A STUDY OF CONSUMER BEHAVIOUR WITH REGARD TO BIODEGRADABLE PRODUCTS IN AIZAWL, MIZORAM

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A STUDY OF CONSUMER BEHAVIOUR WITH REGARD TO BIODEGRADABLE PRODUCTS IN AIZAWL, MIZORAM

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CERTIFICATE

This is to certify that MPhil dissertation entitled "A Study of Consumer Behaviour with Regard to Biodegradable Products in Aizawl, Mizoram" by Alexius Lalchhandama Regn. No. MZU/M.Phil./564 of 29.05.2020 has written the project under my supervision.

He has fulfilled all the required norms laid down under the "Prevention of **plagiarism** in higher Educational Institution (**HEI**) Regulations, 2018" laid down University Grant Commission, New Delhi. The dissertation is the result of his own investigation. Neither the research work as a whole nor any part of it was ever submitted to any university/ institution for any degree.

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DECLARATION

I, **Alexius Lalchhandama**, hereby declare that the subject matter of this thesis is the record work done by me, that the content of this thesis did not form basis of the award of any previous degree to me or to do the best of my knowledge to anybody else, and that the thesis has not been submitted by me for any research degree in any other University/Institute.

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LIST OF ABBREVIATIONS

AMC	: Aizawl Municipal Corporation
PPP	: Public Private Partnership

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1.1. Introduction

The development and the growth of population, increasing urbanization and technological innovations due to the rising standard of living are some of the major causes of waste generation in urban areas. In global scenario the solid waste generated in 2002 is 12 billion tons and it is estimated that in 2025 the global waste generation will be 25 billion tons approximately (Yoshizawa et al., 2005). In India metro cities like Hyderabad, Chennai and Bengaluru are the highest waste produced cities. According to India-water-portal website an individual is estimated to produce an average of 0.8kg/waste/person daily in India. The total municipal solid waste generated in urban India has been estimated at 68.8 million tons per year. The average collection efficiency of municipal solid waste ranges from 22% to 60%. Presently in India, the solid waste generated is about 960 million tons per year. However the Municipal waste generated in India seems to higher than the estimated data (Pappu et. al., 2007).

Within Aizawl Municipal Corporation area, it has been calculated that 159.88 metric tons is generated per day. Out of which, biodegradable products are 60.75 metric tons or 38% of the total wastes. 62.35 metric tons, i.e., 39% is a recyclable wastes and 36.77 metric tons, i.e., 23% is inert ash and debris. The waste generated per capita per day is 495 grams (Lalchhuanawma, 2018).

The difficulty in managing waste is faced most by third world countries (Delmond, 2015) and poor waste management causes several diseases as well as damage to the environment, ecology and climate (Elangovan, 2006). The impact of non-biodegradable products is one of the major global concerns and many consumers are becoming aware and interested in environmentally friendly products, which less hamper the environment. This tendency resulted in the demand for ‘green products’, though the supply of such products is limited initially (Vasanthi and Kavitha, 2016).

In today’s world, consumption of environmental concern products is an essential issue for marketing practitioners and policy-makers. As such, the pressure on environmental friendly concern resulted in the inclusion of corporate social

responsibility within corporate strategies (Johnstone and Tan, 2015). The increasing awareness campaign on the negative effects on the consumption of non-biodegradable products let the consumers resort to the use of biodegradable products (Santos et al., 2013). Consumer choices reflect not only price and quality preferences but also social and moral values, as witnessed in the remarkable growth of the global market for organic and environmentally friendly products (Sehgal and Singh, 2010). The rise of consciousness and awareness on the issue of non-biodegradable products and its impact on nature and its environment came to be the center of exercise.

Therefore the present study deals with biodegradable and compostable products which are produced in Aizawl and focus laid upon consumer behaviour. It also deals with profiling of biodegradable products in Mizoram as well as consumer behaviour towards the Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019. The study also compares the suburb and urban areas of Aizawl in terms of its waste management and the level of awareness among consumers in the suburb and urban areas of the city.

1.2. Concept of Consumer Behaviour

The concept of consumer behaviour began to develop in the late 1950s to 1960s by heavily relying on psychology as a source for conceptual borrowing (Schiffman and Kanuk, 1997). From 1950s to mid-1970s, many marketing scholars shows interest in this fields and there is a huge development in the contents of literature. With the development in the concepts it widen the scope and borrowed several academic disciplines such as sociology, economics, and cultural anthropology apart from psychology and social psychology (Schiffman and Kanuk, 1997).

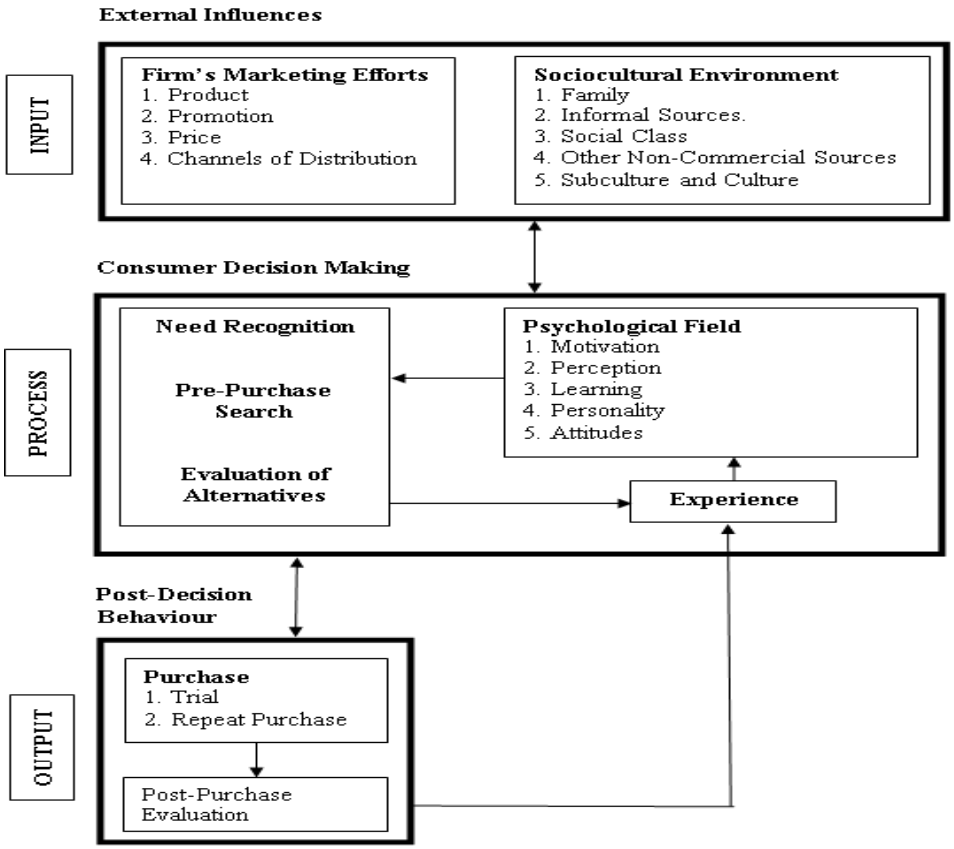
In the early stages consumer behaviour were designed from the managerial perspective which was based on economic theory. It was emphasized from the managerial perspectives for the prediction of the consumption related behaviour (Suja, 2005). Many academician shows interest in the subject as consumer behaviour is influenced by many disciplines and it aids in understanding the consumption

behaviour (Pachauri, 2002). While conducting research, researcher found that it is important to segment the market as consumer behaviour is highly influenced by special needs, personalities, preferences etc. Similarly, consumer behaviour also helps in positioning the products (Suja, 2005).

Many authors have defined consumer behaviour in several ways. However in summarising several consumer behaviour definitions it could be defined as "the behaviour that consumer display in searching for, purchasing, using, evaluating and disposing of products, services and ideas in which their expect will satisfy their needs" (Schiffman and Kanuk, 1997). To elaborate it further, consumer behaviour is concerned about how people make a decision on spending their available or limited resources such as their time, money and efforts on consumption related products and services. This covers what they buy, why they buy it, when they buy it, where they buy it, how often they buy it, how much they buy it, how often they use it, how they assess it after the purchase and consumption, the effect of those assessments on future purchases, and how they dispose of it. This point of view emphasized the fact that customer behaviour is not just buying things or getting services. It starts well before the products or services are acquired or obtained.

Exhibit 1.1

A simplified model of consumer decision making



Source: Schiffman LG and Kanuk LL (2008), Consumer Behaviour, Pearson Prentice Hall, pp.36

Input: In the input stage, the external influences that act as sources of information about a particular product and affect a consumer product-related beliefs, behaviours, and actions are used as inputs in the consumer decision-making model. The marketing mix activities of companies that aim to communicate the benefits of their products and services to prospective consumers, as well as non-marketing sociocultural influences that, when internalised, affect the consumer's purchase decisions, are among the most important input factors.

Marketing Inputs: The Company's marketing efforts are aimed at reaching, informing, and persuading customers to purchase and use its products and services. These decision making process input takes in the form of a specific marketing mix

strategies which consists of the product itself (including its package, size, and guarantees); direct marketing, mass media advertisements, personal selling, and other promotional efforts; pricing policy; and the selection of distribution channels to move the product from the manufacturer to the consumer.

Ultimately, the effectiveness of a company's marketing activities is largely determined by how customers perceive those efforts. As a result, rather than depending on the intended effect of their marketing campaigns, advertisers would be prudent to sponsor customer analysis to keep informed about consumer expectations.

Sociocultural inputs: The customer is often influenced by the second type of input, the sociocultural environment. A broad variety of noncommercial factors make up sociocultural inputs. While less observable, the effects of social class, culture, and subculture are significant input factors that affect how consumers assess and eventually accept (or reject) products. Culture's unwritten codes of conduct implicitly suggest the consumption behaviours to be deemed "right" or "wrong" at any given point in time.

Process: The model's process stage focuses on how consumers make decisions. Individual psychological factors (motivation, perception, learning, personality, and attitudes) determine how external inputs from the input stage impact the customer's recognition of a need, pre-purchase information quest, and alternative evaluation. The act of making a consumer decision consists of three stages at this point: (1) need recognition, (2) pre-purchase search, and (3) alternative evaluation. The consumer's existing psychological attributes are affected by the experience gained through alternative evaluation.

Need recognition: When a customer is confronted with a problem, they are more likely to recognise a need. There tend to be two distinct need or problem recognition styles among consumers. Some consumers are actual state types, meaning they feel they have a problem when a product fails to fulfil their expectations. Other consumers, on the other hand, are desired state forms for which the need for something new can be the trigger for making a decision.

Pre-purchase search: This stage begins when a customer recognises a need that may be met by purchasing and using a product. The consumer's recollection of past experiences may provide ample details to make the present decision. When a customer has no previous knowledge, he or she will need to perform a detailed search of the outside environment for pertinent details from which to make a decision.

Alternative evaluation: Consumers often use two types of information when evaluating potential alternatives: a list of brands from which they plan to choose and the criteria they will use to evaluate each brand.

Output: Purchase behaviour and post-purchase evaluation are two associated post-decision behaviours in the consumer decision making model's output stage. All activities have the purpose of increasing the customer's satisfaction with his or her purchase. Before making a good decision, one should receive both reliable and "up-to-date" knowledge about the commodity that is available, as well as an understanding of the data's basic significance.

Puchase behaviour: Trial purchases, repeat purchases, and long-term commitment purchases are the three categories of purchases made by consumers. Unlike a trial, where the buyer uses the product on a small scale and without committing, a repeat purchase typically indicates that the product has gained the consumer's approval and that he or she is likely to try it again in greater amounts.

Post-purchase evaluation: Consumers evaluate a product's success in terms of their own expectations when they use it, particularly during a trial purchase. These assessments may result in one of three outcomes: (a) Actual performance meets expectations, resulting in a neutral feeling; (b) actual performance exceeds expectations, resulting in positive disconfirmation of expectations (which leads to satisfaction); and (c) actual performance falls short of expectations, resulting in negative disconfirmation of expectations (which leads to dissatisfaction).

Keywords Definition of Consumer:

Consumer is the one who actually participate in the consumption process. The one who purchase or acquire goods or services for his/her personal consumption or to meet the collective needs of the family and households needs but not for resale or used in another production form or manufacturing another output. In this study consumer implies the following points:

1. Any person who consume biodegradable and non-biodegradable carry bags and cups for their own consumption or for their household consumption.

2. Any person or households who consume the service (disposal of solid-waste) provided by Aizawl Municipal Corporation.

1.3. Concept of biodegradable products:

Biodegradable products are those products which have the ability or capability to break down its basic components into the nature (with the help of exposure into air, moisture and elements) without leaving any toxins or in the form of innocuous products by the actions of micro-organisms like fungi, bacteria and other natural biological processes (Chait, 2019) and disappear into the environment. However, depending upon the components of the products and the atmospheric conditions the time taken to decompose varies from a month to a million years (BIO Intelligence Service, 2012).

Most of the academic journals and publications do not distinguish between the term "biodegradability" and "compostability" which may lead the consumer to confusion and potential misunderstanding. DG-Environment European Commission (2012) reports have highlighted the basic definitions of different term used in biodegradable products and its materials as follows:

Biodegradable materials: "Materials that can be degraded by living organisms – in particular microorganisms – into water, carbon dioxide, methane and possibly non-toxic residue".

Biomaterials: “Compounds that are naturally synthesised in the environment (flora and fauna)”.

Bio-based products: “Products that are produced from renewable resources in contrast with petroleum – based products. Bio-based products can be either biodegradable or non-biodegradable”.

Biopolymers: “Paper and plastic materials that are manufactured with renewable resources”.

Compostable materials: “Products that can be decomposed by living organisms into water, carbon dioxide, methane and possibly non-toxic residues under controlled conditions. What is compostable is technically biodegradable. However, what is technically biodegradable is not necessarily compostable depending on the specific controlled conditions”.

Degradation or Decomposition: “Molecular unbinding of the compound due to physical, chemical or biological actions that may lead to the loss of the initial properties of the compound”.

OXO-biodegradation is biodegradation as defined by the European Committee for Standardization (CEN) in CEN/TR 1535–2006, as "degradation resulting from oxidative and cell-mediated phenomena, either simultaneously or successively".

Keywords Definition of Biodegradable Products:

Biodegradable products are those products that can be degraded by particular microorganisms – into water, carbon dioxide, methane and possibly non-toxic residue. But in this study biodegradable implies any products which are made from bio-polymers and compostable materials, which can degrade either in controlled or non-controlled conditions.

1.4. Profile of Mizoram

Mizoram is located in the North-Eastern parts of India. It is the 23rd state of India, which is officially announced on 20th February 1987. Mizoram shares borders with the states of Assam on the North, Tripura on the West, and Manipur on the East. Mizoram also shares borders with countries like Bangladesh in the west and Myanmar in the east and south. The state capital is Aizawl which is located in the north-central part of the state.

Exhibit 1.2

Location of Mizoram in India

Source: https://i.pinimg.com/originals/2e/f9/87/2ef9877f54e2d4f5eab4cc88688-c6bfd.jpg

Mizoram has covered a total area of 21,081 square kilometers and is located between the latitudes of 92.15 and 93.29 degrees east and 21.58 and 24.35 degrees north. The state's length from north to south is 277 kilometers, and its width from east to west is 121 kilometers. The topography of Mizoram consists predominantly of the mountainous terrain of tertiary rocks. The mountain ranges run from north to south direction and largely taper from the middle of the state. Only a few and small patches of flat land lie between these ranges, which are separated by a narrow and deep river valley. Mizoram's terrain is young, and most of the landforms are the result of erosion.

Mizoram has a number of rivers, streams, and brooks that originate in the state's central region and flow south or north, depending on the direction of the north-south trending ridges. Tlawng, Tuirial, Tuivai, and Tuivawl are important rivers that flow north, while Tiau, Chhimtuipui, and Khawthlangtuipui flow south.

Mizoram has a moderate climate because the Tropic of Cancer runs through the state. It is directly influenced by the southwest monsoons and thus receives adequate rainfall. Mizoram receives an average of 2111 millimeters of rain per year. Winter usually begins in November and lasts until February. There is very little rain during this time, and the temperature ranges from 11 to 23 degrees Celsius. Spring lasts from the end of February to the middle of April, with temperatures ranging from 14 to 18 degrees Celsius. May to September is the rainy season, with July and August being the wettest months. During the summer, the temperature ranges between 25 and 30 degrees Celsius. September and October are the autumn months when temperatures range from 18 to 25 degrees Celsius and rain falls in sporadic showers.

The state's total forest area is 19,183 square kilometers, and agriculture is the primary occupation of the people. However, the traditional method of shifting cultivation known as ‘jhumming' has caused a slew of issues for farmers and forests alike, as it results in lower fertility and a shorter jhum cycle. Therefore, only small-scale and traditional industries thrive, with no major industries to brag about. The

ratio of total workers to the total population is 52.57 percent (Main Workers: 3, 62,450 and Marginal Workers: 1, 04,709).

Mizoram has eleven districts, three autonomous district councils, twenty-three subdivisions, and twenty-six rural development blocks. According to the 2011 Census of India, there are 830 villages and 23 notified towns, with 704 inhabited and 126 uninhabited villages. According to the 2011 Census of India, Mizoram has a population of 10, 91,014 people consisting of 5,52,339 Males and 5,38,675 Females. The rural population is 5,29,037, while the urban population is 5,61,977. The population density is 52 persons per square kilometer. Mizoram is one of India's most urbanized states, and it is also the only state where there are no "homeless." According to the 2011 Census of India, 51.12 percent of India's population live in cities. Mizoram is the second-highest in terms of literacy rate, 91.58% (Males: 93.72% and Females: 89.40%) next to Kerela.

Mizoram's population is made up of many ethnic groups that are culturally and linguistically related. Mizo is an umbrella term that encompasses all Mizoram's ethnic groups. The Mizo tribe is divided into several clans, each of which is subdivided into sub-clans with minor linguistic differences. Despite the lack of an authentic record of the Mizo's existence prior to the 17th century, most scholars believe they migrated to their current location from southern China, probably Yunnan province, via northern Myanmar. The Mizo's are a close-knit, homogeneous society that does not discriminate based on gender or class. They are a distinct community, with the village serving as the social unit in which a Mizo's life revolved. The Mizo code of conduct or ethics, which directs their thoughts and acts in war and peace, is known as 'Tlawmngaihna,' an untranslatable word that means hospitable, kind, unselfish, and supportive to others to the Mizo. It also represents self-sacrifice for the greater good. The Mizo perform all voluntary services under the valuable tradition of ‘Tlawmngaihna,' which is still practiced today.

The Mizo had neither a systematic governing institution nor an explicit legal system prior to the British annexation of Mizoram. Clan-wise Chiefs were chosen based on power, force, and courage rather than lineage. With the arrival

of Zahmuaka, however, chieftainship became hereditary. Through the Council of Elders, the Chief exercised many executive and judicial powers over his subjects. In 1890, the British occupied Mizoram, then known as the Lushai Hills, as part of a pacification strategy rather than a desire to expand British imperialism. The British followed a policy of non-interference with the tribes' political relations and administration.

The Lushai Hills was declared an "Excluded Area" and kept isolated from the rest of the world. The administration was unaffected by the Government of India Acts of 1919 and 1935. Chieftainship was abolished in 1952 after independence, and the Lushai Hills became an Assam district until 21 January 1972, when it was given the status of a Union Territory under the Indian Union. On February 20, 1987, it was declared as India's twenty-third state. Local governance was carried out by directly elected Village Councils in both urban and rural areas (VCs).

1.5. Biodegradable Products in Mizoram

With the rise in levels of awareness and the implementation of “Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019”, many of the Mizoram Self-help groups came up with an initiative to manufacture paper bags by using newspapers and other waste materials. This mission was undertaken by Urban Development and Poverty Alleviation. This action gives a hope to many women of Mizo. These self-help groups also organised awareness campaign on the effect of plastic and polythene bags and workshop for making of paper bags was conducted in several educational institutions. These paper bags have been distributed to local retailers by giving awareness of the negative effect of polythene and plastic carry bags. Apart from this, the manufacturing of disposable plate made from arecanut leaves is manufactured in Mizoram. Some of the entrepreneur in Aizawl works to fill the gap by taking the opportunity of manufacturing compostable carry bags and disposable cups. This dissertation also tries to carry out the profiling of such biodegradable products which are produced in Aizawl.

1.6. Plastic waste management in Aizawl

The capital of Mizoram, Aizawl becomes one of the most urbanised districts in Mizoram with the growing of population. The urbanisation increases the production of solid waste which causes several problems in solid waste management. However, the awareness of solid waste management and sanitation occur since the period of Mizo District Council (Lalneihzovi and Lalchhuanawma, 2018). When Mizoram became one of the states of India in 20 February 1987, each of the Local councils have undertaken such solid waste management and Pollution control board has monitor the production of pollution and waste generated in the state. With the increasing in awareness several students clubs was formed such as Mizoram Eco-club and other student's eco- clubs was formed. In 2009 the Local Council starts collecting solid waste by means of Public Private Partnership (PPP). With the existence of Aizawl Municipal Corporation in 2010 as per 74th Constitution Amendment Act, solid waste management was undertaken by Aizawl Municipal Corporation.

"The Aizawl Municipal Corporation plastic Waste Management Bye-Laws 2019" is exercised as per the power conferred by Rule 6(4) of the "Plastic Waste Management Rules, 2016". This Bye-law is exercised from 1st August 2019. The Aizawl Municipal Corporation does not allow to generate bulk wastes (not exceeding 100 Kg per day) by the state government departments, public sector undertakings or private companies, local bodies, hospitals, nursing homes, schools, universities and other educational institutions, hotels, hostels, markets, worship places, sports complexes, etc.

This Bye-law restricted distributing, selling or manufacturing of carry bags made from plastic materials or compostable plastic materials which are used for carrying or dispensing commodities. However it does not include bags used for packaging of goods which are sealed prior to use. This Bye-law is made to minimize the use of plastic within the ambit of Aizawl Municipal Corporation by giving awareness on the problems and effect on the environment due to excessive use of

plastic. It also suggests producers and retailers to take steps for the substitution of plastic bags to other biodegradable and recyclable materials.

1.7. Significance of the study:

In the collection of Municipal waste by Public Private Partnership, barely 80.44 per cent of household wastes are usually collected, the rest of the wastes are disposed to streams (Lalneihzovi and Lalchhuanawma, 2018). The effect of this unmindful disposal is not felt initially. Although consumers are aware of the impact on the environment, discontinuation of its usage is found to be nearly impossible. Due to this reason, it can be questioned whether the value of biodegradable products is not realised or the consumption of non-biodegradable products is already too naturalised so much so that its usage cannot be stopped abruptly.

The awareness and consumption of biodegradable products matters a lot for safeguarding environmental degradation. So, it is necessary to study consumer behaviour which could change the awareness and consumption of such eco – friendly products. With the growth of development and technology some Mizo producers produce biodegradable products which could substitute plastic products. Profiling of such products is necessary as it has contributions to environmental protection.

Many of the consumers and retailers have challenges in the implementation of the “Aizawl Municipal Corporation Plastic Waste Management Bye-Laws 2019”. The consumption behaviour of Mizo people towards biodegradable products and the awareness of this Bye-laws 2019 could be beneficial for the marketers and policy makers to successfully implementing the laws.

1.8. Scope of the study:

The study deals with biodegradable and compostable products which are produced in Aizawl and focus laid upon consumer behaviour. It also deals with consumer behaviour towards the Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019. The study area cover the areas within the jurisdiction of Aizawl Municipal Corporation, consisting of 50 Local Councils.

1.9. Objectives of the study

The objectives of the study are as follows:

1. To analyse the profile of biodegradable products produced within Aizawl.
2. To examine the level of awareness among consumer's on biodegradable products.
3. To examine restrictions of plastic carry bag and its impact on consumer behaviour.
4. To examine the challenges faced and coping strategies applied in the process of restrictions of plastic carry bag.
5. To provide policy suggestion for effective and efficient use of biodegradable products in Mizoram.

1.10. Hypothesis:

H1. There is a significant relationship between age groups of consumers and level of awareness.

H2. There is a significant difference between level of awareness in biodegradable products among consumers in urban and suburb areas in Aizawl.

H3. There is a significant difference on usage of biodegradable products among consumers in urban and suburb areas in Aizawl.

1.11. Limitation of the study

1. There is possibility of dishonesty in responding the questionnaire among the respondent and technical glitch as majority (70 percent approximately) of the data are collected through google forms.

3. The study is limited to the Aizawl Municipal Corporation jurisdiction only, therefore the study is demographically limited to the residents of Aizawl.

4. The sampling covers only 8 wards out 19 wards, further analysis of a large size (whole Aizawl Municipal Corporation ward) may represent a different result of the study.

5. Information gathered from the internet regarding the production biodegradable in Aizawl was not seen in reality while conducting profiling.

6. During the profiling of Biodegradable producers in Aizawl, there could be left out or unidentified biodegradable products producer in Aizawl.

1.12. Chapterization

Chapter 1: Introduction

This chapter begins with the increasing production of solid waste in terms of global scenario to national and state level and how such production of solid wastes creates problems to the world. This chapter includes the concept consumer behaviour and biodegradable products. It briefly profiling the state of Mizoram where the study was carried out. It includes biodegradable products in Mizoram as well as plastic waste management in Aizawl. This chapter includes significance of the study, scope, objectives of the study, hypothesis and limitation of the study.

Chapter 2: Literature Review

This chapter deals with the consumer behaviour with regards to Eco-friendly products which was conducted in international, national and state level. It also review solid waste management related which are conducted in the state level. At the end of the chapter the research gap was highlighted.

Chapter 3: Profiling of Biodegradable products produce in Aizawl.

This chapter deals with identifying or profiling those entrepreneur producing biodegradable or eco-friendly products within Aizawl. It also includes consumer awareness about the production of such biodegradable products.

Chapter 4: Research Design

This chapter deals with how the study was carried out. It includes statement of the problems, sources of the data, population, under which a brief profile of

Aizawl Municipal Corporation is highlighted. It also includes sampling methods and tool used for analysis.

Chapter 5: Data Analysis

This chapter deals with the analysis of the data. It includes demographic profile of the respondents, awareness level of the respondents regarding biodegradable products, consumer behavior towards Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019 and hypothesis testing.

Chapter 6: Findings and Conclusion

This section deals with findings from the analysis of hypothesis, findings from profiling of biodegradable products in Aizawl and findings from the analysis of consumer behaviour among respondents with regard to Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019. It also includes suggestion to various stakeholders.

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2.1. Introduction

This chapter contains review of literature related to consumer behaviour towards eco-friendly products as well as studies related to solid waste management which was carried out in Mizoram. The review is categorised into three groups: researches at the international level, researches at the national level, and researches in Mizoram. In this literature review, chronological methods is used in order to identify the research gap.

2.2. Studies conducted at the International level:

Schwepker and Cornwell (1991) drew a model to exam ecologically conscious consumers by using variables such as locus of control, alienation, social responsibility, purchase intentions, attitude toward litter, perception of pollution, attitude and living towards ecological consciousness for determining the discrepancies that existed between who were willing to purchase and unwilling to purchase environmentally friendly products. The results declared that, attitude toward litter, attitudes toward ecologically conscious living, perception of pollution as a problem and locus of control were the factors for discrepancies i.e., they were more incline to purchase eco-friendly products. However, the authors suggested that these attitudes could be changed with the changing awareness of ecologically friendly products, and highlighted that, those who did not currently purchase eco-friendly packages may purchase with the increase in awareness. So, the authors mentioned that individual, marketers and government have an important role for changing such attitudes.

Roozen and Pelsmacker (1998) studied the attribute of eco-friendly consumer behaviour and proposed methods to evaluate consumer value assessment on eco-friendly products regarding their characteristics and behaviour. The study examined the consumers' attitudes and opinions regarding green consumption value from the initial purchasing stage to the disposal stage. Such attitudes and opinions were measured by using conjoint analysis and found that consumers' green perceptions did

not directly indicateed the green behaviour of the consumers, but it gave indication of what consumers thought was eco-friendly.

Richard and Kalra (2002) drew the importance of developing alternatives products for conventional polymer such as polythene and water-soluble polymers such as detergent and cosmetics. The study also highlighted the importance of disposing biodegradable materials, and also mentioned consumers have low attitude and fewer values for biodegradable products. The study also suggested the usage of biodegradable polymers and water-soluble polymers for a more sustainable environment.

D'Souza et al. (2006) investigated how green consumers responded to product labels while purchasing. The study found that there were consumers, who found it difficult to read and understand the product labels. Meanwhile, there were green consumers who even preferred to buy green products, that have lower quality other than the alternative conventional products, and always looked for environmental information on labels. There were also green consumers who always read labels as well as prices of the products to acquire information in order to make purchasing decision. The study suggested that since eco-label is an important way to communicate and reach environmentally friendly consumers to achieve effective communication a, sufficient product features and a clear information are needed to be provided on the product labels.

Ritch et al. (2009) studied the challenges of sustainable development principles regarding plastic bag consumption. The study found that shifting of consumer from the consumption of conventional plastic bags into sustainable consumption is a huge challenge for government as well as corporate. So, the paper evaluated the environmental effects of plastic bag consumption and the initiatives taken by government and corporate. And the conclusion was drawn from the perspectives of the consumers as well as government policy.

Chen and Chai (2010) studied consumer attitudes towards environment and green products from consumers' perspectives. The study examined the attitudes of

the consumers into three dimensions, such as personal norms, environmental protection and government role. The study also investigated and compared attitudes towards the environment and green products between genders and found no significant relationship. The findings revealed that governmental role and personal norms towards environment highly affect consumers' attitudes on eco-friendly products. Personal norms towards environment was most significant in influencing factors of consumer attitudes while the environmental protection did not have any influence on the consumer's attitudes towards green products.

Paço and Raposo (2010) studied green consumer market segmentation in Portugal. The study utilised several environmental variables to identify distinct market segments. The segmentation was done into three segments such as "The Uncommited", "The Green Activist", and "the Undefined". The results highlighted that the segmentation is significant enough to differentiate green consumer groups from other segments. The study found that many Portuguese consumers support environmental improvement policies but this policy is not the main reason for consumers' eco-friendly actions.

Sehgal and Singh (2010) studied various concepts of eco-friendly products such as eco-labeling, green marketing concepts and the reasons for the rise of eco-friendly business promotion. This paper also underwent a thorough literature review on consumer behaviour such as consumer buying behaviour, ethical consumerism and the impact of eco-friendly products and consumer buying behaviour. The study highlighted the negative and positive impact of eco-friendly products on consumer buying behaviour.

Leonidou et al. (2010) studied the consumer preferences and purchasing behaviour among Cypriot consumers by examining and seeking the relationship between how consumer involvement and attitude toward cultural, political, and their ethical values effected the purchasing behaviour of the environmental friendly consumer, having inward and outward attitudes. The study found that the degree of collectivism, political involvement, ethical values, obedience to the laws and their long term orientation towards environment had positively influenced the inward and

outwards attitudes of the consumers. The inward environmental attitudes highly influenced the purchasing of eco-friendly products where consumers met product satisfaction. While the outward environmental attitudes impeded assuming a general environmental behaviour.

Dangelico and Devashish (2010) studied large and medium size company in Italy and Canada for the purpose of enquiring the strategies and challenges faced while developing green products. This study drew different dimensions of green product motivations such as green productions, the target (customers) and the environmental policies for providing solutions to the risks and challenges faced by firms in various aspects of green product innovation.

Yue et al. (2010) studied consumer preference and their willingness to pay for biodegradable floral package and container, using conjoint analysis by framing sets of hypothetical questions. The study found that the willingness to pay premium price highly depended on the types of biodegradable containers.

Tan (2011) studied the motivating factor, such as environmental threat, environmental knowledge, and perceived consumer effectiveness which could effect and change consumer behaviour towards pro-environmental behaviour in Malaysia by means of reviewing conceptual and empirical literature and propose conceptual model to be considered for green purchase behavioural studies.

Santos et al. (2013) highlighted the implementation of Municipal law 9529/2008 and the introduction of compostable bags, which substituted plastic carrier bags in Belo Horizonte, Brazil. The study is conducted to identify how compostable bags had impact on the consumer purchasing behaviour and assessed whether consumers support municipal law and their willingness to change their purchasing behaviour for eco-friendly products. The study found that the people of Belo Horizonte, Brazil were increasingly concerned on eco-friendly products and after the implementation of Municipal law, many consumers became aware and increased their value on bio-degradable products and accepted that they will change their purchasing behaviour in favor of green products.

Kong et al. (2014) studied how consumer perceptions have influenced consumer purchasing intention of green products by conceptualizing consumers' green product intention as a multidimensional variable, such as eco-label, green advertising, green corporate perception and green product value. The study found that green packaging and green advertising had no significant influence on green purchase intentions, while in the context of consumer perceptions, eco-labeling, green product value and green corporate perception showed significant impact on consumers' purchase intention towards green products.

Johnstone and Tan (2015) studied the reason why consumers who had lots of awareness and concern about the environment chose not to buy environmental friendly products and found a gap. The study explored consumers' perceptions and consumption practices to understand 'green gap', and several ethical barriers on green consumption had been identified. The study found that many consumers found it hard to be green and this created barriers in green purchasing practice. Furthermore, many consumers had unfavorable perception of green messages and green consumers. The study also suggested that green perception may also have an influenced on green purchase.

Joshi and Rahman (2015) studied green purchase behaviour by reviewing 53 empirical articles between 2000 – 2014. This paper identified and explained various barriers that affected green purchase decision making and provides possible explanation. This study measured the consumer purchasing behaviour into a broad category: individual decision maker and situational condition. This paper also provided the main predictors of consumer green purchase behaviour and provided suggestion to policy makers and managerial to formulate strategic implication in order to encourage consumer to purchase green products.

Sijtsema (2016) studied people's perception by exploratory research on bio-based products in 5 European countries and studied perceptions on bio-based: the positive associations of environmental issues like "naturalness" and "environmental friendly" and the negative environmental associations between technology and health issues, and the mixed feelings that can occur among people. The study utilized focus

group discussion in three European countries and found that many of the consumers were not aware of bio-based concept and how bio-based could be used as an additive values and should focus on environmental benefits as well as specific products benefits. The negative and positive association was explained by the "appeal of nature" while mixed feeling comes from the practical experience of the pros and cons of bio-based products.

Lobo and Greenland (2016) studied how the consumer biospheric values had an effect towards the consumption of eco-friendly appliances in Vietnam. The study revealed that the consumers' attitude towards environmental protection was positively influenced by their biospheric value which encouraged the purchase of eco-friendly home appliances. The study also found that consumer having biospheric values did not have perceived inconvenience to purchasing eco-friendly products and many consumer subjective norm was influenced by the consumers biospheric values.

Grimmer and Miles (2017) studied the gap between consumers' intention to purchase, and their actual purchasing behaviour of eco-friendly products, by using the conceptual model of "intention-behaviour gap" proposed by Carrington, Neville and Whitwell (2010). The study was conducted in Australia and found that consumers' intention led to actual behaviour while intention to purchase did not necessarily let the actual buying.

Paço et al. (2018) studied green consumer behaviour in England and Portugal and framed a new model for testing green consumer behaviour: prosocial attitude green consumption value and green communication. A self-administered questionnaire was used to collect survey data and Structural Equation Modeling was used to analyze the data. The study found that prosocial attitude of the consumer had influenced consumer green consumption values, and this green consumption values positively influence green buying behaviour, and consumers could also have idea on green advertising. However consumers green buying behaviour the relationship only had a weak influence from green advertising. The relationship is important to consider to further influence green behaviour when developing green marketing campaign and communication.

Haider et al. (2019) studied the needs and potentiality of biodegradable polymers for environmental sustainability. The study highlighted the required environmental conditions to degrade biodegradable polymer. The testing of biodegradable polymers in artificial environmental condition and real conditions was conducted and it was found that the necessities of testing the authenticity and relevancy of field testing of biodegradable polymers. In addition the study focused on the implication of eco-toxicological in biodegradable polymers. The study also considered the influence of biodegradable polymers towards consumer behaviour and Municipal wastes generation.

2.3. Studies conducted in India:

Elangovan (2000) conducted a study to identify green consumers' behaviour, perceptions and attitudes towards eco-friendly carry packages. The study highlights certain governmental laws for the protection of environment and particularly in solid waste management. The study also investigates the existence of discrepancies between attitudes and behaviour of green consumers. The studied found that, ecologically concerned consumers could be predict and identified from locus of control, alienation and social-demographic variability. The study also found existence of attitudes and behavioural discrepancies is due to market condition, cultural, limited choice, cost of the products and non- availability of the products.

Pappu et al. (2007) studied on hazardous and non-hazardous solid waste generation and its recycling potentials. The study found that Indian produces 960 Million tons of solid waste per year as a by-product of mining, industries, agriculture, municipal and other processes. The finding shows that 350 Million tones are organic wastes produced from agricultural activities, and inorganic wastes produced from industries and mining sectors are 290 Million tones and hazardous waste produced was 4.5 Million tones.

Manaktola and Jauhari (2007) studied and examined the influencing factors of consumer behaviour and attitudes towards green practices in lodging industries

and also explore the intentions to pay for these practices. The study found that consumer who use hotel service are aware of the environmental friendly practices and they valued the hotels who have green practices, but consumer are not willing to pay extra for the services.

Singh (2011) worked on the profiling of Indian Ecological consumer market. The main purpose of his study is to find out awareness or conscious level of Indian towards eco-friendly products and profiling consumer market. The study found that 71.5 per cent of Indian consumers have consciousness towards green products and the green consumer market could be segmented as: environmentally conscious, true environmentalist, comfort zones and un-deciders.

Maheshwari (2014) studies the awareness and buying behaviour of green consumer by examining consumer belief and attitudes towards green products. The study highlighted the efforts taken by the marketers for bringing awareness of green products to consumers and how awareness campaign have impact on consumer to choose green products. The study found that consumer has not seen enough marketing campaign nor do not aware much of green products.

Vasanthi and Kavitha (2016) studied consumer awareness and purchase behaviour of green products in the Tirupur City. The study found that most of the respondents of Tirupur city aware of green products showed a positive attitude towards green products. With regards to purchasing behaviour, majority of the respondents denied to buy green products because of the higher price than the conventional products.

Makhdoomi and Nazir (2016) studied consumer purchasing behaviour towards green products in Kashmir. The purpose of the study was to investigate the factors affecting consumer purchasing behaviour towards green products. He found that consumer satisfaction towards the products have highly influence the consumer purchasing of green products, while demographic factors have no impact towards purchasing behaviour.

Arora and Chahal (2017) examined the factors affecting consumer purchasing behaviour towards green products and its marketing in the state of Punjab and measure consumer awareness level and knowledge of green products. The study found that consumer green purchase behaviour is influenced by consumer environmental concern, perceived behaviour and eco-friendly activities. The study reveals that consumer in Punjab are highly aware of green products.

Jaiswal (2018), studies green consumer behaviour in the state of Uttar Pradesh by investigating the awareness level of consumers and consumers attitudes towards green products. The study examines factors affecting consumer green purchasing behaviour and draws a relationship between tools for marketing green products and the purchasing behaviour. Finally, consumer profiling is done cased on different segmentation like, demographic, behavioural criteria and consumer attitudes towards green products.

2.4. Studies related to Solid waste management in Aizawl

Janet Vanlalhlimpuii's (2013), "Public-Private Partnership in Municipal Solid Waste Management in Aizawl", carried out a study by interviewing experts and official opinion. The study is from the perspectives of issues and challenges faced by the administration and suggests how to improve in Municipal solid waste management.

Lalchhuanawma (2018) examined the satisfaction level of people on municipal services such as solid waste management, parking lots management, property tax, land use regulation and construction of building licensing regulations, etc. The paper examines public perception and satisfaction with the municipal council, and compares the pre-AMC and post-AMC periods. The findings of the study revealed that the Municipal Council has better solid waste collection services than the Village Council, and that citizens are also more satisfied with AMC's

services. This is due to a systematic public-private partnership-based method of garbage collection and disposal (solid waste management).

Lalneihzovi and Lalchhuanawma (2018) identified how widespread sanitation coverage is in the AMC area, as well as household participation rates. A survey is conducted using a random sampling method, two localities from each municipal ward are selected. An in-depth analysis is made possible by interviews held with local council leaders, inquiring about the state of solid waste disposal in their jurisdiction. According to the surveys, only 80.44 percent of households have participated in PPP mode, while the remaining 16.73 percent have not participated.

Singh and Devi's (2019) "Plastic Waste Management: A Review" highlights the issues and challenges confronting AMC in terms of collection, segregation, transportation, treatment, and disposal, as well as the health risks associated with plastic waste handling. The key challenges, according to the report, are limited to door-to-door collection, a lack of public awareness and willingness to participate, a lack of funds, a lack of scientific processing, recycling, and disposal technology.

2. 5. Research gap:

From the above literature review it is found that many researches regarding consumer behaviour towards ecologically concerned products are conducted internationally and nationally. But very few research is conducted regarding how consumer will cope with government strategies for banning plastics bags and how government banning of plastic carriage bags have an impact on the consumer behaviour. The profiling of eco-friendly products as well as the consumer awareness level towards biodegradable products has been least conducted in Mizoram.

So, this present study, "Consumer behaviour towards Biodegradable products in Aizawl, Mizoram" is undertaken to examine consumer awareness level of

ecologically friendly products as well as profiling of the bio-degradable products which are produced in Mizoram. Finally, this study also emphasizes how the Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019 has an impact on the consumers as well as the compliances made by consumers towards the Law (Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019). This study also examines how consumers' adopt coping strategies to overcome the restriction of plastic uses.

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3.1. Introduction

This chapter deals with enterprises who are manufacturing biodegradable disposable paper cups, plates, and carry bags within Aizawl, Mizoram. It includes the year of establishment, from where they import raw materials, quantity of production, marketing channel, scope, and problem faced by the producers. With the increasing consciousness of environmental degradation and the banning of plastic carry bag by Aizawl Municipal Corporation, some of the entrepreneurs started producing eco-friendly paper cups, plate and carry bag which can substitute plastic carry bag and other plastic disposable cup and plate. This chapter also highlights the awareness level of consumer regarding the production of biodegradable carry bag and biodegradable disposable cup in Aizawl

Profiling of enterprises, manufacturing such non-biodegradable disposable paper cups, plates, and carry bags are needed to be performed. A snowballing technique is used for finding those enterprises. So far, there are three enterprises, manufacturing eco-friendly disposable paper cups and one enterprise manufacturing eco-friendly carry bags within Aizawl. There are few supplier of eco-friendly paper pouch like Eco-Save and Thlihiau trading from Chaltlang, Aizawl. But they are ready-made importer and customized the labelling as per the order. However this study only focus on enterprises who manufacture by their own. An interview scheduled is used for collecting the data. The details are shown below in Table no.3.1

Table No. 3.1: Glimpse of the profiling of biodegradable products produced in Aizawl.

1.List of the enterprise			
Rolins Engineering	Skynet	Romte	RS Traders
2. Location of the enterprise			

Ramhlun North, Aizawl Near Presbyterian church	Chanmari, Aizawl Near IndusInd bank	Bethlehem Vengthlang	Dinthar, Aizawl Near Presbyterian church
3. Genesis of the business			
Installation of machine was in July, 2013.	2017	June, 2013	2019
4. Genesis of environmentally friendly products business			
On October 2013 they supply to the market	2017	2013	18th September 2019
5. Kinds of eco-friendly products produced			
Disposable paper Cup	Disposable paper Cup	Disposable paper Cup	Carry bag
6. Quantity of eco-friendly disposable cups or plates or carry bags produced in a single day			
Depending on the demand, approximately 50000 cups a day	Depending on the demand, 1000 - 5000 cups a day	Depending on the demand, the machine can produce 2400 cups per hour	Depending on the GSM (Gram per square meter), Appx. 5000 bags (diff. size and diff. GSM)
7. varieties of disposable cups or plates or carry bags produced			

only one type of cup	2 types of cup, 150 ml and 100 ml	only one type of cup	2 types of carry bag, W cut - size 1 to 9, D-cut - size 1 to 5.
8. Kinds of eco-friendly materials are used to manufacture products			
South Korean product named Kappa paper, which is imported to Delhi	OXO plastic material	PP coated material	Non-woven fabrics, oripol company
9. Sources of Raw Materials – Imported or Local			
Imported	Imported	Imported	Imported
10. Sources of Imported Raw Materials			
Imported from Delhi	NA	NA	NA
11. Sources of printing of the label on the disposable cup or plates or carry bags			
Printing was done in Delhi as the cost of production is lower.	Self-Print	Self-Print	Self-Print (customize could be done for customers)
12. Amount of sales in a month in a month.			

In a month, around 3000 pack was sold and in 1 pack contain 50 pieces of cups.	Depending on the demand,	Depending on the demand,	Depending on the demand,
13. Marketing channel?			
Direct retailing. Depending on the demand they give to retailer	They deliver depending on the demand.	They deliver depending on the demand.	They deliver depending on the demand.
14. Advertisement for your products			
No	Yes	No	Yes
15. Challenges Faced			
Eco-friendly paper plate do not last long to keep hot material. And it easily caught by mold which makes the cup or plate not fresh to keep eatable foods items.	None	The paper for making eco-friendly paper cup was not produced in India, it needs to imported which makesthe production cost higher as to compete plastic disposable cup. Cachar paper mill could manufacture eco-friendly paper cup material but it required 2000 tons to order at once. And for disposable plates the raw material needs to ship to Aizawl, so it do not makes much profit.	None

Source: Primary Data

3.2. Rolins Engineering:

Rolins Engineering is an enterprise, producing eco-friendly disposable paper cups. It is located in Ramhlun North, near Presbyterian Church, Aizawl, Mizoram. Rolins Engineering started their enterprise in the year 2013 and their machine was also installed this month. In October 2013, they started supplying their products to different unorganized retailers. Rolins Engineering has produced only one type of eco-friendly disposable paper cup, which contain a capacity of 150 ml.

Rolins Engineering used South Korean product named Kappa paper which is imported from South Korea to Delhi. From Delhi, they ordered the quantity required and imported to Aizawl, Mizoram. The printing on the paper cup was designed by themselves and for the cost reduction printing was done in Delhi. This could reduce the cost of production which provides an advantages in market competition.

Rolins Engineering paper cup machines can produce approximately 50000 cups in a single day. However, they usually make production depending on the order they received from unorganized retailers and some other occasional events. In a month they usually supply approximately 150000 pieces of paper cups to the market. They directly supply the demand by themselves to various unorganized retailers and other occasional events. Rolins Engineering does not do any kind of advertisement.

Rolins Engineering has a lot of challenges in the quality of eco-friendly paper. Eco-friendly paper cups and plates do not last long to keep hot material and they could be easily caught by mold, which makes the cup and plate not fresh for keeping eatable foods items.

3.3. Skynet

Skynet is an enterprise, producing eco-friendly disposable paper cups and importing other national manufactured paper plates, eco-friendly spoons, etc. It is located in Chanmari, near IndusInd Bank, Aizawl, Mizoram. Skynet started its enterprise in the year 2017 and their machine was also installed in the same year. In

2017, they started opening an outlet in Chanmari, Aizawl. They sell their products in retail and wholesale. They even supply their products to different unorganized retailers and the orders they received. Skynet has produced two types of eco-friendly disposable paper cups, which contain capacities of 150 ml and 100 ml.

Skynet used Oxo plastic material for making disposable paper cups. The printing on the paper cup was designed and printed by themselves in their Industry which is located in Chanmari West, Aizawl. Skynet paper cup machine produces depending on the demand they received. In a single day, they usually produce 1000 – 5000 cups. They directly supply the demand received by themselves to the various unorganized retailers and other occasional events. Skynet performs television advertisements in the local cable network.

3.4. Romte

Romte is an enterprise, producing eco-friendly disposable paper cups. It is located in Bethlehem Vengthlang, Aizawl, Mizoram. They are one of the first enterprises to start a paper cup business in Aizawl. Romte started their enterprise in the year June 2013 and their machine was also installed this month. In 2013, they started supplying their products to different unorganized retailers. They have produced only one type of eco-friendly disposable paper cup, which can contain the capacity of 150 ml.

Romte used PP coated material for manufacturing paper cup, which is imported from Kolkata. The printing on the paper cup was done by themselves and can be customized depending on the order they received. Romte paper cup machine can produce about 24000 cups in an hour. However, they usually make a production depending on the order they received from unorganized retailers and some other occasional events like birthdays, anniversaries, weddings, etc. They directly supply the demand by themselves to the various unorganized retailer and other occasional events. Romte does not do any kind of advertisement.

Romte has a lot of challenges in the production cost. The paper for making eco-friendly disposable paper cups was not produce in India. It needs to be imported from other countries this makes the cost of production higher and it makes it difficult to compete with other plastic disposable cups. Cachar paper mill, Silchar, Assam, could manufacture the material for making paper cups, but required 2000 tons of order. Romte used to manufacture biodegradable plates made from Areca nut leaves and they are one of the first enterprises that started produce biodegradable plates made from Areca nut leaves. But, transportation cost makes difficulties in the production of the biodegradable disposable plates in Aizawl.

3.5. RS Traders

RS Traders is an enterprise, producing eco-friendly carry bags. It is located in Dinthar, Aizawl, Mizoram. They are one of the first enterprises to start an eco-friendly carry bag business in Aizawl. RS Traders started their enterprise in the year 2019 and their machine was also installed this month. On 18th September 2019, they started supplying their products to different unorganized retailers. They have produced two types of eco-friendly carry bags, W-cut, and D-cut. W cut have a different size range from 1 to 9 and D-cut have 1 to 5 size.

RS Traders used Non-Woven fabrics, Oripol Company material for manufacturing carry bags, which is imported from Odisha. The printing on the paper cup was done by themselves and can be customized depending on the order they received. RS Traders carry bag machines can produce approximately 5000 bags in a day. The production quantity rate depends on Gram per square meter (GSM) and the size of the bags. However, they usually makes production depending on the order they received from unorganized and organized retailers. They directly supply the demand by themselves to the various retailers by themselves. RS Traders have performed a lot of sponsorships and advertisement in local cable network.

3.6. Consumer Awareness regarding the production of Biodegradable products within Aizawl.

This section deals with consumer awareness regarding the production of Biodegradable products within Aizawl areas. Firstly descriptive statistics was shown in table 3.2. Secondly, normality of the data was checked in table 3.3. Lastly mean rank comparison was conducted between urban and suburb areas by using Mann Whitney U test.

Table No. 3.2. Descriptive statistics of awareness regarding the productions of Biodegradable products within Aizawl.

Sl. No.	Particulars	Location	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
1	I know that Aizawl has produce biodegradable disposable cup and plate.	Suburb	10	6	83	49	52	200
		Urban	19	5	29	66	81	200
	Total		**29**	**11**	**112**	**115**	**133**	**400**
2	I Know that Mizoram has Produce bag which can substitute Plastic bag.	Suburb	13	18	80	51	38	200
		Urban	28	13	32	60	67	200
	Total		**41**	**31**	**112**	**111**	**105**	**400**

Source: Primary Data

Data Interpretation

The above table 3.2 serial no. 1, is regarding testing consumer knowledge about the production of biodegradable disposable cups and plates in Aizawl. From suburb, ‘neutral’ is the highest score, attaining 83. While in urban areas, ‘strongly agree’ is the highest score, attaining 81.

Serial no. 2 is regarding the testing of consumer knowledge about the production of carry-bag in Aizawl, which can substitute plastic bags. From suburb, 'neutral' is the highest score, attaining 80. While in urban areas, 'strongly agree' is the highest score, attaining 67.

Table No. 3.3. Normality Test of awareness regarding the productions of Biodegradable products within Aizawl.

Statement	Location	Kolmogorov-Smirnova				Shapiro-Wilk	
		Statistic	df	Sig.	Statistic	df	Sig.
I know that Aizawl has produce biodegradable disposable cup and plate.	Suburb	0.221	200	0.00	0.855	200	0.00
	Urban	0.259	200	0.00	0.784	200	0.00
I Know that Mizoram has Produce bag which can substitute Plastic bag.	Suburb	0.203	200	0.00	0.892	200	0.00
	Urban	0.243	200	0.00	0.829	200	0.00

Source: Primary Data **P<0.05**

Interpretation:

The above table 3.3 shows Kolmogorov-Smirnova and Shapiro Wilk test of normality. The null hypothesis is that "all the data are normally distributed". But in the above table, all the statement's P-value shows 0.00, which is less than 0.05. So, the null hypothesis is rejected and it can be concluded that all the data are not normally distributed. So, a Non-parametric test is needed to utilize for further analysis.

Table No. 3.4. Mann Whitney U test of awareness regarding the productions of Biodegradable products within Aizawl.

Sl. No.		Location	N	Mean Rank	Sum of Rank	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig (2-tailed)
1	I know that Mizoram has produce biodegradable disposable cup and plate	Suburb	200	180.14	36027.5	15927.5	36027.5	-3.678	0.000**
		Urban	200	220.86	44172.5				
2	I Know that Mizoram has Produce bag which can substitute Plastic bag	Suburb	200	185.22	37043	16943	37043	-2.732	0.006**
		Urban	200	215.78	43157				

Source: Primary Data **P<0.05**

Interpretation:

The above table no. 3.4 shows mean rank comparisons of the respondents' awareness between suburb and urban areas of the Aizawl Municipal Corporation Area. There are 400 respondents out of which 200 respondents are from suburb areas and another 200 respondents are from urban areas. "Mann-Whitney U – Test" is used to find out the significance difference between suburb and urban.

From the above table 3.4, serial no.1 shows that there is a significance difference between suburb and urban, (U = 15927.5, P<0.05). The urban people have a higher mean rank 228.5 as compare to suburb (mean rank 180.14). So, it is clear that the urban people have higher knowledge than suburb people in the production of biodegradable disposable cups and plates in Aizawl.

From the above table 3.4, serial no.2 shows that there is a significance difference between suburb and urban (U = 16943, P<0.05). The urban people have a higher mean rank 215.78 as compared to suburb (mean rank 185.22). So, it is clear

that urban people have higher knowledge than suburb people regarding the production of a biodegradable disposable carry-bag in Aizawl.

3.7. Summary

From the profiling of biodegradable products in Aizawl, Mizoram, it can be seen that there are few entrepreneurs manufacturing biodegradable products in Aizawl, Mizoram. There are only three enterprises, manufacturing eco-friendly disposable paper cups and one enterprise manufacturing eco-friendly carry bags within Aizawl. Enterprises, engaged in the production of eco-friendly products mostly produced disposable cups and carry bags. All of the enterprise produced eco-friendly products depending on the demand they received and delivered it by themselves.

The material used for producing eco-friendly cup and carry bags are imported from other states. Regarding the product label all the enterprise done label printing by their own, Except Rolins engineering. This product labelling was either design by themselves or according to the customer preferences. Which means the printing label is customizable. From the profiling it can be seen that only two enterprise, namely Sky Net and RS Traders have advertise their products through Television.

The data collected from the consumer regarding the awareness of the production of biodegradable products in Aizawl reveals that people residing in urban areas have higher knowledge about the production of biodegradable disposable paper cup and carry bags in Aizawl in comparison to people residing in suburb areas.

4.1. Introduction

This chapter deals with research design which includes the statement of the problem, sources of data, population, sampling technique and tool utilized for analysis.

4.2. Statement of the Problem

The growth of population in Aizawl city necessitates the existence of Municipal Corporation establishment (Lalchhuanawma and Khiangte, 2019). The Aizawl municipal corporation has monitored, regulated and developed the growth of the city in a systematic and proper manners. One of the primary responsibility of Aizawl Municipal Corporation is the disposal of solid waste. For this, a solid waste management bye law was framed in 2014. Aizawl Municipal Corporation considers all forms of waste management, including waste collection, storage, and disposal. The Sanitation Department of the Aizawl Municipal Corporation, headed by a sanitation officer, is in charge of administration, while the Engineering Department assists in the procurement of vehicles, gadgets, materials, and machinery, as well as the construction of required facilities such as landfill sites. The Sanitation Officer is in charge of waste management and sanitation in Aizawl Municipal Corporation's administrative areas. The entire city has been divided into 19 wards under the sanitation wing, with local councils in each ward. The chairman of the local council is in charge. The management and disposal of solid waste is the responsibility of each local councils (Singh and Devi, 2019).

In 2019, Aizawl Municipal Corporation implemented plastic waste management bye-law. “The Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019” is exercised as per the power conferred by Rule 6(4) of the “Plastic Waste Management Rules, 2016”. This Bye-law comes into effect from 1st August, 2019. The Aizawl Municipal Corporation does not allow to generate bulk wastes (not exceeding 100 Kg per day) by the state government departments, public sector undertakings or private companies, local bodies, hospitals, nursing homes, schools, universities and other educational institutions, hotels, hostels, markets,

worship places, sports complexes, etc. This Bye-law restricted distributing, selling or manufacturing of carry bags made from plastic materials or compostable plastic materials which are used for carrying or dispensing commodities. However it does not include bags used for packaging of goods which are sealed prior to use. This Bye-law is made to minimize the use of plastic within the ambit of Aizawl Municipal Corporation.

The implementation of plastic waste management bye law 2019 bring the opportunity for entrepreneurs as well as it have an impact in the consumption of plastic products such plastic carry bags, disposable plastic cups, plates, etc. So, it is required to examine how banning of plastic have an impact on consumer buying behavior, how the consumer give compliance to the Aizawl Municipal Corporation Plastic Waste Management Bye-law 2019, the challenges and coping strategy of banning of plastic.

The awareness in the negative effects as well as the problems in disposal of plastic waste led the banning of plastic. This banning of plastic create an opportunity for entrepreneur to produce biodegradable products such as biodegradable paper cups, plates, carry bags, etc. This study also explore the enterprises manufacturing or producing biodegradable disposable paper cups, plates and carry bags in chapter 3.

4. 3. Sources of data:

For the study, primary data and secondary data is used. Questionnaire is used for collecting primary data from the Aizawl Municipal Corporation area. For secondary data, economic survey, rules and regulations as well as city ward classification of Aizawl Municipal Corporation is used. Apart from this, journals, articles, published research thesis, newspapers and magazines are utilized for the study.

4. 4. Population:

This section gives a brief account of the study area.

4.4.1. Brief profile of Aizawl

Aizawl, the capital city of Mizoram is located at an elevation of 1132 metres above sea level. The hill city overlooks the Tlawng Valley and the blue hill ranges beyond, which are framed to the north by the craggy Durtlang hills. Because of its size and elevation, it has a mild, sub-tropical climate. National Highway 54 connects Aizawl with Silchar, through National Highway 40 it connects with Agartala, and National Highway 150 connects with Imphal. It is linked by air from Kolkata and Guwahati on a daily basis. According to the 2011 census, Aizawl has a population of 291,822. The sex ratio is 1029 females per 1000 males.

Aizawl has a literacy rate of 98.80%, with male and female literacy rates of 99.30 and 98.31 percent, respectively. It is the state's largest city. It is also the centre of administration containing all the important government offices, state assembly house, and civil secretariat. Apart from this, many of the topmost financial and educational institutions are located in Aizawl.

The people from rural areas migrate to Aizawl for seeking better employment, civic amenities, better educational facilities, etc. (Hlawndo et.al, 2015). Due to the growth in Aizawl population there exist the requirement of establishing Municipal Corporation to monitor, regulate and develop the growth of the city in a proper manner.

Exhibit No. 3.1 Aizawl Municipal Corporation Area Map

Source: http://miyzone.blogspot.com/2010/11/aizawl-municipal-council-lection.html

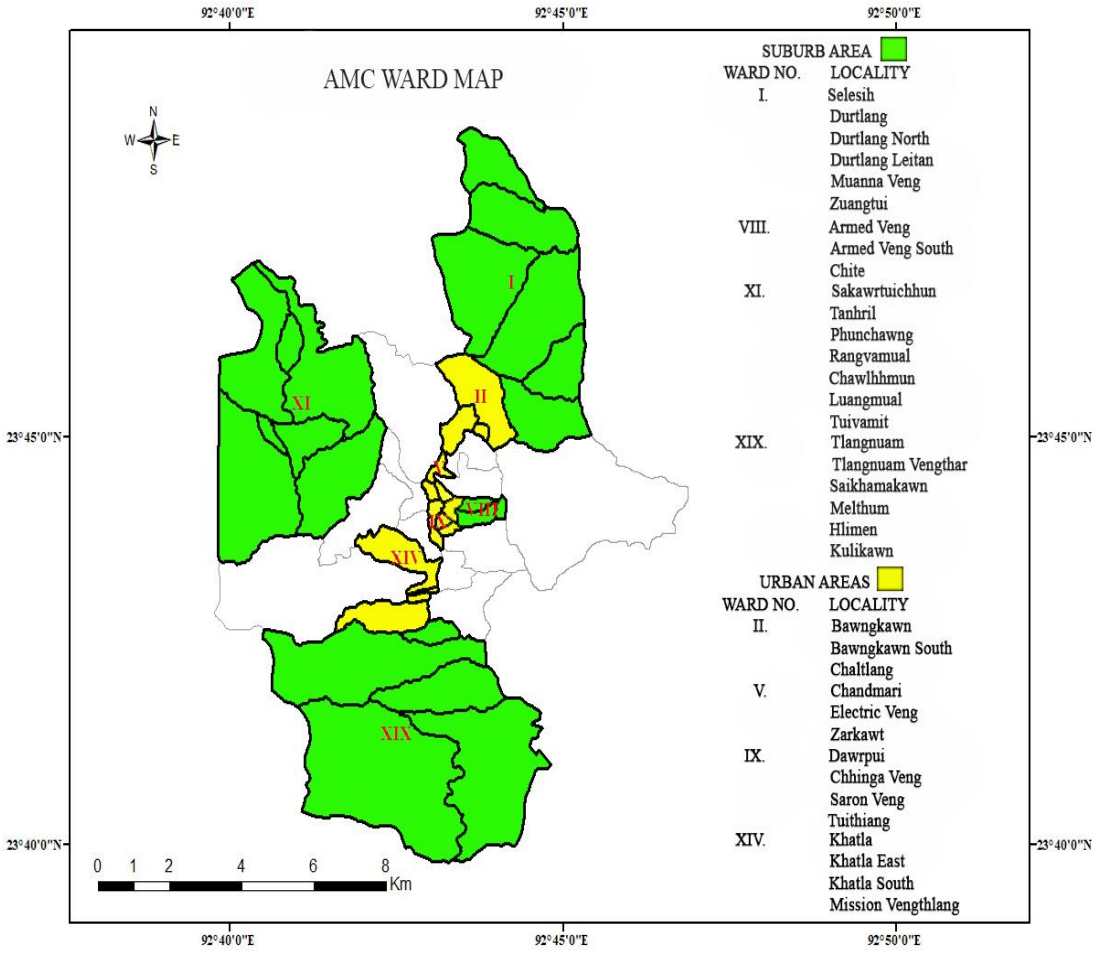
4.4.2. Brief Profile of Aizawl Municipal Corporation

The Aizawl Municipal Corporation is the civil administration authority for the city of Aizawl. When the Congress-Zoram Nationalist Party political alliance was elected to power in the state legislature in 2010, the Aizawl Municipal Corporation was founded with 19 representatives. The Mayor, Vice Mayor, and Commissioners are in charge of the Aizawl Municipal Corporation office. It is made up of 19 elected members who represent the city's 19 wards, as well as those appointed by Governor of Mizoram. Women will be represented by one-third of the overall membership, with six seats rotating every five years. The Corporation has a five-year term in office. Every ward has a Ward Committee, which is made up of a Chairman who is an elected councillor from that ward, as well as two members from each of the local

councils within the ward. There are 83 local councils, having a 5-year term. Aizawl Municipal Corporation has a population of 293416 people and covers the area of 457 km2 (176 sq. mi).

For this study, the Aizawl Municipal Corporation area is broadly divided into urban and suburb. The suburb population of the study has been taken from the peripheral wards of Aizawl Municipal Council (indicated by green colour in exhibit no. 3.2).The urban population of the study has been taken from the central wards ((indicated by yellow colour in exhibit no. 3.2) as shown in exhibit 3.2:

Exhibit No. 3.2, Aizawl Municipal Corporation Ward Map



Source: Author Compilation

4. 5. Sampling:

In 1963, Cochran developed the equation to yield a representative sample for proportions. The sample size was determined by using Cochran's sample size determination and found that 384 respondents is sufficient to represent Aizawl population. Due to the sampling methods a 400 samples is collected from Aizawl Municipal Corporation areas.

Formula of sample size determination for unknown population:

$$\text{Sample size} = \frac{Z^2 P (1-P)}{C^2}$$

Where, Z = Standard normal deviation set at 95% confidence level (1.96).

P = percentage picking a choice or response (assumed to be 50% = .05)

C= confidence interval (0.05 = $\pm$ 5).

For this study Stratified disproportionate random sampling methods is used for selecting the samples from Aizawl Municipal Corporation city ward classification. Out of 19 wards, the whole city is divided into core (urban) and peripheral areas (suburb). Four (4) wards are randomly selected from the core city (urban) and another 4 wards are selected randomly from the peripheral (suburb). From the suburb areas 200 samples are collected and another 200 samples are collected from urban areas which was showed in table no. 4.1. So, the total sample size is 400.

Table 4.1. Data collected from randomly selected Aizawl Municipal Corporation Ward

Suburb				Urban			
Ward No.	**Sl. No.**	**Locality**	**No. of Respondents**	**Ward No.**	**Sl. No.**	**Locality**	**No. of Respondents**
1	1	Muana Veng	8	**2**	1	Chaltlang	13
	2	Selesih	8		2	Chaltlang Lily Veng	13
	3	Durtlang	8		3	Bawngkawn	13
	4	Durtlang North	8		4	Bawngkawn South	13
	5	Durtlang Leitan	8			**Total**	**52**
	6	Zuangtui	9	**5**	5	Electric Veng	16
		Total	**49**		6	Chanmari	16
9	7	Luangmual	8		7	Zarkawt	16
	8	Chawlhhmun	7			**Total**	**48**
	9	Tanhril	8	**11**	8	Dawrpui	13
	10	Sakawrtuichhun	7		9	Saron Veng	13
	11	Rangvamual	6		10	Chhinga Veng	13
	12	Phunchawng	8		11	Tuithiang	13
	13	Tuivamit	8		12	Khatla	12
		Total	**52**	**14**		**Total**	**64**
19	14	Tlangnuam	8		13	Khatla East	12
	15	Tlangnuam Vengthar	8		14	Khatla South	12
	16	Kulikawn	8		15	Mission Vengthlang	12
	17	Saikhamakawn	8			**Total**	**36**
	18	Hlimen	8	**Grand Total of uburb respondents**			**200**
	19	Melthum	10				
		Total	**50**				
8	20	Armed Veng	16				
	21	Armed Veng South	16				
	22	Chite	17				
		Total	**49**				
Grand Total of Suburb respondents			**200**				

Source: Primary Data

4. 6. Tool for Analysis:

This study aims at comparing suburb and urban respondents in Aizawl Municipal Corporation area. A simple statistical method is used to examine and interpret responses from suburb and urban areas. Firstly, normality test is run to check whether the data is normally distributed or not. Shapiro-Wilk test is used for testing normality. As the data observed from Shapiro-Wilk test is significant it signifies that the data is not normally distributed. The relationship between suburb and urban is tested using Spearman Rank-Order Correlation. In this study the Non-

Parametric test of Mann Whitney - U test is used for testing whether there is a significance difference between suburb and urban.

The level of significance, also known as the size of the critical region or region of rejection in this study, is kept at 5%, implying that the level of confidence interval (also known as confidence limit or fiducially limit) is 95 percent, which means that the probability of a sample falling within a region of acceptance is 0.95. This can be interpreted in another way. The chance of making a Type 1 Error, i.e. rejecting true Ho, is 0.05.

4.6.1. The Shapiro-Wilk Test for Normality

The Shapiro-Wilk test, calculates a W statistic that tests whether a random sample, x1, x2,…,,xn comes from (specifically) a normal distribution .

The W statistic is calculated as follows:

$$W = \frac{\left(\sum_{i=1}^{n} a_i x_{(i)}\right)^2}{\sum_{i=1}^{n}(x_i - \overline{x})^2},$$

Where,

$x_{(i)}$ are the ordered random sample values ($x_{(1)}$ is the smallest),

a_i are constants generated from the means, variances and covariances of the order statistics of a sample of size n from a normal distribution

4.6.2. Spearman Rank Correlation (Spearman's Rho)

A Spearman's coefficient of correlation (or rank correlation) is a non-parametric technique for measuring relationship between paired observations of two variables in case of ordinal data where rank are given to different values of the variables. The main objectives of this coefficient is determined the extent to which two of ranking are similar or dissimilar. The coefficient is determined as under:

$$\rho = 1 - \frac{6\sum d_i^2}{n(n^2 - 1)}$$

Where.

d_i = difference between ranks of the i^{th} pair of the two variables;

n = number of pairs of observation

4.6.3. Wilcoxon-Mann-Whitney test (or U-test):

In order to compare and find out the significance difference between suburb and urban, Wilcoxon-Mann-Whitney test or U-test is used. The formula are shown below.

$$U = n_1.n_2 + \frac{n_1(n_{1+}1)}{2} - R_1$$

Where,

n_1, and n_2 are the sample sizes,

R_1 is the sum of ranks assigned to the values of the first sample.

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https://aizawl.nic.in/about-district/

http://miyzone.blogspot.com/2010/11/aizawl-municipal-council-lection.html

5.1. Introduction

This chapter deals with the analysis of the data. It includes demographic profile of the respondents, awareness level of the respondents regarding biodegradable products, consumer behavior towards Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019 and hypothesis testing.

5.2. Demographic Profile of Respondents

This Section deals with demographic profile of the respondents. It includes gender of the respondents, age group of the respondents, monthly income of the respondents, educational qualification of the respondents, occupation and socio-economic status of the respondents.

Table: 5.1. Gender of the Respondents

	Gender of the Respondents	**Suburb**		**Urban**		**Total**	
Sl. No		**n = 200**	**%**	**n = 200**	**%**	**N = 400**	**%**
1.	**Male**	105	26	109	27	214	54
2.	**Female**	95	24	91	23	186	47

Source: Primary Data

Data Interpretation:

The above table 5.1 shows comparison between genders of the respondents among suburb and urban areas of the Aizawl Municipal Corporation Area. The overall number of the respondents is 400, out of which 200 respondents are from suburb areas and another 200 respondents are from urban areas.

From the overall respondents, 54% of the respondents are male, out of which, 26% are from the suburb area and 27% are from the urban area. From the overall respondents, 47% of the respondents are female, out of which, 24% are from the suburb area and 23% are from the urban area.

Table: 5.2. Age of the Respondents

Sl. No.	Age of the respondents	Suburb		Urban		Total	
		n = 200	%	n = 200	%	N = 400	%
1	**18 to 23**	40	10	26	7	66	17
2	**24 to 29**	56	14	53	13	109	27
3	**30 to 35**	52	13	61	15	113	28
4	**36 to 40**	28	7	27	7	55	14
5	**40 Above**	24	6	33	8	57	14

Source: Primary Data

Data Interpretation:

The above table 5.2 shows comparison between the age group of the respondents among suburb and urban areas of the Aizawl Municipal Corporation Area. The overall number of respondents is 400, out of which 200 respondents are from suburb areas and another 200 respondents are from urban areas.

From the overall respondents, 17% of the respondents are between the age groups of 18 to 23, out of which, 10% are from the suburb area and 7% are from the urban area. From the overall respondents, 27% of the respondents are between the age group of 24 to 29, out of which, 14% are from suburb area and 13% are from the urban area. From the overall respondents, 28% of the respondents are between the age group of 30 to 35, out of which, 13% of the respondents are from suburb area and 15% are from the urban area. From the overall respondents, 14% of the respondents are between the age group of 36 to 40, out of which, 7% of the respondents are from suburb area and 7% are from the urban area. From the overall respondents, 14% of the respondents are above the age group 40, out of which, 6% of the respondents are from suburb area and 6% are from the urban area.

Table: 5.3. Monthly Income of the Respondents

	Monthly Income of the Respondents	Suburb		Urban		Total	
Sl. No		n = 200	%	n = 200	%	N = 400	%
1	**Below 10000**	49	12	36	9	85	21
2	**10000 to 30000**	64	16	61	15	125	31
3	**40000 to 60000**	33	8	40	10	73	18
4	**70000 to 90000**	30	8	27	7	57	14
5	**100000 to 120000**	16	4	16	4	32	8
6	**Above 130000**	8	2	20	5	28	8

Source: Primary Data

Data Interpretation:

The above table 5.3 shows comparison between monthly income of the respondents among suburb and urban areas of the Aizawl Municipal Corporation Area. The overall number of respondents is 400, out of which 200 respondents are from suburb areas and another 200 respondents are from urban areas.

From the overall respondents, 21% of the respondents have an income below 10000, out of which, 12% are from the suburb area and 9% are from the urban area. From the overall respondents, 31% of the respondents have an income between 10000 to 30000, out of which, 16% are from the suburb area and 15% are from the urban area. From the overall respondents, 18% of the respondents have an income between 40000 to 60000, out of which, 8% are from the suburb area and 10% are from the urban area. From the overall respondents, 14% of the respondents have an income between 70000 to 90000, out of which, 8% are from the suburb area and 7% are from the urban area. From the overall respondents, 8% of the respondents have an income between 100000 to 120000, out of which, 4% are from the suburb area and 4% are from the urban area. From the overall respondents, 8% of the respondents have an income of above 130000, out of which, 2% are from the suburb area and 5%

are from the urban area. The above table shows that the urban areas of the Aizawl city have a higher income as compare to suburb areas of the Aizawl city.

Table: 5.4. Educational Qualification of the Respondents

Sl. No	Educational Qualification of the Respondents	Suburb		Urban		Total	
		n = 200	%	n = 200	%	N = 400	%
1	**Below Class 10**	27	7	22	6	49	12
2	**Up to class 10**	17	4	25	6	42	11
3	**Up to Class 12**	48	12	39	10	87	22
4	**Up to Bachelor Degree or equivalent**	62	16	71	18	133	33
5	**Up to Master Degree or Equivalent**	43	11	40	10	83	21
6	**Up to M.Phil. or Ph.D.**	3	0.8	3	0.8	6	1

Source: Primary Data

Data Interpretation:

The above table 5.4 shows comparison between educational qualification of the respondents between suburb and urban areas of the Aizawl Municipal Corporation Area. The overall number of the respondents is 400, out of which 200 respondents are from suburb areas and another 200 respondents are from urban areas.

From the overall respondents, 12% of the respondents are below class 10, out of which, 7% are from the suburb area and 6% are from the urban area. From the overall respondents, 11% of the respondents have reached up to class 10, out of which, 4% are from the suburb area and 6% are from the urban area. From the overall respondents, 22% of the respondents reach up to class 12, out of which, 12% are from the suburb area and 10% are from the urban area. From the overall respondents, 33% of the respondents have a bachelor degree or its equivalent degree, out of which, 16% are from the suburb area and 18% are from the urban area. Of the overall respondents, 21% of respondents have a master's degree or equivalent degree, out of which, 11% are from the suburb area and 10% are from the urban area. From

the overall respondents, 1% of the respondents have M.Phil. Or Ph.D. degree, out of which, 0.8% are from the suburb area and 0.8% are from the urban area.

Table: 5.5. Occupation of the Respondents

Sl. No.	Occupation of the Respondents	Suburb		Urban		Total	
		n = 200	%	n = 200	%	N = 400	%
1	**Daily Wages Laborer**	29	7	20	5	49	12
2	**Government Employee**	40	10	40	10	80	20
3	**Business**	48	12	57	14	105	26
4	**Others**	83	21	83	21	166	42

Source: Primary Data

Data Interpretation:

The above table shows comparison between occupation of the respondents between suburb and urban areas of the Aizawl Municipal Corporation Area. The overall number of respondents is 400, out of which 200 respondents are from suburb areas and another 200 respondents are from urban areas.

From the overall respondents, 12% of the respondents are daily wage laborers, out of which, 7% are from the suburb area and 5% are from the urban area. From the overall respondents, 20% of the respondents are government employees, out of which, 10% are from the suburb area and 10% are from the urban area. From the overall respondents, 26% of the respondents are having their own business, out of which, 12% are from the suburb area and 14% are from the urban area. From the overall respondents, 42% of the respondents are having any other occupations, out of which, 21% are from the suburb area and 21% are from the urban area.

Table: 5.6. Socio economic status of the Respondents

Sl. No	Socio Economic Status of the Respondents	Suburb		Urban		Total	
		n = 182	%	n = 215	%	N = 397	%
1	AAY	15	4	15	4	30	7
2	BPL	50	13	41	10	91	23
3	APL	135	33	144	36	279	70

Source: Primary Data

Data Interpretation:

The above table 5.6 shows comparison between socio-economic status of the respondents between suburb and urban areas of the Aizawl Municipal Corporation Area. The overall number of the respondents is 400, out of which 200 respondents are from suburb areas and another 200 respondents are from urban areas.

From the overall respondents, 7% of the respondents are AAY, out of which, 4% are from the suburb area and 4% are from the urban area. From the overall respondents, 23% of the respondents are BPL, out of which, 13% are from the suburb area and 10% are from the urban area. From the overall respondents, 70% of the respondents are APL, out of which, 33% are from the suburb area and 36% are from the urban area.

5.3. Awareness Level of the Respondents regarding biodegradable products

This section deals with the awareness level of the respondents with regards to biodegradable products in Aizawl Municipal Corporation Areas. Certain statements' is asked to the respondents and measuring their acceptance level.

Table: 5.7. Descriptive statistics of Awareness Level of the consumer

Sl. No.	Particulars		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
1	I know that plastic bags take many years to decompose and cause pollution.	Suburb	6	3	66	34	91	200
		Urban	14	7	23	28	128	200
	Total		**20**	**10**	**89**	**62**	**219**	400
2	When I buy products, I try to consider how my use of them will affect the environment and other consumers.	Suburb	15	15	108	44	18	200
		Urban	38	31	62	49	20	200
	Total		**53**	**46**	**170**	**93**	**38**	400
3	Whenever possible, I buy products which I consider environmentally safe.	Suburb	19	32	113	25	11	200
		Urban	40	36	70	42	12	200
	Total		**59**	**68**	**183**	**67**	**23**	400
4	I reuse whenever possible.	Suburb	11	7	80	59	43	200
		Urban	12	6	40	73	69	200
	Total		**120**	**23**	**120**	**132**	**112**	400
5	I make a special effort to buy biodegradable products.	Suburb	20	20	109	38	13	200
		Urban	44	28	65	40	23	200
	Total		**64**	**48**	**174**	**78**	**36**	400
6	When there is a choice, I choose the product that causes the least pollution.	Suburb	19	15	96	50	20	200
		Urban	41	13	56	53	37	200

	Total		**60**	**28**	**152**	**103**	**57**	**400**
7	I read the labels to see if the products are environmentally safe.	Suburb	20	42	100	30	8	200
		Urban	39	43	72	28	18	200
	Total		**120**	**23**	**120**	**132**	**112**	**400**

Source: Primary Data

Data Interpretation:

The above table 5.7 shows the descriptive statistics of the comparison between suburb and urban areas regarding the awareness level towards biodegradable products. The overall respondents are 400, out of which 200 respondents are from suburb areas and another 200 respondents from urban areas.

Serial no. 1 is regarding the knowledge about the decomposition duration of plastic bags. From suburb and urban, 'strongly agree' is the highest score, attaining 91 respondents from suburb and 128 respondents from urban areas.

Serial no. 2 is regarding purchase impact, perception with the environment, and others. From suburb and urban 'Neutral' is the highest score, attaining 108 respondents from suburb and 62 respondents from urban.

Serial no. 3 is regarding the purchase of products perceived to be environmentally safe. Form suburb and urban 'Neutral' is the highest score, attaining 113 respondents from suburb and 70 respondents from urban.

Serial no. 4 is regarding whether the respondents reuse products. From suburb, 'neutral' is the highest score, attaining 80. While in urban areas, 'agree' is the highest score, attaining 73.

Serial no. 5 is regarding whether the respondents make special efforts to buy biodegradable products. Form suburb and urban, 'Neutral' is the highest score, attaining 109 respondents from suburb and 65 respondents from urban.

Serial no. 6 is regarding whether the respondents choose products that cause the least pollution to the environment. Form suburb and urban, 'Neutral' is the highest score, attaining 96 respondents from suburb and 56 respondents from urban.

Serial no. 7 is regarding whether the respondents read the product labels to see if the products are environmentally safe. Form suburb and urban, 'Neutral' is the highest score, attaining 100 respondents from suburb and 72 respondents from urban.

Table: 5.8. Test of Normality regarding Awareness Level of the consumer

Statement	Location	Kolmogorov-Smirnova				Shapiro-Wilk	
		Statistic	df	Sig.	Statistic	df	Sig.
I know that plastic bags take many years to decompose and cause pollution	Suburb	0.281	200	0.000	0.79	200	0.000
	Urban	0.373	200	0.000	0.664	200	0.000
When I buy products, I try to consider how my use of them will affect the environment and other consumers.	Suburb	0.278	200	0.000	0.856	200	0.000
	Urban	0.184	200	0.000	0.903	200	0.000
Whenever possible, I buy products which I consider environmentally safe.	Suburb	0.294	200	0.000	0.856	200	0.000
	Urban	0.204	200	0.000	0.901	200	0.000
I reuse whenever possible.	Suburb	0.202	200	0.000	0.866	200	0.000
	Urban	0.245	200	0.000	0.823	200	0.000
I make a special effort to buy biodegradable products	Suburb	0.292	200	0.000	0.859	200	0.000
	Urban	0.186	200	0.000	0.897	200	0.000
When there is a choice, I choose the product that causes the least pollution.	Suburb	0.259	200	0.000	0.875	200	0.000
	Urban	0.183	200	0.000	0.875	200	0.000
I read the labels to see if the products are environmentally safe.	Suburb	0.266	200	0.000	0.884	200	0.000
	Urban	0.184	200	0.000	0.904	200	0.000

Source: Primary Data **P<0.05**

Interpretation:

The above table 5.8 shows Kolmogorov-Smirnova and Shapiro Wilk test of normality. The null hypothesis is that "all the data are normally distributed". But in

the above table, all the statement's P-value shows 0.00, which is less than 0.05. So, the null hypothesis is rejected and it can be concluded that all the data are not normally distributed. So, a Non-parametric test is needed to be utilized for further analysis.

Table: 5.9. Mann-Whitney U Test of Awareness Level of the consumer

Sl. No		Location	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
1	I know that plastic bags take many years to decompose and cause pollution	Suburb	200	183.44	36687.5	16587.5	36687.5	-3.258	0.001**
		Urban	200	217.56	43512.5				
2	When I buy products, I try to consider how my use of them will affect the environment and other consumers.	Suburb	200	211.25	42249.5	17850.5	37950.5	-1.953	0.051
		Urban	200	189.75	37950.5				
3	Whenever possible, I buy products which I consider environmentally safe.	Suburb	200	205.94	41188	18912	39012	-0.997	0.319
		Urban	200	195.06	39012				
4	I reuse whenever possible.	Suburb	200	180.02	36003	15903	36003	-3.705	0.000**
		Urban	200	220.98	44197				
5	I make a special effort to buy biodegradable products	Suburb	200	207.54	41507	18593	38693	-1.28	0.200
		Urban	200	193.46	38693				
6	When there is a choice, I choose the product that causes the least pollution.	Suburb	200	197.64	39529	19429	39529	-0.515	0.607
		Urban	200	203.36	40671				
7	I read the labels to see if the products are environmentally safe.	Suburb	200	207	41399	18701	38801	-1.181	0.237
		Urban	200	194	38801				

Source: Primary Data ***P<0.05**

Data Interpretation:

The above table 5.9 shows the mean comparison between respondents' awareness between suburb and urban areas of the Aizawl Municipal Corporation Area. There are 400 respondents out of which 200 respondents are from suburb areas and another 200 respondents are from urban areas. "Mann-Whitney U – Test" is used to find out the significance difference between suburb and urban.

From the above table 5.9, serial no.3 shows that there is a significant difference between suburb and urban ($U = 16587.5$, $P<0.05$). The urban people have a higher mean rank 217.56, as compared to suburb (mean rank 183.44). So, it is clear that urban people have higher knowledge than suburb people regarding the duration of decomposition and the pollution caused by plastic.

From the above table 5.9, serial no.1 shows that there is no significant difference between suburb and urban, ($U = 17850.5$, $P>0.05$). Both suburb (mean rank, 211.25) and urban (mean rank 189.75) neither agree nor disagree on how their use of the products will affect the environment and other consumers while buying.

From the above table 5.9, serial no.2 shows that there is no significant difference between suburb and urban ($U = 18912$, $P>0.05$). Both suburb (mean rank 205.94) and urban (mean rank 195.06) neither agree nor disagree that they buy environmentally safe products whenever possible.

From the above table 5.9, serial no 3 shows that there is a significant difference between suburb and urban, ($U = 15903$, $P<0.05$). The urban people have a higher mean rank (220.98) as compare to suburb (180.02). So, it is clear that urban people reuse products more than suburb people.

From the above table 5.9, serial no.4 shows that there is no significant difference between suburb and urban ($U = 18593$, $P>0.05$). Both suburb (mean rank 207.54) and urban (mean rank 193.46) do not make efforts to buy biodegradable products.

From the above table 5.9, serial no.5 shows that there is no significant difference between suburb and urban (U = 19429, P>0.05). Both suburb (mean rank 197.64) and urban (mean rank 203.36) agree that they choose products that cause the least pollution to the environment.

From the above table 5.9, serial no.6 shows that there is no significant difference between suburb and urban (U = 18701, P>0.05). Both suburb (rank scores 207) and urban (rank scores 207) agree that they read product labels to see if the products are environmentally safe.

5.4. Consumer behavior towards Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019.

5.4.1. Introduction

This section emphasized on Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019. It deals with how this Bye-law has an impact on consumers, how consumers make compliances, what are the challenges faced by the consumers and the coping strategy adopted.

Exhibit 5.1 Consumer behavior towards Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019.

5.4.2. Impact on consumer

Table: 5.10. Descriptive statistics of Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019 impact on the consumer.

Sl. No.	Particulars		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
1	Banning of plastic bag bothersome buying.	**Suburb**	9	33	83	47	28	200
		Urban	26	35	66	49	24	200
	Total		**35**	**68**	**149**	**96**	**52**	**400**
2	Alternative to plastic carry bag is rare to buy.	**Suburb**	2	4	69	50	75	200
		Urban	5	7	72	54	62	200
	Total		**7**	**11**	**141**	**104**	**137**	**400**
3	Banning of Plastic carry bag increase our family monthly expenditure.	**Suburb**	50	50	66	15	19	200
		Urban	71	49	59	13	8	200
	Total		**121**	**99**	**125**	**28**	**27**	**400**
4	I often refuse to buy products since I do not have carry bag.	**Suburb**	27	58	66	26	23	200
		Urban	48	45	59	27	21	200
	Total		**75**	**103**	**125**	**53**	**44**	**400**
5	After AMC implement solid waste management Bye law I rarely consume plastic bag.	**Suburb**	7	16	72	67	38	200
		Urban	11	9	71	65	44	200
	Total		**18**	**25**	**143**	**132**	**82**	**400**

Source: Primary Data

Data Interpretation

The above table 5.10 shows the descriptive statistics of suburb and urban areas of the Aizawl Municipal Corporation Area regarding the impact of the Bye-Law on the consumer. There are 400 respondents out of which 200 respondents are from suburb areas and another 200 respondents are from urban areas.

Table 5.10, serial no. 1, is regarding whether banning of plastic bag bother their buying decision. From suburb and urban 'Neutral' is the highest score, 83 respondents from suburb and 66 respondents from urban. Serial no. 2 is regarding the availability of alternative to plastic carry bag. From suburb, 'strongly agree' is the highest score, attaining 75. While in urban areas, 'neutral' is the highest score, attaining 72. Serial no. 3 is regarding whether banning of plastic carry bag increase family monthly expenditure. From suburb 'neutral' is the highest score, attaining 66 respondents while in urban 'Strongly Disagree' is the highest score attaining 71 respondents. Serial no. 4 is regarding whether consumer refuse to buy products since they do not have carry bag. From suburb and urban 'Neutral' is the highest score, 66 respondents from suburb and 59 respondents from urban. Serial no. 5 is regarding whether the consumption of plastic bag decrease or not after the implementation of Aizawl Municipal Corporation Solid waste management bye-law. From suburb and urban 'Neutral' is the highest score, 72 respondents from suburb and 71 respondents from urban.

Table: 5.11. Normality Test of Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019 impact on the consumer.

Statement	Location	Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Banning of plastic bag bothersome buying.	Suburb	0.224	200	0.000	0.904	200	0.000
	Urban	0.178	200	0.000	0.913	200	0.000
Alternative to plastic carry bag is rare to buy.	Suburb	0.239	200	0.000	0.82	200	0.000
	Urban	0.209	200	0.000	0.851	200	0.000
Banning of Plastic carry bag increase our family monthly expenditure.	Suburb	0.175	200	0.000	0.882	200	0.000
	Urban	0.212	200	0.000	0.854	200	0.000
I often refuse to buy products since I do not have carry bag.	Suburb	0.188	200	0.000	0.904	200	0.000
	Urban	0.158	200	0.000	0.895	200	0.000
After AMC implement	Suburb	0.344	200	0.000	0.795	200	0.000

solid waste management Bye law I rarely consume plastic bag.	Urban	0.376	200	0.000	0.756	200	0.000

Source: Primary Data ***P<0.05**

Interpretation:

The above table 5.11 shows Kolmogorov-Smirnova and Shapiro Wilk test of normality. The null hypothesis is that "all the data are normally distributed". But in the above table, all the statement's P-value shows 0.00, which is less than 0.05. So, the null hypothesis is rejected and it can be concluded that all the data are not normally distributed. So, a Non-parametric test is needed to be utilized for further analysis.

Table: 5.12. Mann-Whitney U Test regarding the impact of Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019 towards consumer.

Sl. No.	Statement	Location	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
1	Banning of plastic bag bothersome buying.	Suburb	200	209.2	41839	18261	38361	-1.562	0.118
		Urban	200	191.8	38361				
2	Alternative to plastic carry bag is rare to buy.	Urban	200	208.38	41676	18424	38524	-1.438	0.15
		Suburb	200	192.62	38524				
3	Banning of Plastic carry bag increase our family monthly expenditure.	Suburb	200	215.12	43023.5	17076.5	37176.5	-2.628	0.009**
		Urban	200	185.88	37176.5				
4	I often refuse to buy products since I do not have carry bag.	Urban	200	207.92	41583.5	18516.5	38616.5	-1.322	0.186
		Suburb	200	193.08	38616.5				

5	After AMC implement solid waste management Bye law I rarely consume plastic bag.	Suburb	200	204.52	40903	19197	39297	-0.807	0.42
		Urban	200	196.48	39297				

Source: Primary Data ***P<0.05**

Data Interpretation:

The above table 5.12 shows the mean comparison between suburb and urban areas of the Aizawl Municipal Corporation Area regarding the impact of the Bye-Law on consumers. There are 400 respondents out of which 200 respondents are from suburb areas and another 200 respondents are from urban areas. "Mann-Whitney U – Test" is used to find out the significance difference between suburb and urban.

The above table 5.12, serial .no.1 is regarding whether banning plastic carry bags bother buying products. It shows that there is no significant difference between suburb and urban (U = 18261, P>0.05). The suburb (mean rank 209.2) and urban people (mean rank 191.8) neither agree nor disagree that banning plastic carry bags bothersome buying.

Table 5.12, serial no. 2 is regarding the availability of alternatives to plastic carry bags. It shows that there is no significant difference between suburb and urban (U = 18424, P>0.05). The suburb (mean rank 206.4) and urban people (mean rank 194.6) feels that alternative to plastic carry bag is rare to buy.

Table 5.12, serial no 3 is regarding whether banning of plastic carry bag increase family monthly expenditure. It shows that there is a significant difference between suburb and urban (U = 17076.5, P<0.05). So, it is clear that the both urban and suburb do not agree that banning of plastic carry bag increase family monthly expenditure. The suburb people have a higher mean rank of 215.12 as compare to urban (mean rank 185.88).

Table 5.12, Serial no 4 is regarding whether the customer refuses to buy products since they do not have a carry bag. It shows that there is no significant difference between suburb and urban areas (U = 18516.5, P>0.05). The suburb (mean rank 207.92) and urban people (mean rank 193.08) do not have a problem in buying products as they do not have carry bags.

Table 5.12, Serial no 5 is regarding whether the consumer rarely consumes plastic after implementing AMC solid waste management bye-law 2019. It shows that there is no significant difference between suburb and urban areas (U = 19197, P>0.05). The suburb (mean rank 204.52) and urban people (mean rank 196.48) rarely consume plastic after the implementation of the AMC solid waste management bye-law 2019.

5.4.3. Compliance of consumer with regards to of Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019.

Table 5.13. Descriptive statistics of compliance of consumer with regards to of Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019.

Sl. No.	Particulars	Location	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
1	I support AMC plastic Waste Management Bye-Laws 2019'.	Suburb	1	9	96	66	28	200
		Urban	4	4	88	67	37	200
	Total		**5**	**13**	**184**	**133**	**65**	**400**
2	My family strictly follow the classification of waste made by AMC.	Suburb	2	9	76	54	59	200
		Urban	1	5	46	63	85	200
	Total		**3**	**14**	**122**	**117**	**144**	**400**
3	Our family always dump in AMC Sanitary truck/garbage truck.	Suburb	0	6	66	48	80	200
		Urban	0	7	31	44	118	200

	Total		**0**	**13**	**97**	**92**	**198**	**400**
4	AMC should provide alternative before banning plastic carry bag.	Suburb	0	0	42	96	62	200
		Urban	0	2	43	81	74	200
	Total		**0**	**2**	**85**	**177**	**136**	**400**
5	AMC should provide more dustbin in public place to support proper disposal of waste.	Suburb	11	8	44	47	90	200
		Urban	5	11	45	44	95	200
	Total		**16**	**19**	**89**	**91**	**185**	**400**
6	I believe that industry could reduce the amount of packaging it presently uses for some consumer packaged goods.	Suburb	1	2	88	56	53	200
		Urban	4	4	68	48	76	200
	Total		**5**	**6**	**156**	**104**	**129**	**400**
7	I feel the government should pass legislation making recycling mandatory.	Suburb	5	2	88	54	51	200
		Urban	7	4	65	46	78	200
	Total		**12**	**6**	**153**	**100**	**129**	**400**

Source: Primary Data ***P<0.05**

Data Interpretation

The above table 5.13 shows the descriptive statistics of suburb and urban areas of the Aizawl Municipal Corporation Area regarding the impact of the Bye-Law on consumer. There are 400 respondents out of which 200 respondents are from suburb areas and another 200 respondents are from urban areas.

Table 5.13, serial no. 1, is regarding testing whether the respondents support AMC plastic waste management bye-law 2019. Form suburb and urban ‘Neutral’ is the highest score, 96 respondents from suburb and 88 respondents from urban.

Serial no. 2 is regarding whether respondents and their families strictly follow the waste classification made by AMC. From suburb, ‘neutral’ is the highest score, attaining 68. While in urban areas, ‘Strongly Agree’ is the highest score, attaining 85.

Serial no. 3, is regarding whether the household always dump in AMC Sanitary truck. Form suburb ‘strongly agree’ is the highest score attaining 80 respondents and from urban ‘Strongly agree’ is the highest score, with 118 respondents

Serial no. 4, is regarding the opinion of the respondents, that whether AMC should provide an alternative to plastic carry bag before banning. Form suburb and urban ‘agree’ is the highest score, 96 respondents from suburb and 81 respondents from urban.

Serial no. 5, is regarding the opinion of the respondents, that whether AMC should provide more dustbin in public places to support proper disposal of wastes. Form suburb and urban ‘Strongly agree’ is the highest score, 90 respondents from suburb and 95 respondents from urban.

Serial no. 6, is regarding the wish that the industry could reduce the amount of packaging it presently uses for some consumer packaged goods. From suburb, ‘neutral’ is the highest score, attaining 88. While in urban areas, ‘Strongly Agree’ is the highest score, attaining 76.

Serial no. 7, is regarding the wish that the Government should pass legislation making recycling mandatory. From suburb, ‘neutral’ is the highest score, attaining 88. While in urban areas, ‘Strongly Agree’ is the highest score, attaining 78.

Table 5.14. Normality Test of compliance of consumer with regards to of Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019.

Statement	Location	Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
I support AMC plastic Waste Management Bye-Laws 2019"	Suburb	0.284	200	0.000	0.842	200	0.000
	Urban	0.25	200	0.000	0.843	200	0.000
My family strictly follow the classification of waste made by AMC	Suburb	0.233	200	0.000	0.851	200	0.000
	Urban	0.262	200	0.000	0.815	200	0.000
Our family always dump in AMC Sanitary truck/garbage truck.	Suburb	0.258	200	0.000	0.808	200	0.000
	Urban	0.357	200	0.000	0.723	200	0.000
AMC should provide alternative before banning plastic carry bag	Suburb	0.309	200	0.000	0.741	200	0.000
	Urban	0.267	200	0.000	0.777	200	0.000
AMC should provide more dustbin in the street to ensure cleaner environment.	Suburb	0.26	200	0.000	0.803	200	0.000
	Urban	0.284	200	0.000	0.8	200	0.000
I believe that industry could reduce the amount of packaging it presently uses for some consumer packaged goods.	Suburb	0.274	200	0.000	0.809	200	0.000
	Urban	0.238	200	0.000	0.823	200	0.000
I feel the government should pass legislation making recycling mandatory.	Suburb	0.253	200	0.000	0.829	200	0.000
	Urban	0.237	200	0.000	0.823	200	0.000

Source: Primary Data ***P<0.05**

Interpretation:

The above table 5.14 shows Kolmogorov-Smirnova and Shapiro Wilk test of normality. The null hypothesis is that "all the data are normally distributed". But in the above table, all the statement's P-value shows 0.00, which is less than 0.05. So, the null hypothesis is rejected and it can be concluded that all the data are not normally distributed. So, a Non-parametric test is needed to utilize for further analysis.

Table 5.16. Mann-Whitney U of the compliance of consumer with regards to Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019

Statement	Location	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
I support AMC plastic Waste Management Bye-Laws 2019"	Suburb	200	193.88	38777	17896	37996	-1.93	0.054
	Urban	200	207.12	41423				
My family strictly follow the classification of waste made by AMC	Suburb	200	180.69	36138	17420.5	37520.5	-2.359	0.018**
	Urban	200	220.31	44062				
Our family always dump in AMC Sanitary truck/garbage truck.	Suburb	200	178.83	35766	18677	38777	-1.233	0.218
	Urban	200	222.17	44434				
AMC should provide alternative before banning plastic carry bag	Suburb	200	193.38	38675	16038	36138	-3.612	0.000**
	Urban	200	207.62	41525				
AMC should provide more dustbin in the street to ensure cleaner environment.	Suburb	200	197.66	39531.5	15666	35766	-4.061	0.000**
	Urban	200	203.34	40668.5				
I believe that industry could reduce the amount of packaging it presently uses for some consumer packaged goods.	Suburb	200	189.98	37996	18575	38675	-1.326	0.185
	Urban	200	211.02	42204				
I feel the government should pass legislation making recycling mandatory.	Suburb	200	187.6	37520.5	19431.5	39531.5	-0.525	0.600
	Urban	200	213.4	42679.5				

Source: Primary Data ***P<0.05**

Data interpretation:

The above table 5.16 shows the mean comparison between suburb and urban areas of the Aizawl Municipal Corporation Area regarding the impact of the Bye-Law on consumers. There are 400 respondents out of which 200 respondents are from suburb areas and another 200 respondents are from urban areas. “Mann-Whitney U – Test” is used to find out the significance difference between suburb and urban.

The above table 5.16, serial .no.1 is regarding whether the respondents support AMC plastic waste management bye-law 2019. It shows that there is no significant difference between suburb and urban ($U = 17896$, $P>0.05$).The suburb (mean rank 193.88) and urban people (mean rank 207.12) support AMC plastic waste management bye-law 2019.

Table 5.16, serial no. 2 is regarding whether respondents and their families strictly follow the waste classification made by AMC. It shows that there is significant difference between suburb and urban ($U = 17420.5$, $P<0.05$). The urban people have a higher mean rank (220.31) as compare to suburb (mean rank 180.69). So, it is clear that the urban people participate better as compare to suburb in the classification of waste made by AMC.

Table 5.16, serial no. 3, is regarding whether the household always dumps in AMC Sanitary truck. It shows that there is no significant difference between suburb and urban ($U = 18677$, $P>0.05$). The suburb (mean rank 178.83) and urban people (mean rank 222.17) always dump in AMC Sanitary truck.

Table 5.16, serial no 4 is regarding the opinion of the respondents, that whether AMC should provide an alternative to plastic carry bag before banning. It shows that there is a significant difference between suburb and urban areas ($U = 16038$, $P<0.05$). The urban people have a higher mean rank (207.62) as compare to suburb (mean rank 193.38). So, it is clear that the urban people have higher opinion than suburb regarding that AMC should provide an alternative to plastic carry bag before banning.

Table 5.16, serial no 5 is regarding the opinion of the respondents, that whether AMC should provide more dustbin in public places to support proper disposal of wastes. It shows that there is a significant difference between suburb and urban areas (U = 15666, P<0.05). The urban people have a higher mean rank (203.34) as compare to suburb (mean rank 197.66). So, it is clear that the urban people have a higher opinion than suburb people regarding that AMC should provide more dustbin in a public place.

The above table 5.16, serial .no.6 is regarding the wish that the industry could reduce the amount of packaging it presently uses for some consumer packaged goods. It shows that there is no significant difference between suburb and urban (U = 18575, P>0.05).The suburb (mean rank 189.98) and urban people (mean rank 211.02) agree that the industry could reduce the amount of packaging it presently uses for some consumer packaged goods.

The above table 5.16, serial .no.6 is regarding the wish that the Government should pass legislation making recycling mandatory. It shows that there is no significant difference between suburb and urban (U = 19431.5, P>0.05). The suburb (mean rank 187.6) and urban people (mean rank 213.4) agree that the Government should pass legislation making recycling mandatory.

5.4.4. Challenges of consumer as well as policy maker with regards to Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019.

Table 5.17. Descriptive statistics of challenges of consumer as well as policy maker with regards to Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019.

Sl. No.	Particulars		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
1	Many shops still provide plastic carry bag.	Suburb	19	3	59	51	68	200
		Urban	23	5	54	59	59	200
	Total		**42**	**8**	**113**	**110**	**127**	**400**
2	Banning of plastic bag bothersome buying.	Suburb	9	33	83	47	28	200
		Urban	26	35	66	49	24	200
	Total		**35**	**68**	**149**	**96**	**52**	**400**
3	Alternative to plastic carry bag is rare to buy.	Suburb	2	4	69	50	75	200
		Urban	5	7	72	54	62	200
	Total		**7**	**11**	**141**	**104**	**137**	**400**
4	Banning of Plastic carry bag increase our family monthly expenditure.	Suburb	50	50	66	15	19	200
		Urban	71	49	59	13	8	200
	Total		**121**	**99**	**125**	**28**	**27**	**400**
5	I often refuse to buy products since I do not have carry bag.	Suburb	27	58	66	26	23	200
		Urban	48	45	59	27	21	200
	Total		**75**	**103**	**125**	**53**	**44**	**400**

Source: Primary Data

Data Interpretation

The above 5.17 table shows descriptive statistics comparison between the suburb and urban regarding the challenges faced by the consumer due to the

implementation of Aizawl Municipal Corporation Solid Waste Management Bye-Law 2019'. There are 400 respondents out of which 200 respondents are from suburb areas and another 200 respondents are from urban areas.

Table 5.17, serial no. 1, is regarding whether several shops are still providing plastic carry bags. From suburb 'Strongly agree' is the highest score attaining 68 respondents and from urban 'strongly agree' and 'agree' are the highest score attaining 59 respondents each.

Serial no. 2 is regarding whether banning plastic carry bags bothersome buying. Form suburb and urban 'Neutral' is the highest score, 83 respondents from suburb and 66 respondents from urban.

Serial no. 3, is regarding whether an alternative to a plastic carry bag is rare to buy. From suburb, 'Strongly agree is the highest score, attaining 75. While in urban areas, 'Neutral' is the highest score, attaining 72.

Serial no. 4, is regarding whether banning of plastic carry bag increase household expenditure. From suburb, 'neutral" is the highest score, attaining 66. While in urban areas, 'strongly disagree' is the highest score, attaining 71.

Serial no. 5, is regarding whether the respondents refuse to buy products as they do not have carry bag. Form suburb and urban 'Neutral' is the highest score, 66 respondents from suburb and 59 respondents from urban areas.

Table 5.18. Normality Test of challenges of consumer as well as policy maker with regards to Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019.

Statements	Location		Kolmogorov-Smirnova			Shapiro-Wilk	
		Statistic	df	Sig.	Statistic	df	Sig.
Many shops still provide plastic carry bag.	Suburb	0.191	200	0.000	0.835	200	0.000
	Urban	0.206	200	0.000	0.846	200	0.000

Banning of plastic bag bothersome buying.	Suburb	0.224	200	0.000	0.904	200	0.000
	Urban	0.178	200	0.000	0.913	200	0.000
Alternative to plastic carry bag is rare to buy.	Suburb	0.239	200	0.000	0.82	200	0.000
	Urban	0.209	200	0.000	0.851	200	0.000
Banning of Plastic carry bag increase our family monthly expenditure.	Suburb	0.175	200	0.000	0.882	200	0.000
	Urban	0.212	200	0.000	0.854	200	0.000
I often refuse to buy products since I do not have carry bag.	Suburb	0.188	200	0.000	0.904	200	0.000
	Urban	0.158	200	0.000	0.895	200	0.000

Source: Primary Data ***P<0.05**

Interpretation:

The above table 5.18 shows Kolmogorov-Smirnova and Shapiro Wilk test of normality. The null hypothesis is that "all the data are normally distributed". But in the above table, all the statement's P-value shows 0.00, which is less than 0.05. So, the null hypothesis is rejected and it can be concluded that all the data are not normally distributed. So, a Non-parametric test is needed to be utilized for further analysis.

Table: 5.19. Mann-Whitney U of challenges of consumer as well as policy maker with regards to Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019.

Sl. No.	Statement	Location	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
1	Many shops still provide plastic carry bag.	Suburb	200	204.6	40920.5	19179.5	39279.5	-0.738	0.46
		Urban	200	196.4	39279.5				
2	Banning of	Suburb	200	209.2	41839	18261	38361	-1.562	0.118

	plastic bag bothersome buying.	Urban	200	191.8	38361				
3	Alternative to plastic carry bag is rare to buy.	Suburb	200	208.38	41676	18424	38524	-1.438	0.15
		Urban	200	192.62	38524				
4	Banning of Plastic carry bag increase our family monthly expenditure.	Suburb	200	215.12	43023.5	17076.5	37176.5	-2.628	0.009**
		Urban	200	185.88	37176.5				
5	I often refuse to buy products since I do not have carry bag.	Suburb	200	207.92	41583.5	18516.5	38616.5	-1.322	0.186
		Urban	200	193.08	38616.5				

Source: Primary Data ***P<0.05**

Data interpretation:

The above table 5.19 shows the mean comparison between suburb and urban areas of the Aizawl Municipal Corporation Area regarding the impact of the Bye-Law on consumers. There are 400 respondents out of which 200 respondents are from suburb areas and another 200 respondents are from urban areas. “Mann-Whitney U – Test” is used to find out the significant difference between suburb and urban.

The above table 5.19, serial .no.1 is regarding whether shops are still providing plastic carry bags. It shows that there is no significant difference between suburb and urban (U = 19179.5, P>0.05). The suburb (mean rank 204.6) and urban people (mean rank 196.4) agree that many shops are still providing plastic carry bags.

Table 5.19, serial no. 2 is regarding whether banning plastic bags bothersome buying. It shows that there is no significant difference between suburb and urban (U

= 18261, P>0.05). The suburb (209.2) and urban (mean rank 191.8) people have neither agree nor disagree that banning of plastic bag bother their buying.

Table 5.19, serial no. 3, is regarding whether an alternative to plastic carry bag is rare to buy in the market. It shows that there is no significant difference between suburb and urban (U = 18424, P>0.05). The suburb (mean rank 208.38) and urban people (mean rank 192.62) agree that alternative to plastic carry bag is rare to buy.

Table 5.19, serial no 4 is regarding whether the banning of plastic bags increases the family household expenditure. It shows that there is a significant difference between suburb and urban areas (U = 17076.5, P<0.05). The suburb people have a higher mean rank (215.12) as compare to urban (mean rank 185.88). So, it is clear that the suburb people have disagreed more than urban that plastic bags increase family household expenditure.

The above table 5.19, serial .no.5 is regarding whether the respondents refuse to buy products as they do not have carry bags. It shows that there is no significant difference between suburb and urban (U = 18516.5, P>0.05). The suburb (mean rank 207.92) and urban people (mean rank 193.08) do not agree that they refuse to buy products as they do not have carry bags.

5.4.5. Consumer coping strategy with regards to Aizawl Municipal Corporation Plastic waste management Bye-Law 2019.

Table: 5.20. Descriptive statistics of consumer coping strategy with regards to Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019.

Sl. No.	**Particulars**		**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	**Total**
1	I used self-made carry bag.	Suburb	25	45	85	28	17	200
		Urban	42	38	82	24	14	200
	Total		**67**	**83**	**167**	**52**	**31**	**400**

2	After AMC implement solid waste management Bye law I rarely consume plastic bag.	Suburb	7	16	72	67	38	200
		Urban	11	9	71	65	44	200
	Total		**18**	**25**	**143**	**132**	**82**	**400**
3	I do not have any problem after banning of plastic carry bag.	Suburb	7	21	40	60	72	200
		Urban	10	21	33	66	70	200
	Total		**17**	**42**	**73**	**126**	**142**	**400**
4	My family have regular used carry / bazar bag.	Suburb	4	6	53	49	88	200
		Urban	2	9	49	59	81	200
	Total		**6**	**15**	**102**	**108**	**169**	**400**
5	Many shop still provide plastic carry bag	Suburb	19	3	59	51	68	200
		Urban	23	5	54	59	59	200
	Total		**42**	**8**	**113**	**110**	**127**	**400**

Source: Primary Data

Data Interpretation

The above table 5.20 shows descriptive statistics comparison between suburb and urban regarding the coping strategy with the implementation of Aizawl Municipal Corporation Solid Waste Management Bye-Law 2019'. There are 400 respondents out of which 200 respondents are from suburb areas and another 200 respondents are from urban areas.

Table 5.20, serial no. 1, is regarding whether the respondents are using self-made plastic carry bag. From suburb and urban 'Neutral' is the highest score, 85 respondents from suburb and 82 respondents from urban.

Serial no. 2, is regarding whether the respondents reduce their consumption of plastic carry bag with the implementation of the Aizawl Municipal Corporation Solid waste management Bye-Law 2019. From suburb and urban 'Neutral' is the highest score, 72 respondents from suburb and 71 respondents from urban.

Serial no. 3 is regarding whether the respondents have problem after the banning of plastic carry bags by AMC. From suburb and urban 'strongly agree' is the highest score, 72 respondents from suburb and 70 respondents from urban. This means that the suburb and urban people do not have problems after the banning of plastic carry bags by AMC.

Serial no. 4, is regarding whether the respondents and their family have used regular bazar bags or not. From suburb and urban 'strongly agree' is the highest score, 88 respondents from suburb and 81 respondents from urban.

Serial no. 5, is regarding whether shops are still providing plastic carry bags or not. From suburb 'strongly agree' is the highest score attaining 68 respondents from suburb and from urban 'strongly agree' and 'agree' are the highest consisting of 59 each of the respondents.

Table: 5.21. Normality test of consumer coping strategy with regards to Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019.

Statements	Location		Kolmogorov-Smirnova			Shapiro-Wilk	
		Statistic	df	Sig.	Statistic	df	Sig.
I used self-made carry bag.	Peripheral	0.215	200	0.000	0.903	200	0.000
	Core	0.22	200	0.000	0.892	200	0.000
After AMC implement solid waste management Bye law I rarely consume plastic bag.	Peripheral	0.344	200	0.000	0.795	200	0.000
	Core	0.376	200	0.000	0.756	200	0.000

I do not have any problem after banning of plastic carry bag.	Peripheral	0.338	200	0.000	0.804	200	0.000
	Core	0.363	200	0.000	0.778	200	0.000
My family have regular used carry / bazar bag.	Peripheral	0.351	200	0.000	0.77	200	0.000
	Core	0.363	200	0.000	0.72	200	0.000
Many shops still provide plastic carry bag.	Peripheral	0.191	200	0.000	0.835	200	0.000
	Core	0.206	200	0.000	0.846	200	0.000

Source: Primary Data ***P<0.05**

Interpretation:

The above table 5.21 shows Kolmogorov-Smirnova and Shapiro Wilk test of normality. The null hypothesis is that "all the data are normally distributed". But in the above table, all the statement's P-value shows 0.00, which is less than 0.05. So, the null hypothesis is rejected and it can be concluded that all the data are not normally distributed. So, a Non-parametric test is needed to be utilized for further analysis.

Table: 5.22. Mann-Whitney U of consumer coping strategy with regards to Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019.

Sl. No.	Statement	Location	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
1	I used self-made carry bag.	Suburb	200	209.04	41808	18292	38392	-1.548	0.122
		Urban	200	191.96	38392				
2	After AMC implement solid waste management Bye law I rarely consume	Suburb	200	204.52	40903	19197	39297	-0.807	0.42
		Urban	200	196.48	39297				

	plastic bag.								
3	I do not have any problem after banning of plastic carry bag.	Suburb	200	203.1	40621	19479	39579	-0.514	0.607
		Urban	200	197.9	39579				
4	My family have regular used carry / bazar bag.	Suburb	200	196.54	39309	19209	39309	-0.773	0.44
		Urban	200	204.46	40891				
5	Many shops still provide plastic carry bag.	Suburb	200	204.6	40920.5	19179.5	39279.5	-0.738	0.46
		Urban	200	196.4	39279.5				

Source: Primary Data ***P<0.05**

Interpretation

The above table 5.22 shows the mean comparison between suburb and urban areas of the Aizawl Municipal Corporation Area regarding the impact of the Bye-Law on consumers. There are 400 respondents out of which 200 respondents are from suburb areas and another 200 respondents are from urban areas. "Mann-Whitney U – Test" is used to find out the significance difference between suburb and urban.

The above table 5.22, serial .no.1 is regarding whether the respondents are using self-made plastic carry bags. It shows that there is no significant difference between suburb and urban (U = 18292, P>0.05). The suburb (mean rank 209.04) and urban people (mean rank 191.96) neither agree nor disagree that they use self-made carry bags.

Table 5.22, serial no. 2 is regarding whether the respondents reduce their consumption of plastic carry bag after the implementation of the Aizawl Municipal

Corporation Solid Waste Management Bye-Law 2019. It shows that there is no significant difference between suburb and urban (U = 19197, P>0.05). The suburb (mean rank 204.52) and urban (mean rank 196.48) have consumed plastic carry bags lesser after the implementation of the Aizawl Municipal Corporation Solid waste management Bye-Law 2019.

Table 5.22, serial no. 3, is regarding whether the respondents have a problems after the banning of plastic carry bags by AMC. It shows that there is no significant difference between suburb and urban (U = 19479, P>0.05). The suburb (mean rank 203.1) and urban people (mean rank 197.9) do not have problems after banning plastic carry bags.

Table 5.22, serial no 4 is regarding whether the respondents and their family have used regular Bazar bags or not. It shows that there is no significant difference between suburb and urban (U = 19209, P>0.05). The suburb (mean rank 196.54) and urban people (mean rank 204.46) have used regular bazar bags.

The above table 5.22, serial no.5 is regarding whether the shops are still providing plastic carry bag. It shows that there is no significant difference between suburb and urban (U = 19179.5, P>0.05). The suburb (mean rank 204.6) and urban people (mean rank 196.4) agree that many shops are still providing plastic carry bags.

5.5. Hypothesis Testing

H1. There is a significant relationship between age groups of consumers and level of awareness.

Table: 5.23. Relationship between age groups of consumers and level of awareness.

	Age of the Respondent
Awareness level on biodegradable products	**-0.057**

Source: Primary data ****. Correlation is significant at the 0.01 level (2-tailed).**

The above table 5.23 shows that the relationship between awareness level on biodegradable products and age of respondents. Correlation value is -0.057. So it can be concluded that there is no significant relationship between level of awareness on biodegradable products and the age group of the respondents. Therefore, the alternative hypothesis is rejected and null hypothesis is accepted.

H2. There is a significance difference between level of awareness in biodegradable products among consumers in urban and suburb areas in Aizawl.

Table: 5.24. Difference between level of awareness in biodegradable products among consumers in urban and suburb areas in Aizawl.

	Location	**N**	**Mean Rank**	**Sum of Ranks**	**Mann-Whitney U**	**Wilcoxon W**	**Z**	**Asymp. Sig. (2-tailed)**
Awareness Level	Suburb	200	192.97	38594.5	18494.5	38594.5	-1.309	0.19
	Urban	200	208.03	41605.5				

Source: Primary Data ***P<0.05**

The above table 5.24, shows that the P-value is 0.19, which is greater than 0.05. Therefore there is a significant evidence to retain and accept the null hypothesis and reject the alternate hypothesis that the distribution of awareness is the same in suburb and urban areas of Aizawl. So it can be concluded that there is no significant difference between level of awareness in biodegradable products among consumers in urban and suburb areas in Aizawl.

H3. There is a significant difference on usage of biodegradable products among consumers in Urban and suburb areas in Aizawl.

Table: 5.25. **Difference on usage of biodegradable products among consumers in Urban and suburb areas in Aizawl.**

	Location	**N**	**Mean Rank**	**Sum of Ranks**	**Mann-Whitney U**	**Wilcoxon W**	**Z**	**Asymp. Sig. (2-tailed)**
Usage	Suburb	200	192.86	38573	21527.000	38573	-1.345	0.179
	Urban	200	208.14	41627				

Source: Primary Data ***P<0.05**

The above table 5.25, shows that the P-value is 0.179, which is greater than 0.05. Therefore there is a significant evidence to retain and accept the null hypothesis and reject the alternate hypothesis that the distribution of awareness is the same in suburb and urban areas of Aizawl. So it can be concluded that there is no significant difference between usage of biodegradable products among consumers in urban and suburb areas in Aizawl.

6.1. Introduction

This section deals with findings from the analysis of hypothesis, findings from profiling of biodegradable products in Aizawl and findings from the analysis of consumer behaviour among respondents with regard to Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019. It also includes suggestion to various stakeholders.

6.2. Findings from Hypothesis.

1. There is no significant relationship between level of awareness on biodegradable products and the age group of the respondents.

2. There is no significant difference between level of awareness in biodegradable products among consumers in urban and suburb areas in Aizawl.

3. There is no significant difference between usage of biodegradable products among consumers in urban and suburb areas in Aizawl.

6.3. Findings from profiling of biodegradable products in Aizawl.

From the profiling of biodegradable products in Aizawl, Mizoram, it can be seen that there are few entrepreneurs manufacturing biodegradable products in Aizawl, Mizoram. There are three enterprises, manufacturing eco-friendly disposable paper cups and one enterprise manufacturing eco-friendly carry bags within Aizawl. Enterprises, engaged in the production of eco-friendly products mostly produced disposable cups and carry bags. All of the enterprises produced eco-friendly products depending on the demand they received and delivered it by themselves.

The material used for producing eco-friendly cup and carry bags are imported from other states. Regarding the product label all the enterprise done label printing by their own, Except Rolins engineering. This product labelling was either design by themselves or according to the customer preferences. Which means the printing label is customizable. From the profiling it can be seen that only two enterprise, namely Sky Net and RS Traders have advertise their products through Television.

The data collected from the consumer regarding the awareness of the production of biodegradable products in Aizawl reveals that people residing in urban areas have higher knowledge about the production of disposable paper cup and carry bags in Aizawl in comparison to people residing in suburb areas.

6.4. Finding from consumer behavior with regards to Aizawl Municipal Corporation Plastic Waste Management Bye Law 2019.

1. From the data analysis of awareness level of the respondents regarding biodegradable products, it is found that consumers are generally aware of the negative effect of plastic but there is a poor reflection in their behavior. This could be due to the personal ethics (Sehgal and Singh 2010, Leonidou et al. 2010). The use of plastic has a universal systemic effect. But its impact is not very noticeable at the individual level. Therefore, consumers fail to notice the effect it has at the individual level and take less precautions on how plastic effects the whole world (Taleb, N.N. and Norman, J., 2020). However, the data shows that consumers reused plastic products whichever can be reused.

2. From the analysis, it has been found that Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019 has an impact on consumers in regard to their pattern of plastic usage. The policy implemented by Aizawl Municipal Corporation on the ban of plastic bags has indeed caused inconvenience in purchase of daily commodities among consumer. Nevertheless the policy has not deterred consumers in purchase of various commodities due to the fact that plastic bags are easily available and given at free of cost by the shopkeepers in many retail shops in Aizawl. However, consumers in the market fail to find suitable alternative to plastic bags which ultimately results in the use of plastic bags to purchase their daily commodities. Although the impact of Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019 is negligible it has been found that Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019 has reduced the consumption of plastic bags to some extent.

3. Consumer generally show good compliances in classification of waste according to their types i.e., biodegradable and non-biodegradable wastes. However only 64% of the households from suburbs actively participate in waste classification. Whereas 74% of households from urban actively participate in waste classification. This difference in the level of participation in urban and suburb households can be due to the fact that there is difficulty in access of sanitary trucks in the suburb areas of Aizawl (Anil pratab sing and Angom Sarjubala Devi 2019, Lalneihzovi and H.C Lalchhuanawma 2018).

4. Although there is a strict implementation from Aizawl Municipal Corporation, it can be observed that there is a lack of stringent monitoring system on the use of plastic carry bags in Aizawl. Many consumers agree to the fact that plastic carry bags are freely provided in retail shops around the city as alternative to plastic is difficult and expensive. Which results in consumer's inclination to use plastic carry bags.

5. It has also been found that consumers adopt to the changes made by Aizawl Municipal Corporation in the use of plastic carry bags in Aizawl. Many consumers follow various coping strategies such as using self-made carry bags. The analysis also shows that 22.5% of the respondents from suburb areas us self-made carry bags whereas 19% of the respondents from urban use self-made carry bags. The study also shows that 68.5% of households from suburb and 70% of households from urban use regular bazar bags which includes that there exists a slight progressive impact among consumers lifestyle in reduction of plastic consumptions.

6.5. Conclusion

This section deals with the final conclusion from the study. From chapter 2 i.e., profiling of biodegradable products, it was found that only one enterprise in Aizawl is engaged in production of biodegradable carry bags and three enterprise engaged in production of biodegradable disposable cups. All four enterprises have imported the raw materials from other states. This makes the production cost higher and it reduce the potential to compete with other biodegradable products which are imported from other states. This biodegradable products itself compete with Non-biodegradable products like plastic carry bags, cups and plates are easy to manufacture and the production cost and quality is better. The demand of biodegradable paper cups and plates is not quite high and mostly people consume it on occasional events such as Christmas, wedding ceremony, birthdays, educational functions, etc.

One of the problem faced by the eco-friendly paper cup, plates and carry bag producers is regarding the quality. The material used for making Eco-friendly paper plate do not last long to keep hot material. And it easily caught by mold which makes the cup or plate not fresh to keep eatable food items.

Another problem is regarding the production of eco-friendly paper. The paper used for making eco-friendly paper cup is not produced in India, it needs to be import from other countries which makes the production cost higher as to compete plastic disposable cup. The Cachar paper mill could manufacture the paper used for eco-friendly products but it required 2000 tons to order at once. Which is too huge to order at once.

The examining of the consumer awareness with regards to biodegradable production in Aizawl shows that, majority of the population are aware of it. However, the awareness gradually decline from urban to suburb. This shows that, those enterprises need to involve more in advertising and required to have a proper channel of distribution.

Regarding consumer behaviour towards Aizawl Municipal Corporation Plastic Waste Management Bye-law 2019. Even though many of the consumers are generally aware of the negative effect of plastic but there is a poor reflection in their behavior. This could be due to the personal ethics. The use of plastic has a universal systemic effect. But its impact is not very noticeable at the individual level. Therefore, consumers fail to notice the effect it has at the individual level and take less precautions on how plastic effects the whole world. (Taleb, N.N. and Norman, J., 2020). However, the data shows that consumer reused plastic products whichever can be reused.

Plastic bag consumption is necessary and it makes life easy. The study also found that many of the shops are still providing plastic carry bag. This may be due to stringent monitoring system of the banning of plastic bags. However, 52.5% from suburb and 54.5% from urban areas agree that they consumed plastic carry bags lesser after the implementation of the Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019. Even though the data is negligent one of the positive effect is that, 22.5 % of the respondents from suburb and 19% of the respondents from urban areas used self-made carry bag. Meanwhile 68.5% from suburb areas and 70% from urban areas used regular bazar bag. This lifestyles will helps reduce in the consumption of plastic and it is necessary to promote this kind of lifestyle to consumer.

Consumer generally show good compliances in classification of waste according to their types i.e., biodegradable and non-biodegradable wastes. However only 64% of the households from suburbs actively participate in waste classification. Whereas 74% of households from urban actively participate in waste classification. This difference in the level of participation in urban and suburb households can be due to the fact that there is difficulty in access of sanitary trucks in the suburb areas of Aizawl

With the implementation of The Aizawl Municipal Corporation Solid Waste Management Bye Law 2018 and The Aizawl Municipal Corporation Plastic Waste Management Bye Law 2019. It is evident and clear that the awareness and

importance of proper waste management has been firmly embedded into the minds of consumers. The study through its findings has also shown a positive progress among the consumers in proper waste management and proper use of plastic. However, only time can ensure the fact that Aizawl can be a complete plastic free city with a successful waste management system.

6.6. Suggestion:

After the detailed analysis of data, the following suggestions were recommended by the researcher these suggestions are entirely drawn out from the study.

6.6.1. Suggestion to entrepreneurs:

1. There is a limited choice for eco-friendly products for the normal consumers as well as an ecologically conscious consumer therefore the entrepreneurs in Mizoram need to see the gap identified and try to bridge the gap by manufacturing more eco-friendly products in the local market as the consumers have very little or no choice at all in substituting regular products with eco-friendly products. Hence there must be innovation in variety of products manufactured by the entrepreneurs

2. The existing entrepreneurs manufacturing eco-friendly products need to invest more on awareness and promotion of their products as it has been found that consumers are not aware of the availability of their products in the market. Therefore advertisements need to be the top priority to make the consumers aware of their products in Aizawl.

6.6.2. Suggestion to Consumers:

1. Consumers in Aizawl need to comprehend and understand the rules and regulations laid down by the policy makers of the Mizoram and the various information they need to know and show compliance to the rules and regulations of

the State towards the effort taken by the government of Mizoram to maximize the use of eco-friendly products and minimize generation of plastic waste.

2. Consumers need to play their part by adopting a paradigm shift by changing their pattern of usage of non-biodegradable products by taking measures in their level such as using regular bazar bags and reusing plastic bags as much as possible.

6.6.3. Suggestion to policy makers:

1. The Policy makers need to perform a good monitoring system by ensuring and enforcing rules and regulations by making sure that stores and shops give out and utilise only acceptable and permitted plastic bags.

2. The government needs to perform non-stop awareness campaigns that must be published in mass media.

3. A better system must be chalked out in collection of waste in various localities as the study found that many localities face massive problems in collection of waste through garbage trucks which is not the most efficient and convenient method of collecting waste in various parts of the city.

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APPENDICES

A STUDY OF CONSUMER BEHAVIOUR WITH REGARD TO BIODEGRADABLE PRODUCTS IN AIZAWL, MIZORAM

1. Gender of the Respondent

a. Male ☐ b. Female ☐

2. Age of the Respondent

a. 18 – 22 ☐ b. 23 – 28 ☐

c. 29 – 34 ☐ d. 35 – 40 ☐

e. 41 Years and above ☐

3. Locality of the respondent _____.

4. Monthly Income of the Respondent

a. Below 10000 ☐ b. 10000 – 30000 ☐

c. 40000 – 60000 ☐ d. 70000 – 90000 ☐

e. 100000 – 120000 ☐ f. Above 130000 ☐

5. Educational Qualification of the Respondent

a. Below Class 10 ☐ b. Up to class 10 ☐

c. Up to Class 12 or equivalent ☐ d. Up to Bachelor Degree ☐

e. Up to Master Degree or Equivalent ☐ f. Up to M.Phil. or Ph.D. ☐

6. Occupation of the Respondent

a. Daily Wages Laborer ☐ b. Government Employee ☐

c. Business ☐ f. Others ☐

7. Socio-Economic Status of the Respondent

a. AAY ☐ b. BPL ☐ c. APL ☐

8. I know that Mizoram has produce biodegradable disposable cup and plate.

a. Strongly Disagree ☐
b. Disagree ☐
c. Neutral ☐
d. Agree ☐
e. Strongly Agree ☐

9. I know that Mizoram has Produce bag which can substitute Plastic bag.

a. Strongly Disagree ☐
b. Disagree ☐
c. Neutral ☐
d. Agree ☐
e. Strongly Agree ☐

10. I know that plastic bags take many years to decompose and cause pollution.

a. Strongly Disagree ☐
b. Disagree ☐
c. Neutral ☐
d. Agree ☐
e. Strongly Agree ☐

11. When I buy products, I try to consider how my use of them will affect the environment and other consumers.

a. Strongly Disagree ☐
b. Disagree ☐
c. Neutral ☐
d. Agree ☐
e. Strongly Agree ☐

12. Whenever possible, I buy products which I consider environmentally safe.

a. Strongly Disagree ☐
b. Disagree ☐

c. Neutral ☐

d. Agree ☐

e. Strongly Agree ☐

13. I reuse whenever possible.

a. Strongly Disagree ☐

b. Disagree ☐

c. Neutral ☐

d. Agree ☐

e. Strongly Agree ☐

14. I make a special effort to buy biodegradable products.

a. Strongly Disagree ☐

b. Disagree ☐

c. Neutral ☐

d. Agree ☐

e. Strongly Agree ☐

15. When there is a choice, I choose the product that causes the least pollution.

a. Strongly Disagree ☐

b. Disagree ☐

c. Neutral ☐

d. Agree ☐

e. Strongly Agree ☐

16. I read the labels to see if the products are environmentally safe.

a. Strongly Disagree ☐

b. Disagree ☐

c. Neutral ☐

d. Agree ☐

e. Strongly Agree ☐

17. I believe that industry could reduce the amount of packaging it presently uses for some consumer packaged goods.

a. Strongly Disagree ☐
b. Disagree ☐
c. Neutral ☐
d. Agree ☐
e. Strongly Agree ☐

18. I feel the government should pass legislation making recycling mandatory.

a. Strongly Disagree ☐
b. Disagree ☐
c. Neutral ☐
d. Agree ☐
e. Strongly Agree ☐

19. I support AMC plastic Waste Management Bye-Laws 2019".

a. Strongly Disagree ☐
b. Disagree ☐
c. Neutral ☐
d. Agree ☐
e. Strongly Agree ☐

20. My family strictly follow the classification of waste made by AMC.

a. Strongly Disagree ☐
b. Disagree ☐
c. Neutral ☐
d. Agree ☐
e. Strongly Agree ☐

21. Our family always dump in AMC Sanitary truck/garbage truck.

a. Strongly Disagree ☐
b. Disagree ☐

c. Neutral ☐

d. Agree ☐

e. Strongly Agree ☐

22. AMC should provide alternative before banning plastic carry bag.

a. Strongly Disagree ☐

b. Disagree ☐

c. Neutral ☐

d. Agree ☐

e. Strongly Agree ☐

23. AMC should provide more dustbin in the street to ensure cleaner environment.

a. Strongly Disagree ☐

b. Disagree ☐

c. Neutral ☐

d. Agree ☐

e. Strongly Agree ☐

24. Many shops still provide plastic carry bag.

a. Strongly Disagree ☐

b. Disagree ☐

c. Neutral ☐

d. Agree ☐

e. Strongly Agree ☐

25. Banning of plastic bag bothersome buying.

a. Strongly Disagree ☐

b. Disagree ☐

c. Neutral ☐

d. Agree ☐

e. Strongly Agree ☐

26. Alternative to plastic carry bag is rare to buy.

a. Strongly Disagree ☐
b. Disagree ☐
c. Neutral ☐
d. Agree ☐
e. Strongly Agree ☐

27. Banning of Plastic carry bag increase our family monthly expenditure.

a. Strongly Disagree ☐
b. Disagree ☐
c. Neutral ☐
d. Agree ☐
e. Strongly Agree ☐

28. I often refuse to buy products since I do not have carry bag.

a. Strongly Disagree ☐
b. Disagree ☐
c. Neutral ☐
d. Agree ☐
e. Strongly Agree ☐

29. I used self-made carry bag.

a. Strongly Disagree ☐
b. Disagree ☐
c. Neutral ☐
d. Agree ☐
e. Strongly Agree ☐

30. After AMC implement solid waste management Bye law I rarely consume plastic bag.

a. Strongly Disagree ☐
b. Disagree ☐

c. Neutral ☐

d. Agree ☐

e. Strongly Agree ☐

31. I do not have any problem after banning of plastic carry bag.

a. Strongly Disagree ☐

b. Disagree ☐

c. Neutral ☐

d. Agree ☐

e. Strongly Agree ☐

32. My family have regular used carry / bazar bag.

a. Strongly Disagree ☐

b. Disagree ☐

c. Neutral ☐

d. Agree ☐

e. Strongly Agree ☐

QUESTIONNAIRE FOR BIODEGRADABLE PRODUCTS PRODUCERS

1. Name of the enterprise
2. Location of the enterprise
3. When did you launch the enterprise?
4. When did you begin to manufacture an environmentally friendly products?
5. Which kind of eco-friendly products you produced?
6. How many eco-friendly disposable cups or plates or carry bags can you produce in a single day?
7. How many kinds of disposable cups or plates or carry bags do you make?
8. For your products, what kind of eco-friendly materials are used?
9. Are you importing raw materials or are you using local production?
10. If the raw material is imported, where do you import it from?
11. Is the printing of the label on the disposable cup or plates or carry bags done by you?
12. How many cups/paper bag do you sell in a month, on average?
13. What is your Marketing channel?
14. Have you done some advertisement for your products?
15. What kind of challenges do you face in your company?

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DISSERTATION TITLES

"A Study of Consumer Behaviour with Regard to Biodegradable Products in Aizawl, Mizoram"

PARTICULAR OF THE CANDIDATE:

NAME OF THE CANDIDATE	: ALEXIUS LALCHHANDAMA
DEGREE	: MASTER OF PHILOSOPHY (M.PHIL.)
TITTLE OF THE DISSERTATION	: A STUDY OF CONSUMER BEHAVIOUR WITH REGARD TO BIODEGRADABLE PRODUCTS IN AIZAWL, MIZORAM
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Department of Management

ABSTRACT

A STUDY OF CONSUMER BEHAVIOUR WITH REGARD TO BIODEGRADABLE PRODUCTS IN AIZAWL, MIZORAM

A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF PHILOSOPHY

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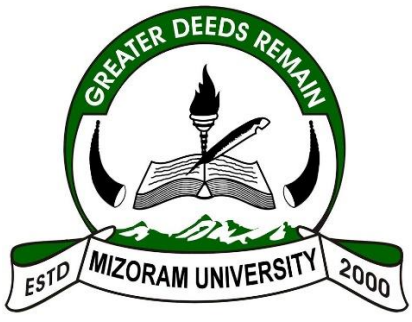

DEPARTMENT OF MANGEMENT
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ABSTRACT

A STUDY OF CONSUMER BEHAVIOUR WITH REGARD TO BIODEGRADABLE PRODUCTS IN AIZAWL, MIZORAM

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ABSTRACT

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Introduction:

The increase in urbanization and technological development are one of the major causes of waste generation in urban areas. The difficulty in managing waste is one of the major global concern. In today's world, consumption of environmental concern products is an essential issue for marketing practitioners and policy-makers. As such, the pressure on environmental friendly concern resulted in the inclusion of corporate social responsibility within corporate strategies (Johnstone and Tan, 2015). Consumer choices reflect not only price and quality preferences but also social and moral values, as witnessed in the remarkable growth of the global market for organic and environmentally friendly products (Sehgal and Singh, 2010). The increasing awareness campaign on the negative effects on the consumption of non-biodegradable products let the consumers resort to the use of biodegradable products (Santos et al., 2013).. The rise of consciousness and awareness on the issue of non-biodegradable products and its impact on nature and its environment came to be the center of exercise.

This dissertation deals with biodegradable and compostable products which are produced in Aizawl and focus will be laid upon consumer behaviour. It also deals with profiling of biodegradable products in Mizoram and lastly it deals with consumer behaviour towards the Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019.

Significance of the Study

In the collection of Municipal waste by Public Private Partnership, barely 80.44 per cent of household wastes are usually collected, the rest of the wastes are

disposed to streams (Lalneihzovi and Lalchhuanawma, 2018). The effect of this unmindful disposal is not felt initially. Although consumers are aware of the impact on the environment, discontinuation of its usage is found to be nearly impossible. Due to this reason, it can be questioned whether the value of biodegradable products is not realised or the consumption of non-biodegradable products is already too naturalised so much so that its usage cannot be stopped abruptly.

The awareness and consumption of biodegradable products matters a lot for safeguarding environmental degradation. So, it is necessary to study consumer behaviour which could change the awareness and consumption of such eco – friendly products. With the growth of development and technology some Mizo producers produce biodegradable products which could substitute plastic products. Profiling of such products is necessary as it has contributions to environmental protection.

Many of the consumers and retailers have challenges in the implementation of the "Aizawl Municipal Corporation Plastic Waste Management Bye-Laws 2019". The consumption behaviour of Mizo people towards Biodegradable products and the awareness of this Bye-laws 2019 could be beneficial for the marketers and policy makers to successfully implementing the laws.

Research Design

Statement of the problem

In 2019, AMC implementation plastic waste management bye law. "The Aizawl Municipal Corporation plastic Waste Management Bye-Laws 2019" is exercised as per the power conferred by Rule 6(4) of the "Plastic Waste Management Rules, 2016". This Bye-law is exercised from 1st August 2019. The Aizawl Municipal Corporation does not allow to generate bulk wastes (not exceeding 100 Kg per day) by the state government departments, public sector undertakings or private companies, local bodies, hospitals, nursing homes, schools, Universities and other educational institutions, hotels, hostels, markets, worship places, sports complexes, etc. This Bye-law restricted distributing, selling or manufacturing of carry bags made from plastic materials or compostable plastic materials which are

used for carrying or dispensing commodities. However it does not include bags used for packaging of goods which are sealed prior to use. This Bye-law is made to minimize the use of plastic within the jurisdiction of Aizawl Municipal Corporation.

The implementation of plastic waste management bye law 2019 brings an opportunity for entrepreneurs or producers. However, it has an impact towards in the consumption of plastic products such plastic carry bags, disposable plastic cups, plates, etc. due to it cost and proximity. The problem in this matter is how banning of plastic will have an impact on buying behavior of consumer and how the consumer give compliance to the Aizawl Municipal Corporation Plastic Waste Management Bye-law 2019. The challenges and coping strategy of banning of plastic is need to consider, as this banning of plastic create an opportunity for entrepreneur to produce biodegradable products such as biodegradable paper cups, plates, carry bags, etc. The response or awareness toward the biodegradable product is also important for the successful implementation of the plastic waste management. This study tries to explore the enterprises manufacturing or producing biodegradable disposable paper cups, plates and carry bags.

Objectives of the study

The objectives of the study are as follows:

1. To analyse the profile of biodegradable products produced within Aizawl.
2. To examine the level of awareness among consumer's on biodegradable products.
3. To examine restrictions of plastic carry bag and its impact on consumer behaviour.
4. To examine the challenges faced and coping strategies applied in the process of restrictions of plastic carry bag.
5. To provide policy suggestion for effective and efficient use of biodegradable products in Mizoram.

Hypothesis:

H1. There is a significant relationship between age groups of consumers and level of awareness.

H2. There is a significant difference between level of awareness in biodegradable products among consumers in Urban and suburb areas in Aizawl.

H3. There is a significant difference on usage of biodegradable products among consumers in Urban and suburb areas in Aizawl.

Research Methodology

a) Sources of data

For the study, primary data and secondary data is used. Questionnaire is used for collecting primary data from the Aizawl Municipal Corporation area. For secondary data, economic survey, rules and regulations as well as city ward classification of Aizawl Municipal Corporation is used. Apart from this, journals, articles, published research thesis, newspapers and magazines are utilized for the study.

b). Sample Size:

The sample size was determined by using Cochran's sample size determination and found that 384 respondents is sufficient to represent Aizawl population. Due to the sampling methods a 400 samples is collected from Aizawl Municipal Corporation areas.

c). Analysis of the data

The data analysis was divided into three section in order to find the result. Firstly descriptive statistic was highlighted. Secondly, normality test was conducted using Shapiro-Wilk test and lastly in order to find the difference between the respondents among urban and suburb areas non-parametric Mann Whitney U test is used.

Chapter Outline

Chapter 1: Introduction

This chapter begins with the increasing production of solid waste in terms of global scenario to national and state level and how such production of solid wastes creates problems to the world. This chapter includes the concept consumer behaviour and biodegradable products. It briefly profiling the state of Mizoram where the study was carried out. It includes biodegradable products in Mizoram as well as plastic waste management in Aizawl. This chapter includes significance of the study, scope, objectives of the study, hypothesis and limitation of the study.

Chapter 2: Literature Review

This chapter deals with the consumer behaviour with regards to Eco-friendly products which was conducted in international, national and state level. It also review solid waste management related which are conducted in the state level. At the end of the chapter the research gap was highlighted.

Chapter 3: Profiling of Biodegradable products produce in Aizawl.

This chapter deals with identifying or profiling those entrepreneur producing biodegradable or eco-friendly products within Aizawl. It also includes consumer awareness about the production of such biodegradable products.

Chapter 4: Research Design

This chapter deals with how the study was carried out. It includes statement of the problems, sources of the data, population, under which a brief profile of Aizawl Municipal Corporation is highlighted. It also includes sampling methods and tool used for analysis.

Chapter 5: Data Analysis

This chapter deals with the analysis of the data. It includes demographic profile of the respondents, awareness level of the respondents regarding

biodegradable products, consumer behavior towards Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019 and hypothesis testing.

Chapter 6: Findings and Conclusion

This section deals with findings from the analysis of hypothesis, findings from profiling of biodegradable products in Aizawl and findings from the analysis of consumer behaviour among respondents with regard to Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019. It also includes suggestion to various stakeholders.

Findings from Hypothesis.

1. There is no significant relationship between level of awareness on biodegradable products and the age group of the respondents.

2. There is no significant difference between level of awareness in biodegradable products among consumers in urban and suburb areas in Aizawl.

3. There is no significant difference between usage of biodegradable products among consumers in urban and suburb areas in Aizawl.

Findings from profiling of biodegradable products in Aizawl.

From the profiling of biodegradable products in Aizawl, Mizoram, it can be seen that there are few entrepreneurs manufacturing biodegradable products in Aizawl, Mizoram. There are three enterprises, manufacturing eco-friendly disposable paper cups and one enterprise manufacturing eco-friendly carry bags within Aizawl. Enterprises, engaged in the production of eco-friendly products mostly produced disposable cups and carry bags. All of the enterprises produced eco-friendly products depending on the demand they received and delivered it by themselves.

The material used for producing eco-friendly cup and carry bags are imported from other states. Regarding the product label all the enterprise done label printing by their own, Except Rolins engineering. This product labelling was either design by themselves or according to the customer preferences. Which means the printing label

is customizable. From the profiling it can be seen that only two enterprise, namely Sky Net and RS Traders have advertise their products through Television.

The data collected from the consumer regarding the awareness of the production of biodegradable products in Aizawl reveals that people residing in urban areas have higher knowledge about the production of disposable paper cup and carry bags in Aizawl in comparison to people residing in suburb areas.

Finding from consumer behavior with regards to Aizawl Municipal Corporation Plastic Waste Management Bye Law 2019.

1. From the data analysis of awareness level of the respondents regarding biodegradable products, it is found that consumers are generally aware of the negative effect of plastic but there is a poor reflection in their behavior. This could be due to the personal ethics (Sehgal and Singh 2010, Leonidou et al. 2010). The use of plastic has a universal systemic effect. But its impact is not very noticeable at the individual level. Therefore, consumers fail to notice the effect it has at the individual level and take less precautions on how plastic effects the whole world (Taleb, N.N. and Norman, J., 2020). However, the data shows that consumers reused plastic products whichever can be reused.

2. From the analysis, it has been found that Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019 has an impact on consumers in regard to their pattern of plastic usage. The policy implemented by Aizawl Municipal Corporation on the ban of plastic bags has indeed caused inconvenience in purchase of daily commodities among consumer. Nevertheless the policy has not deterred consumers in purchase of various commodities due to the fact that plastic bags are easily available and given at free of cost by the shopkeepers in many retail shops in Aizawl. However, consumers in the market fail to find suitable alternative to plastic bags which ultimately results in the use of plastic bags to purchase their daily commodities. Although the impact of Aizawl Municipal Corporation Plastic Waste Management Bye-Law 2019 is negligible it has been found that Aizawl Municipal

Corporation Plastic Waste Management Bye-Law 2019 has reduced the consumption of plastic bags to some extent.

3. Consumer generally show good compliances in classification of waste according to their types i.e., biodegradable and non-biodegradable wastes. However only 64% of the households from suburbs actively participate in waste classification. Whereas 74% of households from urban actively participate in waste classification. This difference in the level of participation in urban and suburb households can be due to the fact that there is difficulty in access of sanitary trucks in the suburb areas of Aizawl (Anil pratab sing and Angom Sarjubala Devi 2019, Lalneihzovi and H.C Lalchhuanawma 2018).

4. Although there is a strict implementation from Aizawl Municipal Corporation, it can be observed that there is a lack of stringent monitoring system on the use of plastic carry bags in Aizawl. Many consumers agree to the fact that plastic carry bags are freely provided in retail shops around the city as alternative to plastic is difficult and expensive. Which results in consumer's inclination to use plastic carry bags.

5. It has also been found that consumers adopt to the changes made by Aizawl Municipal Corporation in the use of plastic carry bags in Aizawl. Many consumers follow various coping strategies such as using self-made carry bags. The analysis also shows that 22.5% of the respondents from suburb areas us self-made carry bags whereas 19% of the respondents from urban use self-made carry bags. The study also shows that 68.5% of households from suburb and 70% of households from urban use regular bazar bags which includes that there exists a slight progressive impact among consumers lifestyle in reduction of plastic consumptions.

Conclusion

With the implementation of The Aizawl Municipal Corporation Solid Waste Management Bye Law 2018 and The Aizawl Municipal Corporation Plastic Waste Management Bye Law 2019. It is evident and clear that the awareness and importance of proper waste management has been firmly embedded into the minds of consumers. The study through its findings has also shown a positive progress among the consumers in proper waste management and proper use of plastic. However, only time can ensure the fact that Aizawl can be a complete plastic free city with a successful waste management system.

Limitation of the study

1. There is possibility of dishonesty in responding the questionnaire among the respondent and technical glitch as majority (70 percent approximately) of the data are collected google forms

3. The study is limited to the Aizawl Municipal Corporation jurisdiction only, therefore the study is demographically limited to the residents of Aizawl.

4. The sampling covers only 8 wards out 19 wards, further analysis of a large size (whole Aizawl Municipal Corporation ward) may represent a different result of the study.

5. Information gathered from the internet regarding the production biodegradable in Aizawl was not seen in reality while conducting profiling.