Janapriya
Journal of Interdisciplinary Studies

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Status of Women Empowerment in Bharatpur Municipality, Chitwan, Nepal

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Abstract

Main objective of this study was to measure the empowerment level of women and to identify the factors that influence women's empowerment. For this purpose a sample of 147 married women of reproductive age (15-49) years excluding widows and divorced were interviewed randomly by using structured questionnaire in Bharatpur Municipality, Chitwan, Nepal. Chi-square test was applied to find the factors associated with empowerment.

It is found that majority of married women were more empowered in the study area. Further, job status, qualification at marriage, monthly income, gadgets and property ownership are the associated factors with empowerment level. Hence, the respondents should be aware on laws against violence and for their rights. They should approach for judicial treatment when they are victims of violence. Their try for paid job needs to be developed. They are to be helped and encouraged for their try in paid job. They must be the members of social organization. Their mobility, access to media, facilities like health, transportation, education, etc. are to be promoted. Their decision power mainly on economic matter and on career building is to be enhanced. The government should launch some programs to increase the empowerment of the women.

Key words: Associated factors, Empowerment, Monthly income, Property ownership, Women

Background

Women's empowerment is a broader area of study. Each concerned researcher attempts to explain it according to his/her own perspective. However there is consensus among them to some extent. Likewise various researchers measure women empowerment keeping in view the nature

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of study and region. The dictionary meaning of the word empower is "to give somebody the power or authority to do something or to give somebody more control over their life or situation

they are in." Power is a key term in word empowerment. Rowlands (1997) suggested four forms of power i.e. power within, power to, power with and power over. Power within refers to self esteem and awareness, power to refers to capacity building, power with refers to collective consciousness and power over refers to conflict between powerful and powerless. Another point of view expresses empowerment as an ability to make choices i.e. choices about marriage, number of children, mobility, job, entertainment and improvement in quality of life. In this regard Kabeer (2001) more precisely defined empowerment as expansion in people's ability to make strategic life choice in the context where this ability was previously denied. She suggested three interrelated dimensions to attain these choices. The dimensions were resources, agency and achievement: where resources refer to the condition under which choices are made. There are two types of resources, material (land, property etc.) and nonmaterial (relationship, network, rules, norms and practices). Second dimension of empowerment is agency that refers to process. It is the skill to set goals, motivation and effort. Combination of resource and agency make choices achievable. Third dimension is achievement which refers to

potential created by previous dimensions. Failure to realize the potential leads to incompetence and disempowerment. During last two decades empowerment has become a popular dialogue in all meetings, seminars, symposiums and workshops concerning human development and socio-economic progress of the country. In all the policies concerning fertility behaviour and demographic transition, child welfare, infant mortality, economic growth and poverty alleviation; women empowerment is used as one of the strategies by many international organizations including World Bank and the major UN agencies (Kabeer, 2001). Dyson and Moore (1983) defined women empowerment as "the capacity to obtain information and make decision about one's private concern and those of one's intimates". On the other hand Dixon-Muller (1978) viewed empowerment as "degree of access to control over material and social resources within family." Furthermore, Malhotra et al. (2002) considered empowerment as a process of gaining and controlling of material and intellectual resources which will support them to develop their self-sufficiency and enable them to achieve their independent rights and thereby challenging the ideology of patriarchy and speaking for the gender-based discrimination. These capabilities facilitate them to organize , in order to acquire authority to make decisions and choices and eventually eliminating their own subordination in all fields of life .The World Bank also defines empowerment as "the process of increasing capacity of individual or groups to make choices and to transform these choices into desired actions and outcomes" (WHO, 2006). All the frameworks of women empowerment adopt almost same route to define women empowerment yet they provide a guideline for proper understanding of the philosophical concept of women's empowerment Combination of abovementioned framework leads to the conclusion that empowerment is basically a development of confidence within individual or group to originate competency, strength and collectively to control their environment. Thus this study aims to explore the factors affecting women empowerment. The findings will provide base, ground proof or logic for

discussion for formulating plans, policies and programs to uplift women empowerment from local to nation level. It will also provide a guideline or base for the further studies and researches on the related topics.

Data and Methods

This study involves the analysis of factors affecting empowerment. The study solely depends on primary information collected by surveying one hundred and forty seven married women of reproductive age (15-49) years excluding widows and divorced were interviewed randomly by using structured questionnaire in Bharatpur Municipality, Chitwan, Nepal. For this purpose, simple Random Sampling Technique was used to choose the five wards for the study. So, out of 14 wards in the municipality, 5 wards were chosen through lottery method. Wards 2, 3, 7, 13 and 14 were the wards drawn. Luckily, wards 2, 3 and 7 had the characteristics of urban areas whereas wards 13 and 14 had the characteristics of rural areas. So, the data was collected from these wards. The total households in these wards were 6579. Out of these households, 147 households (at 8 percent allowable error, 5 percent level of significance taking P= Q = 0.5) were proportionately distributed in wards 2, 3, 7, 13 and 14 as 56, 14, 41, 18 and 18 respectively. Systematic random sampling method was used to collect the data. So, data was collected in interval of every 45(=6579/147) households.

The indicators in this research study for computing empowerment index are influenced mainly from the human empowerment index of UN model given in Nepal Human Development Report, 2004 and Malhotra's (2002) dimensions of empowerment.

For the measurement of empowerment level, different index was given to each of the demographic, social, economic and political variables (Annex-I). First of all, individual separate index was calculated and divided by total index (Total Maximum Value) to find the average individual empowerment level. Then average of the average individual

empowerment level was calculated. If the average individual empowerment is less than the average of average individual empowerment index, it is coded as low empowerment and if equal and high, it is coded as high empowerment level. Finally the overall empowerment level of the respondents was measured. Further, Chi-square test was applied to find out the factors associated with empowerment (Low and High).

Results and Discussion

This is a descriptive study designed to measure the empowerment level of women and factors affecting it. Based on the information gathered from one hundred and forty seven respondents, we have the following results and discussion.

Empowerment

Table 1: Empowerment Level of the Women

Empowerment Level	Number	Percent
Low	71	48.30
High	76	51.70
Total	147	100.00

Source: Field Survey, 2013

*Based on modified UN model given in Nepal Human Development Report, 2004 and Malhotra's (2002) dimensions of empowerment

Table 1 shows that more than half (51.70 percent) of the respondents were having high empowerment level whereas almost half(48.30 percent) of the respondents were having low empowerment level. This shows that more women are empowered in Bharatpur municipality, Chitwan, Nepal.

Factors Associated with Women Empowerment

This section shows the association between women empowerment level and other variables like age, age at marriage, number of children, family head, job status, religion, qualification at marriage, monthly income, gadgets and property ownership.

Table 2: Social, Demographic and Economic Factors associated with Empowerment of the Women

Variables	Empowerment status				Total		*P-Value
	Low		High				
	Number	Percent	Number	Percent	Number	Percent	
Age in Years							
Upto 24	4	2.71	5	3.4	9	6.1	0.622
(25-39)	57	38.8	56	38.1	113	76.9	
40 and above	10	6.8	15	10.2	25	17	
Age at Marriage(Years)							
Before15	8	5.40	4	2.70	12	8.20	0.089
15 to 19	34	23.10	28	19.00	62	42.20	
20 to 25	29	19.70	44	29.90	73	49.70	
No. of Children							
No children	6	4.10	5	3.40	11	7.50	0.954
One child	10	6.80	14	9.50	24	16.30	
Two children	43	29.30	44	29.90	87	59.20	
Three children	6	4.10	7	4.80	13	8.80	
Four & above	6	4.10	6	4.10	12	8.20	
Family Head							
Other	5	3.40	6	4.10	11	7.50	0.375
Husband	57	38.80	54	36.70	111	75.50	
Self	9	6.10	16	10.90	25	17.00	
Job Status **							
House wife	69	46.90	45	30.60	114	77.60	0.000
Works in pvt. office	1	0.70	14	9.50	15	10.20	
Works in govt. office	1	0.70	5	3.40	6	4.10	
Other	0	0.00	12	8.20	12	8.20	

Variables	Empowerment status				Total		*P-Value
	Low		High				
	Number	Percent	Number	Percent	Number	Percent	
Religion							
Hindu	46	31.30	58	39.50	104	70.70	0.076
Buddhist	21	14.30	11	7.50	32	21.80	
Muslim	4	2.70	7	4.80	11	7.50	
Qualification at marriage**							
Illiterate	29	19.70	4	2.70	33	22.40	0.000
Below SLC	37	25.20	16	10.90	53	36.10	
Intermediate or equivalent	5	3.40	32	21.80	37	25.20	
Bachelor and above	0	0.00	24	16.30	24	16.30	
Monthly Income in Rupees**							
Below 10,000	16	10.90	8	5.40	24	16.30	0.000
10,000-20,000	11	7.50	42	28.60	53	36.10	
Above 20,000	44	29.90	26	17.70	70	47.60	
Gadgets**							
Items below 6	12	8.20	18	12.20	30	20.40	0.000
6 to 11 items	57	38.80	25	17.00	82	55.80	
All the 11 items	2	1.40	33	22.40	35	23.80	
Property Ownership(in rupees)**							
No property	23	15.60	3	2.00	26	17.70	0.000
Upto 1 lakh	31	21.10	9	6.10	40	27.20	
1 lakh to 10 lakhs	9	6.10	32	21.80	41	27.90	
More than 10 lakhs	8	5.40	32	21.8	40	27.20	

Variables	Empowerment status				Total		*P-Value
	Low		High				
	Number	Percent	Number	Percent	Number	Percent	
				0			

Source: Field Survey, 2013

** Significant at 1% level of significance.

(p-value is based on chi-squared test); The eleven gadgets refers to television, vacuum cleaner, air conditioner, telephone, washing machine, refrigerator, micro oven, computer, radio, cell phone and gas stove; Property ownership includes the tentative estimation of material resources

Table 2 shows that job status, qualification at marriage, monthly income, gadgets and property ownership have significant association with empowerment level at 1 percent level of significance. It is also found that there is no significant association of empowerment level with

age, age at marriage, religion, number of children and family head. So, it can be concluded that job status, qualification at marriage, monthly income, gadgets and property ownership are the

associated factors with empowerment level.

Conclusion

Based on above findings, it is found that that majority of the women are empowered in Bharatpur municipality, Chitwan, Nepal. Further job status, qualification at marriage, monthly income, gadgets and property ownership are the associated factors with empowerment level. Hence, the respondents should be aware on laws against violence and for their rights. They should approach for judicial treatment when they are victims of

violence. Their try for paid job needs to be developed. They are to be helped and encouraged for their try in paid job. They must be the members of social organization. Their mobility, access to media, facilities like health, transportation, education, etc. are to be promoted. Their decision power mainly on economic matter and on career building is to be enhanced. The government should launch some programs to increase the empowerment of the women.

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Annex I- Index Variables with Maximum and minimum value of index no.

Variables	Maximum value	Minimum value	Mean value
Media exposure	2	0	1
Help of local leaders in empowerment	2	0	1
Girls education status	2	0	1
Women health	2	0	1
Public transport for the women	2	0	1
Women headed business running	2	0	1
Recreation	2	0	1
Family planning	2	0	1
Casting vote in election	1	0	0.5
Voted in one's own choice	1	0	0.5
Worked for some candidate in election	1	0	0.5
Shared on politics with friends, relatives and others	1	0	0.5
Member of any political party	1	0	0.5
Stood in election	1	0	0.5
Victory in election (among candidates)	1	0	0.5
Spending life on their will	1	0	0.5
Need of higher education	1	0	0.5
Permission is to be given to join women organization	1	0	0.5
Protest on gender violence	1	0	0.5
Equal treatment to daughters and sons	1	0	0.5
Women to enjoy equal facility	1	0	0.5
Inherent parental property	1	0	0.5
Final decision on sex	1	0	0.5
Final decision on family planning	1	0	0.5
Final decision on abortion	1	0	0.5

Variables	Maximum value	Minimum value	Mean value
Final decision on pregnancy	1	0	0.5
Protest of marital rape	1	0	0.5
Change of some customs and culture	1	0	0.5
50% reservation on different sectors	1	0	0.5
Single lady should get property from husbands	1	0	0.5
Choosing life partner on their will	1	0	0.5
Knowledge on law/convention	1	0	0.5
Experience the violation of rights	1	0	0.5
Participation in social activities	2	0	1
Approach for judicial treatment	1	0	0.5
Try for paid job	1	0	0.5
Equal wage for equal job	1	0	0.5
Membership of women organization	1	0	0.5
Problems sharing with friends, relatives etc.	2	0	1
Feel need of women's groups	2	0	1
Participation in social welfare	2	0	1
Husband's help and care	2	0	1
Husband's praise and respects	2	0	1
Husbands trust	2	0	1
In-laws help and care	2	0	1
In-law's praise and respect	2	0	1
In laws trust	2	0	1
Owing, buying and selling of valuables	3	0	1.5
Decision on saving	3	0	1.5
Decision on job	3	0	1.5
Going market for shopping	2	0	1
Visiting local health service center	2	0	1
Visiting organization working for ladies	2	0	1
Visiting neighborhood for gossip	2	0	1

Variables	Maximum value	Minimum value	Mean value
Visiting friends and relatives	2	0	1

Original Research

Practice of Family Health among Women in Kaskikot VDC Kaski of Western Nepal

Mr. Krishna Prasad Tripathi

Abstract

This study has been carried out to assess practice of family health among women in Kaskikot VDC of Kaski district. The descriptive and analytical method of research has been used and the survey technique is used to collect necessary information. All the Women at least one child within 24 months in Kaskikot VDC were the population of this study. The sample size was 136 through census method. The interview schedule was the major tool of data collection. Collected data were analyzed both quantitatively as well as analytically as per theirr nature in table, and charts.Four husbands had already done vasectomy male permanent. Similarly 7 women out 39 had done female permanent; mini lap laparoscopy. Likewise 11 husbands used condom, 17 used female temporary like Norplant, Depo-Provera, Foam tablet, IUD etc.Most of the respondents were informed about safe motherhood from the formal education. Majority 123 out of 136 replied that their family arranged something like delivery kit, instant money, blood donor, ghee, new clothes, oil etc.

Keywords: Age at marriage,   contraceptive, family health, responsible parenthood,.

Background

Family is a group of biologically-related persons living together and sharing the common kitchen and purse Family is a group of two or more persons related by birth, marriage, or adoption and residing together in a household family starts with marriage. Family size is increasing with the child bearing.A state of positive interaction between family members which

enables each members of the family to enjoy optimum physical, mental, social and spiritual well being (US Bureau of Census, 1980). The health status of the family is a unit including the impact of the health of one member of the family on the family as a unit and on individual family members; also, the impact of family organization or disorganization on the health status of its members. (Online Medical Dictionary, 2012).

Family health is broadly subdivided into maternal and child health care, human reproduction, nutrition and health education. The concern is importance of the quality of life of the family (WHO, 2012). Factors influencing family health are: family size, age at marriage, birth spacing, relation with family members, economic condition, balance diet, quality education, proper housing and clothing, basic health care and facilities and so on. The roles of parents are as: policy maker, inspirer/motivator, leader/model, guide or educator, pal or friends. So the parents are the main persons of the family who lead their family members to achieve quality of life. They are fully response to their children for caring and sharing.

NDHS (2011). Family health is directly related to the health care services that a woman receives during pregnancy, childbirth, and the immediate postnatal period which are important for the survival and well-being of both the mother and the child. The findings can be used to identify subgroups of women at increased risk of mortality because of nonuse of maternal health services and to assist in the planning of appropriate improvements in services. Antenatal care (ANC) from a skilled provider is important to monitor the pregnancy and reduce the risk of morbidity for mother and baby during pregnancy and delivery About 6 in 10 mothers receive antenatal care from a skilled provider, a significant improvement from 24 percent in 1996. Fifty percent of women make four or more antenatal care visits during their pregnancy, a five-fold increase in the past 15 years. The median duration of pregnancy for the first antenatal visit is 3.7 months.

Eighty-two percent of mothers with a birth in five years preceding the survey were protected against neonatal tetanus. More than one in three births in the past five years have been assisted by a skilled provider. Skilled birth attendance has doubled over the period.In the two years before the survey, 45 percent of women received postnatal care for their last birth in the first two days after delivery. Only 38 percent of women were aware that abortion is legal in Nepal.

Increasing the percentage of births delivered in health facilities is important for reducing deaths arising from complications of pregnancy and improve in family health. Thirty-five percent of births took place in a health facility:26 percent were delivered in a public-sector health facility, 2 percent in government facility, and 7 percent in a private facility. Still two-thirds of births (63 percent) took place at home. There is a strong association between health facility delivery, mother's education, and family health.

The postpartum period is particularly important for women, as during this period they may develop serious, life-threatening complications after delivery. Evidence has shown that a large proportion of deaths occur during this period, with postpartum hemorrhage being an important cause. A postnatal care visit is an ideal time to educate a new mother on how to care for herself and her newborn Therefore, it is highly recommended that women receive at least three postnatal checkups, the first within 24 hours of delivery, the second on the third day following delivery, and the third on the seventh day after delivery. Likewise, newborn care is essential to reduce neonatal problems and death. To identify, manage, and prevent complications, the government of Nepal recmmends at least three postnatal checkups for the newborn within seven days of delivery. From the literature the researchers made their research conceptual framework about the family health. So this conceptual framework could be presented in figure 1.

Figure 1. A framework summarizing the factors associated with Utilization of family health

Independent Variables	Intermediate Variable	Dependent Variable

Education

Occupation

Economic Condition

Social norms and values

Family size

Household head

Age at marriage
Pregnancy

ANC, PNC, Delivery Care,

Family Planning
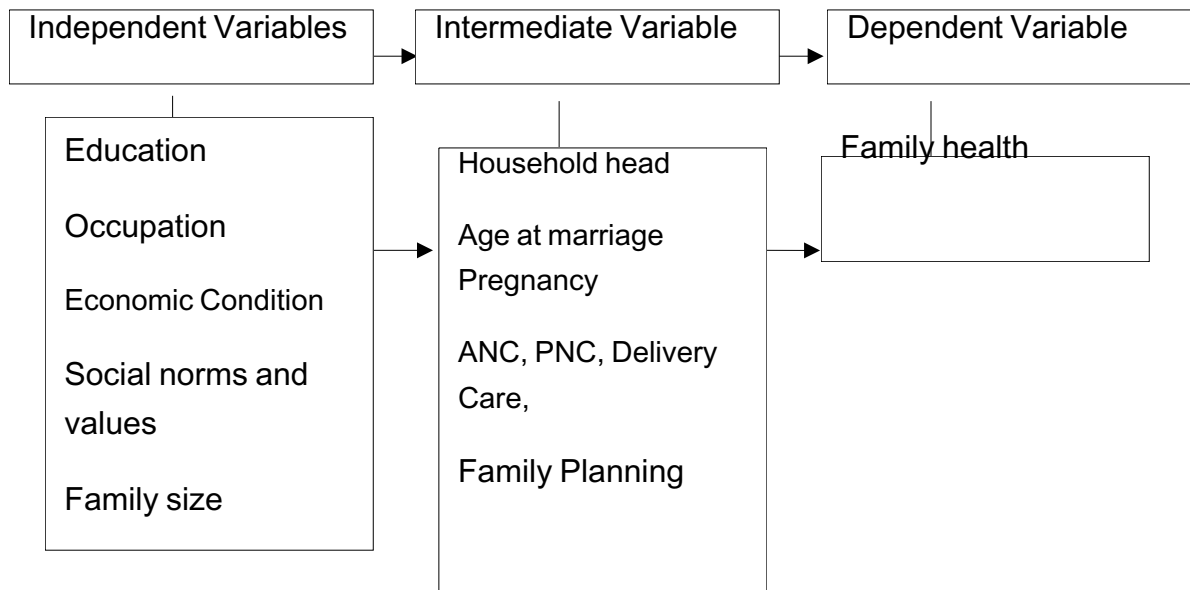
Family health

This conceptual framework showed the relation among the independent variables, intermediate variable and dependent variable. Whereas dependent variable is Family health. Itis influenced by intermediate variables like: Household head, Age at marriage, Pregnancy, ANC, PNC, Delivery Care, Family Planning birth spacing and role of parents. Than these intermediate variables are affected from dependent variables which are education, occupation, economic condition, Social norms, family size, customary and so on.The main objective of this study is to examine the practice of family health among women in Kaskikot VDC.

Data and Methods

The study aims to examine the practice of family health. The descriptive and analytical research design has been applied for the study.The nature of the study was quali-quanti. The primary data were taken from mothers who had at least one child within two years, health post in-charge, MCHW and MCHVs. were the key informants. Similarly, eleven

mothers were involved in two groups for focused group discussion to ask about family health. All the Women having at least one child within 24 months were participated in the survey.

Multi stage sampling techniques have been used. Kaskikot VDC was chosen through convenience sampling. One hundred and thirty six mothers having the children of age 2 years were included and mothers who went out from the homes were excluded. Questions were pretested with 5 mothers in Sarangkot 5 and consult the supervisors to find its reliability. Interview schedule was the main tool for primary data. Univariate and bivariate Bivariate measures have been used. SPSS has been used to analyze the data. An ethical approval was taken from research management cell of PN Campus. The respondents' information were treated in confidence and used solely for the purpose of this study. Female assistant was used to collect data from the females.

Results and Discussion

Age at marriage & age at first pregnancy

Early marriage in Nepal is closely linked to the widespread practice of arranged marriages, where relationships and agreements between families prevail over individual choices. Thus, a decline in very early marriage, accompanied by a decrease in the interval between marriage and cohabitation, may indicate a change in the marital decision-making process and an increase in the level of involvement on the part of spouses in the formation of their own marital unions.

Early marriage is prevalent in Nepal and the study area is not exceptional to this issue. Marriage in a early age leads to early pregnancy which may severely affect the health of mother and child. Fertility levels are one of the most important factors that determine the size and structure of the population of a country. Attitude and practices relating to pregnancy and childbirth in Nepal are influenced by social, cultural and religious factors.

Maternal age at conception has long been demonstrated to have a significant correlation with pregnancy outcome and maternal health. Classically, very young (<20 years old) and old (>35 years) women have been classified as high-risk categories for child bearing.

Table 1: Age at Marriage & Age at First Pregnancy

Age at Marriage	Age at First Pregnancy		
	15 to 20	21 to 35	Total
Under 15	1	0	1
15 to 19	36	44	80
20to 34	0	55	55
Total	37	99	136

Source : Field Survey 2015

Table 1, showed only one woman married under 15 years.Similarly 80 women married 15 to 19 years among them only 37 women were pregnant at the age of 15 to 19 years Likewise 55 women married at the age of 21 to 35. Majority 99 women had pregnant at the age of 20 to 34 years. The result showed that most of the women were aware on the time of first pregnancy. Since a couple of decades, the world is witnessing remarkable advancements in science, literature, arts, and virtually every other field of life. Much such advancement, especially in science and technology has unquestionably created great ease for the human race and in unwanted pregnancy.

Number of Children &Problems Seen at Pregnancy

Number of children ever born reflect the accumulation of births and therefore have limited relevance to current fertility levels. Particularly Nepal has experienced a decline in fertility from 2.4 to 1.3. Which is typically greater for older than younger women. Nevertheless, information on children ever born (or parity) is useful in looking at a number of issues.

Comparisons of differences in the mean number of children ever born and surviving reflect the cumulative effects of mortality levels during the period in which women have been bearing children. Table 3 showed the relation between numbers of Children &Problem Seen at Pregnancy,

Table 2: Number of Children &Problemsduring Pregnancy

Number of Children	Problems Seen at Pregnancy					
	Yes	Percent	No	Percent	Total	Percent
1	25		54		79	
2	9		36		45	
3 and more than 3	2		10		12	
Total	36		100		136	

Source : Field Survey 2015

Table 2 showed that 79 women had only one child in which 25 women had the problems at pregnancy. Similarly 45 women had two children, among them 9 faced problems at pregnancy. Only 7 women had 3 children, among them 2 faced the problems. On the other hand 5 women who had 4 or more children didn't face any problems. It means that those women who hadn't any problems at pregnancy could produce more children. Carrying twins, triplets or more than one baby puts the pregnancy in the high-risk category. Multiple births increase the chances of gestational diabetes, premature labor, and pregnancy related high BP.

Use of Contraceptives

Contraception is the use various devices, drugs, agents, sexual practices, or surgical procedures to prevent conception or impregnation (pregnancy). Contraception helps women plan if and when they want to have a baby. The condom is the only current contraception device that helps protect sexual partners from STIs.Birth control involves one or more actions, devices, sexual practices or medications followed to intentionally prevent or reduce the likelihood of pregnancy or childbirth. The three main routes of birth control to prevent or end pregnancy include contraception (the prevention of fertilization of the ovum by sperm cells), contraception (preventing the fertilized egg from implantation and the chemical or surgical induction of abortion of the developing embryo/fetus. The term emergency contraception is often used instead of contraception.

Respondents were asked whether they used contraceptive devices or method at that time or then. Minority 56 (41.17 percent) out of 136 women used contraceptives among them 39 used modern methods and 17 used traditional methods or devices. Majority of respondent didn't use contraceptives because their husbands were out of home. It means that they were foreign employee.Four used female contraceptives like Dipoprovera, (Tin mahine sui/sangini) oral pills. Similarly two respondents used male contraceptives. It showed that female were aware about contraceptives.

Table 3: Use of Contraceptive

Particular	Number	Percent
Male permanent	4	10.25
Female permanent	7	17.24
Male temporary	11	28.20
Female temporary	17	43.58
Total	39	100

Table 3 showed that four male had already done vasectomy male permanent. Similarly 7 women out of 39 had done female permanent; mini lap or laparoscopy. Likewise 11 husbands used condom, male temporary. Most of the women (17 out of 39) used female temporary like, Norplant, Depo-Provera, IUD etc.Respondents were asked if they used contraceptives ever times. Minority 60 out of 136 replied that they used. Among them 51 used modern devices and 9 used traditional methods. Majority of respondents (35 out of 51) used male temporary. Only 16 out of 51 used female temporary. On the comparison of both ever they used and currently used family planning devices. Female education helps to create small, happy family size.

3.5   Number of Children &Current Use of Contraceptives

Sixty-one percent of all women worldwide who are within the reproductive age (15-44 years old), are using methods of contraception (methods used to deliberately prevent pregnancy). These estimates vary by region: In developed countries, 69% of women used methods of contraception, yet in developing regions it was only 59%. The most commonly used methods worldwide are female sterilization (21%), the I.U.D. (14%), and oral contraception (7%). Over the past 10 years, contraceptive use has increased in developing countries; however there is still a high unmet need for family planning services. No method of contraception is 100% effective other than complete abstinence from sexual intercourse. However, many methods exist that are close to 100% effective if used consistently and correctly. Factors contributing to unintended pregnancy are complex, and may involve the interplay of emotional, psychological, political, religious, cultural, and economic forces(MoPH, New Era and Macro International, 2006).

Table 4:   Number of Children &Current Use of Contraceptives

No. of Children	Currently Using Contraceptives					
	Yes	%	No	%	Total	%
1	28	35.44	51	64.56	79	100
2	23	51.11	22	48.89	45	100
3 More than 3	5	42.85	7	59	12	100
Total	56	41.17	80	58.83	136	100

Source : Field Survey 2015

Table 4 showed that 79 women had only one child among them only 28 women used contraceptives and 51 women did not use contraceptives. Similarly 45. Women that had two children among them 23 used contraceptives. Likewise the women who had 3 children were 7. Among them 3 used contraceptives. Only five women had more than 3 children among them only 2 women used contraceptives. In totality 56 (41.17 percent) out of 136 women used contraceptives.The trend of using contraceptive either they had one child or more than that.Nearly 40 percent female used contraceptives. The women who had only one child used least contraceptives on the comparison to other women who had more than one child.

Birth Preparedness

The birth-preparedness package (BPP) promotes active preparation and decision-making for births, including pregnancy/postpartum periods, by pregnant women and their families The Ministry of Health and Population (MoHP) in Nepal has confronted high rates of maternal and infant mortality during the past two decades through various approaches. The safe motherhood plan of the MoHP defines a range of complementary interventions

to improve maternal and newborn health, one of which is the birth-preparedness package (BPP). The purpose of the package is to encourage pregnant women, their families, and communities to plan for normal pregnancies, deliveries, and postnatal periods and to prepare to deal effectively with emergencies if they occur. The BPP is a demand-creation intervention that promotes key messages and behavior change via inter-personal communication through community health volunteers.

Birth-preparedness programmes generally address 'three delays' to care seeking for obstetric emergencies delay in recognition of problem, delay in seeking care, and delay in receiving care at facility. These delays represent barriers that often result in preventable maternal deaths(Amnesty International 2010).

Respondents were asked if their family arranged any preparedness for the delivery service majority 123 out of 136 replied that their family arranged something like delivery kit, instant money, blood donor Ghee, new clothes, oil etc. Table 6 showed husband occupations and preparedness of it.

Table 5: Husband's Occupation & Birth Preparedness

	Birth Preparedness							
Husband's Occupation	Delivery Kit		Instant Money		Blood donor		Nutrient Food	
	yes	No	yes	No	yes	No	yes	No
Household Worker	3	0	13	0			12	0
Foreign Job	8	0	59	0	5	0	49	0
Gov. Job	4	2	25	2	11	1	20	1
Business	3	0	12	1	5	0	10	1
Labour			4	0	2	0	4	0
Private Job	2	0	8	0	4	0	8	0

Total	20	2	121	3	27	1	103	2

Table 5 showed that whose husband induced in household workers managed 3 delivery kit, 13 managed instant money and 12 managed nutrient food. Similarly 8 foreign job holders prepared delivery kit, 59 arranged instant money, 5 arranged blood donor and 49 arranged nutrient food. Similarly government job holder 4 husbands prepared bought delivery kit, 25 saved the money, 11 arranged blood donor 20 arranged nutrient food. Likewise 3 business holder husband bought delivery kit, 12 saved instant money, 5 arranged blood donor and 10 arranged nutrient foods. Only 4 labors saved money, 2 labour managed 2 blood donors and 4 kept nutrient food for the preparedness of delivery. Similarly 2 private job holder husband bought delivery kit, 8 saved the money, 4 arranged blood donor and 8 kept and arranged nutrient food.

Table 5 showed that 20 women prepared or bought delivery kit. Almost of the pregnant went to hospital but they prepared the kit because in case of they delivered at home they could be used it. Similarly 14 people out of 136 saved money for the delivery. One businessman and two private job holders replied that they didn't save any money for it because they thought it hadn't needed because the government made it free. Similarly 27 husbands managed replied that he could provide the blood, if she needed. Likewise 103 husbands arranged nutrient food for the period. Only one business man and one government job holder replied that they didn't prepare nutrient food for that period because they felt that they had good nutrient food using all the time so it was not needed extra nutrient food. Husband's occupation and preparedness of things are related each other. Higher the income, higher the preparedness and lower the income, lower the preparedness for the delivery. Most of the respondents 121 among 136 saved money for that time. They said if they had money they could call taxi, buy delivery kit, could arrange

blood donor and could buy nutrient food.

Qualitative information also revealed that family members were aware about the health of pregnant member so they prepared so many things like instant money, new clothes, nutritious food especially eggs, chicken mutton etc. No one replied that they went to hospitals when they had delivered. Their friends went to Marry Stop and hospitals if they didn't want the next children. One of the participants made her friend to go to hospital and took the necessary information about abortion.

Conclusion

The result showed that most of the women were aware on the time of first pregnancy. One quarter of pregnant women faced many problems like, swelling, abdominal pain ,severe bleeding, high fever, faintness, vomiting and backache. They are needed to consult doctors in time as a result, they needn't face further complications. Household workers, labors and private workers have more chance to have more children if they don't use contraceptives so they are focused to use contraceptives by the health personnel. Four husbands had already done vasectomy male permanent. Similarly 7 women out 39 had done female permanent; mini lap laparoscopy. Likewise 11 husbands used condom, 17 used female temporary like Norplant, Depo-Provera, Foam tablet, IUD etc.Most of the respondents were informed about safe motherhood from the formal education. Majority 123 out of 136 replied that their family arranged something like delivery kit, instant money, blood donor, Ghee, new clothes, oil etc.

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Original Research

MEDIA LIBERTARIANISM FOR RECIPROCITY AND INTERACTIONS: FACEBOOK USE BY PUBESCENT IN POKHARA, NEPAL

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ABSTRACT

Facebook has created different types of positive and negative impacts, challenges and opportunities in the society. The impact of this social site is harsh on youths. Pedestal on impacts, opportunities and social challenges created by Facebook, the prime objectives of this article are to analyze the use pattern of Facebook for social networking by pubescent and the upshots of Facebook uses on them. Qualitative and quantitative data from both primary and secondary sources were espoused in the study. Primary data were collected through field study espousing the instruments viz. questionnaire, participant observation and key informant interviews. Pubescent are incorporating new media into their behaviors and social practices in a way where the technology is a sheer means to socialize and also the medium of enthrallment and exchanges geared primarily towards social engagement and cultural exchanges based on the principles of reciprocity, mutual obligation and anticipation that grow in space and time with concerns over security, privacy, safety and online communication that affect and relates to relationships, personality, and identity presentation of pubescent. The use of Facebook amid raising consumerism is accountable for democratization, westernization and opening of Nepali society and culture however it has resulted in cultural pollution. Pubescent frequency of Facebook use, parent-children-school relations, intention, awareness and perception on risks and benefits of Facebook are closely linked to the pattern of use and misuse of Facebook.

Key Words: Communication, Social media, Facebook, Consumption media, Pubescent

Background

Communication is a form of interaction which takes place through symbols and signs and where symbol can be gesticulation, pictorial, plastic verbal or any other which operate stimuli to behavior that would not be evoked by a symbol itself in the lack of special conditionings of the persons who responds. Smith (1986) informs that communication is a way of sending meaningful message from one person to another. Firstly, it presupposes a communicator and a receiver. Secondly, there is a relationship of mutual awareness between them, or a kind of orientation of one to another. Thirdly, it implies an intension, especially on the part of the communicator, an external referent –what the message is about; a common language and some sharing of experience.

Modern day communication studies are focusing on the challenges of communication in a diverse and often computer mediated society. Modern students of communication draw on theories and practices common in the field of anthropology, psychology, sociology, linguistics,

semiotics and rhetoric. The evolution of human linguistics and symbolizing ability is functionally linked to the evolution of cultural and social systems depending on constant and complex communicative acts. Levi-Strauss (1969) links the idea of communication with the basic structures of reciprocity and exchange that are central to human society. He examines systems of exchange and circulation of goods or preventatives, and of women, as system of communication in between social groups. Goody et.al (1958), in their studies of literacy and the evolution from primitive to advanced societies emphasized the role played by changes in technology and means of communication.

Anthropologist Mauss's book "The Gift" (1922) proposed that the social whole could be conceived as a system of exchange. The famous question in his book The Gift that drove his inquiry into the anthropology of the gift was: What power resides in the object given that causes its recipient to pay it back? The answer is simple: the gift is a "total presentation", imbued with "spiritual mechanisms", engaging the honor of both giver and receiver. Know—if you have a friend in whom you have sure confidence and wish to make use of him, you ought to exchange ideas and gifts with him and go to see him often. Tantamount to this, in the 21st century, Facebook, which was founded in 2004, has become a popular communication medium for online networking that allows registered users to create profiles, upload photos and videos, send messages, exchange ideas and keep in touch with friends, family and colleagues. Facebook allows anyone who claims to be at least 13 years old to become a registered user of the website (Mezrich, 2009).

Owing to its easy access Facebook has affected the social life and activity of people in various ways. With its availability on mobile devices, Facebook allows users to continuously stay in touch with friends, relatives and other acquaintance wherever they are in the world, as long as there is access to the Internet. It unites people with common interests and/or beliefs through groups and other pages, and has been acknowledged to bring back together missing family members and friends because of the widespread reach of its network. However, in anthropological researches, Facebook is a modern issue and the anthropological researches on Facebook are rare and regarded unusual.

Currently Facebook is considered as the most accepted social networking site with both positive and negative implications. The speeding up of Facebook social networks has resulted in a kind of shift from sociology to anthropology with a hub on its cultural implication to multiple audiences across diverse cultures with communicative instrumentalism which is dynamic under ever changing behavior of people. Although with a short history, Facebook has made a rapid growth in different societies including Nepal. It is popular media among Nepalese pubescent with a high frequency of Facebook use. However, Facebook, though, is beneficial to one's social life; it can cause antisocial tendencies and negative behaviors of populace as they are not directly communicating with each other. This vast cyber-culture has created a whole new method for people to judge each other without even meeting each other face to face. From anthropological standpoint Facebook has created a whole new method of and voyeurism easy access for communication that has impinges on interpersonal relationships and the ethnography of communication between people of various cultures (Drotner, 2000).

The objective of Facebook was to allow students and young adults to share their common interest, but with the time it has lost its true essence. The use and misuse of Facebook in the time being has added to numerous opportunities and challenges in the society. As there have been very little research works on Facebook use in Nepal exploring the opportunities and challenges created by this new social media, hence it is exceedingly necessary to conduct rigorous study on the uses of Facebook as a social media by the youths in urban Nepal where

this social media is used extensively. In Pokhara sub-metropolitan city (tourism hub of Western Nepal) the trend of rapid urbanization and modernization has made this social media a necessity of the people especially the youths. Currently there are no published works on the patterns of Facebook use of youths in Pokhara; hence this study fills up the lacuna and tries to accomplish the existing gap in knowledge in this field. As one of the greatest products of the 21st century, Facebook is a modern phenomenon that deserves critical study. This study focuses on how Facebook evolved into popular social-networking site; the concerns over privacy, security, and safety; and how online communication affects and relates to relationships, personality, and identity presentation of pubescent in urban Nepal. Pedestal on opportunities and social challenges created by new social media Facebook, the key objective of this article is to analyze the use pattern of Facebook for social networking by pubescent and to explore the upshots of Facebook uses on pubescent in Pokhara sub-metropolitan city. Based on Mauss's work "The Gift" few assumptions are devised in this study:

    a) Culture and media are intimately tangled to fix-share-exchange and store cultural expressions, impressions and collective experiences of friends.
    b) Facebook, a new media, is a method for developing a liaison to society but it is full of risk, opportunities and challenges.
    c) Facebook is an idyllic foundation for theory of cultures based on reciprocity analogous to 'gift'.

Data and Methods

Pedestal on the case studies of a cluster of schools situated in Pokhara sub-metropolitan city of Kaski district in western Nepal, pubescent students from five Higher Secondary Schools (HSS) of Pokhara viz. SoS Gandaki, located in Pokhara ward number- 15, Bethany HSS located in Milan Tole Pokhara- 15, Global Collegiate Higher Secondary School (HSS) located in Pokhara-10 Ranipauwa, Rainbow Academic Homes HSS located in Pokhara -15 Kolpatan and Golden future HSS located in Pokhara -15 Rambazar, were selected for the study. The rationale for the selection of these clusters of schools is that these schools are the English medium schools with students from middle class families and with different social and cultural similarities in an urban context. The case studies of a cluster of schools situated in Rambazar area of Pokhara with middle class family students resembling numerous social and cultural similarities represents the higher secondary students in terms of economic and social-cultural identities and similarities. Likewise, owing to the raising trend of rapid migration, urbanization and modernization of Pokhara, the newly introduced social media Facebook has become quite popular and a necessity of boarding school students due to which pubescent users of Facebook has increased drastically. Some take it as a useful tool where others have just the opposite view. Nonetheless, the pattern of Facebook use is ultimately going to affect the career, study and learning of the students. There are different opportunities and challenges created by this new social media; hence it is exceptionally rationale to conduct study on the uses of Facebook as a social media by the youths.

There are altogether 2576 students in the sampled 5 higher secondary students of Pokhara. Among these 2576 students, the total number of Facebook user student is 773 i.e. 30%. Out of 773 Facebook user students, 396 are boys and 377 are girls. Hence, based on quota sampling where gender is the basis of stratification, for this study, 120 boys (15.52 percent) and 100 girls (12.93) were selected altogether, consequently making a total of 220 (28.45%)

Facebook user students. Pedestal on World Health Organization (1986) categorization of adolescence, students in their late pubescent age ranging from 16 to 18 were regarded as pubescent Adolescence or pubescent begins with the onset of physiologically normal puberty, and ends when an adult identity and behavior are accepted. This period of development corresponds roughly to the period between the ages of 10 and 19 years, which is consistent with the World Health Organization's definition of adolescence. Early adolescence prevails during 10–14 years and late adolescence stretches up to 15–19 years.

The nature of data is both qualitative and quantitative. Sources of data were both primary and secondary. Primary data were collected through field study by espousing structured questionnaire, observation method for observing specific behaviors and key informant interviews. List of questions were enlisted in questionnaire anticipating the answers on various aspects of pubescent Facebook use pattern, uses and misuses and ramifications of its use. Observation technique was espoused to observe pubescent student behavior towards Facebook, pattern of use, mind-set on Facebook etc. Eleven key informants (three school teachers, three parents and 5 schools principals separately) were taken for checking the reliability and the cross checking of collected data. Secondary data were collected from books, reports, brochures, profiles, internet sources, books and journals. Secondary information depicts the various facets of Facebook use including the dynamics and approaches on Facebook communication. Collected data was analyzed both qualitatively and quantitatively using computer program SPSS for windows. Simple statistical tools like frequency and percentage were used. Moreover tabulation and graphic representation was made to present the data.

The research was based on two weeks (November 3-16, 2014) participatory data collection with sampled high school pubescent students on their Facebook use pattern.

CONCEPTUAL SKETCH OF THE STUDY

In a world of media libertarianism and democratization of cultures, Facebook use as a social network for reciprocity and interactions is responsible for developing liaison and adding to social capital, change in social-cultural institutions and social practices in urban Nepal. The misuse of Facebook amid raising consumerism and effect of this media on pubescent is liable to cultural pollution. Pubescent frequency of Facebook use, parent-children-school relations, intention, awareness and perception on risks and benefits of Facebook may be closely linked to the pattern of use and misuse of Facebook. The framework (Figure 1) illustrates the vital role of parents and schools on the pattern of pubescent Facebook use mold.

Figure 1: Conceptual Sketch of the Study
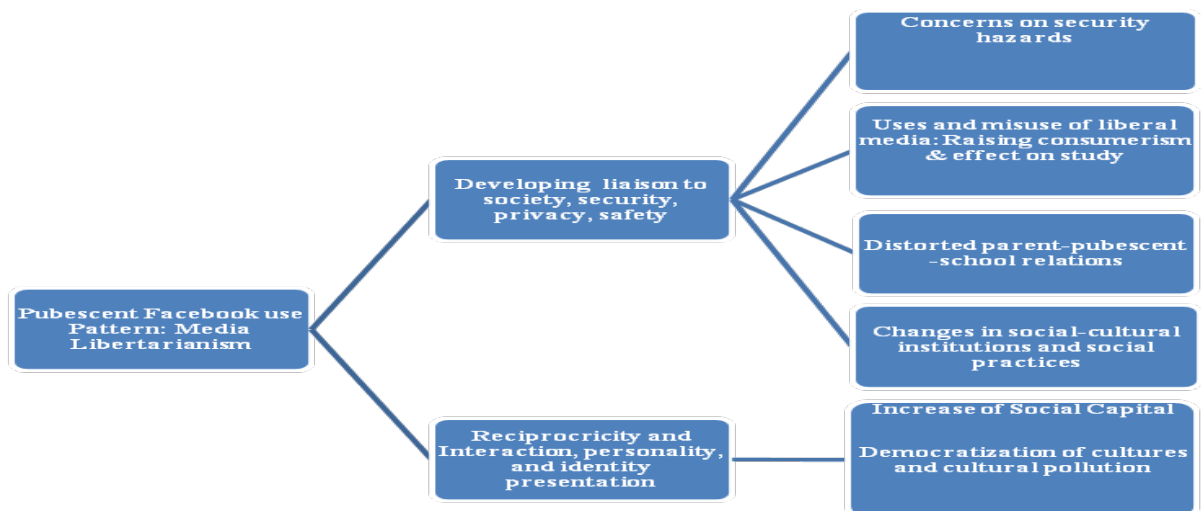
Results and Discussion

Communication as an academic discipline relates to all the ways we communicate, hence it embraces a large body of study and knowledge. It is an essential element so it is often taken in anthropological theory to be paradigm of all cultures and of all social organizations. Smith (1986) identifies different forms of communication: verbal or linguistic; paralinguistic, or non-linguistic. Of those forms, models derived or adopted from linguistics have been extremely influential in the formation of anthropological models of cultural and social organization. Paralinguistic communication, which accompanies language and provides extra messages about it, has been a focus of interest in anthropological linguistics and in the ethnography of speaking. Pedestal on paralinguistic communication, Facebook is a recent creation however anthropological researches on Facebook are atypical. At present Facebook is considered as the most admired social networking site with both positive and negative insinuations. The acceleration of Facebook social networks has resulted in a kind of shift from sociology to anthropology with a hub on its cultural insinuation to multiple audiences across diverse cultures with communicative instrumentalism.

Intermission of Facebook Use

Communication is a dynamic interpersonal process which is never-ending. It is dynamic in the sense that it happens under ever changing behavior of people. Facebook though a petite history, has made a rapid growth. In the current study, it has been deduced that the respondent pubescent students (16-18 years of age) have been using Facebook since 2008 when it was first introduced in Pokhara (Table 1).

Table 1: Duration of Facebook Uses

Duration	Frequency	Percent	Cumulative
Since its entry in Pokhara in 2008	22	10.0	10.00
Since more than a year	113	51.36	61.36
Since one year	48	21.82	83.18

|			
Since a month	37	16.82	100.00
Total	220	100.0	100.00

Source: Field Survey, 2014

Table 1 shows that majority of the respondents (61.36%) have been using Facebook since more than a year. The entry of the last year was substantially high, whereas the entry in the last one month was 16.82 percent.

Frequency of the Interval of Facebook Uses

The inter-relationship of Facebook and its users can only be understood with the frequency of the interval of Facebook use by Facebook users.

Figure 2: Frequencies of Facebook Uses
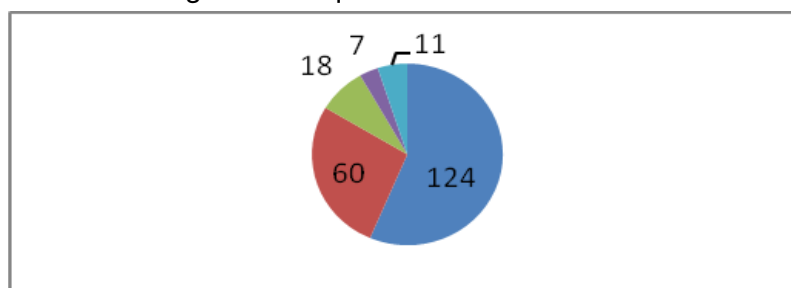
Source: Field Survey, 2014

A majority of respondents 124 (62 %) use Facebook daily whereas only few 7 (3.5%) use it once a month. The tempo of using Facebook is comparatively high that confirms that the pubescent are the regular users of Facebook. 67.73 percent pubescent are the high users of Facebook (Table 2).

Table 2: Tempo of Facebook Use

Tempo	Frequency	Percent
High	149	67.73
Medium	60	27.27
Low	11	5.00
Total	220	100.0

Source: Field Survey, 2014

Merely 27.27 percent of the total respondents claimed that their Facebook use pattern is medium because they use Facebook for 2 to three hours especially on holidays. Only 5 percent of users have a low tempo of half an hour to one hour use of Facebook intermittently. For the pubescent students Facebook is a good friend to connect with childhood friends and relatives who are far-flung. For the excessive users, hanging with Facebook for hours in a room would not have been possible if the users had claustrophobia (fear of restriction and suffocation in small rooms). Pubescent want a community that is totally private and from anthropological perspective this kind of condition is anomie or anarchy. Facebook is providing a means to complement the offline version of community and to live with all inconsistencies.

Intention of Facebook Uses

A more complete anthropological approach within communication ethnography acknowledges that the production, distribution and consumption of communication takes place within "particular performativity local contexts" and are structured by the agency of the participants (Drotner, 2000). However, in recent years communication ethnography has concentrated on

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the role of media in domestic or family context, the national culture and, of course, the so called world communities through the institutional sites where communication practices are situated from the locus of the articulation of many dimensions of social and political discourse (Morley, 2000). The social dimensions of Facebook users in current study are such that pubescent use it for different purposes in different dimensions in diverse contexts. It has been used to be up-to-date with close friends, childhood friends, to connect with relatives who are far-off and to keep records of events. Table 3 depicts the intention of Facebook uses on the part of pubescent.

Table 3: Intention of Facebook Uses

Purpose	Frequency	Percent
Chatting	55	25
News update	26	11.82
Time pass	12	5.45
Gaining knowledge	43	19.55
To meet old friends/kin	47	21.36
Upload Photos	37	16.82
Total	220	100.0

Source: Field Survey, 2014

Majority of students (25%) use Facebook for chatting, to meet old friends and kin (21.36%) and to gain knowledge (19.55%) (Table 3). Students regard Facebook as a substantial medium of news update as well as a favorite medium for time-pass. It is a site for uploading photos (16.82%). Facebook has been used by pubescent for chatting, news update and gaining knowledge by connecting with educational pages and for social purpose by uploading events, uploading festivals photos and status about different festivals. For them Facebook has been a medium of knitting and connecting with an intensely hectic society. Hence, this study understood Facebook uses in relation to anthropological studies of close-knit and intense society, not as part of sociology's encounter with contemporary individualism.

The capability that a user can communicate with other Facebook users in different places has turned this social network into a site for introducing and discussing new ideas. Relations between kin have become closer and wider than the past to the extent that Facebook have turned into an inseparable part of users' life. The first action in using Facebook by pubescent seems exchanging ideas with ex-school friends or relatives who have migrated long ago. Many of the pubescent used these networks for numerous hours a day in order to resurrect what is seen as a more traditional fondness to close social relationships that do come close to classical ideas of community where relationships and exchange between persons and kin relations, are usually seen as a means to grow culture.

Medium of Awareness on Facebook Hazards and Benefits

The students collected information on negative and positive consequences of Facebook from various sources and mediums. Among the respondents, 38.18 percent claimed that print media (newspaper articles) made them aware about the hazards and benefits of Facebook uses (Table 4).

Table 4: Medium of Awareness

Medium	Frequency	Percent
Print Media	84	38.18
Electronic Media	75	34.09
Pamphlets	33	15.00
Public programs/seminars	28	12.72
Total	220	100.0

Source: Field Survey, 2014

Electronic media like television, radio, and print media viz. pamphlets helped them in knowing about the risk, uses and misuses of Facebook. Few got awareness on Facebook uses by attending public programs/seminars.

Parents Reaction

While using Facebook, the respondents got diverse reactions from their parents. Of the parents, 44.09 percent ignored their children's Facebook use habits. .Meager 1.37 percent of the parents motivated and encouraged their children to use Facebook. Majority of parents (54.54%) reprimanded their children for Facebook use.

Table 5: Reactions of Parents

Reaction	Frequency	Percent
Ignore	97	44.09
Motivate	03	1.37
Reprimand	120	54.54
Total	220	100.0

Source: Field Survey, 2014

The overall result shows that majority of parents seems not contented with their children's Facebook uses habit.

Responses of school Administration

Due to the misuse of mobile phone for internet browsing and Facebook uses, schools allowed students to use it during their leisure time. 94.09 percent students reported that they were advised by the school administration when, and how to use Facebook only for academic purposes. But 5.90 percent of the respondent denies of such suggestions.

Facebook as a Consumption Media: Use and Misuse

Boethius (1995) argues that media studies have been transformed during the past three decades by the recognition that consumption of media massages has to be understood and interpreted as a practical activity and hermeneutic process before any assumptions about the effects of media upon audiences, whether intended or unintended by producers, can be made. The Facebook as a consumption media, if used or distorted, has its own effects. Facebook if misused create negative impact on the lives of the people and ultimately society. Although Facebook was created with the notion of allowing students and young adults to share their common interests, but with time it has gone far ahead from its true essence. Facebook has

been blocked intermittently in many countries as Pakistan, China, Iran, Uzbekistan, Syria and Bangladesh on different bases. In Islamic countries Iran and Bangladesh it was banned on the basis of allowing content judged as anti-Islamic and containing religious bigotry. In Nepal and many other countries Facebook is banned at many workplaces to prevent employees from using it during work hours. Among 220 respondents in the current study, 197 (74%) students reported that Facebook has influenced their daily activities. When asked, whether the influence is positive or negative, the students responded as follows:

Uses of Facebook: Positive and Negative

Interestingly, abiding by usual human habit, 220 respondents claimed the positive uses of Facebook. The largest proportion of respondents (44.54%) alleged to use Facebook to share knowledge which they regard as a positive use of Facebook (Table 6).

Table 6: Positive uses of Facebook

Positive influence	Frequency	Percent
Sharing knowledge/information	98	44.54
Making friends	20	9.09
Communicating social works	17	7.72
Updating issues/awareness creation	45	20.45
Knowing near and dear one who are far	27	12.27
Searching old friends	13	5.90
Total	220	100.0

Source: Field Survey, 2014

Majority of students (44.54%) make use of Facebook for sharing knowledge which they regard as positive use. They use Facebook for study purpose by uploading status about the study materials. Of the Facebook user sStudents, (20.45 %) used Facebook for updating new issues and 5.90 % use Facebook to search old friends. Facebook was used to be up-to-date with the latest news from different media, to connect with friends and to share information and photos to know the activities of friends. The positive influences of Facebook have been to connect with the relatives and to share movement which cannot be forgetting ever. It was as an opportunity to share important moments. Students alleged that many social changes take place due to the Facebook. For example extensive use of Facebook was the main cause of Arab Spring and political uprisings in Tunisia, Egypt and many other Arabian countries. In Nepal also political parties and leaders made an extensive use of Facebook for campaigning during the second constitution assembly election in 2013.

On sharing knowledge they claimed that there are many useful information and articles that are shared by different authors and friends from which they can get information on contemporary matters. It is socially beneficial also, for example, they can ask for help for social purposes from different people. They can collect money for the patients suffering from severe illness like kidney failure. It can be used to wish birthday, Dashain, Holi, Tihar, Christmas etc. It is the modern technology which makes people aware about different matters. Many respondents think that Facebook have no any major negative affects on Nepali culture and society, contrary, many positive change is noticed. For instance Facebook users are always hectic hence there are less chances for loitering outside doing unnecessary activities. They observed many changes in the society after the use of Facebook. The major noticeable change is that the Facebook users are capturing the picture everywhere to upload in the

Facebook. They can use Facebook for social purpose by sharing the pages about social disorders, sexual abuse, child rights, gender issues etc which provides useful information on social issues and hence can create awareness. Furthermore, they get information about different fashion, technology, lifestyle etc. It is beneficial for those who are far away from their loved ones and want to keep in touch, specially, it is found to be a great source of association for armed force personals when they are far away from their homes. Pokhara is a place with a heavy influence of Lahure culture (traditional career in Indian and British military as well as private/public sector in India). Many of the ethnic Gurung and Magar families have settled in United Kingdom and Hongkong. Families settled abroad would like to have strong communication with their homeland, kith and kin. Facebook is supportive for them in communicating with their families, Diaspora populations and understanding the effect of their residence in different countries. Facebook has proved to be a kind of meta-friend if used properly.

Perception on Negative Impacts of Facebook: Disarray Created by Facebook

Facebook if misused has more defects than utilities. Some negative impacts of Facebook (if misused) as considered by respondents has been tabulated and presented in Table 7. Students (37.73%) regarded Facebook use as just the waste of time. For them negative impact of Facebook is a distress, and the safety of user accounts has been compromised several times. They take it as addiction/lousy killing the precious time and hampering daily works. Respondents (25.45%) deem that Facebook provoke unwanted tension and mental problems. The excessive use of Facebook can create psychological health problem and aggressive behavior.

Table 7: Negative Impacts of Facebook

Negative Aspects	Frequency	Percent
Waste of time, addiction	83	37.73
Unwanted tension/psychological health problems/aggression	56	25.45
Social insecurity, illegal relations between boys/girls, ruins life	37	16.82
Loss of money	27	12.47
Losing privacy, family disintegration	17	7.73
Total	220	100.0

Source: Field Survey, 2014

Social insecurity, illegal relations between boys/girls was reported by 16.82 % students. Loss of money was reported by 12.47% respondents. They think they can lose privacy by the use of Facebook (7.73%). Knowing about each and every moment of others personal lives can prove to be very dangerous on many occasions. Facebook invites social insecurity. It brings intimacy between boys and girls leading to illicit relations which may aggravate problems in future. Students argued that many people are using Facebook from their fake id which can ruin others life. Pictures are being edited in wrong way. People are easily attracted towards western cultures. They have read in Newspapers about much disorder in the likes and lives of the people by its use. Family disintegration has been augmented by Facebook. 'Many couples rise to the stage of divorce due to the misuses of Facebook', respondents informed. Sexual harassment has been made possible by Facebook. Pubescent are invoked in different addictions and getting less interest and motivation towards their culture. Many students claimed that although membership in various sites is free of charge; but nothing is really free

and in return for the free use of electronic services of these websites, individuals put the major part of their mysteries at the disposal of the networks. The key negative aspect of Facebook is that it has a very narrow border line between favorite pass time and addiction. One starts using it at first to catch friends and ultimately ends up with a lot of copious time in taking playful quizzes and exploring various Facebook applications which has influenced the social life and activities positively and negatively. It has allowed users to incessantly hang within touch with friends, relatives and other acquaintances wherever they are, as long as there is access to the Internet. It is uniting them with common interests and/or beliefs through groups and other pages, and proving to be a catalyst to reunite friends because of the widespread reach of its network. However, the superfluous use of Facebook leads to psychological disorders like severe excitement, egotism and aggression among pubescent.

Ahuja (1982) notes that underdeveloped or traditional societies have little conflict, traditional and early modern societies have the most, and late modern societies have almost none. But, as individual, social and cultural freedom increases in democratic societies, social conflict also increases and as freedom diminishes, conflict decreases. The social conflict cycle is highly correlated to the general political cycle. Over the last few years after the start of the Islamic awakening in the Arab states, people and especially the youths have used Facebook network to announce their protest against dictators ruling over the Arab countries. This has taken place even in the western states and during riots in Britain and USA, economic crisis in Greece, youths well used the Facebook to advance their protests. Many governments deem that Facebook has helped in creating disorders in the society. In the current study, among the 220 respondents, 180 respondents reckon that Facebook has created disorder in the lives of people. They claimed that Facebook is more a disorder creator than a harmonizing media. A vast majority (74.09%) informed that Facebook has aided in creating disorder, personal defamation is the major disorder created by Facebook. Facebook had become a catalyst in the rise of criminal and dishonest activities and break-up of relations in the society. Facebook has proved to be exasperation to the people due to those users who give continuous pressure to acknowledge them. Various evil activities indubitably lead the societies in degradation of moral values and social norms if not checked in time. Respondents suggested that at first, people especially youths should be self-disciplined and they should know about the dreadful impacts of Facebook misuse. Youth should be taught to use Facebook for the benevolent purpose and for creating social, cultural and political awareness rather than creating disorder. Unnecessary issues and propaganda might create disorder in users' lives.

Facebook Impinges on Festivals and Culture of Sharing

The cultural studies approach focuses on the general relations between the social orders of a society and the totality of symbolic forms through which its meaning is explicated and expressed, in short its culture. Whilst they acknowledge the centrality of the mass media in relaying social meanings in modern societies therefore, supporters of this approach stress the need to situate the media in the context of the culture as a whole (Goody et.al. 1958). A subterranean linkage can be traced between media and culture-celebrations and observance patterns of festivals and ceremonies. Facebook not only influence in the personal lives of the people but has role in celebrating festivals as well. Some such influence has been depicted in table based on 67 respondents who responded on Facebook impinges on festivals. Among them, 14.09 % of respondents believe that Facebook has become a tool to express best wishes on festivals (Table 8).

Table 8: Facebook Impinges on Festivals & Culture of Sharing   N=220

| Influence	Frequency		Proportion
Wishing, exchanging/sharing ideas	31	11	14.09
Unique ways	27		12.27
Knowing before hand	07		3.18
Trust and goodwill	02		0.90

Whenever any festival approaches, Facebook users notice many wishes written on the Facebook wall. It reminds of the festivals. Their wishes help bind people together and express joys and sorrows at crucial hours-hence a new culture based on mutual sharing is created. Similar to Kula exchange system of Papua New Guinea, Facebook is becoming a perfect foundation for a theory of culture with enormous collection of ways of life, customs, practices and expectation, rituals based on spirits of good and evil, arts and artifacts, etiquettes of behavior, all of which make for a vastly more elaborate world. These possessions of culture rest on fundamental values by which people are expected to live and are judged. In turn these values craft goals in life that make it rich and complex. Under the Kula traditions who exchange the valuables become the celebrities of the Kula ring. Culture is what guarantee that the people get a life with the complex systems of exchanges based on principles of reciprocity and mutual obligation and anticipation that grow in space and time-first exchanges within Facebook users then through them to others. Hence, culture itself has grown or shrink through exchange that has helped in the democratization and opening of Nepali society and culture.

Drift of Westernization

Armstrong & Hagel (2007) squabble that the prevalence of social media has fundamentally changed the way we read and watch: we think about how we'll share something, and whom we'll share it with, as we consume it. The mere thought of successful sharing activates our reward-processing centers and in the process Facebook plays vital role in changing people's life style. Few such changes have been depicted in the current study depicted below.
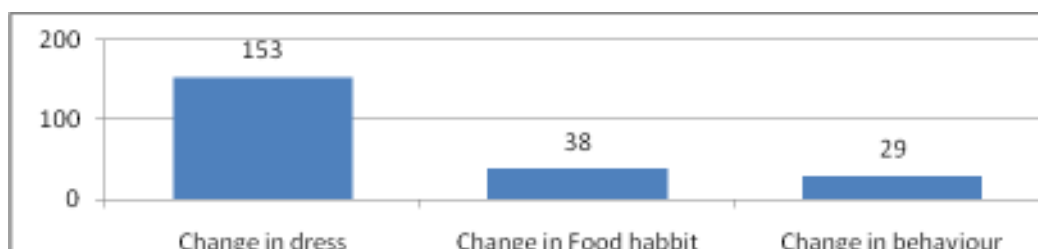
Respondents (69.55) deem that Facebook has brought change in their dress style while 38 (17.27 %) and 29 (13.18 %) respondents deem that change in their food habit and behavior respectively is due to Facebook use. People interact with each other in different ways and day by day the social relation has become more complicated owing to Facebook. Its expansion has led to the expansion and diversity of social interactions especially behavior. The latest type of human relations has been shaped in the Internet social networks. By sharing the private world of their users and minimizing the distance among them, these networks provide an easier impact in human life. It has become a method of rating anyone's social worth and is also responsible for rapid westernization of youths in the matters of dress and food habits. The social Facebook network has proved to be a pioneer for easier but risky communication. Respondents accepted that changes have occurred in their lifestyle.
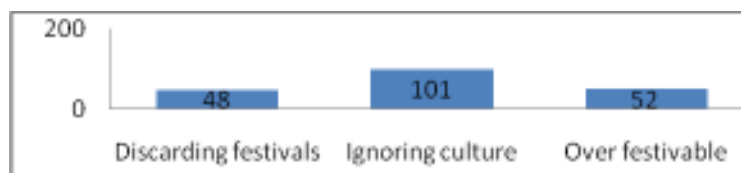
Respondents (45.90%) deems that ignoring their own cultural value is one of the major changes that occurred in their lifestyle which is due to westernization—a consequence of Facebook. Their life style has become more stylish. Discarding local culture, ignoring one's own cultural norms and to be more festive and lavishly are the consequences. Cultural pollution has become a nuisance. Dating culture has emerged; dating is assisting open sexual relation between youths. Obscene movies, misuses of others photos are pervasive as a result of westernization drift. Westernization embedded with democratization and liberalization of Nepali culture and society, is accountable for polluting the conventional norms of Nepali society.

Minimizing the Negative Impacts

Facebook is creating superfluous situation as responded by pubescent. If Facebook is not used properly it has more imperfections rather than expediency. Facebook use was regarded by many pubescent as just the waste of time. Mostly pubescent are destroying their time on Facebook use instead of focusing on study. Facebook is responsible for negative changes in social-cultural institutions and social practices. It is also responsible for raising social insecurity, losing privacy and creating irrational stress. To minimize the negative impacts of Facebook, the pubescent claimed that it is better not to make unknown people as the Facebook friends (31.82%) , to properly manage time for Facebook (23.18%), to maintain privacy (16.36%), to be aware (6.82%) and to make age limit to use Facebook (3.18%) (Table 9). Table 9: Minimizing the Negative Impacts

Ways	Frequency	Percent
Not adding unknowns	70	31.82
Time limit	51	23.18
Proper use	41	18.64
Maintaining privacy	36	16.36
Awareness on problems	15	6.82
Age limit	07	3.18
Total	220	100.0

Source: Field Survey, 2014

Pubescent stressed on setting time limit on Facebook use so that mind may not be diverted to deviant acts. They stressed on accurate use of Facebook and maintaining privacy. The ways to minimize the negative impacts created by Facebook is to use Facebook in the approved manner and not to use fake id to communicate because it is a social network for benign purpose. It is indispensable to be self-aware. To minimize the negative impacts created by Facebook, awareness creation is crucial. Moreover, Facebook creates the possibility for the youth to disclose their personal information to others and to have illicit relationship with the opposite sex hence it is necessary to be aware of the probable problems, many respondents reiterated. Unfortunately such illegitimate relations are often abused by profiteers and have caused much psychological losses for youth. Hence, Facebook if misused has more negative

impact than benefits in the lives of the people and ultimately society. Facebook has influenced the daily activities of youth. For the majority of pubescent Facebook users, it has positive influence in the day to day activities. Most of the youths have positive outlook on Facebook. Though it has several negative impacts on youths and society, it is very minimal compared to positive impacts. Facebook has been used to share knowledge which is a positive aspect of Facebook. Facebook is beneficial for the ones who are far away from their loved ones and want to keep in touch. It is a great source of association for people when they are far away from their family. Diaspora families settled abroad want to have strong communication with their homeland and inhabitants. For them Facebook is helping to make the world very close, small and unite.

With these findings it can be argued that finding the right balance is difficult yet it is very important to find a right balance between entertainment and burden by not adding unknown people, being aware about Facebook nuisance, trying to catch friends weekly or monthly rather than updating them moment to moment that can minimize the negative impacts.

Conclusion

Facebook is a social media conscientious for social expanding of social universe corresponding to both the positive expansion and negative shrinking of space and time allowing information to carry across people, countries, continents and Diasporas. Analogous to Mauss's "The Gift" denoting the honor of both giver and receiver, exchange of ideas and gifts, Facebook (FB) is a popular communication medium for online networking, allowing users to send messages, exchange ideas and keep in touch with friends, family and colleagues. Facebook rests on reciprocal exchanges supporting dependency and interactions with a potentiality to create or destroy communities. It is helping in building consensus as how to behave and do, organizing users interactional exchange process. Facebook users are tied in a vast network on mutual interactions and exchanges. As 21st century social media, Facebook evolved into popular social-networking site in Nepal with the concerns over privacy, security, and safety and how online communication affect and relates to relationships, personality, and identity presentation of pubescent. Under the fast process of interactions and the rapid modernization of Nepali society, the pubescent are using Facebook in high tempo. Entangled in youth culture, pubescent are making optimum uses of Facebook to create profiles, uploading photos, sending messages and keeping in touch with friends, family and colleagues. The uses and impacts of this website have been both positive and negative in their lives. As societies and cultures are democratized, chances increase for its general process into new philosophical frontiers of democracy and media libertarianism with high level of consumerism. Facebook habit draped in speedy consumerism has vitally changed the way the pubescent read and watch, how they think about how to share something, and whom to share it with, as they consume it resulting in the increase of social capital on their part. Westernization via Facebook use embedded with democratization and liberalization of Nepali culture and society is accountable to polluting the conventional norms of Nepali society. Owing to the rising negative impacts of Facebook on pubescent, parent need to take special care of their children in the matters of Facebook use. Pubescent ought to be encouraged to make the best use of Facebook for personality development and career making.

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Institutional Stigma and Discrimination in People Living with HIV in Nepal

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Abstract

There have been some studies on discrimination at the societal level, however, there is a dearth of research on institutional discrimination attached to gender, caste and class, and the discrimination attached to HIV/AIDS, especially in the context of Nepal. Therefore, this study aims to explore discrimination prevalent at institutional levels, especially at government and private institutions, such as hospitals, schools, police offices, employers, and manpower companies, based on experiences of people living with HIV (PLHIV). There is still deep stigma and discrimination in service-providing institutions such as those mentioned above, though institutional stigma and discrimination attached to HIV and AIDS are being reduced in Nepal over recent years. Underlying reasons for stigma and discrimination against PLHIV, especially female, are more likely to be gender power relations, membership of a lower caste and class, economic dependency, and HIV infection. In recent years, there have been significant positive changes in PLHIV with national and international efforts and support of organizations working in the field of marginalised communities. This study provides very important lessons in working with groups of people who have been marginalised and excluded because of gender, caste and class, and particularly with PLHIV, who are experiencing heavy institutional stigma and discrimination inside Nepal. The lessons are also pertinent to other countries, especially developing countries with

socio-economic similarities to Nepal.

Keywords: Access to resources; HIV; institutional stigma and discrimination

Background

PLHIV have been experiencing stigma and discrimination after being HIV diagnosed not only in their societies and communities but also in various service institutions though these trends of the stigma and discrimination have been gradually declining over the years (Stangl, 2010; UNAIDS, 2005; Parker & Aggleton, 2003). The reasons behind declining the stigma and discrimination these days are primarily due to increasing HIV and AIDS knowledge, support of organizations working in the field of HIV and AIDS, and medical advancement, especially in an effective HIV treatment (Stangl, 2010; UNAIDS, 2013). However, PLHIV still have heavy experiences of stigma and discrimination in their lives. While dealing with HIV stigma and discrimination of service providing institutions, there are institutional forms of stigma and discrimination in hospitals, work places and schools. Health personnel can also play discriminatory roles in providing health services to PLHIV. Regarding this, some of the studies conducted in South Asia (including Sub-Saharan Africa) demonstrate that health providers' attitudes towards HIV positive individuals is not very much different from that of the general population (Greeff et al., 2008). A study conducted among PLHIV in Bangladesh from March 2005 to May 2007 found that they are stigmatized, discriminated against and viewed negatively, not only by the general population, but even by

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health providers and hospital staff who are connected to them (Ullah, 2011). The study demonstrates that an overwhelming majority of health personnel such as physicians and nurses demonstrated behaviours towards HIV-positive individuals that were discriminatory. In this study of Bangladesh, although the nurses and the physicians have the theoretical knowledge about the routes of transmission, they did not seem to wish apply that knowledge personally in their own situation. In another study carried out in Thailand regarding the attitudes of health personnel towards PLHIV, nurses held the dominant social perception that women living with HIV were perceived as violators of gender norms, and thus "guilty" victims (Chan, Rungpueng, & Reidpath, 2009). In Nepalese context, this paper aims to explore institutional stigma and discrimination that have affected quality of life of PLHIV.

Data and Methods

This paper follows a qualitative research methodology with a view to deeply examining the experiences of PLHIV. The research area of HIV and AIDS is regarded as a sensitive issue in Nepalese cultural settings (Nepal & Ross, 2010; Family Health International, 2004; Beine, 2002). Understanding the cultural sensitivity of this research area, the research has chosen a path of data collection through organizations working in the field of HIV and AIDS located in the Kathmandu and Pokhara Valleys of Nepal. Furthermore, confidentiality of both participants and organizations was maintained by using codes in the following ways: using pseudonyms for 33

research participants, and numerical order, such as one, two, three and so on for eight organizations from which data were collected.

With an understanding of qualitative research, a flexible research design firstly utilised a semi-structured questionnaire with a framework of various themes to be explored, drawing on the lived experiences of research participants, relating to their identity issues. This allowed greater openness, and further ideas could be brought up by research participants during interviews. This further allowed additional questions to be put to research participants based on participant responses. Secondly, in terms of recruitment, this study aimed to recruit participants through a snowball sampling method with the help of organizations located in the Kathmandu and Pokhara urban areas. This method made it a little easier to find participants for this HIV-sensitive topic, benefitting from information provided by earlier participants in interviews. Ethical approvals were gained from Massey University, New Zealand, as study institution, Massey University Human Ethics Committee (MUHEC), and also from the home country, Nepal Health Research Council (NHRC), Nepal where field work and data collection took place for this research.

This study used a thematic analysis, examining the responses provided by participants in the research field. Themes were organized under main headings and sub-headings by coding obtained from all the texts of field interviews. As the process continued, the summary data were reclassified into broad headings and sub-headings. The field data were analysed by hand through a meaning-making process based mainly on evaluating participants' access to resources. The access to resources is considered to include such factors as economic supporters (often partners, parents and caregivers), place of residence (rural or urban), and personal resilience. In this study,

a meaning-making process is used to examine the level of family and social stigma and discrimination, based on socio-cultural understandings of the Nepalese society. This is very important in a country where, when any disease occurs, people's level of economic status, gender, caste, and educational attainment are considered as predetermined gifts of God and a sense of fatalism exists (Bista, 1991). Although most people do not believe HIV to be the outcome of previous incarnation's bad deeds, the prevalent socio-cultural factors play important roles in shaping social stigma and discrimination for illness; and society generally treats PLHIV accordingly (Aryal, Tiwari, Thapa, & Pandey, 2011).

Results

Even government institutions like hospitals, schools, and police offices mistreat participants in various discriminatory ways, which affect preventative check-ups and treatment at hospital, studying their children at school, and exacerbate feelings of insecurity at police offices. Some examples in regard to institutional discrimination of PLHIV are given below.

Health personnel at hospitals discriminate against participants by delaying treatment and transferring HIV cases to other hospitals, and speaking rude words to them. Research participants shared their bitter experiences of health personnel dealing with them badly after they and their family members with HIV were admitted to hospital.

> My wife was taken to [a] hospital to give birth to our youngest, fourth child   She
>
> was second in line for a delivery operation, after doing the first woman in the
>
> queue. My wife was asked to wait after she was asked to wear the operation
>
> dress when hospital staff came to know that she had HIV. She was then asked to
>
> change into her own dress again, telling her that the delivery operation was not

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possible at the hospital for her because of this disease [HIV]. She was asked to go to [another] hospital. Later, she was asked to return back to the same hospital [the hospital where she had gone first time]. In this way her operation was deliberately delayed. Then the operation was done in the next morning at the hospital where she had gone for delivery at first.

– Rana,

Male

Health personnel also treat participants differently in terms of asking unnecessary questions in regard to the mode of HIV transmission. This can be easily interpreted with a stereotypical mindset that PLHIV in Nepal have been HIV infected through the trade of prostitution in India. Indeed, health personnel are dealing with participants at hospital with unnecessary questions which may be far beyond the reality of how participants are blamed in association with the trade of prostitution.

I suffered a lot from such hatred and discrimination after becoming HIV positive. At that time HIV was not spreading out as it is now. Doctors did not know much about it so they discriminated against us   When the doct or visited me; they used to ask me for how long I stayed at Bombay. I had never heard of Bombay. Before asking me about my details, they used to think that I had been to India and asked me about it   When I was in hospital, staff came and hande d over medicine to a relative who was looking after me instead of giving the medicine to me because of HIV.

– Buddha, Female

Pushpa had a similar experience of discrimination at hospital and she shares her experience:

> Whenever PLHIV need to have an operation, the health personnel try to escape from them saying this kind of operation is not available in their hospitals and request them to go to another hospital in another place or district. In the second hospital, the health personnel also give them the same excuse.
>
> – Pushpa, Female

She [Pushpa] has also a bitter experience of discrimination at hospital in the case of woman living with HIV from a dalit (people belonging to the lowest caste groups) caste on how the woman died due to unavailability of treatment.

> Once there was a woman from the caste [who] had [a] problem in her uterus. She had to have an operation but when she told the health personnel there that she was HIV positive, they did not do the operation and delayed it deliberately. So she ultimately died.
>
> – Pushpa, Female

Children living with PLHIV in this study have been discriminated against at school by people treating them badly and even discarding them from school. Research participants shared their experiences with regard to discrimination against their children by not allowing admission to

school and mistreatment by school teachers and contemporary student friends. Some examples provided can be illustrative in regard to discrimination that happened their children's education due to their own HIV-positive status. Sarita uttered her bitter experiences after the school teacher knew of her and her children's HIV status:

> The school teacher came to me and said that they want to send away my children because the parents of other children came with complaints that if my children will not leave school, they will be compelled to stop their children from going to the school, I stop sending them to the old school.
>
> – Sarita A,
>
> Female

Gita, a widow, expressed her experiences in regard to her son's schooling in relation to discrimination from his school teachers and friends.

> There is a school for my son, not far from my home. He was enrolled there. But teachers did not give him homework. My son had to stay alone on the bench of the classroom. Nobody stayed around him because of HIV. My son said, "Nobody cares about me in my school neither teachers nor my friends". One of the reasons for migrating to other places from my home is to teach my son. Therefore, I am now here and what will be tomorrow I do not know.
>
> – Gita,
>
> Female

Some participants are sacked from their job after employers know their employees have contracted HIV. In this study, participants working as a carpenter at a furniture factory and as servants at houses had to leave their jobs when employers came to know they had HIV after hearing of HIV from other people (Harsit & Suku). They were told indirectly that their work was not necessary anymore for some reasons. Harsit reported that he was fired from his job. Likewise, Suku, a widow expressed her experience of halting her work to continue her household job working with an owner's home in this way: "I was told not to come to work there pretending they did not need anybody once the house owner knew her HIV positive status".

Some participants are mistreated badly at police offices. Police officers discourage them from surviving any more due to HIV infection. One of the male participants shared his experience when he was in custody for a different reason rather than his HIV status. A police officer abused him telling him that "it would be better to die like such a person with HIV rather than to survive in this world" while asking for an HIV medicine (Nabin). The participant was strongly recommended by a doctor to continue his medicine for better health but he had to abstain for more than 40 days.

> Once I was taken into custody. There, we had some arguments. Though they knew about my health condition and I asked them not to keep me from taking medicine for more than 4 days, they did not provide me with medicine and kept me from taking lifesaving medicine for more than 40 days. I had the impression that the police wished me to die at an earlier stage because of my disease [HIV]. This was the worst experience I ever had.

> – Nabin,

> Male

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Likewise, Sandeep was mistreated by his other prisoners telling him to stay away from them pointing out the corner of the room at the time of sleeping. Police staff did not take any notice in regard to his problem though it was their responsibility to listen to problems of prisoners.

> There were people come from theft cases in the police station. They treated me badly. I had to sleep along with them. While sleeping with those people they sent me away from their place pointing out [by finger and mouth] to the corner. So I could not know where to sleep. This type of mistreatment made me heart-broken as well as I got angry against them.
>
> –
>
> Sandeep, Male

Discussion

Nepalese society is built on a hierarchical basis with a high respect for the wealthy and a low respect for the poor, even in public institutions. For example, people are treated at hospital on the basis of how they are dressed with an indication of rich and poor while going to hospital for health check-up. Participants feel discrimination based on the clothing they are wearing.

> In hospital patients are treated in the way they are dressed. If you go there wearing poor clothes, they [health personnel] will delay your treatment. But when my relatives and aunts go there wearing nice dresses, they are treated very well. They are immediately taken in a waiting room for providing them hospital cabins. When my husband and I go there for treatment, they always discriminate us because we are not wearing nice clothes. When they learnt that my husband and

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I are HIV infected, they kept us farther away from other patients and put us close

to the toilet, a dirty place with an awful smell. Staying in those places may make

the situation worse for PLHIV.

– Pushpa, Female

Many participants, especially females, experienced institutional stigma, discrimination and disruption of human needs. Even government institutions like hospitals, schools, police offices, and the institutions dealing with emigration mistreated them in various discriminatory forms. For example, health personnel at hospitals discriminated against them by delaying treatment and transferring HIV cases to other hospitals, including using derogatory language. Some participants were also sacked from their job when employers came to know that their employees were HIV positive. Police personnel, generally known for providing security to each individual also treated participants badly while in police custody. Due to their HIV status, they were not given the chance to take HIV medicine for many days while being held in custody. Likewise, participants' children did not have the opportunity to attend school alongside children of HIV-negative people. All this discrimination and disruption including self-stigma, being made to feel unsafe, due to their association with HIV caused their identity crisis to adversely affect their lives (Rohleder & Gibson, 2006). Moreover, access to resources also plays an important role in dermining discrimination in Nepal, a good treatment for a well dressed person with a good physical apperance and a bad treatment with a person with scruffy physical appearance (Aryal, 2015). These may be pertinent in other developing countries, especially in South Asian context where socio-economic and cultural settings are similar.

Conclusion

HIV stigma and discrimination are heavily prevalent even in government institutions in Nepal that

disrupt in various aspects of PLHIV, especially in HIV treatment, schooling of their children, and

security in police custody. The reasons behind discriminating them are primarily due to poor

access to resources, prevalent stereo-typical thinking on HIV and AIDS, and poor applicability of

HIV knowledge even in health personnel. This study suggests that policy makers and social

workers need to focus on increasing economic status of poor people including ostracised groups

of people such as PLHIV, and applying HIV knowledge into practice while treating them and their

offspring even by health personnel, school teachers and police personnel.

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Original Research

Production of Protease from Aspergillus through solid state fermentation

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Abstract

Aspergillus isolated from soil of Janapriya Multiple Campus and best protease producer was identified by rapid plate assay. Mutation of strain carried under UV- radiation. Production of extracellular protease through solid state fermentation using parent and mutant strain of Aspergillus was studied using shake flask cultures. Result revealed that the mutant strain produced better amount of protease when compared to parent strain. The mutant strain Aspergillus mu produced 7.16 U protease when compared to parent strain Aspergillus which could yield only 5.01 U protease on wheat bran as solid substrate in 72hrs incubation. The pattern of enzyme yield was increased initially and reached optimum and again decreased.

Keywords

Aspergillus, Enzymes, Isolates, Protease, Solid state fermentation,

Background

Enzymes are proteins composed of 20 amino acids. They are produced by cellular anabolism, the naturally occurring biological process of making more complex molecules from simpler ones. Enzymes increase the rate of biochemical reaction and decrease the time for those reactions to reach equilibrium. They are not consumed in the chemical reaction, and thus their action is catalytic (Nielson, 1991). Enzymes used in food processing are produced by bacteria, fungi, higher plants and animals. Most of the organisms that produce enzymes are fungi. Mycolytic enzymes are primarily originated as a desire of microbiologists to understand the chemical nature and ultra structure of fungal cell wall. A number of enzymes can be classified under mycolytic enzymes viz; protease, cellulase, xylanase etc. In addition to the conventional applications in food and fermentation industries, microbial enzymes have attained significant role in biotransformation involving organic solvent media mainly for bioactive compounds.

Protease enzyme conducts proteolysis by hydrolysis of the peptide bonds that link amino acids together in the polypeptide chain. Proteases are the most valuable commercial enzymes and account for 60% of the total enzyme market (Rao et al, 1998). They find increased application in food, pharmaceutical, detergent, leather, tanning industry and to some extent in silver recovery and peptide synthesis (Godfrey and West, 1996; Kumar and Takagi, 1999; Oberoi et al, 2001). Microbial protease accounts for 60% of total enzyme in market. Though plants and animals also produce extra cellular proteases, microorganisms are the preferred source because of their rapid growth, limited space required for their cultivation, longer shelf life and the ease with which they can be genetically manipulated to generate improved enzymes (Rao et al, 1998). Extra cellular proteases help in hydrolysis of protein in the cell free environment and their cellular uptake (Kalitz, 1988).

Solid state fermentation should define any fermentation process occurring in the absence or near-absence of free water, employing a natural substrate as above or inert substrate used as solid support (Pandey et al. 2001). In general solid-substrate (state) fermentation (SSF) is defined as the growth of microorganisms on solid materials in the absence of near-absence of free water. The substrate however must contain enough moisture, which exists in the absorbed form within the solid matrix (Pandey, 1992). Solid state fermentation offers numerous advantages over submerged fermentation (SmF) system, including high volumetric productivity, relatively higher concentration of the products, less effluent generation, requirement for simple fermentation equipments, etc. (Hesseltine, 1977; Pandey, 1992). A number of such substrates have been employed for the cultivation of microorganisms to produce host of enzymes. Some of the substrates that have been used included sugar cane bagasse, wheat bran, rice bran, maize bran, gram bran, wheat straw, rice straw, rice husk. Wheat bran however holds the key, and has most commonly been used, in various processes (Nigam and Singh, 1994). Generally, smaller substrate particles provide larger surface area for microbial attack and thus, are a desirable factor.

Data and Methods

The experiments carried in Janapriya Multiple Campus from January to April, 2015. Soil samples collected from various places of Janapriya multiple Campus were used for the isolation of Aspergillus as per the method of Seifert (1990). The isolates were tentatively identified in the laboratory as described by Rapper and Fennell (1965) and were maintained on potato dextrose agar (PDA) slants. The isolates obtained from the above steps were subjected for rapid screening of protease production by plate assay as per Gulati et al. (1997). The modified Czapek Dox's medium was supplemented with phenol

red (2.5% prepared in ethanol) dye. The media was autoclaved and plates were prepared. Control plate was maintained without gelatin. The plates were inoculated with Aspergillus isolated from the soil. The zone and colony diameter was measured after 48 hrs. The isolate, which has given maximum zone of clearance, has been selected for further study.

The agro based materials wheat bran was collected from local places in pokhara. Aspergillus, isolated and maintained at 4°C on potato dextrose agar (PDA) was used as inoculum. Spore suspension was made from five days old cultures that had been grown on PDA slants at 30°C. It was prepared by suspending the spores from one tube in 10 ml of sterilized distilled water containing 0.1ml Tween–80 (Lingappa and Vivek Babu, 2004). SSF was carried out in 250 ml Erlenmeyer flasks. The substrates were autoclaved at 120 ^0C for 20 min and cooled to room temperature. Then the flasks were inoculated with one ml of spore suspension and the contents were thoroughly mixed by gentle tapping. Thus prepared flasks were maintain P_H -5 and moisture 50% and kept in slanting position and incubated for a period of 7 days at 35°C (Lingappa and Vivek Babu, 2004). The samples were withdrawn in aseptic condition. 1 gm of moldy substrate was taken into a beaker and distilled water (1:10) was added to it. The contents of flasks were allowed to have contact with water for 1 hr with occasional stirring with a glass rod. The extract was filtered through Whatman filter No.1. The clear extract was centrifuged. The supernatant were used as enzyme preparation. Thus prepared crude enzyme was used for assay.

The strain Aspergillus was subjected to UV irradiation to induce mutation for better yield of protease. Spore suspensions of the Aspergillus were irradiated using a 15W Phillips UV lamp at distances 10cm for 10 min. The irradiation was performed in a dark room and the irradiated suspensions were protected from light until plating was done on Czapek Dox agar in order to minimize any photo-reactivation effects as described by Gardener et al. (1956) and Banik et al. (1975). Under the present study mutant strain was isolated and labeled as Aspergillus mu. The samples were withdrawn after incubation period completed in aseptic condition. 1 gm of moldy substrate was taken into a beaker and distilled water (1:10) was added to it. The contents of flasks were allowed to have contact with water for 1 hr with occasional stirring with a glass rod. The extract was filtered through Whatman filter No.1. The clear extract was centrifuged. The supernatant were used as enzyme preparation. Thus prepared crude enzyme was used for assay.

The test tubes containing 1ml gelatin solution and 1ml enzyme extract were incubated at 60°C for 10 minutes. After 10 minutes 3 ml TCA was added to each test tube to stop the reaction. The precipitates formed were centrifuged at 5000 rpm. The protein concentration in the supernatant was determined by Lowry's method (Lowry et al, 1951). Optical density was recorded at 525 nm. Protease activity was expressed as Tyrosine equivalents using the standard curve prepared for measurement of proteins under same set of conditions as described above using standard solution of Tyrosine. Enzyme activities of the partially purified enzyme were expressed in International Units (IU). One mol of tyrosine equivalents released per minute IU was defined as one per ml under the following assay conditions using tyrosine standard curve (Silva et al, 2005).

Results

The Aspergillus plate isolated from soil and Aspergillus which exhibited higher zone of diameter considered as potential strain for protease production among the strains isolated from the soil. Aspergillus was used to produce protease via solid state fermentation. Partial purification of an enzyme improves the economics of the enzyme production process. To obtain optimum levels of the protease production wheat bran was used as substrate, which is an easily available agricultural residue. Protease having the enzyme activity of 5.01 IU was obtained from parent strain and 7.16 IU from mutant strain. Result on the studies relating to the protease production by the parent and mutant strain of Aspergillus on wheat bran substrate fermented at different interval is presented in table 1. Results revealed that the mutant Aspergillus produced better amount of protease when compared to parent. Enzyme production was in increasing order and rich optimum level and further increase in incubation period result in decrease in enzyme activity.

Table 1: Enzyme activity in IU by Aspergillus and Aspergillus mu.

Time in hours	Aspergillus	Aspergillus mu
0	0	0
24	1.5	2.1

48	1.45	5.0
72	5.01	7.16
96	4.0	5.1
120	2.4	4.4
144	1.2	3.2

Discussion

Soil is the exceptionally rich sources for potential enzyme producing organisms for various microorganisms. Fungi are abundant in soil. Therefore, in the present study soil has been chosen as a source and the soil samples were collected from various places of Janapriya Campus for the isolation of Aspergillus. After the isolation of Aspergillus, they were subjected to rapid screening for the production of protease by rapid plate assay method as described by Gulati et al. (1997). Mutagenesis is achieved by different methods like irradiation, chemicals, fast neutrons etc. (Bradley, 1966). The use of fast neutrons is a costly affair. The chemical mutagens are inefficient, less potent and cause side effects to the researchers (Lawley, 1966). Therefore, irradiation mutagens were used for mutagenic study when mold are the target organisms. Generally X-rays, gamma rays and UV rays are frequently used. Of these X-rays and gamma rays have high penetrating power and cause, greater nuclear damages as well as lethal effect in the organisms. Hence, the powerful mutagens causing nuclear damages are generally avoided. On the other hand, UV rays with shorter wave length than the visible light are mild mutagens. Hence they are considered to be ideal for induction of mutations (Elander, 1969; Hopwood, 1970; Thoma, 1971). The mutants were obtained from Aspergillus by UV irradiation and used for protease production. The mutant Aspergillus mu showed maximum production of protease.

Conclusion

Therefore, in the present study attempts have been made on the suitability and utility of

wheat bran as substrate for the production of protease by employing locally isolated

strain of Aspergillus. This study deals with the materials used and methodology adopted in the isolation, screening and solid state fermentation procedure and mutation of Aspergillus for maximum production of protease. The isolates of Aspergillus were initially subjected for protease production through rapid plate assay by evaluating their zone of clearance. Of these one isolate which exhibited higher zone of diameter was considered as the promising strain for protease production.

Acknowledgement

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Rural Urban Differential in Untouchability during Menstruation among Nepalese
Adolescents and Youths

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Abstract

Despite the changing social and cultural norms and efforts of governmental and non-governmental organizations, social taboo and inhibition against menstruation is still common in Nepal. The main aim of this paper is to examine rural urban differential in untouchability during menstruation among Nepalese adolescent and youth. This paper uses the cross sectional data drawn from Nepal Adolescent and Youth Survey 2010, a nationally representative sample of 14853 adolescent and youth (7109 boys and 7644 girls) aged 10-24 year from 9000 households. This survey uses two stages stratified sampling techniques for data collection. Univariate, bivariate and multivariate techniques have been used for analyzing the data. Pretested structured questionnaire were used to collect the information. The mean age at menarche among adolescent and youth is13.5 year and varies significantly between 10 and 21 years. Place of residence (rural urban areas) is not an important factor associated with untouchability during menstruation but education, mass media exposure, and mother's education are significant negative predictors (p˂0.000). Respondents from indigenous (odds ratio 4.1times) and lower castes (odds ratio 1.5 times) and Hindu religion are more likely to avoid touching during menstruation as compared with respondents from other religions and upper castes. This study is conclusive that there is no significant difference in untouchability during menstruation among adolescent and youth due to rural and urban areas. However, an attention is to be paid on education, mass media exposure and mother's education for generating awareness towards healthy menstrual practices among adolescent and youth.

Key Words: Adolescent, menstruation, rural, untouchability, urban, youth

Background

Adolescence and youth is one of the transitional stages of life cycle in which various changes (physiological, physical, psychological, social and others) occur. During this period, the girls bear the physical signs such as: developing breast, growth of pubic and

underarm hair and widening hips and other changes (Nagar & Aimol, 2010). Among them, menstruation is one of the physiological changes that happens only among girls (Dasgupta & Sarkar, 2008). The first menstrual period among girls is known as menarche and it may begin as early as nine years or as late as 15 years but normally occurs sometimes between ages 11 and 14 years (Hopwood, 2001). In other words, menstruation is the sign of girls becoming mature or capable of giving birth (Macquire, 1994).

Although menstruation is natural and biological realities, it is linked with several misconceptions, myths, superstitions and ill practices. In fact, cultural bound values shape its' meaning and management in many societies at the global level (Umeora & Egwuatu, 2008). In south Asian context, especially in India and Nepal menstruation is considered as unclean and impure period in which restrictions are made to conduct social, households and even individual activities (accept untouchable, prohibition to go religious places, unable to participate in social activities and interaction, restrictions to go to the sources of water, unable to households chores and livestock and etc) (Singh, 2006; Khanna, Goyal & Bhawsar, 2005; Garg, Sharma & Sahay, 2005; Puri, & Kapoor, 2006; Kumar & Srivastava, 2011).

Menstrual hygiene is one of the important aspects of health practice that has a long term effect on reproductive health outcomes among women. A bulk of studies reveals that unhygienic menstrual practices is closely associated with several gynecological problems and high prevalence of acquiring infections among women (Bhatia & Cleland, 1995; Sing, Devi & Gupta, 1999; Nemade, Anjenaya & Gujar, 2009) . It is therefore, maintaining menstrual hygiene may be one of the best strategies for improving overall reproductive and sexual health outcomes.

Despite the changing social and cultural norms and efforts of governmental and non-governmental organizations, social taboo is still common against menstruation in Nepal. In western rural Nepal, women are kept in separate huts during menstrual period. These huts are poorly managed, not fit for living any human being and generally separated from their homes. Women are compelled to spend their menstrual days in these huts and are not allowed to enter their own homes. This system is known as Chaupadi Hut System in western Nepal. In addition, they are not allowed to touch any family members and eat any nutritious food. Due to the lack of an appropriate sanitation, hygiene and nutritious food, majority of women fall sick and some of them loss their lives as well (Uprety & Bhandari, 2010; UN, 2011).

Although education and backwardness is assumed as the prime factors influencing menstrual practices, several studies document that women's culture, age, religion, household economic condition, occupation of women, place of residence (rural and urban), parental education largely influence perception and practices during menstruation among women (Kumar & Srivastava, 2011; Dutta & Ray, 2006; Ray & Dasgupta, 2012; WaterAid, 2012). Among these factors; a significant number of literatures documents that rural urban areas show a pronounced variation in menstrual practice among women (Thakre, Thakre, Reddy, Rathi, Pathak & Ughade, 2011; WaterAid, 2012; Salve, Dase, Mahajan & Adchitre, 2012; Juyal, Kandpal, Semwal & Negi, 2012).

A high proportion of women (in rural areas) follow traditional norms for managing menstrual hygiene and different ethnic communities have their indigenous practices and these practices vary significantly with numerous factors. Therefore, it is important to identify the factors associated with menstrual practices. In our best understanding, large number of previous studies have assessed knowledge, attitude and practice using univariate analysis but majority of studies lack multivariate analyses by considering relevant covariates. Therefore, this paper attempts to investigate the factors associated with rural urban differential in menstrual practices by using multivariate statistical technique in Nepalese context.

Adolescents and youths have been chosen as a study sample because of the reason that this section of the population have less knowledge about the outcomes of unhygienic menstrual practices and are also most vulnerable of acquiring infections associated with reproductive and sexual health due to immature physiology.

Data and methods

Nepal is a predominantly agricultural country in which about 70.0 percent of total population (76.0 percent of household) rely on agriculture for their livelihood (Ministry of Local Development, 2012 & Central Bureau of Statistics, 2011). Topographically, the country is divided into three distinct belts: Mountain, Hill and Tarai and is further divided in five development regions (Eastern, Central, Western, mid Western and far Western), 14 zones and 75 districts administratively. The latest population census 2011 records 26.42 million population comprising 48.5 percent male and 51.5 percent female. More than 16.0 percent of the total population is between the age of 15 and 24 years. The census also records 83.0 percent (as compared with 17.0 percent urban) rural population. This figure

is based on the government classification of 58 municipalities as urban areas and 3913 village development committees (VDCs) as rural (CBS, 2011). This indicates that an overwhelming proportion of Nepalese population lives in rural areas.

This paper uses the cross sectional data drawn from a nationally representative sample of Nepal Adolescent and Youth Survey (NAYS) 2010/11 conducted by Ministry of Population and Health (MOPH) Nepal. The study was initiated in early 2010 and the data collection was carried out between September and December 2010. The main purpose of the survey was to generate specific data for formulating the policies and programs on various issues of adolescent and youth. For sampling design, this survey uses two stages stratified sampling techniques in which 300 EAs (enumeration areas or clusters) were selected using probability proportion to size comprising rural and urban samples (237 rural and remaining 63 urban clusters) at the first stage. In the second stage, 30 households from each clusters were selected using systematic random sampling. Finally, a total of 14853 adolescent and youth (7109 boys and 7644 girls) aged 10-24 year from 9000 households were chosen.

The survey had administered household and individual questionnaires. Household questionnaire collected information on basic household and individual characteristics and individual questionnaire collected information on various issues (attitudes, perception and practices towards marriage, fertility, health behavior, sexuality and etc.) associated with adolescent and youth . The individual questionnaires were administered to all young people of age 10-24 years through direct interviewed by the trained interviewer. All statistical analyses have been performed by using SPSS version 16.0 for windows (www.spss.com).

Data analyses have been performed in three stages. First, univariate analysis (percentages) has been used. Secondly, bivariate (Chi square test for independence) and finally multivariate analyses (binary logistic regression) have been used to explore the joint effect of explanatory variables on untouchability during menstruation. The binary logistic regression model has been used as a multivariate technique due to dichotomous (yes or no) nature of response variable. Those associations having P-values less than 10.0 percent are regarded as statistically significant.

Measures

Although menstrual practice comprises a large number of components and no single indicator is sufficient to measure its' magnitude, this paper considers avoid touching during menstruation as a main response. This is because of the reason that

untouchability during menstruation is the common practice among women in Nepalese societies. To measure this variable, the survey inquired respondents whether they had actually avoided touching during menstruation. This variable is dichotomous comprising two responses: yes or no.

The main predictor for the present study is place of residence, which has been divided into two groups: rural and urban. This categorization is based on government's classification of municipalities as urban and VDCs as rural (CBS, 2011). Similarly, respondents' age, education, mass media exposure, parental education, religion, race/ethnicity, marital status, household economic condition, ecological belts and developmental regions (although the country comprises five development regions, the survey assumes Kathmandu as a separate development region) have been examined as potential confounders.

Age is a completed number of years as reported by respondents at the time of survey and has been grouped into three categories: 10-14, 15-19 and 20-24 years. Education also represents the completed educational level of respondents and also possesses three groups: primary, secondary and SLC (school leaving certificate) and above. Similarly, mass media exposure is a composite index consisting three components: reading newspaper every day, listening radio every day and watching television every day and contains three categories: low (exposure to any one), medium (exposed to any two) and high (exposed to any three). Parental education represents the educational status of father and mother of respondents. Education of parents has been grouped in four categories: illiterate, primary, secondary and SLC and above. For religion, more than 88.0 percent of sample consists of Hindu, remaining religious communities (Buddhist, Christian, Muslim, Jain, Sikh unidentified and others) are in small number and therefore has been grouped into Hindu and others for an analytical purpose. Although the sample consists large number of ethnic communities (more than 77 communities), it has been categorized into four groups: upper caste (Chhetri, Brahmin-Hill, Brahmin-Tarai, Thakuri, Sanyashi, Jha, Rajput, Baniya, Marwadi, Jain, Bangali), indigenous caste (more than 49 ethnic groups) (Nepal Federation of Indigenous People, 2012), lower caste (more than 20 communities) (Nepal Dalit Commission, 2012) and others (others and unidentified groups).

Likewise, household economic condition is also a composite index indicating poor, medium and rich. This index has been prepared by the household's ownership of selected assets and is extensively used by Macro International in various demographic health surveys at the global level (IIPS & ORC Macro, 2000; Montgomery, Gragnolati,

Burke and Parede, 1999). This index varies from 8 to 62 representing poor (0-14), medium (15-24) and rich (25 -62).

Ethical Approval

This study obtained ethical approval from ministry of population and health (MOPH) ethical committee and informed consent was taken from all participants before administering the survey questionnaire.

Results and Discussion

Background characteristics respondents

The sample consists about 80.0 percent of rural and 20.0 percent urban population. There is no significant difference between rural and urban sample according to selected background characteristics. More than 83.0 percent of respondents fall in age group 15-24 years. About half of the respondents (from rural and urban areas) have acquired secondary level education. In terms of household economic condition, one in two respondents from rural areas as compared with one in ten respondents from urban areas are from the household with poor economic condition. One in three respondents are married. An overwhelming proportion (88.0 percent) of respondents are affiliated to Hindu religion. More than 33.0 percent of fathers and two third of mothers are illiterate.

Table 1: Percent of adolescent and youth classified according to selected background characteristics

Characteristic	Rural	Urban	Characteristic	Rural	Urban
Age			Hindu	3781 (88.4)	985 (89.4)
10-14	767 (17.9)	183 (16.6)	Others	496 (11.6)	117 (10.4)
15-19	2014 (47.0)	792 (44.6)	Father's education #		
20-24	1500 (35.0)	427 (38.7)	Illiterate	1508 (36.5)	378 (35.1)
Education			Primary	640 (15.5)	196 (18.2)
Primary	658 (18.0)	161 (16.8)	Secondary	829 (20.1)	231 (21.4)
Secondary	1866 (51.0)	475 (49.6)	SLC and above	595 (14.4)	140 (13.0)
SLC and above	1138 (31.0)	321 (33.6)	Mother's education +		
Mass media exposure			Illiterate	2777 (66.5)	707 (65.8)
Low	585 (14.7)	194 (18.8)	Primary	355 (8.5)	88 (8.2)
Moderate	2587 (65.0)	629 (61.1)	Secondary	363 (8.7)	87 (8.1)
High	809 (20.3)	207 (20.1)	SLC and above	179 (4.3)	41 (3.8)
HH economic condition			Development region		
Poor	2019 (47.2)	125 (11.3)	Eastern	861 (20.1)	377 (34.2)
Medium	1861 (43.5)	354 (32.1)	Central	1193 (27.9)	168 (15.2)
Rich	401 (9.4)	623 (56.6)	Western	827 (19.3)	206 (18.7)
Marital status			Mid Western	504 (11.8)	151 (13.7)
Never married	2909 (68.0)	712 (64.6)	Far Western	418 (9.8)	116 (10.5)
Married	1372 (32.0)	309 (35.4)	Kathmandu valley	478 (11.2)	84 (7.6)

Caste groups			Ecological belts		
Upper caste	2084 (48.7)	514 (46.6)	Mountain	315 (7.4)	101 (9.2)
Indigenous caste	1535 (35.9)	417 (37.8)	Hill	2125 (49.6)	478 (43.4)
Lower caste	482 (11.3)	130 (11.8)	Tarai	1841 (43.0)	523 (47.5)
Others	180 (4.2)	41 (3.7)	N	4281 (79.5)	1102 (20.5)
Religion					
Note: The analysis has only included the sample of adolescents and youths who have already menstruated.					
# = Sum of the percent is not equal to 100 due to exclusion of 687 cases for literate category					
+ = Sum of the percent is not equal to 100 due to exclusion of 652 cases for literate category					
HH = Household					

Menstrual Practices

The mean age at menarche of respondents is 13.5 year and varies significantly between 10 and 21 years (table not shown). Table 2 presents a pronounced variation in menstrual practice according to rural urban areas. Social taboo against menstruation is more prevalent in rural areas as compared with urban areas. More than two-thirds of respondents in rural areas perform differently as compared with their urban counterparts.

Table 2: Percent of adolescent and youth who practice differently during menstruation

Practices	Rural n (%)	Urban n (%)	Total n (%)
1. Avoid offering/prayers	2875 (80.0)	715 (20.0)	3590 (95.5)
2. Stay away from kitchen	2181 (79.6)	551 (20.4)	2732 (72.7)
3. Avoid physical contact with other persons	59 (75.4)	19 (24.6)	78 (2.1)
4. Sleep in shed/ stayed in Chaupadi hut	70 (82.4)	15 (17.6)	85 (2.3)
5. Avoid touching plants	458 (76.7)	139 (23.3)	597 (15.9)
6. Stay/sleep in the separate room of the house	402 (76.0)	127 (24.0)	529 (14.1)
Multiple response are allowed			

Management of Menstrual Hygiene

In terms of managing menstrual hygiene, no significant difference exists between rural and urban areas. Among the various practices for managing menstrual hygiene, a majority of respondents (more than 82.0 percent in rural as compared with 84.1 percent in urban areas) use cloth, followed by sanitary pad (15.6 percent rural versus 15.2 urban) and less than 2.0 percent in rural areas as compared with less than 1 percent in urban area use nothing .

Table 3: Management of menstrual hygiene

Management of menstrual hygiene	Rural	Urban	Total
Use of sanitary pad	262 (15.6)	68 (15.2)	330 (15.5)
Use of cloth	1393 (82.8)	376 (84.1)	1769 (83.1)

Use nothing			27 (1.6)	3 (0.7)	30 (1.4)
Total			1683 (79.1)	447 (20.9)	2130
Chi square test is not significant 3253 cases are missing due to non response					

Untouchability during Menstruation

Table 4 shows the odds ratio from logistic regression models of untouchability during menstruation by selected background characteristics. Mass media exposure, religion, caste, mother's education (rural areas) and spatial variables appear as strong predictors, while education of respondents has mild association. Respondents having high exposure to mass media are about 50.0 percent less likely to avoid touching as compared with respondents having low exposure. Similarly, respondents from indigenous communities are more than 4.0 times likely to aviod touching as compared with respondents from upper castes. The odds of untouchability is higher among respondents from Hindu religion as compared with respondents from other religions.

Table 4: Odds ratios from logistic regression models of adolescent and youth who avoid touching during menstruation by selected background characteristics

Characteristic	Adjusted odds ratio			Characteristic	Adjusted odds ratio		
	Rural	Urban	All		Rural	Urban	All
Age				Religion			
10-14 (r)	1	1	1	Hindu (r)	1	1	1
15-19	0.95	1.18	0.95	Others	0.32***	0.75***	0.87***
20-24	0.94	1.21	0.94	Father's education			
Education				Illiterate (r)	1	1	1
Primary (r)	1	1	1	Primary	0.87	0.92	0.88
Secondary	0.92*	0.80*	0.91*	Secondary	0.75	0.82	0.87
SLC and above	0.71**	0.78	0.74**	SLC and above	0.52	0.61	0.47
Mass media exposure				Mother's education			
Low (r)	1	1	1	Illiterate (r)	1	1	1
Moderate	0.71***	0.83***	0.73***	Primary	0.79	0.64	0.92
High	0.54***	0.52***	0.52***	Secondary	0.62***	0.58	0.75***
HH economic condition				SLC and above	0.37***	0.23**	0.63***
Poor (r)	1	1	1	Development regions			
Medium	0.92	1.73	1.12	Eastern (r)	1	1	1
Rich	0.74	1.27	0.82*	Central	0.97	1.07	0.98
Marital status				Western	1.13	1.02	1.18*
Never married (r)	1	1	1	Mid Western	1.34***	1.71*	1.48**
Married	0.91	0.95	0.92	Far Western	0.32***	0.36***	0.31***
Caste groups				Kathmandu valley	1.82***	1.23	1.69***
Upper caste (r)	1	1	1	Ecological belts			
Indigenous caste	4.09***	5.12***	4.25***	Mountain (r)	1	1	1
Lower caste	1.53***	1.58	1.53***	Hill	1.41**	1.13*	1.35*
Others	1.25	3.7*	1.5*	Tarai	4.32***	2.84***	3.62***
Note: *p<0.10 **p<0.05 ***p<0.01(based on binary logistic regression model) r = reference category							

Discussion

Majority of respondents in rural areas avoid offering/prayers, avoid touching, sleep or live in shed or Chaupadi hut, avoid physical contact with other persons and avoid touching plants. For example, 80.0 percent of rural (as compared with 20.0 percent of urban) respondents avoid prayers/offering and stay away from kitchen during the menstruation. More than three out of four respondents from rural areas avoid physical contact with other persons. Although traditional norms have been weakening, staying and sleeping in separate shed or Chaupadi hut is still prevalent in rural Nepal. More than 2.0 percent of respondents sleep in Chaupadi shed/hut and it is more prevalent in western rural areas. More than 82.0 percent of respondents in rural areas as compared with 18.0 percent from urban areas stay or sleep in separate shed or Chaupadi hut. Similarly, 76.0 percent of respondents from rural areas avoid touching plants. Sleeping or staying in the separate room is one of the common practices among Nepalese women (76.0 percent stay and sleep in separate room of the household in rural areas). This indicates that social taboos against menstruation is still common in rural areas. This may be due to the fact that rural society is strict to follow traditional norms and superstitions associated with menstrual practices [20, 30, 31]. The possible confounders may be education and mass media exposure. A large number of studies in an Indian context also confirm this finding (WaterAid, 2012; Tiwari & Oza, 2006; Kandel, Rajbhandari & Lamichhane, 2012).

In terms of managing menstrual hygiene, a higher proportion of respondents use cloth pad as compared with sanitary pad. The possible explanation of this reason may be due to accessibility and economic factors associated with sanitary pad (Salve, Dase, Mahajan & Adchitre, 2012) [21]. This is more or less similar to the other findings at the global level (Mundey, Kesharwani, Mundey & Goyal, 2010; WaterAid Nepal, 2009).

Education (particularly for SLC and above in rural areas) has significant negative association with untouchability during menstruation. About 29.0 percent of respondents having SLC and above education from rural areas are less likely to avoid touching as compared with their counterparts having primary level education. However, education does not matter for urban areas. One of the potential explanations of this reason may be due to the fact that education has been linked to women's increased ability to negotiate with cultural and religious taboos. This study is consistent with various studies conducted in an Indian context as well (Salve, Dase, Mahajan & Adchitre, 2012).

Respondents having high exposure to mass media are less likely to avoid touching as compared with respondents having low exposure. One of the possible explanations of this reason may be due to the fact that mass media (radio, TV, FM and newspapers) makes respondents more aware about living healthy and also facilitates to lessen degree of superstitions. This finding is also established by an Indian context (Dune & Sharma, 2012).

Respondents from other than Hindu religions are less likely to avoid touching. It is almost universal that the women from Hindu religion are more strict to follow the traditional norms, beliefs and other religious practices, therefore respondents from Hindu religion may be bound to adopt this practice. Similarly, mothers are the main source of knowledge of getting information about menstruation and therefore they have a significant role in knowledge and practices of menstrual hygiene among adolescent and youth. In addition, mothers' education may be one of the important factors associated with better hygienic practices during menstruation to their daughters. As expected, respondents whose mothers acquire higher education are less likely to avoid touching during menstruation (education of mother is more likely to be important for rural respondents). This may be due to the fact that educated mothers are less likely to order their daughters for following strict traditional norms associated with menstrual practices. Some of the previous studies also agree with this finding (NEFIN, 2012;Tiwari, Oza & Tiwari, 2006)[26, 30].

Although it is highly argued that respondents from indigenous and lower caste are less likely to follow superstitions, traditional and religious norms associated with menstrual practices in Nepal, this study shows that respondents from rural and urban indigenous communities are about 4.0 times more likely to aviod touching as compared to respondents from upper castes after controlling for other covariates. None of the existing literatures are available to agree or disagree this finding. Therefore, further study is suggested to draw a firm conclusion.

Respondents from rural mid western and Kathmandu valley are more likely to avoid touching than their counterparts from rural eastern development region. There may be three possibilities for this reason. First, menstruation is assumed as an unholy period and women are prohibited to participate in various activities in rural mid western Nepal. Second, one of the serious discriminatory practices "Chaupadi Hut" is still prevalent in this region (Kane, Rajbhandari & Lamichhane, 2012). Third, majority of Newar communities assume that menstruation as a dirty period and incidence of untouchability may be higher in rural Kathmandu. Similarly, Respondents in rural and urban Tarai are

more likely to avoid touching during menstruation as compared to respondents from mountain belt. There may be two possible explanations for this reason. First, a majority of respondents affiliate with Hindu religion (in which menstruation is assumed as unholy period) in Tarai region. Secondly, women are less autonomous in terms of decision making in Tarai belt and therefore may be bound to accept superstitions although they are literate.

Limitations

One of the serious limitations of this study is to focus on specific issue (untouchability during menstruation) due to the unavailability of information although menstrual practices include a large number of activities. Furthermore, management of menstrual hygiene is one of the vital factors for good reproductive health outcomes among adolescents and youths, there is lack of sufficient information to illustrate valid and firm conclusion. Nevertheless, this study helps to elucidate the determinants associated with menstrual practice among adolescent and youth in Nepal.

Conclusion

This study is conclusive that untouchability during menstruation among adolescent and youth does not differ significantly by rural and urban areas in Nepal. However, this study highlights four important issues: mass media exposure, religion, castes and mother's education (particular for rural areas) that influence menstrual practices among adolescent and youth. First, mass media exposure is one of the key factors that facilitates them to be more aware about various superstitions and traditional taboos and inhibitions associated with menstrual practices. Therefore, information, education and communication (IEC) may be one of the best strategies for empowering adolescents and youths towards menstrual practices. Secondly, caste groups is another important factor affecting menstrual practices. Although, it is highly discussed that respondents from upper caste (as compared with other caste groups) are more likely to follow strict traditional menstrual practices, this study reveals that respondents from indigenous and lower ethnic communities are more likely to avoid touching during menstruation. Therefore, further research is suggested to draw firm conclusion. Thirdly, religion is also a key dimension of Nepalese societies that has significant association with menstrual practices. It is obvious that adolescents and youths from Hindu religion are compelled to follow strict norms associated with menstruation. Awareness programs may be immediate actions for adolescent and youth in rural, interior and remote parts of the

country. Fourthly, mother's education is also prime factor related with menstrual practices among daughters and daughter in law. Thus informal and adult literacy program for mothers and mother in law (particularly for rural, interior and remote parts of the country) may also be useful option for promoting the knowledge and practice associated with good menstrual hygiene.

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Research

Stem Biomass Modeling of the Eucalyptus camaldulensis from Eastern Terai of Nepal

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Abstract

Effective management of forest resources depends on accurate measurement of tree variables and modeling. This study was carried out to develop a nonlinear mathematical relationship between biomass (W in kg) as dependent variable and diameter at breast height (Dbh/D in cm) and total height (H in m) as predictor variables of Eucalyptus camaldulensis. A purposive sampling with the consideration of different Dbh classes of thirty seven trees was used from the Sagarnath plantation area of Sarlahi district of eastern Terai, Nepal. Diameter at breast height and total height were measured and volume of representative number of trees was calculated after destructive felling by making small segments using Newton's formula. Small disc for each segment was carried out for the determination of density of each segment by water displacement method. Biomass of stem was obtained by multiplication of volume with dry wood density and used as a basis for developing the model. The measured data were subjected to previously develop robust and strong mathematical models and evaluated by using different test statistics. Among several models tested, polynomial equation for biomass of stem as $W=7.283+0.118D^2+0.823H-0.003D^2H$ with adjusted coefficient of determination 0.99 and minimum root mean square error (RMSE=0.58 Kg) with significant parameters ($p<0.05$) and showed desirable behavior of flexibility and robustness. The model can be used in assessment of E. camaldulensis resources, stem carbon, generating local volume table and in the management of these resources by communities and other concerned stakeholders.

Key Words: above ground biomass, Dbh, eucalyptus camaldulensis, height, modelling, Nepal

Background

Biomass equations or volume equations are now widely developed in forestry and agroforestry for both industrial and scientific purposes. These models have the same objectives to evaluate some difficult-to measure tree characteristics from easily

collected data such as diameter at breast height (dbh), total height, or tree age. Generally, equations are linear, exponential, allometric or hyperbolic (Laurent et al. 2005). Accurate estimation of tree and forest biomass is crucial for both practical forestry issues and scientific forest management (Parresol 1999; Wang 2006; Chapagain et al. 2014). Total-tree or component- tree biomass is estimated mostly by using biomass models developed with the data from adequate numbers of destructively sampled trees selected from the tree population considered (Ketterings et al. 2001; Basuki et al., 2009; Sharma 2011; Subedi and Sharma 2012, Chapagain et al. 2014). Previously established biomass prediction models for various tree species and geographical areas can be found in the literature (e.g. Ter-Mikaelian and Korzukhin 1997; Keith et al. 2000; Zianis et al. 2005; Muukkonen and M akip a 2006; Muukkonen 2007; Navar 2009, Chapagain et al. 2014). Biomass models are developed with regression methods using one or more explanatory variables. Most commonly used explanatory variables are tree diameter, height and wood density, and they are used singly or in combination in the models (Chaturvedi et al. 2012a;Subedi and Sharma 2012,Chapagain et al. 2014). However, the contribution of these parameters for above ground biomass differs with respect to sites, succession stage of the forest, disturbance levels, species composition etc (Whitmore, 1984; Brunig, 1983).

Eucalyptus camaldulensis (Kingdom: Plantae, Order: Myrtales, Family: Lauraceae and Genus: Eucalyptus) commonly known as Masala (river red gum as trade name) is a moderate sized tree species with straight clean bole. Almost all Eucalyptus is evergreen (White1988c; Jackson1994). Eucalyptus tolerates infertile acidic sandy or rocky soils, or water-logging. Eucalyptus camaldulensis is one of the 800 species of genus Eucalyptus. It is a plantation species in many parts of the world, but is native to Australia, where it has the most widespread natural distribution, especially beside inland water courses. The species can grow upto 45 metres (148 ft) in height. It has smooth bark, ranges from white and grey to red-brown in color, which is shed in long ribbons. The species has a large, dense crown of leaves. The base of the bole can be covered with rough, reddish-brown bark. The juvenile and adult leaves are stalked, with the adult leaves broad at the base, tapering to the tip. The adult leaf colour is a dull blue-green. The leaf also contains several to many oil-producing glands in the un-veined areas of the leaf. It is a fast growing tree species (http://en.wikipedia.org/wiki/Eucalyptus_camaldulensis).

In 1981 -1985, K.J. White established the different species of Eucalyptus in Sagarnath (150m above mean sea level) of Eastern Nepal through plantation. The primary purpose of this plantation was to support fuelwood demand of Nepal. The experiences indicate that E. camaldulensis is suited for this area for it's general adaptability to sites

and conditions found in the Terai as well as it's high yield and utility for a variety of products currently in demand in the area.

Biomass of the individual trees or forest stands can be modeled by using diameter alone; diameter and total height; diameter, total height and wood density. But the model based on diameter, total height and wood density are not much frequent because of the involvement of higher cost in preparation and use of this types of biomass models.
Due to unavailability of wood density values, in this study, only Dbh and total height was used to fit the best model. The least square regression technique was used to develop the biomass models. The strong relationship between these parameters have already been reported (Rai and Proctor, 1986, O'Neill and De Angelis, 1988). Despite of the huge potential of Eucalyptus camaldulensis in Nepal, a limited number of studies have been carried out especially in biomass models. Therefore this study was carried out to develop allometric biomass models which is expected to contribute for the scientific and commercial management of this species.

Data and Methods

Study Area

Sagarnath area is situated in Saralahi and Mahottary district in the eastern Terai region of Nepal. This area is developed with Sagarnath plantation project especially for plantation of Eucalyptus camaldulensis. Sarlahi lies between $26^040'$ to $27^010'$ N Latitude and $85^020'$ to $85^050'$ E Longitude and Mahottary is situated in 26° 36' to 28° 10' N latitude and 85° 41' to 85° 57' E longitude . The temperature ranges between $20.7\text{-}31.4^0$ C in Sarlahi and the total annual precipitation recorded as 2096 mm and the temperature ranges between $20\text{-}31^0$ C in Mahottari with total annual precipitation recorded as 1083 mm (VDC profile, 2008). But this study was carried out only on the Sagarnath forest area of Sarlahi district.

Estimation of Biomass

Thirty seven trees with the consideration of different diameter at breast height (Dbh) classes were selected during June -July 2012 by purposive sampling to fit the distance independent models. To remove the variation in density of stem, a smooth and straight stem was chosen. After deciding the number and size of the tree to be felled, Dbh (cm) was measured and the tree was felled. After felling the tree, stump height and total length from the foot of the trunk to the top of the trees was measured by using linear tape. The branches were removed from the main stem of the individual tree. Then the main stem was divided into number of segments in such a way that the length of each

segment does not exceed 3 m. Within the limit of 3m, the length of each segment was decided based on the tapering of the stem segment. For each segment, three diameters at thick, middle and thin end and length were measured. Volume of each segment was calculated by using Newton's formula. Then, disc from each section were extracted, weighted and packed in bag in order to dry in the laboratory. The volume of water displaced by sample discs was estimated by using the principle of water displacement method. The oven dry weight of the sample discs was estimated by drying the sample disc in the oven at lab until the constant weight of the disc was obtained. Then, density of each section of the tree was obtained by dividing the dry weight by volume of the water displaced by the sample disc. Biomass of each section was determined by multiplying volume of each section with the corresponding density of extracted disc. Total biomass of each stem was calculated by summing all the biomass of segments.

Models

Seven different non linear models were used to fit biomass of stem as dependent variable and height and/or diameter as independent variables (Table 1). All these models possess few parameters, mathematically strong and therefore have commonly been used for modeling various tree species and stand characteristics.

Parameter estimation and model evaluation

The commonly used two modeling approaches were used in this study. First; fitting the candidate models; second; evaluation of the fitted models. In the first step, candidate models were fitted by regression analysis.

Table 1: Models used to fit the biomass and height- diameter relationship

Designation	Models
Model M1	$W = \beta_0 + \beta_1 D^2 + \beta_2 H + \beta_3 D^2 H$
Model M2	$W = \beta_0 + \beta_1 D^2 + \beta_2 H + \beta_3 H^2 + \beta_4 D^2 H$
Model M3	$\ln W = \beta_0 + \beta_1 \ln D$
Model M4	$\ln W = \beta_0 + \beta_1 \ln D + \beta_2 H$
Model M5	$\ln W = \beta_0 + \beta_1 D + \beta_2 \ln H$
Model M6	$\ln W = \beta_0 + \beta_1 \ln D + \beta_2 \ln H$
Model M7	$\ln W = \beta_0 + \beta_1 \ln(D^2 H)$

W=Biomass (Kg), D= Diameter at breast height (cm), H=Total height (m),
β_0, β_1, β_2 β_3 and β_4 = Parameters and ln=Natural logarithm

The second step, i.e. evaluation of the fitted models was carried out using following criteria:

- Adjusted coefficient of determination (R^2_{adj}): It shows a proportion of total variance explained by the model with the adjustment of the number of parameters, p and the number of non-missing observations, n. It was estimated as:

- Significance of the parameter values: Parameter estimates should be significantly different from zero ($p<0.05$).

- Homogeneity of the residuals: Plotting of the residuals from the model over predicted values or independent variables should show a random, constant variance pattern around a residual value of zero.

- Distribution of residuals, i.e. histograms of residuals were plotted to display the distribution (normal or abnormal) patterns of the residuals.

- Root Mean Squared Error (RMSE): RMSE determines the accuracy of model predictions and it is considered one of the most important model evaluation criteria. RMSE was calculated using following formula:

Where   and   are the observed and predicted values respectively;   is the total number of observations used to fit the model; and   is the number of parameters.

- Visual examination of the fitted curves overlaid on the scattered plots of the observed data. It is the most important part in modeling.

Results and Discussion

Bio -physical characteristics of the sampled trees

For the representative size of sample trees, different Dbh class size with its Dbhs and heights are presented in tabulation form. Summary of the descriptive statistics of tree characteristics with biomass for each Dbh class size with numbers of trees, mean±standard error, maximum and minimum values of each tree variables/characteristics are presented in Table 2.

Table 2: Summary statistics of the sampled biomass modeling trees of Eucalyptus camaldulensis from Sagarnath, Sarlahi, Nepal, 2012

	Dbh classes (cm)

Tree variable	Descriptive Statistics	5-10	10-15	15-20	20 and more	All combined
Dbh (cm)	No.of trees	12	8	8	9	37
	Mean±SE	7.92±0.42	12.34±0.45	17.09±0.44	23.89±0.85	14.74±1.06
	Minimum	5.50	11.20	15.50	21.00	5.50
	Maximum	9.50	14.35	19.00	29.60	29.60
Height (m)	Mean±SE	7.82±0.44	11.83±0.52	17.47±0.69	23.33±0.62	14.55±1.05
	Minimum	5.30	10.34	14.73	20.21	5.30
	Maximum	10.70	14.30	20.77	26.10	26.10
Biomass/tree(Kg)	Mean±SE	19.87±1.06	30.97±1.14	42.89±1.12	60.09±2.13	37.03±2.67
	Minimum	13.81	28.11	38.91	52.71	13.81
	Maximum	23.85	36.02	47.69	74.30	74.30

Table 2 depicts the overall summary statistics of the felled trees of the E.camaldunensis with respect to Dbh classes in the Sagarnath plantation forest of Eastern Terai, Sarlahi, Nepal. Thirty seven trees of different diameter classes with average Dbh (14.74±1.06) cm and average height (14.55±1.05) m were felled for the required stem biomass modeling of the components of this species.The range of Dbhs and heights of this species has expanded from 5.50-29.60 cm and 5.30-26.10 m respectively. Almost the same quantity of standard error regarding to Dbh and heights of tree variable has appeared of this species indicates that proportion of dbhs and height distribution was not vary considerably. Orwa et al. (2009) reported that E. camaldulensis commonly grows to 20 m tall, occasionally reaching 50 m. Regarding to average biomass per tree in each diameter class interval (table 2) has been increasing in the ratio of 1:1.56:2.16:3.02 respectively but the highest standard error has occupied by largest diameter class interval due to more variability of biomass per tree in the class. Pooled average biomass per tree has appeared to be more than that of 5-10 and 10-15 Dbh classes and less than that of other two classes.

Biomass models
Models for stem biomass with respect to height and diameter

Stem biomass was taken as dependent predicted variable and Dbh and height were taken as independent predictor variables. For the normality of the dependent and independent variables, different transformations were performed. Candidates' models; Adjusted R2, RMSE, parameters with values and their significance are presented (Table 3)

Table 3: Models for stem biomass with respect to height and diameter

Designation/Model	R2 adj.	RMSE	Parameters' value				
			β0	β1	β2	β3	β4
Model M1 W= β0+ β1D2+ β2H+ β3D2H	0.999	0.58	7.283*	0.118*	0.823*	-0.003*	-
Model M2 0+β1D2+β2H+β3H2+β4D2H	0.990	0.60	5.299*	0.104*	1.282*	-0.016	-0.002*
Model M3 lnW =β0+ β1lnD	0.989	1.063	0.917*	1.001*	-	-	-
Model M4 lnW = β0+ β1lnD+ β2H	0.990	1.003	0.995*	1.741*	0.00047	-	-
Model M5 lnW= β0+ β1D+ β2 lnH	0.987	1.050	1.36*	0.010*	0.72*	-	-
Model M6 lnW = β0+ β1lnD+ β2lnH	0.995	1.004	0.91*	0.999*	0.003	-	-
Model M7 lnW =β0+ β1ln(D2H)	0.998	1.019	0.930*	0.333*	-	-	-

* Significant (P<0.05)

In case of stem biomass modeling, parameter estimates were tested at 5% level of significance. Except the models M2, M4, and M6, parameter estimates of all the models were significant (P<0.05). Almost all the models except M3 and M5 described more than 99% biomass variability (Table 3) i.e. out of total variation, about 99 % of the variation in the dependent variable has been explained by independent variables so that applied independent variables has deterministic role for the biomass modeling. Because of lowest adjusted R2 as well as highest RMSE of M3 and M5, these are excluded from further analysis. Out of two remaining models, M1 demonstrated higher R2 adj. and lower RMSE than M7; though the difference between these two models in fit statistics is very small. Generally, it is not a good decision to select a best model in such a case by considering only the value of fit statistics (R2 adj. and RMSE).Therefore, graphical analysis of residuals was also carried out. Since a residual may be viewed as the deviation between the data and fit, it is a measure of the variability not explained by the regression model.Graphical residual analysis was performed and the residual distributions pattern and shape of the fitted curves were examined with these two models.

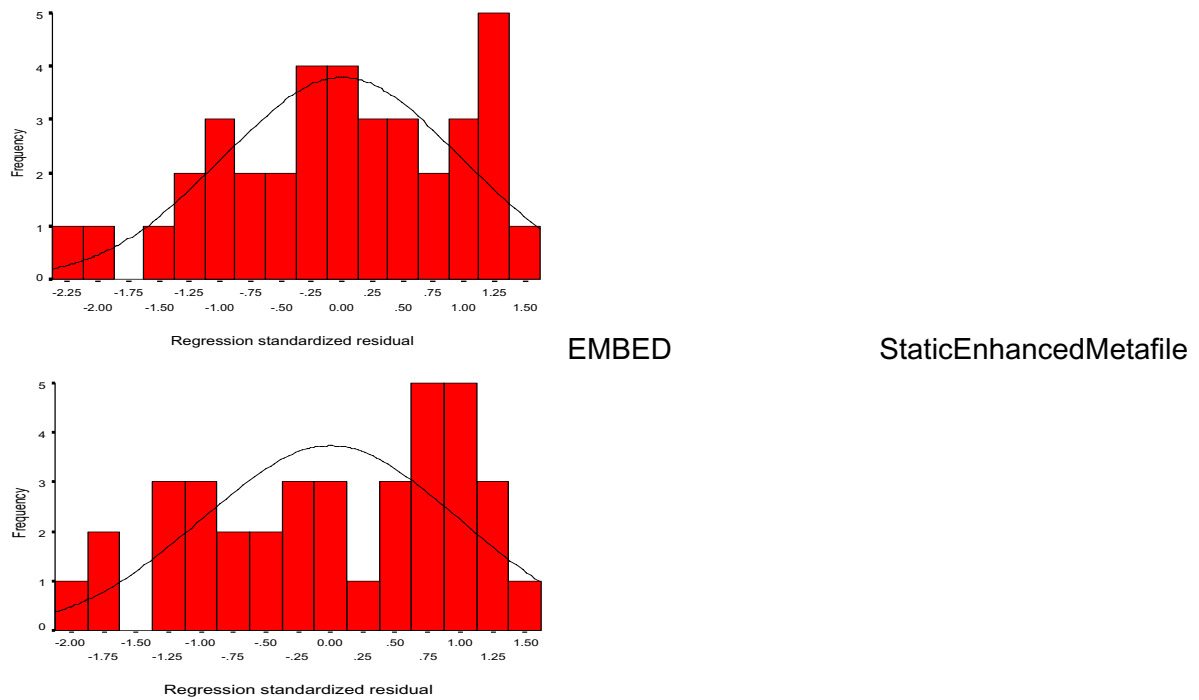EMBED   StaticEnhancedMetafile

Fig 1: Histogram of stem biomass model M1 and M7

In none of two models (M1 and M7), the histograms are true normal. But comparatively, the model M1 showed more normal distribution of residuals than the model M7.
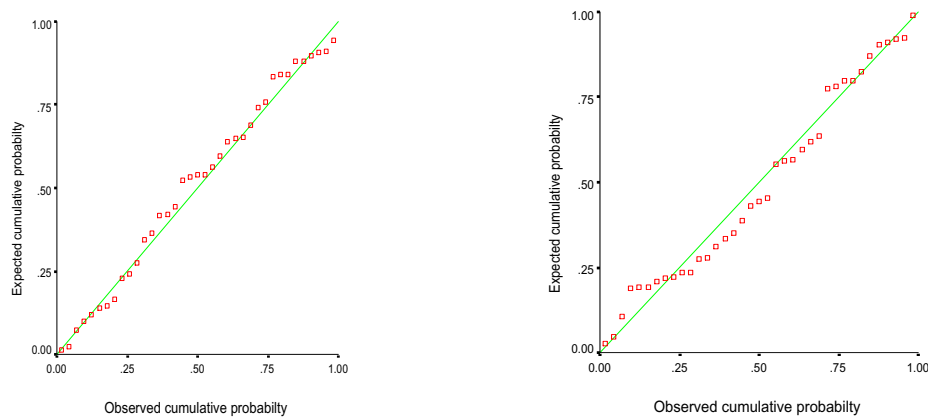
Fig 2: Normal Probability Plot (NPP) curve of model M1 and M7

The visual examination and comparison of normal probability plot curves for model M1 showed more cluster of residuals points' towards the line of equal distribution than M7. Though some distinguishable differences were observed through histograms and normal probability plot curves, analysis of standardized residuals through scatter plots were also carried out to draw a concrete conclusion (Fig 3).
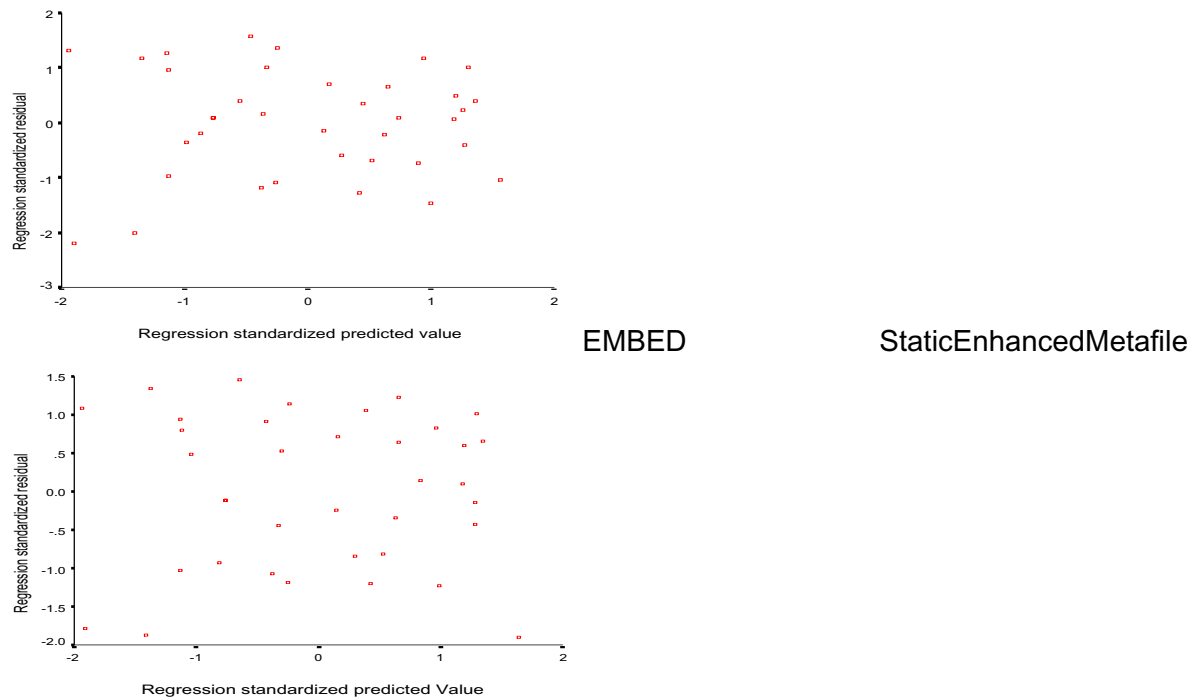
EMBED   StaticEnhancedMetafile

Fig 3: Scatter plots of standardized residual of model M1 and M7

The scatter plot of residuals versus the corresponding standardized predicted (fitted) value is useful for detecting several common types of model inadequacies. Though exactly horizontal band could not be observed, the distribution of residuals against the standardized predicted value was on both side of the zero in both models and distributed more or less randomly. Comparatively, model M1 showed the smaller random variation of residuals of around zero against the predicted value than model M7. Therefore, from the interpretation of fit statistics and graphical analysis of residuals, the model M1 is considered best fitted model among the available ones.

Various models were compared to ascertain the best model fit that do not indicate deviation from the general assumptions of linear regression and those show the best goodness of fit. The best relationship between wood biomass and diameter was obtained when the log of biomass was regressed against the log of diameter and height. Logarithmic allometric models are widely used in tree biomass studies (Whitesell et al, 1988; Claesson et al, 2001; Ter-Mikaelian et al 1997 and Ingerslev and Hallbacken, 1999) and it generally gives reliable results for many types of biomass prediction (Claesson et al, 2001), which explains their wide application in biomass studies (Claesson et al, 2001; Ingerslev and Hallbacken, 1999; Crown and Schlaegel, 1988 and Kadeba, 1991).

Conclusion

Among seven candidate models tested, Dbh and total height as well as different quadratic, polynomial and logarithmic transformation of these explanatory variables and biomass of stem and its transformation described as explained variable which best described our data (smallest RMSE=580 g and largest R^2 adj=99%) with the significance of the parameters ($P<0.05$). On the basis of findings of the study, it is concluded that the best fitted model for stem biomass was found in the form of polynomial equation as $W=7.283+ 0.118D^2+ 0.823H -0.003D^2H$. The derived model should be used to make local biomass table of E. camaldulensis in Sagarnath area of Sarlahi district as well similar types of other areas of Nepal. The future study should be concentrated into larger areas with the incorporation of more variables like wood density, crown diameter and crown length.

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Review Article

Liquidity and Assets Management of Commercial Banks

Kedar Raj Gautam

Abstracts

Health of an individual financial institution (FI) is a function of multiple factors such as capital base, quality of assets, liquidity position, management quality, market sensitivity, earnings etc. Liquidity is a financial institution's capacity to meet its cash and collateral obligations without incurring unacceptable losses. Both liquidity deficit and much more liquidity surplus indicate the problem in the financial health of a bank. As per the NRB directives relating to liquidity, the cash reserve ratio (CRR) to be maintained by commercial bank is 6 percent and CD ratio not more than 80 percent. The sound financial condition of banks is largely depended on the quality of assets held by them. The asset quality refers to the capacity of assets that generate income as well as the recoverability of the principal amount as per their prescribed terms and conditions. An internationally recognized non-performing loan benchmark is 5percent. This paper attempts to examine the liquidity position and assets management in the framework of Basel II. The liquidity position as measured by the CRR indicates that both banks have good liquidity as the CRR is greater than NRB benchmark but as per CD ratio BOK needs to reduce CD ratio to comply the NRB regulation as the CD ratio is greater than standard. Quality of assets of both banks as measured by assets management indicators is good. Though both banks have good liquidity and assets management, EBL has good liquidity and assets management as compared to BOK.

Key Words: Assets quality, directives, liquidity, non-performing loan

Background

Health of financial sector depends upon health of individual FIs. Health of an individual FI is a function of multiple factors such as capital base, quality of assets, liquidity position, management quality, market sensitivity and earnings (Saunders and Cornett, 2004). International monetary authorities such as International Monetary Fund and international FI like the World Bank have underpinned the need of healthy financial sector to build up

the confidence of private sector in the liberalized financial system. Therefore, they have directed their member countries to reform the financial sector and conduct the regular health check -up of FIs through onsite and offsite supervision. (NRB, 2005).Nepal Rastra Bank (NRB) as an apex monetary authority of the country started to monitor and control the finance industry especially at the end of the 1990s by issuing directives to the FIs. It initiated the offsite and onsite supervision of FIs to maintain their sound financial health and to build up the confidence of the private sector in the liberalized financial system and protect the interest of the investors.

The Basel Committee on Banking Supervision (BCBS) released the "International Convergence of Capital Measurements and Capital Standards: Revised Frameworks." Popularly known as Basel II, on June 26, 2004.This framework was updated in November, 2005 and a comprehensive version of the framework was issued in June, 2006. The Basel II framework incorporates three complementary -Pillars' (namely minimum capital requirements, supervisory review process and market discipline) that draw on the ranges of approaches to help ensure that banks are adequately capitalized in commensurate with their risk profile.With a view of adopting the international best practices, NRB has already expressed its intention to adopt the Basel II framework, though in a simplified form (Khanal, 2010).

Liquidity is a financial institution's capacity to meet its cash and collateral obligations without incurringunacceptable losses. Adequate liquidity depends upon the institution's ability to meet both expected and unexpected cash flows and collateral needs without adversely affecting either daily operations or the financial condition of the institution. In the case of commercial banks, first type of liquidity risk arises when depositors of commercial banks seek to withdraw their money and the second type does when commitment holders want to exercise the commitments recorded off the balance sheet. Commercial banks have to borrow the additional funds or sell the assets to pay off the deposit liabilities. They become insolvent if sale price of assets are not enough to meet the liability withdraws. The second type of liquidity risk arises when demand for unexpected loans cannot be met due to the lack of funds. Both liability side liquidity risk (First type risk) and assets side liquidity risk (second type risk) affect the health of commercial banks adversely.Hence, Bank should have adequate liquidity to minimize both asset side liquidity risk and liability side liquidity risk of a bank. Both liquidity deficit and much more liquidity surplus indicate the problem in the financial health of a bank.

Much more liquidity surplus hurts the profitability of the bank by reducing the return on assets. Similarly liquid deficit also cost much to the bank in terms of the higher purchasing price of liquidity and hurts in the reputation of the banks. Therefore, bank should strike the trade-off between the profitability and liquidity risk (Baral, 2005).A bank is considered to be a liquid if it has ready access to immediately spendable funds at reasonable cost at precisely the time those funds are needed (Rose, 2002).

As per the NRB directives relating to liquidity, the cash reserve ratio (CRR) to be maintained by licensed institutions for"A" class: 6 percent, for "B" class: 5.5 percent and for "C" class: 5 percent of total deposits and liabilities. Similarly, the statutory liquidity ratio (SLR) for "A" Class, "B" Class, "C" Class are respectively 15% of domestic deposit liabilities, 11 % and 10 % of total deposit liabilities (NRB Unified Directives 2071).In case of balance to be maintained as falls short, NRB will charge penalty.Commercial bank's liquidity exposure can be measured by analyzing the sources and uses of liquidity. In this approach, total net liquidity is worked out by deducting the total uses of liquidity from the total sources of liquidity. In addition, different liquidity exposure ratios such as borrowed funds to total assets, core deposit to total assets, loan to total deposits, and commitment to lend to total assets are used to measure the liquidity position of a commercial bank (Saunders and Cornett, 2004).In this study,NRB balance to total deposit(CRR) and credit (loan) to total deposit ratio used to analyse the liquidity position of selected commercial banks.

The sound financial condition of banks is largely depended on the quality of assets held by them. The asset quality refers to the capacity of assets that generate income as well as the recoverability of the principal amount as per their prescribed terms and conditions. The quality of assets would depend largely on the risk management system of institution. An excess of defaulted or delayed repayment of loans and high percentages of other non-earning assets have negative effects on institution's earning because these assets are not earning income. Loan and advances dominate the asset side of the balance sheet of any financial institution. Moreover, the earnings made from such loans and advances take up a major span in income statement of the institutions (Bauer,& Ryser,2014). Asset quality measures how effective an institution is at lending money to people who are willing and able to repay promptly from the income generating as a result of investing in the productive sectors. To have a success of such institutions, it is to crucial need to know the value of loan and advances which have a direct impact in the earnings of the institution

(Gupta &James, 2005).

NRB has directed the FIs in regards to the concentration of the Loan. Any licensed FIs can grant the fund base loan to a single borrower or borrowers related to the same business group up to the 25 percent of its primary capital. In the same way, it can provide the non-fund base loan up to 50 percent of its core capital. Similarly, it has directed FIs to classify the loans into performing loans and non-performing loans/ assets. Further, non-performing loans are classified in to three groups: Substandard, doubtful and bad debt or loss (Baral, 2005).

Non-performing loan means an outstanding loan not repaid, i.e. neither payment on interest or principle are made. In cases of the banks the loans and advances are the assets as the banks flow loans for the funds generated through shareholders equity, money deposited by the people and fund having through the borrows. Hence the terms NPA means the loans and advances that are not performing well. Thus all the irregular loans can be termed as NPA. The definition of NPA differs with countries of the Asia pacific economic cooperation (APEC) forum: loan is classified as non-performing only after it has been in arrear for at least six months. In India, after three months from the date of deemed commercial production to release interest income, any default or reschedule was considered as NPA on the book of accounts. In Nepal, non-performing loans/assets include all loans in the portfolio more than 90 days overdue on interest or principle payments (NRB, 2005).

As per the NRB directive, the loans and advances should be classified in to the following four categories. The first category is pass loan. It refers to the loans and advances whose principal amount is not past due over for three months included in this category. These are classified as performing loans/assets. The second category is substandard loan. All loans and advances that are past due for a period of three months to six months are included in this category. The third category is doubtful debt/loan. All loans and advances which are past due for a period of six months to one year are included in this category. The last category of loan is bad debt/loss. All loans and advances which are past due for more than one year and have least or thin possibility of recovery or considered unrecoverable shall induced in this category.

Loan and advances falling in the above category of sub-standard, doubtful and loss class are defined as non-performing loan. Nepal Rastra Bank has made it mandatory to

financial institution to make the loan loss provisioning on the basis of outstanding loans and advances.The loan loss provisions for pass loan, substandard loan, doubtful debt and bad debt are respectively 1%, 25%, 50%, and 100%(NRB Directives, 2070). Loan loss provision set aside for performing loans is defined as general loans loss provision and loss provision set aside for non-performing loan is defined as specific loan loss provision.

NRB uses composition of assets, non- performing loan to total loan ratio, net non-performing loan to total loan ratio as the indicators of the quality of assets of commercial banks (NRB, 2005). In this study, non-performing loan to total loan ratio, loan loss provision to total loan and advance andloan loss provision to non-performing loan ratio are used to measure the quality of assets held by commercial banks. This study, therefore, attempts to analyse the liquidity and assets management of selected commercial banks based on Basel II framework.

Data and Methods

This study tries to describe the real situation of liquidity and assets management of selected commercial banks by using descriptive research design. This study is based on secondary data obtained from Annual reports of these banks, Economic Bulletin and Banking, Financial Statistics and Supervision Report published by Nepal Rastra Bank. There are 30 commercial banks on Mid-July 2014. Of these, 3 are public, 6 are joint venture and the rest of them are domestic private banks(NRB, 2014). For the purpose of the study, Bank of Kathmandu Limited and Everest Bank Limited are taken as sample. These banks are selected using purposive and convenient sampling. One joint venture bank - Everest Bank Ltd,(EBL) and another domestic private sector bank - Bank of Kathmandu Limited(BOK). The analysis of the study is based on Basel II framework.

Result and Discussion

This section deals with the analysis of indicators of liquidity and assets quality of selected commercial banks in the Basel II framework.Liquidity position is analysed by using NRB

balance to total deposit (CRR) and credit (loan) to total deposit ratio. Similarly, quality of assetsis analysed by using non-performing loan to total loan ratio, loan loss provision to total loan and advance and loan loss provision to non-performing loan ratio.

Cash Reserve Ratio

Cash reserve ratio (CRR) refers to the portion of total deposit that financial institutions have to keep at central bank as deposit. If the central banks decide to increase the CRR, the available amount with the banks comes down. The NRB uses CRR to drain out excessive money from the system.

Table 1

Cash Reserve Ratio (CRR)

FY	NRB Benchmark	CRR		Difference, (actual- benchmark)	
		BOK	EBL	BOK	EBL
2066/067	5.5	8.32	15.53	2.82	10.03
2067/068	5.5	8.10	9.55	2.60	4.05
2068/069	5.5	8.72	17.22	3.22	11.72
2069/070	5	9.41	15.19	4.41	10.19
2070/071	5	6.82	16.91	1.82	11.91

Source: Annual report of EBL and BOK & Monetary Policy

Table 1 presents the Cash Reserve Ratio (CRR) maintained by EBL and BOK along with the NRB benchmark. As seen above data EBL has maintained sufficient level of CRR than BOK during study period. EBL has maintained highest CRR of 17.22 in F.Y 2068/069 and the lowest CRR of 9.55 % in 2067/068. Similarly BOK has also maintained CRR above than NRB bench mark. In FY 2069/070 BOK has maintained highest CRR 9.41% and in 2070/71 FY has maintained lowest CRR that is 6.82. BOK and EBL have maintained sufficient level of deposit at NRB and fulfil the regulation of liquidity as lay

down by the Nepal Rastra Bank.

Credit to Deposit Ratio (CD Ratio)

Credit to deposit ratio is the ratio between total credit and total deposit. If the ratio is less than 1, the bank relied on its deposit to make loans to its customer without any outside borrowing. On the other hand, if the ratio is greater than 1, the bank has borrowedcapital from other to lend higher rate rather than relying entirely on its own deposit. Banks may not be earning an optimal return if the ratio is too low. If the ratio is too high, the bank might not have enough liquidity to cover any unforeseen funding requirement or economic crises. It is a commonly used statistic for assessing a bank's liquidity.

Table 2

Credit to Deposit Ratio (CD Ratio)

(Amount in"000")

FY	EBL		BOK		CD Ratio	
	Total Loan	Total Deposit	Total Loan	Total Deposit	EBL	BOK
2066/06			16664931			82.03
7			17468194			83.11
2067/06			18813937			75.28
8			22555919			81.43
2068/06			28304224			
9	28156399	36932310		20315834	76.24	
2069/07	31661842	41127914		21018417	76.98	
0	36616831	50006100		24991449	73.22	
2070/07	44197762	57720464		27700987	76.57	
1	48450304	62108135		34115672	78.01	82.97

Source Annual Report of EBL and BOK

The CD ratios of EBL are less than that of BOK during the study period. The EBL has lent out as loans and advance maximum only up to 76.98% of its total deposit mobilization. Similarly BOK has lent out as loan and advance maximum only up to 83.11 %. As per NRB standard CD ratio shall be below 80%, EBL has to able keep CD ratio below then NRB benchmark. But BOK has failed to keep CD ratio as per NRB standard except FY 2068/069.

3.3Non-Performing Loan (NPL) to Total Loan (TL)

Loan and advances represents the single largest assets category for the bank. Loan is risky assets. An internationally recognized non-performing loan benchmark is 5%. However, in general, 5 percent to 10 percent of non-performing assets is considered as satisfactory level of quality of bank assets.Non-performing Loan to total loan is presented below.

Table 3

Non-Performing Loan to Total Loan

(Amount in "000")

FY	EBL		BOK		NPL to TL,(%)	
	Total NPL	Total Loan	Total NPL	Total Loan	EBL	BOK
2066/06		2815639	259524	1666493	0.446	1.557
7		9	326329	1	0.343	1.868
2068/06		3166184	443392	1746819	0.840	2.357
8		2	346014	4	0.625	1.534
2068/06		3661683	304701	1881393	0.971	1.077
9	125560	1		7		
2069/07	108512	4419776		2255591		
0	307492	2		9		
2070/07	276198	4845030		2830422		
1	470404	4		4		

Source: Annual report of BOK and EBL

Table 3showsthat the ratio of NPL to TL of EBLis lower as compared to BOK. It indicates that EBL is able to manage its risky assets efficiently. The NPL to TL of EBL falls below 1 percent during study period.Though the BOK has higher NPL to TL ratio, BOK is able to decrease NPA level from 2.35% to 1.07 % during the study period.

Loan Loss Provision to total Loans and Advances

Nepal Rastra Bank has made it mandatory to financial institution to make the loan loss provisioning on the basis of outstanding loans and advances. To stabilize earning and remains solvent in bad times, banks estimate losses and seek to hold enough capital to absorb future write –off. Provision for loss loan to total loss is the expression of numerical relationship between loan loss provisions for loss loan to total losses loans.

Table 4

Loan Loss Provision to total Loans and Advance

(Amount in "000")

FY	Loan Loss Provision		Total Loan and Advance		LLP to TL Ratio	
	EBL	BOK	EBL	BOK	EBL	BOK
2066/06				16664931		2.276
7				17468194		2.798
2067/06				18813937		2.685
8				22555919		2.188
2068/06				28304224		
9	600043	379369	28156399		2.131	
2069/07	604151	488758	31661842		1.908	
0	705856	505199	36616831		1.928	
2070/07	804575	493607	44197762		1.820	
1	878280	562547	48450304		1.813	1.988

Source: Annual report of BOK and EBL

Table 4 shows that the loan loss provision to total loan advance ratio of EBL is in decreasing trend. It ranged from 2.131 percent in the F.Y 2066/067 to 1.813 percent in the F.Y 2070/071. The decreasing trend of loan loss provision ratio indicates that the loan and advance includes high portion of performing loan rather than non-performing loan. Similarly, the loan loss provision to total loan advance ratio of BOK is in decreasing trend. It ranged from 2.798 percent in the F.Y 2067/068 to 1.988 percent in the F.Y 2070/071. Comparing two banks, it can be shown that the EBL is good positioning in provision for loan loss against total loan than BOK.

Loss provision (LLP) to Non-Performing Loan (NPL)

NPL coverage ratio is calculated as loan loss provision divided by gross non-performing loans. The ratio shows the extent to which non-performance loans are already covered by provision.

Table 5

Loan Loss Provision (LLP)

(Amount in"000")

FY	Loan Loss Provision		Total NPL		LLP to NPLRatio, %	
	EBL	BOK	EBL	BOK	EBL	BOK
2066/06				259524		146.18
7				326329		149.77
2067/06				443392		113.94
8				346014		142.66
2068/06				304701		
9	600043	379369	125560		477.89	
2069/07	604151	488758	108512		556.76	
0	705856	505199	307492		299.55	
2070/07	804575	493607	276198		291.3	
1	878280	562547	470404		186.71	184.62

Source: Annual report of BOK and EBL

Table 5 presents the loan loss provision booked for the possible losses incurred from Non -Performing Loan. BOK booked NPL coverage ratio of 184.62%, in F.Y 2070/71 which is highest and 113.94% is lowest on 2068/069. Similarly EBL has booked NPL coverage ratio highest in F.Y 2067/068 that is 556.76% and 186.71% is lowest on FY 2070/071. The trend of NPL coverage ratio of BOK is in increasing trend whereas the NPL coverage ratio of EBL is in decreasing trend.

Conclusion

The liquidity position as measured by the CRR indicates that both banks have good liquidity as the CRR is greater than NRB benchmark.EBL has stored high liquidity affecting its financial health adversely by deteriorating profitability.EBL has maintained CD ratio as per NRB standard but BOK has CD ratio greater than NRB standard. So BOK needs to reduce CD ratioto comply the NRB regulation.Quality of assets of both banks as measured by NPL to TL isquite good. Nonperforming assets of both banks have far below than even international standard. Though both banks have good assets management, assets management of EBL is remarkable as compare to BOK. The decreasing trend of loan loss provision ratio of both banks indicates that the loan and advance includes high portion of performing loan rather than non-performing loan. On a nutshell, EBL has good liquidity and assets management as compared to BOK.

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Electricity Supply and Demand Trend in Pokhara Sub Metropolitan City of Nepal

Devilal Sharma

Abstract

Energy demand forecasting is an essential activity of electricity providers. Without an accurate picture of the future, which may be based upon the past, over capacity or shortages in power may result producing unexpected high costs. An accurate forecast requires adequate data, for without it, the results of the forecast are unreliable. Trending analysis is used to forecast of energy demand model for Pokhara Sub-Metropolitan City service area. Trending analysis is used to develop and test the validity of a forecasting model and determine if a more precise model could be developed. The real data provided by Pokhara Distribution Center is used to develop the equation which defines the future trend of the energy demand. And based upon the equation we forecast the future demand. On the other hand we also forecasted the future demand by using the simulation method by considering the various factors and this method gives more accurate result. In this project we compared the forecasted data with the real data and evaluated the error. Due to the result of small error, the study relies to the accuracy of the result. Result regarding total demand of electricity up to 2075BS reached to 123133632 KWH from 81824845 KWH. Similarly, domestic consumption have an influential share of total demand and no of domestic consumer increased to 48914 from 35634 during forecasting period.

Keywords : Demand, electricity, energy, forecast, power supply, regression, trending values.

Background

Electricity demand forecasting is important because the future is uncertain. Also, electricity forecasting attempts to predict what the future electricity demand will be. Forecasting electricity demand helps to determine if there will be a shortage of electricity, and the need for new power plants or the implementation of conservation measures, or an overabundance of electricity and the need for shutting down of some of the power plants. Thus, over forecasting can lead to a decade of over capacity. Under forecasting can mean a long and explosive period while capacity catches up with loads. Another important reason for energy demand modeling is costs. Energy shortages may develop whose costs are usually a large multiple of the volume of energy not supplied, but if forecasts are too high opportunity costs might be uselessly tied up for long periods of time. In other words, if the forecast results in a shortage of electricity, prices would increase and the consumer would pay more for energy. Yet, if the forecast results in an overabundant supply, the costs associated with shutting down power plants and other ways of decreasing supply would be passed on to the consumer. The three important reasons exist for modeling energy demand. The first reason is that the timely and reasonable reliable availability of energy supplies is vital for the functioning of a modern economy. Secondly, the expansion of energy supply systems usually requires many years, and the third reason is that investments

in such systems generally are highly capital intensive, on average, accounting for some 30% of gross investments in most countries (Rob, 2001).

Another important aspect of energy modeling is in the area of deregulation. In many states, including Pokhara, deregulation of the transmission sector of the electricity industry may take place in future. With deregulation, the future is even more uncertain as the market will decide price and price will determine demand. Therefore, the importance of electricity demand forecasting grows. Electricity generators will have competition from out-of-state generators, while existing generators in Pokhara will have expanding territories. Thus, the lines are no longer clearly drawn as to who services what customer.

Electricity demand is the amount of electricity being consumed at any given time. It rises and falls throughout the day in response to a number of things, including the time and environmental factors. Managing demand is the key for utilities, and this became an increasing issue at the end of the 20th century, as utilities struggled to balance electricity needs with aging electrical grids. The infrastructure behind the electrical grid is woefully outdated in many regions of the world, presenting a potential serious threat to economic well-being. One problem with electricity is that it does not lend itself well to storage. As a result, utilities typically generate power in an on-demand style, ramping up electricity generation when energy demand rises, and slacking off when the demand falls. Storing electricity is extremely inefficient with existing technology, making it difficult for utilities to bank energy against a time of sudden demand. Electricity demand can fluctuate wildly. At 8:00 AM during temperate weather, for example, demand is usually very low on the other hand at 6:30 PM demand is very high or at Peak. Peak demand are terms used in energy demand management describing a period in which electrical power is expected to be provided for a sustained period at a significantly higher than average supply level. Peak demand fluctuations may occur on daily, monthly, seasonal and yearly cycles. For an electric utility company, the actual point of peak demand is a single half hour or hourly period, which represents the highest point of customer consumption of electricity. The daily peak demand usually occurs around 6:30 pm. At this time, there is a combination of office, domestic demand and at some times of the year, the fall of darkness. The supply of Electricity is defined as the amount of electricity, which is passing through the supply station to overcome the demand of the consumer.

According to the Annual report of Nepal Electricity Authority the annual peak power demand of the Integrated Nepal Power System (INPS) in fiscal year 2013/14 is estimated to be 1,201 MW. Out of 1,201 MW of peak demand, only 791 MW could be supplied and 410 MW power was shed. Out of the 791 MW of power actually supplied, 436.4 MW was contributed by NEA hydro, 22 MW by NEA thermal, 216.4 MW by IPP hydro and the rest 116.2 MW was import. Compared to the preceding fiscal year's figure of 1,094.6 MW, the annual peak power demand of the INPS registered a growth rate of 9.7 %.

Energy demand of INPS in fiscal year 2013/14 is estimated at 5,909.96 GWh, out of which only 4,631.51 GWh (78.4%) could be supplied. The rest 1,278.45 GWh (21.6%) was resorted to load shedding. Of the total supplied energy volume, 3,559.28 GWh (76.8%) was contributed by domestic generation and 1,072.23 GWh (23.2%) by import from India. Domestic supply included 1,258.94 GWh (35.4%) from IPPs and the rest 2,300.34 GWh (64.6%) was from NEA owned power stations with a share of 2,290.78 GWh from hydro and 9.56 GWh from thermal. The annual peak demand of the Pokhara City in fiscal year 2012/13 is estimated around 28 MW as per the data provided by the Pokhara Distribution Center. The total number of consumers of NEA including community and bulk buyer (India) consumer categories at the end of fiscal year 2013/14 reached 2.71 million. Out of the total number of consumers of 2.71 million, the domestic consumer category alone accounted for 2.56 million (94.37%). For PSMC the total

number of consumer 40993 the domestic consumer is 39329 (95.84%).

Baum (1993) says that forecasters believe electricity will remain one of the fastest growing energy sectors. A large portion of the increase in demand for electricity is due to an increase in residential demand. With the overall increase in electricity demand in the residential sector combined with the increased use of electricity for residential cooling, heating and lighting during every day, a daily peak residential model called daily load curve is needed. From daily load curve, yearly load curve can be evaluated to avoid future shortages or to determine how much electricity is available for sale to other companies. A model to determine residential peak electricity demand is normally a function of variables that measure temperature, electricity price, the price of substitutes, such as natural gas price, the number of customers, and economic indicators, such as income. Such a model for electricity supply and demand trend prediction of PSMC is developed in this research.

The study the electricity supply and demand trend of future year needs an accurate model of Load Forecasting. Accurate models for electric power load forecasting are essential to the operation and planning of a utility company. Load forecasting helps an electric utility to make important decisions including decisions on purchasing and generating electric power, load switching and infrastructure development. Load forecasting is also important for the operation and planning of electric power generation. To minimize the operating cost (thermal dominated system), electric suppliers will use forecasted load to control the number of running generator units. The nationwide energy estimation, planning of new plant, routine maintenance and scheduling of daily electrical generation depends on accurate load forecasting of the future.

The population growth of PSMC in Fiscal year 2011/12 is estimated to be 2,64,991 with increased rate 5.27%. On the reference of this increased rate population growth of PSMC is projected to be 3,09,132 (NEA, 2067).

The study is concerned about what is the supply and demand condition of electricity in PSMC. In addition to this what is the future the market condition and demand and supply pattern of Pokhara valley?

The primary objective of the study is to assess the supply and demand trend in Pokhara Sub-Metropolitan City of Nepal. In addition to this the study aims to make projection/forecast of Demand and supply of electricity in PSMC. And to Suggest the Nepal Electricity Authority to take the necessary action to overcome the increasing trend of demand.

Data and Methods

This section describes the methodology used to forecast the peak demand and energy demand of PSMC. Included in the discussion are the variables that potentially impact peak electricity demands for this service area. The study also discussed about the steps taken to analyze the model using regression analysis.

For Trending method most commonly used mathematical expressions are:

- Polynomial (linear, quadratic, cubic etc.)
- Exponential (In terms of Average load growth) $A + Bt + Ct^2$
- Power $A(1 + B)^t$
- Z-transfer function
- AI mainly ANN At^α

The most common techniques used to fit these expressions is to use a least square error method.

Let's consider a general expression of equation

A set of known samples of fk(xi) (for $i = 0....q$) $y = F(x) = c_o f_o(x) + c_1 f_1(x) + ... + c_k f_k(x)$
and their corresponding functional value of yi.

The coefficients cj (for $j = 0,1 .....k$) are to be found out.

If y is measured quantity corresponding to x

$$y = F C$$

Then, for an approximated value of C error

$$ye = y - F C$$

In least square error approximation method we intend to minimize the square of the error, i.e.

$$ye^2 = J = (y - F C)^1 * (y - F C)$$

$$\frac{dJ}{dx} = 0$$

For J (square of the error) to be minimum,
Differentiating with respect to C and equating to zero gives

$$0 = 0 - F^1 y - y^1 F + 2F^1 F C$$
$$= -F^1 y - F^1 y + 2F^1 F C$$
$$\text{Or } 0 = -2 F^1 y + 2 F^1 F C$$
$$\text{Or } C = [F^1 F]-1 F^1 y$$

Comparing with $C = M-1 N$

Gives

$$M = F^1 F \text{ and } N = F^1 y$$

Consider a planner who has annual peak load data on each of a City substations, going back for past n years. He wants to forecast future loads by trending, (Finding a polynomial equation, that fits substation area's historical load data and then extra plotting that equation to project into future.) There are wide number of polynomials that he could use for the curve fit. Suppose the polynomial is defined by;

$$L(t) = a_3 t^3 + a_2 t^2 + a_1 t^1 + a_0$$

Where; L(t) annual peak load for year t and ai are real coefficients

For Known samples of L(t) corresponding to known t, The above equation can be elaborated as:

$$L(1) = a_3(1)^3 + a_2(1)^2 + a_1(1)^1 + a_0$$
$$L(2) = a_3(2)^3 + a_2(2)^2 + a_1(2)^1 + a_0$$
$$L(n) = a_3(n)^3 + a_2(n)^2 + a_1(n)^1 + a_0$$

Or

$$\begin{bmatrix} L(1) \\ L(2) \\ L(3) \\ \\ L(n) \end{bmatrix} = \begin{bmatrix} 1 & 1 & 1 & 1 \\ 8 & 4 & 2 & 1 \\ 27 & 9 & 3 & 1 \\ \\ (n)^3 & (n)^2 & (n)^2 & 1 \end{bmatrix} \begin{bmatrix} a_3 \\ a_2 \\ a_1 \\ a_0 \end{bmatrix}$$

i.e. $$L = PA$$

Pre multiplying both sides by PT;

$$P^T L = P^T PA$$

Or $$A = [P^T P]{-1} * P^T L$$

Thus coefficients an can be obtained for any set of known value of t and corresponding L(t) and hence can be used to extend the polynomial for any future t;

Results and Discussion

As per the data provided by the Pokhara Distribution Center the Supply and Demand KWH or Units of the PSMC of past 6 years is presented in the following table.

Table 1: Supply and demand units of PSMC

Year	2065	2066	2067	2068	2069	2070
Demand	54843134	62876083	64828077	73267208	75491054	81824845
Supply	56832253	69002381	72368919	80808895	83259627	91887586

(Source: PDC, NEA)

The data above represents the supply and demand scenario of Pokhara Sub-Metropolitan City. The total energy consumed by the Pokhara city is increased by 80,32,949 unit in year 2066 but only 19,51,995 unit is increased in the year 2067. From above figure, the increase in energy consumption rate is rapidly decreasing. One of the reasons for this may be the load shedding of electricity and another may be decrease in urbanization. For year of 2068, 2069, 2070 the increase in the consumption units is respectively 84,39,131; 22,23,846; 63,33,791. The increased unit of consumption of per year was seen widely fluctuated. The supply is depends on the demand of the city so supply also follow the demand trend. Due to this abnormality of data, the prediction of the future data is also uncertain.

Table 2: Supply and demand trend of PSMC consumer class wise

Consumer Class	2065	2066	2067	2068	2069	2070
Domestic	32696073	38060703	39186138	44726877	45449892	49665557
Commercial	6956833	9085638	9580058	11639723	12500934	13541237
Industrial	7028584	7500043	7611471	7778275	7970998	8804395
Street Light	1983336	1983336	1983336	1983336	1983336	1988336
Irrigation	502809	414920	515133	537678	605359	653119
Temple	102687	120232	120651	142233	129462	147097
Non commercial	5572812	5702211	5831290	6459086	6851073	7025104
Total	54843134	62876083	64828077	73267208	75491054	81824845

(Source PDC, NEA)

The data shows that the consumption of Pokhara is dominated by the Domestic Consumer. About 61% of the total energy is consumed by the domestic consumer. The consumption percentage of the domestic, commercial are increasing while the industrial and non-commercial consumers is decreasing. Which reflects the results that the industrialization of Pokhara city in deceasing as compared other category.

The domestic consumption of the Pokhara city is increasing rapidly. For the year of 2066, the yearly increase in consumption is about 53 lakhs units but for year 2067 the yearly growth is only about 11 lakhs. In the similar way, the increased in the yearly consumption is abnormal for subsequent years. The slope of the graph is high in year 2065 to 2066; 2067 to 2068 and 2069

to 2070 which reflects the high increasing consumption but the slope for 2066 to 2067; 2068 to 2069 is small means the growth in consumption is small.

The commercial consumption of the Pokhara city is increasing moderately. For the year of 2066 the yearly increase in consumption is about 21 lakhs units but for year 2067 the yearly growth is only about 5 lakhs. In the similar way, the increased in the yearly consumption is abnormal for subsequent years. The graph has maximum slope between year 2065 to 2066 and minimum slope is between years 2067 to 2068. The commercial consumption of the Pokhara city is increasing very slowly. For the year of 2066 the yearly increase in consumption is about 5 lakhs units but for year 2067 the yearly growth is only about 1 lakhs. In the similar way, the increased in the yearly consumption is abnormal for subsequent years. The graph has maximum slope between year 2069 to 2070 and minimum slope is between years 2067 to 2068.

The consumption of the street light was seen constant throughout the year 2065 to 2070 which means that the street lights which are added during the city expansion was not included and the flat consumption is consider. The irrigation/water supply consumption of the Pokhara city is increasing very slowly. For the year of 2066 the yearly decrease in consumption is about 1 lakhs units but for year 2067 the yearly growth is only about 1 lakhs. In the similar way, the increased in the yearly consumption is abnormal for subsequent years. The graph has maximum slope between year 2066 to 2067 and negative slope is between years 2065 to 2066.

The Consumption of temple was following the increasing and decreasing trend. During the year 2068 to 2069, the consumption is decreasing while in other years the consumption is slightly increasing. The non-commercial consumption of the Pokhara city is increasing slowly. For the year of 2066 the yearly increase in consumption is about 1 lakhs units but for year 2068 the yearly growth is only about 6 lakhs. In the similar way, the increased in the yearly consumption is abnormal for ahead year. The graph has maximum slope between year 2067 to 2068 and minimum slope is between year 2066 to 2067.

Projection of energy consumption of PSMC by Trending/Regression Method

Here we use past three year data to project the future energy consumption by using the second order polynomial equations.

$E(t) = A0 + A1t + A2t2$

$E(1) = [1\ 1\ 1]\ *[A0\ A1\ A2]T$

$E(2) = [4\ 2\ 1]\ *[A0\ A1\ A2]T$

$E(3) = [9\ 3\ 1]\ *[A0\ A1\ A2]T$

$$\begin{pmatrix} E(0) \\ E(1) \\ E(2) \end{pmatrix} = \begin{pmatrix} 1 & 1 & 1 \\ 4 & 2 & 1 \\ 9 & 3 & 1 \end{pmatrix} \begin{pmatrix} A(0) \\ A(1) \\ A(2) \end{pmatrix}$$

Matrix E= [73519933,75308333, 81825896]T

Matrix A = [76460696, -5305345, 2364582]T

The Polynomial equation which describe the energy demand of the PSMC is

$E(t) = 76460696 - 5305345t + 2364582t^2$

Table 3: Forecasted energy consumption of year 2068 to 2075 .

Year	2068	2069	2070	2071	2072	2073	2074	2075
Demand	73269933	75308333	81825896	93072622	109048511	129753563	155187778	185351156

The regression analysis uses the past year data trend to forecast the future value. Here we use the data of 2068, 2069 and 2070 to fit a best curve, which define the energy demand of PSMC. The curve is a function of the time and by putting the value of time t we easily get the future energy demand of Pokhara. The forecasted demand of Pokhara for the year 2071 is 93072622 Kwh, which is about 12% higher than the previous year. The energy demand increased by 12% per year is below than the expected as compared to the foreigner country but due to load shedding and political instability, the growth of the energy demand of Pokhara is well below than the forecasted value.

We also forecasted the energy demand by considering the individual demand of the each consumer class. If we compare the two way of forecast (one by taking total energy another class wise forecasting and adding) forecasted value of class wise consumer method is seems to be more accurate. Although total energy demand of Pokhara is highly dominated by domestic consumer the different between two methods may be negligible one.

Demand Forecast of PSMC Consumer Class Wise

Domestic

Matrix E= [44726877,45449892,49665557]T

Matrix A = [47496512, -4515960, 1746325]T

Hence the Polynomial equation which describe the Domestic energy demand of the PSMC is

$E(t) = 47496512 - 4515960t + 1746325t2$

Table 4: Forecasted domestic energy consumption of year 2068 to 2075

Year	2068	2069	2070	2071	2072	2073	2074	2075
Demand	44726877	45449892	49665557	57373872	68574837	83268452	101454717	123133632

The forecasted energy demand of the domestic consumer is presented in the table above. The forecasted energy for year 2071 is 57373872 Kwh which is about 15.5% higher than the previous year. Due to the increase in urbanization and socio-economic status the increased in the domestic consumption is expected. The Percentage increased in the domestic consumption is in the increasing order from 15.5% to 21.36%.

Commercial

Matrix E= [11639723,12500934,13541237]T

Matrix A = [10957604, 592573, 89546]T

The Polynomial equation which describe the Commercial energy demand of the PSMC is

$E(t) = 10957604 + 592573t + 1746325t2$

Table 5: Forecasted commercial energy of year 2068 to 2075

Year	2068	2069	2070	2071	2072	2073	2074	2075
Demand	11639723	12500934	13541237	14760632	16159119	17736698	19493369	21429132

The forecasted energy for the year of 2071 for commercial consumer is 14760632 Kwh which

is about 9% higher than the previous year. Due to the less commercialization of Pokhara city the increased in the commercial consumption is tiny. The percentage increased in the forecasted energy demand is range from 9% to 9.93% which reflects the commercial energy forecast is increasing with a fixed percentage,

Industrial

Matrix E= [7778275, 7970998, 8804395]T

Matrix A = [8226226, -768288, 302337]T

Hence the Polynomial equation which describe the Industrial energy demand of the PSMC is

$E(t) = 8226226 - 768288t + 302337t2$

Table 6: Forecasted industrial energy consumption of year 2068 to 2075

Year	2068	2069	2070	2071	2072	2073	2074	2075
Demand	7778275	7970998	8804395	10278466	12393211	15148630	18544723	22581490

The Industrial consumption of the Pokhara city is depicted in the table above. The forecasted energy of year 2071 is 1027466 which is about 16.74% higher than the previous one. The percentage increased in the industrial consumption is ranges from 16.74% to 22.41%

Non Commercial

Matrix E= [6459086,6851073,7025104]T

Matrix A = [5849143, 718921,-108978]T

The Polynomial equation which describe the Non Commercial energy demand of the PSMC is

$E(t) = 5849143 + 718921t + 302337t2$

Table 7: Forecasted Non commercial energy consumption of year 2068 to 2075

Year	2068	2069	2070	2071	2072	2073	2074	2075
Demand	6459086	6851073	7025104	6981179	6719298	6239461	5541668	4625919

While taking the past three year of data and forecasting the consumption of the non commercial consumer the forecasted demand of year 2071 is 6719298 which is 0.62% less than the previous year. We can't expect the decreased in the energy consumption of any class consumer. This is one of the limitations of the trending method.

Irrigation/Water Supply

Matrix E= [537678,605359,653119]T

Matrix A = [450076, 97562,-9960]T

The Polynomial equation which describe the Irrigation energy demand of the PSMC is
$E(t) = 450076 + 97562t - 9960t2$

Table 8: Forecasted irrigation energy consumption of year 2068 to 2075

Year	2068	2069	2070	2071	2072	2073	2074	2075
Demand	537678	605359	653119	680958	688876	676873	644949	593104

Temple

Matrix E= [142233,129462,147097]T

Matrix A = [185410, -58380,15203]T

The Polynomial equation which describe the Temple energy demand of the PSMC is

$E(t) = 185410-58380t+15203t^2$

Table 9: Forecasted temple energy consumption of year 2068 to 2075

Year	2068	2069	2070	2071	2072	2073	2074	2075
Demand	142233	129462	147097	195138	273585	382438	521697	691362

The world trend of energy consumption increasing is expected to be exponential but the increase in the consumer number is linear. So we use the first degree linear equation for defining the consumer increasing trend.

Domestic Consumer Number Prediction

Matrix E= [37412,39329]T

Matrix A = [35495,1917]T

The Polynomial equation which describe the Domestic Consumer Number of the PSMC is

$E(t) = 35495+1917t$

Table 10: Forecasted domestic consumer of year 2068 to 2075

Year	2068	2069	2070	2071	2072	2073	2074	2075
No.	35634	37412	39329	41246	43163	45080	46997	48914

In Pokhara the yearly increased in the domestic consumer number is about 2000 in number. From 2068 to 2070 the increase in the consumer number is about 2000 per year so by following this trend we forecast the future year which equation define the consumer number.

Commercial Consumer Prediction

Matrix E= [503,539]T

Matrix A = [467,36]T

The Polynomial equation which describe the Commercial Consumer Number of the PSMC is

$E(t) = 467+36t$

Table 11: Forecasted commercial consumer of year 2068 to 2075

Year	2068	2069	2070	2071	2072	2073	2074	2075
No.	447	503	539	575	611	647	683	719

Industrial Consumer Prediction

Matrix E= [697,739]T

Matrix A = [655,42]T

Hence the Polynomial equation which describe the Industrial Consumer Number of the PSMC is

$E(t) = 655+42t$

Table 12: Forecasted industrial consumer of year 2068 to 2075

Year	2068	2069	2070	2071	2072	2073	2074	2075
No	655	697	739	781	823	865	907	949

Non Commercial Consumer Prediction

Matrix E= [293,304]T

Matrix A = [282,11]T

The Polynomial equation which describe the Non Commercial Consumer Number of the PSMC is

$E(t) = 282+11t$

Table 13: Forecasted non commercial consumer of year 2068 to 2075

Year	2068	2069	2070	2071	2072	2073	2074	2075
No.	283	293	304	315	326	337	348	359

Irrigation Consumer Prediction

Matrix E= [11,12]T

Matrix A = [10,1]T

The Polynomial equation which describe the Irrigation Consumer Number of the PSMC is

$E(t) = 10+t$

Table 14: Forecasted irrigation consumer of year 2068 to 2075

Year	2068	2069	2070	2071	2072	2073	2074	2075
No.	11	11	12	13	14	15	16	17

Although neither forecasting method produced reliable forecasts of electricity demand, the exercise did result in a number of implications. The most obvious implication is the need for adequate data. The data set must be large enough so that the past can accurately reflect the future. Without a sufficient data set, problems arise such as the ones discussed in the Results Section. Without an adequate data set, electricity demand may be over or underestimated. When the results of the forecast are not logical, it may be advantageous to use subjective inputs. Subjective inputs rely upon the interpretation of the trend of the data to forecast future values. Therefore, when the results of the resulting confidence intervals are not logical, it is necessary to revert back to subjective methods of trend extrapolation. Discussion and analysis above result to reach total demand of electricity up to 2075BS reached to 123133632 KWH from 81824845 KWH. Similarly, domestic consumption have an influential share of total demand and no of domestic consumer increased to 48914 from 35634 during forecasting period.

Conclusion

This thesis describes the long term load forecasting using the regression and simulation method. In the report, we present the energy demand and peak demand of PSMC which gives the future electricity market condition of the Pokhara city. Based on the result the electricity utilities can forecast their plan to meet the demand of Pokhara. In Nepal NEA had the solo authority to distribute the electricity throughout the Nepal so the concept of deregulation and distribution automation seems unimportant in the present scenario. But due to the long load shedding and unwell management of NEA present need of electricity market is deregulation. In the deregulated market of electricity, many utilities are present to supply the demand in the various cities so the proper forecast of energy is the very essential. By following the forecasted peak

demand and energy the electricity utility can easily manage the sources and infrastructures to fulfill the demand of electricity. So we reached on the conclusion that by using the result of this report the utility can easily manage the future market condition of electricity supply of Pokhara.

Recommendation

Based on the result of the report the following recommendations have been drawn.

In order to achieve higher accuracy in forecasting, large number of historical data shall be used. The factors such as per capita income, total population, price of electricity, price of gas, max/min temperature etc. shall be included in the model development. More accurate load factor, load pattern shall be measured particularly for Pokhara. Due to the increased in socio economic status the use of home appliances is largely increasing so the end use appliance method of forecast shall also include.

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View Point

Marketing and Entrepreneurship Development in Context to Engineering Sector

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Abstract;

Market is the sum of people, income and expectations. Marketing is the process of managing these variables by planning and implementing 7ps as: product, price, place, promotion, people, process and physical facilities within an enterprise to satisfy its customers. An enterprise cannot survive without marketing. Entrepreneur establishes a enterprise by taking the risk that starts something new. Entrepreneurial marketing help to enterprise establishment and total market success. Engineering had got technical scope to setup and regulate business enterprises. Engineers are those personality who posses good psychological system useful to be a successful entrepreneur. So they should plan and execute entrepreneurial marketing mix to be a successful businessman.

Key words: Business, entrepreneurship, engineering, marketing, personality, science etc.

Background

An organization is the sum of people, resources, equipments, capacity, system etc. surrounded by environmental forces functioning efficiently and effectively as per the plan and direction of management. It refers to the process of getting the things done through others to achieve the desired objectives in shortest possible time and minimum cost. At present management is focusing to dynamism, formulation of strategy, team work, total quality management and internationalization in global context. Complexities are increasing to incorporate and regulate the organizations/enterprise. Establishment of the entity will be meaningless if market will not be successful. So marketing is also the subject of higher priority from the very beginning in the innovation of an enterprise.

Marketing and entrepreneurship are just like two sides of a coin. Fundamentally, an enterprise operates production, marketing, finance, human resources,

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administration, research and development activities. After the establishment of an enterprise, marketing and other activities must be planned and executed. In this context marketing management operates many activities related to organizations offerings. Besides this, any profession or personality can also be marketed on the basis of its perspectives. Due to multipurpose scope of marketing, here it is focused for the purpose on the basis of review and justification that what is relation in between marketing and engineering and how an engineer can be marketed/ guided to be a successful entrepreneur?

Marketing

In this modern context, marketing is a planning and execution process;

- That starts from identifying customer needs and produces goods and services to distribute in convenient places at reasonable price after communication.

- That also utilizes system model to know the customers and market feedback after the sales of product for further improvements.

- It also focuses to customer's satisfaction, consumerism, discharges social responsibilities and extends relationships among the stakeholders.

- Develops new products, modifies existing one searches new market segment, analyzes competitive situation and builds the image through positioning.

- Focuses profit by achieving organizational goals.

    Thus, marketing can be perceived as;

Yesterday   =>Buying and selling

Today   =>Satisfaction to customers

Tomorrow   =>Building relationship networks.

Entrepreneurship

Generally an entrepreneur is an individual who takes risks and starts something new. In broader sense, entrepreneur;

- Organizes and operates enterprise for personal gains.

- He pays current prices for the materials consumed in the business, for the use of the land, for the personal services he employs and for the capital he requires.

- He contributes his own initiatives and skill in planning, organizing, directing, coordinating and controlling the activities of an enterprise.

- He also assumes the chance of loss and gains creating by unforeseen and uncontrollable circumstances.

- Thus, an entrepreneur is a innovator

In general sense, entrepreneurship is a quality that indicates to courage to establish and run units smoothly and continuously. Widely entrepreneurship is the process of creating something new with the value by devoting the necessary time and efforts assuming along with financial and social risk to receive the reward as money and personal satisfaction. Thus, it is the process of;

- Creating or starting new organizations.

- Developing a new business model.

- Utilization of human and other resources.

- Responsible for success or failure.

- Bearing of financial and social risk.

- Receiving monetary and personal satisfaction rewards.

- Managing the overall environment.

Entrepreneurial marketing is not a traditional single marketing strategy, it is combination of more concepts and theories that differentiates it from traditional marketing practices. It contains many of the fundamental principles of marketing because they are typically designed for well established firms. Entrepreneurial marketing utilizes a toolkit of new concepts to help for enterprise establishment and total market success.

Many entrepreneurial marketing strategies are born as per the needs. New businesses might have persons for working on their marketing efforts. They work within limited budgets and have access to a fraction of the resources that their major competitors have.

The most common features of entrepreneurial marketing include;

- Innovation as the original feature

- Risk taking for benefit and performance

- Being proactive for better result

- Try to highlight the company's greatest strengths while emphasizing their value to the customer.

- Focusing on innovative products or exemplary customer service is a way to stand out from competitors.

- They gain popularity by using cheap and accessible tools including viral videos, Tweets, Face book pages, and email marketing.

Engineering Field

Engineering is a broad term that covers a wide range of applications and industries. Combining mathematics, science and technology, engineers produce creative solutions to real world problems. Engineers apply;

- Mathematics and sciences such as physics to find suitable solutions to problems or to make improvements to the status.

- Are now required to have knowledge of relevant sciences for their design projects.

- They are learning new material throughout their career.

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If multiple options exist, engineers weigh different design choices on their merits and choose the solution that best matches the requirements. The crucial and unique task of the engineer is to identify, understand, and interpret the constraints on a design in order to produce a successful result. It is usually not enough to build a technically successful product; it must also meet further requirements. Constraints in engineering include available resources, physical, imaginative or technical limitations, flexibility for future modifications and additions, and other factors, such as requirements for cost, safety, marketability and serviceability. By understanding the constraints, engineers derive specifications for the limits within which a viable object or system may be produced and operated.

Scope of Engineering in Business Sector

It is proved that holistic approach has to apply to achieve maximum success. For this knowledge of technology, management and legal procedures are most. Science and engineering knowledge is very important for achievement of overall organizational objectives.

Engineering had got technical scope in economic and non-economic organizations. It can control to any field partially or fully. By considering this reality, engineering can setup and regulate;

- Consultancy Service

- Computer & electronic development related projects

- System operation

- Mechanical engineering related projects

- Electronics & Communication operations

- Electrical Engineering operations

- Automobile Engineering operations

- Biomedical Engineering operations

- Refrigeration & Air-Conditioning Engineering operations

- Marine Engineering operations

- Aircraft Engineering operations, etc

These all areas have business scope as well as professionally associated with business field which can be established and operated being an entrepreneur or can work as an executive employee.

Qualities of a Good Entrepreneur

There are entrepreneurs who are extremely successful and everything they touch seems to turn to gold, and there are some that do not see as much success. Following entrepreneurial qualities responsible for driving success.

1. Not being afraid of delegating tasks.

2. Managing time effectively.

3. Visualizing goals and success.

4. Listening and communicating well.

5. Understanding your time is valuable.

6. Seeking help when you need it.

7. Getting out of the office to be fresh.

8. Knowledge of time management, marketing, law, technology, etc.

9. Prompt decision making.

10. Ability to manage conflicts/Stress

11. Human resources management related activities.

12. Evaluation & control capacity.

13. Overall organizational planning, organizing, directing, motivating, leading, coordinating and controlling quality.

Personality Development

Personality means a dynamic organization within the individual of those psychological systems that determines unique adjustments to his environment. Personality as the sum of ways in which an individual reacts with others. It is a combination of measurable traits that a person exhibits. Personality development refers to growth and development of a person's whole psychological system. Personality looks at some aggregate whole that is greater than the sum of the parts.

Major determinants of personality are;

- Heredity

- Environmental norms & culture.

Personality can be developed by considering;

- Finding the area of interest

- Own knowledge inventory

- Relevant to own career

- Long term objectives determination

- Side support activities to the career

- Physical and other features

- Matching to national culture

- Excellent exposure development

- Feedback & follow-up

Personality can be measured by using the ways;

- Self-report survey (self measurement)

- Observer-rating surveys (measurement by observations)

- Projective measures (Evaluating by the essay written about pictures and drawings)

Marketing of an Engineering Personality

Sufficient engineers have substantially the same nature. A good engineer is likely to have certain basic traits/features.

- Engineers are curious and enjoy discovering how things work and solving problems.

- Engineers use logic to examine ideas and develop theories and explanations.

- Engineers like science.

- Engineers are able to concentrate intently on a subject.

- Engineers are creators who are always looking for better ways of doing things.

- Engineers want order and structure at work and in their personal life.

- Engineers enjoy discussion, debate (and arguing), about their topic.

- Engineers appreciate and respect intelligence in others.

- They often have a good sense of humor.

- Engineers commonly want to help to solve the world's problems.

- Engineers want to introduce rules and principles systematically in economic and non-economic sector.

Process steps of engineering personality marketing (engineering personality marketing mix) are;

- Expose your quality with outstanding knowledge/features through appropriate communication channel/media.

- Consider the cost/price to be incurred for developing/offering the tangible or intangible things from your side

- Where it can be offered or provided conveniently to the customer or user.

- What are the benefits/utilities including quality of goods or services that you can provide and communicate how it is superior with compared to competitors.

- How many people must be involved to complete the desired work/service.

- What processes have to establish and operate for smooth production/service providing.

- What are the required physical things to achieve your objectives.

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Right Choice in the Life

A person must be able to choose right in the life on the basis of;

1. Interested area with good feasibility.

2. Means & resources available to utilize.

3. Expertise/adequate knowledge of the proposed field or area.

4. Easy to achieve the objectives.

5. Less dependent with others.

6. Minimum number of input items.

7. High speed of conversion.

8. Corporate operation possibility.

9. Useful to the members of the family/team.

10. Growth/expandable.

11. Permission by state/legal considerations.

12. Competition complexity.

13. Environmental context.

Conclusions

Overall presentation can be concluded as;

- Marketing is a multipurpose discipline that is equally useful in any object oriented activities. It is a common process to be used in individual and

organizational context to offer and accept something to fulfill needs and wants.

- Entrepreneur is an individual who starts organizational activities by taking the risk.

- Entrepreneurship is a process of creating something new with value by devoting the time and efforts as well as utilizing the means and resources. He/she performs an innovation.

- Entrepreneurial marketing highlights quality of entrepreneur to create a new concept to help for the enterprise establishment and total market success.

- Engineering is the science to choose the solution that best matches to the problem.

- There is business scope of engineering for consultancy, process design, computer hardware/software, machinery tools, physical creation/construction, marine engineering, biomedical engineering, aircraft engineering, refrigeration & air-conditioning, electronics & communication, electrical engineering, automobile engineering, etc.

- A entrepreneur should have the quality of management of knowledge, human behavior, physical means and other resources through planning , organizing, directing, leading, motivating, coordinating, controlling to achieve the desired objectives in minimum time and cost. He/she should have knowledge of system approach to be a complete entrepreneur.

- Personality is the sum of ways that a person reacts and interacts with others. Better combination of qualities in a person help to adjust with environment dynamically.

- Main aspects of engineering personality marketing are 7Ps i.e. product, price, place, promotion, people, process and physical facilities.

- Right choices in the life have to be backed by interest, knowledge, resources/means available, legal support and overall environmental support.

- Any profession or personality like engineers can also be encouraged to be a entrepreneur on the basis of their perspectives

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