

## A STUDY ON BRAND PREFERENCE OF PACKAGED DRINKING WATER IN MADURAI REGION / COMPOSITE MADURAI DISTRICT

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### Introduction

Water is the main component of the human body. In fact, the body is composed of between 55 and 78 percent water, depending on body size. Adequate and regular water consumption has numerous health benefits. As an added plus, it has no calories, fat, carbohydrates or sugar. The amount of water you consume everyday plays an important role in maintaining a healthy body. Experts recommend drinking eight to 10 glasses of water each day to maintain good health. Furthermore, the Institute of Medicine has determined the adequate intake of total beverage per day (AI) to be about three liters or 13 cups for men and 2.2 liters or nine cups for women. Water forms an essential part of every human being. Since it is a human necessity it makes best sense to do business in. As a normal human being requires an average of 2-3 liters of water everyday and world population is more than one billion (growing at 2-3% annually) the business opportunity is enormous and the potential is largely untapped. The bottled water industry is estimated to be a whopping. It has grown at a rate of 38-40% annually over the past four years. Initially bottled water brands like the French manufactured Damone were promoted at clubs, fitness centers, cinemas, department stores, malls, ice-cream parlors, cafes and retail sports outlets, besides restaurants, hotels and supermarkets with a price tag of ` 70/- for 1 liter bottle. Other brands later began pitching for the larger middle class and lower middle class markets.

Drinking water or potable water is water safe enough to be consumed by humans or used with low risk of immediate or long term harm. In most developed countries, the water supplied to households, commerce and industry meets drinking water standards, even though only a very small proportion is actually consumed or used in food preparation. Typical uses (for other than potable purposes) include toilet flushing, washing, and landscape irrigation. The word potable came into English from the Late Latin *potabilis*, meaning drinkable. Over large parts of the world, humans have inadequate access to potable water and use sources contaminated with disease vectors, pathogens or unacceptable levels of toxins or suspended solids. Drinking or using such water in food preparation leads to widespread acute and chronic illnesses and is a major cause of death and suffering worldwide in many different countries. Reduction of waterborne diseases and development of safe water resources is a major public health goal in developing countries. Water has always been an important and life-sustaining drink to humans and is essential to the survival of most other organisms.<sup>[1]</sup> Excluding fat, water composes approximately 70% of

the human body by mass. It is a crucial component of metabolic processes and serves as a solvent for many bodily solutes. The United States Environmental Protection Agency in risk assessment calculations previously assumed that the average American adult ingests 2.0 litres per day. However, the United States Environmental Protection Agency now suggests that either science-based age-specific ranges or an all ages level (based on National Health and Nutrition Examination Survey 2003-2006 data) be used.<sup>[3]</sup> Bottled water is sold for public consumption in most habitated parts of the world.

#### **Water is Essential to Life**

Water is second to oxygen as being essential for life. People can survive days, weeks, or even longer without food, but only about four days without water. The average adult consumes and excretes 2 or more quarts of water each day. Some of this water is supplied through foods but most is consumed through beverages. It is generally recommended that adults consume 6 to 8 cups (48 to 64 ounces) of liquids daily. Some beverages, such as coffee, tea, soda with caffeine, and alcohol are diuretic and increase urine excretion. These beverages, if consumed in large quantities, can upset the body water balance.

#### **What's In Your Water and What Does It Mean To Your Health?**

Drinking water is never pure. Water naturally contains minerals and microorganisms from the rocks, soil, and air with which it comes in contact. Human activities can add many more substances to water. But drinking water does not need to be pure to be safe. In fact, some dissolved minerals in water can be beneficial to health. For example, the National Research Council (National Academy of Sciences) states that drinking water containing dissolved calcium and magnesium generally contributes a small amount toward calcium and magnesium human dietary needs. Fluoride, either naturally occurring or added to the water supply, can help protect against tooth decay. Whether or not drinking water is safe will depend on which substances are present and in what amounts.

#### **Safety of Packaged Drinking-Water**

Water is packaged for consumption in a range of vessels, including cans, laminated boxes and plastic bags, and as ice prepared for consumption. However, it is most commonly prepared in glass or plastic bottles. Bottled water also comes in various sizes, from single servings to large carboys holding up to 80 litres. In applying the Guidelines to bottled waters, certain chemical constituents may be more readily controlled than in piped distribution systems, and stricter standards may therefore be preferred in order to reduce overall population exposure. Similarly, when flexibility exists regarding the source of the water, stricter standards for certain naturally occurring substances of health concern, such as arsenic, may be more readily achieved than in piped distribution systems. However, some substances may prove to be more difficult to manage in bottled water than in tap

water. Some hazards may be associated with the nature of the product (e.g., glass chips and metal fragments). Other problems may arise because bottled water is stored for longer periods and at higher temperatures than water distributed in piped distribution systems or because containers and bottles are reused without adequate cleaning or disinfection. Control of materials used in containers and closures for bottled water is, therefore, of special concern. Some microorganisms that are normally of little or no public health significance may grow to higher levels in bottled water. This growth appears to occur less frequently in gasified water and in water bottled in glass containers than in still water and water bottled in plastic containers. The public health significance of this microbial growth remains uncertain, especially for vulnerable individuals, such as bottle-fed infants and immune compromised individuals. In regard to bottle-fed infants, as bottled water is not sterile, it should be disinfected - for example, by boiling - prior to its use in the preparation of infant formula. For further information, see the supporting document.

#### **Heterotrophic Plate Counts and Drinking-water Safety**

Ozone is sometimes used as an oxidant before bottling to prevent precipitation of iron and manganese, including natural mineral water. Where the water contains naturally occurring bromide, this can lead to the formation of high levels of bromate unless care is taken to minimize its formation. When ozone is used after the addition of the minerals to dematerialized water, the presence of bromide in the additives may also lead to the formation of bromate.

#### **Packaged Natural Mineral Water**

Packaged natural mineral water shall be water obtained directly from natural or drilled sources from underground water-bearing strata. Packaged natural mineral water is collected under conditions which guarantee the original microbiological purity and chemical composition of essential components and subjected to permitted treatments which include separation from unstable constituents, such as compounds containing iron, manganese, sulphur or arsenic, by decantation and/or simple filtration, if necessary, accelerated by previous aeration. No disinfection process is permitted.

#### **Packaging**

The packaged water shall be packed in clean, hygienic, colourless, transparent, tamperproof and sealed containers of various types/sizes/ made from plastic materials as permitted in either IS. Containers with features like Cool Jugs, Jugs with built-in taps, Jars with threaded (reusable) caps without seal etc. shall not be permitted. Single-use disposable/collapsible jars are also not permitted. There are many terminologies presently adopted by the industry and consumer for describing the different packaging containers of packaged water. For the purpose of uniformity in describing the various types of

containers, descriptions as given in Table 1 have been derived. In case of change in material (i.e., PET/PC) it shall be treated as separate type (ex. PET Jar, PC Jar).

Packaged drinking water industry has grown many fold in all the developed economics of the world. The product is targeted especially at touring and traveling market segments. The market is also growing due to contamination/shortage of water supply in the cities. At present the Indian market is dominated by processed water. The demand for consumption of mineral water in India has been estimated at approx. 500 million liters of pure water bottles and the market is expected to grow at a rate of 25- 35% per annum. The domestic market of mineral water is mainly derived from the tourism sector. Further, the demand may also be from institutional sector as well as from higher income bracket group in urban areas. In view of the large scope of packaged drinking water, the project will have tremendous scope for its development.

#### **Potential Health Benefits of Bottled Drinking Water**

There is a belief by some consumers that natural mineral waters have medicinal properties or offer other health benefits. Such waters are typically of high mineral content, sometimes significantly higher than concentrations normally accepted in drinking water. Such waters often have a long tradition of use and are often accepted on the basis that they are considered foods rather than drinking-water *per se*. Although certain mineral waters may be useful in providing essential micro-nutrients, such as calcium, these Guidelines do not make recommendations regarding minimum concentrations of essential compounds, because of the uncertainties surrounding mineral nutrition from drinking-water. Packaged waters with very low mineral content, such as distilled or demineralized waters, are also consumed. Rainwater, which is similarly low in minerals, is consumed by some populations without apparent adverse health effects. There is insufficient scientific information on the benefits or hazards of regularly consuming these types of bottled waters (see WHO, 2003b).

#### **International Standards for Bottled Drinking-Water**

The Guidelines for Drinking-water Quality provide a basis for derivation of standards for all packaged waters. As with other sources of drinking-water, safety is pursued.

#### **Guidelines for Drinking-Water Quality**

Through a combination of safety management and end product quality standards and testing. The international framework for packaged water regulation is provided by the Codex Alimentarius Commission (CAC) of WHO and the FAO. CAC has developed a *Standard for Natural Mineral Waters* and an associated Code of Practice. The Standard describes the product and its compositional and quality factors, including limits for certain chemicals, hygiene, packaging and labelling. The CAC has also developed

### **Application of the Guidelines in Specific Circumstances**

A Standard for Bottled/Packaged Waters to cover packaged drinking-water other than natural mineral waters. Both relevant CAC standards refer directly to these Guidelines. The CAC *Code of Practice for Collecting, Processing and Marketing of Natural Mineral Waters* provides guidance on a range of good manufacturing practices and provides a generic WSP applied to packaged drinking-water. Under the existing CAC *Standard for Natural Mineral Waters* and associated Code of Practice, natural mineral waters must conform to strict requirements, including collection and bottling without further treatment from a natural source, such as a spring or well. In comparison, the CAC *Standard for Bottled/Packaged Waters* includes waters from other sources, in addition to springs and wells, and treatment to improve their safety and quality. The distinctions between these standards are especially relevant in regions where natural mineral waters have a long cultural history. For further information on CAC, its Codex Committee on Natural Mineral Waters, the CAC *Standard for Natural Mineral Waters* and its companion Code of Practice.

### **Informing the Public**

Consumers may be aware of a potential problem with the safety of their drinking water because of media coverage, their own senses or informal networks. Lack of confidence in the drinking-water or the authorities may drive consumers to alternative, potentially less safe sources. Not only do consumers have a right to information on the safety of their drinking-water, but they have an important role to play in assisting the authorities in an incident by their own actions and by carrying out the necessary measures at the household level. Trust and goodwill from consumers are extremely important in both the short and long term. The health authorities should be involved whenever a decision to inform the public of health-based concerns or advice to adopt health protection measures such as boiling of water may be required. Such guidance needs to be both timely and clear.

### **Consumer Acceptability**

Even though, in an emergency, supplying water that contains a substance present at higher concentrations than would normally be desirable may not result in an undue risk to health, the water may not be acceptable to consumers. A number of substances that can contaminate drinking-water supplies as a consequence of spills can give rise to severe problems with taste and/or odour. Under these circumstances, drinkingwater may become so unpalatable as to render the water undrinkable or to cause consumers to turn to alternative drinking-water sources that may present a greater risk to health. In addition, water that is clearly contaminated may cause some consumers to feel unwell due to a perception of poor water quality. Consumer acceptability may be the most important factor in determining the advice given to consumers about whether or not the water should be used for drinking or cooking.

### **Processing and Bottling**

Raw water to be processed is collected in tanks. A known quantity is pumped into the above tank where the water is dozed with alum for coagulation with heavy metals or insoluble matters. The water after coagulation is allowed to settle for an hour. The impurities may be removed by Reverse Osmosis techniques also. The supernatant water is taken to the chlorination tank where primary disinfection is brought about by bubbling chlorine gas. The water is then passed through sand filters for trapping of undissolved impurities. The water after sand filtration is passed through Carbon filters for removal of odour, colour and also for dechlorination. It is then passed through series of micro fillers comprising of 5 micron, 1 micron and 0.4 micron filter followed by ultraviolet disinfection system for terminal disinfection. Packing is done in PET bottles of 1 liter capacity through an automatic rinsing, filling, and capping machine fitted with an ozone generator. The bottles after capping are shrink wrapped (Optional) and packed in corrugated boxes of one dozen each. Quality control and standards The plain drinking water has to be bottled in pet bottle as per IS Specifications (IS:14543:1998: Packaged Drinking Water and IS:13428:1998: Packaged Mineral Water). The details of the specification can be obtained from Bureau of Indian Standard, Manik bhawan, 9, Bahadur shah Zafar Marg, New Delhi 110002.

### **Water resources**

Water resources are sources of water that are useful or potentially useful. Uses of water include agricultural, industrial, household, recreational and environmental activities. The majority of human uses require fresh water. 97 percent of the water on the Earth is salt water and only three percent is fresh water; slightly over two thirds of this is frozen in glaciers and polar ice caps. The remaining unfrozen freshwater is found mainly as groundwater, with only a small fraction present above ground or in the air. Fresh water is a renewable resource, yet the world's supply of groundwater is steadily decreasing, with depletion occurring most prominently in Asia and North America, although it is still unclear how much natural renewal balances this usage, and whether ecosystems are threatened. The framework for allocating water resources to water users (where such a framework exists) is known as water rights.

### **Water Uses**

#### **Agricultural**

It is estimated that 70% of worldwide water use is for irrigation, with 15-35% of irrigation withdrawals being unsustainable. It takes around 2,000 - 3,000 litres of water to produce enough food to satisfy one person's daily dietary need. This is a considerable amount, when compared to that required for drinking, which is between two and five litres. To produce food for the now over 7 billion people who inhabit the planet today requires the water that would

## Brand

Brand is the "name, term, design, symbol, or any other feature that identifies one seller's product distinct from those of other sellers." Brands are used in business, marketing, and advertising. Initially, livestock branding was adopted to differentiate one person's cattle from another's by means of a distinctive symbol burned into the animal's skin with a hot branding iron. A modern example of a brand is *Coca-Cola* which belongs to the Coca-Cola Company. In accounting, a brand defined as an intangible asset is often the most valuable asset on a corporation's balance sheet. Brand owners manage their brands carefully to create shareholder value, and brand valuation is an important management technique that ascribes a money value to a brand, and allows marketing investment to be managed (e.g.: prioritized across a portfolio of brands) to maximize shareholder value. Although only acquired brands appear on a company's balance sheet, the notion of putting a value on a brand forces marketing leaders to be focused on long term stewardship of the brand and managing for value.

The word "brand" is often used as a metonym referring to the company that is strongly identified with a brand. *Marque* or *make* are often used to denote a brand of motor vehicle, which may be distinguished from a car model. A *concept brand* is a brand that is associated with an abstract concept, like breast cancer awareness or environmentalism, rather than a specific product, service, or business. A *commodity brand* is a brand associated with a commodity. A logo often represents a specific brand.

## Brand awareness

Brand awareness refers to customers' ability to recall and recognize the brand under different conditions and to link to the brand name, logo, jingles and so on to certain associations in memory. It consists of both brand recognition and brand recall. It helps the customers to understand to which product or service category the particular brand belongs and what products and services sell under the brand name. It also ensures that customers know which of their needs are satisfied by the brand through its products (Keller). Brand awareness is of critical importance in competitive situations, since customers will not consider a brand if they are not aware of it. Various levels of brand awareness require different levels and combinations of brand recognition and recall:

- Most companies aim for "**Top-of-Mind**". Top-of-mind awareness occurs when a brand pops into a consumer's mind when asked to name brands in a product category. For example, when someone is asked to name a type of facial tissue, the common answer is "Kleenex", represents a top-of-mind brand.
- **Aided awareness** occurs when consumers see or read a list of brands, and express familiarity with a particular brand only after they hear or see it as a type of memory aide.
- **Strategic awareness** occurs when a brand is not only top-of-mind to consumers, but also has distinctive qualities which consumers perceive as making it better than

other brands in the particular market. The distinction(s) that set a product apart from the competition is/are also known as the Unique Selling Point or USP.

Marketing-mix modeling can help marketing leaders optimize how they spend marketing budgets to maximize the impact on brand awareness or on sales. Managing brands for value creation will often involve applying marketing-mix modeling techniques in conjunction with brand valuation.

#### **A Foot Note about Bottled Water from Municipal Sources**

It is important to note that purified bottled water is not "just tap water in a bottle." Once the municipal source water enters the bottled water plant, several processes are employed to ensure that it meets the purified or sterile standard of the U.S. Pharmacopeia 23rd Revision. Those treatments can include ozonation, reverse osmosis, distillation, or de-ionization. The finished water product is then placed in a bottle under sanitary conditions and sold to the consumer. Some critics of bottled water imply that people may be unaware that they are consuming bottled water that is from a municipal water source and has been placed in a bottle without being purified. As stated above, this is not the case. If a bottled water product's source is a public water system and the finished bottled water product does not meet the FDA Standard of Identity for purified or sterile water, the product label must disclose the public water system source.

Mineral Water is natural water containing not less than 250 parts per million total dissolved solids. Mineral water is distinguished from other types of bottled water by its constant level and relative proportions of mineral and trace elements at the point of emergence from the source. No minerals can be added to this product. It comes from a source tapped at one or more bore holes or spring, and originates from a geologically and physically protected underground water source. No minerals may be added to this water.

Sparkling Bottled Water is water that, after treatment and possible replacement with carbon dioxide, contains the same amount of carbon dioxide that it had as it emerged from the source. Sparkling bottled waters may be labeled as "sparkling drinking water," "sparkling mineral water," "sparkling spring water," etc.

Artesian Water/Artesian Well Water is water from a well that taps a confined aquifer (a water-bearing underground layer of rock or sand) in which the water level stands at some height above the top of the aquifer.

Well Water is water from a hole bored, drilled, or otherwise constructed in the ground, which taps the water aquifer.

#### **Fluoridated**

This type of water contains fluoride added within the limitations established in the FDA Code of Federal Regulations. This category includes water classified as "For Infants" or "Nursery."



**Groundwater**

This type of water is from an underground source that is under a pressure equal to or greater than atmospheric pressure.

**Purified Water**

This type of water has been produced by distillation, deionization, reverse osmosis, or other suitable processes. Purified water may also be referred to as "demineralized water". It meets the definition of "purified water" in the United States Pharmacopoeia.

**Spring Water**

This type of water comes from an underground formation from which water flows naturally to the Earth's surface.

**Sterile Water**

This type of water meets the requirements under "sterility tests" in the United States Pharmacopoeia.

**Perceptions about Bottled Water**

Bottled water is perceived by many as being a safer alternative to other sources of water such as tap water. Bottled water usage has increased even in countries where clean tap water is present. This may be attributed to consumers disliking the taste of tap water or its organoleptics. Another contributing factor to this shift could be the marketing success of bottled water. The success of bottled water marketing can be seen by Perrier's transformation of a bottle of water into a status symbol. However, while bottled water has grown in both consumption and sales, the industry's advertising expenses are considerably less than other beverages. According to the Beverage Marketing Corporation (BMC), in 2013, the bottled water industry spent \$60.6 million on advertising. That same year, sports drinks spent \$128 million, sodas spent \$564 million, and beer spent \$1 billion.

Consumers tend to choose bottled water due to health related reasons. In communities that experience problems with their tap water, bottled water consumption is significantly higher. The International Bottled Water Association guidelines state that bottled water companies cannot compare their product to tap water in marketing operations. Consumers are also affected by memories associated with particular brands. For example, Coca-Cola took their Dasani product off of the UK market after finding levels of bromate that were higher than legal standards because consumers in the UK associated this flaw with the Dasani product.

"Bottled water sales are higher amongst African - American, Asians and Hispanic groups, which typically have lower incomes than whites." Some hypothesize that these differences are due to the geographic distribution of ethnic groups. It was theorized that ethnic differences in bottled water usage "mirror the variability of water system quality between urban, suburban and rural areas (Abrahams et al. 2000) and it was also pointed out

that they might reflect the memory of past problems caused by deficient tap-water systems in deprived areas (Olson 1999)." In France, a similar geographic study in the early 1970s found that bottled water consumption was found to be much higher in urban areas (Ferrier 2001). This finding was "also explained in terms of the poor quality of urban tap water and of the bad condition of the old lead pipes in French cities. Nonetheless, while poor tap water quality may motivate the public to search for alternative sources, it alone does not necessarily lead to higher consumption of bottled water."

Some surveys "found that bottled water, far from being an alternative to tap water, seems to be mostly consumed as a substitute for alcoholic and traditional soft drinks (e.g. AWWA-RF 1993; FWR 1996) - the exception being when water contamination presents serious health risks and the trust in the tap water company is highly eroded (e.g. Lonnon 2004)."<sup>[48]</sup> Another explanation for the rise in popularity of bottled water is alternative explanation is that "the consumption of 'pure' and 'natural' bottled water in degraded environments may represent a symbolic purging behavior."<sup>[48]</sup> Many low-income families avoid drinking tap water because they fear it may cause sickness. <sup>[49]</sup> "The consumption of bottled and filtered water has dramatically increased in the United States during the past decade, with bottled water sales tripling to about \$4 billion a year. More than 50% of the US population drinks bottled water. Despite the fact that it is widely believed that 25% to 40% of bottled water is simply bottled tap water, 'people spend from 240 to over 10,000 times more per gallon for bottled water than they typically do for tap water.' An annual supply of bottled water for a person who consumes 8 glasses a day would cost approximately \$200; the same amount of tap water would cost approximately \$0.33. In general, women are more likely to drink bottled water than men, and Hispanic women are the group most likely to drink bottled water."<sup>[50]</sup>

Bottled, filtered, and tap water are all for the most part safe in the United States.<sup>[50]</sup> The Environmental Protection Agency regulations for tap water are "actually stricter than the Food and Drug Administration regulations for bottled water."<sup>[50]</sup> A study of drinking water in Cincinnati, Ohio, discovered that bacterial counts in bottled water were often higher than those in tap water and fluoride concentration was inconsistent.<sup>[50]</sup> Globally, there is an intensifying environmental backlash against bottled water usage. As global consumption of bottled water soars, environmental groups such as the World Wide Fund for Nature (WWF) and Greenpeace have warned of the huge environmental footprint of the plastic in which the water is packaged.<sup>[51]</sup>

Bottled water also requires large amounts of energy to produce and transport. An Australian town in New South Wales even voted to ban bottled water because of environmental concerns.<sup>[51]</sup> In 2001 a WWF study, "Bottled water: understanding a social phenomenon", warned that in many countries, bottled water may be no safer or healthier than tap water and it sold for up to 1,000 times the price. It said the booming market would put severe pressure on recycling plastics and could lead to landfill sites drowning in mountains of plastic bottles.<sup>[51]</sup> Also, the study discovered that the production of bottled

water uses more water than the consumer actually buys in the bottle itself.<sup>[51]</sup> After a Sydney-based beverage company wanted to open a water extraction plant in the New South Wales town Bundanoon, residents outlawed the sale of bottled water. The town continues to fight the company's proposal in court.<sup>[51]</sup> "In the same week the New South Wales state premier also banned all state departments and agencies from buying bottled water because of its huge environmental footprint, joining more than 70 cities in the United States, Canada and the United Kingdom that have banned bottled water in their departments."