Understanding the psychology and legal perspective of plastic dependency in Nigeria

Abstract

Using the theory of planned behavior, this article aims to understand the psychology of plastic dependency in Nigeria. The plastics pollution has been more prevalent in its impact on the marine and terrestrial environment in Nigeria. This article engages with the mind-set of stakeholders from both governance and policy perspectives with the purpose of investigating and analysing the theory of planned behavior to form a baseline for policy making and further research on how to combat plastics pollution in Nigeria and catalyse pro-environmental behavioral intentions on the use of plastic.

Keywords: Plastic pollution; Plastic dependency; Plastic bag prohibition, Marine environment pollution; theory of planned behavior; Environmental worldview, Nigeria.

Introduction

Nigerian was ranked first in plastic pollution in sub-Saharan Africa producing between 5million to 10 million tonnes of plastic waste per-annum and an average of .2kg per person **(**Jambeck, et al, 2015). There is a geometric surge in plastic dependency in Nigeria given the social acceptance, more supply as a result of increased demand and less active implementation of legal framework for control of production and use of plastic products. The plastic dependency has attracted global multidisciplinary actions in recent years given that behavioral sciences have shown how human behavioral models can help in understanding and managing human dependency **(**Heidbreder, et al, 2019**;** Ramkissoon and Vishnee, 2018) on plastic which has resulted to abysmal consequences due to plastic waste pollution.

In the triadic reciprocal model of social cognitive theory (Bandura, 1986), it is noted that human behavior and cognition have reciprocal influences on the environment (social and physical). Accordingly, social acceptability of plastic consumption has increased how people appreciate and routinely use plastic despite the pronounced awareness of the associated problems. Within the behavioral science parlance in plastic dependency, terms such as perception, attitude, habitual, social norms, situational factor, and personality are usually presented **(**Heidbreder, et al, 2019) in describing human behavior**.** Plastic dependency is not a planned behavior, however it is developed behavior over time due to the perceived convenience and advantages of using plastic compared to other alternatives. These advantages

include the fact that plastic aids packaging which ensures that products are protected from contamination, moist and insects. Also, it helps to preserve products, prevent waste and makes it easy to transport products and it is resistant to reacting to many chemicals (Galvin). No doubt plastics have played very useful role in the society, but the dependency on it is also creating social problems and there is the need for a change of attitude (Galvin) to reduce the use of plastics. We need plastics but we don't need the waste. The world Economic forum has predicted that soon plastic waste will be more than fish in the ocean because animals will likely get into trouble ingesting plastic mistaking it for food. (Balzer, 2019). It is generally accepted that consumption habit or consumption intention has shifted significant toward plastic-free living in recent times. (Linh et al, 2019) which invariably entrenches plastic dependency.

Sholars agrees that changing human behavior is an effective way to reduce plastic waste (Allison et al 2022), while Ramkissoon and Mavondo, 2017 argue that environmental problems could be understood by investigating human attitudes and behavior. Dealing with plastic dependency requires changing the behaviors of key actors in plastic system because the success of a policy or law is dependent on the behavioral intention of people to reduce plastic consumption (Van, 2021). For instance, influencing producers to provide reusable and recyclable alternatives to single-use plastics and people should demonstrate a positive behavior to use these alternatives. (Allison et al, 2022) It therefore implies that factors that determine people's behavior are important in dealing with plastic dependency. (Allison et al, 2022). This notwithstanding, there are policy choices that could influence changes in behavior towards plastic waste such as communication, marketing and environmental and social planning (Allison et al, 2022).

Managing the behavioral component of plastic dependency will most likely be effective if it is aligned with a strong political will and legal framework that influences a pro-environment behavior. One behavioral model that has high promise in understanding the individual and behavior component of plastic dependency is the human planned behavior as depicted in the theory of planned behavior (TPB**) (**Ajzen, 1991**).** TPB is hinged on the assumption that three independent variables determine and influence how behavioral intentions are formed (Linh et al, 2019.) These variables are attitude which is the positive or negative evaluation of a given behavior; subjective norms, which considers the impact of social pressure on behavioral intentions; and the degree of perceived behavioral control which deals with the ease or difficulties in performing the behavior based on past experiences, refers and anticipated

challenges (Ajzen, 1991). TPB suggest that the more favorable the attitude and subjective norm towards a behavior; the higher the perceived behavioral control and the more likely an individual's intention to perform the particular behavior. (Linh et al, 2019).

Plastic waste is one of the contemporary environmental challenges today and like other environmental issues like climate change, environmental behaviors of people are major accentuating factors. This implies that dealing with these issues will require influencing the behavior or attitude of people to the environment as a person with a pro-environmental behavior is more likely to respond more positively to issues relating to the protection of the environment. (Ramkissoon and Vishnee, 2018) The underpinnings of this paper is that environmental problems could be understood by investigating human attitudes and behavior. (Ramkissoon and Mavondo, 2017). This paper investigates and analyses the theory of planned behavior to form a baseline for policy making and background for further research on how to reduce plastic dependency in Nigeria from both legislative governance and policy perspectives.

Methods

The paper is theoretical research which is mainly desk and library-based study. This will involve the use of both doctrinal research methods, including literature review and content analysis to evaluate existing literatures relating to the relationship of behavioral sciences in addressing environmental issues. Specifically, the paper builds on the theory of planned behavior as developed by Ajzen and Linh et al ((Linh et al, 2019; Ajzen, 1991) to contend that plastic dependency can be addressed by positively influencing the behavioral tendencies of plastic producers and users.

Theoretical framework

The theory of planned behavior is an extension of the theory of reasoned action which is important in dealing with behaviors people have incomplete volitional control over. (Linh et al, 2019) TPB assumed that behavioral intentions and eventually behavior are determined by three key antecedents: (Linh et al, 2019, Ajzen, 1991)

a. Attitudes towards the behavior in questions: This is the degree to which a person has positive or negative feelings of the behavior of interest (use and disposal of plastic product), and it entails a consideration of the outcomes of performing the behavior (Linh et al, 2019). It is the perception of an individual about a particular behavior (Ajzen 1985) which could be favorable or unfavorable (Hee Yeon Kim and Jae-Eun Chung 2011) and peoples inclination to

display that behavior (Leonard 2004). In other words, people are likely to exhibit behaviors they have positive attitude to (Linh et al, 2019). This is relevant, as a positive attitude towards the use of plastic will likely have positive impact on behavioral intentions of producers, suppliers and consumers to reduce plastic waste and plastic dependency.

b. Subjective Norm: This is the social pressure from environment on the individual to perform or not to perform the behavior. (Ajzen, 1991; Linh et al, 2019). It inquires about the degree of social acceptability of the behavior (use of plastic Products)? The impact of influential people such as close friends, relatives, colleagues on others determines significant their behaviors or attitude to some things. (Hee, 2000; Linh et al, 2019). The correlation between subjective norms and behavioral intentions is positive as people are more likely to repeat behaviors other people attach importance to. (Dean et al 2012) Hence, subjective norms could positively affect consumers' behavioral intentions towards the reduction of plastic waste (Linh et al, 2019). This is so as it is observed that 'consumers who hold positive subjective norms toward certain behaviors will have positive behavioral intentions.' (Linh et al, 2019).

C. Perceived behavioral control: This is the individual's perception of the extent to which performance of the behavior is easy or difficult **(**Ajzen, 1991 and mirrors the experiences of the past including expected obstacle (Linh et al, 2019; Paul et al 2016). Perceived behavioral control seems to increase when individuals perceive they have more resources and confidence. Therefore, it involves the individuals control beliefs regarding the behavior. In other words, perceived behavioral control and behavioral intention could also influence certain behavioral tendencies in an individual. (Linh et al, 2019; Chen and Tung 2014; Ajzen 1985). Perceived behavior control is the difficulty or ease with which a person performs and has been proven to have positive impact on consumers' behavioral intentions towards the reduction of plastic waste. (Linh et al, 2019).

From the foregoing, TPB seems to suggest that the mechanism of managing human plastic dependency need a multifaceted approach which will involve moderating the activities that influence attitude formation which will include evolving an implementable legal framework and redirecting social acceptability of plastic dependency to social rejection of plastic dependency. Various communication and media channels can easily help in this advocacy. With this on ground, TPB suggests that the subject norm will change towards rational use of plastic. This is even so where there is an active behavioral control in form of strong political will and legal framework. Legal and policy framework are aimed at controlling social behaviors. Hence, the normative elements of laws are more potent when they take into

cognizance the factors that influence the behavioral patterns they seek to control. Ramkissoon et al, 2013, observes that there are increasing efforts by environmental behavioral scientists to use ideologies of behavior to address environmental issues by reducing behaviors that are detrimental to the environment and encouraging pro-environmental attitudes (Ramkissoon et al, 2013). This is hinged on the argument that positive influence of human behavior can catalyse responsible actions (Ramkisson and Smith, 2014). In other words, for TPB to be effective in achieving a changed behavior towards plastic dependency, the environmental worldview of the target people is important. It is the perception of people that determines their attitude. The general perception on the use of plastic in Nigeria is very high and this, to a large extent determines the subjective norms which eventually determines the perceived behavior. Hence, Linh et al, 2019 contends that environmental knowledge is a critical aspect of TPB as it could impact the subjective norm significantly. They insist on the need for education on the impact of products on the environment and how products could be produced in an environmentally friendly way to instigate environmentally friendly behavior (Linh et al, 2019). This is important as the connection between Environmental knowledge and environmentally friendly behavioral intention has been established (Kim and Chung 2011). In other words, environmental education on plastic dependency could help to change negative environmental worldview on the use of plastic.

However, influencing behavioral changes does not come without some challenges, among which is the tendency for lifestyle patterns to be deeply embedded in worldviews (Ramkisson and Smith, 2014). Worldviews in the context of the environment has been construed as 'more or less internally consistent set of values that profoundly inform our understanding of the environment' (Ramkisson and Smith, 2014; Hedlund de Witt, 2013). Environmental worldviews could significantly affect people's understanding and perception (Hedlund de Witt, 2012) of plastic dependency and their inclination to change their attitude. (Gifford, 2011). Also, there are evidence supporting that environmental worldviews could influence people's emotions, which invariably can result in a change in behavior. (Ramkisson and Smith, 2014). This implies that taking steps towards initiating behavioral changes demands not only a profound understanding of how to stimulate environmental change but the impact of emotions on environmental beliefs and acceptance of personal responsibility (Ramkisson and Smith, 2014). This is particularly important in the understanding of the psychology of plastic dependency considering that individual environmental worldviews are important drivers of emotions.

The implication of the foregoing is that communication is critical in influencing human behaviors (Ramkisson and Smith, 2014) and catalysing pro-environment behaviors. In essence, knowledge about plastic dependency and its impact on the environment is necessary to influence pro-environment thinking patterns as the lack of knowledge of information on the appropriate way to behave in the society could lead to wrong behaviors and inhibit their chances of changing behavior (Ramkisson and Smith, 2014). The twist in this contention is that studies on persuasion and learning, for instance Petty and Cacioppo, 1986 suggest that the same information may be processed differently by different people depending on 'prior knowledge, cognitive abilities, values, accepted worldviews and social and institutional factors' (Ramkisson and Smith, 2014). However, scholars contend that messages that are consistent with people's environmental worldviews and appeal to their emotions could in effect lead to the desired behaviors (Ramkisson and Smith, 2014; Spence & Pidgeon, 2010). This is consistent with the knowledge-deficit approach which is hinged on the dissemination of appropriate information in anticipation of an increased awareness resulting in change of attitude (Ramkisson and Smith, 2014; Owens, 2000). For instance, information that could produce high level of fears could significantly influence behavioral change (Witte and Allen 2000). In other words, the communication of sanctions could instil fear and change of a disposition towards plastic dependency. This is more so as information consistent with environmental worldview could instigate the development of positive emotions in an individual leading to acceptance of responsibility (Ramkisson and Smith, 2014) for environmental behavior. Decision making processes can be significantly influenced by environmental worldviews which determines people's likelihood and obligation to act (Ramkisson and Smith, 2014). Ramkisson and Smith, 2014 aptly demonstrates the applicability of this, by contending that an individual's emotions may be moulded by their environmental values, as it develops or reinforces a feeling of personal concern for the environment. They stressed that people with 'positive emotions have stronger environmental values and are more predisposed to accept personal responsibility out of concern for the environment which obligates them to act.

Plastic dependency in Nigeria

Nigeria ranks ninth in the world for plastic pollution and plastic waste mismanagement **(**Jambeck, et al, 2015). Many factors contribute to why Nigerians rely heavily on plastic wastes. Due to lack of potable water in Nigeria, most homes really on sachet water to solve

water shortage (Dumbili and Henderson 2020). It is estimated that about 70% of Nigerians use at least one sachet of water daily which means that about 60 million of plastic sachets is used and disposed daily (Dumbili and Henderson 2020; N. Nwafor and T.R. Walker 2020). This behavior on the use of plastic is unlikely to change unless there is a corresponding positive action by the government to provide potable drinking water and introduce policies/legal framework with provisions that can influence the behavioral intentions relating to plastic use of its citizens.

Figure 1: A typical site of a plastic dumpsite in Nigeria (J. Nwafor, 2021)

Apart from plastic sachet water, there are other sources of plastic waste in Nigeria. The use of plastic bottles, straws, and plates is also rampant in Nigeria. These plastic plates are cheaper than ceramic plates and normally would be used by most of the masses that are poor. Again, vendors package consumables using polythene plastic bags that are mostly single use. Dumbili and Henderson identifies another source of plastic waste to include the cultural practice of storing waste products in different homes by using plastic waste bags and other containers. These waste bags are then dumped inside drainage channels (Dumbili and Henderson 2020) which eventually ends in the marine and terrestrial environment, considering that most drainage channels are designed to offload their contents into the nearby network of rivers through the River Niger to the Atlantic Ocean.

Two factors also make the situation worse – indiscriminate disposal and lack of recycling facilities of plastic wastes in Nigeria. Even though this material is largely recyclable, only a

small percentage of it is recycled. (See figure 1) As a result, a rising amount of polythene is discharged into the environment resulting in the clogging of drainage systems, pollution of farmlands, and fuelling wildfires **(**Nnaji, 2014). Stacks of littered plastic garbage clutter Nigerian streets and neighbourhoods on a regular basis, especially during the rainy season **(**Adegboye, 2018). The different waste management systems by the states in Nigeria are not effective. It is possible that in a community, there is no dumpsite which leads to indiscriminate disposal of plastic waste. At the long run, the general behavior formed by this is that indiscriminate disposal of plastic waste is normal. Although, management of plastic waste is a global challenge, developed countries seem to have effectively deployed some mechanisms like recycling and implementation of plastic control laws to check plastic dependency. Unfortunately, in developing countries, the case is different (Godfrey, 2019). It is either there is no policy or legislative framework, or the government lacks the will to implement or force a change in behavior towards plastic dependency. The focus on Nigeria is underscored by the fact that it is one of the most populous undeveloped countries, which can be used as a case study of plastic dependency in developing countries. There are a number of factors accentuating plastic dependency in Nigeria, but the most dominant factors are the general lack of awareness of the negative impact of the use of plastic and the punitive structuring of existing/proposed plastic control policies and legislative instrument without provisions to stimulate positive behavioral changes to the use of plastic. Both factors will be discussed further.

Lack of awareness

The general lack of awareness of the negative impact of the use of plastic contributes to why there is a high level of plastic dependency in Nigeria. In a study conducted by Ifegbesan et al among some universities students shows that "only 40.5% of the students expressed serious concern for the solid waste practices'' (Ifegbesan et al, 2017**)**. This figure would likely be lower among the less educated members of the society. In contrast, in a recent study carried out by Barbir et al among European citizens, they discovered that while 61% of participants showed a positive attitude toward active plastic reduction, 96% are already modifying their behavior or trying to find alternatives to plastics **(**Barbir et al. 2021)

In June 2021, the Global Water Challenge and Coca Cola Foundation sponsored a programme aimed at raising awareness on the negative effects of the use of plastic on the environment Tagged "plastic to resources". The programme was "designed to address plastic waste

challenge in Lagos [State of Nigeria], empower women and youths to turn waste into wealth." The goal was to help change behavior of consumers on waste disposal through a waste collection and aggregation system, while also empowering women with skills on how to turn waste-to-wealth **(**Olatunji, 2021). Individuals have also tried raising awareness in this regard. For instance, in 2020, visual artist, Adeyemi Emmanuel, started collecting discarded plastics and used them to launch his line of bags, wallets, and gift boxes made of 20% leather and around 80% plastic waste, called ECO (Chile, 2020). It is not certain how far awareness activities like the above have permeated the mind of the masses, but it is hoped that when they are consistent and widespread, there would be a shift in the behavior of Nigerians towards the use of plastic.

Legal and Policy Response

In Nigeria, much work has not been done in introducing specific legislation or policy on plastic waste. However, there are general laws that by implication affect the management of plastic waste. For illustration, the National Environmental Standards Regulatory and Enforcement Agency (NESREA) Act is a general legislation on environmental regulation and management. It does not specifically address the problem of plastic waste. The Act states the functions of NESREA which are mainly compliance enforcement responsibilities, licensing, as well as data gathering duties. Pursuant to the NESREA Act, NESREA has made the National Environment (Domestic and Industrial Plastic, Rubber and Foam Sector) Regulations 2011. Although the Regulations go further than the NESREA Act in framing a policy context for combating plastic waste, it remains highly limited and deficient for the purpose of addressing the problem of plastic waste. The Regulations are targeted at manufacturers and do not represent a robust regulation guiding the handling of plastics. Also, section 2 provides that 'the principal thrust of these Regulations is to prevent and minimize from all operations and ancillary activities of the Domestic and Industrial Plastic, Rubber and Foam Sector to the Nigerian Environment'. This means that it is not targeted at plastic imported into Nigeria. The Regulations provide some form of framework for plastic waste management. In section 3 emphasis is placed on prevention, reduction and elimination of pollutants at source. While section 7, in non-compulsory language, incorporates the 5Rs (reduce, repair, reuse, recycle and recover) into the framework of the Regulations. Section 11 makes it mandatory for manufacturers and importers to subscribe to an Extended Product Stewardship Programme including the Buy Back Programme provided for under Schedule XIII of the Regulations.

Plastic legislation in Nigeria is either general or industry-specific. One of the most noteworthy attempts to frame a specific legislation on plastic waste control in recent times is a proposed bill on plastic bags prohibition (Nwafor & Walker, 2020), which however seems to have lost steam. The Plastic Bags Prohibition Bill (the "Bill") intended to prohibit the manufacture and use of plastic bags in Nigeria. The Bill which has only two sections neglected many useful components and has not been situated into any policy, theory or effective strategy. Apart from the inelegant drafting of the Bill, the provisions are unlikely to affect the attitude of Nigerians towards the use and importation of plastic bags. It is merely punitive without addressing consumer behavior towards plastic bags. However, it adopted the prohibition approach and mandates the use of paper bags as a substitute, which agrees with the thinking that although paper packaging may also result in litter as a result of portability, the environmental impact of paper waste is much less disastrous than that of plastic because paper is readily bio-degradable.

Law as an instrument of social engineering could be effective in controlling behavior. They are the codification of the controlling powers of agencies of the government. But control in this sense does not always have to be coercive; a law could be a prescription of positive consequences for a desired change (Todorov, 2005; Skinner, 1953). Nowadays, countries do not just employ punitive measures to curb environmental problems, they also use policy instruments that address economic variables like price of goods and taxes to control consumer behavior and ultimately curb some certain environmental issues. These policy instruments are called market-based instruments (MBIs). Neither the Bill, the Regulations or any existing law have any provision relating to MBIs **(**Chime, 2021). MBIs are necessary to aid legislations/policy to influence behavioral change and they align with the philosophy of TPB which focusses on introducing measures that can influence behavioral intentions through attitudinal change, control of subjective norms to elicit perceived behavioral control.

Understanding market-based instruments (MBIs)

In the area of plastic pollution, MBIs work by highlighting the environmental impact of plastic use by attaching a price to it, to give incentive to plastic manufacturer or user to reduce this impact **(**Prahl and Hofmann, 2016). Three families of MBIs have been identified to include price-based, right-based, and market friction reduction MBIs. While in price-based instruments, lawmakers set a price on goods and services to reflect positive or negative environmental impacts, in right-based instruments governments set a limit on a product's quantity or quality **(**Cairns et al, 2015). Market friction reduction on the other hand is a non-

financial MBI that is geared towards the operation of markets through measures like information improvement and market growth (Cairns et al, 2015). These three types of MBIs are represented below (University of Waterloo) see figure 2.

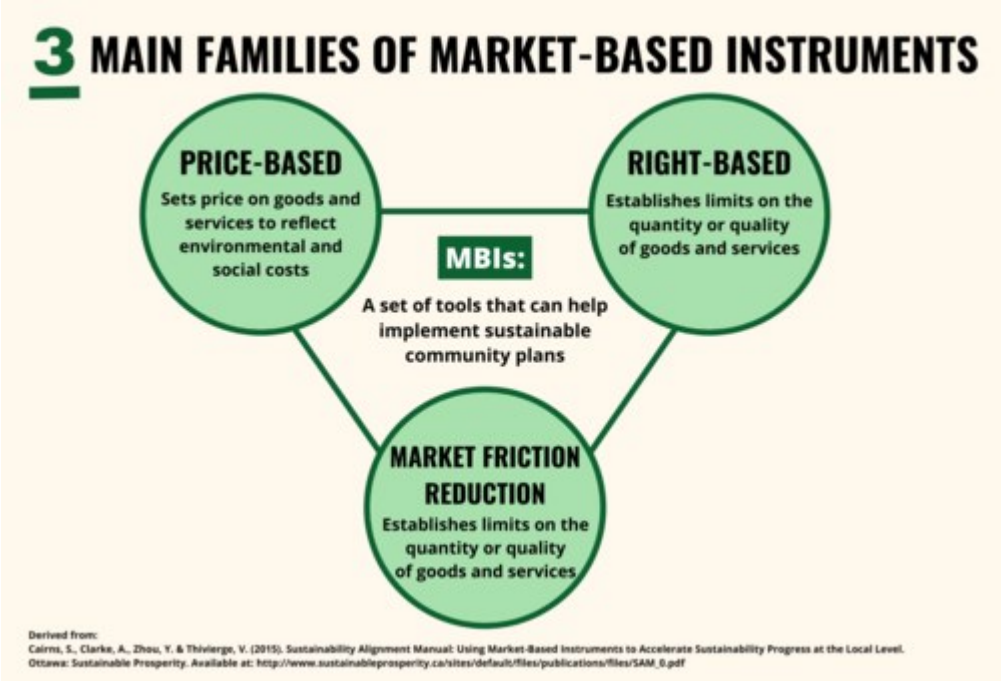

Figure 2

MBIs are different from regulatory/administrative instruments also called non-market-based instruments in the sense that the latter are prescriptive and come in the form of bans, regulations, permits, directives, and so on (INTOSAI Working Group on Environmental Auditing, 2016). The Bill for instance, is "an outright ban" (N. Nwafor and T.R. Walker, 2020) on the use of plastic bags in Nigeria. Like already adopted in some countries, apart from the fact that MBIs have the potential to increase government revenue, they give producers and consumers incentives to modify their behavior and look for more effective ways to make environmental progress while allowing them the flexibility to choose how they do it (INTOSAI Working Group on Environmental Auditing, 2016).

In other words, legislation and policies on plastic control must consider behavioral change as a key objective and provisions relating to MBIs could help in achieving this objective and attaining a positive planned behavioral intention on plastic use. In the United Kingdom, there is 'A Green Future: Our 25-Year Plan to Improve the Environment' policy aimed at, among other things, the reuse and recycling of plastics (HM Government, 2018). In addition to this, there is already an MBI in the form of tax on plastic bag, which was announced in May 2021. The

single-use carrier bag charge increased from 5 pence to 10 pence and extended to all businesses in England. The charge has seen a 95% cut in plastic bag sales in major supermarkets since 2015 **(**The UK Department for Environment, Food & Rural Affairs, 2021)**.** The effect of these policies on the consumer behavior towards plastic bag could be seen in the reduction from the average use of plastic bags per household in England from 140 to 4 single-use plastic bags. In terms of revenue, the policy is expected to benefit the UK economy by over £297 million over the next 10 years **(**The UK Department for Environment, Food & Rural Affairs, 2021)**.**

In South Africa, under section 24 (d) of the Environment Conservation Act (Act No. 73 of 1989, prohibits plastic bags less than 30 μm thick and imposes a tax on thicker bags (Edoga, 2008; N. Nwafor and T.R. Walker, 2020). Retailers were obligated to charge a fixed fee of 46 cents per plastic bag and 3 cents levy. Unfortunately, this has not had any positive impact on the behavior of consumers in South Africa. This failure is attributed to the inability of the government to provide alternatives to the use of plastic bag. So, it is not enough to have MBIs in place, alternatives to plastic bags must be created.

The way forward in Nigeria.

Provision of potable water*:*

Since most plastic waste generated in Nigeria are from sachet water (Dumbili and Henderson 2020; N. Nwafor and T.R. Walker, 2020), provision of potable water will go a long way in reducing the number of plastics used in Nigeria. Access to safe drinking water is still a major challenge in Nigeria as more than 30% of Nigerians lack access to clean water **(**Muposhi 2021; USAID, Nigeria, Water) and Nigeria is most likely to miss the Sustainable Development Goals target for access to water. (Oko, 2021) The situation is worst for children as 26.3 million Nigerian children which is about one third of the total Nigerian Children still lack access to sufficient water to meet their daily needs. **(**UNICEF)**.** Considering the strong correlation between lack of access to water and plastic dependency in Nigeria, it is argued that a deliberate policy to increase access to water in homes will translate into the reduction of production of sachet water with the attendant effect of a drastic decline in plastic dependency.

Provisions for MBIs*:*

There should be in place either tax on plastic bags or increase in the price of goods packaged with plastic bag. This should only happen when the government has already provided potable water. One of the objectives of taxation is to regulate human behavior (Olivota and Sussman,

2015) hence, tax could be an effective tool in TPB as a subjective Norm antecedent. This type of taxes is known as pigouvian taxes which are not principally targeted at revenue generation but to discourage certain patterns of behavior **(**Stavins, 2003). These taxes have been used to control carbon emissions and cigarette smoking in some countries. **(**Pigouvian Taxes, The Economist 2017) However, in adopting the introduction of pigouvian taxes to discourage plastic dependency a two-pronged approach is suggested. Firstly, a high tax could be imposed on the use of plastics for packaging water, processed foods and use of plastic bags. Secondly, tax rebate should be provided to companies and firms for the use of alternatives to plastics. The likely effect of this double-edged approach, is that human behavior will likely respond positively to avoiding paying additional taxes and enjoying some benefit for changing their attitude towards plastic dependency.

Provision of Alternatives to Plastics:

Any policy against the use of plastics without providing alternatives will likely not enjoy wide support considering that the attitudes towards the behavior in Nigeria shows a high propensity to use plastics. Hence, the government must deliberately encourage the use of biodegradable materials for packaging**. (**Courtnell) For instance, compostable materials made from bio-based polymers and non-toxic wheat or corn materials, wrapping paper or paper bags made from trees or organic cotton **(**6 Green Alternatives to Plastic Packaging) and bioplastic materials made from biodegradable sources, such as vegetables, rice, and other organic and plant-based compounds (Dube) can be used as alternatives to plastic wrapping materials and plastic bags. However, packaging water poses an entirely different challenge as these biodegradable packaging materials may not be suitable for the packaging of wet substances. This notwithstanding, there are efforts to introduce bioplastic recyclable bottles in the nearest future. Coca Cola is taken the lead in this direction with its plans to introduce plant bottles (bioplastic bottles) made from 100% natural materials for the packaging of water and drinks**. (**Wyrzykowski) If this plans comes to fruition, it will reduce plastic dependency considerably and the technology could be adapted to the packaging of satchet water, satchet drinks and wet food. Furthermore, the government can reinforce a positive behavior towards the use of biodegradable alternatives to plastics by incentivising it. Incentives could include research grants to companies who are inclined to the initiative and three years tax moratorium for companies investing in researching for alternatives to plastics.

Provision of Plastic Recycling Centers

No doubt plastic still remains one of the most convenient and cost-effective choice for packaging. It has even been argued that it is 'still the most environmentally friendly choice when it comes to packaging materials.'**(**Dube) This implies that in spite of the negative impact of the use of plastic packaging in Nigeria considering that it is not biodegradable, it will take some time to address the issue of plastic dependency in Nigeria as there are no deliberate public policy to research on alternatives in Nigeria and global efforts are yet to provide a sustainable alternative to plastic especially in the packaging of water and drinks. This being the case, it is imperative for the government to introduce some mitigating measures. The most effective mitigating measure in the circumstances is to encourage the recycling of plastics. Presently, some form of recycling is taking place at a very small scale driven mostly by small scale entrepreneurs with very limited capital. Government can upscale this practice by encouraging the setting up of recycling plants in major cities in Nigeria. This can be done by introducing a policy[1] (Magoum) that mandates, the federal government, state government and all major companies that use plastic packaging in large quantities to buy the plastic waste and establish recycling centers to recycle them. This will have positive effect on the behavior of people as some persons will take up as a means of livelihood, the picking up of waste plastics which will be sent to the recycling centers for monetary benefits. This approach has been adopted by some countries including the UK **(**The UK Department for Environment, Food & Rural Affairs). Also, South Africa has introduced strict laws that compels manufacturers to set up collection points, recover and recycle plastic waste from their products**. (**Danie, 2020) Similarly, India has a proposed plan of 100% recycling and reuse of petroleum plastic by 2025 and 75% recycling and reuse of other plastics by 2030. It has also imposed a ban on disposal of recyclable waste like plastics in landfills by 2022**. (**Aggarwa, 2020).

Awareness on the danger of using plastic*:*

Programmes aimed at creating awareness on the danger of using plastic on the environment should be put in place in schools, markets, and places of worship. Most Nigerians are unaware of the negative impact of plastic dependency in Nigeria. Hence, the attitude is the encouragement of the continuous use of plastics for packaging of water, drinks, household items and bags to convey purchased goods from malls. In creating awareness, the support of

[1] Nigeria approved a new plastic waste management policy in 2020 but it needs to be reviewed and it was to a large extent not implemented.

the print and electronic media should be elicited considering their spread and the issue should be treated as a public interest news item to bring it within the corporate social responsibility of the media houses to ensure the publicity is not affected by cost. Also, there is need to leverage on the use of social media platforms in creating awareness about the dangers of plastic dependency. Awareness is important is changing a persons environmental worldview which is necessary in getting the person to perform a positive behavioral intention to the use of plastics (Ramkisson and Smith, 2014).

***Passing and expansion of the Bill**:*

A combination of regulatory/administrative instruments and MBIs will be very effective in curbing the menace of plastic waste in Nigeria. To this end, the lawmakers should pass the Plastic Bags (Prohibition) bill[2] (PLAC Bills Track) into law. Before the passage of the bill there is need to expand it by introducing provisions on market-based instruments such as plastic use tax in addition to sanctions. This is necessary to provide a regulatory framework to impel the policy and administrative measures put in place by the government as a subjective norm. It is also necessary to activate the behavior conditioning effect of sanctions for breach of the law. However, regulatory frameworks will be more effective if other recommendations highlighted above have been implemented.

Conclusion

Plastic dependency is a behavioral intention formed rather unintentionally. It is an outcome of the social reality prevailing in a society like Nigeria. Plastic dependency is entrenched by the increasing reliance on the use of plastic for packaging purpose. Changing this behavioral pattern requires influencing positive behavioral intentions (Van, 2021) because plastic dependency is sustained by the benefits or the perceived convenience of using plastic compared to other alternatives (Galvin). This is evident from the considerable gravitation of plastic consumption patterns towards the preference for plastic (Linh et al, 2019). The need for plastic cannot be deemphasised but it must be balanced with the need to protect the environment. Hence, legislative policy instrument must consider how to sustain the benefits derivable from the use of plastics or provide competitive alternatives which will be followed by instruments that can influence behavioral changes in plastic use address dependency

[2] The bill (HB 1437) has been passed by the House of Representatives since 22 May 2019 but yet to get the concurrence of the Nigeria Senate to become law based on Nigerians bicameral legislative structure at the federal level.

disposition of users and producers. Human behavioral change is indubitably an effective method to address negative environmental practices especially with regards to plastic waste (Allison et al 2022) as environmental challenges could be better understood by examining human attitudes and behavioral intentions (Ramkissoon and Mavondo, 2017). Dealing with plastic dependency requires changing the behaviors of key actors in plastic system because the success of a policy or law is dependent on the behavioral intention of people to reduce plastic consumption

Using the TPB, the reason why Nigeria is one of the highest users of plastic in the world is understood. Plastic dependency is an attitudinal behavior informed by many factors like lack of potable water, awareness on the danger of using plastics to the environment, unwillingness to use alternatives to plastic, lack of political will to introduce and enforce polices on plastic reuse and recycling and absence of MBIs. TPB suggests that managing human plastic dependency needs a multifaceted approach, and regarding the situation in Nigeria, merely banning of the use and importation of plastic bag like the Bill intends to do, will not be effective. Also, providing for MBIs like a tax regime on plastic without more, will not achieve the desired result. This could be seen from the situation in South Africa. Even though there is a charge on plastic, it has not been effective in changing consumer behavior on plastic use. This is because the government failed to emphasis the alternative choices to the use of plastic bags (N. Nwafor and T.R. Walker, 2020). In essence, to curb dependency on plastic bag use, a mere command-and-control regulation will not achieve the result; it needs a multifaceted approach already highlighted. This is so because the effectiveness of law and policy instruments could largely be determined by their structure. Why the traditional approach is to impose sanctions as deterrent, there is a shift towards the use of market based instruments or regulatory/administrative instruments also called non-market-based instruments.

TPB provides a platform to address human plastic dependency as it emphasises the control of actions that influence attitude formation as a way of stimulating positive behavioral intentions towards plastic dependency. Having a legal framework to control the use of plastic is good but for such frameworks to be effective, it must be tailored at changing social acceptability of plastic dependency to social rejection of plastic dependency. This is important considering that the normative elements of laws could be more effective if it is structured to influence the behavioral patterns positively (Van, 2021). Behavioral theories and ideologies could provide theoretical fulcrum for policy makers to develop strategies to deal with environmental issues

and influence change in negative environmental behavior. (Ramkissoon et al, 2013). For TPB to achieve its objective of influencing a changed behavior towards plastic use, the environmental worldview of people must be considered. This is important. Considering the impact of perception on the formation of attitude. Accordingly, there is need for positive environment education to influence the worldview of people towards the use of plastic (Linh et al, 2019). To put it in another way environmental education on plastic dependency can influence a positive behavioral change on the use of plastic.

In concluding this paper and presenting some recommendations, it is necessary to reiterate that lack of awareness of the deleterious effect of plastic dependency is a major factor behind its proliferation. Hence, effective communication and dissemination of appropriate information on plastic dependency and its impact on the environment is important in influencing change in human behavior towards plastic use and sustaining a pro-environment behavior. It is the contention of this paper that in addition to increasing awareness of the negative impact of plastic use, other social challenges like lack of portable drinking water must be addressed. Also as highlighted above, policies and legal instruments must adopt a market-based instrument approach. More important considering the emphasis of TPB on positive behavioral change, dealing with plastic dependency demands a pro-environment behavior toward plastic waste management. This implies that policy instrument must catalyse a positive behavior towards plastic recycling, reuse and use of alternatives to plastic.

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There is no Competing interest to declare by any of the authors.

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