## 2.3. The Situation of Nepal

Early education in Nepal, based on Hindu and Buddhist philosophy, was not vocational in character. Vocational work such as metal works, leather crafts and tailoring were considered the work of low-caste people within the Hindu caste system (Kafle 2009). A systematic, formal style of mass education in Nepal started in the 1940s (Aryal 1970; MOE 1956; Vir 1988). The first five-year plan (1956-1961) set a goal of universalizing compulsory and free primary education by 1985. This national commitment has been reaffirmed in many national and international forums, such as the Karachi Plan, the Jomtien and Dakar declarations, the National Education System Plan (NESP), the Basic and Primary Education Program (BEPE), and others. Various models of educational expansion and improvement have been achieved because of these initiatives. However, the situation is still far from ideal.

Broadly, formal education in Nepal can be divided into school education and higher education. Formal school education does not accept technical/vocational students. It severely restricts horizontal movement of students from technical/vocational fields to academia, and vice versa. Though an amendment of the Education Act 2006 has put forth the provision to move to a higher level in the technical/vocational stream[2], VET will have to face considerable resistance from those in favor of the traditional education structure at the level of implementation (Kafle, 2009:15). In general, so called high caste people, who usually enjoy the control in all levels of government and bureaucracy, oppose the expansion of vocational education. They tend to maintain the status quo, because the traditional educational structure helps them to keep their superior status in the Hindu caste based Nepali society.[3]

There were significant changes in the field of VET in the 1980s. Vocational subjects in general schools were reduced by 50%. At the same time, separate technical schools were established in various parts of the country. The purpose of the rural technical school was to produce the skilled workforce needed for agriculture, health, rural construction, and mechanization. Likewise, the objective of the urban technical school was to produce the skilled workforce needed for cottage and modern industries. Virtually all technical schools were established with external assistance. Switzerland was then and is still now one of the major donors for the development of technical/vocational

---

2 For details, see: http://www.doe.gov.np/download/download_970384948.pdf (accessed July 27, 2011).

3 Hindu caste system has four hierarchy of caste, namely: Brahman, Chhetri, Baisya and Sudra. According to the Population Census of Nepal 2001, the first two, Brahman and Chhetri, are the ruling class, so called "high caste" , which composed of 33.95% of total population. Baisya composed of various ethnic groups having their own unique culture and tradition, which represents 53.23% of total population. Sudra, also called Dalits, is the lowest caste group, which is even considered as "untouchable" , meaning that they are not allowed to visit temples, public water resources, enter houses of so called high caste people, etc. Dalits represents 12.82% of total population.

education in Nepal (Sharma 1998).

There are a number of institutions that provide VET in Nepal. Among them, the Department of Cottage and Small Industries (DCSI) has a long history of vocational training starting from 1939. Records show that the real thrust in offering vocational training in various skill areas was initiated in 1956 with the establishment of Cottage Industry Centers. Currently, DCSI and the Cottage and Small Industry Development Board (CSIDB) organize skill training in all 75 districts of the country.

On behalf of the Ministry of Labor and Transport Management (MOLT), the Department of Labor and Employment Promotion (DOLEP), with its two training center systems, Skill Development Training Centers (SDTCs) and Vocational Training Centers (VTCs), are responsible for looking after skill training of workers. At present, 14 Skill Development Training Centers (SDTC) are operating throughout the country, spread across different zones.

Similarly, the Council for Technical Education and Vocational Training (CTEVT), the largest institute for VET in Nepal, offers full-fledged specialist training for 5,500 regular students and 10,000 short-term trainees, annually, from its 19 public technical-schools in agriculture, health, construction, tourism, and industry related courses. More than 118 CTEVT affiliated private technical schools provide vocational training for about 10,000 students in virtually every district of Nepal.[4] Furthermore, international and national nongovernmental organizations (NGOs) have been playing an active role in HRD through VET in Nepal, especially after the political shifts towards democracy in 1990 (Nepal South Asia Centre 1998; Sharma 1998; Kafle 2009).

However, Nepal's vocational education development is mostly supply driven (Kafle 2009). There is no coordination between industry and vocational training institutes including CTEVT. Neither company provides trainings to generate manpower to meet their demand. Kafle (2009: 67) further put: "There has been no participation of potential employers in training design and implementation" in Nepal. Foreign companies, which are not much attracted in Nepal yet, also seem weak in transferring technology through training and development activities. Though the current situation is yet to be explored, Chitrakar and Weiss (1995) empirically found that foreign investment had only a small impact on skill development and labor income in Nepal. However, it is expected to attract more and more foreign investments in the country, because of improving security and political situation in recent years.

On the other hand, there is still a high level of educational inequality based on gender (Bhatta 2009). According to the Nepal Labor Force Survey (NLFS) 2008, which is nationally representative, about 63.2 % of Nepalese aged 5 years and over in 2008 can

4 For details, see: http://www.apacc4hrd.org/conf_workshop/apacc05/SM/Kafle/ (accessed July 27, 2011).

read and write; however, male and female literacy levels were 74.7% and 53.1%, respectively. Similarly, the proportions of the male and female adult populations (15 years and above) that had never attended school were 32.4 % and 58.2 % in 2008, respectively.

Based on the NLFS 2008, Figure 4 shows the gender-wise distribution of the population in terms of those who are attending, or have ever attended, school/university. The figures represent the number of people ever attending school/university by percentage in all the 73 districts of Nepal, both male and female. 'Ever attending school /college' accounts for the population that has attended school in the past or is currently attending. It also shows the percentage of people who have received any VET. We can observe a wide variation between genders. The common feature is that more districts report fewer females ever attending school than those that appear more equal. In Nepal, there are 75 districts, which serve as the major local administrative units of the country. Out of these 75 districts, 2 districts are excluded from the survey, as they are too remote to conduct a survey. These excluded districts are Manag and Dolpa.

Figure 4 also reveals that the female proportion of the population in the ever attending school section is low in Darchula, Baitadi, Bajhang, Bajura, Humla, Mugu, Kalikot, among others. These districts are remotely located and have very low levels of development. These districts are mainly located in western parts of the country. However, some districts from the eastern and middle parts also have a high disparity in education, such as Rasuwa, Nuwakot, Sindhupalchowk, Siraha, Saptari, and others. Some districts have low GDE, such as Kaski, Baglung, Gulmi, Kaski, Tanahu, Lamjung, Gorkha, Chitawan, Jhapa, among others. Interestingly, there are some districts which have a higher number of females than males, such as Arghakhanchi, Palpa, Parbat and Syanja. In general, these districts have more touristic spots, city centers and industries. Overall, the percentage of females ever attending school is 43%, while that of males is 57%.

There are several reasons behind the high levels of the gender gap in education in Nepal. Deep rooted socio-cultural practices and behavior that mainly comes from the Hindu religion, which is based on caste system (as explained earlier), is the most formidable barrier to girls' education. For instance, early marriage, preferential treatment of the male child, viewing girls as someone else's property and perceived dubious benefits of educating girls, etc., all are fueling gender disparity in education in the country. People and parents are largely unaware of the benefits of girls' education. In addition, ethnic origin with lower caste and minor religious identity are also powerful determinants of gender and ethnic exclusion in Nepal (Manzoor and Govinda 2010). For instance, "untouchability" is causing double disadvantages for their education to Dalits (low caste) girls.[5] High rate of poverty incidence, 47%, of Dalits further

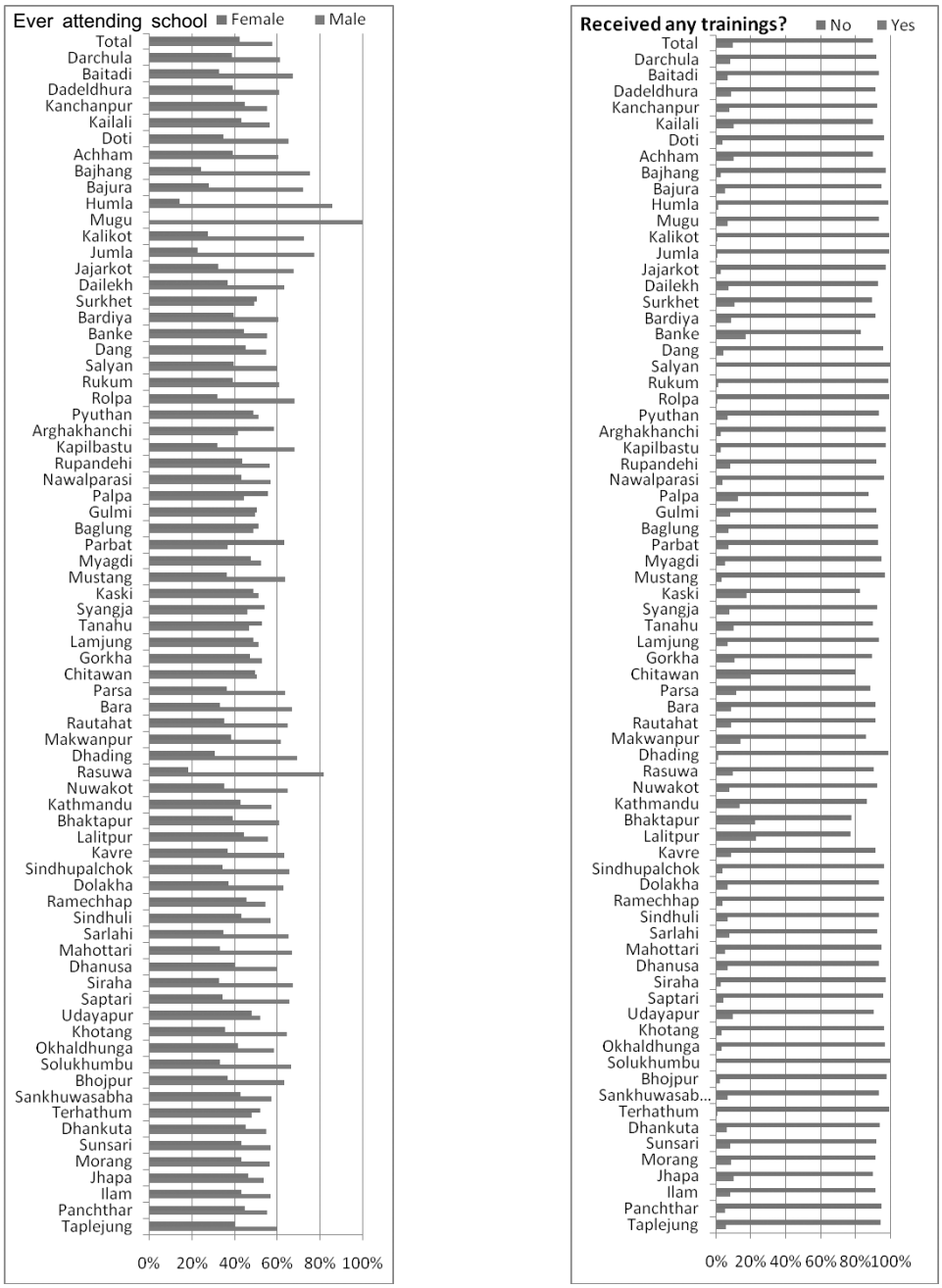


Figure 4: Ever Attending School by Gender and Trained Manpower in Nepal, 2008

Source: Author's calculation using raw data from the Nepal Labor Force Survey 2008

5 "Untouchability" is the form of sociocultural practice of Hindu caste system in Nepal and India, which treats the lowest caste group (Dalits) as untouchable in many respects as explained in footnote 3. Although, this practice was abolished legally in a century ago, untouchability is still rampant in many parts of the country.

indicates the extremely low living condition of them and the situation of girls and women within the Dalits population are further worse.

In terms of its trained population, which is defined as those having received any vocational or professional training, the national average is less than 10%. Most of the districts below the national average are in hilly regions and western parts. For example, Darchula, Baitadi, Dadeldhura, Doti, Bajhang, Humla, Kalikot, Jumla, Jajarkot, Salyan, Rukumand Rolpa have extremely low levels of trained labor. Some of the districts from eastern parts also have extremely low levels of trained manpower, such as Solukhumbu, Terhathum, PanchtharTaplejung, among others. However, some of the Terai districts, constituting the plains in southern parts of the country, also showed lower than the national average of trained people, e.g. Kanchanpur, Dang, Kapilbastu, Nawalparasi, Siraha, Saptari, among others.

In contrast, the capital city, Kathmandu, its neighboring districts Bhaktapur and Lalitpur, the touristic city Pokhara, and some industrial districts such as Banke, Makwanpur, and Jhapa have a higher rate of trained manpower than the national average. However, the national average of trained manpower in Nepal itself is low at 9.93%. Although, the role of vocational training outside the formal school system is very useful for developing a skilled workforce, the high level of gender disparity in general education is hampering the process.

According to the Nepal Labor Force Survey (NLFS) 2008, the major subjects of vocational and professional training are computer science, dressmaking/tailoring, health-related training, agriculture and animal husbandry, teacher training, driving skills, handicrafts/spinning/weaving, electrical, hairdressing/beauty work, other craft, trade & industrial, cooking and food preparation, engineering and police (security) work (CBS, 2009). Among them, the survey found that women's share is higher than men in the following subjects of vocational training: (1) hairdressing and beauty work (95%); (2) dressmaking, tailoring (90%); (3) handicrafts, spinning and weaving (80%), and (4) health related trainings (60%). On the other hand, male share is remarkably high in all the remaining subjects, for example, electrification (98%); driving (98%), engineering (96%); police (security) work (95%); other craft, trade and industrial (93%); etc. Interestingly, though cooking and food processing job is mainly performed by women in household level, male share in this subject is more than 90 percent (CBS, 2009).

Mostly, such trainings are short in nature. For instance, 88 percent of the trainings are for less than 12 months, about 60 percent are for less than six months, and most of agriculture and health-related courses last for less than a month (CBS, 2009). These trained people work as skilled workers, but not as managers. It is true that trained people are less likely to be unemployed or underemployed than the people who only

have general education. Unfortunately, there is no system of providing vocational guidance and post-training services to facilitate these trained people to get a suitable job smoothly.

The next section discusses the data and methodology to examine the impacts of gender disparity in general education on skilled manpower development.

## 3. Data and Methodology

### 3.1 The Data: Nepal Labor Force Survey (NLFS) 2008

This study uses data from the Nepal Labor Force Survey (NLFS) 2008. The survey is the second of its kind; the first was conducted in 1996/97. The Central Bureau of Statistics (CBS) of the Government of Nepal carried out the survey with additional technical assistance from the International Labor Organization (ILO) and funding from the United Nations Development Program (UNDP). With a two-stage stratified sampling design, the survey selected a nationally representative sample of 16,000 households from 800 Primary Sampling Units (PSU) equally distributed between urban and rural areas. The sample design of the survey is presented in Table 1.

Table 1: Sample Design for NLFS 2008

| Stratum | PSUs | Households |
|---|---|---|
| Mountain | 34 | 680 |
| KTM Valley Urban | 131 | 2,620 |
| Other Hill Urban | 99 | 1,980 |
| Rural Hill | 179 | 3,580 |
| Urban Terai | 170 | 3,400 |
| Rural Terai | 187 | 3,740 |
| Total | 800 | 16,000 |

Source: NLFS 2008 (CBS 2009:5)

According to CBS (2009), the survey covered the entire country, except for two districts: Jumla and Manang. All permanent residents of the country were considered eligible for inclusion in the survey, including foreign nationals. However, households of diplomatic missions and institutional households such as schools, hostels, army camps and hospitals were excluded. Homeless people and those living away from the household for six months or more were also excluded. NLFS aimed at providing a set of comprehensive statistics on employment, unemployment, and under-employment. The survey collected basic demographic information on all individuals of the household, including literacy and the level of education of each member. It also collected data on

technical education and vocational/professional training, which is the main dependent variable in this study.

There were a total of 130 questions in eight sections on the questionnaire, and they were developed primarily on the basis of the ILO manual (for details, see Hussmanns, Mehran and Verma 1990). The questionnaire was pre-tested several times and revised as per feedback received from each pre-test. The response rate was very high, with data not collected for only 24 households out of 1,600. The fieldwork was continued throughout the whole year, starting from January.

Questions 26 to 30 were related to education and were asked to all household members aged 5 and above. However, this study uses the results of questions 29 and 30 as explanatory variables. Question no. 29 asked whether the respondent ever attended/attending school/college. From the raw data provided by this question, the percentage of the gap between male and female respondents ever attended/attending school/college was calculated for each district as a measure of GDE. As such, the higher the value, the greater the GDE for the district. This study decomposes GDE measures in terms of different levels of education. Although data is available to the individual school grade and university level, for simplicity, it combines respondents' results; grades 1 to 5 are categorized as ever attending primary level school. Similarly, grades 6 to 10 are categorized as ever attending secondary level, and higher than grade 10 is categorized as ever attending a higher education school. This categorization is based on the Nepalese system of formal education.

Likewise, questions 31 to 36 were related to VET and were asked to members aged 14 and above. In question no. 31, respondents were asked whether they had received any formal vocational or professional training. Their answers are presented in Figure 4 in the previous section and serve as the main dependent variable, as this study intends to investigate the effects of GDE on HRD. Although the question extends to determine the main subject of training and its length, this study proposes these aspects be saved for future research.

It is necessary to create a new set of data to make the information usable to answer the research questions. Thus, the raw data set of NLFS 2008 will be reorganized by merging the two original data sets together. Initially, the raw data set of NLFS 2008 was organized into five different data files; namely, household information, individual information, absentee information, remittances information and sample information. To serve the purpose of this research, the data sets for household information and individual information will be combined into a single database and processed to produce a usable data set for this study. It will use all 73 districts (out of a total 75 districts) included in the NLFS 2008.

## 3.2 The Model

The basic presumption of developing the model is that if school education were highly stratified across gender, the proportion of trained manpower to the population would be small. This is because a certain level of school education is required to obtain certain vocational training. Thus, the expected relationship is that the larger the proportion of unschooled females (GDE) is, the smaller the proportion of trained manpower (HRD) would be. However, there would be other potential variables that affect HRD, which should be controlled to capture the real impact of GDE on HRD. Hence, the following ordinary least square (OLS) regression model is used to analyze the data.

$$log(HRD)_i = \beta_0 + \beta_1 log(ME)_i + \beta_2 log(GDE)_i + \epsilon_i$$

Here, *HRD* is the dependent variable, referred to as the percentage of the population having any vocational or professional training in district $i$, and *GDE* is the measure of gender disparity in different levels of education.

The number of the manufacturing establishments (*ME*) is used as the control variable, because a higher number of manufacturing firms is expected to create trained manpower. ME also captures the rural-urban bias and level of development of the district, because districts with a higher number of manufacturing firms are more likely to have a greater proportion of urban population, as well as a higher level of socioeconomic development. Therefore, it is expected that ME have positive effects on HRD. Beta ($\beta$) is the coefficient of each explanatory variable that explains the magnitude and direction of impact on the dependent variable, HRD. Beta is the main parameter of interest in the regression analysis. In addition, $i$ represents the group identifier (i.e. 73 districts), and $\epsilon$ is the error term. To neutralize the different units of the variables, and to more easily interpret the coefficient, all of the variables are logged before running the regression. Robust OLS regression results are reported to correct the possible problem of heteroskedasticiy.

The summary statistics of the data are presented in Appendix 1 and a correlation matrix is shown in Appendix 2. As the correlations among the explanatory variables used in each regression equation are not large, the problem of multicollinearity is also within the acceptable limit. Several diagnostic tests also support the argument.

## 4. Results

The results of the regression analysis are presented in Table 2. While the coefficients show the magnitude, the sign of the coefficient indicates the direction of the effect, and the number of asterisks [*] indicates the level of significance of the effect. No asterisk means no significant effect. One asterisk [*] means the effect is significant at 10%. Two asterisks [**] means the effect is significant at 5%, and three asterisks

[***] means the effect is significant at 1%.

Each column represents the result of different regression equations. Column 1 presents the result of overall GDE measured by the percentage of difference between males and females ever attending school/college in all levels of education. Column 2 represents the results of GDE in primary level. Column 3 reports the results when the main explanatory variable is GDE in secondary level. Finally, Column 4 reports the results for GDE in higher-level education.

Clearly, GDE in all levels of education has highly significant negative impacts on HRD. For instance, column 1 shows that the coefficient of overall GDE indicator is -0.295. This figure implies that if we decrease the GDE in all levels of education by 1%, the proportion of trained manpower will increase by 0.295%. This effect is highly consistent in each of the different levels of education. If GDE in the primary level were to drop by 1%, it would increase trained manpower by 0.354%. Interestingly, all of the effects are significant at the 1% level.

Table 2: Impacts of GDE on HRD in Nepal, 2008

Dependent Variable: Received any vocational/professional training (% of total labor force)

| Variables | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Log of manufacturing establishments | 0.232*** | 0.249*** | 0.191*** | 0.225*** |
| | (0.0494) | (0.0558) | (0.0543) | (0.0467) |
| Log of GDE, all levels combined | -0.295*** | | | |
| | (0.0743) | | | |
| Log of GDE, Primary level (1-5) | | -0.354*** | | |
| | | (0.0914) | | |
| Log of GDE, Primary to Secondary (6-10) | | | -0.379*** | |
| | | | (0.128) | |
| Log of GDE, Higher (Higher secondary + university) | | | | -0.477*** |
| | | | | (0.178) |
| Constant | -3.895*** | -4.313*** | -4.007*** | -3.734*** |
| | (0.253) | (0.334) | (0.261) | (0.249) |
| No. of observations | 57 | 49 | 50 | 53 |
| R-squared | 0.405 | 0.422 | 0.408 | 0.431 |

Note: Ordinary Least Square (OLS) robust estimations are reported. Standard errors are in parentheses; *** p<0.01, ** p<0.05, * p<0.1 GDE is the percentage of gap between male and female respondents who ever attended school/college

Source: Raw data of the Nepal Labor Force Survey (NLFS) 2008 was used to generate all variables except manufacturing establishments, which was taken from the Census of Manufacturing Establishment of Nepal 2006/07. Both data are sourced from the Central Bureau of Statistics (CBS), Nepal

The results from columns 3 and 4 are also strongly significant at the 1% level, and the coefficients are negative, which indicates that decreasing GDE would improve HRD. Interestingly, the magnitude of the coefficient increased with the higher level of education. It is as expected, because we know that GDE is higher in higher education than secondary level, and higher in secondary level than primary level. Thus, there is more potential to reduce GDE in secondary and then college level education, which would have a greater impact on HR development in Nepal and in the LDCs, as well.

The results in each column are entirely consistent with each other. The control variable, number of manufacturing establishments, is found highly significant (at 1% in all four columns) for increasing the proportion of trained manpower in the total labor force. This is as per the expectation, as the manufacturing sector creates demands for trained manpower because manufacturing firms create demand for a trained labor force. At the same time, some of the manufacturing firms also provide vocational or technical training, which also help increase the supply of trained manpower. In both cases, they have a positive impact on the share of trained manpower.

## 5. Conclusion

Based on the literature review, trend analysis and the outcome of the empirical analysis of the raw data of the Nepal Labor Force Survey 2008, this study clearly shows that GDE is hindering HRD in LDCs. Thus, in the context of the growing importance of HRD in solving the persistent problem of unemployment, reducing GDE at a rapid pace is essential in LDCs. The other benefits of female education, or of reducing GDE, are also widely acknowledged by academics and development practitioners alike.

Therefore, it is recommended to the governments and policy makers in LDCs that female education be given prime priority for the HRD of the country, which is essential in several crucial aspects of development. Firstly, human resources development contributes to the reduction of unemployment; meeting the high demand of trained manpower in the manufacturing sector would ultimately help the country industrialize. Secondly, it contributes to the reduction of inequality as VET serves best for rural and deprived urban youth. Finally, a sufficient supply of trained manpower attracts foreign direct investment (FDI), which is one of the most desired resources for development in such resource-scarce countries. Many scholars have already pointed out that FDIs mostly go to countries with a higher quality of human resources, and with practical skills and knowledge, because such countries can adapt quickly to new technology that leads them to increase their productivity.

In fact, GDE causes many socioeconomic problems in LDCs. Exploring the socioeconomic consequences of GDE helps us understand the severity of its ill effects.

Ultimately, such exploration motivates policy makers to overcome the causes of GDE. However, to this author's knowledge, there are limited scholarly works that explore the relationships between GDE and HRD, particularly in LDCs, to date. Thus, further research is proposed by which such analysis is extended to other aspects of employment and development. For instance, it is essential to explore the demand side situation of skills needed for industries to avoid the mismatch between the vocational training courses and rapidly changing of skills demands. Furthermore, exploring ways to attract and encourage women to vocational trainings, particularly in engineering, computer sciences, trade and industrial, driving, and so on, would help to reduce gender wage inequality in particular and gender disparity in general.

## Acknowledgements

The preliminary draft of this paper was presented at the 14th UNESCO-APEID International Conference on "Education for Human Resource Development," October 21-23, 2010 in Bangkok, Thailand. I would like to thank Professor Kazuo Kuroda and other participants of the conference for their helpful suggestions. I also thank to anonymous referee/s for his/her crucial comments to improve this paper.

## References

Aryal, Krishna R. 1970. *Education for the Development of Nepal.* Kathmandu: Shanti Prakashan.

Balogh, Thomas. 1969. "Education and Agrarian Progress in Developing Countries," in Hufne, K. and Naumann, J., (eds.), *Economics of Education in Transition.* Stuttgart: Ernst Klett. 259-268.

Benavot, Aaron. 1989. "Education, Gender, and Economic Development: A Cross-national Study." *Sociology of Education.* Vol. 62: 14-32.

Bhatta, Pramod, (ed.). 2009. *Education in Nepal: Problems, Reforms and Social Change.* Kathmandu: Martin Chautari.

CBS (Central Bureau of Statists). 2009. *Nepal Labor Force Survey 2008: Statistical Report.* Central Bureau of Statistics, Kathmandu.

_____. 2003. *Population Monograph of Nepal 2003.* Central Bureau of Statistics, Kathmandu.

Chitrakar, Ramesh and John Weiss. 1995. "Foreign investment in Nepal in the 1980s: A cost benefit evaluation". *Journal of Development Studies.* Vol. 31, No. 3: 451-466

Hussmanns, Ralf, Farhad Mehran,& Vijaya Verma. 1990. *Surveys of Economically Active Population, Employment, Unemployment and Underemployment: An ILO Manual on Concepts and Methods.* Geneva: ILO.

Haveman, Robert H., and Barbara L. Wolfe. 2001. "Accounting for the Social and Non-

market Benefit of Education," in John F. Helliwell, (ed.), *Contributions of Human and Social Capital to Sustained Economic Growth and Well-Being*. (Human Resources Development Canada).Vancouver: University of British Columbia Press.

Hill, M. Anne, and Elizabeth M. King. 1993. "Women's Education in Developing Countries: An Overview," in Elizabeth M. King and M. Anne Hill. Baltimore, MD, (ed.), *Women's Education in Developing Countries: Barriers, Benefits, and Policies*. Johns Hopkins University Press. 1-50,

Kafle, Agni P. 2009. *Workforce Development in Nepal: Policies and Practices*. Asian Development Bank Institute.

Lillis, Kevin and Desmond Hogan. 1983. "Dilemmas of Diversification: Problems Associated with Vocational Education in Developing Countries." *Comparative Education*. Vol. 19, No. 1: 89-107.

Low, Linda. 1998. "Human Resource Development in the Asia-Pacific," *Asian-Pacific Economic Literature*. Vol. 12, No. 1: 27-40.

Manzoor, Ahmed and Govinda, R. 2010. "Universal Primary Education in South Asia: A right that remains elusive," *Prospects* 40:321-335.

Ministry of Education, HMG/Nepal. 1956. *The Report of the National Education Planning Commission*. Kathmandu.

Nadler, Leonard and Zeace Nadler (eds). 1990. *The Handbook of Human Resource Development*. John Wiley & Sons: New York.

Nepal South Asia Centre. 1998. *Nepal Human Development Report 1998*. Kathmandu.

Sharma, T. N. 1998. *The Role of Technical Education and Vocational Training in the Broader Perspective of Nepal's Employment and Training System*. Unpublished doctoral dissertation, University of Southern Illinois, Carbondale.

UNESCO Institute of Statistics (UIS). 2010. *Global Education Digest*. http://www.uis.unesco.org/template/pdf/ged/2010/GED_2010_EN.pdf (Accessed August 4, 2011).

UNESCO. 2008. "The Dakar Goals: Monitoring Progress and Inequality," in *EFA Global Monitoring Report,* 2008*: Overcoming Inequality; Why Governance Matters*. Paris and London: UNESCO and Oxford University Press. http://unesdoc.unesco.org/images/0017/001776/177683E.pdf (Accessed August 4, 2011).

Vir, Dharam. 1988. *Education and Politics in Nepal: An Asian Experiment*. New Delhi: Northern Book Center.

Appendix 1: Summary Statistics

| Variable | Obs. | Mean | Std. Dev. | Minimum | Maximum |
|---|---|---|---|---|---|
| Respondents who received any vocational/professional training (% of total) | 73 | 0.07159 | 0.04864 | 0.004 | 0.228 |
| Log of no. of manufacturing establishments | 66 | 52.2273 | 85.9899 | 1 | 480 |
| Log of GDE, all levels combined | 73 | 0.29645 | 0.27762 | -0.714 | 1 |
| Log of GDE, Primary level (1-5) | 73 | 0.1117 | 0.19829 | -0.519 | 0.607 |
| Log of GDE, Primary to Secondary (6-10) | 73 | 0.22308 | 0.29187 | -0.393 | 1 |
| Log of GDE, Higher (Higher secondary +university) | 70 | 0.40627 | 0.46011 | -1 | 1 |

Source: Raw data of the Nepal Labor Force Survey (NLFS) 2008 is used to generate all variables except for manufacturing establishments, which is taken from the Census of Manufacturing Establishment of Nepal 2006/07. Both data are sourced from the Central Bureau of Statistics (CBS), Nepal.

Appendix 2: Correlation Matrix

| | Variables | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| 1 | Log of respondents who received any vocational/professional training (% of total) | 1 | | | | | |
| 2 | Log of no. of manufacturing establishments | 0.6127 | 1 | | | | |
| 3 | Log of GDE, all levels combined | -0.5134 | -0.5557 | 1 | | | |
| 4 | Log of GDE, Primary level (grade 1-5) | -0.4317 | -0.1199 | 0.5891 | 1 | | |
| 5 | Log of GDE, Primary to Secondary (grade 6-10) | -0.6141 | -0.4846 | 0.8409 | 0.5034 | 1 | |
| 6 | Log of GDE, Higher (Higher secondary +university) | -0.428 | -0.4766 | 0.5885 | 0.2956 | 0.6093 | 1 |

Source: Raw data of the Nepal Labor Force Survey (NLFS) 2008 is used to generate all variables except for manufacturing establishments, which is taken from the Census of Manufacturing Establishment of Nepal 2006/07. Both data are sourced from the Central Bureau of Statistics (CBS), Nepal.

(Received 25th Octorber, 2011)
(Accepted 13th January, 2012)