

Environment Protection through behavioural economics

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Abstract

In the present age of industrialization, the economy and per capita income has had immense progress, while our environment is facing life threatening problems such as different kinds of pollution and large amounts of energy consumption leading to scarcity of resources, thereby threatening the development of human kind. Although the industrialization and consumption of energy are necessary for human development, the excess use of resources caused by the psychological biases of people, if reduced can strongly mitigate the environmental problems. This paper investigates the relation between behavioural economics and environment protection to understand why people don't always make the rational decision, even if they have the information and tools available to do so. To answer this question, I used thematic analysis to analyse the previously existing qualitative data for secondary research and conducting surveys to collect primary research. Our analysis

shows a strong correlation between human psychology and environment protection. Analysis reveals that 80% of the 700 people opted for the default option when they were at the restaurant. The same study applies in the case of environment. We conclude that incentivising consumers using behavioural economics increases eco-friendly choices amongst people.

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Introduction:

Behavioural economics is grounded in empirical observations of human behaviour and combines elements of economics and psychology to understand how and why people behave in a certain way. Moreover, the field of behavioural economics exemplifies that people are a subject to emotion, impulsivity and are influenced by their environment and circumstances. Furthermore, behavioural economics describes the fact that people do not always make rational or optimal decision even if they have the information and tools available due to the concept of 'bounded rationality' which states "That people have limited cognitive ability, information and time." In fact behavioural economics has been referred to as an undismal science due to its pivotal role in informing policy makers about aspects such as personal health, labour, consumer markets and personal finance. Even though the world is progressing our surroundings are gradually becoming vulnerable and contaminated

thereby deteriorating the health and functioning of various industries including agriculture, fishing, astronomy, development of macro machines and transportation leading to instability amongst societies. Here are specific perspectives about some of the key stakeholders.

Individuals

Most individuals are causing extra pollution and energy consumption due to restlessness and lack of awareness. For example, people don't switch off the light because they are too lazy to reach the switch. While 'garbage classification' is a beneficial action for both individuals and environment yet people still continue to stick to the 'traditional' method of putting all the garbage into one big bag and then simply dump it because garbage segregation requires time and effort. On the other hand, sometimes people cannot see the potential benefits of using certain products. For example, using phosphorous free laundry soap powder, reduces the

amount of phosphate that wastewater plants are required to clean up. Henceforth, lack of awareness alongside the desire to stay in comfort zone and procrastinate can prevent people from taking measures to protect the environment. Therefore, it's highly essential to make use of insights from behavioural economics to structure policies, websites and announcements to ensure they are relatable and convince people to follow them.

Corporations

Nearly every business contributes to air pollution via operations and supply chains. Common sources include the emissions from burning fuels, emissions from cooking and harmful gases released via distribution and delivery vehicles. The "Gray Areas" such as circular economies can not only help corporations in being eco-friendly but also earning profits at the same time. However, the lack of awareness within corporations can cause psychological

effects, impact the judgement and lead corporations to make wrong decisions.

Governments

Governments play a pivotal role in influencing people to take corrective measures. Recently, over the past few years governments have been successful in understanding the importance of creating new policies. However, the developing nations are struggling to implement these policies, and there is a lot to be learned from developed nations. According to a recent survey, these policies implemented in Asian Nations specifically India are not strict enough and the government agencies are not carrying them out in the adequate way. In addition, according to a survey conducted by tech.iefing.com reports 63% of the participants think that a large amount of e-waste is due to lack of supervision by the government.

Existing Problems

According to Behaviour Change and Energy Use by Cabinet Office, “the behaviours of individuals can deviate greatly from a standard rational choice model.” According to which people objectively weigh up costs and benefits of investing time and money in making their homes eco-friendly by being more energy efficient and sustainable. In many cases, people tend to behave rationally due to Daniel Kahneman’s concept of Heuristics which delineates one’s perception isn’t always the truth and our choices may be cost effective. Hence, due to this people do not behave rationally due to Daniel Kahneman’s concept of Heuristics which delineates one’s perception isn’t always the truth and our choices may be cost effective. Hence, due to this people do not behave rationally and make mistakes in weighing the pros and cons of certain actions, which results in extra energy use and environmental protection.

Social Impact and Purpose

Due to the interdependent world, we all tend to interact with each other, one’s behaviour is largely influenced by the behaviour and opinions of those around him/her. Many people tend to do what others around them are doing, which portrays a form of crowd psychology. The same is evident through low participation in garbage classification within China and the excess use of fossil fuels all around the world. In fact, sometimes people don’t take certain actions if nobody else is following them, even if the actions are beneficial and universally accepted. For instance, If the whole neighbourhood continues to throw their garbage without any classification and establish it as a norm, one who tries to set apart and separate garbage might stop segregating waste thinking his/Dher efforts won’t make a difference. Additionally, In the countryside where almost all farmers set fire on their fields after harvest in order to create more fertile soil, a farmer who does not do so will be widely considered as “an

idiot,” which leads to a large number of farmers setting fire and contaminating the air. Furthermore, the same practice takes place for factories. When all the factories in the neighbourhood are emitting a large amount of waste, one factory owner might consider the action of sacrificing profits in exchange for lower pollution as foolish, which causes massive pollution. The corresponding problem is prevalent in almost every public area in China, causing strong setbacks for individuals to behave in an eco-friendly way.

Incentives related to behavioural economics

To follow certain actions, we need motivation and this motivation may come in the form of incentives. For example, to convince people to buy electric cars it's essential to provide people with incentives. The incentives could be monetary, or in other forms such as one can receive a discount on their energy or water bills if they have consumed less resources than the

average. Additionally, one can receive special services from the government if they continue to take eco-friendly measures. Likewise, one can also pay fewer taxes on purchasing cars if he/she is buying an electric car. Therefore, all these incentives can encourage people to be green.

Therefore, Incentives can be given in many different ways. It can be given to communities carrying out green work like garbage classification, using less air conditioning, driving more eco-friendly cars, using less water and electricity, or producing less waste, or using less plastic bags, with promised benefits which can cause people behave in the way we expect because of their eagerness to bring the benefits to both themselves and the people within their own communities. While everyone in a community is following the sustainable practices, one will be more likely to carry out the same things due to the “social influences,” which adds to the

effectiveness of the incentives and environmental measures.

Proper forms of incentives are essential for attracting certain groups of people. When deciding to use incentives to deal with problems, policy makers and researchers should consider the benefits and risks associated with it.

Advantages of social impacts

While sometimes social impacts can cause individuals within a group to not behave in an eco-friendly way because of crowd psychology, they can also influence people in more positive ways using the same mechanism. Since, many people tend to do the same as everyone else around them, a person might be more likely to behave in an eco-friendly manner if others around him/her are doing so. Hence, regulating the main proportion of a group can have impact on the whole group. Therefore, people can combine incentives together with “social norms” to establish a regulation, in order to

encourage people to take environment friendly measures.

Utilizing Comparison

While many people tend to take measures that are of the best interest for themselves, people also care about their reputation and reviews of others. Even though many charity organizations are offering a large amount of money for those who are unemployed, many still prefer to get a job even if the salaries from the jobs are almost the same as the financial aids they receive for doing nothing. The reason behind this is “people want to be respected”

If we can draw several comparisons between different people and communities, a lot of people will probably begin to act in an eco-friendly manner because they want to be better than others. Considering comparison is important, we must frame it in different fields and ways:

1. Comparison on energy consumption
2. Comparison on pollution emission between corporations

3. Comparison on eco-friendly product usage

4. Comparison on pollution reduction between states or cities

5. Comparison on garbage classification

Comparison between corporations can not only encourage eco-friendly actions among the corporations, but also provide consumers with the information about how green several companies are compared to the others, which can help the consumers decide when purchasing goods.

Utilizing the status-quo bias

Most of the times people are unwilling to change simply because they have the idea that the current product they are using comprises more benefits or is just more valuable. This leads the corporations and households to be unenthusiastic and relentless in terms of purchasing new eco-friendly products and get rid of the old ones. However, if we take advantage of such biases, a lot can be achieved using the help of status quo.

To begin with, status quo is caused by existing problems which results in people being unresponsive. The government or legislator can set regulations requesting the corporations or other institutions and households to use eco-friendly products. When the regulations are established and the eco-friendly products serve as the status quo for all new corporations, people will be more likely to stick to the eco-friendly ones instead of switching to other polluting products and equipment even if they bring them more profits.

Case Studies

The environmental problems have been strolling over the world for past few years. Many governments, organizations and individuals have formed and implemented measures to help reduce pollution and energy consumption. The following are several existing examples that can be referred to when making decisions:

1. Green Deal

The Green Deal was launched by the UK government to encourage citizens to be eco-friendly and energy efficient. The government tried to achieve this by providing all energy saving products for free to the first timers. Since, a lot of energy was saved with the assistance of these products, people had to pay less money for their energy bills. Due to this, the citizens of UK not only saved money but also contributed to the environment for a greater good. Therefore, with the help of many different government departments and corporations the Green Deal covered 45 different types of improvements and saved a large amount of money for both people and nation, thereby contributing to environmental well-being.

2. China Energy Label:

China Energy Label was launched by the Chinese Government, requiring all the producers and importers to evaluate the energy effectiveness of the products and print a tiny label showing the energy saving performance level on all the products.

Furthermore, the performance is divided into five different labels with level 1 being the best. Such signs are mandatory throughout the country hence must be shown and explained on the outer packages or instructions of the products, thereby encouraging the customers to go ahead with these eco-friendly commodities.

As Hu said, such regulations “can effectively notify the customers about the energy efficiency of the product and guide them to acquire high quality energy saving devices.”

3. Huimin Project:

The Huimin Project started in 2009 and lasted till 2013. The project aimed to encourage the purchase of energy efficient products. The government offered many subsidies for the consumers who purchased eco-friendly products such as air conditioners or washing machines with greener technologies. The Huimin project was brought to an end because the subsidies were being too costly for the product and by the time it ended, many people had already

installed green products and didn't need subsidies for the same.

4. "The Recycle!!" by NEYC Volunteer Association:

The organization encourages students to recycle used bottles and paper by promising that all of the benefits made by recycling go straight to students, for example, in China purchasing toilet paper in the public washroom is very rare in public schools, purchasing snacks for holidays, and using the money as starting funds for school volunteers, a nice trip doing volunteer work and having fun while escaping from school that everyone enjoys. With other means like posters, presentations or public speeches the organization is able to save tons of trees every year, by further engaging students in corrective measures to save environment.

Sustainability and Behavioural Economics

To understand how to attract customers using the phenomena of sustainability, one must analyse the psychology of consumers. For instance, when a meat based dish is

served at one of the large events, 5-10% of diners will request a vegetarian alternative.

However, at the 2009 edition of Behaviour, Energy, and Climate Change conference, the organizers had decided to reverse the options and offered a vegetarian dish as the default option and meat as an alternative. Consequently 80% of the 700 people who attended the conference opted for vegetarian option. Hence, through this case we can conclude that variation in presentation or formulation of the alternatives presented led the consumers to make different choices.

Promoting Sustainability

Through behavioural economics it is possible to incentivise people to buy renewable energy instead of conventional energy. It is pivotal to realize that there is a clear difference between the intention and action of consumers seeing as people tend to stick with the default option. In this context, if we inform people that their city is partially supplied by renewable and

conventional energy, yet the default contract is based on the use of renewable energy. Hence, people are less likely to make a switch, they will stick with the default option thereby using renewable energy.

Carbon Emissions Accounting

The shift towards sustainable business practices is something which society has been striving for. Customers are increasingly demanding more visibility into the carbon footprint of the products they purchase. Regardless, the impact that this level of transparency may have with respect to consumers, it is likely that in future it will become an obligation to provide information about the environmental impact on labels.

Within the Climate 21 Program “SAP Product Carbon Footprint Analytics” is a tool that provides information on the carbon emissions of a product throughout the entire value chain, including product, raw materials, energy use and transport. Beyond

this, it allows integration with information on third party products and solutions, so as to analyse and comprehend the breakdown of emissions and obtain comparisons of each of the activities that make up this value chain.

Today behavioural economics is widely used by governments to incorporate the concept of public policies and use it to better understand user perceptions and improve educational outcomes. Similarly, private companies utilize it to understand consumer psychology and promote enhanced decision making. Some of the metrics that influence the decision making processes are those related to CSR (Corporate Social Responsibility) and ESG (Environmental Social and Governance). The following concept delineates the fact that if a company is socially responsible and follows sustainable approaches, the customers may choose it over the unsustainable corporations.

Incentives & Loss Aversion

One of the major challenges related to behavioural economics is the ways in which we deal with cognitive biases and difficulties in decision making process. One solution is to generate small incentives, stimuli or “nudges” that assist people in making the expected decisions.

For instance, knowing what our neighbours are doing can influence what we do as well.

In our everyday lives we need a push to outperform, to work hard, to dream and to achieve our goals. With that being said, a small gesture of appreciation can push us to remain consistent and do things the right way. For example, some utilities and energy companies include a happy face on the bill if the customer is using less energy than the average of their neighbours, keeps them willing to take corrective measures. Additionally, the corresponding comparative report permits one to find their drawbacks and has the potential to have a great effect.

Prospect Theory Applications

According to the prospect theory by Daniel Kahneman “not losing makes one happier than winning”

To better illustrate this, we can use the example of thermos or reusable containers when ordering coffee. In some places they give a discount if we bring our own container. The most effective way to generate impact would be to introduce the discount in the price of coffee and charge an extra from those who want a disposable cup. Seeing as, people don't believe in saving but rather are worried about overspending.

According to Daniel Kahneman, Nobel Laureate in Economics 2002, there are various factors (biases and heuristics) that influence our decision making process and that leads us to make mistakes.

Science starts from the basis that humans are not 100% rational beings and that our

behaviour is subject to the stimulation of multiple factors, internal and external, which often lead us to make irrational decisions.

People are unable to fully analyse and distinguish the various options and scenarios that are presented to them, so they employ shortcuts and heuristic thinking. Given this, the mind creates response mechanisms that, unconsciously, help to simplify the decision making process. This process is influenced by prejudices, emotions, tendencies and other elements in such a way that, many times, these decisions have the potential to cause a negative impact on environment and finances.

Sustainability and Innovations

Sustainability aims to protect our environment but is also a great driver of innovation. In fact one of the objectives that must be established for a company is to manage innovation under sustainable structures at the social, environmental and

government levels. In order to promote behavioural economics, the plan must consist of three fundamentals:

1. Measure and Understand: First we need a sophisticated and transparent way of tackling the CO2 footprint through our customers value chain and of accounting and managing accumulated carbon credits and taxes in real time. This will assist the corporations to understand how different actions of our clients are impacting the CO2 footprint and suggest specific actions along with stimuli to change behaviours.

2. Lead by example: It's essential for one to be able to raise awareness using small actions and gestures, such as using a train instead of an airplane, can positively impact environment. In addition, the phenomena of compensation can be used to reduce these emissions such as planting a tree for each purchase in the SAP store.

3. Create Impact: Lastly, we need a strong community to generate impact and a sense of purpose for our employees, customers and stakeholders. For example, companies such as SAP are serving as catalysts with many actions such as the Zero Waste Economy Program, SHIFT program for the elimination of plastics, or Climate 21.

Yet the challenge to motivate a change in consumer choices is still prevalent and is leading to reduce CO2 emissions, eliminating plastics from the ocean, increasing water recycling and promoting water savings.

Sustainable Resilience

Promoting and implementing principles and standards of responsible business behaviour can help us create an environment that is based on well accepted, economic, social and environmental principles.

The recent coronavirus outbreak has exponentially accelerated the demand for a robust infrastructure that can operate efficiently during these difficult times. This serves as a great opportunity for the business world to find a way to provide technologically advanced, resilient but also sustainable infrastructure.

Hence, Incentives similar to the ones aforementioned are needed to accelerate the planet's development and behavioural economics can come in handy to better understand people's behaviour when it comes to sustainability.

Tackling Environmental Problems using Behavioural Insights

The process of individual decision making is constrained by limited cognitive resources and bounded willpower. It is further influenced by the consideration of other people's

well-being and willpower.

Furthermore, this is ultimately reflected in the consumption and investment decisions along with the actions regarding compliance with environmental regulation.

Insights from behavioural economics can help policy makers obtain a deeper understanding of the behavioural mechanisms contributing to environmentally harmful choices and develop more effective policies to address environmental problems. Furthermore, behavioural insights can be used to both improve the effectiveness of existing policy instruments and to device new ones, providing another arrow in policy makers quiver to prompt more environmentally sustainable behaviours. They should not be viewed as a substitute but also a complementary tool to traditional environmental policy instruments such as pricing and regulation.

Theoretical framework conveys that all individuals make both frequent decisions such as food consumption choices, or an occasional one such as the purchase of a car based on the same utility maximisation exercise with complete information. In fact, individuals act under perfect self-control and consider nothing but their own self-interest. Moreover, humans have well-formed and time consistent preferences, which remain unaffected by the way the decision is framed or by the impact it has on others. The people with such decision making skills are often called as homo economicus.

This field of research includes cognitive and social psychology, sociology and neurosciences. Therefore, it builds upon a diverse range of research methods seeing as these disciplines analyse the mechanisms driving human behaviour. Taking into account behavioural economics, one can design more

economically efficient and environmentally effective policy interventions.

Behaviourally tested interventions are designed as “initiatives based on the ad hoc test or scaled out after an initial experiment” while the behaviourally informed interventions are “initiatives designed explicitly on previously existing behavioural evidence.” Hence, the behaviourally tested interventions serve as invention while the behaviourally informed interventions are policies or initiatives that count as an innovation.

Pro-Environment Behaviour, Consumption and the Environment

Consumers make choices in a number of domains that lead to environmental impacts. They buy products, utilize water and energy, and discard waste. Additionally, standard neoclassical economic analysis on policy emphasizes the impact of income and prices on behaviour. A behavioural

approach to the analysis of consumer behaviour acknowledges limits to rationality and self-interest thereby taking into account psychological factors.

As discussed, the role of bounded rationality in individual decisions on energy use and conservation is supported by many studies. A well-known finding is the energy efficient paradox. It refers to the persistent gap between optimal energy use and conservation. While at the same time, the literature suggests market failures is the main cause of the slow spread of energy efficiency.

Examples of such barriers include modification, lack of public concern for energy issues and limited information. In addition, behavioural anomalies, such as risk aversion, inertia or routines and habits, affect energy use.

Knowledge obtained using prospect theory has been used to study household switching behaviour in electricity

markets. This includes addressing behavioural anomalies like loss aversion, default bias, and the status quo affect as possible explanations for consumer behaviour. Ek and Soderholm find empirical evidence that the choice of households to switch to other service providers is influenced by a status quo effect.

Pichert and Katsikopoulos offer an experimental analysis of consumer decision making related to green electricity use. They examine people's motivation for choosing green electricity in a laboratory experiment and came to a conclusion that default options have a strong influence on consumer choice. The policy should be created in a way wherein green electricity is handed as the default option. This is a theoretical study of adoption, consumption and green products.

Another strand of research examines time consistent preferences, considering the role of habits and routines in unsustainable consumption. This primarily includes two particular domains such as energy use and transport issues. For instance, using data from an experiment conducted in Sweden, has deemed that behaviour appears to be a key factor in choosing means of transport. A reduction in car use may be facilitated by interrupting habitual car use using "deliberation intervention," in particular if the car user has both a strong car habit and a stringent moral intervention to reduce personal car use.

With regards to energy consumption, habits have served as an explanation for the efficiency paradox mentioned above. A policy lesson acquired from the observation is that a behavioural change in lifestyles fosters energy saving which might be facilitated by promotional techniques like the

provision of information in several ways.

Several studies over the years have assessed additional motives for behavioural use such as household energy and recycling activities. For instance, Kotchen and Moore analyse the motivation of households to participate in green electricity programs using empirical data from the U.S. Furthermore, their results show that households which have a greater concern for the environment or stronger altruistic attitudes are more likely to adopt green electricity. Similarly, Clark in a study of Dutch households investigated the influence of internal and external variables on household participation in green electricity programs. In their study, they have concluded that those with high intrinsic motivation and values like altruism may explore early adoption of green electricity. To further exemplify this conclusion, we must consider “warm

glow” motivation when adopting green electricity programs. The authors conclude that people receive benefits from solely contributing to environmental quality when participating in a green electricity program. Recycling and waste disposal at household level is costly, messy and time consuming. In addition, Households might not be aware of the social benefits gained through proper waste management because they are hardly noticeable, which makes free riding more likely. Likewise, Individual moral and social motives for recycling activities are important determinants for people’s willingness to pay for sorting waste. Unfortunately, these motivations significantly lower the costs associated with household recycling efforts which affect the adequate regulatory policy. In an empirical study conducted in Norway it is found that civic duty orientation is an important motive for recycling behaviour. Ackerman found

that altruistic considerations dominate in collection and recycling efforts undertaken by households. Similarly, Berglund (2006) shows that people may derive positive “warm glow” feelings by contributing to a better environment through recycling. Finally, Halvorsen used empirical data on recycling activities by Norwegian households to study how social and moral norms affect their utility. Yet, norm based incentives like feelings of self-respect and warm glow contribute to significant recycling efforts.

Practical solutions of behavioural economics

1. Incentives for companies that produce less pollution:

With all the former experiments and analysis, it is proven that incentives should be given to the companies that are being greener than their competitors. Their efforts must be recognized and appreciated to ensure

sustainability, persistent efforts as well as motivation within them. Beyond this, the government can alter ecommerce and use their framing skills to make green products popular while cutting taxes for the companies on purchasing green equipment. Through the implementation of such measures, the companies will be interested in purchasing such products.

2. Forming Social Norms:

Due to the status quo bias along with social impacts people tend to stick to the current state. Therefore, in order to bring a change it's highly essential to make “green” as a social norm. To do this, the government can device following policies:

1. Making energy efficient appliances mandatory for newly built buildings and factories.
2. Creating garbage classification mandatory, specifically through government department buildings.

3. Establishing more charging devices for electric cars around the city to make electric cars more popular and trusted.

3. Reducing air conditioning usage and central heating temperature in schools and working places:

As the former experiments have portrayed, adjusting 1 degree Celsius in working places can cause people to consume less energy while also having a positive impact on pollution levels.

The following idea can be applied to all the working places and schools, this has the potential to be highly advantageous in terms of contributing to economy and reducing pollution.

Conclusion of practical solutions on behavioural economics:

As proved through the past segment of analysis, insights from Behavioural Economics can be used to reduce pollution and energy consumption. However, the exact methods must vary

depending on locality to locality and country to country. Therefore, demographics such as environment, local policies, education standard and infrastructure will play a huge role to frame policies. Nevertheless, basic ideas and principles shall be executed. After all, with many effective ideas in mind, people can take proper actions post researching and analysis to construct a healthier environment for citizens.

Behavioural Intervention – Scope:

Behavioural interventions tackling environmental problems have pursued a broad range of objectives:

1. Encourage conservation of resources, such as energy, water and materials;
2. Promote private investment in more efficient technologies;
3. Incentivise environmentally sustainable consumption patterns;
4. Increase compliance with environmental regulation and

participation in voluntary schemes, both on the side of individuals and firms.

Encourage Resource Conservation:

Problem 1: Lack of awareness

To begin with, residential energy and water conservation are frequently hampered due to poor communication of real time information on consumption levels and associated costs to end users. For example, households rarely know how much electricity is consumed when baking a meal in an electric oven or while using a washing machine. Likewise, we are usually ignorant about the volume of water being wasted when taking a shower or washing the dishes. Hence, it's essential to invent smart meters with visible devices that provide real time feedback to consumers, such as home displays and smartphone apps which can increase the salience of information on consumption, thereby promoting

resource conservation. Furthermore, levers based on social comparisons such as benchmarking household consumption against that of relevant social groups (for e.g. same sized households in a similar locality), can also help conserve energy and water.

Beyond this, framing simpler and salient information on utility bills about resource consumption and costs can contribute to conservation efforts.

Furthermore resource conservation can also be encouraged through *changes in the physical environment*, such as the installation of intuitively designed thermostats or the placements of stickers will remind people periodically to take corrective measures. Greener default settings, such as switching from one sided to double sided printing, will assist us in saving valuable resources.

Finally, it is worth noting that a careful coupling of two or more

aforementioned interventions can enhance their effectiveness (e.g. simultaneously providing real time feedback and comparative levels of consumption amongst households). Additionally, implementation of office competitions to leverage social comparison can also be a major boost to the industrial sector.

Problem 2 – Bounded Willpower

Bounded willpower is often responsible for individual's failure to make investments which are in their long term interest, such as certain investments in more efficient technologies. Therefore, it's imperative to come up with Efficiency labels (e.g. energy or fuel efficiency labels) in order to direct consumers to purchase more efficient products. To move on, enriching labels with salient information in the long run monetary savings from the use of more efficient products both in absolute terms and in comparison with the best product

in class aids consumers weigh out the costs and benefits of investing in efficiency. This has proven to work for high consumption products (e.g. cars, washer-dryers), but further testing is needed to validate whether or not this is also the case with lower consumption.

Problem 3 - Incentivise environmentally sustainable consumption

Individuals have difficulties in analysing information about the environmental impact of certain products. Information about CO2 emissions, for example, is not directly translated to specific environmental impacts and individuals rarely have an understanding of differences in the environmental impact between local and foreign goods produced.

Similarly, framing product information (e.g. labels, in store banners) in a simpler way to encourage more environmentally sustainable

consumption patterns is a promising application of behavioural insights. For example, persuasive messages inviting consumers to purchase imperfect-looking food products in order to prevent food waste have been shown to be effective even without substantial price cuts. At the same time, information about the environmental footprint of consumer goods, as well as indicators of CO₂ emissions and air pollution from new cars, deserve a more thorough explanation to provide an actual grip on purchase decisions.

Test Successful Applications of behavioural insights in other policy areas and contexts

Applications of behavioural insights to environmentally relevant policy have, thus far, mostly focused on the energy domain (energy conservation, energy efficiency). As water consumption is prone to the same behavioural biases as energy consumption, the low hanging

fruit is to test the performance of behavioural interventions that have proven to be successful in the energy domain in the water policy context. This also includes testing promising interventions which draw on multiple behavioural levers, such as combining real-time feedback with the use of social comparisons. Similarly, another extension is testing previously renowned interventions which have been successful in dwellings.

While much attention has been paid to programmes aiming to promote households to conserve resources (e.g. Energy and water) at home, minimal emphasis has been placed on resource conservation in office environments.

Tackling Environmental Problems with the Help of Behavioural Insights

- **Problem Diagnosis:** Policy makers can exploit behavioural insights to recognize the patterns and biases contributing to the environmental

problem they aim to tackle. This is required for the identification of behavioural levers on which effective policy interventions shall rely. Beyond this, a deeper understanding of the cognitive mechanisms at the core of individual decision making can pave the way for more effective design, implementation and evaluation of policies to tackle environmentally detrimental behaviours.

- **Policy design and implementation:** Once a given behavioural bias has been identified as impacting environment negatively, behavioural insights can inform the design and implementation of policies, building upon a more realistic view of individual behaviour and its interaction with environmental policy instruments. Policy makers can use a range of behavioural

levers to design and roll out an appropriate policy intervention.

- **Policy evaluation:** Applying behavioural insights to policy making motivates a thorough evaluation approach. In order to test the effectiveness of a certain behavioural intervention, its outcomes should be empirically assessed. Measurable indicators of policy effectiveness should be defined prior to implementing the intervention. Furthermore, analysing variations in these indicators allows appraising whether the intervention has been successful according to policy makers' objectives. This serves as an evaluation to the prior formed success criteria.

Alterations to the physical environment:

- The physical environment can noticeably affect individual

decision-making, especially in contexts in which choices are made instantly, on the basis of automated mechanisms and habits. Examples of such interventions are modifications in the location and appearance of recycling bins, or the installation of automatic water taps to limit water consumption.

- **Changes to the default policy**

As individuals are prone to status-quo bias, they often postpone making decisions until or unless it becomes inevitable to do so. Defaults can have a great control in contexts in which people are resistant to change. Examples of such interventions is a change to the default setting of thermostats (i.e. to a lower baseline temperature in order to foster energy savings).

- **Use of social norms and comparisons**

As individuals are social beings, not solely driven by their own payoffs, they are affected by the way people surrounding them behave (social norms), by how they compare to their peers (social comparisons) as well as by moral injunctions. An example of this type of intervention is the comparison of a household's energy or water utilization to the consumption of a same sized households in the same neighbourhood.

- **Use of feedback mechanisms**

Several routine behaviours, such as energy consumption or waste disposal, have considerable environmental impacts. However, these impacts are often not sufficiently salient for consumers. Providing them with timely feedback can make such contexts more transparent, increasing awareness of environmental externalities stemming from daily

consumption choices. For example, real-time in-home displays connected to smart energy meters can provide real time feedback on energy consumption and costs.

- **Reward and punishment schemes can be used as “carrots and sticks”**

Associating a salient, material payoff to consumers’ achievements.

For example, rewarding households who have been particularly savvy with water consumption during scarcity periods may generate a positive norm for water conservation.

- **Goal setting and commitment devices**

As individuals are bound by status-quo bias and inertia, effortful behaviour changes can be encouraged by setting specific and measurable goals and using

commitment devices to regularly follow up on progress. One such example involves pinning down an objective of energy savings and following up on the objective with regular feedback and tips.

5 Global Environmental Problems

- Climate Change

Behavioural Economics can be used to mitigate climate change precisely by reducing carbon emissions. However, as portrayed by human psychology it is essential to understand why some people make decisions contrarily than others, when choosing similar products and services. In fact, small and large companies, financial institutions and other service providers are utilising this science for their betterment.

As the society continues to strive for sustainable development customers

are demanding more visibility into the carbon footprint of the products they purchase. Regardless, of the impact that this level of transparency may have with respect to consumers, it is likely that it will become an obligation to provide information about the environmental impact on product labels.

Over the past few years, implementation of Climate 21 Program “SAP Product Carbon Footprint Analytics” has been an accurate tool to analyse the carbon emissions of a product throughout the entirety of value chain inclusive of production, raw materials, energy use and transport. Beyond this, it permits integration with information on third party products and solutions, to be able to analyse and understand the breakdown of emissions or even to obtain

comparisons of each of the activities that make up this value chain.

Similarly, behavioural economics has become fashionable seeing as in recent months it has been applied to different areas of our daily lives. For example, governments have been integrating this concept to define public policies and use it to identify the perceptions of users and improve educational outcomes at a low cost. With respect to the private sphere, companies use it to get closer to their customers and encourage better decision making.

Some of the metrics that influence the decision making process are those related to CSR (Corporate Social Responsibility), ESG (Environmental Social Governance) or sustainability in general. This further represents that if a company is socially responsible and makes

decisions about sustainability and climate change, the customer may choose it instead of other “less sustainable” alternatives.

To begin with, not all customers behave in the same way under the same scenarios, therefore it is important to create customizations for various segments of customers. Beyond this, it should be taken into account that there is a divergence between millennials and adults in relation to the perception of sustainability. With sustainable investing, for example, we see that a certain lack of awareness and interest in the social investment space impacts our retirement planning considerations.

According to the studies conducted by British Context, providing feedback on energy consumption via smart meters upholds energy

savings amongst households. However, it is important to pair smart meters with visible devices, such as real time information displays, in order to make energy consumption patterns salient.

There is limited evidence on the impact of changes in default on consumers choice of electricity contracts differing in the energy mix they propose.

Solutions Proposed:

1. Impact of willingness to pay and purchase decisions:

Consumers placed higher bids for more environmentally friendly products when they were shown the environmental footprint or the carbon footprint label. Both footprints had the same aim of encouraging people to choose eco-friendly products. It did not seem that the composite environmental footprint label

changed behaviour to a greater extent than the carbon footprint label.

2. Understanding of label meanings and its impact on purchase decisions

If they had a higher level of understanding of the label, respondents were more likely to choose the better performing product (from a lifecycle analysis perspective) and to be willing to pay more for it. This was shown to be valid for both labels.

Consumers exposed to explanatory information on the labels had a better understanding of the ratings.

3. Differences in impacts across products:

The labels seemed to increase willingness to pay for washing machines and televisions but not for light bulbs, possibly because of the lower monetary stakes

associated with purchasing the latter.

4. Behavioural drivers of label understanding and purchase decisions:

Consumers are likely to focus mainly on standard indicators such as product performance characteristics and less so on environmental or carbon footprint indicators, especially when their understanding of the latter is limited.

Consumers' pro-environment stances or prior exposure to product labelling do not seem to strongly drive their willingness to pay for greener products.

Conclusion

Therefore, through this research and investigation we can conclude behavioural economics can assist the environmental sphere in two ways: improving benefit cost analysis and creating

policy mechanisms in a way
which can influence
environmental behaviour.

Overall, behavioural economics
can be used to solve some of the
great challenges in the fight of
climate change.

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