

**AVAILABILITY OF DRINKING WATER AND IT'S IMPACTS ON
STUDENTS' HEALTH IN JMC**

By

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DECLARATION

I hereby declare that the work presented in this research report entitled “**Availability of Drinking Water and its Impacts on Students' Health in Jmc**” has been done and has not been submitted elsewhere. Sources of information have been specifically acknowledged by reference to the authors of institutions.

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Date: July, 2018

RECOMMENDATION FOR ACCEPTANCE

This is to certify that Mr. Krishna Prasad Tripathi prepared the research report entitled **“Availability of Drinking Water and its Impacts on Students' Health in Jmc”** under my guidance and supervision. I recommend this research report for approval and acceptance.

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ABSTRACT

The study entitled "AVAILABILITY OF DRINKING WATER AND IT'S IMPACTS ON STUDENTS' HEALTH IN JMC" is carried out to find out to assess the condition (quantity) of drinking water and examine the impact of drinking water on student's health in the campus. It was delimited to Janapriya Campus of Kaski district. The descriptive and analytical method of research was applied to meet the objectives and the survey technique was used to collect necessary information. All the students in JMC were the population of this study. The sample size was 160 through lottery method. The questionnaire KII and observation schedule were the major tool of data collection. Collected data were analyzed both quantitatively as well as analytically as per their nature in table, and charts.

Master students and other science students got bottle drinking water in their own classroom who studied in Maitri building. It is seen that there were three jars with cold and hot drinking water. On the other hand students spent nearly 2 to 5 minutes to drink water in other buildings. Campus has its own boring system from 2071/ 01/ 17 B.S. The water was lab tested in the beginning by the microbiology department and recommended that it was safe. It was found that the water filter of Euro Guard were changed time to time.

Out of 160 students 124 students did not complain about quality of drinking water but only eleven students said that the water was not safe. So that 6 students bought it. Other 5 brought from their homes because they needed boiled water. More than one fourth students i.e., 28.63 percent said that the campus should manage cups, bottle, mug or jug as the students' ratio. Nearly two third students i.e., 63.63 percent said that the water had smell due to underground water. Nearly 80 percent students said that the water was clean but 20 percent said it didn't look clean due to mud, unsafe buckets, jug, and old bottle. Thirty one students felt water born diseases during their JMC period but they did not it confirm either college water or residential or outside water was unsafe. If students don't satisfy with the college water, they were not recommend their younger to enrolled in JMC. So that the campus had the plan to make the round corner taps for the drinking water with the support of UGC.

TABLE OF CONTENTS

	Page No.
TITLE PAGE	i
DECLARATION	ii
RECOMMENDATION FOR ACCEPTANCE	iii
ACKNOWLEDGEMENT	iv
ABSTRACT	v
TABLE OF CONTENTS	vi
LIST OF TABLES	viii
ACRONYMS	ix
CHAPTER I INTRODUCTION	1-6
1.1 Background of the Study	1
1.2 Statement of the Problem	3
1.3 Objectives of the Study	4
1.4 Justification or Rational of the Study	5
1.5 Delimitations of the Study	5
1.6 Definitions of the Terms Used	6
CHAPTER II REVIEW OF RELATED LITERATURES	7-11
2.1 Review of Theoretical Literature	7
2.2 Review of Empirical Literature	8
2.3 Conceptual Framework	10
CHAPTER III RESEARCH METHODOLOGY	11-13
3.1 Research Design	11
3.2 Population of the Study	11
3.3 Sampling procedures and Sample Size	11
3.4 Sources of Data	11
3.5 Tools/Instruments for Data Collection	12
3.6 Data Collection Procedure	12
3.7 Methods of Analysis and Presentation of Data	12
CHAPTER IV ANALYSIS, INTERPRETATION AND DISCUSSION OF RESULT	13-41
4.1 Analysis, Interpretation and Discussion of Result	13
4.1.1 Demographic Profile	13

	4.1.2 Sources of Drinking Water	13
	4.1.3 Quantity of Drinking Water	14
	4.1.4 Time Spent for Drinking Water	16
	4.1.5 Store of Drinking Water	17
	4.1.6 Managing Ways of Drinking Water	18
	4.1.7 Drinking Water Access Points	19
	4.1.8 Providing Cups at Water Access Points	21
	4.1.9 Causes of Smelling	22
	4.1.10 Lab Test and Look Like	23
	4.1.11 The Water Looks Like	24
	4.1.12 Dissatisfaction and Buying Water	25
	4.1.13 Using Method of Purification	28
	4.1.14 Place of Paying	29
	4.1.15 Person and Issue of Complain	31
	4.1.16 Time of Maintain	33
	4.1.17 Diseases Due to Water	34
	4.1.18 Water and Its Impact on Students Enrolments	36
	4.1.19 Areas of Improvement	37
4.2	Major Findings	39
CHAPTER V	SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATION	42-44
5.1	Summary	42
5.2	Conclusions	43
5.3	Recommendations	43
REFERENCES		
APPENDICES		

LIST OF TABLE

Table	Title	Page
4.1	Sources of Drinking Water	14
4.2.	Quantity of Drinking Water in JMC	15
4.3	Time Spent for Drinking Water	16
4.4	Store of Drinking Water in JMC	17
4.5	Managing Ways of Drinking Water	18
4.6	Fountains of Drinking Water in JMC	20
4.7	Alternative Ways of Cups for Drinking Water	21
4.8	Causes of Smelling	22
4.9	Taste of Water in College	24
4.10.	The Water Looks Like	25
4.11	Causes of Dissatisfaction	27
4.12	Using Methods of Purification	29
4.13	Places for Paying Money to Get Drinking Water	30
4.14	Person to Complain	32
4.15	Issues of Drinking Water	33
4.16	Time of Maintain	33
4.17	Diseases Due to Drinking Water	35
4.18	Water and Its Impact on Students Enrolments	36
4.19	Areas of Improvement	37

ACRONYMS

ACC	Assistant Campus Chief
AI	Adequate Intake
AIDS	Acquired Immunodeficiency Syndrome
BBA	Bachelor of Business Administration
CBS	Central Bureau of Statistics
CC	Campus Chief
CMC	Campus Management Committee
FOE	Faculty of Education
FSU	Free Student Union
FTAQCD	Food Technology and Quality Control Division
JJIS	Janapriya Journal of Interdisciplinary Studies
JMC	Janapriya Multiple Campus
JRCC	Janapriya Research and Consultancy Committee
KII	Key Informants Interview
HIV	: Human Immunodeficiency Virus
MBS	Master of Business Statistics
MOHP	Ministry of Health and Population
MDG	Millennium Development Goal
NAST	National Association of Science and Technology
NDHS	Nepal Demographic Health Survey
NGO	National Governmental Organization
QAA	Quality Accreditation Assurance
UGC	University Grand Commission
UNICEF	United Nation International Children Emergency Fund
UN	United Nation
VDC	Village Development Committee
WHO	World Health Organization
WSC	Water Supply Corporation

CHAPTER I

INTRODUCTION

1.1 Background of the Study

Water is one of the most basic elements for all living beings on this earth. About to present of the human body is made up of water. Human being can live without food for sometime but not without water. Water is used for various purposes such as drinking, cooking food, washing clothes, bathing, growing crops, construction work and for generating hydro-electricity. Water plays vital role in the development of the country. If pure drinking water is supplied, citizen will be healthy and they can contribute to their country as a result development of a country will be rapid.

Various United Nation (UN) agencies reported roughly 780 million people around the world lack access to clean drinking water. The World Health Organization (WHO) estimates 6.3 percent of all deaths are caused by limited access to safe drinking water. The Millennium Development Goals, one of which includes a target to halve the proportion of people without access to safe drinking water and basic sanitation by 2015. According to the (U.N.), more than 14,000 people die daily from water-borne illnesses. The world is on-track to meet the Millennium Development Goal (MDG) water target based on the indicator “use of an improved drinking water source but, at the current rate of progress, this still will leave 672 million people without access to improved drinking water sources in 2015, and possibly many hundreds of millions more without sustainable access to safe drinking water (WHO & UNICEF 2012).

The government of Nepal has not given much more attention for drinking water supply at higher education. No doubt, this is a rich country around the world for water resources. Drinking water quality varies from place to place, depending on the condition of the source water from which it is drawn and the treatment it receives. Drinking water or potable water is water safe enough to be consumed by humans or used with low risk of immediate or long term harm. In most developed countries, the water supplied to households, commerce and industry meets drinking water standards. Over large parts of the world, humans have inadequate access to potable water and use sources contaminated with disease vectors, pathogens or unacceptable levels of toxins or suspended solids, Leggett, D.J., Brown, R., Stanfield, G., Brewer, D. &

Holliday, E. (2001). Water has always been an important and life-sustaining drink to humans and is essential to the survival of most other organisms not only at campuses.

The quality of drinking-water may be controlled through a combination of protection of water sources, control of treatment processes and management of the distribution and handling of the water. Polluted water and unsanitary practices are at the root of many health problems in developing countries like Nepal Health-based targets are an essential component of the drinking-water safety framework, WHO (1993). They should be established by a high-level authority responsible for health in consultation with others, including water suppliers and affected communities. They should take account of the overall public health situation and contribution of drinking-water quality to disease due to waterborne microbes and chemicals, as a part of overall water and health policy. They must also take account of the importance of ensuring access to water, especially among those who are not served at Campus students.

The City University of New York, campuses are all connected to the New York City water system which is considered to be one of highest quality municipal water system in the united stated. The New York City Department of Environmental Protection regulates and protects reservoirs and the water is tasted more than half a million times a year at various points throughout the system. Additionally Department of environmental protection adjusts the (PH) of the water to minimize corrosion and adds phosphoric acid to create a protective film on pipes to prevent the release of lead and other metals.

Water is an important element for life. Every Nepali citizen should have access to water sufficient to meet basic needs, including drinking, cooking and sanitation. Nepal lies between two giant countries India in the south, east and west and China in the North. Nepal stretches about 855 km from the West to the East and its width varies from around 145 to 241 km. The total land area is 147,181 square kilometres. Nepal consists broadly of five physiographic regions which occur in the following order from south to north: the Terai (14 per cent of the total land area); the Siwaliks (13%), the Midhills (30%), the High Mountains (20%) and the High Himalayas (23%). It has a population of 26.66 million with an annual growth rate of 1.35 per cent. The population density is 180 per square km and the literacy rate is 65.9 per cent. The male literacy is 75.1 per cent and female 57.4 per cent. The life expectancy

rate of males is 68 years and that of females 69 years. Nepal is rich in water resources. In fact, among other figures drinking water supply within country especially in education sector is not satisfactory (CBS, 2011).

1.2 Statement of the Problem

Safe and pure drinking water is the birth rights of all humankind as much a birth right as clean air. The majority of the world's population, however, does not have access to safe drinking water. This is certainly true in most parts of Africa and Asia Most water requires some type of treatment before use, even water from deep wells or springs. One reason safe drinking water is of paramount concern is that 75 per cent of all diseases in developing countries arising from polluted drinking water. Water covers 70 per cent of the globe's surface, but most is salt water. Freshwater covers only 3 per cent of the earth's surface and much of it lies frozen in the Antarctic and Greenland polar ice. Freshwater that is available for human consumption comes from rivers, lakes and underground sources and aquarium, (WHO & UNICEF 2012).

Although Nepal is naturally bestowed with ample water resources only 82 percent of population have access to safe and clean drinking water. Improved services such as piped water and covered wells make up for almost 93 percent of water coverage in urban areas and 79 percent in rural areas (with 6.7 percent water piped to the house, 32.5 outside the house and 39.6 percent using covered wells). The remaining has to depend upon the conventional sources like unsafe wells, lake, river, spring, etc.

According to Kantipur T. V. (11 August 2016) about the title Polluted drinking water in Kathmandu concluded that water from the tap was mixed with drainage. Similarly water of jar and mineral water were not safe because of coli form, the germ found in faeces. Water from underground was with the mix of Arsenic so the government said it isn't good water for drinking. NAST collected water sample from different places of Kathmandu which was provided to public by Water Supply Corporation and lab tested found that 50 percent sample were found germs Ecoli so such water shouldn't provide to public. Food Technology And Quality Control Division (FTAQCD) collected 79 samples of Mineral water and lab tested and concluded that 23 percent water found low quality and aware to the company . Consumers compelled to drink such water as a result there were so many water borne diseases. The government

should control to all concerned companies and the Water Supply Corporation (WSC) in time and makes them provide safe and pure drinking water (You Tube Video Translated).

Once the researcher asked students to provide drinking water nearby Bachelor in Business Administration (BBA) building. Students replied whether it was the safe water. They showed the glass, filter pot Euro guard. Same time it was realized to maintain and asked the staff to maintain it as possible the researcher has the queries to observe the drinking water availability in Campus and the relation with the students' admission or enrolments. The researcher observed the situation of drinking water availability in some colleges and have some questions related it. Either the students are happy or not with the facilities of drinking water. Is the source and drinking water safe? Is the facility sufficient or not? What are the problems they faced with the drinking water these questions lead the researcher to find out the situation of it.

Drinking water is one of the major necessary things. It is necessary time to time. If the students feel there is lack of safe and pure drinking water, they have negative attitude towards Campus. As a result the admission of the Campus may hamper. Students don't recommend their friends, brothers, sisters, and relatives for admission where they cant get safe and pure drinking water which is second necessities after air. The unsafe drinking water leads to many water born diseases like dysentery, typhoid, diarrhoea, vomiting, cholera, abdominal pain, worm etc. So the Campus management should manage the proper pure, safe drinking water. From the above the statement of the problem is availability of drinking water and its impact on health of JMC students.

The researcher made the following research questions for breaking down the study.

- i. What is the condition of drinking water in JMC?
- ii. What types of impact seen on student's health?.
- iii. What are the policies towards drinking water at campus?
- iv. How is the water purified and safe?

1.3 Objectives of the Study

The key objective of this study is to examine the drinking water availability at JMC. However, other specific objectives are as follows:

- i. To assess the condition (quantity) of drinking water in JMC.
- ii. To examine the impact of drinking water on student's health.
- iii. To identify the policies towards drinking water at campus..

1.4 Rationale of the Study

- i. This study focused only drinking water accessibility at JMC. It aims to determine the main source of drinking water at JMC, which serves as a proxy indicator for whether drinking water is safe or not.
- ii. The assumption is that certain types of drinking water sources are likely to deliver drinking-water of adequate quality for the basic health needs. This approximation will be used because it would be too costly and time consuming to assess drinking-water quality through surveys that are considered likely to provide safe water first.
- iii. Several other factors, in addition to the quantity of water available and the time and distance to the source, affect the quality of the access that campus have drinking-water.
- iv. Drinking water treatment at campus can significantly impact the quality of water at the point of use. Appropriate treatment involves any method proven to be effective in removing or killing pathogens, such as boiling the water, adding bleach or chlorine to the water, using a water-filtering device, solar disinfection of the water and settling methods.
- v. However, the research mainly consider the availability of drinking water at JMC. But obviously who wish to study further about drinking water availability at other sector would be a good guideline as well.

1.5 Delimitation of the Study

- i. The study was delimited within JMC.
- ii. Only availability and quantity of drinking water were the issue.
- iii. Observation sheet, questionnaire and KII were the tools to collect the data.
- iv. Impact of drinking water on health was studied.

1.6 Definition of Terms Used

Availability	:	Find easily
Bacteria	:	Microscopic living organisms usually consisting of a single cell.
Campus Policy	:	Policy regarding drinking water in campus.
Contaminant	:	Anything found in water (e.g., microorganisms, chemicals, radionuclide's, etc.) which may be harmful to human health.
Guideline	:	A general rule, principle, or piece of advice.
Parameter	:	A numerical or other measurable factor forming one of a set that defines a system or sets the conditions of its operation
Sustainable	:	Competent to be maintained at a certain rate or level, which means conserving an ecological balance by avoiding depletion of natural resources.
Quantity of Water	:	Amount of needed water.

CHAPTER II

REVIEW OF RELATED LITERATURE

2.1 Theoretical Literature:

According to Nepal's millennium development goal report, around 270,000 households in the country gained access to safe drinking water. Even the households that do have access to safe drinking water don't have access to quality water. Report of e-kantipur state that 85 percent of Nepalese drinking water is not up to per with the international standard of good quality drinking water. Nepalese officials reported Western Region has the highest access to safe drinking water (61 percent)

Provision of safe drinking water, adequate sanitation and personal hygiene are vital for the sustainable environmental conditions and reducing the incidence of diarrhoea, malaria, trachoma, hepatitis and morbidity levels. Water-related diseases continue to be one of the major health problems globally. An estimated 4 billion cases of diarrhoea annually represented 5.7 per cent of the global disease burden in the year 2000, (WHO & UNICEF, 2012). One of the major strategies for tackling this problem is the installation of protected sources such as boreholes, standpipes or wells to provide water of better quality. The quality of drinking-water may be controlled through a combination of protection of water sources, control of treatment processes and management of the distribution and handling of the water. Guidelines must be appropriate for national, regional and local circumstances, which require adaptation to environmental, social, economic and cultural circumstances and priority setting.

The quality of water, whether used for drinking, domestic purposes, food production or recreational purposes has an important impact on health. Water of poor quality can cause disease outbreaks and it can contribute to background rates of disease manifesting themselves on different time scales. Initiatives to manage the safety of water do not only support public health, but often promote socioeconomic development and well-being as well. This document sets out the strategy adopted by the World Health Organization (WHO) to manage water quality with a view to protecting and promoting human health. The water quality and health strategy is a framework for action by the WHO Secretariat. It was prepared through a consultative process, building on past World Health Assembly resolutions, in particular WHO

64/24, expert consultations, and feedback from a wide range of stakeholders on WHO water quality guidelines and associated activities. It also builds upon the MDGs, the human rights to water and sanitation and the post 2015 MDG process, which give increased attention to water quality aspects, which defines strategic objectives and includes activities to guide the water quality work done by WHO guidelines.

Contaminated water serves as a mechanism to transmit communicable disease. Such as diarrhoea, cholera, dysentery, typhoid and guinea worm infection. WHO estimates that in 2008 diarrhoeal disease claimed the lives of 2.5 million peoples? For children under five, this burden is greater than the combined burden of HIV/AIDS and malaria. A total of 58 countries from all continents reported a cumulative total of 589854 cholera cases in 2011, representing an increase of 85 per cent from 2014. The greatest proportion of cases was reported from the island of Hispaniola and the African continent. These trends reflect the need to shift from basic responsiveness to a comprehensive, multidisciplinary approach that works with communities to improve access to safe drinking-water and sanitation encourages behavioural change and promotes the targeted use of oral cholera vaccines where the disease is endemic.

All water utilities should deliver to the consumer an adequate supply of high-quality drinking water at a cost commensurate with the needs of each individual water system. To achieve this objective, the water should come from the highest quality source of supply available and be appropriately treated to meet regulatory and water supply industry criteria. Drinking water quality criteria should be based on documented health effects research, consumer acceptance, demonstrated treatment techniques, and effective utility management These local utility program should include establishment of system baseline data for future use by the utility. This information about source of supply, facilities, and operations can assist in the identification of conditions that prevent the utility from achieving compliance with water quality criteria this also allows decision-makers and stakeholders to make evidence-based choices and direct efforts to where they are needed, as well as promotes increased investment in the drinking water sector (NPC, 2010).

2.2 Empirical Literature

Gyawali (2015). Made the research on a study of drinking water accessibility at government higher secondary schools in Pokhara the study was conducted at ten

selected schools. The objectives of the research were to find out the condition of drinking water among 10 higher secondary schools in Pokhara, Students from class 11 and 12 were selected through random sampling. Students of all faculties were respondents. There were 74 boys and 44 girls altogether 118 were in total. Similarly, ten head masters, ten chairmen of school management committee, ten chairmen of parent's teacher association were selected from every school for data collection period. An observation schedule was also prepared and put the remark by the researcher. It was targeted particularly to know water purification system, water distribution, water availability, and water quality status and school policy regarding to drinking water. Although, water accessibility was not a big concern in selected school but the quality of drinking water was poor. No doubt, there was euro guard, filter and tap at schools but it seemed to be insufficient. Somewhere tap was broken but the whole water distribution system was not much bad at all.

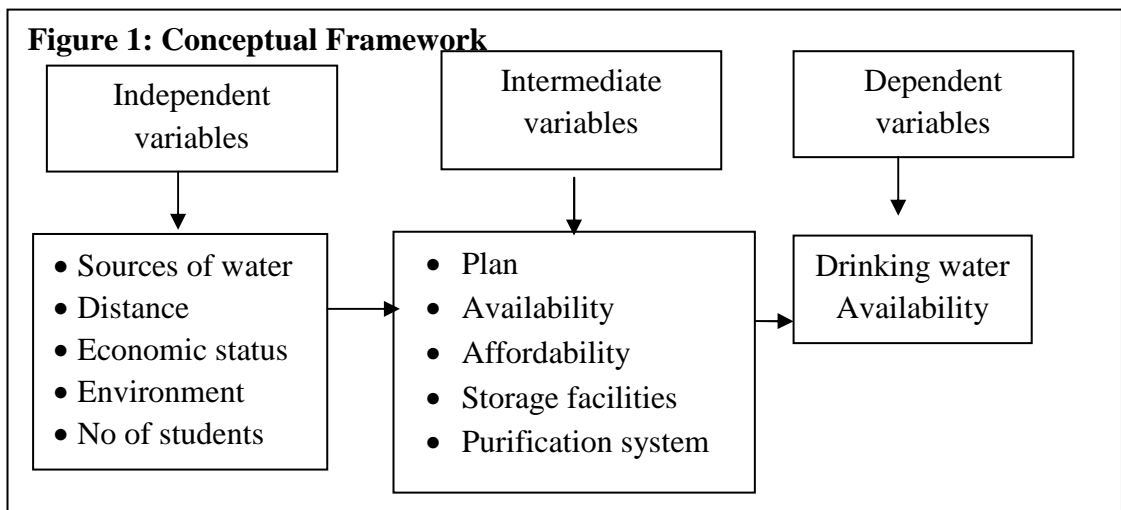
Majority told the tap was their source of drinking water at school. Most of the taps were running at ground, which was significance in numbers. Sometimes there was scarcity of water but no longer felt the problem. At school day, during meal period more than half respondents got drinking water. A very interesting fact and figure came out that nearly fifty per cent respondents told water fountains don't work properly. Likewise, school supported to raise awareness for quality drinking water huge number of respondents remarkable task made on it. Similarly, some of them few respondents i.e. one fourth per cent of total respondents put the notice near water fountain. Although less than two per cent respondents believed to address sustaining the water access plan long term and students were asked to carry bottle water from home which was less than five per cent in figure not highlighted like the school policy towards drinking water supply level.

Adhikari (2016) made the research on drinking water quality status of the JMC. The objective of the research were to assess the physical, chemical and bacteriological parameters of Bore well water and to assess the suitability of water with WHO and NDWQ standards for drinking water quality. He concluded that borehole water of JMC is not highly vulnerable to physico- chemical as well as bacteriological pollution. Still Arsenic was in higher amount of its continuous monitoring is necessary. It was found that change in the seasons (premonsoon, monsoon and post

monsoon) have slight impact on the quality of water of the borehole water. For this reason, it is recommended that groundwater for human consumption is treated in the same manner as surface water sources before distribution to users. He recommended that the water should check physical parameters like turbidity, pH, color, test and odor daily. Bacteriological analysis and EC are referred to check monthly where as TD quality. Other chemicals are advice to check yearly. It is highly recommended to test water quality at least ones a year to maintain its quality within standard limits. At the time of lab test the water quality in JMC was good

2.3 Conceptual Framework

This study was conducted with the aim to explore and evaluate on drinking water availability at JMC. Figure depicts conceptual framework that could be used to carry out the research.



This conceptual framework was developed among independent variables, intermediate variables and dependent variables. Water availability at JMC is dependent variable. Drinking water is influenced by various contributing factors such as, plan, availability, affordability, storage facilities, purification system, etc. The independent variables are like distance, no of students, educational status, economic status, which are influenced by the intermediate variables.

CHAPTER III

RESEARCH METHODOLOGY

This chapter focused research design, population of the study, sampling procedure and sample size, tools/instrument for data collection, standardization for tools, data collection procedure and method of data analysis and interpretation etc.

3.1 Research Design

This study based on descriptive case study and analytical research design. Qualiquan method has been followed in this research. The data was collected simultaneously and relevant information was taken for the purpose of drinking water availability and its impact on students health at JMC of Kaski District.

3.2 Population of the Study

Janapriya Multiple Campus in Kaski district was the population of the study. The students of Bachelor and Master level from Humanities and Social Science, Education, Management and Science faculties assumed as total population. According to administration section there were 1256 students in day shift and 3094 in the morning shift. All together there were 4350 students. Three key informants were interviewed on policy related subjects on drinking water.

3.3 Sources of Data

Both primary and secondary data were used. Primary data were taken through the respondents like students and key informants. Research report, books and journals related with drinking water were used as the secondary sources of the research.

3.4 Sampling Procedure and Sample Size

Multi stage sampling techniques have been used. First Janapriya Multiple Campus is chosen on the basis of convenience method. According to administration office there were 4350 students in four faculties. Forty students in each faculty were taken through quota method. One hundred sixty students were taken as the respondents through random sampling method. All available students inside the campus classroom were taken and students who were absent while talking data were excluded.

3.5 Tools/Instruments for Data Collection

The observation sheet, questionnaire with open and close type questions and KII were the major tools of data collection. Similarly, various materials such as books, journals, reports of, NGOs and INGOs were studied and analysed to prepare survey tools. A direct observation was held with the help of some pre determined norms. Questionnaire were pre-tested at Prithvi Narayan Campus Pokhara to get its validity. Then the researcher improved its weak points or drawbacks and receives the feedback from the supervisor and make it more reliable and valid. Six people were selected as the key informants and they were asked only for the policy on drinking water.

3.6 Data Collection Procedure

First of all, the researcher took authority to do the research on the topic. Being a lecturer of such campus, the researcher took permission from the Campus Chief to meet the students and stakeholders. Afterwards, the researcher told them about the fact of the visit. Then the researcher provides questionnaire to the respondents. After that the researcher observed and filled the observation sheet. Both primary and secondary data were used. Primary data were taken from the students from questionnaire and the key informants like CC, Senior administration staff and chair person of FSU with the help of interview. Various materials such as books, journals, reports of, NGOs and INGOs were the secondary sources which were used while preparing the report..

3.7 Method of Data Analysis and Interpretation

After collecting the data from observation sheet and questionnaire, those facts and figures were analysed in the descriptive manner. A few statistical tools such as percentage is used to analyzed data. All the data were presented in tables. Necessary comparison were done with other's finding and conclusion. The researcher interpreted with the help of national and international data like the recommendation of C.L. Aderson, Kerry and Lerry who contributed on School Health Programme. WHO standards were the another fact of comparison.

CHAPTER IV

ANALYSIS, INTERPRETATION AND DISCUSSION OF RESULT

4.1 Analysis, Interpretation and Discussion of Result

This chapter deals the analysis and interpretation of the data, which were collected by the researcher from Janapriya Multipale campus, Pokhara. The analysis and interpretation were focused through the mathematical tools on the various aspects of drinking water availability at JMC.

The following presentation highlights each of these characteristics as obtained during data collection period. Moreover, the finding has been shown via table, graph and pie chart including short description of each aspect.

4.1.1 Demographic Profiles

The researcher asked the respondents to fill their details as name, age, sex, religion, and place of residence. According to their response 46.25 percent were under 20 years and rest 53.75 percent students were above 20. Similarly 44.37 percent respondents were male and rest female. Likewise 75 percent students were Hindu, 10 percent students were Buddhist, 3.12 percent were Christian and 11.87 percent students didn't response on the religion. As asked their residence 60 percent were inside the valley or in Pokhara, 23.12 percent students were out of valley and 16.88 percent didn't response about their residence.

4.1.2 Sources of Drinking Water

Water covers about 71 percent of the surface .About 97 percent the Earths water is found in the oceans but it is too salty for drinking, growing crops and most industrial uses. The remaining 3 percent is fresh water. Water is used for drinking and other activities. Water found on the surface of earth is called surface water and that under the ground is called underground water. Surface water is found in the ocean, sea, river, lake, stream, pond etc. There are 6000 rivers and rivulets in Nepal. The water from the well and the pipe water is underground water (Jha, & Shah, 2002). Students were asked whether there was water facility or not Cent percent or 100 percent students said that there in JMC had water facility.

Table 4.1: Sources of Drinking Water

Sources of Drinking Water	Number of Respondents	Per cent
Pipe water	74	46.23
Own underground water	52	32.50
Vehicle water	-8	5.00
Others	18	11.25
Not response	8	5
Total	160	100

Sources: Field Study, 20017

Table 4.1 shows the students' knowledge on the source of drinking water in their college. In the beginning of the college had pipe water. The pipe water had inefficient and the college had to compel to buy vehicle water. For the reason the campus started its own underground water from 2071 B.S, After that the college disconnected the pipe line which the drinking water supply corporation. According to response of the students the source of drinking water in college was pipe water, 46.23 percent, own underground water, 5 percent vehicle water, and 11.25 percent others source. It means that the water may be rain water. Before operating its own underground water, JMC had water scarcity so water was carried on vehicle. Some respondents have been continuously reading there for 5 or 6 years. They knew the situation and some didn't know the source either its own drinking water or pipe water. National census 2011 has collected information on households having accesses to different types of main sources of drinking water. The options for main source of drinking water were tap or piped water, tube well or hand pumped water, covered well or Kuwa, uncovered well or Kuwa, spout water and river or stream water

4.1.3 Quantity of Drinking Water

Generally an adult needs at least 3 to 4 liters drinking water daily for the good health. Every day people lose water through their breath, perspiration, urine and bowel movements. For human body to function properly, an individual must replenish its

water supply by consuming beverages and foods that contain water. So how much fluid does the average, healthy adult living in a temperate climate need? The Institute of Medicine determined that an adequate intake (AI) for men is roughly about 13 cups (3 litres) of total beverages a day. The AI for women is about 9 cups (2.2 litres) of total beverages a day. Everyone has heard the advice, "Drink eight 8-ounce glasses of water a day." That's about 1.9 litres, which isn't that different from the Institute of Medicine recommendations. Students generally stay 5 to 6 hours in the college. They need to eat breakfast and snacks. They need to drink safe and pure drinking water. Students were asked how much water they drank while they were staying in the college. Their replied were shown in table 4.2.

Table 4.2: Quantity of Drinking Water in College

Quantity of Drinking Water	Education	Management	Humanities	Science	Total	Percent
Half litre	5	7	11	5	28	17.5
One litre	5	7	11	10	33	20.62
Two litre	3	3	0	6	12	7.50
It depends on the situation	27	20	18	19	84	52.5
Not drinking college water	0	3	0	0	3	1.87
Total	40	40	40	40	160	100

Sources: Field Study, 20017.

Table 4.2 shows that 17.5 percent students drank half litre, 20.62 percent drank one litre, 7.50 percent drank two litres and majority 52.5 percent drank water as the situation. Only 1.87 percent students didn't drink college water. They carried boiling water from their homes. According to Kerry, Larry, & Charles (n d) the basic minimum quantity is 2 gallons per pupil per day. If the building is fully equipped, including showers and kitchen facilities.

4.1.4 Time Spent for Drinking Water

Clean water, free of pollution, bacteria and other contaminants, is the bedrock upon which sustainable, thriving and equitable human societies are built. Good governance of the ecosystems that provide quality drinking water which is an essential pre-requisite

It's pretty common knowledge that **drinking enough water is essential to detoxification, healthy metabolism, & overall health.** The usual figure given is about 8 glasses of water (64 ounces or about 1.9 liters) for an adult, though this varies based on climate, lifestyle, physical condition, and exercise habits. [This water calculator](#) is a useful tool for getting an idea of how much water is needed per day. **Drinking water at the correct time maximizes the positive effects on the human body.** **Everyday** 2 glasses of water after waking up helps **activate internal organs.** It's best to sip and not chug these, and if two feels like too much, just drink one. Similarly, 1 glass of water 30 minutes before a meal (but not any closer to eating time!) helps **digestion.** Then 1 glass of water before taking a bath helps **lower blood pressure** and 1 glass of water before going to bed is also **beneficial for cardiovascular health** (WHO& UNICEF, 2012).

Students came to college in the morning at 5.55 Or 10.55 after some walk either from Ratna Chowk or Airport Chowk or little further so it is better to drink a glass of water before entering the class .If they got water in hands or nearer they could drink as they like. The researcher wanted to know that how far the water and what time they got it when they wanted to drink .The responses were shown as in table.

Table 4.3 : Time Spent for Drinking Water

Time Spent for Drinking Water	Number of Respondents	Percent
Get water within a minute	71	44.37
Get water within 2 minutes	50	31.25
Get water within 5 minutes	28	17.50
Get water more than 5 minutes	11	6.87
Total	160	100

Sources: Field Study, 20017.

Table 4 .3 reveals that how much time they spent to drink water. Generally in the same class they had to spend different time to drink water. Master students got bottle water in their own classes so they had water in their hands as a result they got water within a minute. But other students needed to go ground floor so they took more time. As their replied many students 44.37 percent students drank water within a minute. Similarly 31.25 percent students could drink water within two minute .Nearly one quarter students 24.23 percent took 5 minute or more time to drink water.

4.1.5 Store of Drinking Water

That still leaves three whole glasses of water (per the 8 glass average) to sip on throughout the day. To avoid tainting water with estrogenic chemicals and other harmful substances, store water in and drink from a glass or [stainless steel container](#). **No more bottled water or chlorinated tap** recommend obtaining a [good quality water filter](#) for people sink at home and getting in the habit of having enough water with everyday life (WHO & UNICEF, 2012).

Table 4.4: Store of drinking Water in College

Store of Drinking Water	Education	Management	Humanities	Science	Total	Percent
Tank	8	12	5	4	29	18.12
Bucket	30	7	30	30	97	60.62
Bottle	0	18	2	3	23	14.37
Others	2	3	3	3	11	6.87
Total	40	40	40	40	160	100

Sources: Field Study, 20017.

Table 4.4 shows that that 18.12 percent student said water was stored in underground and roof top tanks. Similarly 60.60 percent told that college stored drinking water in the large buckets. Similarly 14.37 percent students told bottle was the storing of

drinking water. Some students 6.87 percent said that there was jar for drinking water with cold or hot water near by the faculties' offices.

4.1.6 Managing Way of Drinking Water

Students were asked whether the quantity of drinking water that they received was adequate or not . Two third students 66.25 percent replied that it was sufficient. Similarly twenty five respondents out of one hundred sixty (15.62) replied that it wasn't sufficient. Likewise 18.12 students replied that it was poor. Again they were asked how it could be solved if the water was inadequate .The responses were shown in the table 4.5

Table 4.5: Managing Way of Adequate Drinking Water in College

Management Way	Education	Management	Humanities	Science	Total	Percent
Request to municipality	14	9	10	12	45	28.12
Buy mineral water	9	11	8	18	46	28.75
Use underground water	10	12	8	8	38	23.75
Others	7	8	14	2	31	19.37
Total	40	40	40	40	160	100

Sources: Field Study, 20017.

Table 4.5 reveals that 28.12 percent students said college asked the municipality to add tap to make adequate water supply. Similarly 28.75 percent told that college produced or buy mineral water and provide freely or buy and sell at the cost recovery system. Nearly one quarter 23.75 percent students told college should use its own underground water. Some students said that college could use rain water for the cleaning and gardening purpose and jar water or vehicle water. It is the pleasure movement that the college had already used its own underground water from....

Water is consumed daily in large amounts by human. It is responsibility of the school districts to provide safe and pure drinking water. Ideally, the water supply should be obtained from municipal sources. When this isn't possible, well should be drilled (Kerry, Larry, Charles, n.d).

Most schools and colleges obtain their water from established public water. These supplies are under the surveillance of the health department, and the school properly can accept. This supervision as adequate, some schools provide their water supplies, usually by drilling wells. A deep more than 30 feet drilled well is the recommended water sources for a school when no public supply is available (Anderson, 1972).

4.1.7 Drinking Water Access Points

Fountains with running water fountains provide the most sanitary drinking facilities for the schools. One fountain per seventy five pupils is an acceptable standard (Anderson, 1972). Sanitary drinking fountains should be strategically placed throughout the school building. These fountains should be easily accessible to persons in wheelchairs and should be placed in such a way as to minimize safety hazards. It is better if drinking fountains are placed in wall recesses rather than projecting into hallways The fountains should be of the (Jet) type as opposed to (bubblers).Further , the drinking fountains should be designed for easy cleaning: this cleaning should be occur several times daily. (Kerry, Larry, Charles,n.d).

A drinking fountain, also called a water fountain or a bubbler, is a [fountain](#) designed to provide drinking water. It consists of a basin with either continuously running water or a [tap](#). The drinker bends down to the stream of water and swallows water directly from the stream. Modern indoor drinking fountains may incorporate [filters](#) to remove impurities from the water to reduce its temperature. Students were asked how many fountains were there in JMC. Their response were as

Table 4.6: Fountains of Drinking Water in College

Number of Fountains	Education	Management	Humanities	Science	Total	Percent
Less than five	23	5	23	28	79	49.37
Five to ten	3	6	5	6	20	12.50
More than ten	6	11	2	4	23	14.37
Others	8	18	10	2	38	23.75
Total	40	40	40	40	160	100

Sources: Field Study, 20017.

Table 4.6 reveals that 49.37 percent students said there were less than 5 fountains. Similarly 12.50 percent told that there were five to ten fountains. Nearly one quarter 23.75 percent students replied that they didn't know the numbers of fountains in the college. According to observation there were 2 fountains on the buckets at ground floor, 2 at first floor and one in at middle of first and second floor of main building. Similarly 5 buckets and 5 steel glasses were found at BBA building. Only one jar with cold and hot water was placed on Maitri building. All together there were only 11 fountains in JMC except in the canteen. There were nearly 4350 students in the college, One fountain had the load of four hundred students. It was inefficient in the comparison of C. L. Anderson s recommendations.

Students often expressed a desire for chilled water. While some fountains were certainly inviting and deliver clean-tasting water, this is certainly not the case in everywhere. And water fountains may not be the best way to ensure adequate access to drinking water. Imagine a busy lunchroom with a hundred students lining up to grab a sip of water from a fountain. It's pretty difficult to get a substantial drink of water for them. So the location and number of fountains were the major things to fulfil the thirst in time.

(Kerry, Larry, & Charles, n.d).wrote on their book on organization of school health programme that there should be a sufficient number of fountains throughout the facility to meet the daily demands. There should be at least one fountain per floor and at least one fountain for every one hundred students.

One quarter of respondents 25.65 percent said that those fountains were at the ground floor. Similarly 28.12 percent said that those fountains at the middle floor. Likewise 21.25 percent respondents said those fountains were in every floor. Only 12.50 percent students replied that those fountains were in the canteen. Rest of 12.50 percent students didn't know where were those fountains. MBS students got the bottle water in their own classroom so they suggested to provide the bottle water in every classroom.

4.1.8 Providing Cups at Water Access Points

Most of the drinking water in JMC stored in buckets. There were steel glasses to drink water. Students were in queue for drinking water. Students were asked if cups were provided at water access points. Two third of the respondents or 67.50 percent told there were cups or jug at water access points. On the other hand those cups or jug were insufficient. Nearly two third students 65 percent told that those cups or jug were insufficient. Students were asked how to manage such problems. The responses were as:

Table 4.7 Alternatives of Cups for Drinking Water

Alternative Ideas	Education	Management	Humanities	Science	Total	Percent
Providing the cups as students ratio	10	7	11	8	36	22.5
Provide bottle	14	18	14	13	64	40
Provide mugs	11	10	5	7	33	20.62
Others	5	5	10	12	27	16.87
Total	40	40	40	40	160	100

Sources: Field Study, 2017

Table 4.7 reveals that 22.5 percent students said that the campus should manage cups as the students ratio. On the other hand 40 percent told that campus should provide bottles to drink water. Similarly 20.62 percent students replied that mugs are the best solution to drink water. Only 16.87 percent told that fountains and access points should be added with the cups to solve the problems.

From the observation the researcher found that mugs of one litre were found near the buckets. Students put it here and there and dipped inside the containers. On ground floor in the morning and mid time especially at the break time students were in queue to get water. It is better to provide 4 to 6 litre bottle water from the Euro Guard in the class which helps to keep the time.

4.1.9 Causes of Smelling

Drinking water smelling causes were common. Water smells as rotten egg smell, sulphur smell in water. How to diagnose the cause of rotten egg or sulphur smell in drinking water. What other common smells are found in drinking water and what causes them. Health risks associated with some water smells. Iron-bacteria can produce diesel or fuel oil smells in the water, cucumber smells, and even sewage smells in the water supply (WHO,1993).

Table 4.8 Causes of Smelling

Causes of Smelling	Education	Management	Humanities	Science	Total	Percent
Contaminated of chemicals	5	3	1	3	12	36.36
It has muddy	2	5	3	1	11	33.33
It is directly tap water	1	4	4	3	12	36.36
Others	7	3	8	3	21	63.63
Total	15	15	16	10	56	169.68

Sources: Field Study, 2017

Note there are multiple response alternatives for this table so the sum of all categories may not be equal to the total cases or respondents. Sources: Field Study 20017

Table 4.8 shows that 36.36 per cent said the cause of drinking water smelling was contaminated with chemicals. Similarly, 33.33 per cent said that mud was the cause of smelling. Likewise, 36.36 respondents told that direct tap water was the cause of smelling. Rest 63.63 percent students told that there were so many reasons for smelling the water. One of the main cause was the source of water is underground. Underground water always has bad smell.

4.1.10 Lab Test and Look Like

Water sustains the life on earth, without water no life can sustain ever. Anthropological studies reveal that human civilizations sprouted alongside riverbanks and water has worked as a promoter and protector of human life and civilization. However, overpopulation and misuse of water resources has now resulted in water shortages and water pollution in many places.

Students were asked if the water of JMC had been tested before. Only 20 percent students said that it was tested before. Rest 80 percent told it hadn't been tested before. The respondents who said yes asked when the water tested .Most of them replied that it was tested last year, some said one month ago, 3 said that it was tested 2072|01|5. Other 2 students replied it was tested three years ago .Similarly 2 said that it was tested one month ago or one year ago. It means no one knew when it was tested. According to campus chief, it was tested last year by the Microbiology department and concluded that it could be drunk without filtration. It was totally safe to drink. The researcher requested to test it time to time to confirm either it was safe or not.

Again they asked if it was informed to parents. Only 17.5 percent respondents replied that yes, it was informed to parents. Most 82.5 replied that it wasn't informed to parents. After that all of the respondents asked whether it was necessary to inform to parents. Almost 81.25 percent told it was necessary to inform the parents in time. Students were asked whether it had taste or not. More than one third students or 34.37 (55 out of 160) percent respondents said it had taste. According to their responses the taste as:

Table 4.9 Taste of Water in College

Tastes	Education	Management	Humanities	Science	Total	Percent
Sweet	4	3	2	5	14	25.24
Salty	2	1	4	1	8	14.54
Sour	33		7	1	11	20
Others	9	4	6	3	22	40
Total	18	8	19	10	55	100

Sources: Field Study, 2017.

Table 4.9 reveals that 25.24 percent students said that the water was sweet, 14.54 percent said it was salty, 20 percent told sour and 40 percent or 22 students said that it was egg taste, muddy taste, coriander taste, Muddy taste.

4.1.11 The Water Looks Like

Generally water is tasteless, colourless in nature .Water looks blue-green light, noticeable in great depths but it appears colourless as used in the home. There may have certain foreign substances in the water. Infinitely small microscopic particles add colour to water. Colloidal suspensions and non-colloidal organic acids as well as neutral salts also affect the colour of water. The colour in water is primarily of vegetable origin and is extracted from leaves and aquatic plants. Naturally water draining from swamps has the most intense colouring. The bleaching action of sunlight plus the aging of water gradually dissipates this colour, however. All surface waters possess some degree of colour. Likewise, some shallow wells, springs and an occasional deep well can contain noticeable colouring. In general, however, water from deep wells is practically colourless (WHO & UNICEF (2012)).

An arbitrary standard scale has been developed for measuring colour intensity in water samples. When water is rated as having a colour of 5 units, it means: the colour of this water is equal in intensity to the colour of distilled water containing 5

milligrams of platinum as potassium chloroplatinate per liter. Highly coloured water is objectionable for most process work in the industrial field because excessive colour causes stains. And while colour is not a factor of great concern in relation to household applications, excessive colour lacks appeal from an esthetical standpoint in potable water. Further, it can cause staining. U.S. EPA Secondary Drinking Water Regulations recommend that potable water possess colour of less than 15 units. In general, colour is reduced or removed from water through the use of coagulation, settling and filtration techniques. Aluminium sulphate is the most widely used coagulant for this purpose. Super chlorination, activated carbon filters and potassium permanganate have been used with varying degrees of success in removing colour. Students were asked what the water looks like were as:

Table 4.10 The Water Looks Like

Looks Like	Education	Management	Humanities	Science	Total	Percent
Clean	30	35	30	32	127	79.37
Dirty	2	1	4	4	11	6.87
Muddy	3	1	4	2	10	6.25
Others	5	3	2	2	12	7.5
Total	40	40	40	40	160	100

Sources: Field Study, 2017.

Table 4.10 reveals that 79.37percent students said the water was clean, 6.87 percent said it was dirty, 6.75 percent told that it was muddy and 7.5 percent said that it was others.

4.1.12 Dissatisfaction and Buying the Water

The quality of water, whether used for drinking, domestic purposes, food production or recreational purposes has an important impact on health. Water of poor quality can cause disease outbreaks and it can contribute to background rates of disease manifesting themselves on different time scales. Initiatives to manage the safety of

water do not only support public health, but often promote socioeconomic development and well. Contaminated water serves as a mechanism to transmit communicable disease such as diarrhoea, cholera, dysentery, typhoid and guinea worm infection. WHO estimates that in 2008 diarrhoeal disease claimed the lives of 2.5 million people. For children under five, this burden is greater than the combined burden of HIV/AIDS and malaria. A total of 58 countries from all continents reported a cumulative total of 589 854 cholera cases in 2011, representing an increase of 85% from 2014 being as well (WHO, 2011a).

Pure uncontaminated water does not occur in nature. It contains impurities of various kinds - natural and man-made. The natural impurities are not essentially dangerous. These comprise dissolved gases (e.g. nitrogen, carbon dioxide, hydrogen sulphide, etc. which may be picked up during rainfall,) and dissolved minerals (e.g. salts of calcium, magnesium, sodium, etc) which are natural constituents of water following its contact with soil; and suspended impurities (e.g. clay, silt, sand, and mud) and microscopic organisms. These impurities are derived from the atmosphere, catchment area and the soil. The greatest proportion of cases was reported from the island of Hispaniola and the African continent. These trends reflect the need to shift from basic responsiveness to a comprehensive, multidisciplinary approach that works with communities to improve access to safe drinking-water and sanitation, encourages behavioural change and promotes the targeted use of oral cholera vaccines where the disease is endemic.

Millions of people are exposed to dangerous levels of biological contaminants and chemical pollutants in their drinking-water due to inadequate management of urban, industrial or agricultural wastewater. In addition, dangerously high concentrations of chemical hazards, such as arsenic and fluoride, originating from natural sources affect millions and cause conditions such as cancer and fluorosis. Inorganic arsenic is present at high levels in the groundwater of a number of countries, including Argentina, Chile, China, India (West Bengal), Mexico, the United States of America, and particularly Bangladesh where 20 million and 45 million people are at risk of being exposed to arsenic concentrations that are greater than the national standard of 50 µg/L and the WHO guideline value of 10 µg/L, respectively. Although consumption of contaminated water represents the greatest risk, other routes of transmission can also lead to disease and contribute to the disease burden. For

example, WHO estimates that more than 200 million people are affected by schistosomiasis and around 800 million more are at risk of infection.

Students were asked if they satisfied with the water they drank which the college managed. Nearly two third of the respondents satisfied with the water but rest 35.62 Or 57 respondents didn't satisfy with the water which they got in their college. Students were asked the reasons if they didn't satisfy with the water. The reasons were as:

Table 4.11 Causes of Dissatisfaction

Reasons of Dissatisfaction	Number	Percent
The cups are dirty	11	19.29
The water is with parasites, dust, gum or trash	17	29.82
. The Euro guard looks like old and dirty	26	45.61
The water store pots are not clean and don't operating	16	28.07
Total	57/70	122.79

Note: There are multiple response alternatives for this table so the sum of all categories may not be equal to the total cases or respondents. Sources: Field Study 2017

Table 4.11 show that there were 57 respondents who didn't satisfy with the drinking water which JMC college provide to the students .Only four reasons were given to choose but some students chose more than 2 or 3 reasons that is why the responses were more than respondents. Nearly 50 percent respondents said that the Euro guard looks like old and dirty. Similarly 17 respondents replied the water is with parasites, dust, gum or trash .Likewise 28.07 percent said the water store pots are not clean and don't operating. On the observation it was seen that the euro guard was seemed old and dirty . Similarly the cups and glasses which were kept near by the buckets were dirty. Inside the water store pot or buckets looks like dirty too. So the researcher asked to the operators to give the attention on the subject of cleanliness.

Purifying water may reduce the concentration of particulate matter including suspended particles, parasites, bacteria, algae, viruses, fungi, as well as reducing the amount of a range of dissolved and particulate material derived from the surfaces that come from runoff due to rain. The standards for drinking water quality are typically set by governments or by international standards. These standards usually include minimum and maximum concentrations of contaminants, depending on the intended purpose of water use. Visual inspection cannot determine if water is of appropriate quality. Simple procedures such as boiling or the use of a household activated carbon filter are not sufficient for treating all the possible contaminants that may be present in water from an unknown source. Even natural spring water – considered safe for all practical purposes in the 19th century must now be tested before determining what kind of treatment, if any, is needed. Chemical and microbiological analysis, while expensive, are the only way to obtain the information necessary for deciding on the appropriate method of purification.

Students were asked if the water was dirty then they bought the drinking water. Only 28 out of 54 students replied that they bought the water and rest 26 students brought water from their homes. Only 28 students were asked when they bought the water. Less than half respondents or 12 out of 26 replied that they bought water sometimes when they seemed it was dirty and muddy. Similarly 22.22 said that they bought water when they had money. Likewise only 18.51 percent said they bought regularly or always. Rest 16.16 percent replied that they bought randomly if they liked to drink mineral water especially when they talk round and eating noodles, chips, and rooted corn or like such.

4.1.13 Using Methods of Purification

Water purification is the process of removing undesirable chemicals, biological contaminants, suspended solids and gases from contaminated water. The goal is to produce water fit for a specific purpose. Most water is disinfected for human consumption ([drinking water](#)), but water purification may also be designed for a variety of other purposes, including fulfilling the requirements of medical, pharmacological, chemical and industrial applications. The methods used include physical processes such as [filtration](#), [sedimentation](#), and [distillation](#); biological processes such as [slow sand filters](#) or [biologically active carbon](#); chemical processes

such as [flocculation](#) and [chlorination](#) and the use of electromagnetic radiation such as [ultraviolet light](#). Again students were asked if they were dissatisfied with the water how it could be cleaned and made drinkable. The responses were included in table 4.12.

Table 4.12 Using Methods of Purification

Particulars	Number	Percent
By changing filters time to time	67	41.87
By using chemicals	23	14.37
By buying jar water	47	29.37
Others....	28	14.37
Total	160	100

Sources: Field Study, 2017.

Table 4.12 shows the way of solving problems or dissatisfaction from the point of view of the respondents. Those suggestions were key points to improve the drinking water. Some respondents 41.87 percent said that filters should be changed time to time, 14.37 percent told that using chemical was one of the solution of addressing dissatisfaction. Other 29.37 replied that buying jar water would be the solution of dissatisfaction. Some respondents 14.37 percent said that SODIS method, boiling or using high power new purify machine would be the best way of solving the dissatisfaction.

4.1.14 Place of Paying

In Pokhara, drinking water problem is increasing as population of the district has doubled in the past 20 years and new water sources have not been explored to meet the ever increasing demand. However local community and other organisations like government higher secondary school compelled to pay monthly water bills at Water Supply Corporation without enough water supply to their connections.

Students were asked whether they needed to pay for drinking water .Only 23.12 percent students or 37 respondents out of one hundred sixty replied that they needed to pay but rest of others said that they didn't pay for it.

Table 4.13 Places for Paying Money to Get Drinking Water

Places for Paying Money	Number	Percent
Water supply corporation	11	29.72
Cafeteria	10	27.02
Municipality	5	13.51
Campus	11	29.72
Total	37/ 160	100

Sources: Field Study, 2017.

Table 4.13 shows that 11 respondents said that they needed to pay the money to water corporation. Similarly 10 respondents told that they needed to pay to canteen. Likewise other 5 students opined that they needed to pay to municipality. According to Assistant Campus Chief students need not pay anywhere mentioned above. Campus provided safe and pure drinking water without any cost. The campus had its own underground water from 4 years ago. It was sufficient and good for health. It was tested before by the chemical department and proved it was safe and drinkable. Nowadays college disconnected the water system which the Water Supply Corporation provided within the municipality. Both the canteen and the campus had euro guards and serve the water. Campus staff and teacher had facilities of hot or cold water for drinking water with the machine. Those students who replied they needed to pay the money had the opinion that if students don't pay fee how the college paid the money in concerned departments so it was the students paying in concerned departments.

4.1.15 Persons and Issues of Complains

Most households in Nepal (89 percent) obtain drinking water from an improved source, while 11 percent still rely on non-improved sources. There has been some improvement in access to an improved water source since 2006, when 82 percent of the households used an improved source of drinking water (MOHP, New ERA, and Macro International, 2007). Households in urban areas have greater access to an improved source of drinking water than households in rural areas (93 percent versus 88 percent), but the urban-rural gap has narrowed in the last five years. The most common source of drinking water in urban areas is water piped into the *Housing Characteristics and Household Population* • 15 dwelling/yard/plot, with more than two-fifths of households having access to this source. In contrast, a tube well or borehole is the most common source of drinking water in rural areas, used by two-fifths of households. Fifty eight percent of households have a source of drinking water within their premises, compared to 46 percent five years ago. Thirty-five percent of households spend less than 30 minutes on gathering water, while about 7 percent of households spend 30 minutes or longer. Accessing drinking water takes longer in rural areas than urban areas, with 8 percent of households taking 30 minutes or more to obtain water. There has been little change in the past five years in the time taken to access drinking water. The vast majority of households are able to access drinking water from their main source all year (94 percent), with little urban-rural difference.

The majority of households (82 percent) do not treat drinking water, and rural households are particularly likely not to do so (87 percent, compared to 54 percent of urban households). Forty-six percent of households in urban areas treat drinking water, compared to 13 percent in rural areas. Overall, a ceramic, sand, or other filter is the most common treatment method (10 percent), followed by boiling water prior to drinking (9 percent).

The basic determinants of better health, such as access to safe water, and sanitation, are still in a critical state in Nepal. Poor access to safe drinking water and sanitation facilities and poor hygiene are associated with the vast majority of households in Nepal (89 percent) have access to an improved source of drinking water (NDHS 2014).

Students have the right to make voice on their dissatisfaction. Student union is the organization to voice the problems. The chairman of the student union asked whether he and his organization made the issue of drinking water. The organization observed the store pots, glasses, mugs, and euro guard and asked to made healthy, cleaned, and safe. Students were asked whether they complained about drinking water. Only 32 students out of 160 replied that they complained to the following concerned people.

Table 4.14 Person to Complain

Person	Education	Management	Humanities	Science	Total	Percent
Campus chief	1	8	1	1	11	29.72
Administrative officer	2	2	1	5	10	27.02
Owner of the canteen	1	1	2	1	5	13.51
Others	3	5	2	1	11	29.72
Total	7	16	6	8	37/160	100

Sources: Field Study, 2017

Table 4.14 shows that only 37 students complained to different persons when they felt something was wrong in the delivery of drinking water. According to data 11 students complained to campus chief, similarly 11 students complained to others like the office assistants, likewise 10 students had complained to administrative officers and rest five respondents had complained to owner of the canteen. They are asked what sort of complains were they made. The complains were as:

Table 4.15 Issues of Drinking Water

Issues of drinking water	Education	Management	Humanities	Science	Total	Percent
Inadequate water supply	3	0	1	2	6	18,75
Impure drinking water	3	4	3	1	11	34.37
Filter system is old and not working properly	3	3	3	2	11	34.37
Raise fund for drinking water	0	2	1	1	4	12.5
Total	9	9	8	6	32/160	100

Sources: Field Study, 2017

Table 4.15 shows that only 36 students out of 160 complained on different topics. More than one third 34.37 percent or 11 students complained about impure drinking water. Similarly 34.37 percent or 11 respondents complained that filter system is old and not working properly. Only 6 respondents complained on inadequate water supply. Only 4 students told that they asked to make the fund to provide safe and pure drinking

4.1.16 Time of Maintain

Table 4.16 Students complained to the concerned persons and departments but their voice was considered as in the function in different time. It depends on the issues. Generally the chairman or chief or the administration immediately fulfil their demands when it could be fulfilled without money or with less money: if so they ordered to maintain immediately. Time of Maintain

Table 4.16 Time of Maintain

Time Taken	Number of Respondent	Per cent
Within 24 hours	10	31.25
within 2 days	4	12.5
Within a week	4	12.5
Others	14	43.75
Total	32	100

Sources: Field Study, 2017

Table 4.16 shows the time of maintain when someone complained about drinking water. Nearly one third respondents replied that the concerned authority maintained the problems within 24 hours. Similarly 12.50 or 4 out of 32 said that the concerned people or staff maintained or solved the problem within 2 days and the same percent said that they maintained within one week. Rest 43.75 percent replied that the concerned authority didn't listen their voice or they maintained on the time bases but not immediately.

Students were asked if they had access the water any time Very few students 4 out of 160 replied that they didn't get the access the water any time. Students were asked if the college provided students with access to drinking water during meal period. Just 10.62 percent students replied that they didn't get water during meal period. On the observation there were water bottles on all the tables in the canteen. Probably those students went out to have snacks.

4.1.17 Diseases Due to Water

Man's health may be affected by the ingestion of contaminated water either directly or through food ; and by the use of contaminated water for purpose of personal hygiene and recreation .The term water -related diseases includes the classical water-borne diseases. Developing countries carry a heavy burden of water-borne diseases the heaviest being the diarrhoeal diseases . Water -related diseases may be classified as follows: In the hilly areas the sources of water very far and limited, there was no sufficient water in urban areas. Diseases like dysentery, diarrhoea, typhoid and cholera spread due to unsafe and polluted water. The water of Terai suffered from skin diseases due to presence of arsenic in the tube well water. Only 31 students out of 160 felt the following health diseases due to the water.

Table 4.17 Diseases Due to Drinking Water

Diseases	Education	Management	Humanities	Science	Total	Percent
Diarrhoea	4	3	1	6	14	45.16
Cholera	0	1	1	1	3	9.67
Stomach pain	2	3	3	6	14	45.16
Worm	0	2	2	1	5	16.12
Dysentery	0	1	2	1	4	12.90
Gastroenteritis	0	0	0	1	1	3.22
Guardia	0	0	0	1	1	3.22
Hepatitis	0	0	0	0	0	0
Others	0	4	0	0	4	12.90
Total	7	15	9	17	48/31	100

Note There are multiple response alternatives for this table so the sum of all categories may not be equal to the total cases or respondents. Sources: Field Study 2017

Table 4.17 shows that 31 out of 160 students felt waterborne diseases while running in jmc. Students were asked what the diseases were felt or seen . Diarrhoea and stomach pain were the major health problems seen which were 14 in numbers. They didn't feel sure of it whether it was due to college water or out of college water. Only five respondents were found suffered from worm. Students only stayed 6 hours in the colleges and rest of the time they lived in their home and they drank water where they stayed. Above mentioned diseases were seen on students so the campus always aware if the water is safe or not. Most of the respondents 122 out of 160 students satisfied with the water which JMC provided. Rest 38 students didn't satisfy and wanted to provide the suggestions.

- Campus should check the water time to time if it was safe and pure.
- Filters which were used in Euro Guard should be change time to time.
- Glasses, jugs, bottle and buckets should be cleaned.
- Water access points should be placed in every floor in `every building.
- Campus should provide jar water and take minimum fee for it.
- SODIS system is better to use in the college.

- Parents and students should be informed about the result of checking water.
- It is better to provide water in their own reading rooms like in master students.

4.1.18 Water and Its Impact on Students Enrolments

All students want that the campus has good physical and mental environments like good compounding, attractive campus building, proper playgrounds, Attractive gardening, good gymnasium, appropriate lab and library, safe and sound classroom, proper light and ventilation, appropriate furniture, clean and sufficient urination and rest room, democratic environment, parental administer, pal teachers, sound and effective result, life long education, good human relation among the concern people. These things motive the students and parents to select and join in the college. So the campus management committee should thing about it. The researcher wanted to know whether there is relation or not between the drinking water and enrolment in the campus. So the researcher asked the students whether the drinking water impacted on students enrolments. Most of the students 60.62 percent replied yes and rest replied no. Only those students who replied yes are asked how it impacted. Their answers were as

Table 4.18 Drinking Water and its Impact on Student's Enrolments

Reasons	Education	Management	Humanities	Science	Total	Percent
Students talk at public place and all know that the water in JMC is bad.	3	7	5	6	21	21.64
Fountains, cups, store pots are not sufficient / inadequate and dirty as a result students cannot get water properly .	6	4	5	4	19	19.98
If students are not satisfied they don't recommended their younger.	6	13	20	12	51	52.57
Others	2	1	3	2	8	8.24
Total	15	25	33	24	97/160	100

Sources: Field Study, 2017.

Table 4.18 shows that how the drinking water and its impact on students enrolments. Majority of the respondents 52.57 told the researcher if the senior students were dissatisfied with the drinking water, they don't recommended their younger. Nineteen students out of 16 said that fountains, cups, store pots are not sufficient / inadequate and dirty as a result students cannot get water properly As a result it arouse the bad impact on JMC and difficult to recommend others.21. 64 percent told that students talk at public place and all know that the water in JMC is bad so parents hesitate to join their children in the college. Only 8.24 percent said others.

4.1.19 Areas of Improvements

Nothing is cent percent good in the world. Everything is needed to improve with the new time and generation. Science and technology innovate new technology day by day so the campus always need to improve its program like in drinking water. The respondents were asked what the areas were for improvement in providing drinking water in JMC..

Table 4.19 Areas of Improvements

Areas of Improvements	Education	Management	Humanities	Science	Total	Percent
Water fountains don't work properly maintain regularly.	2	3	2	2	9	5.62
Fountains, cups and store pots are not sufficient / inadequate , add more	15	6	5	5	41	25.62
Fountains are not located as the student's level. It should be kept as their height.	3	4	5	5	24	15
Water isn't safe and pure so change the filter	15	12	13	13	45	28.12
Others	5	15	15	15	41	25.62
Total	40	40	40	40	160	100

Sources: Field Study, 2017.

Table 4.19 shows that students liked some improvements on the drinking water. Only 5.62 percent students thought that water fountains don't work properly maintain regularly. Similarly 25.62 percent thought that fountains, cups and store pots are not sufficient/inadequate so the campus should have add more. Likewise 15 percent respondents thought fountains are not located as the student's level. It should be kept as their height. On the other hand 28.12 percent said that water isn't safe and pure so change the filter time to time. One quarter students told different ideas to improve drinking water accessibility. Master level 3 students advised that JMC college could start its own plants to purified the water and put the bottle water in the classrooms and in the canteen. If campus makes the plan on it, students will provide the minimum charge for the water bottle. Just 15 students said that all of the mentioned things should be done in time. Others said that SODIS method was the best so use it after filtration process. It was better to carry drinking water from their home, etc.

Key Informants were asked about college policies towards drinking water supply and concluded that College supported to raise awareness for quality drinking water in JMC. Campus conducted seminar and informed students about the quality of drinking water after started boring water with lab test by the leadership of Subash Adhikari, member of Micro biology department. They concluded that the water in JMC was safe and fresh. Campus chief added that all staff drank the same water. The researcher asked why some students and teachers carried drinking water in the bottle. Campus chief told that if someone wants to drink boiled water and hot water, he or she needed to carry water from the home. Key informants asked why the some students and teachers bought bottle water in the canteen the team replied that it was their satisfaction. The team told that those people drank college water the next day. Campus seeks opportunity for funding so UGC helped for the all round development as well as the development of drinking water.

The campus had the policy and strategies about drinking water that in every building had one round corner in which running taps are adjusted from the highly equipped filter water in the top roof tank. Students can get water every time. There will not any buckets and no one sees the empty buckets. The campus will place the sign or poster or notice near water safety. College manages to test water time to time with the help of Microbiological department.

4.2 Major Findings

The researcher found the following facts during the study.

- i. Only 17.5 percent students drank half liter, 20.62 percent drank one liter, 7.50 percent drank two liters and majority 52.5 percent drank water as the situation. Only 1.87 percent students didn't drink college water.
- ii. Master students got bottle water in their own classes so they had water in their hands as a result they got water within a minute. As their replied many students 44.37 percent drank water within a minute. Similarly 31.25 percent students could drink water within two minutes. Nearly one quarter students 24.23 percent took 5 minute or more time to drink water due to lack of insufficient cups.
- iii. According to observation there were 2 fountains on the buckets at ground floor, 2 at first floor and one in at middle of first and second floor of main building. Similarly 5 buckets and 5 steel glasses were found at BBA building. Only one jar with cold and hot water was placed on Maitri building. All together there were only 11 fountains in JMC except in canteen.
- iv. Nearly two third i.e.63.63 percent students told that there were so many reasons for smelling the water. One of the main cause was the source of water is underground. Underground water always has bad smell.
- v. Almost 81.25 percent told that result of lab test on drinking water should provide parents in time. More than one third students or 34.37 (55 out of 160) percent respondents said it had taste.
- vi. Many i.e.79.37 percent students said that the water was clean, 6.87 percent said it was dirty, 6.75 percent told that it was muddy and 7.5 percent said that it was others.
- vii. Nearly 50 percent respondents said that the Euro guard looked like old and dirty. Similarly 17 respondents replied the water was with parasites, dust, gum or trash .Likewise 28.07 percent said the water store pots were not clean
- viii. Only 28 out of 54 students replied that they bought the water and rest 26 students brought water from their homes. Less than half respondents or 12 out of 26 replied that they bought water sometimes when they seemed it was dirty and muddy . Similarly 22.22 said that they bought water when they had

money. Likewise only 18.51 percent said they bought regularly or always. Rest 16.16 percent replied that they bought randomly

- ix. Only 11 students complained to campus chief, similarly 11 students complained to office assistants, likewise 10 students had complained to administrative officers and rest five respondents had complained to owner of the canteen about the drinking water.
- x. Out of 160 students, 124 students were not complain about quality of drinking water but only 36 students out of 160 complained on different topics. 11 students complained about impure drinking water. Similarly other 11 respondents complained that filter system is old and not working properly. Only 6 respondents complained about inadequate water supply. Only 4 students told that they asked to make the fund to provide safe and pure drinking water.
- xi. Just 10.62 percent students replied that they didn't get water during meal period. On the observation there were water bottles on all the tables in the canteen. Probably those students went out to have snacks.
- xii. Only 31 out of 160 students felt waterborne diseases while running in JMC. . Diarrhoea and stomach pain were the major health problems seen which were 14 in numbers. They didn't feel sure of it whether it was due to college water or out of college water. Only five respondents were found suffered from worm.
- xiii. Nineteen students out of 160 said that fountains, cups, store pots are not sufficient / inadequate as a result students cannot get water properly.
- xiv. Only 5.62 percent students thought that water fountains don't work properly maintain regularly. Similarly 25.62 percent thought that fountains, cups and store pots are not sufficient / inadequate so the campus should have add more.
- xv. Likewise 15 percent respondents thought fountains are not located as the student's level. It should be kept as their height. On the other hand 28.12 percent said that water wasn't safe and pure so change the filter time to time. One quarter students told different ideas to improve drinking water accessibility.
- xvi. Master level students advised that JMC college could start its own plants to purify the water and put the bottle water in the classrooms and in the canteen.

if campus makes the plan on it, students will provide the minimum charge for the water bottle.

- xvii. The campus had the plan to make the round corner taps for the drinking water with the support of UGC.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATION

5.1 Summary

This study entitled "Availability of drinking water and its impacts on student's health in JMC Kaski" is carried out to find out the condition of drinking water and its impact on students health. The study was focused on availability of drinking water. The descriptive case study and analytical method of research was applied to meet the objectives and the survey technique was used to collect necessary information. All the students who were studying in JMC were taken total population of the study. The sample size was 160, who were available in study time. Multi stage sampling technique has been used; the study area was selected through convenience sampling. There were four faculties. All faculties were selected through census method. Bachelor and Master Students were selected through lottery method. Only 40 students from each faculty were selected through tossing methods. The questionnaire and observation schedule were the major tool of data collection. The data was analyzed in a descriptive and analytical way with percentage, tables.

It was found that there was safe drinking water in JMC. The campus has its own underground water source. The water was stored in underground tank .Secondly it was stored in roof top tanks. Thirdly it goes to Euro Guard from the pipeline .The pipe goes from Euro Guard to Buckets which has totally covered. There was a tap in all bucket. There were 5 buckets in BBA building. Each bucket has one jug or glass to drink water. Similarly 5 buckets were in Administrative building and each has one jug. two buckets were at ground floor, two were at first floor and one at at the middle of 2 and three floor. Filling bottle were kept on Maitri building. Hot and cold drinking water was available at the first floor or outside of Maitri building. Euro Guards looks old and felt to change its filters. Glasses had ticks inside and seems dirty. Pipe from Euro guard in BBA building had leakage. Cups or jug or glass were insufficient so it is better to put bottle and cups near the water access points. Drinking water is essential thing in the college so it should be provided sufficiently so that students will recommend their younger to enrol in the same college where they studied.

5.2 Conclusions

The study is concluded that the drinking water is sufficient as the students' ratio. It was found that there was safe drinking water in JMC. Many i.e. 79.37 percent students (124 out of 160) said that the water was clean and safe for the drinking propose but only i.e. 6.87 percent said it was dirty, 6.75 percent told that it was muddy and 7.5 percent said that it was others. The bad is seen that students dipped the jug to take water without opening the tap that is why some dust particulars seems inside the buckets. It was seen that students went to long toilet and came there near the water access points and took jug and deepen inside the bucket to wash the hand. So the soap and water should manage near by the toilet or hand washing bin properly.

At the beginning of operating of boreholes water in JMC was tested by the microbiologist Subash Adhikari on the basis of parameters of NDWQA and found that the water in the JMC was good. The filter of Euro guard changed time to time and assured that the water quality is good for the health. To minimize the water borne diseases, college should manage safe and pure water. As a result students were satisfied and recommended their younger. Only 31 out of 160 students felt water born disease in their college but they didn't sure whether it might be the result of campus water or home water. The campus has the policy to make water corner in very floor of every building. with the help of UGC Similarly campus has the policy to put soaps and towel near by every washing bins.

5.3 Recommendations

On the basis of findings and conclusion following recommendation are given.

- i. Drinking water supply should be distributed on regular basis with quality assurance.
- ii. This study focuses on availability of drinking water and its impact on student's health in JMC. But similar types of research can be conducted in other institutions as well.
- iii. A complete research could be done on drinking water availability in others colleges or comparative study on availability of drinking water at private and government schools.

- iv. It is better to put soap and towel near by the wash bin which makes the clean, safe hands.
- v. Further studies can be conducted on “How to provide the quality of drinking water and reduce the water borne diseases.

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APPENDIX I
OBSERVATION SCHEDULE

S.N.	Observation Items	Good	Satisfactory	Poor	Remarks
1	Source of water				
2	Water Purification System				
3	Water Distribution				
4	Water Availability				
5	Campus Policy for Water Supply				

Janapriya Campus Pokhara .

1 Source of water

Good → Own water from underground water

Satisfactory → Municipality supply water

Poor → Vehicle water

2. Water Purification System

Good → Water of Euro Guard

Satisfactory → Other Filter Water

Poor → Tap Water

3. Water Distribution

Good → 24 hours running access/ fountains everywhere

Satisfactory → Water available at the mid place and in the bathrooms and restrooms

Poor → Drinking water is available only one place

4. Water Availability

Good → In every block, in the cafeteria, in the playground and at office desk .

Satisfactory → In every block and every floor

Poor → Drinking water in only one place of every block.

5. Campus Policy for Water Supply

Good → Long term policy, adequate budget; coordinate with other organizations

Satisfactory → Try to fix own source

Poor → Budget and coordination are not included in campus policy.

APPENDIX II

Questionnaire

Name: (Optional).....

Age Sex a) Male b) Female

Religion.....Place of residence.....

- 1) Is there water facility in your College? a. Yes b. No
- 2) if yes, which sources of drinking water is available there?
 - a. Pipe water b. Own underground water
 - c. Vehicle water d. Others
- 3) How much water do you drink per day in your college?
 - a. 1 litre b. 2 litre
 - c. 3 liters d. It depends on situation
- 4) How far the source of drinking water?
 - a. get water within a minute b. get water within 2 minutes
 - c. get water within 5 minutes d. get water more than 5 minutes
- 5) Where is the water stored ?
 - a. Under ground and roof top tanks b. Buckets
 - c. Bottles d. Others.....
- 6) If no, how can the college manage adequate water?
 - a. Request to municipality to add fountains b. Buy mineral water
 - c. Use underground water d. Others.....
- 7) Is the quantity of drinking water that you receive adequate?
 - a. Yes b. No c. Poor
- 8) How many running taps are there in your college?
 - a. less than 5 b. 5-10 c. More than 10 d. Others.....
- 9) Where are those taps?
 - a. In the cafeteria b. at every floor c. at the middle floor d. others....
- 10) Are cups provided at water access points? a. Yes b. No
- 11) If cups are available, are they sufficient ?
 - a. Yes b. No
- 12) If no, how can it be managed ?
 - a. provide the cups as the students ratio b. provide bottle
 - c. provide mugs d. others.....

- 13) Generally, how does the water smell?
 a. Good b. Bad c. None
- 14) If bad, why is it smelled badly?
 a. Drinking water contaminated with chemicals b. It has muddy.
 c. It is directly tap water. d. Others.....
- 15) Has the water of your campus been tested before? a. Yes b. No
- 16) If yes, when was it last tested?
- 17) If yes, was it informed to parents? ? a. Yes b. No
- 18) If no, is it necessary?
- 19) Does the water have a taste? a. Yes b. No
- 20) If yes, what sort of test is it?
 a. Sweet b. Salty c. Swore d. Others
- 21) What does the water look like?
 a. Clean b. Dirty
 c. Muddy d. Others
- 22) Do you satisfy with the water you drink in your college?
 a. Yes b. No
- 23) If no, why don't you satisfy?
 a. The cups are dirty
 b. The water is with parasites, dust, gum or trash
 c. The Euro guard looks like old and dirty
 d. The water store pots are not clean and don't operating
 e. Others.....
- 24) If it is dirty, how it can be cleaned and be make drinkable?
 a. By changing filters time to time b. By using chemicals
 c. By buying jar water d. Others....
- 25) Do you need to pay for drinking water? a. Yes b. No
- 26) If yes, where do you pay for it?
 a. Water supply corporation b. cafeteria
 c. Municipality d. campus
- 27) Have you made any complain about drinking water in the past one year?
 a. Yes b. No

- 28) If yes, what sort of complain do you make?
 a. about inadequate water supply. b. About Impure drinking water
 c. filter system is old and not working properly
 d. About raise fund for improving water access.
- 29) If you complain, when does the concern authority maintain?
 a. within 24 hours b. Within 2 days
 c. Within a week d. Others.....
- 30) Do students have access the water at any time ?
 a. Yes b. No
- 31) Does the college provide students with access to drinking water during meal period?
 a. Yes b. No
- 32) Do you feel sick as the cause of your college water?
 a. Yes b. No
- 33) If yes, what sort of diseases have you feel ?
 a. Diarrhoea b. Cholera
 c. Stomach pain d. Others.....
- 34) If no, are you satisfied with drinking water service? a. Yes b. No
- 35) Is drinking water impacted on students enrolments? a. Yes b. No
- 36) If yes, How does it impact?
 a. Students talk at public place and all know that the water in JMC is bad.
 b. Fountains, cups, store pots are not sufficient / inadequate and dirty as a result students cannot get water properly .
 c. If students are not satisfied they don't recommended their younger.
 d. Others.....
- 37) What are the areas for improvement in providing drinking water?
 a. Water fountains don't work properly maintain regularly.
 b. Fountains, cups and store pots are not sufficient / inadequate , add more.
 c. Fountains are not located as the student's level.It should be kept as their height.
 d. Water is not safe and pure so change the filters.
 e .Others.....

APPENDIX III

- 1) What are the college policies towards drinking water supply? (If any, write down into the box given below). For the Campus Chief, Administration staff and Chair man of Student Union.

S.N	Particulars	Tick
1	Students are asked to carry bottle water from home.	
2	College supported to raise awareness for quality drinking water.	
3	Seek opportunity for funding.	
4	Address sustaining the water access long term plan.	
5.	Gather partners to support the effort.	
6.	Develop water promotion strategies.	
7.	Improved risk management practiced by all stakeholders for water safety.	
8.	Placing signs or posters or notice near water fountains.	
9	College manages to test water time to time with the help of chemistry dept	
10	Change the filters time to time	

APPENDIX IV

Parameters of NDWQS applicable for Rural Surface Water

Supply Systems

Category	Parameter	Unit	Maximum Concentration Limits	Remarks
Physical	Turbidity	NTU	5(10)	
	pH		6.5-8.5*	
	Color	TCU	5(15)	
	Taste & Odor		Non objectionable	
	Electrical Conductivity	µS/cm	1500	
Chemical	Iron	mg/l	0.3(3)	
	Manganese	mg/l	0.2	
	Chromium	mg/l	0.05	
	Fluoride	mg/l	0.5-1.5*	
	Ammonia	mg/l	1.5	
	Nitrate	mg/l	50	
	Total Hardness	mg/l	500	
	Calcium	mg/l	200	
	Residual Chlorine	mg/l	0.1-0.2*	In systems using chlorination
Microbiological	E-Coli	MPN /100 ml	0	
	Total Coliform	MPN/100ml	0 (95% sample)	

* This represents minimum and maximum concentration limits.

() When there is no alternative, the values kept under parentheses will apply