CHAPTER-III

AN OVERVIEW OF CONSUMERS’ ATTITUDE, PACKAGED DRINKING WATER AND THE PROFILE OF STUDY AREA OF TIRUNELVELI DISTRICT.

This chapter provides background information on the consumers’ attitude, packaged drinking water and the profile of study area of Tirunelveli District.

3.1 CONSUMERS’ ATTITUDE – AN OVERVIEW

3.1.1 Introduction

Consumer attitudes are a composite of a consumer’s beliefs, feelings and behavioral intentions towards some object within the context of marketing, usually a brand or retail store. These components are viewed together since they are highly interdependent and together represent forces that influence how the consumer will react to the object. Consumer attitudes are both an obstacle and an advantage to a marketer. Choosing to discount or ignore consumers’ attitudes of a particular product or service while developing a marketing strategy guarantees limited success of a campaign. In contrast, perceptive marketers leverage their understanding of attitudes to predict the behavior of consumers.

3.1.2 Consumer Attitude

Originally, the term attitude is derived from the Latin words for posture or physical position. The general notion was that a body’s physical attitudes suggested the types of activity or action in which a person would engage (Willkie, 1986)\(^{61}\). In the words of Allport (1935), an attitude is "a mental and neural state of readiness,

organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related". Consumer perception of the product determines the consumers’ readiness to accept and adopt the product, or otherwise. According to Fishbein and Aizen (1975), it is a learned predisposition to respond in a consistently favourable or unfavourable manner with respect to a given object. Krech (1962), specify an attitude as a person's enduring favourable or unfavourable evaluations, emotional feelings, and action tendencies toward some objects or ideas. Bearden (1995) and Kotler (2004) observe that people have attitudes toward almost everything: religion, politics, food, music, clothes, and others. Attitudes put them into a frame of mind of liking or disliking an object, moving toward or away from it.

Attitudes lead people to behave in a fairly consistent way towards similar objects. Boone and Kurtz (2004) describe attitudes as a person's enduring favourable or unfavourable evaluations, emotions or action tendencies toward some objects or data. As they form over time through individual experiences and group contacts attitudes become highly resistant to change. Berkowitz (2000) maintains that attitudes are shaped by our values and beliefs, which are learned. Values vary by level

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of specificity\textsuperscript{66}. Bearden et al (1995) describes values as shared beliefs or cultural norms about what is important or right\textsuperscript{67}.

Values, such as the need to belong or to succeed, represent important goals to which consumers subscribe. Values are transmitted to the individual through the immediate and remote environments such as family, organizations (school, religions, institutions, businesses), and other people (the community, the social environment). Kahle et al (1986) observes that cultural values directly influence how consumers view and use individual products, brands, and services. Values influence the goals people pursue and the behaviour used to pursue those goals. Many marketing communication campaigns recognize the importance of values as advertising themes and justification for purchase.

A belief, according to Bearden et al (1995) and Kotler (2004), is a descriptive thought that a person holds about something. In marketing context, a belief is a thought about a product or service on one or more choice criteria. Markets are interested in the beliefs that people formulate about specific products and services because these beliefs make up product and brand images that affect buying behaviour. If some of these beliefs are wrong and prevent purchase, the marketer will have to launch campaign to correct them\textsuperscript{68}. Berkowitz et al (2000) specify beliefs as a consumers' subjective perception of how well a product or brand performs on different attributes. Beliefs are based on personal experience, advertising, and


discussions with other people. Beliefs about product features are important because, along with personal values, they create the favourable or unfavourable attitude the consumer has towards certain goods and services. People's beliefs about a product or brand influence their buying decisions.

Marketers are interested in the beliefs people have in their minds about their products or brands. Baron and Bryne (1987) describe an attitude as a lasting, general evaluation of people (including oneself) object, advertisement, or issues. An attitude is lasting because it tends to endure overtime; it is general because it applies to more than a momentary event such as viewing an advertisement, though one might overtime develop a negative attitude towards all advertisements.

Consumers have attitudes toward a wide range of attitude objects, from product-specific behaviours to more general consumption-related behaviours. Thus, Petty (1997) determines that an attitude is the way we think, feel, and act towards some aspect of our environment such as a retail store, television program, or product. According to Chisnall (1975) attitudes may be acquired or modified by influences arising from four principal sources: information exposure, group membership, environment, and want satisfaction.

Attitudes are an expression of inner feelings that reflect whether a person is favourably or unfavourably predisposed to some ‘stimulus’ or ‘object’ (e.g., a restaurant, a brand, a service, a retail establishment). Attitudes are viewed as outcome of psychological processes. This implies that attitudes are not directly observable, but

can only be inferred from what people say or what they do. In consumer research the data collected on attitudes are the state-of-mind type\textsuperscript{72}. According to Hair et al (2000), state-of-mind data represent the mental attributes of individual that are not directly observable or available through some type of external sources. There are no other means of authenticating related responses. They exist only within the minds of respondents. Therefore, attitudes are assessed by asking questions on or making inferences from behavior. From all these attitude definitions, attitude has three important characteristics – the attitude “object”, attitudes as a learned predisposition, and that attitudes have consistency\textsuperscript{73}.

An attitude in marketing terms is defined as a general evaluation of a product or service formed over time (Solomon, 2008). An attitude satisfies a personal motive and at the same time, affects the shopping and buying habits of consumers. Lars Perner (2010) defines consumer attitude simply as a composite of a consumer’s beliefs, feelings, and behavioural intentions toward some object within the context of marketing. A consumer can hold negative or positive beliefs or feelings towards a product or service. A behavioural intention is defined by the consumer’s belief or feeling with respect to the product or service. Consumers are individuals with likes and dislikes\textsuperscript{74}. When the preponderance of people in a particular group feel one way or another about a product, service, entity, person, place or thing, it is said to be a generalized consumer attitude that could affect the marketing of that person, product or entity in positive or negative ways. Marketers strive to influence consumer attitudes and understanding the prevailing attitude is the first step to changing it if

\textsuperscript{72} Chisnall, Peter M.(1975), Motivation research (Marketing); Marketing; Consumers, McGraw Hill (London and New York)


needed\textsuperscript{75}. A wider definition of attitude sees it as “an enduring organization of motivational, emotional, perceptual and cognitive processes with respect to some aspect of our environment” (Hawkins, Best and Coney, 2004). More specifically, “attitude refers to knowledge and positive or negative feelings about an object or activity” (Pride and Ferrell, 1991) and can also be seen as an “overall evaluation that expresses how much we like or dislike an object, issue, person or action” (Petty, Unnava, and Strathman, 1991 apud Hoyer Macinnis, 2001; Solomon, 2004)\textsuperscript{76}.

According to Katz (1960) and Grewal, Mehta and Kardes (2000) attitudes serve four key functions for individuals: \textit{knowledge function}, as a means of organising beliefs about objects or activities such as brands and shopping, often determining subsequent behaviours; \textit{Value-expressive function}, when attitudes are formed and serve to express an individual’s central values and self-concept; \textit{Utilitarian function}, based on classical condition theory, with people tending to form positive attitude towards rewarding products and negative attitude towards other products and also \textit{Ego-Defensive function}, when people form attitudes to defend their egos and self-images against threats and shortcomings\textsuperscript{77}.

Attitudes are formed by all of the four different influences but generally one of them plays a more important role. Hawkins, Best and Coney, 2004 describe attitude be treated as a Knowledge function, in such a way that it will be formed by the way individuals organise their beliefs towards a company and then form their subsequent purchasing behaviour\textsuperscript{78}.

\textsuperscript{75} http://www.ehow.com/about_6536655_definition-consumer-attitude.html#ixzz2MvA1RbL4
3.1.3 Theories of Attitude

➤ Balance theory

Scientists, analyzing consumer attitude refer to several balance theories, which are, however, based on the primary theory of Fritz Heider. Balance theory studies the relationship of elements that are evaluated by people as interrelated and subjectively perceived as relationship of three elements that provide attitude structures, defined as triads. According to the theory of balance an individual evaluates surroundings as a triad. Every triad is composed of three elements: 1) a person and his cognition; 2) the object of attitude; 3) another person or object. Solomon, claim that the principal human aim is to retain harmonious and balanced relationship of the elements of the triad. That is why it is possible to draw a conclusion that following the theory of balance, celebrities and the information received make the strongest influence on attitude formation\(^79\).

➤ Cognition dissonance theory

The methods of attitude formation and change are based on the prevailing traditional opinion that consumers have a certain attitude towards a particular object, formed before performing particular actions. Schiff man and Kanuk (2004) as well as Loudon and Della Bitta (1993) examine the theory that interprets the formation of attitude conditioned by behaviour differently\(^80\). This is called the theory of cognition dissonance, claiming that a consumer experiences comfort or discomfort when mutually conflicting ideas, gathered about the object are contracted.

Fishbein’s model of attitude towards an object

Generalizations of attitude compatibility based on single attribute theories provide assumptions for grounding of the need to examine multi-attribute attitude models. The models of multi-attribute attitude examine consumer attitude with the evaluation of attitude object as a function of consumer cognition and the principal features of the object or as convictions about a particular object. From the magnitude of models of this trend, the model, suggested by Fishbein is the most relevant and was studied by Solomon et al, (2002) Loudon and Della Bitta (1993) and other authors; therefore, the model is being analyzed in detail. Fishbein states that people form attitude to objects on the basis of convictions, related with the object. Convictions, in turn, are determined by personal experience of using the object or by information, acquired from other sources. Using Fishbein’s model it is possible to evaluate the following three components of attitude (Solomon et al., 2002): 1. Silent convictions of a consumer in respect of the object (appearing during the assessment). 2. Probability that an object possesses attributes, important for a consumer. 3. Evaluation of every important attribute. Four ways that can change consumer’s attitude, identified using Fishbein’s model are: 1. Emphasizing relative advantages. If the brand considered has more advantages in comparison with another brand in respect of their attributes, it is important to prove to the consumer that these attributes are extremely significant. 2. Strengthening conceivable relationship of the product and its attributes. Identifying that a consumer does not associate the brand with certain significant attributes it is necessary to emphasize and convince the consumer with the importance of their existence. 3. Introducing new attributes. A positive attitude to a 70 brand could be formulated while introducing some unknown attributes. 4. Changing the opinion about competitors.
3.1.4 Concept of Attitude

- **The Attitude “Object”**

  An attitude object is anything towards which one an attitude has. In the consumer-oriented definition of attitude, the word object should be interpreted broadly to include specific consumption or marketing-related concepts, such as product, product use, advertisement, service personnel, price, physical evidence, medium process or retailer, and others. In carrying out attitude research, it is important for the research to be object-specific.

- **Attitudes as a Learned Predisposition**

  Most scholars believe that attitudes are learned. This implies that attitudes relevant to purchase behaviour are found as a result of direct experience with the good or service, information acquired from others, and exposure to mass media. Attitudes might result from behaviour but are not same with behaviour. They are a reflection of either a favourable or an unfavourable evaluation of the attitude object. As a predisposition, attitudes have a motivational quality, that is, they might propel a consumer toward a particular behaviour or repel the consumer away from a particular behaviour.

- **Attitudes Have Consistency**

  Consumer attitude-behaviour consistency describes the extent to which attitude leads to purchase. Attitudes are relatively consistent with the behaviour they reflect, although they are not necessarily permanent, they do change as the individual is exposed to new stimuli. Sometimes situational influences on consumer intervene and disrupt the consistency between attitudes and behaviour of a particular individual. Attitude-behaviour consistency describes the extent to which attitude leads to
purchase. This is determined by a variety of consumers factors (resource, experience, state vs action orientation), situational factors (intervening time, unforeseen events, message repetition, and social influences), and measurement factors (level of specificity, timing of measurement). Each of this can be affected by marketer actions.

3.1.5 Functions of Consumers Attitudes

Katz (1960) identifies four key functions, which attitudes serve for individuals. These include utilization, value-expressive, ego-defensive and knowledge functions.

- **Utilitarian Function or Adjustment Function**

  The utilitarian function is related to the basic principles of reward and punishment. Consumers develop some attitudes toward products simply on the basis of whether these products provide pleasure or pain. Adjustment serves the purpose of helping an individual intelligently to adjust our likes and dislikes to the realities of our external environment. Thus, the adjustment function is “utilitarian” in nature as it helps consumers to maximizing their pleasure and minimizing their pain as they wend their ways through the environment.

- **Value-Expressive Function**

  A value-expressive function is an expression of the consumer's central values and self-concept. A person forms a product attitude not because of its objective benefits, but because of what the product expresses about him or her as a person. Thus, consumers who value nature and the environment are likely to develop attitudes about products and activities that are consistent with that value. These consumers are

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likely to express support for environment protection initiatives, to recycle, and to purchase and use "green" products. This calls for green and social marketing. Value-expressive attitudes are highly relevant to lifestyle analysis, which focus on how consumers cultivate a cluster of activities, interests, and opinions to express a particular social identity.

➢ Ego-Defensive Function

Attitudes sometimes protect consumers’ ego from threats to their self-identities and feelings of personal worth. Attitudes are formed and used to protect and defend one's egos and images against external influences and internal feelings of shortcoming. In marketing, ego-defensive attitudes are likely to be operating for some consumers in such areas as social attractiveness, physical fears of injury, or harm.

➢ Knowledge Function

Some attitudes are formed as a result of a need for order, structure, or meaning. This need is often present when a person is in a confused state or is presented with a new product or service. Some attitudes serve primarily as a means of organizing beliefs about objects or activities such as brands and shopping. These attitudes may be accurate or inaccurate with respect to "objective" reality, but the attitude will often determine subsequent behaviors rather than "reality". An attitude can serve more than one function, but in many cases a particular one will be dominant. By identifying the dominant function a product serves for consumers what benefits it provides - marketers can emphasize these benefits in their communications and packaging.⁸².

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3.1.6 The Trilogy of Attitudes

Many scholars have been motivated to understand the relationship between attitudes and behaviour. To achieve this, they sought to construct models that capture the underlying dimensions of an attitude, focusing on specifying the composition of an attitude in order to better explain or predict behaviour. Some of the most important attitude models are: the tri-component attitude model, multi-attribute attitude models, the trying-to-consumer model, and attitude-toward-the-ad models. The underlying view of human behaviour has been that all behaviour is actually a combination of mental, emotional, and physical dimensions.

- **The Attitude - Purchase Behaviour Relationship and Marketing Implications**

  According to Hawkins et al (2004), the field of consumer behaviour refers to the study of individuals, groups, or organizations and the processes they use to select, secure, use and dispose of products, services, experiences, or ideas to satisfy needs and the impacts that these processes have on the consumer and society. Thus, an understanding of consumer behaviour is very important for developing effective marketing strategy, regulating a marketing practice, or bringing about socially desirable behaviour.

- **Attitude-Altering the Cognitive Component**

  Smith and Swinyard suggest that a common and effective approach to changing attitudes is to focus on the cognitive component. Four basic marketing strategies are used for altering the cognitive structure of a consumer's attitude.

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(a) Increasing the strength of an existing positive belief. This strategy involves shifting beliefs about the performance of a brand on one or more attributes.\(^{84}\).

(b) Improving evaluation of a strongly held belief about a salient attribute. This requires constructing a new means-end chain by linking a more positive, higher-ordered consequence to that attribute. Most consumers consider some product attributes to be more important than others. Marketers often try to convince consumers that those attributes on which their brands are relatively strong are the more important.

(c) Adding a new salient belief about the attitude objects-ideally, one with a positive evaluation. Sometimes, this strategy requires a physical change in the product itself. By making a product or brand has the capacity to solve more of consumers’ problems, the consumers will have an additional belief that the product’s or brand’s value has increased.

(d) Making an existing favourable belief more salient, usually by convincing consumers that the attribute is more self-relevant than it seemed. The final strategy for changing the cognitive component is to change the perceptions of the ideal brand or situation.\(^{85}\).

➢ **Attitude- Altering the Affective Component**

It is increasingly common for a firm to attempt to influence consumers' liking of their brand without directly influencing either beliefs or behaviour. If the firm is

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successful, increased liking will tend to lead to increased positive beliefs, which could lead to purchase behaviour should a need for the product category arise.

3.2 PACKAGED DRINKING WATER-AN OVERVIEW

3.2.1 Introduction

Packaged drinking water is often referred to as one of capitalism's greatest mysteries: "The packaging and selling of something that is already freely available". Indeed, while in many countries perfectly safe water from the tap is offered at little or no cost, the consumption of packaged drinking water around the world has exploded in the last decade, increasing vastly and steadily. It shows that the consumers’ attitude of buying plays key role to increase the marketing of packaged drinking water. The study can travel in correct way by knowing the background of packaged drinking.

Tirunelveli, the penultimate southern most district of Tamil Nadu, is described as a microcosm of the state, owing to its mosaic and diverse geographical and physical features such as lofty mountains and low plains, dry Teri structures, rivers and cascades, seacoast and thick inland forest, sandy soils and fertile alluvium, a variety of flora, fauna, and protected wild life. Knowing the background of the study area is very significant for carrying out the study.

3.2.2 Packaged Drinking Water-A Global View

The global packaged drinking water market has seen a remarkable and continued annual growth in the past 15 years. In value terms, the total global packaged drinking water market for 2010 stands approximately at 66$. The year 2000 was highly impressive with the annual growth rate reaching 11.4%. Whilst it has not been as high in the years since, the rate has remained above 6.0%, displaying the market’s strength hand resilience, proving that the fundamental packaged drinking water values
of quality, purity, availability and hydration are as strong today as they have ever been. For consumers seeking health and well being, packaged drinking water is an alternate to the traditional soft drinks. The media attention on the growing obesity problem in the West, particularly in the European and North American populations, the links made between it and the increased consumption of soft drinks by children has reinforced the growth of packaged drinking water. A closer look at the dynamics of the global market reveals that with respect to the split between still and sparkling water, still formats have steadily gained share over their sparkling counter parts as sparkling water remains the preserve of the households.

Sparkling water is becoming increasingly out of vogue and reflecting a wider overall trend towards still beverage consumption. Much of the growth in still water consumption has been driven by water for coolers and other bulk formats. Parallel to this, the increasing consumer preference for still water hydration on the above has bolstered the still water sector. Traditionally, still water hydration has been a substitute for tap water in countries where shortages occur during hot summers or the tap water is not of the required drinking quality. Sparkling water is often seen as a substitute for carbonates and this is particularly true for flavoured sparkling water.

For a local drinking water initiative several water supply models are already established, tested and proven effective in the developed countries. Given the prevailing social and technical cost needed to revitalize or put in place functional public institutions, associated technologies and political will power, it is much undoubted that the standard industrialized world model for delivery of safe drinking water technology may not be affordable in much of the developing world in the foreseeable future. Subsequently, with the renewed global commitments towards the

86 Bull.Enviro.pharmacol.life.sci.,volume1(6)may 2012:01-04
MDGs marked for 2015, the importance of locally sourced, low-cost alternative drinking water schemes in contributing to increased sustainable access in rural and urban settings of developing nations cannot be over emphasized.

One of such local interventions in Nigeria, where public drinking water supply is endemic is packaged drinking water. This form of packaged water is usually distributed and sold in sachets. Packaged water refers to water that is packaged generally for consumption in a range of vessels including cans, laminated boxes, glass, plastic sachets and pouches, and as ice prepared for consumption. Scattered around the breadth of developing nations are small, medium and large scale industries that manufacture packaged water sold as sachets (commonly referred to as pure water).

The packaged water industry started initially as a cottage business to meet the demand of the thirsty population not adequately catered for by the available municipals. Today, the packaged water industry has become part of the unofficial economy as the sales of thousands of brands of thermoelectrically sealed nylon sachets containing about 0.5 litre water have increased tremendously in many developing nations.

- **Leading Players**

Danone with Evian and Volvic, Nestlé with pure Life, Poland Spring, Perrier and San Pellegrino, Coca-Cola with Bonanqua and Kinley, Dasani and Ceil and PepsiCo with Aquafina, Aqua Minerale and Aqua Diamant are undoubtedly the brand giants of the global packaged drinking water market. There are of course other packaged drinking water brands owned by these companies and other alike making a splash at national, regional and international levels. While Donone and Nestlé have
been in packaged drinking water heavy weights for many years, PepsiCo have been doing packaged drinking water heavy weights for many years; PepsiCo and Coaca-Cola Company have spent the last few years expanding their portfolios into still drinks, shifting its dependence on its carbonated soft drink (CSD) brands, to juice, sports drinks and packaged drinking water. The Coca-Cola Company, renowned for its dominance in the global water arena, wanting to capitalize on the growing demand for healthier beverages. The recent acquisition of vitamin water maker Glacéeu and the success of its brands in North America and elsewhere around the globe suggest that the future is a bright one.

➤ Global Developments

The US, China, Mexico, Germany and Italy currently hold the top five positions in the global packaged drinking water league table in terms of volume consumed. Over the next five years, strongest growth is forecast on India, Pakistan, New Zealand, Bolivia, Russia and the Czech Republic. PepsiCo’s current motivation and focus for growth in its Indian operations, along with the company’s strong noncarbonated beverages portfolio, is set to drive growth in the consumption of packaged drinking water in the country. Conversely, there will be low levels of growth experienced in the more mature market of West Europe with demands driven by consumers looking for water products with added flavours and functionality. With regard to North America, continued double-digit growth is expected through to 2015 as consumer desire for healthier beverages continues unabated. For Latin America and the Middle East Steady growth of around 5% is forecast.

Flavoured water is becoming increasingly popular with the international demand growing for a product that goes beyond the normal refreshment factor of plain waters to one where increased flavour and functionality is present. Packaged
drinking water incumbents have been launching flavoured variants to their popular brands for the past few years. However, there has been a fascination with the functional or enhanced water segment, amounts of energy in water extraction, water processing, bottling and transportation, not to mention the waste created by the empty bottles for landfill sites around the globe.\textsuperscript{87}

**3.2.3 Packaged Drinking Water – In India**

- **History of Packaged drinking water in India**

Mineral packaged drinking water in India under the name 'Bisleri' was first introduced in Mumbai by Bisleri Ltd., a company of Italian origin in 1965. Mineral packaged drinking water were in glass bottles in two varieties - bubbly and still in 1965. This company was started by Signor Felice who first brought the idea of selling packaged drinking water in India. Parle bought over Bisleri (India) Ltd in 1969 and started bottling Mineral water in glass bottles under the brand name 'Bisleri'. Later Parle switched over to PVC non-returnable bottles and finally advanced to PET containers. Since 1995 Mr. Ramesh J. Chauhan has started expanding Bisleri operations substantially and the turnover has multiplied more than 20 times over a period of 10 years and the average growth rate has been around 40% over this period. In 2012 with 8 plants and 11 franchisees all over India Bisleri command a 60% market share of the organized market. Currently, Bailley has a national presence in 5 lakh retail outlets across the country. They have increased manufacturing plants for Bailley from 29 to 60, presently 40 plants are operational and few more will be ready

\textsuperscript{87} Et al bull.environ.pharmaco.life.sci.,volume1(6)may2012-01-04
for operations over the next few months,” informed Nadia Chauhan, joint managing
director of Parle Agro.88

- **Packaged Drinking Water in India**

  Between 1999 and 2004, the Indian packaged drinking water market grew at a
compound annual growth rate (CAGR) of 25 per cent - the highest in the world. The
total annual packaged drinking water consumption in India had tripled to 5 billion
liters in 2004 from 1.5 billion liters in 1999. Global consumption of packaged
drinking water was nearing 200 billion liters in 2006. The overall packaged drinking
water in India is estimated to touch the Rs10,000 crore mark in the 2012-13 fiscal,
growing at a compound annual growth rate (CAGR) of 19%, says a new report by
Ikon Marketing Consultants. Presently, this market is estimated at Rs 8,000 crore, and
could touch Rs15, 000 crore by 2015, The rising trend of bulk water consumption in
homes and institutional segments will pave the way for bulk water packs to acquire
half of the total packaged drinking water market within next four-five years.
According to a national-level study, making packaged drinking water is today a
cottage industry in the country. Today it is one of India’s fastest growing industrial
sectors.

- **The packaged Drinking Water Industry**

  India is the 10th largest packaged drinking water consumer in the world. In
2002 the industry had an estimated turnover of Rs.10 billion (Rs. 1,000 crores). Today
it is one of the India’s fastest growing industrial sectors. Between 1999 and 2004 the
Indian packaged drinking water market grew at a compound annual growth rate
(CAGR) of 25 percent the highest in the world. With over a thousand packaged

drinking water producers, the Indian packaged drinking water Industry is big by even International standards. There are more than 200 brands, nearly 80 percent of which are local and most of the small scale producers sell non-branded products and serve small markets. In fact, making packaged drinking water is today a cottage industry in the country. Leave alone the metros, where a bottled-water manufacturer can be found even in a one-room shop, in every medium and small city and even some prosperous rural areas there are packaged drinking water manufacturers. Foreign Tourists have been the main consumers of the mineral water as they face a lot of digestion problems due to different food habits. Domestic Tourists have switched over to mineral water mainly because of safety and hygiene factors. Like soft drinks, drinking mineral water is also considered fashionable by some people.

- **Packaged drinking water law in India**

  The late nineties marked the commencement of packaged drinking water regulation in India. Solely handled by the Bureau of Indian Standards in collaboration with the Health Ministry, the rules on its safety were drafted into a Prevention of Food Adulteration Act. The original plan was to come up with a standard that matches with international standards. Given the complexities and the technologies involved in the implementation, the PFA Act however remained vague on the issue of allowable levels of pesticides in packaged drinking water. With growing health concerns, a stakeholder meeting between the BIS and the Health Ministry officials marked the declaration of specific allowable limit - no pesticide should exceed 0.0001 mg/litre and total content of pesticide not exceeding 0.005 mg/litre. It was agreed that testing methods and support are to be provided by the BIS. The term "mineral water" is misleading because our laws do not stipulate the minimum mineral content level required for water to be labelled as such, Ahmadabad-based Consumer Education and
Research Society (CERS), an independent non-profit institution with a sophisticated product-testing laboratory, recently carried out a detailed study on 13 major brands of packaged drinking water available in the country. As, many as 10 of the 13 brands had foreign floating objects in clear violation of norms found in the survey. The CERS study indicates that there is an urgent need to revise standards for packaged drinking water.89

3.2.4 Packaged Drinking Water in Tamilnadu

As clean water is a basic necessity for a healthy living as most of the diseases are water borne, our Honourable Chief Minister Jayalalitha announced on 7th June, 2013 and launched integrated drinking water projects to benefit lakhs and lakhs of people in four districts namely Tuticorin, Sivaganga, Pudukottai and Tirupur living in over 2300 hamlets at a cost of about Rs.453 crores which included funds for annual maintenance of the projects also. In Tuticorin Rs. 94.4 crore drinking water projects for 248 hamlets in Kovilpatti, Kayathar, Vilathikulam and Ottapidaram by tapping water from Tamiraparani has been sanctioned and Rs.1.62 crores has been set apart for annual maintenance. In Pudukottai an integrated drinking water project to benefit 1776 hamlets in Viralimalai Ponnamaravathy, Tirumayam, Arimalam and Kunnandarkoil and in Sivaganga to benefit 125 hamlets in S.Pudur, Sakkottai by tapping water from Cauvery has been ordered. Both the above schemes were estimated to cost Rs.301.5 crores and Rs. 10.86 crores has been set apart for the annual maintenance of the two projects. Similarly in Tirupur district 158 hamlets in Kudimangalam and Udumalpet by tapping water from Tirumurthy dam has been sanctioned. The scheme is estimated to cost Rs.54.14 crores and Rs.1.20 crores has been set apart for annual maintenance.

89 www.scribd.com
➢ Tamilnadu Packaged Drinking Water

Manufacturers Association founded in 2002 is the sole representative body of all segments of the Tamilnadu Packaged Drinking Water Industry consisting of large, medium and small-scale manufacturers. TPDWMA mission is to ensure its members to offer the highest standards of quality, safety and hygenic packaged drinking water to the customer together with an unimpeachable quality.

➢ Amma Mineral Water in Tamil Nadu

Tamil Nadu Chief Minister J Jayalalitha on 7 June, 2013 announced that state transport corporations will set up mineral water plants and sell packaged drinking water at Rs10 per litre. Gummundipoondi on the outskirts and started functioning on 15th September 2013 at the state capital with a capacity of three lakh liters per day. According to Jayalalitha the packaged drinking water will be sold in long- distance buses and at bus stands. The transport corporations sell a bottle of water at Rs10 while the Railways and private players have priced their water bottles at Rs15 and Rs20 per litre respectively. One-litre bottles are sold on long-distance govt. buses, in termini across the State and motels. The production of packaged drinking water by large players constitutes nearly 75 per cent of the total production. 90

3.2.5 Packaged Drinking Water in Tirunelveli

The river Thamiraparani originates from the Western Ghats which is found in this district. It flows through a distance of 125k.m. It starts from the Western Ghats and flows through Papanasam, Ambasamudram, Kalidaikurichi, Veeravanallur, Tirunelveli, and finally reaches the sea. The people who are dwelling in and around the towns and villages use the water from Thamiraparani for drinking. There are 11

90 Trinity mirror, Thursday 10 January 2013vol.18 no226pages8
taluks in this district. Since the water from the Thamiraparani and the underground water is insufficient for the people due to heavy rise in population and dry climate, many companies sprang up to manufacture packaged and pure drinking water for the consumers. The purified drinking water is filled in cans and bottles and sold. Large scale manufacturing companies laid foundation in this district for the process of manufacturing packaged drinking water. More than 15 companies are found in this district. At present the government of Tamilnadu also sells drinking water named “Ammakudineer” in bus stands and railway stations.

3.2.6 Production of Packaged Drinking Water

Water has a number of features which make it unique amongst consumer products and services. Firstly, a safe water supply is a prerequisite for stable healthy societies. Secondly, unlike most services, most consumers have no choice over their tap water supplier. There are no traditional water markets of competing suppliers in most of the world and thus consumers cannot choose a different supplier if they become dissatisfied with the water services they receive, although there is a market for bottled water, so consumers do have some choice when it comes to drinking water. Production and marketing of packaged drinking water under goes the following aspect.

- **Production**

Production of packaged drinking water under goes various stages during its production, all the technical aspect and quality assurance are considered to get standard packaged drinking water.
Process of production

The water is processed with multi stage purification processes such as - sand filter, activated carbon filter, ultraviolet disinfection, ultra filtration, Reverse Osmosis and Ozonization.

<table>
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<tr>
<th>Sand filter</th>
<th>Eliminates load of total suspended solids in the raw water.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activated carbon filter</td>
<td>This filter removes most of the organic contamination and pesticide residuals from the water. It also controls taste and odor of water.</td>
</tr>
<tr>
<td>Ultraviolet disinfection (UV)</td>
<td>Water is exposed to UV light of wavelength 245 nanometers (nm). A dosage of 16000 Microwatt/sq.cm at 40°C for effective Disinfection.</td>
</tr>
<tr>
<td>Ultra filtration</td>
<td>A low pressure membrane process that removes dissolved organic macro molecules, viruses, pyrogen enzymes etc.</td>
</tr>
<tr>
<td>Reverse Osmosis</td>
<td>This process eliminates dissolved impurities like unwanted salts and retains minerals which are essential to human body.</td>
</tr>
<tr>
<td>Ozonization</td>
<td>This is the strongest oxidizer and disinfection agent which acts on broad spectrum of microbiological organisms.</td>
</tr>
<tr>
<td>Filtration</td>
<td>This pumps water through a microscopic filter that is rated for a certain size organism. The standard size rating is the micron.</td>
</tr>
<tr>
<td>Capacity flow rate</td>
<td>1000 lit/hour.</td>
</tr>
<tr>
<td>Raw water quality</td>
<td>1000 ppm as TDS</td>
</tr>
<tr>
<td>Motive power</td>
<td>1 KW</td>
</tr>
</tbody>
</table>

Source: www.dcmsme.gov.in
Production of Process Stages

The production of packaged drinking water undergoes the following stages:

- Raw water from Source
- Raw Water Storage
- Raw Water Lifting Pump
- Sand Filter
- Activated Carbon Filter
- Base Exchange Softener
- Ultraviolet Disinfection
- Micro Filteration System
- High Pressure Pump System
- Desalting
- Mixing
- Storage of Treated Water
- Polishing Filteration
- UV Disinfection System
- Filling, Sealing & Capping M/C

Source: www.smallb.in.com

3.2.7 Technical Aspects in Packaged Drinking Water

The packaged drinking water bottling design, quantity and packaging requirements and package types are given below.

- Processing and Bottling

Raw water to be processed is collected in tanks. A known quantity is pumped into the above tank where the water 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 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 litre 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.\textsuperscript{91} 

\begin{itemize}
  \item \textbf{Processing of Water for Bottling}
  
  In India, the quality of drinking water is very poor in comparison to other countries. Treatment of water is required for purification. To produce high quality drinking water as prescribed by the World Health Organisation (WHO), conventional processing methods like coagulation, flocculation, sedimentation, ion exchange, filtration and oxidation etc. are not sufficient. Membrane processes have advantages over other treatment processes. Micro-filtration and ultra-filtration are said to be very useful in removing micro-organisms. Reverse osmosis membranes are used to remove various contaminants found in drinking water. A combination of reverse osmosis and de-ionization can be used to produce high quality water.

  \item \textbf{Bottle Filling}
  
  Before filling, freshly manufactured plastic bottles are rinsed and inverted from where they go for filling on rotary bottle filler. The water flows from the filler bowl into the bottles via Ventra flow valves. These valves use an airlock method for

\end{itemize}

\begin{footnote}
\textsuperscript{91} \texttt{www.mssewb.org}
\end{footnote}
accurate filling. The variation is not more than 5mm. When liquid reaches the end of the valve sleeve, air cannot escape Pressure is created at the top of the bottle, and no more liquid can enter. The airlock method provides consistent, repetitive filling and reduce product loss. The fillers are available in a wide range of configurations and are adaptable to a variety of capping systems. IS : 14543 - 1998 (Specification for Packaged Drinking Water) prescribes the hygienic practices to be followed in respect of collecting water, its treatment, bottling, storage, packaging, transport, distribution and sale for direct consumption , so as to guarantee a safe, hygienic and wholesome product. The bottles are generally capped using roll-on type plastic caps, with pilfer proof rings.  

(1) One litre bottle: This is meant to spell safety and security for consumers. It is positioned on a prestige plant form for the achiever segment who likes to make a fashion statement by drinking mineral water. This segment gets the maximum sales.

(2) 500 ml bottle: This size has been introduced in the market to target the individual and local travellers.

(3)PET Bottles: The size of the PET bottles varies from 10 to 20 litres. These are mainly for institutional sales (Wedding Parties, Hotels, corporate, etc.)

- Bottle Labelling

The last step is the labelling of bottles. In the earlier days, gummed paper labels were used which satisfied only the legal requirements of declaration. When these labels came in contact with moist surface, they lost their identity. Later shrink film plastic labels came into use for this application. Auto-sleeve system for labelling then became a commercial success. Auto-sleeve labels are used both for one way and

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refillable-multi-trip plastic bottles. It is a stretchable label made of low density polyethylene of special grade. The Department of Health, Ministry of Health and Family Welfare have notified to carry the following declaration on the label of the disposable bottle of mineral water or packaged drinking water. Other labelling requirements should be as per PFA Rules and Packaged Commodities Rules as prescribed in IS: 14543 – 1998 (Specification for Packaged Drinking Water).

➤ Packaging Requirements

It is well known that drinking water should be packed in clean, colourless, odorless, clear, tamperproof containers, which are hygienically safe. Much of the water is packaged in similar bottles as carbonated soft drinks.

3.2.8 Types of Plastic Package

As the market has evolved, so too has its packaging mix. Bottles may be the favourite container for packaging water, but glass rarely features as the first choice today. Glass together with cans and cartons have a diminished share. Glass retains a high profile in outlets where the water is for consumption on the premises (hotels, restaurants, cafes) remaining particularly strong in Central and South America and Europe, especially Germany. Plastics are versatile materials and are in many cases capable of matching or surpassing the characteristics of other types of packages. They do not corrode, are hygienic, lightweight and often provide opportunities for reducing the weight of the packages used. A variety of polymers are available which can be used for packaging of drinking water.

➤ Polyethylene

Low-density polyethylene film is the most important group of plastics used in packaging drinking water. Polyolefin’s also have the highest calorific value of all
constituents in the packaging waste stream and are, therefore, prime candidates for disposal through incineration with energy recovery.

- **Polyethylene Terephthalate (PET):**

  PET is the most extensively recycled plastic generally. It is easier to collect than other plastics. It has a high intrinsic value, which is economic to recycle even with existing collection systems and there are well-developed markets for its recycling, such as carpet fibres and fibre film. The important feature of used PET is its ability to be converted chemically to the monomer from which it was produced using hydrolysis or methonolysis.

- **Polypropylene (PP)**

  Polypropylene (random clarified co-polymer) is widely used for food contact applications throughout the world and enjoys favourable status with food and regulatory agencies. PP containers/cups with peelable lids are used for packaging of drinking water in 100, 200ml Capacities with suitable lids for closures.

- **Poly Vinyl Chloride (PVC):**

  Earlier, the most commonly used package for mineral water was stretch blow molded bottle of PVC, as PVC is rigid, clear and has adequate impact strength. Compared to other polymers, PVC requires lower amount of energy to produce. If collected separately, it can be readily recycled. The recycled PVC is sandwiched between inner & outer layers of virgin polymer in co-extruded PVC pipes. The major concern for safe use of PVC for non-toxic and food contact applications is the residual monomer level in the resin.
- **Polycarbonate (PC):**

  Polycarbonate can be processed into useful end products by any of the usual processing techniques like extrusion, blow moulding, injection moulding etc. Polycarbonate containers are popularly used for muti-trip application for mineral water containers of 15-20 liters.

- **Polyethylene Naphthalate (PEN):**

  This is a high performance resin and the containers made out of this resin are used for refillable, returnable mineral water.

- **HIPS (High Impact Polystyrene):**

  Containers cater to the 200ml mineral water market. These containers are provided with heat sealable peelable lids.

- **Strength, Color Clarity and Purity:**

  Unlike carbonated drinks, the bottles filled with still water need only enough strength to hold water and to survive impact. Clarity is one of the most important requirements and is the main reason why clear bottles of plastics are used. A resin with higher levels of co-polymer adds to the clarity. As regards the light blue colour in the bottles, is permissible for one time use. However in India, the BIS (Bureau of Indian Standards) have prescribed colourless bottles for multi trip/reusable containers. Since currently almost all the bottlers use blue coloured containers, many studies have been conducted and if establish in the regard whether blue colour helps to reduce the UV effect and the percentage of blue colour that could be considered to be added without affecting the clarity of the bottle. Because water is a flavourless product, using a plastic that remains tasteless and odourless is imperative.
(1) **Distillation:** In this process, water is turned into a vapour. Since minerals are too heavy to vapourize, they are left behind, and the vapours are condensed into water again.

(2) **Reverse osmosis:** Water is forced through membranes to remove minerals in the water.

(3) **Absolute 1 micron filtration:** Water flows through filters that remove particles larger than one micron in size, such as "Cryptosporidium", a parasitic protozoan.

(4) **Ozonation:** Bottler of all types of waters typically use ozone gas, an antimicrobial agent, to disinfect the water instead of chlorine, since chlorine can leave residual taste and odour to the water.

> **Mandatory Certification:**

To prevent adulteration, the quality of the bottle and its sealing drew great attention and concern. The standardisation of the quality of the water and the bottles was not thought of earlier. There was a concern whether mushrooming brands in packaged drinking water would really ensure quality and safety. The provisions of mandatory BIS certification and that of Prevention of Food Adulteration Act (PFA) have brought in assurance to the consumers that packaged drinking water is trustworthy.

**3.2.9 Confirmatory Of Packaging Materials to Indian Standards**

The Bureau of Indian Standards has formulated standards for packaging materials used in contact with drinking water. The plastic materials used should conform to the relevant Indian Standards.
BIS’ standards:

The “BIS norms must be adhered before filling of Packaged Drinking Water in the containers. The standards basically specify requirements of the basis resin, colours and pigments, catalysts, emulsifying agents, residual monomers, antioxidants, other additives and the migration. The Indian Standards prescribed by government related to packaged drinking water are summarised.

**IS: 9833 – 1981**: List of pigments and colorants for use in plastic in contact with food stuff and drinking water.

**IS: 10141 – 1982**: Positive list of constituents of Polyethylene for its safe use in contact with food stuff and drinking water.

**IS: 10146 – 1982**: Specification of Polyethylene for its safe use in contact with food stuff and drinking water.

**IS: 10148 – 1982**: Poly Vinyl Chloride and its co-polymer for its safe use in contact with food stuff and drinking water.

**IS: 10149 – 1982**: Styrene polymers in contact with food stuff, pharmaceuticals and drinking.

**IS: 10151 – 1982**: Poly Vinyl chloride and its co-polymer for its safe use in contact with foodstuffs, pharmaceuticals and drinking water.

**IS: 10909 – 1984**: Positive list of constituents of Polypropylene in contact with food stuff, pharmaceuticals, and drinking water.

**IS: 10910 – 1984**: PP and its copolymer for its safe use in contact with food stuff and drinking water.
**IS: 11705 – 1986:** EAA co-polymer, positive list of constituents for safe use with food stuff and drinking water.

**IS: 12229 – 1987:** Positive list of constituents of PET/PBT for its safe use in contact with food stuff and drinking water.

**IS: 12252 – 1987:** PET (Polyethylene Terephthalate)/PBT (Polybutadeine Terephthalate) for safe use in contact with food stuff and drinking water.

**IS: 12248 – 1988:** Positive list of constituents of Nylon 6 Polymers for its safe use in contact with food stuff and drinking water.

**IS: 12247 – 1988:** Specification for Nylon 6 for its safe use in contact with food stuff and drinking water.

**IS: 10142 – 1989:** Styrene polymers for its safe use in contact with food stuff, pharmaceuticals and drinking water.

**IS: 14543 – 1998:** Prescribes the quality and safety requirements of packaged drinking water.

**IS: 9845-1998:** Determination of overall migration of constituents of plastic materials and articles intended to come in contact with foodstuffs- Method of analysis.

**IS: 10142-1999:** Polystyrene (crystal and high impact) for its safe use in contact with foodstuffs, pharmaceuticals and drinking Water quality.

**IS: 14971-2001:** Polycarbonate resins for its safe use in contact with foodstuffs, pharmaceuticals and drinking water.

**IS: 15186: 2002:** Polyalkylene Terephthalate (PET and PBT) for their safe use in contact with foodstuffs, pharmaceuticals and drinking water.


IS: 15303-2002: Determination of antimony, iron and selenium in water by electro thermal atomic absorption Spectrometry.

IS: 15410-2003: Containers for packaging of natural mineral water and packaged drinking water.

IS: 14543:2004: Have been formulated by the Bureau of Indian Standards to provide quality norms for Packaged drinking water.


➢ Processing and Quality Assurance

To ensure packaged drinking water is held safe free from contamination, ultraviolet treatment and deionization process is carried out. Ozone is unstable trivalent oxygen, a very powerful bactericide with no side effect, as it disintegrates into oxygen within couple of hours. Sterilization effect of deionized water continues even after water is packaged, thereby ensuring safety of mineral water up to its final packing. To ensure high quality of packing materials components like caps and bottles are manufactured, in-house from resins of quality suppliers. Good manufacturing practices are stringently followed at all times. Processing is regularly monitored at every stage testing source water, processing parameters, microbial quality, packaging material integrity and finally, shelf life studies, forms an integral point of quality and safety assurance plan.

93 www.bureauindianstandards.com
The casing tube itself is protected with stainless steel mesh to give a preliminary filtration to the water. Ultra filtration gives water reduction in turbidity and adds sparkle.

Activated carbon purifier helps to remove colour and odour in water. Reverse osmosis membrane has porosity of less than 0.01 micron the process renders water free of micro, organisms and also reduces dissolved solids.

3.2.10 Marketing

Marketing is indeed an ancient art; it has been practiced in one form or the other since the days of Adam and Eve. The word, marketing has been defined differently by authorities in different ways. The traditional objective of marketing had been to make the goods available at places where they are needed. This idea was later on changed by shifting the emphasis from “exchange” to “satisfaction of human wants. Marketing, in its descriptive definition, “The performance of business activities that direct the flow of goods and services from the producer to consumer or user”

➢ Market and Demand Aspects

Earlier bottled drinking water was privileged to high class, foreign tourists and highly health conscious people. But the present decade has witnessed increasing popularity among average consumers. Increasing living standards, disposable income, education and awareness among the consumers, domestic and foreign tourists, sophisticated business houses and offices have increased rapidly the sales of bottled water in recent years. The growing demand for bottled water clearly shows the scarcity of clean drinking water and the quality of tap water. It has become an icon of healthy lifestyle emerging in India. Selling - ‘safety’ – i.e. pure and simple water have now become one of the fastest growing industries in India despite the harsh
truth it is built on the foundation of bad governance, inequality and obvious exploitation. However, bottled water provides the distinct advantages of convenient packing, consistent quality and is ubiquitous.

➢ Market potential

Unfortunately sufficient safe potable water is not available everywhere in the country, either harmful chemical substance are found in the layers of earth which enter into water or it may be contaminated due to pathogenic micro-organisms. If such water is consumed, the body suffers from water born diseases. Due to this, it has become imperative to process and bottle safe potable water for the mankind in prevailing conditions. The demand for purified water becomes more during summer season. Although few companies have already entered in the bottling of safe potable water and mineralized water, still huge gap is there in between demand and supply at all metropolitan-cities and towns. Packaged drinking water is widely accepted in offices, restaurants, railway stations, airport, bus stands, and hospitals and to some extent even in rich house-holds. So there is good scope for establishing the units for processing and bottling plain and mineralized drinking water in different parts of the country.  

3.2.11 Bottled Water Industry

The following section will provide some background knowledge on the bottled water market in terms of size, share, segmentation and competition, from a global perspective. This is important in order to better understand the scope of the project and the industry. It is worth noting that the global bottled water market is divided into three main geographical regions: Americas, Asia-Pacific, and Europe. Furthermore, it

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consists of four product categories: sparkling flavoured water, sparkling unflavoured water, still flavoured water and still unflavoured water.

➢ Market Share by Value

The market share by value percentage of 2005-2009 in bottled industry at global level in Asia-Pacific, Americas, and European market is being presented in figure 3.1

FIGURE 3.1

Market Share by Value (%): 2005 - 2009

Source: Data monitor, 2010

Figure 3.1 reveals that European market is the largest market in the bottled water industry\(^\text{95}\), which in 2009 accounted for 50.9% of the global market value.

\(^{95}\)Europe: Belgium, Czech Republic, Denmark, France, Germany, Hungary, Italy, Netherlands, Norway, Poland, Romania, Russia, Spain, Sweden, The Ukraine and the UK
Since 2005 European market share has declined 0.9% much as a result of the increase of consumption in the Asia Pacific region. Furthermore, the Asia-Pacific region accounted for 18.8% of the global market in 2009, an increase of 5.2% and is consequently the fastest growing market in the industry. Most of the Asia-Pacific gains are at the expense of the Americas region where the market share has declined by 4.3%.

➢ Market Value Growth

The market value growth in countries like United States, Asia Pacific, and European i.e. the Global market in 2005-2009 is presented figure 3.2.

**FIGURE 3.2**

**Market Value Growth (%): 2005-2009**

![Market Value Growth Chart](chart.png)

Source: Data monitor 2010

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66 Asia-Pacific: Australia, China, Japan, India, Singapore, South Korea and Taiwan
67 Americas: Argentina, Brazil, Canada, Chile, Colombia, Mexico, Venezuela, and the US
Figure 3.2 States the market value growth from 2005 to 2009\textsuperscript{98}. Where the difference between the markets is emphasized. The Global market value growth is 4.7\% in 2009, which is 2.3\% less than in 2008. This slow down, is largely due to the very low market value growth in the US market value, which fell from 8.7\% in 2007 to 0.6\% in 2009. According to Beverage World (2009) the market decline was a result of two main factors: First, it stemmed from the economic crisis and lead to consumers’ lack of willingness to purchase bottled water. Second, the increased environmental awareness of the consumers is also claimed to have an effect on the United States market value growth.

- **Market Share Product Categories**

The market share according to the four product categories in the industry namely, sparkling flavoured water, sparkling unflavoured water, still flavoured water and still unflavoured water is being presented figure 3.3

\textsuperscript{98} The market is valued according to retail selling price (RSP) and includes any applicable taxes (Datamonitor, 2010).
Figure 3.3. Indicates the market share according to the four product categories in the industry namely, sparkling flavoured water, sparkling unflavoured water, still flavoured water and still unflavoured water. Still Unflavoured water is by far the biggest segment of the market. Its share has largely remained unchanged over the years as it remains most popular and most consumed product. Similarly, unflavoured sparkling also remains largely unchanged. Evidently the categories remain stable in their market share and show very little evidence of any changing preferences.
Market Players, Share by Volume

The market players, share by volume of percentage 2005-2009. There are few major global players ruling the industry namely, Nestle, Groupe Danone, Coca-Cola and others. It is being presented in figure 3.4

FIGURE 3.4

Market Players, Share by Volume (%) 2005-2009

![Bar chart showing market shares of Nestle, Groupe Danone, The Coca-Cola Company, and Others from 2005 to 2009.]

Source: Data monitor, 2010

Figure 3.4 shows the market players, share by volume of percentage during 2005-2009. There are few major global players ruling the industry. Notably, the global actors shown in Figure 3.4 are largely faced with fierce competition from local actors in each country. Evident from the figure above, Nestlé has lost
considerable market share to Danone and Coca-Cola paired with an increased competition from the local actors (other).

➤ Market rivalry

The switching cost in the industry is very low due to the fact that the product is essentially the same, water, which is also available from the tap. Hence, the competing brands have to pay careful attention as to how they are positioned and perceived in the market, as the consumer easily can switch over between products. Due to this low switching cost and the strong presence of local competitors in the respective market, competition tends to be quite fierce. Moreover, retailers purchasing decisions are strongly influenced by consumer demand, which often favours popular brands. This adds additional pressure for bottled water companies to effectively differentiate in the sector. Design elements thus become particularly relevant when defining a product’s positioning strategy and forecasting return on investments. Awareness towards consumer trends is essential.

3.2.12 Safety of Packaged Drinking Water

While the term bottled water is widely used, the term packaged drinking water is perhaps more accurate. Water sold in countries for consumption can come in cans, laminated boxes and even plastic bags. However, bottled water is most commonly sold in disposable plastic bottles. Bottled water also comes in various sizes from single servings to large carboys holding up to 80 liters. Depending on the climate, physical activity and culture, the drinking-water needs for individuals vary, but for high consumers it is estimated to be about two liters per day for a 60 kg person and one liter per day for a 10 kg child. Drinking-water may be contaminated by a range of chemical, microbial and physical hazards that could pose risks to health if they are
present at high levels. Examples of chemical hazards include lead, arsenic and benzene. Microbial hazards include bacteria, viruses and parasites, such as Vibrio cholerae, hepatitis A virus, and Cryptosporidium parvum, respectively. Physical hazards include glass chips and metal fragments. Because of the large number of possible hazards in drinking-water, the development of standards for drinking-water requires significant resources and expertise, which many countries are unable to afford. Fortunately, guidance is available at the international level. Bottled water is drinking water, packaged in bottles for individual consumption and retail sale. The water used can be glacial water, spring water, well water, purified water or simply water from the public water supply (tap water). Many countries, particularly developed countries, regulate the quality of bottled water through government standards, typically used to ensure that water quality is safe and labels accurately reflect bottle contents. In many developing countries, such standards are variable and are often less stringent than those of developed nations. While bottled water companies are facing criticism from activists saying the product’s plastic harms the environment and privatizes a basic human right, the bottled water industry has countered those claims. For instance, though organizations such as Corporate Accountability International say that “millions” plastic bottles end up in landfalls, the industry points out that PET bottles make up only one-third of 1 percent of the waste stream in the United States. Meanwhile, the Natural Resources of Defense Council, Sierra Club and world wildlife fund have all urged their supporters to consume less bottled water and various campaigns against bottled water are starting to appear. Though many of these campaigns claim that bottled water is no better than tap water, the fact is that some bottled water companies use municipal water as the source, but it is additionally purified or treated. Therefore, as the International Bottled Water
Association states, bottled water “is not simply tap water in a bottle”. Supporters of bottled water view the product not just as an alternative for municipal water, but as a healthy choice instead of soft drinks or sport drinks that can be purchased in restaurants, convenience stores or vending machines.\(^{99}\)

### 3.2.13 Need for Packaged Drinking Water

Millions of people, both in rural and urban India, suffer from inadequate or no tap water supply. Even some parts of Mumbai, the financial capital of the country, get a mere two hours of daily water supply. The Virar suburb of the city gets water for 45 minutes. So, packaged drinking water is much in demand by residents – even though the business, profiting from the sales are thriving from access to public water sources. Peter Gleick of the Pacific Institute writes in his World Water report as "In many parts of the world, tap water is not available or safe to drink," "In these regions, the failure of governments’ to provide basic water services has opened the door to private companies and vendors filling a critical need, albeit at a very high cost to consumers." Packaged drinking water has been treated by distillation, reverse osmosis, or other suitable process and that meets the definition of "purified water"\(^{100}\).

### 3.2.14 Advantages of Packaged Drinking Water

Many people like to drink bottled water because they feel that tap water may not be safe, but is bottle water really any better? Although some companies have been found selling bottled water that is straight from a tap, most don't. Most bottled water - if it's from a reputable company - is filtered until pure. Each brand tastes a little different from the next due to varying mineral content. The big advantage of bottled water is that it is easy to take with you on a journey. It comes in a safe and attractive

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\(^{99}\) www.tarj.in  
\(^{100}\) www.scribd.com.
package that makes us feel like we are drinking something that is good for our bodies and water is good for us. A really big advantage is that it contains no chlorine as tap water does. This alone will make it taste heaps better. Tap water can sometimes be contaminated. This can happen due to water surges dislodging dirt and debris from old pipes, or it can be due to a contaminated supply source. At least, when you have a supply of bottled water on hand, you won't be without a drink if the power goes off. Get great-tasting bottled spring water for your office water cooler at Tranquil Water.

3.3 TIRUNELVELI DISTRICT – AN OVERVIEW

3.3.1 Introduction

Tirunelveli District is a district of Tamil Nadu state in southern India. The city of Tirunelveli is the district headquarters. A unique feature of this district is that it encompasses all five geographical traditions of Tamil Literature; kurinji (mountains), mullai (forest), marudham (paddy fields), neithal (coastal) and palai (desert). Tirunelveli District was formed on September 1, 1790 by the East India Company (on behalf of the British government), and comprised the present Tirunelveli and Thoothukudi districts and parts of Virudhunagar and Ramanathapuram districts. The founding date of Tirunelveli District is commemorated as Tirunelveli Day. The British East India Company named it Tinnevelly district; its headquarters was first located in Palayamkottai (an adjacent city), where it had its military headquarters during its operations against the Palayakars. There are three reasons attributed for naming the district Tirunelveli. The primary reason is after the largest city of the district; another reason is that it was called TirunelveliSeemai under the Nayaks and Nawabs. Finally, it served as the southern capital during the Pandyan Empire. Both

http://www.dictirunelveli.in/profile.html
Tirunelveli and Palayamkottai grew as twin cities in the district. In the early 20th century, parts of Tirunelveli district were separated into Ramanathapuram and Virudhunagar districts. In 1986, Tirunelveli district was further split into two districts for administrative purposes: Chidambaranar (present-day Thoothukudi) and Nellai-Kattabomman (later Tirunelveli-Kattabomman and present-day Tirunelveli) districts.¹⁰²

Tirunelveli District has a geographical area of 6759 sq. kms, in the South eastern portion of Tamil Nadu and is triangular in shape. It lies between 8°.05’ and 9°.30’ of the Northern latitude and 77°.05’ and 78°.25’ of Eastern longitude. This district has 3 Revenue divisions comprising of 11 Taluks, 60 Firkas 19 Development Blocks, 616 Revenue Villages and 425 Village Panchayats.¹⁰³

**Figure 3.5: Tirunelveli District Map**

¹⁰² http://www.edreamsinetcafe.in/tirunelveli/history.htm
¹⁰³ http://en.wikipedia.org/wiki/Tirunelveli_district
3.3.2 Occupation

Agriculture plays a vital role in the District’s economy. The total cropped area was 171155 hectares, which worked out to 25.32% of the total area of 675850 hectares. The important food crops are Paddy, Cholam, Ragi, Cumbu Maize and other minor millets. The commercial crops are Cotton, Chillies, Sugar Cane and Groundnut. Of the total cultivated area of 145047 hectares in the district, 26108 hectares were sown more than once.\(^{104}\)

3.3.3 Irrigation

The District is blessed with the western ghats from which all the perennial rivers flow and drain towards the east. The surface water of the District is drained into major river basin viz Thamiraparani, Vaippar, Nambiar and Hanumanthi. Thamiraparani is the major river basin in the District. The other Streams which are seasonal in nature are Servallar, Manimuthar, Ramanathi, Pachayar, Chittar and Uppodai rivers which drain into the Tamiraparani basin. The source of irrigation is the Canal, Tank and Well, which covers 133106 hectares.\(^{105}\)

<table>
<thead>
<tr>
<th>Irrigated Area</th>
<th>In Ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net irrigated area</td>
<td>83210</td>
</tr>
<tr>
<td>By canals</td>
<td>1559</td>
</tr>
<tr>
<td>By wells</td>
<td>34908</td>
</tr>
<tr>
<td>By Tanks</td>
<td>32467</td>
</tr>
<tr>
<td>By other sources</td>
<td>244</td>
</tr>
</tbody>
</table>

**Table 3.1: Source of Irrigation (In Ha)**

**Source:** Tirunelveli District Hand Book 2011-12

\(^{104}\) [www.nellai.tn.nic.in/hand_book/tirunelveli_profile.pdf](http://www.nellai.tn.nic.in/hand_book/tirunelveli_profile.pdf)

\(^{105}\) Ibid
Table 3.2: Size of Agriculture Land Holdings

<table>
<thead>
<tr>
<th>Limitation of Area</th>
<th>Number</th>
<th>Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 ha</td>
<td>2,45,930</td>
<td>78,264</td>
</tr>
<tr>
<td>Between 1 and 2 ha</td>
<td>34,298</td>
<td>48,044</td>
</tr>
<tr>
<td>Above 2 ha</td>
<td>25,418</td>
<td>1,11,312</td>
</tr>
</tbody>
</table>

Source: Tirunelveli District Hand Book 2011-12

Tirunelveli has been an agricultural area throughout its history. The district is a major producer of rice, coconuts, bananas, spices and forest-based products. The area and production of crops in the years 2011-2012 are as given in the table 3.3.

Table 3.3: Production of Crops

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Hec.</th>
<th>Production in Tonnes (2011-2012)</th>
<th>Productivity Kg./hec. (2011-2012)</th>
<th>% to the total area sown</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(A) Food Grains</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paddy</td>
<td>86725</td>
<td>351.8</td>
<td>4411.000</td>
<td>47.9</td>
</tr>
<tr>
<td>Others</td>
<td>11840</td>
<td>24.6</td>
<td>2665.500</td>
<td>6.54</td>
</tr>
<tr>
<td>Pulses</td>
<td>16433</td>
<td>7.8</td>
<td>477.500</td>
<td>9.08</td>
</tr>
<tr>
<td><strong>(B) Oil Seeds</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groundnut</td>
<td>1090</td>
<td>2.237</td>
<td>2212.000</td>
<td>0.60</td>
</tr>
<tr>
<td>Gingelly</td>
<td>1027</td>
<td>0.25</td>
<td>331.000</td>
<td>0.56</td>
</tr>
<tr>
<td><strong>(C) Other Crops</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotton</td>
<td>2721</td>
<td>7.151(Bales)</td>
<td>500.000(Lint)</td>
<td>1.50</td>
</tr>
<tr>
<td>Others</td>
<td>61089</td>
<td>--</td>
<td>--</td>
<td>33.76</td>
</tr>
</tbody>
</table>

Source: G.ReturnFasli 1421
The district's livestock and poultry populations are as given in the table 3.4.

**Table 3.4: Livestock and Poultry Populations**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>418694</td>
</tr>
<tr>
<td>Buffaloes</td>
<td>78777</td>
</tr>
<tr>
<td>Bovines</td>
<td>497471</td>
</tr>
<tr>
<td>Sheep</td>
<td>487273</td>
</tr>
<tr>
<td>Goats</td>
<td>390570</td>
</tr>
<tr>
<td>Horses and Ponies</td>
<td>245</td>
</tr>
<tr>
<td>Pigs</td>
<td>12752</td>
</tr>
<tr>
<td>Rabbits</td>
<td>2401</td>
</tr>
<tr>
<td>Camels</td>
<td>-</td>
</tr>
<tr>
<td>Donkeys</td>
<td>961</td>
</tr>
<tr>
<td>Domestic Dogs &amp; others</td>
<td>67877</td>
</tr>
<tr>
<td>Fowls</td>
<td>1205376</td>
</tr>
<tr>
<td>Ducks, Drakes &amp; Duckling</td>
<td>9095</td>
</tr>
<tr>
<td>Turkeys</td>
<td>2168</td>
</tr>
<tr>
<td>Others</td>
<td>1944</td>
</tr>
</tbody>
</table>

**Source:** Tirunelveli District Handbook 2011-12

**3.3.4 Demographic Details**

According to the 2011 census Tirunelveli district has a population of 3,072,880, roughly equal to the nation of Oman or the US state of Iowa. The district has a population density of 458 inhabitants per square kilometer (1,190 /sq mi). Its
population growth rate over the decade 2001-2011 was 13.66%. Tirunelveli has a sex ratio of 1024 females for every 1000 males, and a literacy rate of 82.92%.

Table 3.5: Tirunelveli District Population

<table>
<thead>
<tr>
<th>Description</th>
<th>2011</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Population</td>
<td>3,072,880</td>
<td>2,723,988</td>
</tr>
<tr>
<td>Male</td>
<td>1,518,595</td>
<td>1,333,939</td>
</tr>
<tr>
<td>Female</td>
<td>1,554,285</td>
<td>1,390,049</td>
</tr>
<tr>
<td>Population Growth</td>
<td>13.66%</td>
<td>8.93%</td>
</tr>
<tr>
<td>Area Sq. Km</td>
<td>6,703</td>
<td>6,703</td>
</tr>
<tr>
<td>Density/km²</td>
<td>458</td>
<td>403</td>
</tr>
<tr>
<td>Proportion to Tamilnadu population</td>
<td>4.26%</td>
<td>4.36%</td>
</tr>
<tr>
<td>Sex Ratio (Per 1000)</td>
<td>1024</td>
<td>1042</td>
</tr>
<tr>
<td>Average Literacy</td>
<td>82.92</td>
<td>76.09</td>
</tr>
<tr>
<td>Male Literacy</td>
<td>89.66</td>
<td>85.21</td>
</tr>
<tr>
<td>Female Literacy</td>
<td>76.38</td>
<td>67.43</td>
</tr>
<tr>
<td>Literates</td>
<td>2,298,262</td>
<td>1,829,064</td>
</tr>
<tr>
<td>Male Literates</td>
<td>1,223,964</td>
<td>997,278</td>
</tr>
<tr>
<td>Female Literates</td>
<td>1,074,298</td>
<td>831,786</td>
</tr>
</tbody>
</table>

Source: Tirunelveli District Hand Book 2011-12

3.3.5 Tirunelveli District Urban Population

Out of the total population in Tirunelveli District according to the 2011 census, 49.49 percent live in urban regions in the district. In total 1,520,645 people live in urban areas of which males are 752,908 and females are 767,737. Sex Ratio in the urban region of Tirunelveli district is 1020 as per 2011 census data. Similarly,

child sex ratio in Tirunelveli district was 961 in 2011 census. Child population (0-6) in urban region was 144,909 of which males and females were 73,879 and 71,030. This child population figure of Tirunelveli district is 9.81% of total urban population. The average literacy rate in Tirunelveli district as per census 2011 is 86.40% of which males and females are 92.16 % and 80.79 % literates respectively. In actual number 1,188,649 people are literate in the urban region of which males and females are 625,763 and 562,886 respectively.  

3.3.6 Tirunelveli District Rural Population

As per 2011 census, 50.51% population of Tirunelveli district live in rural areas of villages. The total Tirunelveli district population living in rural areas is 1,552,235 of which males and females are 765,687 and 786,548 respectively. In rural areas of Tirunelveli District, the sex ratio is 1027 females per 1000 males. If child sex ratio data of Tirunelveli district are considered, the figure is 965 girls per 1000 boys. Child population in the age 0-6 is 156,366 in rural areas of which males were 79,558 and females were 76,808. The child population comprises 10.39 % of total rural population of Tirunelveli district. The literacy rate in rural areas of Tirunelveli district is 79.49 % as per census data 2011. Gender wise, male and female literacy stood at 87.18 and 72.06 percent respectively. In total, 1,109,613 people were literate of which males and females were 598,201 and 511,412 respectively.  

\[ \text{http://www.census2011.co.in/census/district/50-tirunelveli.html.} \]

\[ \text{Ibid} \]
### Table 3.6: Tirunelveli District Rural and Urban Population

<table>
<thead>
<tr>
<th>Description</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (%)</td>
<td>50.51 %</td>
<td>49.49 %</td>
</tr>
<tr>
<td>Actual Population</td>
<td>1,552,235</td>
<td>1,520,645</td>
</tr>
<tr>
<td>Male</td>
<td>765,687</td>
<td>752,908</td>
</tr>
<tr>
<td>Female</td>
<td>786,548</td>
<td>767,737</td>
</tr>
<tr>
<td>Sex Ratio</td>
<td>1027</td>
<td>1020</td>
</tr>
<tr>
<td>Literates</td>
<td>1,109,613</td>
<td>1,188,649</td>
</tr>
<tr>
<td>Male Literates</td>
<td>598,201</td>
<td>625,763</td>
</tr>
<tr>
<td>Female Literates</td>
<td>511,412</td>
<td>562,886</td>
</tr>
<tr>
<td>Average Literacy</td>
<td>79.49 %</td>
<td>86.40 %</td>
</tr>
<tr>
<td>Male Literacy</td>
<td>87.18 %</td>
<td>92.16 %</td>
</tr>
<tr>
<td>Female Literacy</td>
<td>72.06 %</td>
<td>80.79 %</td>
</tr>
</tbody>
</table>

**Source:** Tirunelveli District Hand Book 2011-12

### Table 3.7: Classification of Workers (Nos.)

<table>
<thead>
<tr>
<th>Workers</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivators</td>
<td>2, 51,257</td>
</tr>
<tr>
<td>Small &amp; marginal farmers</td>
<td>2, 06,252</td>
</tr>
<tr>
<td>Agricultural labourers</td>
<td>3, 49,069</td>
</tr>
<tr>
<td>Artisans</td>
<td>23,687</td>
</tr>
<tr>
<td>Household / Cottage industries</td>
<td>1, 90,122</td>
</tr>
<tr>
<td>Allied agro – activities</td>
<td>73,428</td>
</tr>
<tr>
<td>Other workers</td>
<td>3, 15,595</td>
</tr>
</tbody>
</table>

**Source:** Tirunelveli District Hand Book 2011-12
3.3.7 Transport Services

Transport services play a vital role in the economic development of the nation opening up remote areas, stimulating the growth of agriculture as well as industry, besides facilitating communication. Transport services also contribute to the growth of the nation’s economy.

The road network in Tirunelveli district consists of national highways (94.000 km), national highways (A1) (181.00 km), state highways (561.039 km), corporation and municipalities road (1001.54 km), Panchayat union and Panchayat road (1658.35 km), town Panchayat and township road (863.51 km) and forest roads (114.450 km). The national highway road from Madras to Nagercoil connects the district headquarter with Madurai, Virudhunader and Nagercoil and also connects the main cities within the Tirunelveli District. The railway network in Tirunelveli district consists of broad gauge (229.878 km). Tirunelveli district consists of totally 27 railway stations.

3.3.8 Educational Services

Tirunelveli district, or more specifically, Palayamkottai, is called the Oxford of South India as the city has excellent educational institutions. The Manonmaniam Sundaranar University is named after the famous poet who penned the Tamil Thai Vazhthu, the official song of the state. This University has 26 departments, and offers some unique courses in Tamil Nadu, like Criminology and Criminal justice. In view of improving the quality of technical education in the southern parts of Tamil Nadu, Anna University Tirunelveli was established in 2007. The University offers a variety of engineering and technology courses in both undergraduate and postgraduate streams. Research facilities are being established in a start-of-the-art campus near
Palayamkottai. The district has many prestigious old government and private colleges in the medical, legal, engineering, arts, pharmaceutical and physiotherapy fields. School education is from the government and private managements in the district.109

### Table 3.8: Number of Educational Institutions in the District

<table>
<thead>
<tr>
<th>S.No</th>
<th>Educational Institutions</th>
<th>Total Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Universities</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Arts and Science Colleges</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>Medical Colleges</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Physiotherapy College</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Engineering Colleges</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>Law College</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Pre Kindergarten Schools</td>
<td>241</td>
</tr>
<tr>
<td>8</td>
<td>Primary Schools</td>
<td>1521</td>
</tr>
<tr>
<td>9</td>
<td>Middle Schools</td>
<td>431</td>
</tr>
<tr>
<td>10</td>
<td>High Schools</td>
<td>114</td>
</tr>
<tr>
<td>11</td>
<td>Higher Secondary Schools</td>
<td>185</td>
</tr>
<tr>
<td>12</td>
<td>Teacher Training Institutes</td>
<td>28</td>
</tr>
</tbody>
</table>

**Source:** District Profile – Hand Book 2011 – 12

### 3.4 CHAPTER SUMMARY

Consumers often drink packaged drinking water as an alternative to tap water. They think it tastes better (no chlorine taste) and perceive it to be safer and of better quality. They also look for security. Food scandals in industrialized countries and water-borne diseases in developing countries greatly influence consumer’s attitudes. Consumers buy bottle water to feel well and to lose weight, packaged drinking water

is perceived as a healthy alternative to other beverages, higher living standards and auto usage enable people to easily bring home more and heavier bottles of water. In the offices bottle water is now a common sight on the desk, next to the computer and the telephone. Drinking packaged drinking water is a sign of a rise in the social scale. Above all, packaged drinking water has become a huge marketing success. Further insight to the challenges facing the brand can be gained by identifying which members of the buying centre will be the users, influencers, deciders and buyers.

This chapter dealt with consumers’ attitude, production and marketing of packaged drinking water and profile of the study area (Tirunelveli District). About consumer attitude concept, Packaged drinking water global level, leading players, global developments, Indian level of packaged drinking water, law point of view, packaged drinking water in Tamilnadu and manufacturing level, Amma mineral water, packaged drinking water in Tirunelveli and Taluk level of packaged drinking water bottling design, quantity and packaging requirements and types of packages and BIS standards, marketing level of packaged drinking water industry in market value growth, global level of share value, market players share volume, safety of packaged drinking water, need of packaged drinking water, advantages of packaged drinking water and finally profile of the study area were discussed and explained in this chapter.