

ANALYSIS OF THE CHALLENGES AND BARRIERS OF ADOPTING WATER ACCOUNTING FOR HOSPITALITY INDUSTRY IN SRI LANKA

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Abstract

The purpose of this research article is to identify whether there is any challenges and barriers in adopting water accounting concept for hospitality industry in Sri Lanka by examining the perception of selected hotels about the nature and degree of usability of water accounting in their daily operations. The study employs a structured questionnaire to obtain the view from selected hotels about challenges and barriers in adopting water accounting in hospitality industry in Sri Lanka. The results suggest that there are challenges and barriers in adopting water accounting system in Sri Lanka and identified number of issues and recommendations which address identified issues on water accounting practices in hospitality industry.

Key Words: Water, water Source, Water Storage, Water Accounting, Water treatment Plant (STP)

1. Introduction

Water is playing a key role in human beings as well as all animals and the plants. Water is essential in industrial, agricultural and domestic purpose. Therefore water need to a country for economic, social and cultural growth. Since people throwing garbage in to the water resources, careless use of water in households activities the water had been polluted today mostly. Schornagel, Niele, Worrell, & Boggemann(2012)have stated that freshwater is already a scare resource and it became a global issue. But the demand for the water is increased most in current society because of the rapidly growing population and the high competition between the different water users. Therefore companies must adopt a proper managing and accounting system for water since it is a valuable resource for survival and growth of elements in the earth.

The Water Accounting Standards Board, (2009, p. 13) Australia's national water accounting standard setter defines water accounting as '[a] systematic process of identifying, recognising, quantifying reporting and assuring information about, the rights and other claims to that water and the obligations against the water'. Many companies consider about the corporate social responsibility today. So the companies are trying to get a competitive advantage from managing the water resources well. The water accounting can facilitate the information useful to the water users in a proper structure.

The objective of this research is to identify the application and the adoption of water accounting to the Sri Lanka and challenges and barriers in adopting the system to the Sri Lanka. However, only few researchers had been carried out for water accounting. In Sri Lanka the application of the water accounting is very rare and it is used as water management and recycling.

Therefore it is very essential to investigate about the challenges for water accounting in Sri Lanka. Since the hospitality industry such as hotels much utilised water in their operations, focused about the challenges facing by the hospitality industry when using the water accounting. Even though there is a management process in a hotel, such as used their waste water for some activities like irrigations there is no any proper management and accounting system for that process. The management of a company not bother about the monetary value they can gain from getting this water accounting in to the profit and loss statement. Every parties relating to the water management in a company such as urban councils, public at large want to have a strong relationship for a better water accounting application. Also the

management of a company imagine that, applying the water accounting for their operations is not adding value more than the cost bear by them. In the European countries there is a proper accounting for water than the Sri Lanka. But in Sri Lankan context the application of the water accounting for the business operation is not considered much by management since there is not a good understand among the accountants about that.

According to the (2016, p. 15) '[t]he water accounts have led to a set of four groups of indicators: water availability, human water use and consumption, water efficiency, and water costing and pricing'. Since there are several indicators for water accounting, through this study going to consider about the application of the water accounting in those aspects and challenges in implementing this in Sri Lanka.

Overall Objective

Provide a comprehensive analysis regarding the existing challenges and barriers of adopting water accounting practices for hospitality industry with the prevailing resources and conditions in Sri Lanka.

Specific Aims

- 1. To find out the challenges and barriers of adopting water accounting practices in hospitality industry:**
 1. Identifying existing challenges and barriers of water accounting for hospitality industry in Sri Lanka.
 2. Relevancy and applicability of water accounting practices for hospitality industry in Sri Lanka.
 3. Identifying any disagreements towards applying water accounting concept in Sri Lanka
 4. Possible recommendations in ways of applying water accounting practices in Sri Lanka.
- 2. Factors impacting the gap between theory and practice of adopting water accounting concepts in Sri Lanka.**

Significance of the Study

Water accounting can be defined as the systematic study of the current status and future trends in water supply, demand, accessibility and use within a specified spatial domain. Sri Lanka has a growing tourism industry. Since gaining independence from the British in 1947, Sri Lanka has continued to attract foreign investors and tourists to the island. Today the

hospitality industry in Sri Lanka Play a vital part in contributing to the Gross Domestic Productivity (GDP).An introducing the water accounting to the hospitality industry in Sri Lanka bring the more challenges and barriers in current scenario. As the water accounting is not much familiar to the Sri Lanka, Managers do not aware about this area. Nowadays foreigners are much aware and concern about green product and services. So concern more on water accounting would generate customer attraction to the hospitality industry and also this concept direct the hospitality industry towards sustainable management.

The remainder of this research paper reviews the related literature, elaborates research design and methods, discusses research findings and their implications and in the conclusion, the study suggests priorities in future research attempts and recommendations for overcoming challenges and barriers of adopting water accounting for hospitality industry in Sri Lanka.

2. Literature Review

Definitions and concepts

Water

The Water Accounting Standards Board (2009) in Australia remark water as the liquid which descends from clouds as the rain and forms of streams, lakes, ground water and seas. This may exist as solid, liquid and gaseous. It includes both ground water and surface water.

Fresh water is already a scarce resource with growing population, per capital gross domestic product and the global climate. All industrial businesses are consuming more water than oil, gravel and other kind of minerals. Then if a company can manage the water consumption within the organization it will create additional cost to the company and also additional competitive advantage in the future.(Schornagel, Niele, Worrell, & Boggemann, 2012)

Water entity

Water Accounting Standards Board(2009) highlighted the water entity as a physical entity, an organisation or individual, which:

- a) Holds or transfers water
- b) Holds or transfers rights or other direct or indirect claims to water
- c) Has inflows and/or outflows of water

d) Has responsibilities relating to the management of water.

Water Accounting

The Water Accounting Standards Board, (2009) Australia's national water accounting standard setter, defines water accounting as "a systematic process of identifying, recognising, quantifying, reporting and assuring information about water, the rights and other claims to that water, and the obligations against that water". It should have proper way to distribute the scarce water resource among all consumption parties although it is not sufficient to meet all the requirements within the company. It is more important to secure the water resource for future period of time by investing for future. Water management and accounting is to serve the human beings by providing high quality and credible information relevant to decisions affecting water resource planning, investment and allocation. (Chalmers, Godfrey, & Lynch, 2012)

Water Accounting Methods

There are 3 main accounting methods in practice to identify the water as a cost which is hidden with the product.

- Life Cycle Assessment
- Water Footprint
- Global Water Tool

In Life Cycle Assessment, it is discussed about aggregated environmental impact of products. Withdrawal part is not included here.

Under Water Footprint method, it is concerned about water resource management perspective and use and allocation of fresh water sustainably, equally and efficiently.

Under Global Water Tool method, more concern about Contextualisation of corporate water demands. Complication of water related data assessment and water related risk.

Although there are above methods to account for water, any of them doesn't base on set of requirements for industrial operations. The accounting method should meet a generic water-accounting methodology for industrial operations suitable for the analysis of emerging disruptive forces on water-using industrial operations. It enables water use to be recorded in terms of direct water withdrawal, consumption and discharge at both the industrial-site and

supply chain or pathway levels. This may give chance to reduce the water related risk and increase the water related opportunities.(Schornagel, Niele, Worrell, & Boggemann, 2012)

Broader view on literature on global basis

To begin the process to develop water accounting standards, it should develop a set of user information requirements and deliver demonstration water accounting reports. We consider measures that have been, and can be, taken to ensure high quality and credibility in water accounting standard setting at national and international levels. The supply chain connected, aggregated and identification of hidden cost will guide future research in ways that will contribute to the value of water accounting as an information system that facilitates effective and efficient resource allocations.

For the effective water management method it must be supply chain oriented to sustain long period of time. In accounting it may refers to the water related matters as the reporting part. But it should record as the accounting method through identifying the water related risks to the potential impact on economic and environment situation for a company. Industry must be referred to find ways to encourage organisations to recognise the strategic importance of water and the environment such that they incorporate these issues into their strategic plans and goals.(Christ, 2014)

The need for water management and accounting is highly emphasized in the current world due to the increasing necessity of water conservation and therefore it has led to a necessity of water accounting in the emergent business field. An overview of water-related business risks and exposes the need for sound corporate water management and accounting and how to perform a critical examination of water- related issues from an accountability perspective is clearly defined in this research study. (Signori & Bodino, 2013) According to that the corporate world has opened their eyes on major threats raised as a result of huge water consumption in the world and the extensive waste of water in the world per a one single day. According to the research, the extensive global business entities can be recognized as one of the major contributors to the world water consumption. As a result of that a more focus has been initiated towards extensive water management and water accounting currently.

This study has mainly focused on business risk related to water. Negative trends in water have forced companies' attention to the uncertainty that unfavourable negative effects may have on their business. In addition to that the awareness of harmful impacts that their wastewater discharge also has been increased. As a one part of water management and

disclosures regarding water accounting, there are imposed laws and standards which are to be implemented to become high ranked global organizations. Therefore they incorporate the water accounting as a part of water management and waste water management. Apart from that there is a moral and social accountability for all human beings and organizations to conserve water resource and use relevant tools to implement waste water management such as water recycling. (Monzonis, Longo, Solera, Pecora, & Andreu, 2016)

Water accounting has become a prominent requirement today due to the findings that one fifth of the total world population lives in regions where water is in short supply, a quarter of the population is short of water because of inefficient infrastructure (Sofocleous, 2010.P.295, cited in Signori & Bodino, 2013). Water related problems sometimes have been raised due to the geographical issues of different countries. However now it has become more important to secure the water resource and to reduce the wastewater to the highest possible level. So many organizations over the countries have pursued to implement a water management system and adopting water accounting system in addition to the financial reporting.

In 2007, the common wealth act has been imposed to indicate the national importance of water information and to identify the new functions for the water accounting including issuing national water accounting standard. The WACF required that the general purpose water accounting reports should be audited or reviewed, but does not establish the framework for assurance commitments (Ernst & Young, 2012, cited in Signori & Bodino, 2013). Australian government wanted a standardized water accounting structure to be structured and be consistent over the all reports regarding water all over the periods between different report entities to improve decision making and stakeholder confidence. Water accounting system implementation is very much essential to meet and satisfy the different stakeholders' expectations over the periods.

But prior to release these acts, it was important to evaluate the costs and benefits of adopting these standards to both preparer and user. According to their findings, the costs and benefits are varied depending on the nature of the organization. They identified the four main costs and three main benefit categories. (Devotee Access Economics, 2012, cited in Signori & Bodino, 2013) Cost incurring for education and training, purchasing of equipment, publication and documentation and cost of assurance were identified as main costs relating to water accounting where reduced reporting, informed decision making and stewardship of a

publicly owned natural resource were identified as main benefits.(WASB & Bureau of Meteorology,2012, cited in Signori & Bodino, 2013)

A significant growth in economic activities has been resulted due to the rapid urbanization and globalization of the world and this has increased the globalization of production and consumption activities. The huge consumption of goods and services has caused a various environmental impacts all over the world. Due to the increasing international trade, it has become essential to determine all environmental impacts accurately. In environmental pressures accounting, there are two approaches to measure these environmental pressures called producer and consumer approaches. Under these two approaches they have noted the major global environmental pressures specially relating to water. As a result of that they have developed the methodologies under two approaches relating to water management and handling waste water management.

McDonald-Kerr (2017)," Water, Water, Everywhere: This article is talking about the how do we relates the environmental and social issues in assessing the price of a product. In other words how we are accounting environmental and social issues. This research article relates with the Australian Public Sector Companies. Throughout the research article, it only talks about that limiting area. They do not try to generalize these factors According to the finding of the article; it illustrates the problem of valuing non-financial information. However these findings are not supported and insufficiently explained by the evidence of the article. And also use basic measurement for valuing the environmental and social issues. Although it talks about the uncertainty of the impacts arising on non- financial information on decision making process, it does not talk about how it solves. As well as the major problem relates with the environmental accounting is that impact coming from government legislation or other legal authorities. Most of the research article including this article also concern about their government reporting requirements when describing the issues.

Economic Accounting of Water: The Botswana Experience is one of the research articles explaining the value of the water resources and their use within the economy. Water consumption is growing day by day with the increasing of population and economic growth, per capita water consumption is decreasing day by day. It is a major economic problem faced by the economy and there need to be proper way of managing water resources. At the beginning this article is explaining the issues relate with the water that we have faced. The

important thing is that the harmful effects for the agricultural and mining sector. (T.Setlhogile, Arntzen, & Pule, 2016)

Likewise application of water accounting for the company's activities saves a big amount of value. So managers can bring that value in to the annual reports of the company and that creates a big opportunity to increase the value of the company. But the problem is accountants are not aware of this opportunity. Nowadays accountants have to perform different functions in a company. Therefore they consider that the time spend for water accounting is a mere wastage of time and non-value adding to the company.

Identifying the challenges with water accounting system to Sri Lanka

Currently, it has become recognition part in accounting profession assessing water and water related issues and how to take into account water related risk and value. Water Accounting has been taken special attention in recent years with population growth and climate changes by influencing to both quantity and timing of the water.(Christ, 2014)When looking at about supply chain of a company, it is more related with the water management system and it has become the important part in the sustainability reporting and accounting information.

In Sri Lankan context water accounting is a new concept since most of geographical areas within the country are not facing scarcity of water. That issue is referred only for some specific area. In that context also it is applied some methods to identify the hidden cost from water scarcity as water management and water recycling system. So for Sri Lanka it is a future oriented study, since this is applicable for whole the country as the accounting method and accounting standard with the future resource scarcity. Therefore main objective of this study is to identify the challenges and barriers which emerging from adoption of water accounting system.

Our study focuses on the challenges and barriers which emerging from adoption of water accounting system in hotel industry.Due to the dynamic changes in the environment and the increment of the urban population the water accounting take an essential part of accounting today. Even though the accountants not much aware about the water accounting it is a crucial advantage to the hospitality industry such as hotels. But there are many challenges to the water accounting when adopt it in a company like hotel.

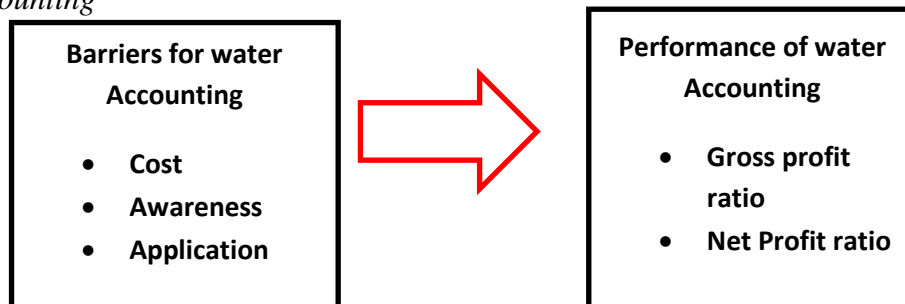
Water is a main resource to a hotel industry. In the present situation in Sri Lanka many hotels including most famous hotels, not distribute waste water correctly. Lot of companies

distributes waste water into the sea or rivers. But it is not a good consideration to the country as a human being. When we get a one unit of water for consumption want to aware about how we distribute this one unit of waste water. For the water accounting in the hospitality industry wants to consider about the waste water.

Conceptual Model

The relationship between the challenges and barriers for water Accounting and Performance of water accounting were derived from the literature review carried out.

Figure 1: Relationship between Barriers for water Accounting and Performance of water Accounting



The conceptual model hypothesis that the cost, awareness and application are negatively affected to the gross profit ratio and net profit ratio used as alternative dependent variable.

Hypothesis

The following hypotheses were derived based on the conceptual framework developed.

- Cost : This is the cost incurred in the application of water accounting
H 1: High cost is negatively linked to the performance of the water accounting.
- Awareness : This is the lack of awareness of the management about the water accounting
H 2: Higher lack of awareness is negatively linked to the performance of the water accounting.
- Application: This is the difficulty in the application of water accounting.
H 3: Higher difficulty in the application of water accounting is negatively linked to the performance of the water accounting.

Based on developed hypotheses, next the methodology is discussed.

3. Methodology

Research Approach

Quantitative research approach has been used for the study to identify the challenges and barriers of adopting water accounting for hospitality industry. A quantitative research approach was decided on after consideration of the aims of this study and how similar studies were conducted.

Population and Sample

The data is expected to collect from Hospitality Industry in Sri Lanka. The population is all companies in the hospitality industry which are having a more than 2 star rank in Sri Lanka.

Table 1: Category and number of companies

Category	Number of entities	Percentage
Five Star	14	19%
Four Star	17	24%
Three Star	14	19%
Two Star	28	38%

Source: Sri Lanka Tourism

Accommodation Guide, 2016

Sample Size and Selection of Sample

Sample size is 20 hotels and expected to obtain the data from field study (observation) and face to face semi structured interviews. Sample is selected from one non-probabilistic sampling method called convenience sampling method which is easy to reach within the boundaries of time and resources available. When selecting the sample, it is assumed that these companies represent the other companies in that hospitality industry.

According to the Sri Lanka Tourism Accommodation Guide, the total numbers of 2 and above star hotels in each province are as follows. Based on the weightage given for each province, we have selected 20 companies.

Table 2: Sample selection

Province	Number of entities	Sample
Southern	14	03

Central	19	04
Eastern	03	-
North Central	07	02
North Eastern	04	01
Western	25	06
Sabaragamuwa	01	-

Sources of Data

It is intended to use both primary and secondary data sources for the study. Primary data will be collected through semi structured interviews and observations done by the field study done in selected companies. Secondary data, which are expected to be taken from, annul reports, magazines and paper articles.

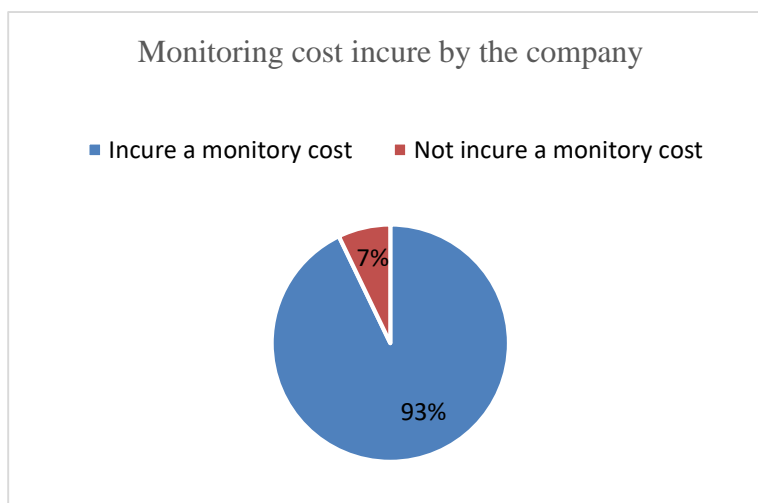
Collection of Data

Data collection is expected to done through semi structured interviews and observation. And also expect to collect data by referring annual reports of the companies and magazines and paper articles. What is already known about this topic and identify the gap between the theory and practice is done by literature review.

4. Findings and Discussions

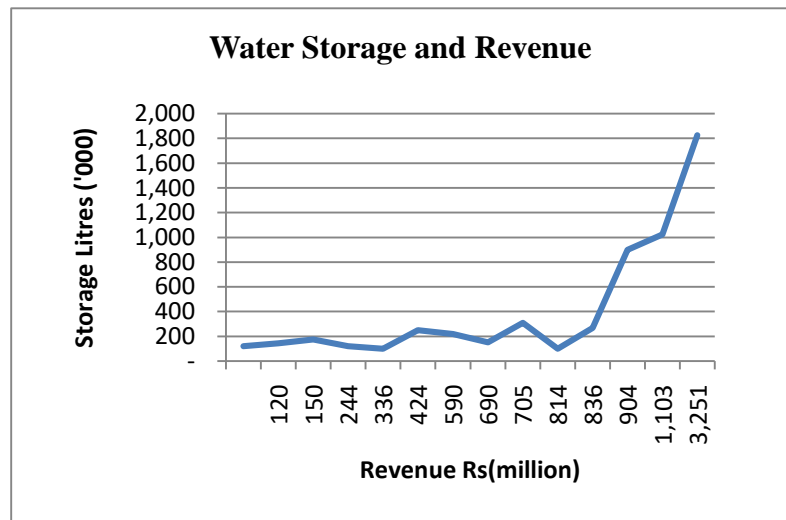
This section shows the empirical findings on the study of analysis of the challenges and barriers of adopting water accounting for hospitality industry in Sri Lanka. The discussion section has developed under six sections as challenges with water sources, water storage, water usage, water wastage, and water treatment plant and finally the challenges on adopting water accounting.

Challenges with water source have emerged with the high volume of water as scare resource consumed by the hotel in order to carry out day to day operations of the company. There are many water sources for a company in hospitality industry such as hotels. Those are mainline (national water board), bore wells, open wells, tankers bottled water recycle



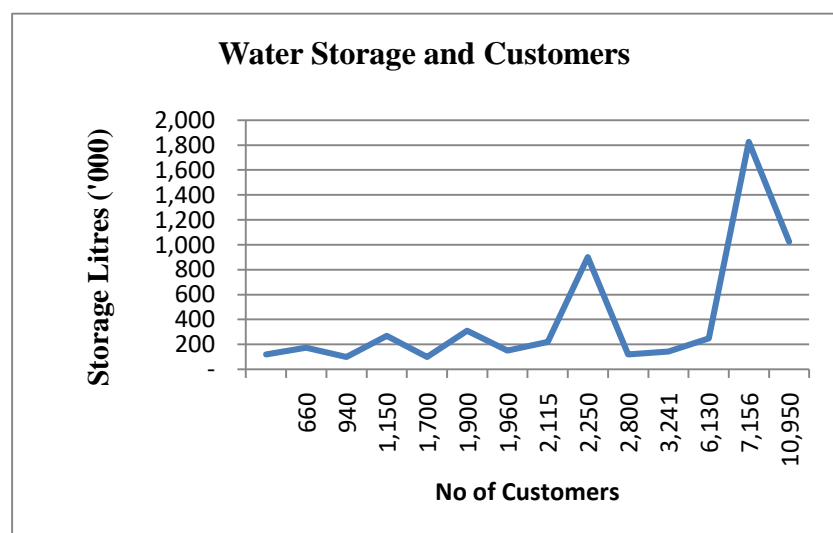
water. From the observation carry out, can conclude that many hotels has used mainline (national water board) to get the water for their activities. According to the findings of the study hotels located at urban areas are confronting high monitoring cost with regard the water source of the company due to use of national water supply.

The relationships can be obtained for the water storage in 3 main aspects such as revenue, customer and rooms. Because water storage of the companies selected for the observation are varied due to



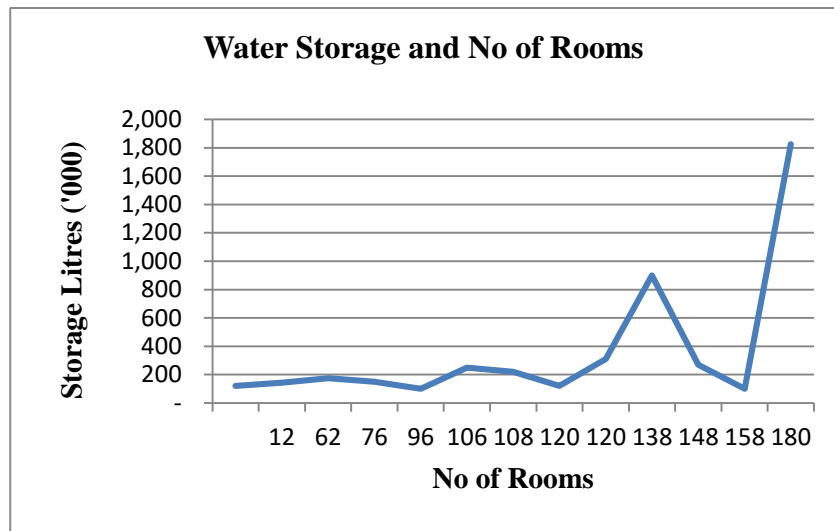
those aspects. When come to the relationship between the water storage and the revenue there is a positive relationship between those two variables. Because when the revenue of the company increased the water storage maintained in the company also increased. According to the line chart (water storage and revenue) can easily identify the positive relationship. Because when the revenue increases the water storage maintained by the company has increased significantly. The companies which have higher revenue can bear a large cost for the maintenance of the water storage. From that can conclude the large companies that have higher revenue base, have a proper knowledge to maintain the water cost correctly. Because large companies do not like to increase their expenses such as water.

And also the relationship between the water storage and the customer also has a positive relationship because when the no of customers increased the water storage maintained by the company has increased. Because when a company has large customer base they want to maintain



proper water storage to facilitate good service to the customer. A customer in the hospitality

industry use water in many aspects. So a company in the hospitality industry wants to have good water storage. In the line chart of water storage and customers properly show that there is a positive relationship between the water storage and the customers.



Water storage and the no of rooms also have a positive relationship according to the observation have done. Since a large company has many rooms the water expenses incurred for those rooms has increased. Because the cleaning expense incurred for the rooms has increased when there are more rooms in a hotel. So a company chooses mechanism to store the water definitely.

In our research, another critical variable on which we collected date is “water usage by the companies in hospitality industry. The water usage by the companies in hospitability industry is mainly based on several factors. They can be identified as follows,

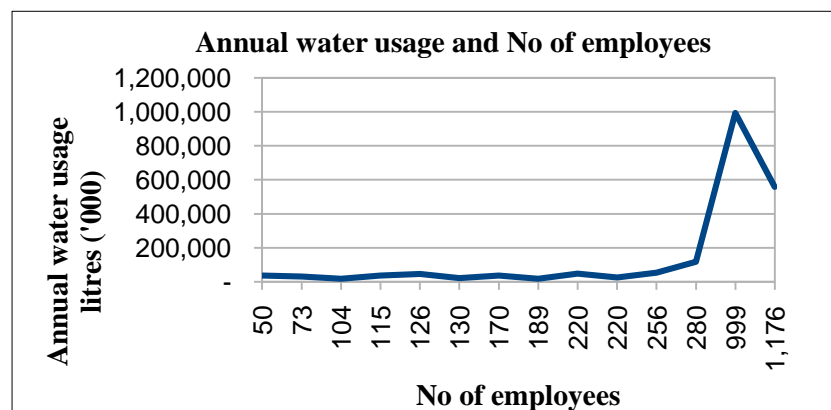
- Based on number of employees
- Based on number of customers
- Based on number of rooms

Since the water usage by companies highly depend on the above three factors, we collected data from our selected sample with relation to the number of employees of such companies, number of customers and number of rooms of such entities. Based on such gathered data on water usage, we could arrive on certain relationships and patterns by analysing the data. Thus the analyses regarding the above three factors of water usage are discussed below.

➤ **The water usage based on the number of employees**

Data could be gathered with related to the number of employees of each hotel in the sample using the questionnaires as the data collection method. According to our observations based on the data gathered, we could see a good relationship between the number of employees of the entities in the hospitality industry and the water usage of such entities.

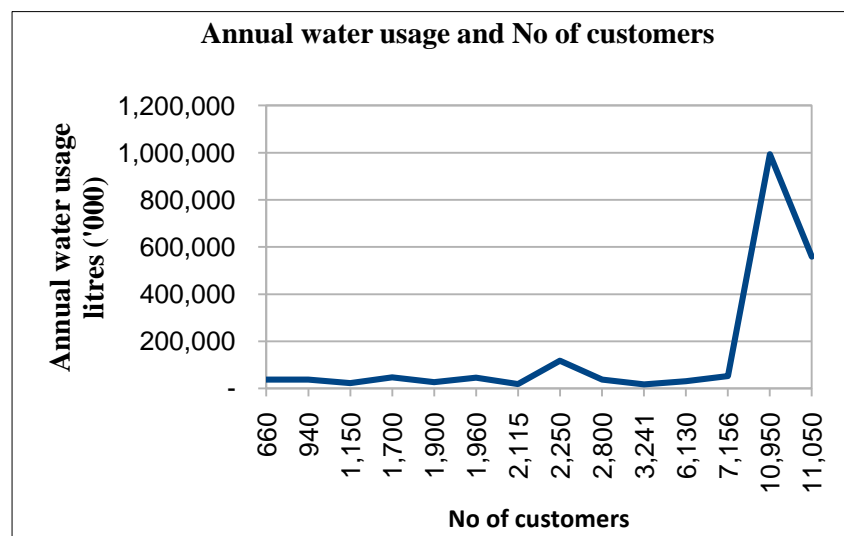
According to the graph it shows an increase in water usage over the increase in number of employees of the entities. According to the observations from our research, we could see that the companies in the hospitality industry which generate high revenue are having higher number of employees within such entities and having spread covering all the divisions of entity. The companies are spending certain litres of water for each employee per day. The staff cost includes the water consumption cost of employees too. Therefore higher the number



of employees would generate a higher amount of water usage. According to the graph, it shows the highest water usage of 1000,000,000 litres at the employee level of 999.

➤ The water usage based on the number of customers

Data could be gathered with related to the number of customers of each hotel in the sample using the questionnaires as the data collection method. According to our observations based on the data gathered, we could see a good relationship between the number of customers of the entities in the hospitality industry and the water usage of such entities. Because customers are the key factor of a business entity and especially for the hospitality industry, the entities



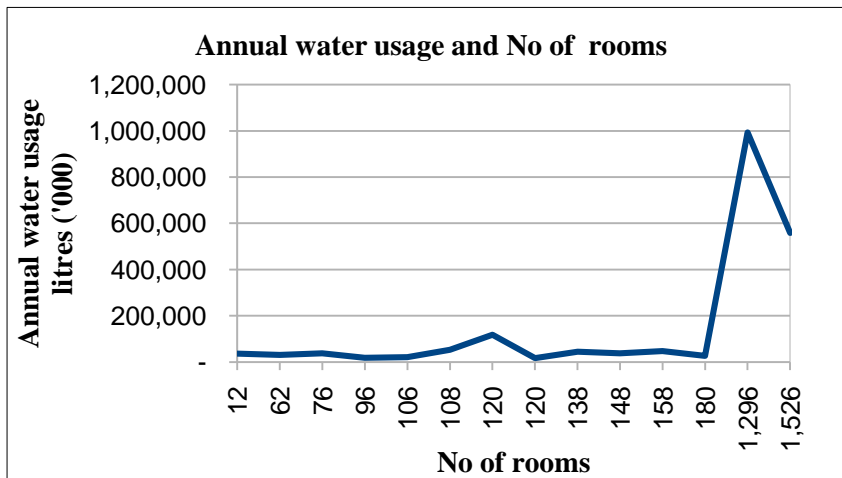
are highly consuming water in the provision of services to the customers. According to the hotels in the sample, the majority of the customer base represents the foreign customers directing to such hotels.

According to the graph it shows an increase in water usage over the increase in number of customers of the entities. According to the graph, when it moves the customers from 6,130 to 10,950 it shows a gradual

increase in water usage by such entities indicating a positive relationship between number of customers and water usage.

➤ The water usage based on the number of rooms

Number of rooms is a very crucial factor for the companies in the hospitality industry, because their revenue mainly generates from the room income. Therefore we gathered data with related to the number of rooms of each hotel in the sample using the questionnaires. According to our observations based on the data gathered, we could see a good relationship



between the number of rooms of the entities in the hospitality industry and the water usage of such entities.

According to the graph it shows an increase in water usage over the increase in number of

rooms in the sample. According to the observations from our research, we could see that the companies in the hospitality industry which generate high revenue are having higher number of rooms. The companies are spending certain litres of water for each occupied room per day. Therefore higher the number of rooms would generate a higher amount of water usage. According to the graph, it shows the highest water usage of 1000,000,000 litres at the room level of 1,296.

As per data obtained through questionnaires we have identified the relationship with the water usage and the wastage of the water. When the water usage of a company is very high in line with that water wastage also increases. Most of the companies have a high water consumption to generate higher revenue as discussed earlier and that affect to increase the water wastage of the company. The main three types of waste water generated by companies are black water, grey water and waste laundry water. The main issue encountered in hospitality industry is that how to dispose waste water or use that again for their operations with the recycling process. It is realized that the importance of the sewage treatment plant (STP) for the companies in the hospitality industry. Based on industry analysis we have

identified the four factors which influence for implementing STP. They are; obtain cost benefit, as a legal requirement, as a marketing method and to include in sustainability report.

If the water wastage of the company increases they could not achieve their targeted objectives because they have to incur cost to dispose wastage. The companies dispose waste water to the environment it generates environmental cost. And also through implementing STP Companies can reuse treated waste water for the day to day operations like for cooling towers, Irrigation and the primary wash water in the laundries.

And other reason is that public companies more concern about the sustainability reporting. Increased demand on energy supply, an increased burden on solid waste management and the pollution of water bodies are among the high level of negative environmental effects in the hospitality industry. Nowadays companies more concern about the sustainability development because they have realized that their survival is depend on the environment. The sustainability reporting is the most important mean that companies used to communicate about their sustainability activities to their stake holders. Therefore company includes information about the water usage, Number of litres of waste water, and Number of litres used by the company with recycling.

And also there is a legal requirement that companies in the hospitality industry which is having more than 10 rooms need to maintain STP. All companies' operations are affected by the internal and external environmental factors that are included legal environment. Without complying with the National Environmental regulations and other Government rules and regulations, company cannot survive.

Some of the companies use the STP as a marketing method because nowadays most of the people more concern about the environment and they are more towards to consume environmental friendly products.

According to the research data we have analysed, the significance of the STP based on factors discussed earlier and realized that following kind of significance.

Factors	Get cost benefit	As a legal requirement	As marketing method	As sustainability report
Priority	3	2	4	1

The most important point of the STP is that, it can be included in the sustainability report. Now a days with the importance of the integrated reporting, financial statement users concern about both financial and non-financial data. In here also public sector companies are more likely to include sustainability report in their annual report because they publish it. Both public sector and private sector without considering the volume of revenue they have generated, they have to comply with the legal requirements in that industry.

According to the above information, higher amount of revenue is generated by public companies situated in urban area. And other important factor we have identified is that, those companies have to incur higher amount of monetary cost with waste water management than others. The reason for that is they have to dispose very easily to the environment without incurring a cost. Due to the limited space, hotels in urban areas need to incur cost to dispose the waste water to the environment Because of that for the purpose 100% of the waste water generated at the hotel is treated onsite and as the hotel's design gave consideration to reusability of waste water.

There is a less importance for the STP as a marketing method, but specially some of the private sector companies used that as a marketing method.

Further based on the research following reasons can be identified as why company not consider about nominal cost regarding water management accounting.

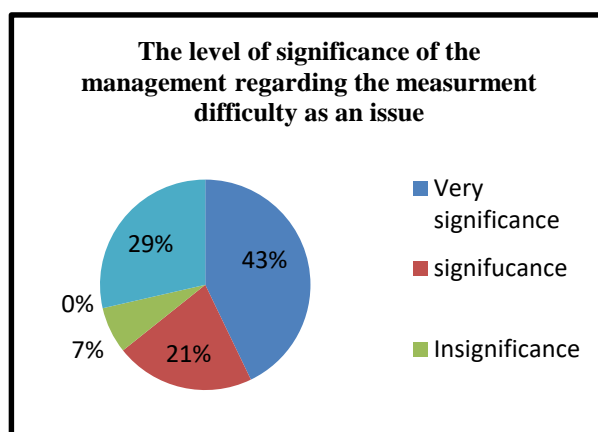
Difficult to measure hidden cost of water wastage

According to the face to face interview and observation there are several limitations in respect of measuring waste water that are arose from main activities such as cooking, washing, cleaning etc. Most of companies do not give priority to measure the waste water that generated from above mentioned activities due to difficulty in measure.

According to the pie chart, 43% of sample emphasize that the difficult to measure hidden cost of water wastage as the very significance issue while 21% of the sample emphasize that the difficult to measure hidden cost of water wastage as the significance issue. From the sample, 7% says that this issue as insignificant issue in determining the hidden cost related to the waste water.

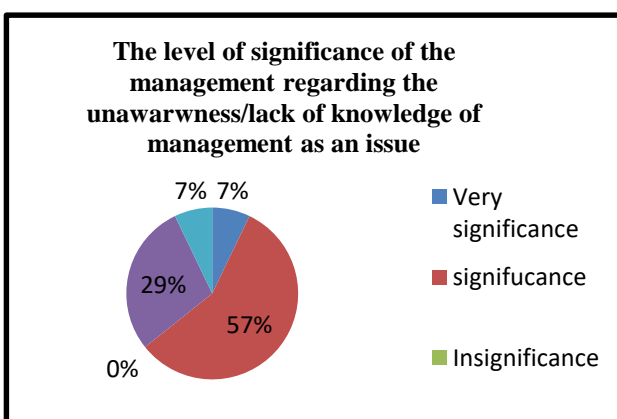
Management awareness

Usually managers are only concerning about the financial performance. They have proper knowledge about financial reporting and they are trying to sharp their knowledge about financial reporting. But managers do not concern about water accounting and they do not have interest to implement water accounting system. Not only that they perform their works only considering profit and not in water management. Due to lack of information sources about water accounting, managers are not aware of aware of water accounting systems and water management.



As per literature review, it shows that accountants of foreign countries (European countries) pay special attention about this and in foreign countries, government pay special consideration on water management. They introduce programmers to develop water accounting system. When it comes to the Sri Lankan situation, it is quite difference. Sri Lankan government does not implement programmers to develop a water accounting system.

According to the pie chart, 7% of sample emphasize that the unawareness of the management in identifying the hidden cost of water wastage as the very significance issue while 57% of the sample emphasize that the unawareness of the management in identifying the hidden cost of water wastage as the significance issue. From the sample 29% do not consider this issue as insignificant issue in determining the hidden cost related to the waste water.

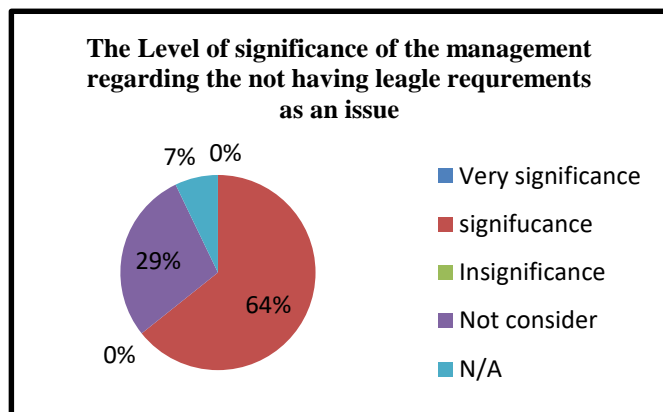


There is no any specific legal requirement

According to present law in Sri Lanka and accounting standards formed by the Sri Lanka accounting setter board, there is no any legal requirement identified for the damage caused to the environment and impact to the society due to water wastage. Because of that reason the

companies in the hospitality industry do not recognize about the waste water in their daily usage in their financial statements. Due to the huge competition in the hospitality industry companies always try to maximize their profitability. Therefore, they do not try to give a monetary value to the environmental and social impacts occurred due to their business activities in their financial statements. The main reason for this can be identified as not mentioning a specific standard for water wastage by the legal system in Sri Lanka and Sri Lanka accounting standards.

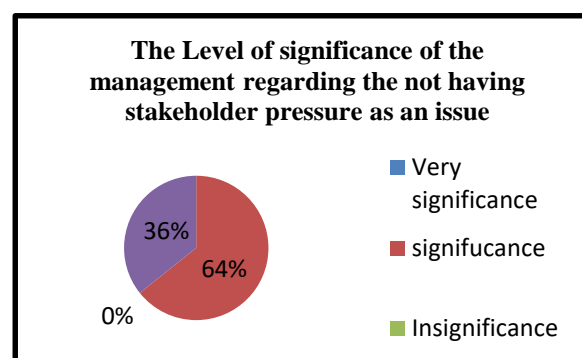
According to the pie chart, 64% of sample emphasizes that lack of any legal requirements in relation to the waste water management as a barrier in identifying the hidden cost of water wastage as the significance issue. From the sample 29% do not consider this issue as insignificant issue in determining the hidden cost related to the waste water.



No pressure from stakeholders

Present Sri Lankan society identifies water as a free good and not as a scarce resource. Therefore, people do not pay much concerned about the social and environmental impact occurred due to the water wastage and addition of polluted water to the environment by companies. But today water has become a scarce resource and environmental and social impact due to water pollution and water wastage has gradually increased. But still companies do not identify the monetary value of this water wastage and water pollution occurred due to their business activities in their financial statements, as there is no pressure from stakeholders regarding this matter.

According to the pie chart, 64% present of sample emphasize that non pressure from stakeholder as a barrier in identifying the hidden cost of water wastage as the significance issue. From the sample 36% do not consider this issue as insignificant issue in determining

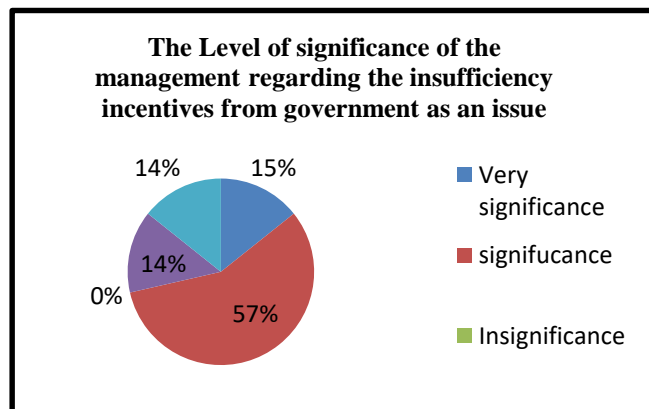


the hidden cost related to the waste water.

Insufficient incentive from government

Involvement of the government is essential for the success of the activities that increase the environmental and social welfare. The benefits of minimizing the water wastage and water pollution are enjoyed by the whole society rather than one single company. Due to that most of the competitive companies reluctant to enter in to the social and environmental welfare activities without any government incentives. Therefore, government should always provide incentives to motivate companies for social and environmental welfare activities. But at present Sri Lankan government do not provide sufficient incentives for the companies in the hospitality industry to motivate them to minimize water wastage and water pollution. Companies consider this as one of the major reason for failing to identify the hidden cost occurred due to water wastage and water pollution.

According to the pie chart, 15% of sample emphasize that Insufficient incentive from government as a barrier in identifying the hidden cost of water wastage as the very significance issue while 57% of the sample emphasize that the not having incentive from government as a barrier in identifying the hidden cost of water wastage as the significance issue. From the sample 14% consider this issue as insignificant issue in determining the hidden cost related to the waste water.



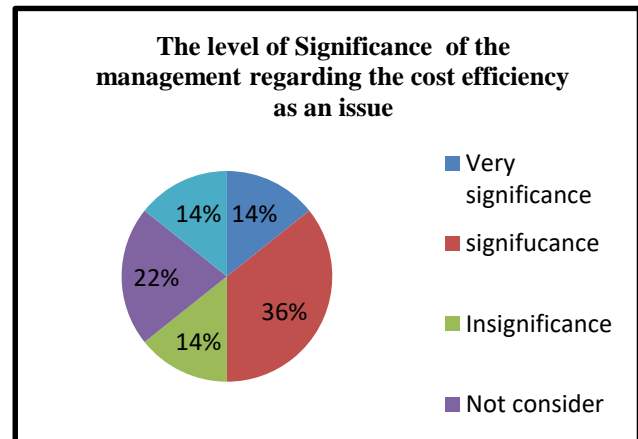
Cost efficiency

Based on the interviews and observations that could be identified top management of companies think that it is difficult and high costly to measure the cost of water wastage because measurement process requires high technical knowledge and technical equipment. In order to acquire that knowledge and technical equipment company will have to bear high cost and commitment.

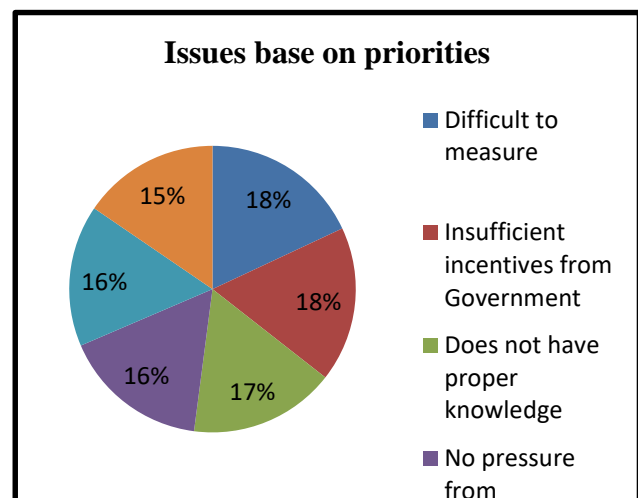
Above finding under insufficient incentives and low pressure of stakeholders, there is no significance government incentives and pressure from stakeholders to identify the hidden

cost. As a result of that, companies are not going to identify the hidden cost because they think that identification of hidden cost does not generate sufficient benefits in order to cover cost of it. Hence, competitive companies that are operating in the hospitality industry hesitate to implement measurement process in order to identify the hidden cost of water wastage.

According to the pie chart, 14% of sample emphasize that cost efficiency as a barrier in identifying the hidden cost of water wastage as the very significance issue while 36% of the sample emphasize that the cost efficiency as a barrier in identifying the hidden cost of water wastage as the significance issue. From the sample 22% do not consider this issue as insignificant issue in determining the hidden cost related to the waste water.



When it comes to the analysis of above reasons, overall conclusion can be made as, difficult to measure the hidden cost is the most significance reason and the inefficiency incentives from government as next significant reason. The unawareness of the company management regarding the hidden cost, less pressure from stakeholders, not having legal requirements and cost efficiency have the respective priorities in respect of this issue.



5. Conclusion

According to analysis section it shows that the use of water accounting is very limited in the hospitality industry due to the variance reasons. Those are the difficult to measure the hidden cost with water consumption, lack of knowledge with regarding the water accounting in the operations of the company and the technological development of STP process, unwillingness of the management to bear higher initial cost to develop efficient STP, lack of knowledge and motivation of society and stakeholders regarding water accounting concept and mainly no any legal requirement to apply water accounting concept. All of these have been deeply discussed under above chapter.

According to the discussion, it always indicates that there should have proper knowledge with top management regarding the water accounting concept. Since management doesn't have proper knowledge the hidden cost with water consumption doesn't present in the financial statements. However one day all companies have to take into consideration this concept because of the water is a scare resource. Further, hotels at urban areas are confronting this issue at large scale while hotels at rural areas are not much affected. Although large hotels have already experienced the efficient STP with the operations of the company it does not address to the proper water accounting process and they are also facing above issues commonly.

Considering the observations and the analysis, the study can be concluded that there are so many challenges and barriers in adopting water accounting concept in hospitality industry and there should proper guidance for hotels to overcome above issues. In adopting, maintaining and controlling the efficient STP system and water accounting in hotel industry, the proper guidance and documentation to address various issues are demanded by the all hotels in the industry directly or indirectly, from the findings of the study.

It is recommended to introduce the separate accounting standard for water accounting addressing all above issues. It may motivate companies to adopt this accounting and hidden cost to be shown from the figures in financial statements. Standard provides the clear and unique way to recognize, measure, present and disclose an accounting transaction or event. Accordingly, water accounting standard shows the mandatory requirement to adopt hidden cost into accounting figures.

Further it can be recommended that motivation from government can be increased. Analysis part indicates that medium and small size hotels are not having that much involvement to

water accounting concept. Then, government can provide incentives to start up the water accounting process as well as government can maintain central STP process on behalf of them for a certain period of time. High valuable training program can be given all hotels to carry out the water accounting concept with participation of knowledgeable persons.

Moreover, to control the all above recommendations particular professional body can be created. Monitory board can provide consultant service when required and check whether entities are relying on the legal requirements. Finally, it can be concluded that there are so many challenges and barriers in adopting water accounting in hospitality industry. However, it can be reduce those challenges and barriers identified to a certain level through above recommendations.

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APPENDICES

Appendix 01 - Questionnaire



Department of Accounting
Faculty of Management Studies and Commerce
University of Sri Jayewardenepura

The Questionnaire survey on "Analysis of the challenges and barriers of adopting water accounting for hospitality industry in Sri Lanka"

Dear Ladies and Gentlemen,

We would like to ask you few questions concerning on water accounting application in your company. The survey is anonymous and the data will not be used outside this project. Obviously your contribution is highly appreciate

Company profile

1.1) Name of the company.....

1.2) Address of the company.....

1.3) Type of the company

a) Private company

☐

b) Public company

• Listed company

☐

• Non listed company

☐

c) Others

☐

1.4) Name and position of key contact person

.....
.....

1.5) Please specify the district located

.....

1.6) The company is located,

Near to water source	Away from the water source
Beach <input type="checkbox"/>	Urban area <input type="checkbox"/>
River <input type="checkbox"/>	
Water fall <input type="checkbox"/>	Rural area <input type="checkbox"/>
Other (please specify) <input type="checkbox"/>	
(.....) _____	

1.7) Type of the hospitality

Tourist hotel	<input type="checkbox"/>
Guest house	<input type="checkbox"/>
Restaurants	<input type="checkbox"/>
Travel agencies	<input type="checkbox"/>
Boutique villas	<input type="checkbox"/>
Others (Please specify)	
(.....)	

1.8) Relevant rank of the hotel

5 stars

4+ star

4 star

3 stars

Others (Please specify)

(.....)

☐
☐
☐
☐
☐

1.9) Financial performance of the company

Description	Amount (Annual)Rs.	
	2016	2017
Turnover		
Gross profit		
Net profit		
Total Assets		
Stated capital		
Water expense		
Maintenance cost of STP		

2) Water sourcing

2.1) Water source	Quantum sourced (Daily / Monthly)
Mainline (national water board)	
Bore wells	
Open wells	

Tankers	
Bottled water	
Recycle water	

2.2) Is there any issues regarding existing water sources?

Type of the issue	For Company	For society
Quantum of the water source		
Quality of the water source		
Cost related to water source		
Legal and environmental issues		
If any		

2.3) what are the solutions had been used to solve above identified issues? (If any)

.....

.....

.....

2.4) what are the future plans company expected to be implemented to reduce the water sourcing issues? (If any)

.....

.....

.....

03) Water storage

3.1) Question	Response (include details if any)
How many sumps? Volume of the each sumps? What are the various sumps used for? Nature / end use of water stored in each sumps	
How many overhead tanks? Volume of the each OHT? Nature / end use of water stored in each OHT	
How many bore wells (including depth and yield of bore wells). What is the water used for?	
How many open wells (including depth and yield of bore wells). What is the water used for?	
Is there a separate system of storage to provide STP treated water for flushing/ landscaping	

3.2) Are there any issues regarding existing water Storage?

Type of the issue	Issues
Quantum of the water storage	
Quality of the water storage	
Cost related to water storage	
Legal and environmental issues relates to storage	
Are there any complaints from society regarding the water storage of company?	
If any	

3.3) What are the solutions had been used to solve above identified issues? (If any)

.....

.....

.....

.....

3.4) What are the future plans company expected to be implemented to reduce the water storage issues? (If any)

.....

.....

.....

04) Water usage

4.1) Main water utilization activities in the company

Guest Rooms	<input type="checkbox"/>
Kitchen	<input type="checkbox"/>
Laundry	<input type="checkbox"/>
Lockers and public toilets	<input type="checkbox"/>
Others	<input type="checkbox"/>
- Pool	<input type="checkbox"/>
- Air conditioning	<input type="checkbox"/>
- Steam generation	<input type="checkbox"/>
-	<input type="checkbox"/>

4.2) Water use (KL / day)

Measure	Landscape	Toilet	Drinking	Cooking	A/C	Others
Gross water demand						
Recycled water that is reused						

4.3) Are there any issues regarding usage of water?

Type of the issue	Issues
Managing water storage	
Quality of the Service	
If any	

4.4) What are the solutions had been used to solve above identified issues? (If any)

.....

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.....

.....

4.5) What are the future plans company expected to be implemented to reduce the water storage issues? (If any)

.....

.....

.....

.....

4.6) Does company use rain water as water source of it?

If yes,

	Comment
How does collect rain water	
For what purpose	
Does company recycle the rain water	
Do you used any chemical to rain water	

05) Water waste

5.1) Average water dispose per day

Source of waste water	Quantity (KL/ day) estimated
Kitchen/restaurant	
Toilets and washrooms	
Housekeeping/maintenance	
Laundry	
Grounds	
Others	

5.2) The company dispose their waste water to,

Natural environment

General waste water system

Reuse by recycling

Others (Please specify)

☐
☐
☐
☐

(.....)

Are there mixed waste water?

Have any report regarding disposal water?(ex: Toxic report)

.....

5.3) Is there any issues regarding usage waste water?

Type of the issue	Issues
Cost related to water wastage	
Legal and environmental issues relates to wastage	
Negative Picture about the company in respect of customer mind.	
Are there any compliance regarding the waste water of company from society	
If any	

5.4) Solutions had been used to solve above identified issues? (If any)

.....

5.5) What are the future plans company expected to be implemented to reduce the water wastage issues? (If any)

.....

06) Water treatment plant (STP)

6.1) STP details	Response (include details if any)
What is the volume of water discharged by the STP	
Is this water used for any purpose? If yes, what and how much?	
Is there separate plumbing for (Kitchen and bath water) and (flush water)?	
Does rain water also pass through the STP?	
Has the STP output been tested?	
Use any chemical for water recycling	

6.2) Is there any issues regarding existing water sources?

Type of the issue	Issues
Quantum of the STP	
Cost related to water source	
Technical and maintenance	
Are there any complaints from society regarding the STP of company?	
Legal and environmental issues	
Does recycle sewage? How to dispose the sewage?	
If any.....	

6.3) Solutions had been used to solve above identified issues? (If any)

.....

.....

.....

6.4) What are the future plans company expected to be implemented to reduce the water sourcing issues? (If any)

.....

.....

.....

.....

07) Others

7.1) What is the main reason to develop that source (if they use own generating system)

To get cost benefit

☐

As a Legal requirement

☐

As Marketing method

☐

As a sustainability management system

☐
☐

Others (Please specify)

(.....)

7.2) If the company have water management system,(please indicate the relevant level of significance)

Reason	Level of significance			
	Very significant	Significant	Insignificant	Not consider
To get cost benefit				
As a Legal requirement				
To Marketing purpose				
As a sustainability management system				
Others (Please specify)				
(.....)				

7.3) The Financial value reflected in the company's financial statements in relation to the water comprise of,

Only the water bill amount

☐

Water bill amount and Recycling cost

☐

Water bill amount, Recycling cost and nominal cost of wastage water

☐

Others (Please specify)

☐

(.....)

7.4) If the company does not have water management system, Does Management have an idea about implement the recycling system for dispose water

☐

Yes

☐

No

7.5) If Yes, How long will the company take to implement a water management system

Within 01 year

☐

Within 05 year

☐

Within 10 year

☐

More than 10 year

☐

7.6) Does the management believe that is there any nominal cost that should be recognized in the financial statements?

☐

Yes

☐

No

7.7) If no, reasons for not considering the nominal value of wastage water in to the account are, (please indicate the relevant level of significance)

Reason	Level of significance			
	Very significant	Significant	Insignificant	Not consider
Difficult to measure				
There is no any legal requirement				
No significant impact for financial Performance				
Top management has not an idea				
Additional cost may be arise				
Since there no tendency for water Accounting in Sri Lanka				
Others (Please specify)				
()				

7.8) There should be a separate water accounting system for waste water management.

Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree