



**ST. MARY'S UNIVERSITY**  
**SCHOOL OF GRADUATE STUDIES**

**PUR (WATER PURIFIER) OUTLET AND  
HOUSEHOLD SURVEY AT BELE TOWN,  
WOLAYTA ZONE**

**BY**  
**ALEMAYEHU TEGEGNE**

**MAY, 2015**  
**ADDIS ABABA, ETHIOPIA**

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**A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY,  
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## **DEDICATION**

This work is dedicated to my late father Tegegne Biresaw, who grew up me in a good manner and lived for me.

# TABLE OF CONTENTS

<b>ACKNOWLEDGEMENTS.....</b>	<b>iv</b>
<b>ACRONYMS .....</b>	<b>v</b>
<b>LIST OF TABLES.....</b>	<b>vi</b>
<b>LIST OF FIGURES.....</b>	<b>vii</b>
<b>ABSTRACT .....</b>	<b>viii</b>
<b>CHAPTER ONE: INTRODUCTION.....</b>	<b>1</b>
<b>1.1. Background of the Study .....</b>	<b>1</b>
<b>1.2. Company Profile.....</b>	<b>4</b>
<b>1.3. Statement of the Problem .....</b>	<b>6</b>
<b>1.4. Research Questions .....</b>	<b>7</b>
<b>1.5. Objective of the Study .....</b>	<b>7</b>
1.5.1.General objective .....	7
1.5.2.Specific objectives .....	7
<b>1.6. Definition of Terms .....</b>	<b>8</b>
<b>1.7. Significance of the Study.....</b>	<b>9</b>
<b>1.8. Scope of the Research .....</b>	<b>10</b>
<b>1.9. Organization of the Thesis.....</b>	<b>10</b>
<b>CHAPTER TWO: LITERATURE REVIEW .....</b>	<b>12</b>
<b>2.1. Drinking Water .....</b>	<b>12</b>
<b>2.2. Outlet Survey .....</b>	<b>16</b>
2.2.1. Availability .....	17
2.2.2. Visibility .....	18
2.2.3. Price .....	19
2.2.4. Expired Stock.....	21
2.2.5. Out of stock.....	22
2.2.6. Market Share.....	23
<b>2.3. Household Survey .....</b>	<b>24</b>
2.3.1. PUR.....	26

<b>CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY.....</b>	<b>29</b>
<b>3.1. Research Design.....</b>	<b>29</b>
3.1.1. Research design for outlet survey.....	29
3.1.2. Research design for household survey.....	29
<b>3.2. Population and Sampling Technique.....</b>	<b>30</b>
3.2.1. Population and sampling technique for outlet survey.....	30
3.2.2. Population and sampling technique for household survey.....	31
<b>3.3. Source of Data and Data Collection Tools.....</b>	<b>32</b>
<b>3.4. Data Collection Procedures.....</b>	<b>32</b>
3.4.1. Procedures of data collection for outlet survey.....	32
3.4.2. Procedures of data collection for household survey.....	33
<b>3.5. Methods of Data Processing and Analysis.....</b>	<b>33</b>
<b>3.6. Ethical Considerations.....</b>	<b>33</b>
<b>CHAPTER FOUR: RESULTS AND DISCUSSION.....</b>	<b>35</b>
<b>4.1. Results of the Study.....</b>	<b>35</b>
4.1.1. Outlet survey results.....	35
4.1.1.1. Availability and Visibility of PUR Survey Results.....	36
4.1.1.2. Availability and Visibility of PUR POS Survey Results.....	37
4.1.1.3. Selling Price of PUR Survey Results.....	38
4.1.1.4. Availability of Expired PUR Stock Survey Results.....	39
4.1.1.5. PUR Out of Stock Survey Results.....	39
4.1.1.6. Market Share Survey Results.....	41
4.1.2. Household Survey Results.....	41
4.1.2.1. Interview Respondents' Level of Education.....	42
4.1.2.2. Households' Drinking Water Source and Treatment Behavior.....	42
4.1.2.3. Market Share, Quality, Place, Visibility, Stock Out, Price and Shelf Life of PUR.....	46
<b>4.2. Discussion.....</b>	<b>52</b>
4.2.1. Availability and Visibility of PUR.....	52
4.2.2. Availability and Visibility POS of PUR.....	53
4.2.3. Price of PUR.....	53
4.2.4. Availability of Expired PUR Stock.....	53

4.2.5. Stock Out of PUR .....	54
4.2.6. Market Share.....	54
4.2.7. Households’ Drinking Water Source and Treatment Behavior .....	55
<b>CHAPTER FIVE: SUMMARY, CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS OF THE STUDY.....</b>	<b>57</b>
<b>5.1. Summary the Major Findings .....</b>	<b>57</b>
<b>5.2. Conclusions.....</b>	<b>57</b>
<b>5.3. Limitation of the Study .....</b>	<b>59</b>
<b>5.4. Recommendations.....</b>	<b>59</b>
<b>REFERENCES.....</b>	<b>61</b>
<b>APPENDICES .....</b>	<b>I</b>
<b>APPENDIX A.....</b>	<b>I</b>
<b>APPENDIX B.....</b>	<b>IV</b>

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## ACRONYMS

AIDS	Acquired Immuno Deficiency Syndrome
AWD	Acute watery diarrhea
CDC	Center for Disease Control and Prevention
DALY	Disability Adjusted Life Years
EDHS	Ethiopia Demographic and Health Survey
HIV	Human Immuno Deficiency Virus
NGO	Nongovernmental Organization
OOS	Out of Stock
P&G	Procter and Gamble
PLHIV	People Living With HIV
POS	Point of Sales Material
PSI	Population Services International
PSI/E	Population Services International Ethiopia
RRP	Recommended Retail Price
SNNPR	Southern Nations, Nationality and People Region
SPSS	Statistical Package for Social Scientists
TV	Television
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
US	United States
WHO	World Health Organization

## LIST OF TABLES

Table 1.1: Estimates of diarrhea deaths among children aged less than 5 years in low-and middle-income regions of the world, 2004.....	2
Table 2.1: Summary of household water treatment options performance.....	15
Table 2.2: Potential treatment capabilities of PUR.....	27
Table 4.1: Result summary of the availability of expired PUR stock at retail outlets.....	39
Table 4.2: Result summary of retail outlets that faced PUR stock outs at least once for the last one year.....	40
Table 4.3: Result summary of reasons for PUR out of stock.....	40
Table 4.4: Result summary of the market share of household water treatment chemicals in retail outlets.....	41
Table 4.5: Result summary of household drinking water source.....	43
Table 4.6: Result summary of facility types where household water treatment chemicals were purchased.....	48
Table 4.7: Result summary of visibility of PUR at retail outlets based on household survey respondents.....	49
Table Appendix 1: Result summary of the outlet survey.....	VII
Table Appendix 2: Mortality and morbidity rate of children under five in Bele Town.....	VIII

## LIST OF FIGURES

Figure 2.1: Water treatment process and safe storage.....	26
Figure 2.2: The two sides of a sachet of PUR.....	27
Figure 4.1: Result summary of availability of PUR stock in retail outlets during research visit .....	36
Figure 4.2: Result summary of visibility of the available PUR stock at retail outlets.....	37
Figure 4.3: Result summary of the availability PUR POS during research visit in retail outlets.....	37
Figure 4.4: Visibility of the available PUR POS at retail outlets during research visit.....	38
Figure 4.5: Result summary of the retail outlets selling price of PUR.....	39
Figure 4.6: Result summary of the household survey interview respondents' level of education.....	42
Figure 4.7: Result summary of the household drinking water cleanness and potability.....	43
Figure 4.8: Result summary of necessity of treating household water.....	44
Figure 4.9: Result summary of households' drinking water treatment frequency using point of use water treatment chemicals.....	44
Figure 4.10: Result summary of other household water treatment methods used .....	45
Figure 4.11: Result summary of reported volume of water treated per a sachet of PUR.....	46
Figure 4.12: Result summary of the point of use household water treatment chemicals used.....	46
Figure 4.13: Result summary of qualities of PUR liked by respondents.....	47
Figure 4.14: Result summary of disliked attributes and processes of PUR.....	48
Figure 4.15: Result summary of respondents reported that they experienced stock out of PUR at retail outlets.....	49
Figure 4.16: Result summary of respondents' reported action taken during stock outs.....	50
Figure 4.17: Result summary of the purchasing price of a sachet of PUR reported by households.....	50
Figure 4.18: Result summary of the reasonability of the unit purchasing price of PUR.....	51
Figure 4.19: Result summary of respondents checking shelf life during purchasing.....	51

## ABSTRACT

*There were repeated complaints from consumers about stock out and price increase on point of use water treatment chemicals at retail outlets through mass media. The researcher performed PUR outlet and household survey in Bele Town, Wolayta Zone to evaluate the complaints of customers in scientific ways. The researcher used descriptive and qualitative research methods for both surveys. He used purposive sampling techniques for outlet survey and simple random sampling technique for household survey. Twenty three retailers and one hundred ninety four households were used as sample for this research. The data were collected from these samples using questionnaires at face to face interview for both surveys and additional observation for outlet survey. The collected and evaluated data were analyzed using descriptive statistical tools for both surveys. The Outlet survey was measured in terms of PUR and PUR Point of Sales Materials (POS) availability and visibility, PUR selling price, availability of PUR expired stocks and the market share of PUR against other point of use water treatment chemicals. The findings of the study showed that the complaints of consumers through mass media were correct and only 8.7% retailers surveyed fulfilled all the requirements of the indicators of outlet survey. The total achievement percentage for each outlet survey indicator was different as indicated in the result section of the research. In the household survey the researcher counter checked the information obtained in the outlet survey in addition to assessed and analyzed the households' behavior on household water treatment and their knowledge on point of use household water treatment. The household survey results showed that the behavior of households in treating their household water was very good but there were some differences in the response of household survey to the indicators used to assess the outlet survey. Based on the findings the researcher recommended PSI/E to organize a workshop to give a theoretical and practical training to all stakeholders on identified gaps.*

**Keywords:** *outlet survey methods, availability, visibility, market share, price, expired stock, household survey and behavior.*

# CHAPTER ONE

## INTRODUCTION

### 1.1. Background of the Study

More than one billion people lack safe drinking water globally (UNDP, 2007) and according to Farthing & Selam (2012) there are about 2 billion cases of diarrheal disease worldwide each year. Diarrhea is the leading cause of death in children under five years of age globally (Nakawesi, Wobudeya, Ndeezi, Mworozzi & Tumwine, 2010). Global deaths from diarrhea of children aged less than 5 years were estimated at 1.87 million and it is approximately 19% of total child deaths (Boschi-Pinto, Velebit & Shibuya, 2008). According to Ahs, Tao, Lofgren and Forsberg (2010), of all the medical conditions, diarrhea is the second leading cause of healthy time lost to illness, i.e., 72.8million Disability Adjusted Life Years (DALYs).

According to UNICEF and WHO (2009) diarrhea kills more young children than AIDS, malaria and measles combined. The burden of diarrheal disease disproportionately affects young children in low and middle income countries who have higher incidence rates (Walker, Perin, Aryee, Boschi-Pinto & Black, 2012). African and South East Asia Regions combined contain 78% (1.46million) of all the diarrhea deaths occurring among children in the developing world; 73% of these deaths are concentrated in just developing countries (Boschi-Pinto, et al., 2008). Sub-Saharan Africa is the region, where highest rate of child mortality was reported, where one in eight children dies before age of five (Tamiso, Yitayal & Awoke, 2014). In addition, waterborne diarrheal diseases lead to decreased food intake and nutrient absorption, malnutrition, reduced resistance to infection, and impaired physical growth and cognitive development (Lantagne and Gallo, 2008).

Table 1.1: Estimates of diarrhea deaths among children aged less than 5 years in low-and middle-income regions of the world, 2004

WHO region	Mortality Stratum <sup>a</sup>	Average of diarrhea-proportional Mortality (%)	Estimated diarrhea deaths (thousands)	Uncertainty ranges (thousands)
Africa (AFR)	D	17.8	402	346-455
	E	17.5	365	315-413
Americas (AMR)	B	13.3	35	30-40
	D	14.9	14	12-16
Eastern Mediterranean (EMR)	B	13.4	12	190-250
	D	16.9	221	190-250
South-East Asia (SEAR)	B	22.3	44	34-53
	D	24.5	651	500-793
Western Pacific(WPR)	B	13.8	105	90-118
World		18.7	1870	1558-2193

<sup>a</sup> WHO sub regions are defined on the basis of levels of child and adult mortality: A, very low child and very low adult mortality; B, low child and low adult mortality; C, low child and high adult mortality; D, high child and high adult mortality; E, high child and very high adult mortality.

Source: *Boschi-Pinto et al., 2008*

In Ethiopia diarrhea is the leading cause of under 5 mortality, causing 23% of all under 5 deaths (73,341 children per year). Some of the main factors for these are low access of households to improved source of drinking water and low percentage of households treating their drinking water. Even when water is safe at the source, contamination occurs during transportation, handling and storage (UNICEF, 2014).

According to Ahs *et al.* (2010) and Zwane and Kremer (2007) nearly 1 billion people in this world are currently relying on unimproved water sources for drinking and for other

domestic activities. These sources include unprotected wells, ponds and rivers. Even where water can be considered to be improved, the water may not meet the microbiological standards set by WHO.

Even though increasing access to improved drinking water is one of the millennium development goals of Ethiopia, according to The Ethiopian Demographic and Health Survey (EDHS) (2014) only 55 percent of the households in Ethiopia have access to an improved source of drinking water, with a much higher proportion among urban households (95 percent) than among rural households (46 percent). Also according to EDHS (2011) only 9.1 percent of the total population gets appropriately treated water for drinking.

Programs that provide education about access to microbiologically clean water, enough water and /or supply water purifier chemicals with subsidy all help to reduce the incidence of diarrheal disease (Lantagne and Gallo, 2008). One of the main mechanisms to reduce diarrheal disease is to use the point of use water treatment or household water treatment (Ahs *et al.*, 2010). Randomized impact evaluations of point-of-use water treatment systems (disinfection of water in the home, for example) suggest that these technologies can reduce diarrhea incidence some 20–30 percent (Zwane and Kremer, 2007). According to Cutler and Miller (2005) the rapid declines in the U.S. child mortality rate in the early twentieth century was largely a result of improvements in water quality.

According to EDHS (2014) the appropriate water treatment methods includes boiling, bleaching, staining and filtering. However some of these practices do not remove all infectious agents. The safe handling and safe storage of water should be practiced concomitantly with water quality improvements, to prevent contamination by hands, animals, utensils or flies during transport or storage of water (Ahs *et al.*, 2010). The improved drinking water sources based on 2014, EDHS are: piped water into dwelling, piped water to yard or plot, public tap or stand pipe, borehole, protected well, protected spring, rain water and bottled water.

In Ethiopia according to EDHS (2014) 5.7 percent of the population use chemicals to treat their house hold water. These point of use water treatment chemicals available are WuhaAgar, PUR, Bishan Gari and Aqua tab. PUR (Lantagne and Clasen, 2009) and Bishan Gari are applicable to turbid water since they have flocculent in their formulation. Whereas, WuhaAgar and Aqua Tab are more applicable to water which look clean since they have no flocculent in their formulations.

## **1.2. Company Profile**

Population Services International (PSI) is a leading non-profit making social marketing organization in the world that addresses the health problems of low-income and vulnerable populations in more than 67 developing countries. PSI/Ethiopia (PSI/E), founded in 2003, is the local platform of PSI and has national programs in malaria, child survival and sexually transmitted infections including Human Immuno Deficiency Virus (HIV)/ Acquired Immuno Deficiency Syndrome (AIDS). PSI promotes products, services and healthy behaviors by using private sector marketing techniques and innovative communication campaigns to motivate the low-income and vulnerable people to lead healthier lives.

PSI/E is social marketing two household water treatment chemicals and one of these is PUR. According to United Nations Development Program (UNDP) (2007) the Procter & Gamble (P&G) Company developed PUR Purifier of Water in conjunction with the Centers for Disease Control and Prevention (CDC). PUR sachets were previously produced in Pakistan and now it is produced in Singapore under the brand name P&G Purifier of Water and sold in commercial marketing, social marketing and disaster relief (Christensen & Thomas, 2008).

PSI/E in collaboration with P&G implements a program that social market PUR. The main goal of the program is to reduce diarrhea-related child morbidity and mortality by increasing practice of point-of-use water treatment. So far PSI/E distributed more than 82,000,000 sachets of PUR with accompanying behavioral change communication



activities. The key target audience for PUR is caregivers of children under the age of five, as they are seen as critical decision-makers regarding household water treatment and the larger community during acute watery diarrhea (AWD) emergency through institutional partners (Project Agreement, 2013).

The program performed the following major activities to achieve its goal (Program Report, 2013):

- Expand and support acute watery diarrhea(AWD) and malnutrition epidemic response efforts by emphasizing the importance of PUR,
- Expand and increase demand for PUR to target children through school program,
- Sales and distributions of PUR to people living with Human Immuno Deficiency Virus (PLHIV) in palliative care program, and
- Activate, support, capacitate and expand the existing water venders, retailers and wholesaler

According to Tegegne (2014) PSI/E uses different promotional mixes to create demand and boost for the sale of PUR, these are:

- Advertisement, e.g., television (TV) and radio,
- Personal sales, e.g., interpersonal communications, training, public service announcement and demonstration and door to door promotion and sales,
- Sale promotion to motivate trade customers and consumers, e.g., quantity discount, street shows and folk dramas.

Also, PSI/E tries to give a better service to consumers by capacitate the trade customers, mainly retailers about availability and visibility of a product and point of selling materials (POS), selling of a product within recommended retail price (RRP), i.e., at or below RRP and avoiding of expiration a product at the retail outlets (Tegegne, 2014).

### 1.3. Statement of the Problem

There were repeated complaints from customers through mass media about the stock out and increase selling price of water treatment chemicals at retail outlets. As one of the supplier of the household water treatment chemicals PSI/E was asked to give response to the complaints of customers directly through mass media. PSI/E's response on these issues was on air by Fana Broad Cast Corporation on August 1<sup>st</sup>, and October 3<sup>rd</sup>, 2014. But, to give the correct response to consumers for such types of critical questions require data supported by scientific research beyond simple assessment report. The researcher wanted to evaluate the complaints of consumers and to identify the causes of the problem if the complaints were correct and propose the solution in order to benefit all the stakeholders.

PUR outlet survey includes the availability and visibility PUR and PUR POS, PUR selling price to consumers, the availability of any expired PUR stock at retail outlets and the market share of PUR against other point of use water treatment chemicals. The aim of PUR household survey was to countercheck the results obtained from retail outlet survey and also to get additional information on the households' water treatment behavior, how they treat their household water and the knowledge they have on point of use water treatment chemicals and household water treatment.

The reasons why the researcher selected Bele Town for the study were that: first, it is a town where the water supplied by the City Administration is both contaminated and turbid (Birhanu, 2014). Second, in the country where there is no correct recording and reporting system, according to Bele Health Bureau Disease Prevention Department Report, the mortality rate of children under 5 years at 2004 and 2005 E.C in Bele Town were 50 and 32 children, respectively. The results of the mortality rate, i.e., 1.56% & 1%, in 2004 & 2005 E.C, respectively, of children under 5 were above the expected national mortality rate, i.e., 0.87% (Ethiopian Census, 2007; Boschi-Pinto *et al.*, 2008; & Bele Health Bureau Disease Prevention Dep't Report, 2011-2013). Third, it is one of the very few semi-urban towns applicable for PUR. Fourth, it is one of the nearest area to the capital city that can be

accessed through road transportation. Fifth, PUR has better acceptance in the town and to evaluate the complaint scientifically based on research.

The town is located in Kindo Koisha Woreda, Wolayta Zone in Southern Nations, Nationality and People Region (SNNPR). It has a total of 23,154 populations with 49 percent and 51 percent male and females, respectively (Birhanu, 2014).

## **1.4. Research Questions**

This study focused on looking for answers to the following basic research questions to address the research problem:

1. Do PUR and POS available and visible to the target groups in each retail outlet?
2. How expensive is the unit price of PUR against the recommended retail price?
3. Is there any expired PUR stock in the retail outlets?
4. What is the market share of each water treatment chemicals in the market of Bele Town?
5. Was there stock out of PUR in retail outlets for the past one year?
6. How is consumers' behavior in treating their household water and the knowledge they have on household water treatment?

## **1.5. Objective of the Study**

### **1.5.1. General objective**

The general objective of this research is to do PUR outlet and household survey in Bele Town, Wolayta Zone in SNNPR.

### **1.5.2. Specific objectives**

The specific objectives of the research include:

- To assess the availability and visibility of PUR in selected retail outlets present in Bele Town,

- To assess the availability and visibility of PUR POS in selected retail outlets present in Bele Town,
- To evaluate the price of PUR against PSI/E recommended retail price (RRP) of PUR in each selected retail outlets and households,
- To assess the presence of any expired PUR stock in the sample retail outlets,
- To analyze the market share of each water treatment chemical in the selected retail outlets.
- To assess the stock out experience of PUR in selected retail outlets.
- To assess the household knowledge and behavior in household water treatment.

## 1.6. Definition of Terms

**Outlets:** Defined as a facility that sells a product directly to consumers (O’Connell *et al.*, 2013). In our case the outlets are drug shops and selected commodity retail outlets with the potential to sell PUR and found in Bele Town.

**Outlet Survey:** According to O’Connell *et al.* (2013) the study they used to know the market share, availability, price, history of stock outs and availability of expired stock of a product in the outlets.

**Household Survey:** According to Shewchuk *et al.* (2011) the survey they used to capture the households’ treatment seeking pattern, use and knowledge of the product.

**Disability Adjusted Life Years (DALYs)** is a measure of overall disease burden, expressed as the number of years lost due to ill-health, disability or early death [http://www.who.int/mental\\_health/management/depression/daly/en/](http://www.who.int/mental_health/management/depression/daly/en/)

**Market Share:** According to shewchuk *et al.* (2011) market share is the total volume/quantity a product sold or distributed in a given period and in a given geographical area as proportion to the total volume/quantity of that industry. In the research the researched used the volume or quantity of water treatment chemicals that treats 20lt of

water as unit of measurement to calculate the market share of each household water treatment chemicals.

**Availability** is the presence of a product in stock of a facility and expressed as the percentage of facilities where the product is found on the day of data collection (Van Mourik, Cameron, Ewen and Oliang, 2010).

**Visibility** means the fact, state or degree the product and POS are visible to the customers (<http://www.thefreedictionary.com/visibility>).

**Price** means the price that the retailers' ask in exchange of a product (Van Mourik *et al*, 2010). In this research the price of PUR that the retailers sold to consumers was evaluated against the recommended retail price of one sachet of PUR set by PSI/E, i.e., 1.25Birr/1Sachet of PUR.

**Expiry date** means the last date that a product, as food, should be used before it is considered spoiled or ineffective usually specified on the label or package (<http://www.thefreedictionary.com/expiration date>).

## 1.7. Significance of the Study

By implementing the recommendations issued by the researcher correctly the following stakeholders will be benefited from this research as stated below. For the society it will help to get an alternative water purifier chemical, i.e. PUR, at the RRP whenever needed as a result it will help them to lead a better life by reducing water born diseases. For the retailers it increases their revenue, profit and their facility brand, i.e., the society perceives the facility where they can get a product they want. For the government it facilitates the achievement of one of its developmental and transformational goal, i.e., 77 percent of the population will drink treated water at the end of the development and transformation period. Also, for the program it assists to increase DALYs avert

## **1.8. Scope of the Research**

The scope of the research is limited to outlet and household survey of PUR in selected retail outlets and households, respectively in Bele Town, Wolayta Zone within the last one year. The outlet survey includes availability and visibility of PUR and its POS, price, the availability of expired PUR stock and market share of PUR against other water treatment chemicals. The outlets included in the research were drug stores and commodity shops with the potential to sell PUR. In the household survey the researcher counterchecked the information he got from outlet survey in addition to research the households' behavior and knowledge in household water treatment practices.

The researcher used descriptive and qualitative research methods for both outlet and household surveys. Also to analyze the data collected the researcher used descriptive methods, percentages, frequencies, figures and tables.

## **1.9. Organization of the Thesis**

The thesis is comprised of five chapters. As indicated above chapter one contains introduction part of the research. Some of the sub titles addressed in this chapter are background of the study, statement of the problem, basic research questions, general and specific objective of the study, definition of terms, significance of the study and scope of the research.

Chapter Two contains literature review part of the study. In this chapter the researcher tries to address what other scholars have and haven't done related to research topics.

In Chapter Three the researcher addresses the research design and methodology part of the study. Here the researcher shows what methodology, population; sampling techniques, source of data, data collection tools and methods of data analysis he used in the research.

Chapter four contains result and discussion part of the research. Here the researcher shows what results he found in the research and discusses the similarities, differences and contradicts of the result he found against other scholars finding, theories and principles raised in the literature part of the study.

Chapter five comprises of summary of the findings, conclusion, limitation and recommendation of the study. Besides to these five chapters the research paper contains acknowledgement, acronyms, list of tables, list of figures, abstract, reference and annex parts of the study.

## CHAPTER TWO

### LITERATURE REVIEW

The global burden of diarrheal disease continues to rise. Successful diarrheal mortality and morbidity rate reduction requires adequate supply chain management of water treatment chemicals and bringing behavioral change on households on the use of water treatment chemicals. To do this research the researcher wanted to review what other scholars did in the outlet survey of water treatment chemicals and household survey of water treatment locally and globally. In the outlet survey literature review the researcher reviewed the availability and visibility of PUR and PUR POS, the selling price of PUR, the availability expired stock and the market share of water treatment chemicals. Whereas in the household literature review the researcher reviewed the household's behavior in treating their household water and their knowledge on the household water treatment as reviewed below.

#### 2.1. Drinking Water

Since 1990 over 2 billion people have gained access to improved sources of drinking water, and 116 countries have met the millennium development goals (MDG) target for water. In 2012, 89% of the global population used an improved source of drinking water. More than half the world's populations, almost 4 billion (56%) people, now enjoy the highest level of water access: a piped water connection at their homes. But much remains to be done. More than 700 million people still lack ready access to improved sources of drinking water; nearly half are in sub-Saharan Africa (WHO & UNICEF, 2014).

According to UNICEF (2010) the intervention progress of WASH is inequitable. There continues to be many disparities in WASH coverage: between middle income and low



income countries, between urban and rural communities, and between rich and poor households. Ethnic minorities and other marginalized groups have lower level of access, and women continue to be disproportionately affected by poor WASH services.

Increasing access to improved drinking water is one of the MDG that Ethiopia and other nations worldwide have adopted. The source of the water is an indicator for suitability for drinking. The improved sources that are likely to provide suitable water for drinking are: piped sources within the dwelling, yard, or plot; a public/ stand pipe, or borehole; a protected well; spring water and rain water (EDHS, 2011). According to WHO & UNICEF (2006) unimproved drinking water sources include: unprotected dug well; unprotected spring; cart with small tank/drum; bottled water; tanker-truck; surface water (river, dam, lake, pond, stream, canal; and irrigation channels). Bottled water is considered improved only when the household uses water from an improved source for cooking and personal hygiene. Despite the efforts made by some countries, approximately 340 million people in Africa are without access to safe drinking water and only 26 countries will reach the water target.

According to EDHS (2014) more than half of the households in Ethiopia (55%) have access to an improved source of drinking water, with a much higher proportion among urban households (95%) than among rural households (46%). The most common source of improved drinking water in urban household is piped water, used by 88% urban households. In contrast, only 16% of rural households have the access to piped water. Only 16% and 12% rural households have access to drinking water from a protected well and spring, respectively.

According to EDHS (2011) only 9.1 percent of the total population gets appropriately treated water for drinking and of these 5.7, 2.6 and 1.3 percent of the population uses chlorination, boiling and filtration through clothes, respectively.

According to Lantagne, Quick & Mintz (no year) many of randomized controlled intervention trials have indicated the role of drinking water contamination during

collection, transport and storage. Therefore, point-of-use drinking water treatment and safe storage options can accelerate the health gains associated with improved water and by preventing disease; household water treatment practices can contribute to poverty reduction and development. Although studies have shown that household water treatment technologies can reduce the likelihood of diarrheal illness by about 30%, levels of adoption and continued use remain low (Poulos *et al.*, 2012).

The most common household water treatment options available are chlorination, filtration (biosand and ceramic), solar disinfection, combined filtration/chlorination, and flocculation/chlorination (Lantagne, Quick & Mintz, no year) and their performances according to the criteria's listed are indicated in Table 2.1 below.

Table 2.1: Summary of household water treatment options performance

Criteria	Lab studies				Field Studies		Can intervention be brought to scale?
	Virus	Bacteria	Protozoa	Residual Protection?	Acceptable to User?	Health Impact	
Chlorination	Medium	High	Low	Chlorine	Yes	Yes	Yes (Operates at village & national level)
Biosand Filtration	Unknown	Medium- High	High	No	Yes	Unknown	Unknown (Operates at village & regional level)
Ceramic Filtration	Unknown	Medium- High	High	No	Yes	Yes	Unknown (Operates at village & regional level)
Solar Disinfection	High	High	High	Safe Storage	Yes	Yes	Unknown (Operates at village & regional level)
Filtration & disinfection	Medium	High	Unknown	Chlorine	Yes	Yes	Unknown (Operates at village & regional level)
Flocculation & Chlorination	High	High	High	Chlorine	Yes	Yes	Yes (Operates at village & national level)

Source: Lantagne, Quick & Mintz, no year

## 2.2. Outlet Survey

According to O'Connell *et al.* (2013) outlet survey is the study that they used to know the market share, availability, affordability, price, history of out of stock, and availability of expired stock of a product in the outlets. Different researchers and NGOs like WHO and UNICEF performed outlet survey to evaluate one or more of these variables at different times in different countries and some of these literatures are reviewed below.

In 2013, Abiye, Tesfaye & Hawaze performed outlet survey in barriers to access: availability and affordability of essential drugs in a retail outlet of public health centers in South Western Ethiopia; In 2005, Federal Democratic Republic of Ethiopia Ministry of Health and WHO jointly performed outlet survey on price of medicine in Ethiopia; and in 2008, Cameron, Ewen, Ross-Degnan, Ball & Laing in collaboration with WHO did outlet survey on medicine prices, availability, and affordability in 36 developing and middle-income countries. In 2013 O'Connell recommended a method how to implement medicine outlet survey form his experience.

Now days, clever consumer goods companies know that simply measuring store visits and order taking is no longer enough. Sales representatives still need to check the in-store fundamentals: Are the right products there (physical availability of the product), in the right place (visibility), and at the right price? That's the first step in 'winning at the shelf (stayinfront.com, 2011).

Today's in store visit needs to go beyond call recording and order taking. With the right retail execution tools, representatives can increase a retailer's support of products and services, and directly influence consumer behavior, enabling reps to become true agents-of-change. Three core areas of focus for the reps are: getting the retailers' support for your products, i.e., build brand support, maximizes the opportunity to purchase it, and the consumer's desire to consume it (stayinfront.com, 2011).

According to James (2010) in order to create a sustainable behavioral change on the target group for the required agenda or issue it is recommended to use social marketing approach, i.e., rather than selling a specific product selling sustainability of that product that means selling the idea of accessibility, availability, visibility, affordability, using the product within its shelf life and so on.

The writer of this research paper initiated to do the outlet survey since there were repeated complaints about the availability and price of household water treatment chemicals from consumers through mass media. To be benefited from the sales and/or distribution activities of a specific product, the outlet survey should be monitored regularly by the responsible staffs using the indicators for the outlet survey, i.e., availability and visibility of the product and POS, price, market share and availability of any expired stock.

### **2.2.1. Availability**

According to Van Mourik *et al.* (2010) availability means the presence of a product in stock of a facility and the outcome measures used was percentage availability. The outlets survey done on essential medicines in retail outlets of public health centers found in South Western Ethiopia by Abiye *et al.* (2013) showed that only 128 essential medicines (56.6%) were available during the visit time. Low availability of essential drugs forced the patients to purchase drugs from private facilities, go to informal sector or forgot the treatment. The outlet survey done by The Federal Democratic Republic of Ethiopia Ministry of Health and WHO jointly in 2005 showed that the availability of medicines in public health facilities was lower than private pharmacies but comparable to availability in special pharmacies. The availability of all types of medicines also varied widely between medicine outlets surveyed in all sectors. In the same study the availability of 10 commonly used drugs were inadequate, i.e., below 75% in public health facilities and special pharmacies. The low availability of drugs in public health facilities and special pharmacies reported that patients were forced to purchase drugs from private facilities, go to informal sector or forgot the treatment.

The outlet survey done in 36 developing and middle income countries on medicine price, availability and affordability showed that the availability of the basket of 15 generic medicines were low ranging from 9.7% to 79.2%. Regional availability ranged from 29.4% in Africa 54.4% in the Americas; that mean availability in the public sector was lower than in the private sector in all regions. Even the availability of generic reported to low ranging from 50.1% in the West Pacific to 75.1% in the Southeast Asia. In the same study a wide variation in availability of generic medicines were noted in both private and public sector. In Western Pacific Countries, public sector availability of generic medicines ranged from 22.2% in Philippines to 79.2% in Mongolia. Similarly, private sector availability of generics in Africa ranged widely, ranging from 14.8% in Chad to 79.1% in Ethiopia (Cameron *et al.*, 2008).

The outlet survey done by Van Mourik *et al.* (2010) in 36 countries on cardiovascular medicines showed that the availability varied considerably, i.e., 0% to 100%, across the surveyed countries, even within income groups. The overall availability of cardiovascular was poor (mean 26.3% in public sector, 57.3% private sector). In this research also the private sector had better availability of cardiovascular medicines than the public sector. Across income groups higher income regions tended to have better availability than lower income regions.

Even though household water treatment chemicals contributes a lot in the reduction of mortality and morbidity rate of children under five years old, there is no any scientific evidence that shows the availability of these products at the public and private retail outlets.

### **2.2.2. Visibility**

Visibility means the fact, state or degree the product and POS are visible to the target groups (<http://www.thefreedictionary.com/visibility>). According to stayinfront.com (2011) at least 70% of product selections are made within the store. One of the ten principles of retail shoppability according to Bruke (2005) was to make the product clearly visible as

consumers walk into the store and through the aisles. Fixtures should be selected and arranged to improve sightlines.

Shelf space allocation directly impacts the retailers' profit and it is a very challenging job for the retailers to allocate proper space to the product. Retailers allocate more space to those products which contribute more to his profit by increasing product visibility. As much shelf in a visible place is allocated to brands, it raises market share equally, share of shelf equals to market share (Zameer & Waheed, 2012). According to Murray (2010) effective shelf management techniques, including the visibility of products showed a 7 percent milk sales increase in New York.

According to McKenzie-Mohr (2000) promotion is effective in altering consumers' preference to purchase one brand over another. In-store display is one of the trade promotion methods in retail stores. Variations of in-store displays include point-of-sale displays to encourage impulse buying; floor stickers, or advertisements for products on the aisle of a store; feature displays, which can be located at the end of an aisle to draw attention to a product; and special racks, or manipulation of a store shelf to make more space available for a product or bring attention to the promoted product. In-store displays can be perceived as more visually appealing to consumers than product alone on a retail shelf (stayinfront.com, 2011).

Measuring the visibility of the product, PUR, and its POS at selected retail outlets was one of the indicators for this outlet survey in order to know how visible were the POS and the product for the target group.

### **2.2.3. Price**

Price means is the money that the retailers' ask in exchange for one sachet of PUR from consumers and the outcome measures used were price ratio to international reference price (Van Mourik *et al.*, 2010). In this research the price was evaluated against the

recommended retail price of one sachet of PUR set by PSI/E, i.e., 1.25Birr/1sachet of PUR.

WHO and Health Action International (HAI) developed medicine price manual, accompanying books and databases to provide a new approach for measuring the prices of medicines. The reason for developing these tools were that high prices are the major barriers to the use of medicines and better health and yet, too little is known about the prices that people pay for medicines in low and middle income countries (WHO & HAI, 2003).

The survey done on the price of essential medicines in Ethiopia showed that the public procurement prices for most sold and lowest price generic products in Ethiopia were lower than the international reference prices by 29% and 39%, respectively. The same survey showed that the price of medicines were lowest in public facilities and highest in private pharmacies. Prices in special pharmacies were in between that of the two sectors. For, example, the patient charges for the most sold and lowest price generic products were 69.2% and 67.2% in private pharmacies and 15.9% and 26.2% in special pharmacies, respectively above the patient charges in public health facilities (Minister of Health of Ethiopia & WHO, 2005).

The finding of the survey done by Cameron *et al.* (2008) on the medicine prices, availability, and affordability in 36 developing and middle- income countries showed that patients at private sector paid 9 to 25 times international reference prices for lowest-priced generic products and over 20 times international reference prices for originator products across WHO regions. Public sector patient prices were generally lower than prices in the private sector in most regions.

A survey done on availability, price and volume of antimalarials in seven malaria endemic countries showed that the first line quality assured Artemisinin-based combination therapy (ACT) is 5 to 24 times more expensive than non-Artemisinin therapies, and significantly



more expensive than the most popular antimalarial in each country (O' Connell *et al.*, 2011).

According to O' Connell *et al.* (2013) one of the challenges in conducting medicine outlet survey is the measurement of price in a standardized ways across drug types because the considerable variation in strength, pack size, formulation and dose length across products, even within a given therapeutic class. But here the researcher used the price of one sachet of PUR since he wanted to assess its selling price against the recommended retail price of a sachet of PUR.

According to Lubensky (2011) manufacturers use non binding recommended retail prices (RRP) in markets ranging from common household goods found at grocery store to big ticket items as electronics, appliances and cars and it serves as a price ceiling. In most countries retailer price restrictions imposed by manufacturers have traditionally been consider harmful for society by antitrust authorities and, consequently, forbidden. But in recent years, the prevailing antitrust doctrine has changed, modifying its negative attitude towards some forms of price restrictions. Recommended retail price is now permitted for example by the European Commission under the belief that it prevents price making retailers from increasing the retail price (Colangelo & Martini, 2004).

#### **2.2.4. Expired Stock**

According to O' Connell *et al.* (2013) it is one of the indicators used for medicine outlet survey. Shelf life (expiration dating period) means “the time period during which a drug product is expected to remain within the approved shelf life specification, provided that it is stored under the conditions defined on the container label. The shelf life of a product is established based on stability study on physical, chemical and microbiological of a minimum of three batches of a product (ICH Q1A (R2)).

Medicines are not immortal. Due to their very nature, they react to the environment around them and breakdown over a period of time. Factors that will shorten the lifespan of a drug

are moisture, increased temperature, manufacturing impurities, and, for some drugs, light, so storing your medicines correctly has a big effect on the long –livity of your medications (Swaroop & Varun, 2011).

A Joint Industry Unsalable Bench Mark Survey done in America by R2Raftery (2003) showed that the amount expired products that was removed from the supply chain in 2001 reported about \$900,000,000 worth of inventory that accounted 0.154 percent of all the commodity value.

A product should be consumed or used before its expiration date. In most food stores, waste is minimized by using stock rotation, which involves moving products with the earliest sell by date from the warehouse to the sales area, and then to the front of the shelf, so that most shoppers will pick them up first and thus they are likely to be sold before the end of their shelf life. This is important, as consumers enjoy fresher goods, and furthermore some stores can be fined for selling out of date products; most if not all would have to mark such products down as wasted, resulting in a financial loss (R2Raftery,2003).

#### **2.2.5. Out of stock**

Store out of stock (OOS) occurs when the store is completely out of inventory. Excessive store OOS arise from mistakes in ordering, demand forecasting, or supply chain. OOS has impacts that extend well beyond the lost sales of the OOS item alone. A variety of strategic and operational costs apply to both retailers and suppliers including decreases in store and brand equity attenuated impact of promotions and trade promotion funds (Gruen & Corsten, 2007).

OOS, i.e., unavailability of a product, is commonly observed in the retail environment, but there have been few empirical studies regarding the effects of out of stock of consumer goods due to lack of data on OOS (Che, Chen and Chen, No year). According to Abiye *et al.* (2013) OOS of essential medicines in public facilities forced the patients to purchase drugs from private facilities, go to informal sector or forgot the treatment.

The research done by Gruen & Corsten (2007) showed that retailers can sustain out of stock reduction below the industry average of 8.3% by improving the following root causes for most out of stocks: item data accuracy; ordering and inventory accuracy; demand forecasting accuracy; store and shelf replenishment; shelf space allocation; and item management

#### 2.2.6. Market Share

According to Shewchuk *et al.* (2011) market share is the total volume or quantity a product sold or distributed in a given period and in a given geographical area as proportion to the total volume or quantity of that industry.

According to O' Connell, *et al.* (2013) one of a challenge in conducting medicine outlet survey is the measurement of sales volume (i.e., market share) in a standardized way across drug types because of the considerable variation in strength, pack size, formulation and dose length across products, even within a given therapeutic class. For chronic conditions, measures such as daily the daily dose have been used as the unit of comparison.

According to Howard & Bartram (2003) the daily volume of water required for hydration is 2.2lt, 2.9lt and 1.0lt for female adult, male adult and children, respectively and this brings around 10lt of water require for hydration for the household that has a family size of 5 people. Even though it varies according to the type of diet the household prepares, the average daily requirement of water for cooking per capita is around two lt. The total daily household water requirement for hydration and cooking will be 20lt. Therefore, the researcher used the volume/quantity of chemicals that uses to treat 20lt of water as unit of measurement to calculate the market share or sales volume of water treatment chemicals. Based on this assumption, the quantity or volume of water treatment chemicals used to treat 20lt of water will be as follows: PUR-2 sachet; WuhaAgar-3ml; Bishan Gari-1 sachet and Aqua Tabs- 2 tablet.

### 2.3. Household Survey

According to United Nation's Department of Economics and Social Affairs Statistics Division (2005) household surveys are among the three sources of social and demographic statistics in many countries and the other two are population and housing censuses and administrative record system. Household surveys provide a cheaper alternative to censuses for timely data and a more relevant and convenient alternative to administrative record systems.

Different researchers used household survey for collection of detailed and varied socio-demographic data pertaining to conditions under which they engage, demographic characteristics and cultural factors which influence behavior, as well as social and economic change. This however doesn't preclude the complementary use of data generated through household surveys with data from other sources such as censuses and administrative records (UN, 2005). Some of the household surveys done by different researchers are reviewed below.

Littrell *et al.* (2011) performed household survey in six African countries to know the household treatment seeking behavior for fever in children under 5 years old. The Government of Ethiopia did demographic and health survey at different times to collect household data on health, water, primarily maternal and infant health but not limited to this, and demography (EDHS, 2011 & 2014). According to ENDA (2013) the Government of Ethiopia in collaboration with the Oromia Regional State and World Bank performed water, sanitation and hygiene household survey in selected towns of Oromia.

According to the EDHS (2014) more than half of the households in Ethiopia (55%) have access to an improved source of drinking water, with a much higher proportion among urban households (95%) than among rural households (46%). The most common source of improved drinking water in urban household is piped water, used by 88% urban households. In contrast, only 16% of rural households have the access to piped water. 16%

and 12% rural households have access to drinking water from a protected well and spring, respectively.

According to EDHS (2011) only 9.1 percent of the total population gets appropriately treated water for drinking and of these 5.7, 2.6 and 1.3 percent of the population uses chlorination, boiling and filtration through clothes, respectively.

According to Ntow (2010) 65% of Liberian households have the access to an improved water source and 16% of the households reported treating their drinking water with bleach or chlorine and 80% of the households reported doing nothing to treat their drinking water.

United Nation's Department of Economics and Social Affairs Statistics Division (2005) developed a hand book on household surveys design to include in one publication the main sample survey design issues that can conveniently be referred to by practicing national statisticians, researchers and analysts involved in sample survey work and activities in countries. WHO (2009) also developed the household survey that measures the people's access and use of medicines when faced with either acute or chronic diseases. The questionnaire covers health seeking behavior, as well as source; availability, cost, affordability, and appropriate use of medicines. It gathers information on household practices, as well as beliefs and other factors that influence the decision to seek professional advice or to take medicines.

The researcher used household survey to know their household water treatment behavior, where they get the water treatment chemicals when they need, the price, availability, visibility of water treatment chemicals, the knowledge on water treatment chemicals and how to treat household water using PUR and so on.

### 2.3.1. PUR

**PUR is a combined flocculant-disinfectant. The PUR packet was developed by Procter and Gamble (P&G) in collaboration with the U.S. Centers for Disease Control and Prevention (CDC) to replicate the community water treatment process at the household level. PUR is a powder which contains both coagulants and a timed release form of chlorine. PUR is sold in a single packets designed to treat 10l of water (CAWST, 2009).**

**The product uses coagulation and disinfection to remove turbidity and pathogens from water at the same time. When added to water, the coagulant first helps the suspended particles join together and form large clumps, making it easier for them to settle to the bottom of the container. Then chlorine is released over time to kill the remaining pathogens. The treated water contains residual free chlorine to protect against recontamination (CAWST, 2009).**

**According to CAWST (2009) PUR removes contamination in the following ways. Particles that cause turbidity (e.g. silt, clay) are generally negatively charged, making it difficult for them to clump together because of electricity repulsion. But coagulant particles are positively charged, are they chemically attracted to the negative turbidity particles, neutralizing the latter's negative charge. With mixing the neutralized particles then accumulate (flocculation) to form larger particles (flocs) which settle faster. The flocs can then settled out or removed by filtration. Some bacteria and virus can also attach themselves to the suspended particles in water that cause turbidity. Therefore, reducing turbidity levels through coagulation may also improve the microbiological quality of water. As well, chlorine forms hydrochloric acid when added to water which reacts through oxidation with microorganisms and kill them.**

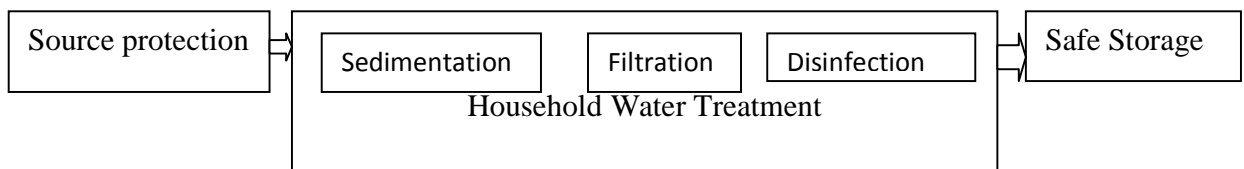


Figure 2.1: Water treatment process and safe storage

Source: CAWST, 2009

Table 2.2: Potential treatment capability of PUR

Very effective for:	Somewhat effective for:	Not effective for:
<ul style="list-style-type: none"> <li>• <b>Bacteria</b></li> </ul>	<ul style="list-style-type: none"> <li>• Some heavy metals(e.g. Arsenic, chromium, lead)</li> </ul>	<ul style="list-style-type: none"> <li>• Cryptosporidium parvum</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Virus</b></li> </ul>	<ul style="list-style-type: none"> <li>• Taste, odor, color</li> </ul>	<ul style="list-style-type: none"> <li>• Toxoplasma Oocysta</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Some protozoa</b></li> </ul>		<ul style="list-style-type: none"> <li>• Dissolved chemicals</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Helminthes</b></li> </ul>		
<ul style="list-style-type: none"> <li>• <b>Turbidity</b></li> </ul>		

Source: CAWST, 2009

The water purification process using PUR is as follows as indicated in Figure 2.1: Add the whole contents of 1 sachet of PUR to 10lt of water and stir vigorously for 5 minutes until floc forms and the water is clear. Left the water for 5 minutes for the suspended particles to settle. Filter the water through a clean, 100% cotton cloth and dispose of separated floc in latrine. Then wait the water for 20 minutes before drinking to allow the complete disinfection of pathogens using chlorine. Finally, store the water in suitable container to prevent recontamination (www.aquaya.org).

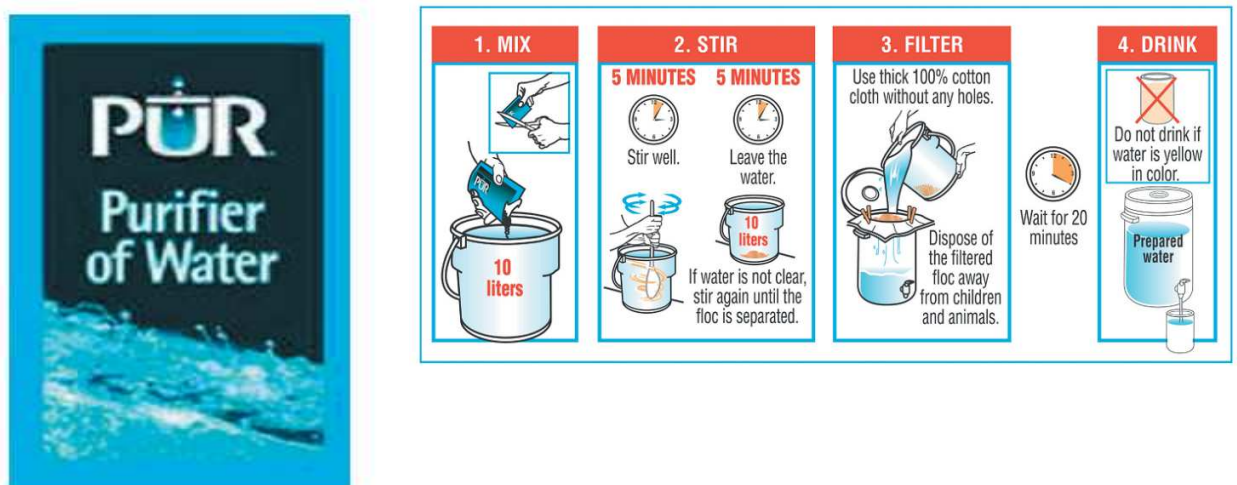


Figure 2.2: The two sides of a sachet of PUR

Source: [www.aquaya.org](http://www.aquaya.org)

### 2.3.2. Why consumers prefer a product to another

According to Hilgenkamp & Shanteau (2010) brand name of a product has influence on consumer's purchasing intentions. The same research also showed that the consumer's purchased intentions were based on their perceived quality. According to the research done to car customers by Hasan (2008) showed that customers prefer to purchase well known brand products, s/he had already heard of rather than going for the product they don't know much about.

Building strong relationship with customers has become a prime strategic objective of retailers to retain the existing customers and to attract new customers. Now a day's retailers face a dynamic and competitive environment. With increased globalization, market saturation, and increased competitiveness through mergers and acquisitions, retailers are seeking competitive advantage by better managing customer relationship (Fayaz, Reddy and Rao, 2013).

According to Raghav, Sharma and Mishra (2013) the consumer buying behavior, i.e., what they buy, how they buy, where and when they buy, in how much quantity they buy, depends on their perception, self concept, social and cultural background and their age and family cycle, their attitude, beliefs, values, motivation, personality, social class and many other factors that are both internal and external to them.

The research done by Zeithaml (1988) showed that the consumers' perception for price, value and quality are considered pivotal determinants role of shopping behavior and product choice

In this part the researcher wanted to know what attributes of PUR the consumers like and dislike in order to understand the issues behind the market share of PUR against other point of use water treatment chemicals.



## CHAPTER THREE

### RESEARCH DESIGN AND METHODOLOGY

#### 3.1. Research Design

##### 3.1.1. Research design for outlet survey

The study adopted descriptive and qualitative research methods using face to face interview and observation at each selected retail outlets using prepared questionnaire annexed herewith as appendix 1 (Shewchuk *et al*, 2011). The questions are both open ended and closed ended. Descriptive research is used to obtain information concerning the current status of the phenomena to describe what exists with respect to variables or conditions in a situation (Mugenda & Mugenda, 2003). The researcher used descriptive research designs with the intent of obtaining information concerning the current status of outlets and describes “what exists” regarding to availability and visibility of PUR & its POS, availability of expired PUR stocks, price and market share of PUR against other household water treatment chemicals.

The retail outlets included in the study were drug shops and commodity shops with the potential to sell PUR, i.e., kiosks. The reason why the researcher selected retail outlets for the study was that those are the facilities that sell PUR directly to consumers in Bele Town.

##### 3.1.2. Research design for household survey

The study adopted descriptive and qualitative research design in order to get the existing information regarding to the behavior and knowledge of families on household water treatment. The household survey also used to get information for counter checking the information obtained from outlet survey. The data were collected from households having

a child under five years old by face to face interview using prepared questionnaire annexed herewith as appendix B.

The reason why the researcher selected households' having a child under five years old for the household survey was that the mortality and morbidity rate due to drinking untreated water of children under five years old are very high as compared to the other population groups.

## **3.2. Population and Sampling Technique**

### **3.2.1. Population and sampling technique for outlet survey**

A variety of methods can be used to develop a sampling frame. The common approaches include pre-existing lists, local key informants and/or a census approach (O'Connell *et al.*, 2013). For this research the researcher used local key informants to develop the sampling frame. The key informants helped the researcher in identifying the range and the location where the local outlets selling PUR are located. 48 commodity and pharmaceutical retail outlets were identified as sampling frame or target population.

Twenty three retail outlets, i.e., one drug store and twenty two commodity retail outlets were selected as a sample for study using purposive sampling. The inclusion criterion for the sampling was to be pharmaceutical retail outlet or commodity outlet found in the highway near to the market area with the potential to sell PUR.

According to Taddie & Yu (2007) purposive sampling techniques have been referred to as non probability sampling or purposeful or qualitative sampling". It involves selecting certain units or cases "based on a specific purpose rather than randomly". According to Tongca (2007) it can be used with both qualitative and quantitative research techniques. The reason why purposive sampling technique used was that to collect quality data needed for the research from population fulfilling the inclusion criteria that enabled the researcher to answer the research questions.

### 3.2.2. Population and sampling technique for household survey

WHO introduced the household survey in 2002, with the objective of providing a low cost tool that would give valid, reliable and comparable information on outcomes, functions, and inputs to health care system. An additional objective is to build the evidence base necessary to monitor goals and adjust policies, strategies and programs (WHO & UNICEF, 2006). To do the household survey at national level, WHO in “A Training Guide for Field work” for the sampling scheme recommended using 30 households in each of the selected region([http://www.who.int/medicines/areas/coordination/training\\_slides\\_data\\_collection.pdf](http://www.who.int/medicines/areas/coordination/training_slides_data_collection.pdf)). According to the same guideline WHO recommended options for household unit sampling and these are random sampling from a complete list and purposive or non probability sampling if the criteria for controlling selection are established as indicated above in order to collect quality data needed for the research from population using the inclusion criteria.

The target population for household survey was households having at least a child less than five years old and 402 households were identified as sampling frame. 200 households were selected as sample using simple random sampling technique from 402 target population. The sample size was determined according to Yemane (1967) simplified formula to calculate sample size. From the two kebles each 100 households having children under five years old were taken as samples. The selected households were interviewed face to face to get the household survey data using prepared questionnaire.

$$n = \frac{N}{1 + N(e)^2}$$

Where n is the sample size; N is the population; and e is the level of precision or sampling error= (0.05).

$$N = \frac{402}{1 + 402(0.05)^2} = 200.$$

Hence the total sample size is 200. Since the number of households in each Keble is almost the same, therefore the number of samples in each keble is each 100 households.

### **3.3. Source of Data and Data Collection Tools**

The researcher used both primary & secondary source of data for both outlet and household surveys. According to Hox and Boeije (2005) primary data means original data collected for a specific research goal and secondary data means data originally collected for a different purpose and reused for another research question. The data from retail outlets was collected through questionnaire, i.e., annexed as appendix A, using face to face interview and observation. Also, the data from households' was collected through questionnaire, i.e., annexed as appendix B, using face to face interview. Both outlet and household survey questionnaires were adopted from WHO Outlet (O' Connell, 2013) and household survey interview questionnaire (WHO & UNICEF, 2006), respectively.

### **3.4. Data Collection Procedures**

#### **3.4.1. Procedures of data collection for outlet survey**

The researcher collected the research data using structured questionnaire adopted from O' Connell (2013) according to the following procedure:

1. The applicability of the questionnaire was tested here in Addis Ababa at outlets and reviewed based on the findings;
2. Each retail outlet that was included in the research was selected using the inclusion criteria, i.e., being pharmaceuticals retail outlet or commodity shop with the potential to sell PUR and found in the highway at the market area;
3. Got permission from each retailer to collect the data using face to face interview and observation; and
4. Collected data using data collection tool, i.e., structured questionnaire.

### **3.4.2. Procedures of data collection for household survey**

1. Even though the questionnaire was adopted from WHO, the applicability of the questionnaire was tested here in Addis Ababa at households and reviewed based on the findings;
2. To ensure the quality of data collected, data collectors and supervisor were trained on how to approach households, how to ask questions and how to complete survey forms; and also the supervisor tried to evaluate the filled questionnaire during data collection in order to correct for the next interview;
3. Each household with a child under five years of old was selected and asked for permission to do the household survey, and;
4. Collect the data using questionnaire in face to face interview.

### **3.5. Methods of Data Processing and Analysis**

For data analysis the data from each questionnaire was copied, edited, tabulated, summarized and analyzed using descriptive methods which showed the detail findings of the study. The descriptive methods used involves; frequencies, percentages and presentations of tables and graphs. Data were analyzed using Statistical Package for Social Scientists (SPSS) and excel. All tables, bar graphs and pie charts that show the result are clearly labeled and presented so that the reader can easily understand the information contained in them. These results can assist the researcher to put results, discussion, summary, conclusion and recommendation about the study.

### **3.6. Ethical Considerations**

The study was primarily focused to gather primary qualitative data to perform PUR outlet and household survey at Bele Town, Wolayta Zone in SNNPR. The study neither involves any experiment on human subjects nor conducted without the consent of the study participants. Above all, the researcher did not ask the study participants to engage into

risks as a result of participating in this study. Besides, informed verbal consent was obtained from all outlet and household survey respondents during data collection. The respondents were given the right to refuse or take part in the study.

All the primary data collection in the organization was under the permission of the managers and without any offence in ethical rules during the whole research process.

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.1. Results of the Study

This section presents the research results obtained from outlet and household survey done at Bele Town, Wolayta Zone on the sample population using face to face interview and observation by the researcher for outlet survey and only face to face interview for household survey. In both cases the researcher used prepared questionnaire for data collection.

In the outlet survey twenty three retail outlets were selected using the inclusion criteria, i.e., to be pharmaceuticals retail outlet or commodity outlet found in the highway near to the market area with the potential to sell PUR, and interviewed. The data obtained from all twenty three outlets were found complete and therefore used for outlet survey data analysis.

In the household survey two hundred households were selected using the inclusion criteria, i.e., households having a child less than five years of old, and interviewed. The data collected from two hundred households were evaluated and one hundred ninety four found complete and used for household data analysis.

The researcher presents the results obtained in both outlet and household survey studies in details in the following sections.

##### 4.1.1. Outlet survey results

The outlet survey results showed us that the retail outlets that satisfied all the indicators of outlet survey used, i.e., the availability and visibility of the PUR and PUR POS, selling

price of PUR within the RRP and absence of expired PUR stock, were only 8.7 percent of the samples surveyed and which were very unsatisfactory.

#### *4.1.1.1. Availability and Visibility of PUR Survey Results*

PUR stock was available in twenty retail outlets from twenty three, i.e. 87 percent of the total retail outlets, during the research visit as indicated in Figure 4.1 below. But, 13 percent of the total retail outlets included in the research had no PUR Stock during the research visit.

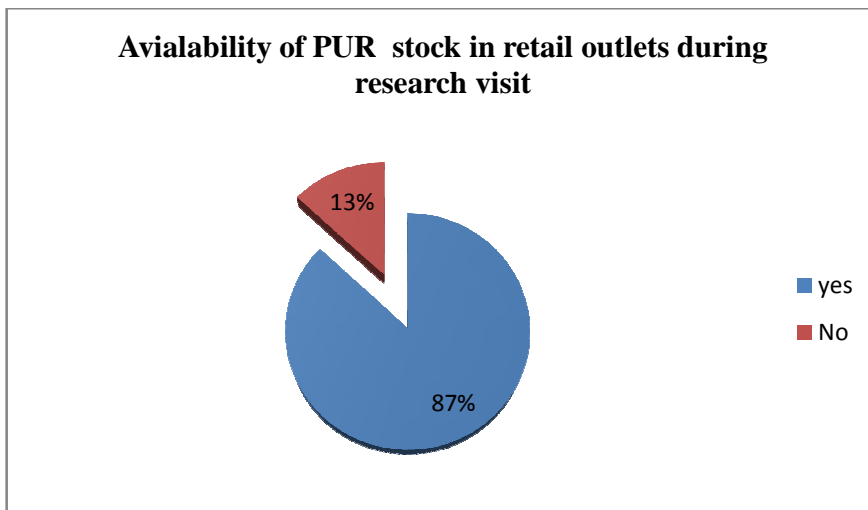


Figure 4.1: Result summary of availability of PUR stock in retail outlets during research visit

*Source: Own survey, November 2014*

Even though 87 percent of the total outlets surveyed had PUR during the research visit, 35% of the retail outlets, which had PUR stock during the research visit, kept it in a place that wasn't visible to the target group as indicated in Figure 4.2 below.



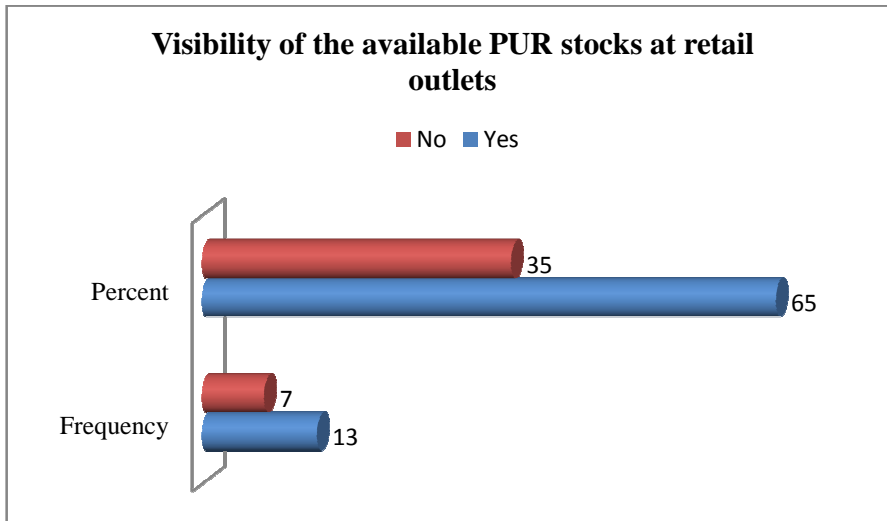


Figure 4.2: Result summary of visibility of the available PUR stock at retail outlets

Source: Own survey, November 2014

#### 4.1.1.2. Availability and Visibility of PUR POS Survey Results

The research results not only showed the problem on the supply chain system of PUR but also on the availability and visibility PUR POS that could assist PUR sales as indicated in Figure 4.3 & 4.4 below, respectively. The research result showed that only 17.4 percent of all the surveyed retail outlets had PUR POS during the research visit.

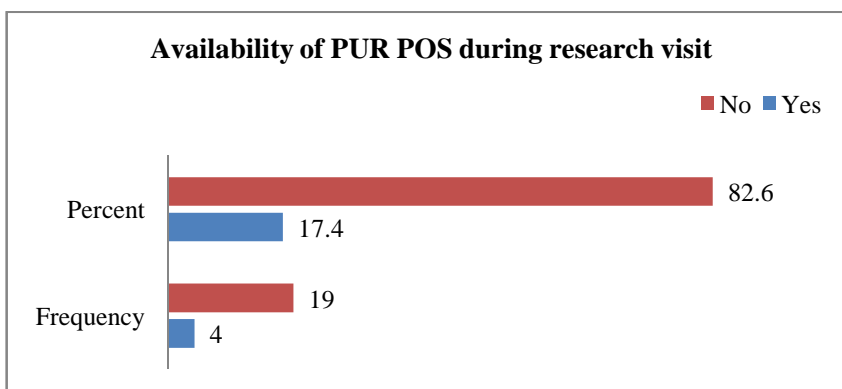


Figure 4.3: Result summary of the availability PUR POS during research visit in retail outlets

Source: Own survey, November 2014

However, 75 percent of the facilities, i.e., three out of four retail outlets, that had PUR POS during the research visit kept it in a visible place to the target groups as indicated in Figure 4.4 below.

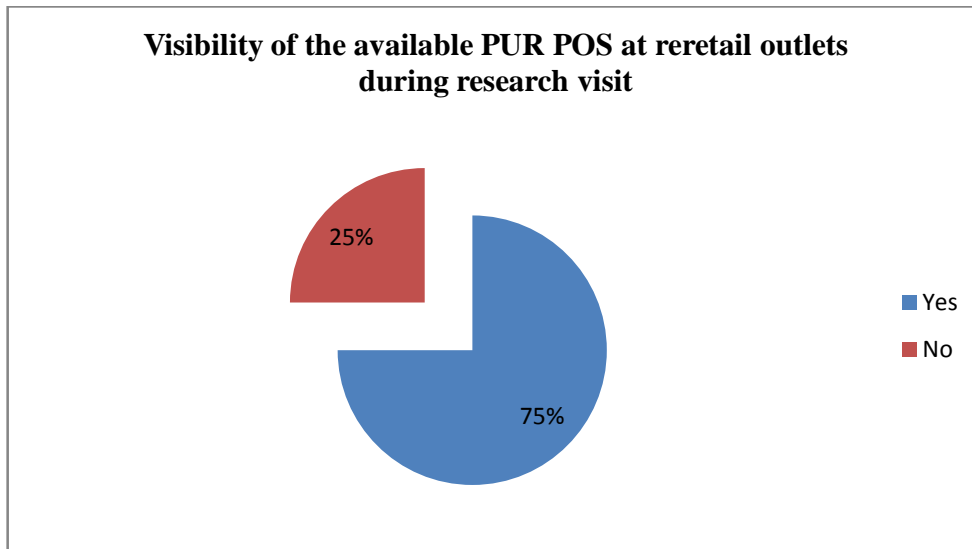


Figure 4.4: Visibility of the available PUR POS at retail outlets during research visit

Source: Own survey, November 2014

#### 4.1.1.3. Selling Price of PUR Survey Results

PSI/E set RRP to PUR, i.e., 1.25 birr/sachet to make it affordable to the target group. But, 21.7 percent of the total retail outlets surveyed sold PUR above the RRP as indicated on Figure 4.5 below. The retail outlets that sold PUR within RRP were 69.5 percent of the total retail outlets surveyed and 8.7 percent of the facilities surveyed reported that they didn't sell PUR.

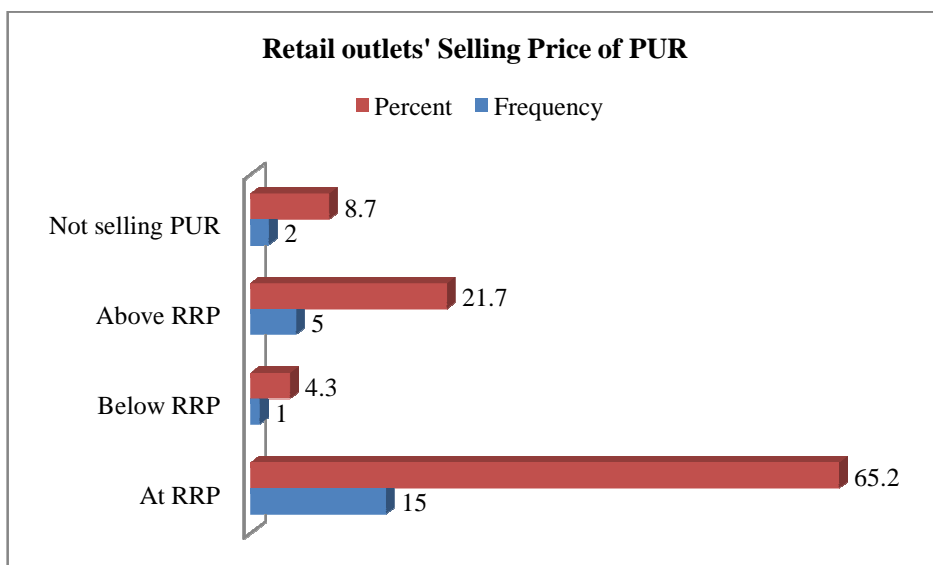


Figure 4.5: Result summary of the retail outlets selling price of PUR

Source: Own survey, November 2014

#### 4.1.1.4. Availability of Expired PUR Stock Survey Results

The research results showed that there was no stock of PUR expired in all retail outlets included in the research as indicated in Table 4.1 below. This was one of the best practices of retailers in transaction of PUR that we found at the research.

Table 4.1: Result summary of the availability of expired PUR stock at retail outlets

Availability of expired PUR stock at retail outlets	Frequency	Percent
No	23	100
Yes	0	0

Source: Own survey, November 2014

#### 4.1.1.5. PUR Out of Stock Survey Results

The outlet survey results showed that 65.2 percent of the total outlets included in the survey experienced PUR out of stock at least once for the last one year as indicated in table

4.2 below. Only 8 retail outlets from twenty three surveyed had not experienced PUR out of stock for the last one year.

Table 4.2: Result summary of retail outlets that faced PUR stock outs at least once for the last one year

<b>Have retail outlets ever faced stock out for the last one year?</b>	<b>Frequency</b>	<b>Percent</b>
Yes	15	65.2
No	8	34.8
Total	23	100

*Source: Own survey, November 2014*

Based on the findings the reasons for PUR out of stock were different as indicated in Table 4.3 and those includes insufficient capital and infrequent supply of PUR from PSI/E (46.7 percent), unsuitability of supply system (33.3 percent) and afraid of expiry, not fast moving and didn't know the demand exactly each reason accounts 6.7 percent of the total reasons reported by the retailers for PUR out of stock.

Table 4.3: Result summary of reasons for PUR out of stock

<b>Reasons for PUR out of stock</b>	<b>Frequency</b>	<b>Percent</b>
Insufficient capital & infrequent supply from PSI	7	46.7
Not fast moving	1	6.7
Unsuitability of the supply system	5	33.3
Afraid of expiry	1	6.7
Doesn't know the demand exactly	1	6.7
Total	15	100

*Source: Own survey, November 2014*

#### 4.1.1.6. Market Share Survey Results

Even though currently there are four types of water treatment chemicals available in the market including PSI/E's WuhaAgar, the outlet survey finding showed that the market share of PUR was 100 percent in all retail outlets included in the research as indicated in Table 4.4 below for the past one year. The researcher learned that there was some market share for Bishan Gari before three years ago but according to the response of interviewees it lost its entire market share to PUR since customers prefer PUR to Bishan Gari due to its quality. The unit of measurement used for all water treatment chemicals was volume/quantity of water treatment chemicals used to treat 20 lts of water that is the average daily household water requirement.

Table 4.4: Result summary of the market share of household water treatment chemicals in retail outlets

Name of household water treatment chemical	Reported quantity/volume sold for the last one year	Market Share	Remarks
PUR	118,860	100	Unit of measurement (UOM) 2 sachets
WuhaAgar	0	0	UOM 3ml
Bishan Gaari	0	0	UOM 1sachet
Aquatabs	0	0	UOM 1tablet

Source: Own survey, November 2014

#### 4.1.2. Household Survey Results

In the household survey two hundred households were selected according to the inclusion criteria, i.e., households that have at least a child below five years old, and interviewed using the structured questionnaire. Questionnaires that found to be completed, i.e., one hundred ninety four, were used for data analysis. The data from those questionnaires were transferred into SPSS sheet and analyzed using frequencies, percentages, charts and tables. The result summaries from each indicator are presented below.

#### 4.1.2.1. Interview Respondents' Level of Education

The level of education for interview respondents were as follows: illiterate 10.8 percent, meseretetimihiirt 4.1 percent, elementary 48.5 percent, high school 16.0 percent and above high school 19.6 percent. The education level of 2 interview participants was not recorded on the questionnaire that accounts 1.0 percent of the total interview participants as indicated below in Figure 4.6.

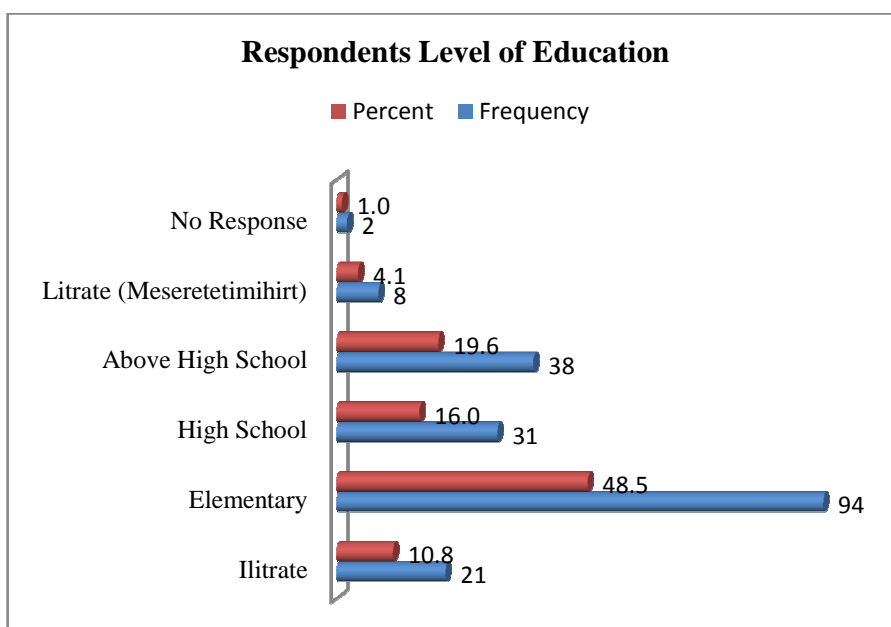


Figure 4.6: Result summary of the household survey interview respondents' level of education

Source: Own survey, March 2015

#### 4.1.2.2. Households' Drinking Water Source and Treatment Behavior

The household survey result summary showed that the source of drinking water for all households' was pipe water as indicated in Table 4.5 below.

Table 4.5: Result summary of household drinking water source

Source of Household Drinking Water	Frequency	Percent
Pipe water	194	100.0

Source: Own survey, March 2015

However, 95 percent of household survey respondents believed that the pipe water they used for drinking was not clean and potable as indicated in Figure 4.7 below.

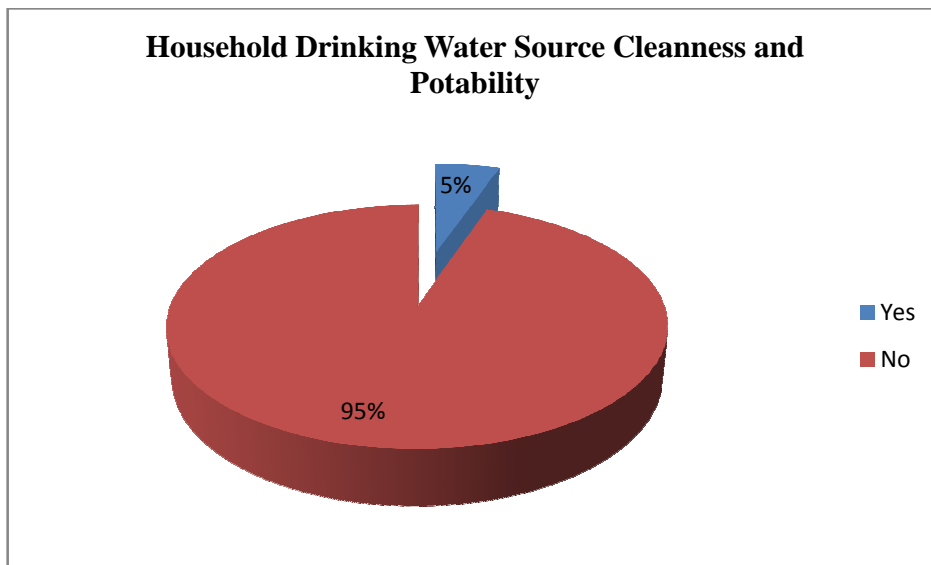


Figure 4.7: Result summary of the household drinking water cleanliness and potability.

Source: Own survey, March 2015

The household survey results showed that 99 percent of respondents believed that it is necessary to treat water at the household level before using as indicated in Figure 4.8 below.

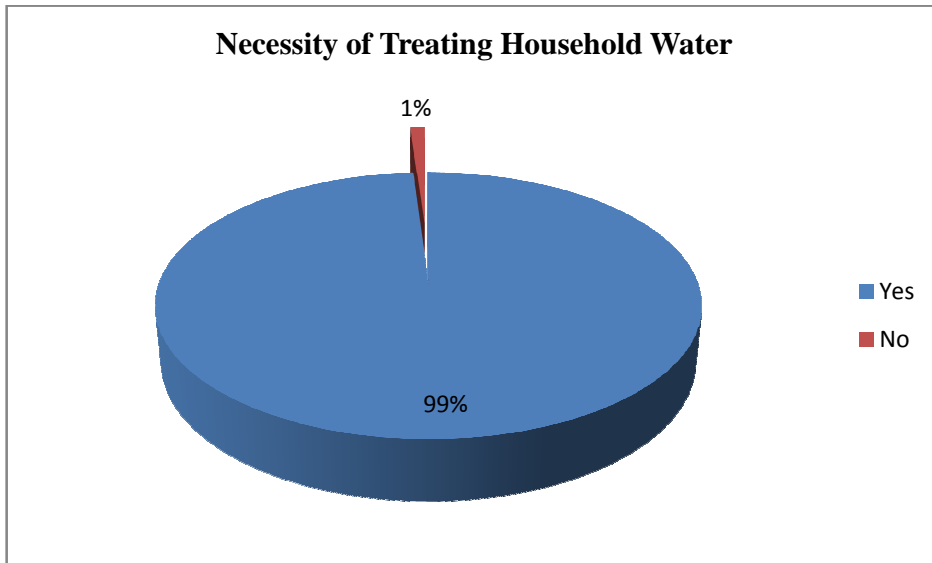


Figure 4.8: Result summary of necessity of treating household water  
 Source: Own survey, March 2015

According to the household survey result 100 percent of the respondents treated their household drinking water using point of use water treatment chemicals. Of those, 16 and 84 percent of households treated their household drinking water sometimes and always, respectively using point of use water treatment chemicals as presented in Figure 4.9 below.

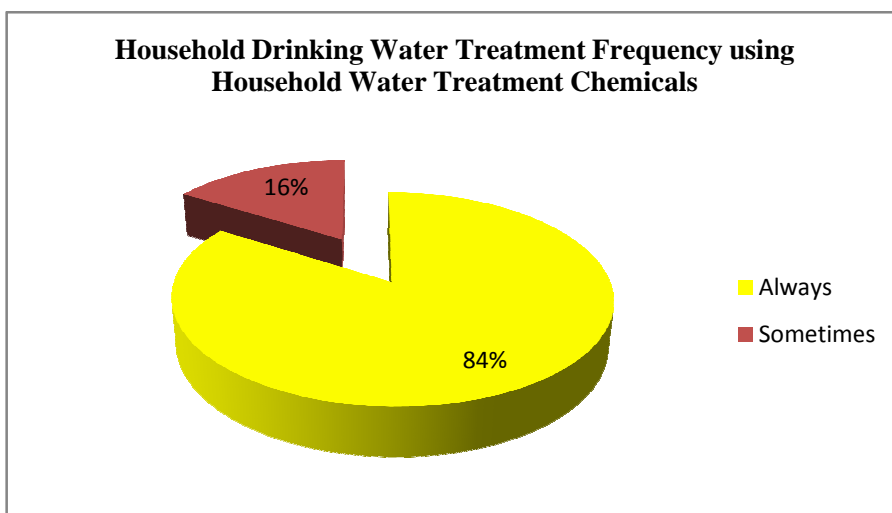


Figure 4.9: Result summary of households' drinking water treatment frequency using point of use water treatment chemicals  
 Source: Own survey, March 2015



Besides that 57.2 percent of the households surveyed used other treatment options in addition to point of use household water treatment chemicals to treat their household drink water. Of these 47.9, 7.2, 1.0 and 1.0 percents used filtration, boiling, exposed to sun and other methods to treat their household drinking water. But 42.8 percent of the interview respondents of the household survey didn't use other household drinking water treatment options except point of use household water treatment chemicals to treat their household drinking water as presented in Figure 4.10 below.

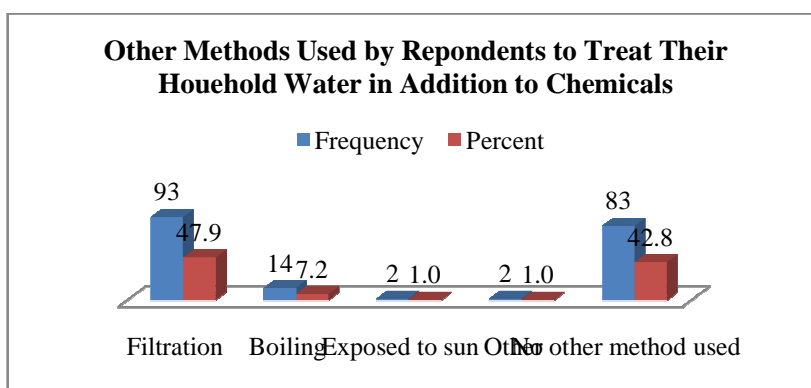


Figure 4.10: Result summary of other household water treatment methods used  
 Source: Own survey, March 2015

Also, 28.9 percent of the household survey respondents used the wrong quantity of PUR as point of use water treatment chemicals to treat their household water. 66 percent of the respondents reported that they used the correct quantity of PUR to treat their household water, i.e., a sachet of PUR to treat 10lts of water. 4.1 percent of the household survey respondents used other point of use water treatment chemical to treat their household water as indicated in Figure 4.11 below.

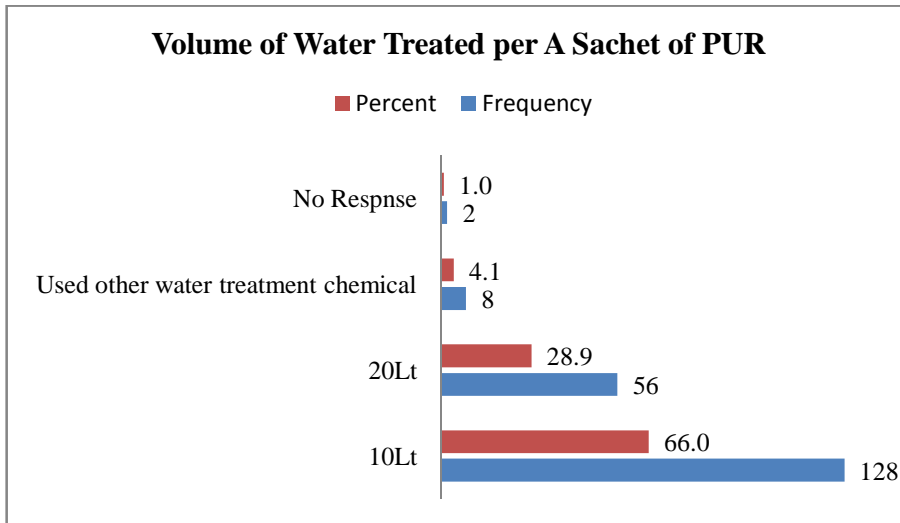


Figure 4.11: Result summary of reported volume of water treated per a sachet of PUR

Source: Own survey, March 2015

#### 4.1.2.3. Market Share, Quality, Place, Visibility, Stock Out, Price and Shelf Life of PUR

The household survey results showed that 4 percent and 96 percent of respondents used WuhaAgar and PUR as point of use water treatment chemicals, respectively to treat their household water as indicated below in Figure 4.12.

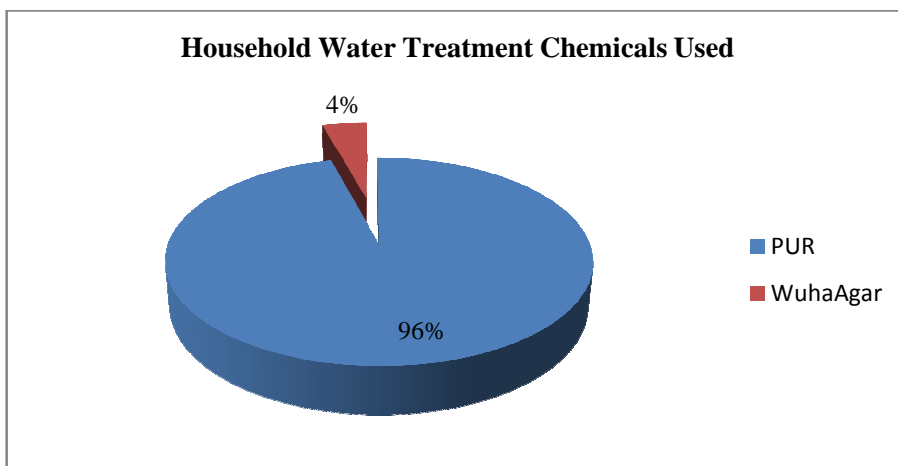


Figure 4.12: Result summary the point of use household water treatment chemicals used at household level

Source: Own survey, March 2015

The research result also showed that the reasons why 96 percent of the household survey respondents used PUR as point of use household water treatment chemical were: purification capacity and has no smell, has no smell, doesn't need time, and purification capacity that accounted 15.8, 10.5, 2.1 and 71.6 percents of household respondents, respectively as indicated in Figure 4.13 below.

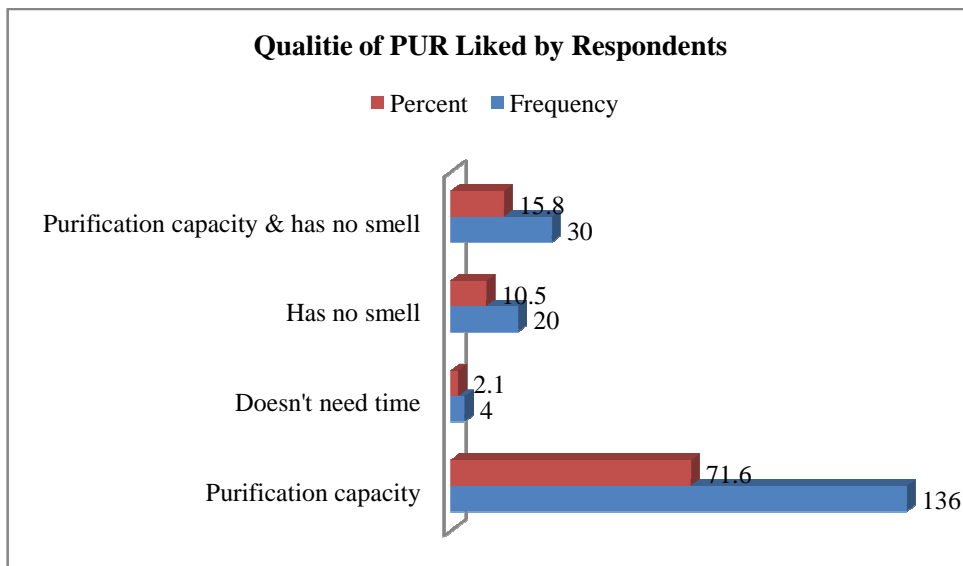


Figure 4.13: Result summary of qualities of PUR liked by respondents

Source: Own survey, March 2015

Even though 96 percent of the household survey respondents used PUR as point of use water treatment chemical, they reported that they had attributes and/or process of PUR they disliked as point of use household water treatment chemical, these were: the process needs time, the purification process is tough and the nature of the byproduct of purification make the consumer to feel bad and these features and processes accounted 41.6, 2.1 and 11.6 percents, respectively of the total household survey respondents as indicated in Figure 4.14 below.

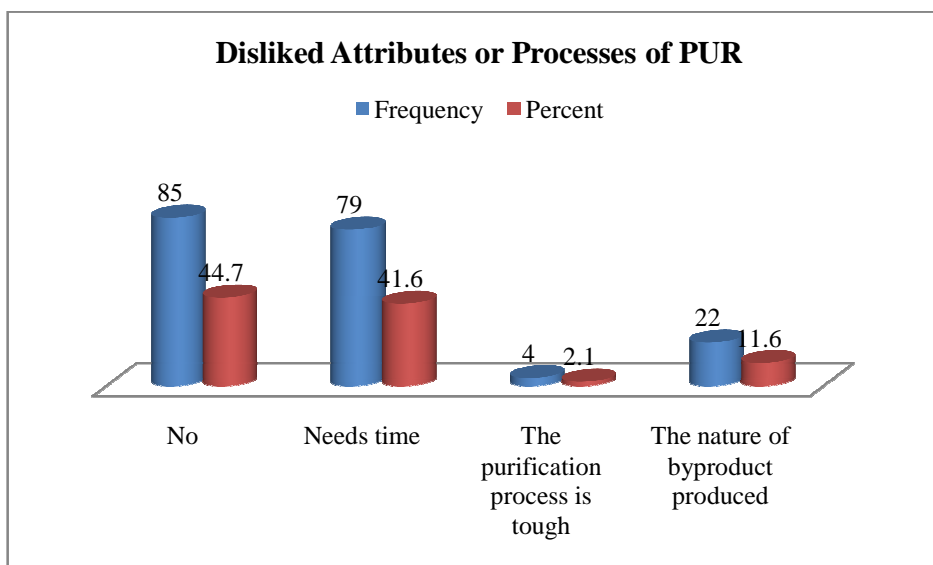


Figure 4.14: Result summary of disliked attributes and processes of PUR

Source: Own survey, March 2015

Retail outlets like kiosks were the place where 99 percent of the household survey respondents got their point of use household water treatment chemicals by purchasing as indicated in Table 4.6 below.

Table 4.6: Result summary of facility types where household water treatment chemicals were purchased

Facility of Purchase	Frequency	Percent
Kiosk	192	99.0
No Response	2	1.0
Total	194	100.0

Source: Own survey, March, 2015

Based on the household survey results all respondents believed that retailers kept PUR in a place that was visible to the target group as indicated below in Table 4.7 below.

Table 4.7: Result summary of visibility of PUR at retail outlets based on household survey respondents

Visibility of PUR at retail outlets	Frequency	Percent
Yes	194	100.0

Source: Own survey, March 2015

The household survey results showed that 97 percent of the respondents found PUR at retail outlets whenever they needed for the last one year. But, only 3 percent of the respondents found stock out of PUR at least once for the last one when they needed at retail outlets as indicated in Figure 4.15 below.

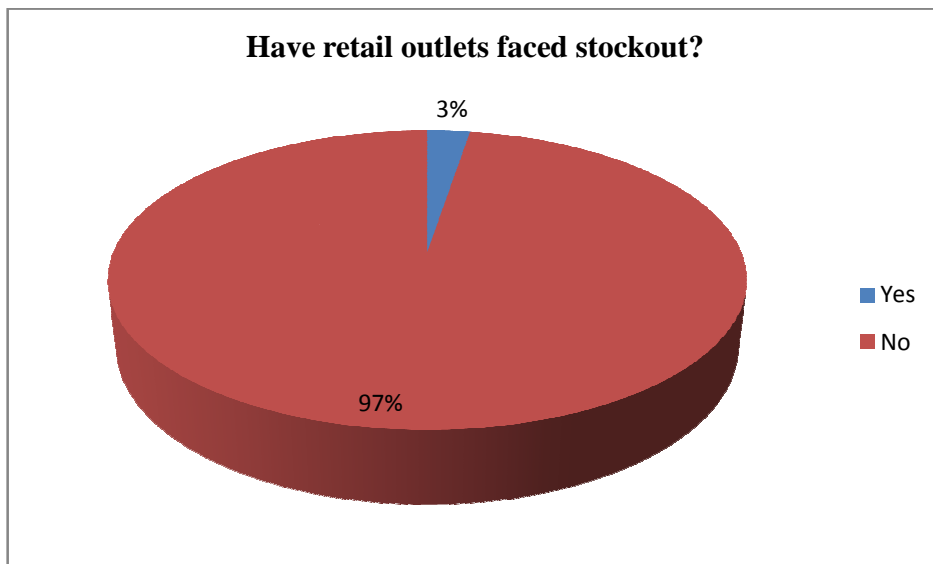


Figure 4.15: Result summary of respondents experienced stock out of PUR reported at retail outlets

Source: Own survey, March 2015

From the 5 households who reported that they faced stock out of PUR at retail outlets at least once for the last one year when they needed, 2 of them, i.e., 1 percent of the household survey respondents reported that they used without treating their household water as indicated in Figure 4.16 below.

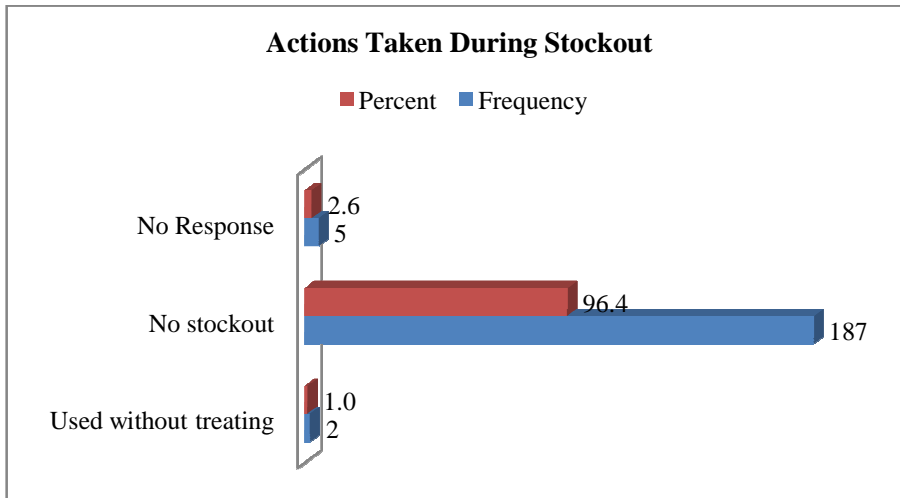


Figure 4.16: Result summary of respondents' reported action taken during PUR stock outs  
 Source: Own survey, March 2015

According to the findings 18.0 percent and 72.2 percent of household survey respondents reported that they purchased a sachet of PUR with 1.25 (i.e., at RRP) and 1.50 birr (i.e., above RRP), respectively. 5.7 percent and 4.1 percent of the respondents didn't report how much they purchased a sachet of PUR and used other product as point of use household water treatment chemical, respectively as indicated in Figure 4.17 below.

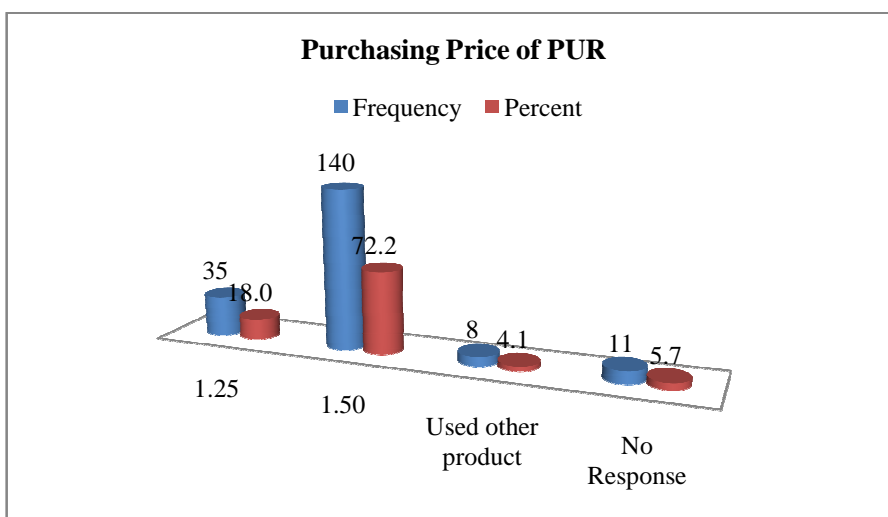


Figure 4.17: Result summary of the purchasing price of a sachet of PUR reported by households

Source: Own survey, March 2015

Based on the findings 38.1 percent of the household survey respondents believed that the unit purchasing price of PUR was not reasonable. But, 57.7 percent of respondents believed that it was reasonable for them as indicated Figure 4.18 below.

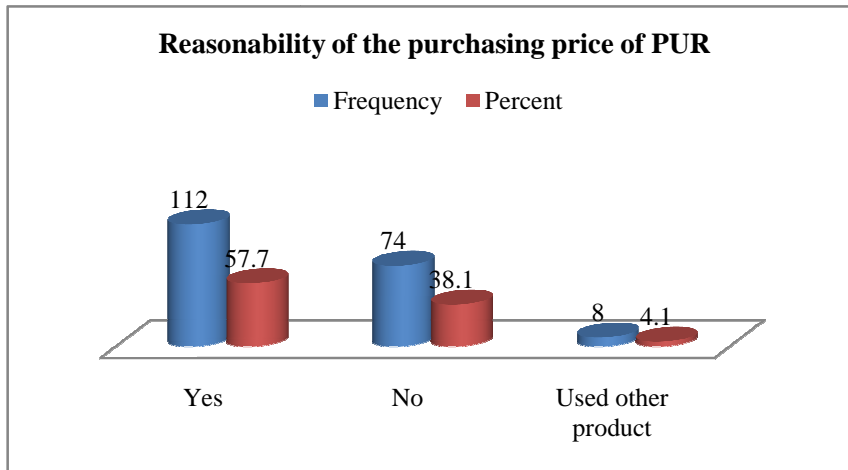


Figure 4.18: Result summary of the reasonability of the unit purchasing price of PUR  
 Source: Own survey, March 2015

Also the household survey results showed that 87.6 percent of respondents reported that they checked the shelf life of a product during purchasing. Only 11.3 percent of the household survey respondents reported that they didn't check the shelf life of a product during purchase. 1 percent of the survey participants didn't report whether they checked the shelf life or not during purchasing as indicated in Figure 4.19 below.

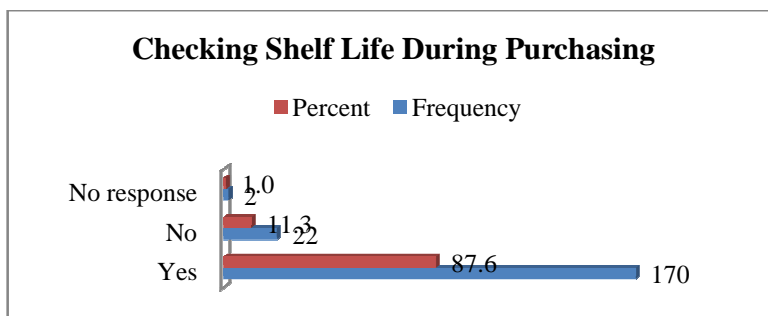


Figure 4.19: Result summary of respondents checking shelf life during purchasing  
 Source: Own survey, March, 2015

## 4.2. Discussion

### 4.2.1. Availability and Visibility of PUR

Significant number of retail outlets included in the outlet survey, i.e., 87 percent as indicated in Figure 4.1 had PUR during the research visit. That means the probability of getting PUR at retail outlets by consumers whenever they need is very high. Based on this result the availability of PUR at retail outlets was better than the availability results found on 15 generic medicines , i.e., from 9.7 percent to 79.2 percent, at outlet survey done in 36 developing and middle income countries by Cameron et al, 2008. Also the PUR availability result was better than the availability results of 10 commonly used drugs in Ethiopia done by Federal Democratic Republic of Ethiopia Ministry of Health in collaboration with WHO in 2005.

Even though 87 percent of outlets included in the survey had PUR during the research visit, 35 percent of retail outlets which had PUR during the research visit kept it in a place that wasn't visible to the target group as indicated in Figure 4.2 This result contradicts one of the ten principles of retail shoppability, i.e., to make the product clearly visible to the target group (Bruke, 2005).

Definitely keeping the product in invisible place affects the revenue and profit they can generate from PUR and the turnover over of PUR since according to stayinfront.com (2011) at least 70% of product selection is made in the store. But, according to the household survey results all the respondents believed that PUR was kept at visible place in retail outlets as indicated in Table 4.7 that contradicts the visibility result obtained from outlet survey, i.e., only 65% of retailers that had PUR during the research visit kept in a visible place as indicated in Figure 4.2.



#### **4.2.2. Availability and Visibility POS of PUR**

Only 17.4 percent (Figure 4.3) of the retailers included in the outlet survey had PUR POS during research visit. This result contradicted with stayinfront.com (2011) idea, i.e., since at least 70 percent of product selections are made within the store, POS and products must be available and visible in the store. The finding also contradicted to Mekenzie-Mohr (2000) idea, i.e., promotion is effective in altering consumers' preference to purchase one brand over another brand and therefore promotion should be done. One way of promoting a product is to make available and visible the product to the target groups at the retail outlets. But, the finding showed that only 17.4 percent of retailers had PUR POS and 75 percent of retailers that had PUR POS put it in a visible place to the target groups.

#### **4.2.3. Price of PUR**

PSI/E set RRP to make PUR affordable to the target group. But, as indicated in Figure 4.5 21.7 percent of retailers included in the outlet survey reported that they sold PUR above RRP, i.e. 20 percent above RRP. Also, based on the household survey results 72.2 percent of respondents (Figure 4.17) reported that they purchased PUR above the RRP, i.e. 20 percent above RRP. As a result 38.1 percent of the household survey respondents felt that the purchasing price of PUR was not reasonable for them and it became the major barrier to the use of the product as mentioned by WHO and HAI (2003). That made PUR unaffordable to the target group and as the result the turnover, revenue and profit from PUR could decrease for the retail outlets and the DALYs averted and revue of PSI/E might decrease for short term and bring sustainability issue of PUR in long run.

#### **4.2.4. Availability of Expired PUR Stock**

There was no expired PUR stock reported by anyone of the retailers included in the outlet survey for the last one year as indicated in Table 4.1 Also the household survey result showed that 87.6 percent of the household survey respondents reported that they checked

the shelf life of a product during purchasing (Figure 4.19). That means retailers sold or used it before the expiry date. This was one of the best practices of retailers in transacting PUR. This could be due to the available demand for PUR and/or the quantity of stock they hold.

#### **4.2.5. Stock Out of PUR**

There was stock out of PUR in 65.2 percent of retailers surveyed as indicated in Table 4.2 below at least once for the last one year. Based on the result, factors which contributed for the stock out were: insufficient capital and infrequent supply of PUR from PSI/E (46.7 percent), not fast moving (6.7 percent), unsuitability of the supply system (33.3 percent), afraid of expiry (6.7 percent), and didn't know the demand exactly (6.7 percent). These stocks out factors were similar to those reported by Gruen & Corsten (2007). But, only 3 percent of the household survey respondents experienced stock out of PUR at retail outlets at least once for the last one year. One percent of the household survey respondents reported that they used untreated water for drinking during PUR stock out at retail outlets. These showed that different retailers faced stock out of PUR at different period of the year. Had it not been like that, the percentage of stock outs reported by household survey respondents would have been increased more than reported.

#### **4.2.6. Market Share**

According to the outlet survey (Table 4.4) the market share of PUR was 100 percent but in the household survey only 96 percent of respondents reported that they used PUR as point of use water treatment chemical. Both studies showed that the market share of PUR in the town was very high as compared to other point of use household water treatment chemicals. Since the water of Bele is turbid and contaminated using PUR as a point of use household water treatment chemical that has both disinfection and flocculation property by the majority of the household survey respondents was the right decision. WuhaAgar and Aqua tab are not as applicable as PUR for turbid water since they do not haven flocculent.

That was the reason why their market shares at retail outlets (Table 4.4) and household (Figure 4.12) were zero or very low, respectively. Some of the qualities that contributed for consumers' preference of PUR to other point of use water treatment chemicals including Bisha Gari were purification capacity, has no smell and doesn't need time as indicated in Figure 4.13.

#### **4.2.7. Households' Drinking Water Source and Treatment Behavior**

Even though the source of drinking water for all household survey respondents was pipe water (Table 4.5) and according to EDHS (2011) pipe water is one of the improved sources that are likely to provide suitable water for drinking, but according to Birhanu (2014) the pipe water of Bele was not clean and potable. Also, 95 percents of the household survey respondents believed that the water they used for drinking was not clean and potable (Figure 4.7) and 99 percent of respondents believed that treating the household water before drinking is mandatory (Figure 4.8). 100 percent of the respondents treated their household water using point of use water treatment chemicals (Figure 4.12). Of those, 84 percent of the household survey respondents treated their household water always using point of use water treatment chemicals (Figure 4.9). This result is by far better than the national survey done in 2011, i.e., only 9.1 percent of the total population gets appropriately treated water for drinking (EDHS, 2011). More than 57 percent of the survey respondents used other point of use water treatment methods like filtration, boiling, exposed to sun and other methods to treat household water (Figure 4.10). This result is also better than the national survey result (EDHS, 2011).

The findings showed that significant number of the household survey respondents used drinking water that was not fulfilled the minimum requirement for potable water since they used the wrong quantity of PUR to treat their household water, i.e., 1 sachet of PUR for 20Lt as indicated in Figure 4.11. According to [www.aquaya.org](http://www.aquaya.org) the correct PUR to water proportion to treat household water is 1 sachet of PUR to 10 lt of water. As a result, there was a possibility that a person who drank such drinking water could be affected by water born disease. If the society had used the correct quantity of PUR to treat their drinking

water, the retailers would have increased their annual revenue and profit from PUR around four times; the possibility of consumers to be affected by water born diseases could have been also reduced; and the DALYs averted and the annual revenue of PSI/E could have been also increased.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS OF THE STUDY**

#### **5.1. Summary the Major Findings**

Even though PUR was available in 87 percent of the retail outlets included in the outlet survey, there were stock outs in most of them at least once per year due to different reasons. Also significance number of retail outlets kept the product in non visible place to the target groups. But there was no expired PUR stock in anyone of the facilities included in the research even though the market share of PUR according to the outlet survey was 100 percent and 87.6 percent of the household survey respondents checked the expiry date of a product during purchasing.

Most consumers (72.2 percent) purchased PUR above the RRP and 38.2 percent of respondents believed that the unit PUR Purchasing Price was not reasonable for them. Even though the source of drinking water was pipe water, it was reported that not clean and turbid and all household survey respondents treat their drinking water using point of use water treatment chemicals. According to the household survey results 96 percent of respondents used PUR as point of use water treatment chemical. But, significant numbers, i.e., 29 percent, of them treat their household water using the wrong quantities of PUR.

#### **5.2. Conclusions**

PUR was one of main water treatment options available for the society of Bele Town to treat their turbid and contaminated water that is supplied through pipe by the town administration. Using PUR as alternative point of use household water treatment chemical contributed to the reduction of mortality rate of children under five in the society of Bele as

indicated in table Appendix 2. But, retailers didn't understand the impact the indicators for the outlet survey had on the turnover of a product, the revenue and profit they generated from a product.

Households at Bele had a good behavior of treating their household water using point of use water treatment options before drinking. They treated their household drinking water using point of use water treatment chemicals 100 percent (Figure 4.9) and other treatment options (Figure 4.10) like filtration (47.9 percent), boiling (7.2 percent), exposed to sun (1 percent), and other method (1 percent) in addition to chemical treatment. One of the major chemical treatment options they used was treating using PUR, i.e., 96 percent. From the total household survey respondents 16 and 84 percent of them treat their household water sometimes and regularly with household water treatment chemicals as indicated in (Figure 4.9).

The majority of households (96 percent) at Bele prefer PUR as point of use household water treatment chemical for its purification capacity and has no smell (15.8 percent), has no smell (10.5 percent), doesn't need time (2.1 percent) and purification capacity 71.6 percent) as indicate in Figure 4.13 and as the results of these the reported market share of PUR at surveyed retail outlets was 100 percent.

Households (72.2 percent) purchased PUR 20 percent above RRP (Figure 17) of PUR that was set by PSI/E to make the product affordable to its target groups. Also 21.7 percent of retailers reported that they sold PUR above RRP as indicate in Figure 4.5.

The supply chain system of PUR from PSI/E warehouse until it reaches the consumers at Bele was not good (Table 4.2) even though significant number of retailers (87 percent) had PUR during research visit as indicated in Figure 4.1 and small quantities of households (3 percent) reported that they experienced stock outs (Figure 4.15) when they wanted to purchase PUR at retail outlets. The absence of PUR wholesaler in Bele Town was one of the main factors for the stock out and selling of PUR above RRP. The main reasons for absence of continuous supply of PUR in 86.7 percent of retail outlets were infrequent

supply from PSI/E, didn't know the demand exactly, unsuitability of the supply chain system and/or combination of these as indicated in Table 4.3.

Almost all retailers were not communicated correctly about how to treat their water using PUR and the components and impact of the indicators for the outlet survey in revenue and profit maximization in the selling of PUR and other consumer goods as the results of the indicators for outlet survey are generally low (Table Appendix.1). Also significant number of consumers (28.9 percent) used the wrong quantity of PUR to treat their household water (Figure 4.11). PUR was not promoted well to the target group in Bele by using PUR POS and keeping the product at the visible place in the retail outlets to ensure its sustainability. The sales and distribution staffs of PSI/E didn't give equal value for the availability and visibility of POS as compared to the availability and visibility of the product to boost the sales of PUR and only 17.4 percent of the respondents received PUR POS from PSI/E (Figure 4.3). All retailers surveyed used or sold PUR before its expiry date (Table 4.1) and it was one of the best practices of retailers in transacting PUR that we identified at the research.

### **5.3. Limitation of the Study**

Due to financial, distance and time constraints the research is confined to Bele Town, Wolayta Zone.

### **5.4. Recommendations**

The researcher recommended PSI/E to organize a workshop to give a theoretical and practical training to all stakeholders, who are society leaders, retailers, PSI/E Sales and Distribution Staffs, responsible government officials and extension health workers, living at Bele Town and other PUR applicable areas on the following identified problems.

- The components of the indicators for the outlet survey, i.e., availability and visibility of PUR and PUR POS, Selling Price of PUR, and availability of expired

PUR stock and their effect positively and negatively on the product turnover, revenue and profit of the retail outlets, mission and revenue of PSI/E and on the health and living impact of consumers;

- How to treat drinking water using PUR correctly;
- How to forecast the future sales (i.e., Only for retailers)
- To sell the vision of PSI/E, i.e., to reduce mortality and morbidity of children under five due to water born diseases by bringing behavior change on the society and supplying water treatment chemicals continuously at the RRP.

The researcher also recommended to PSI/E to teach the consumer how to treat their household water using PUR and inform the RRP of PUR through selected promotion methods, like using advertisements, sales promotion and so on.

PSI/E should have at least one wholesaler at Bele Town who can keep the required quantity of PUR throughout the year and sell within the recommended wholesale price to retailers. This make the supply chain system of PUR suitable to retailers and the retailers can get PUR in the nearby whenever needed and on credit. As a result of this PSI/E can assist the retailers to reduce stock outs that will happen due to unsuitability of the existing supply chain system.

Also, the researcher recommended to anyone interested to do further study in order to know the relationship and extent of the impact that the indicators for the outlet survey will bring on the turnover, revenue and profit maximization of PUR.



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# APPENDICES

## APPENDIX A

### **Interview questionnaire to assess the quality of coverage Indicators and market share analysis of PUR**

Dear Interview participant,

First of all I would like to thank you for giving your precious time for this face to face interview to assess the outlet survey of PUR.

This questionnaire is designed to study the outlet survey of PUR in retail outlets found in Bele Town. The information you provide will help me better understand indicators for the outlet survey of PUR. Therefore, I kindly request you to respond to these face to face questions frankly and honestly. The information that I will get from you will be treated confidentially and will not be disclosed for the third party.

**NB: Please give this face to face interview only if you are voluntary.**

**Date:** \_\_\_\_\_

**Name of Facility:** \_\_\_\_\_ **Town:** \_\_\_\_\_

**Woreda/District:** \_\_\_\_\_ **Name of Interviewee:** \_\_\_\_\_

**Mobile No:** \_\_\_\_\_

Q1. Have you PUR stock at your facility currently?

A. Yes

B. No

Q2. If yes, have you ever faced stock out for the last one year?

A. Yes

B. No

Q3. What the reason is behind if you have ever faced stock outs?

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Q4. If PUR is available in your facility, is it visible to consumers? (Observation)

A. Yes

B. No

Q5. If it is not visible why s/he didn't put in a place that makes the product visible to the target group?

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Q6. Do you have any POS for PUR at your facility?

A. Yes

B. No

Q7. If yes, is the POS visible to the target group? (Observation)

A. Yes

B. No

Q8. What is the reason why s/he didn't put in a place that makes the POS visible to the target group or not available in the facility?

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Q9. What is your selling price of one sachet of PUR? \_\_\_\_\_ Birr

A. At the RRP

B. Below RRP

C. Above RRP

Q10. Do you have the information about PSI/E's RRP for PUR?

A. Yes

B. No

Q11. What is the reason if it is above or below the RRP?

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Q12. Have you ever have expired PUR at your outlet for the past one year?

A. Yes

B. No

Q13. If expired, what is the reason behind?

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Q14. What is the total quantity of PUR sold for the past one year? \_\_\_\_\_ (in sachet)

Q15. What other water purifier chemicals you sold to customers for the last one year?

Bishan Gari. \_\_\_\_\_ (in sachet)

Aqua Tabs \_\_\_\_\_ (in blister)

WuhaAgar \_\_\_\_\_ (in bottle)

Assessed By: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**NB: The questionnaire is adopted from WHO Outlet survey questionnaire (O' Connell 2013).**





6. Which household water treatment chemical did you use to treat your drinking water for the past one year?  
 A. PUR                      B. WuhaAgar                      C. Aqua Tabs                      D. Bishan Gari
7. What do you like about the product you use?  
 \_\_\_\_\_  
 \_\_\_\_\_
8. What do you dislike about the product you use?  
 \_\_\_\_\_  
 \_\_\_\_\_
9. How much did you purchase one sachet of PUR for the last one year?  
 A. 1.25                      B. 1.50                      C. 2.00                      D. different from listed prices  
 E. Varies with occasions
10. If your answer to Q 9 is varies with occasions, how much or if you said different from listed, specify?  
 \_\_\_\_\_  
 \_\_\_\_\_
11. Do you think that the purchasing price of PUR is fair to you?  
 A. Yes                      B. No
12. Where do you get/purchase PUR whenever you need?  
 A. Kiosk/shop                      B. Donation                      C. Public Health Facilities                      D. Other source  
 If your answer is other source, please specify: \_\_\_\_\_
13. Were there times that you didn't get PUR at retail outlets to purchase for the past one year?  
 A. Yes                      B. No
14. If your answer to 13 is yes, what actions did you take to treat your drinking water?  
 \_\_\_\_\_
15. How many liters of water do you treat with 1 sachet of PUR?  
 A. 10 lt                      B. 20 lt                      C. 30                      D. 40                      E. Different Qty  
 If different quantity, specify: \_\_\_\_\_
16. Do retailers keep PUR at visible place in your opinion?

A. Yes

B. No

17. When purchasing PUR or other household water treatment chemical do you check the shelf life written on the product?

A. Yes

B. No

**NB. This questionnaire was adopted from WHO Household Survey Questionnaire (WHO & UNICEF, 2006)**

**Collected By:** \_\_\_\_\_ **Date:** \_\_\_\_\_ **Signature:** \_\_\_\_\_

Table Appendix 1: Result summary of the outlet survey

S. No	Respondent Identification Number	Did PUR available during visit?	Was there any stock out for the last 1 year?	Did PUR Visible to customers during visit?	Did POS available during visit?	Did POS visible to customers during visit?	Selling price of PUR during visit	Was there expired PUR Stock for the last 1 year?	Total Qty of PUR sold for the last 1 year	Total volume/qty of other chemicals sold for the last 1 year
1	1, 5 &9	Yes	No	Yes	No	Not available	At RRP	No	10320	0
2	2 &14	No	Yes	Not available	No	Not available	Not Selling PUR	No	180	0
3	3,8,12,13 & 20	Yes	Yes	Yes	No	Not available	At RRP	No	36720	0
4	4, 15 & 18	Yes	No	No	No	Not available	Above RRP	No	7680	0
5	6 &7	Yes	No	Yes	Yes	Yes	At RRP	No	4320	0
6	10	Yes	Yes	Yes	Yes	No	At RRP	No	4320	0
7	11,17 & 22	Yes	Yes	No	No	Not available	At RRP	No	36000	0
8	16	Yes	Yes	Yes	Yes	Yes	At RRP	No	5760	0
9	19	Yes	Yes	No	No	Not available	Below RRP	No	5760	0
10	21	No	Yes	No	No	Not available	Above RRP	No	120	0
11	23	Yes	Yes	Yes	No	Not available	Above RRP	No	7680	0

KEY: RRP= recommended retail price, UOM for quantity/volume of chemicals sold is volume/qty of chemicals used to treat 20lt of water; *Source: Own survey, November 2015*

Table Appendix 2: Mortality and morbidity rate of children under five in Bele Town

S. No	Morbidity Rate	Mortality Rate
2004	385	50
2005	335	30
2006	201	8

*Source: Bele Health Bureau Disease Prevention Dep't Report for year 2004, 2005 & 2006 E.C*

## **DECLARATION PAGE**

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of Dr. Tesfaye Wolde. All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

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**Name**

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**Signature & Date**

## **ENDORSEMENT**

This thesis has been submitted to St. Mary's University, School of Graduate Studies for examination with my approval as a university advisor.

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**Advisor**

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**Signature & Date**