

Sustainable Food Consumption in India: Present State, Viability, Barriers and Possibilities

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Abstract: Veganism as a lifestyle is becoming increasingly popular in the world due to its various advantages but somehow the growth has not been so significant in India. This paper aims to identify the scope of veganism as a culture in India and the factors that impede its growth. Primary data is collected to study consumer behaviour and to assess their knowledge on the subject. Various factors such as price, age, knowledge, gender, etc were identified. To understand the impact of these factors on the decision of people to switch to a vegan diet, regression analysis is conducted between the dependent and independent factors. The paper deeply analyses the impact and feasibility of the growth of this culture on the demand and supply side of the market in India. In conclusion, the paper presents some policy suggestions such as fat tax, green contracts and nudges which can lead to a more sustained form of consumption in the country.

Keywords: Veganism, Sustainability, Consumer Behaviour, Regression Analysis, Fat Tax, Green Contracts, Nudge.

INTRODUCTION

The term “vegan” was coined in 1944 by a small group of vegetarians in England. Veganism conceptualises a way of living that seeks to exclude—as far as is possible and practicable—all forms of exploitation of, and cruelty to, animals for food, clothing or any other purpose; and promotes the development and use of animal-free alternatives for the benefit of animals, humans and the environment. Veganism, an extreme form of vegetarianism, is currently defined as a way of living that attempt to exclude all forms of animal exploitation and cruelty, be it from food, clothing, or any other purpose. Vegans avoid meat, chicken, fish, shellfish, eggs, dairy, and honey, as well as any other products containing animal-derived additives. People may choose to go vegan for a variety of reasons, including ethical, health-related or environmental concerns.

According to Google trends, with an exponential rise in the popularity of veganism across the globe in the last decade, the interest in this dietary choice peaked in 2020 as searches such as “Vegan restaurants near me” became frequent on Google. Countries such as the US, Australia and the UK have the highest rankings in terms of the percentage of the vegan population in the world. In the past decade, people over 15 years of age identifying themselves as “Vegans” have increased by 260% in Britain. There was a 400% rise in people who followed a vegetarian diet in Portugal over the past decade; half of them practised a vegan diet. Sales for vegan products in Britain rocketed by 1500% in 2020. The trend corresponds to the threat of climate change, the health gains by quitting animal products and the rising awareness of the negative impacts of meat consumption. The global vegan market is forecasted to witness an annual growth rate of 9.2%.

With a slow but steady acceptance of vegan foods in a cuisine-rich country like India, it is evident that more people are willing to shift to vegan diets and more MNCs are planning to grow their plant-based food business in the country. The Indian vegan market is expanding since 2017 and it is expected to grow more by 2025. There has been a rampant increase in fully vegan restaurants in cities like Mumbai, Pune, Goa, Bangalore and Hyderabad. As observed

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through various surveys conducted, a rise in sales of vegan food items is expected in India by 2022, owing to two main reasons: one, promotion by influential Indian personalities such as Virat Kohli, Shahid Kapoor, Sunil Chettri among others and two, health benefits related to veganism such as weight loss, improvement in kidney functioning, reversing lifestyle disorders, etc.

Indian cuisine already includes several vegan food items such as cereals, dals and rice which are considered the staple diet of Indians. The concept of plant-based food is not new to India, however, there are vegan products that may seem “too western” to include in their diets and certain products that they might be too resistant to remove from everyday consumption, such as dairy. India was the largest consumer of cow milk in 2020, consuming over 81 million metric tonnes, not taking into account other types of animal milk. India is also the world's largest producer of milk, with 22 percent of global production. Vegetarians and non-vegetarians have been substantial consumers of dairy products, thus the growth of the vegan market in India is yet to witness its peak.

With the threat of Global Warming on the horizon, several countries have agreed to reduce their carbon and GHG emissions. More and more efforts are now being put into developing renewable, green and sustainable energy, green production practices and waste reduction. The Kyoto protocol, Paris Summit and the various UN conferences on SDGs, Environment and Development are the product of the concerns of nations combined and the conscious effort to tackle the problem.

Other than high dependency on fossil fuels for energy, consumer demand and consumption are also significant factors for carbon emissions. Consumerism is at an all-time high and with India being an open economy, demand for both domestic and imported goods are on the rise. As per Third Advance Estimates for 2019-20, total food grain production in the country was estimated at a record 295.67 million tonnes. The production of Rice, Wheat and Nutri/Coarse cereals have also risen substantially to meet the demands of the rising population. Livestock is believed to be a significant contributor to climate change, representing 14.5% of global anthropogenic greenhouse gas emissions. Worldwide, dairy and beef production accounts for 20% and 41% respectively, of the emissions of this sector followed by buffalo milk and meat, with 8% of the emissions (Gerber *et al.* 2013). According to a report on Greenhouse Gas Emissions from the Food System, agriculture is a major contributor to GHG emissions, accounting for up to 30% of the global total. Of this, 10–12% is emitted directly from farms, particularly methane and nitrous oxide.

Climate change is projected to have adverse effects on India's development, due to the rapid industrialization, urbanisation, economic growth and increasing population. Water resources, agriculture and health are among the most vulnerable sectors that are projected to take the biggest hits. Most of India's policies and efforts for reducing carbon emissions are through taxing/penalising large manufacturing units that pollute the environment, regulating pollution produced by companies and vehicular pollution and investing in sustainable, renewable power resources.

However, an untapped space for carbon emission reduction is regulating carbon footprints through altering consumption patterns. There are not many policies and campaigns that focus on reducing carbon emission by promoting alternative food consumption that produces fewer carbons and uses less water for production. Since agriculture and related industries are a pivotal part of a country's production activities, they can be leveraged to meet carbon emission reduction goals for the country. With a lack of demand-side policies to curb carbon emissions, the relevance of our study lies in analysing a sub-population of the country and finding the viability, barriers and possibilities of introducing environment-friendly food alternatives in a country like India.

LITERATURE REVIEW

Xiaou Tang & Tania Mousel (2016) use quantitative analysis in their paper to explore the driving factors and the barriers that influence Swedish consumers when it comes to consuming vegan products. They make use of the Theory of Reasoned Action model and conclude that health and the environment, the taste and the traditions attached to certain foods are the most important factors impacting the food-related decisions of Swedish consumers.

Jihe Hwang *et al.* (2020) determine the relationship between consumers' purchase behaviour and ambivalence towards alternative meat in Korea. The paper demonstrates that the consumers' buying intentions concerning cultured meat and plant-based meat alternative are different based on concepts of ambivalence. The analysis is done by identifying the positive and negative cognitions depending on their perception of alternative attributes. The outcomes indicate that sustainability and food neophobia are two different factors influencing consumers' payoffs whereas unnaturalness, food curiosity and distrust of biotechnology are the traditional factors affecting consumers' purchasing choices.

Andreas Baumann (2013) in his thesis on “Greenhouse gas emissions associated with meat-free diets in Sweden”, conducted a Life Cycle Assessment (LCA) test on data collected from vegan and vegetarian subjects to analyse

the emissions difference in the two diets. His study concluded that dairy products cause the most emissions as compared to any other single food group in vegetarian diets. The difference in daily GHG emissions between vegan and vegetarian diets was found to be 0.48kg CO₂ per day, the higher emissions coming from vegetarian diets; when extrapolated to one year, the difference between an individual vegan and vegetarian diet turns out to be 170kg.

H. Pathak, N. Jain, A. Bhatia, J. Patel, P.K. Aggarwal (2010) in their study calculated the carbon footprint of Indian food consumption and analysed the differences in GHG emissions from vegetarian and non-vegetarian foods. A comparison of GHG emissions from five common Indian meals showed that a non-vegetarian meal with mutton emitted the highest amount of GHG, 1.8 times than the vegetarian meal, 1.5 times of a non-vegetarian meal (with chicken) and 1.4 times a lacto-vegetarian meal. They also highlighted that mutton consumption causes more GHG emissions as compared to consumption of food grain and poultry products.

J. Kearney (2010) in his paper *Food Consumption Trends and Drivers* highlighted the major drivers and trends in food consumption. He recognised income (total and disposable), urbanisation, food availability and accessibility, geography, food choices, religion, culture, globalisation, marketing and consumer attitudes to be some of the major driving forces of food consumption patterns. He also reflected on the nutritious and economic burdens of a shift in eating patterns globally.

Anil and Anjali Narang (2015) in their paper reflect upon moral and ethical ideas attached to consumption, as animals and the environment are direct or indirect victims of our dietary choices. They treat vegetarianism and veganism as a 'philosophy' that entails compassion and kindness that can be realised through mindful consumption. The paper has a sociological and philosophical approach to the action of consuming animal products and harming the environment and how it reflects on a human's compassion and kindness to other humans, eventually determining disruption of peace translating from human-animal to human-human violence.

Rita Coelho in her thesis *Veganism: Motivations and Obstacles*, highlights health, environment and ethics or some combination of these to be the major motivations for people to switch to vegan diets. Whereas, factors such as religious or cultural identity, taste preference, stigma and mainstream consumption patterns prove to be barriers to the adoption of vegetarian/vegan diets. Her analysis highlights an individual's age to have an effect on the adoption and maintenance of a vegan diet and those females tend to participate in vegan diet adoption much more than their counterparts.

RESEARCH METHODOLOGY

The study is based on primary as well as secondary data. Primary research was conducted all across the country through a google form. The main purpose of the survey was to study the various factors which impact the growth of veganism in India. Questions related to various factors like knowledge about veganism, awareness about sustainable food consumption, price, etc were asked. A total of 251 responses, of people from all age and income groups, were received and they have been analysed in the paper.

Econometric analysis has been done using simple and multilinear regression models on the available data of factors. The ordinary least squares method under the Classical Linear Regression Model is used. Testing of the model as well as for coefficients is done at 5% level of significance. Excel and R have been used for the analysis.

The CLRM assumptions of linearity in parameters, random sampling, no perfect collinearity, Homoscedasticity and autocorrelation have been satisfied and then the multiple regression results have been presented and analysed. Breush-Pagan test was performed to check heteroscedasticity whereas the Durbin Watson test was performed for autocorrelation.

RESEARCH OBJECTIVE

The role of the consumers in lowering GHG emissions has not been widely reported. The aim of this study is to gain an understanding of the scope of sustainable eating patterns in India by assessing the demand side. The following are the objectives of this study, taking into account the scope and limitations of the research.

- To determine the relationship between the current state of veganism in India and several factors viz. age, income, gender, price, knowledge etc.
- To evaluate the barriers and concerns regarding veganism and its feasibility in India.
- To examine the knowledge, outlook and practice of the community towards ethical food products in order to provide policy recommendations for sustainability in India.

RESULTS AND DISCUSSION

Statistics → Factor ↓	Multiple R	R- Squared	Coefficient Value	Intercept Value	P-value of Coefficient
Gender	0.211768959	0.044846092	0.21589404	0.4	0.000733657
Knowledge	0.145851103	0.021272544	0.170680628	0.4	0.020802137
Equal Price	0.575661732	0.331386430	0.578507078	0.207207207	1.5E-23
Less Price	0.619391725	0.383646110	0.631456953	0.15	5.53E-28

Regression Analysis: Regression analysis was performed on the following three factors:

- 1) **Gender:** After conducting a simple linear regression analysis, we observe that there exists a weak positive relationship between the choice of switching to a vegan diet and the gender of the consumer. While gender is a statistically significant factor in explaining the dependent variable, it only explains 4% of the phenomenon, implying that gender has a very weak effect on the phenomenon of an individual switching to a vegan diet. According to the regression result obtained, the probability for a female to switch to a vegan diet (as a stand-alone factor) is roughly 62% whereas for a male it is 40%. (Appendix, Figure 1)
- 2) **Knowledge:** After conducting a simple linear regression analysis, we observe an extremely weak positive relationship between knowledge about veganism and the decision to switch to a vegan diet. The R-square value for the factor is 0.0212, which is roughly 2% implying that knowledge about veganism does not play a very significant role in determining the switch to a vegan diet. However, the probability of an individual when they possess knowledge about veganism is 57% whereas when there is no knowledge about the concept, the probability of switching is just 40%. This implies that when people possess formal knowledge about veganism, they are more likely to consider switching their diet. (Appendix, Figure 2)
- 3) **Price:** The simple regression result for the prices revealed that there exists a positive relationship between the price of vegan food products and the will to switch to vegan food. Price has the highest R squared values of 33% and 38% amongst all the other factors, depicting that the high price of the vegan product is one of the main reasons why people hesitate in shifting to a vegan diet. As observed through Figures 3 and 4, 60% of people are willing to shift to a vegan diet if the prices of vegan products are less than the prices of their corresponding non-vegan alternatives whereas 56% of respondents are likely to switch their dietary preference if the prices of vegan and non-vegan products are the same. (Appendix, Figure 3 and 4)

Other factors

- 1) **Age:** According to the analysis, there exists an extremely weak - negative relationship between age and the corresponding decision to switch to a plant-based diet. Among the youth in the age group of 18-25, around 56% of the respondents are likely to switch to a vegan diet as compared to 35% in the age group of 60 and above. This shows that the younger generation in India is more inclined towards the idea of adding vegan products to their diet than the older ones.
- 2) **Income:** According to the analysis of the survey responses, an exceptionally weak-negative relationship exists between income and the relative decision to switch to veganism, which suggests that people with higher income levels are more reluctant to shift to plant-based diets than people with lower income degrees. 63.63% of people with an annual family income of INR 0-3 lakhs are likely to shift to veganism as compared to 43.33% of people with an annual family income of more than INR 15 lakhs.
- 3) **Packaging:** According to the survey responses obtained, 55.4% of the samples chose a product on the basis of its packaging while 44.6% answered that the packaging does not matter to them. This observation entails that packaging can be modified to influence customers to buy certain vegan products. (Appendix, Figure 5)
- 4) **Purchasing Platforms:** Post-Covid, 45.8% of the samples said they prefer buying groceries on online platforms while 54.2% still prefer to physically go to the store to buy their groceries. This entails that behavioural nudges can be implemented both online and in-store to influence customers to buy certain plant-based alternatives. (Appendix, Figure 6)
- 5) **Availability of products:** As per the survey conducted, 41% of the samples believe "unavailability of vegan products" to be one of the reasons for people being reluctant to make the switch to a plant-based diet in the country.

Availability of vegan food products is challenging in the country, especially in rural areas. Therefore, several efforts can be made to make sure that vegan products are accessible to the entire population of the country.

- 6) **Tastes & Preferences:** As per the survey conducted, 81.3% of the respondents agree that the established tastes and preferences of Indians could be one of the reasons for the slow growth of veganism in India. Thus, people find it extremely difficult to switch to veganism in a nation with deep cultural roots and wide culinary choices.
- 7) **Social Media:** Social media platforms have played a major role in popularising the concept of veganism by increasing its accessibility, especially amongst the younger generation. The survey conducted depicts that 43% of the respondents heard about the term ‘veganism’ through social media. Vegan brands use digital platforms to promote their new products, several Instagram pages are devoted to promoting vegan lifestyles and endless vegan recipes are pinned on Pinterest which makes learning about the lifestyle incredibly easy.

Multiple Regression

For the multilinear regression, three models have been devised, each including two independent factors. Multilinear regression analysis for each model has been performed and the results are interpreted as under:

Model 1: Individual will to switch to Veganism on the basis of Gender and Knowledge

Regression Statistics	Values
Multiple R	0.25037694
R Square	0.06268861
Adjusted R square	0.05512965
Standard Error	0.48612289
Significance F	0.00032629
Observations	251

	Coefficients	Std. Error
Intercept	0.285689	0.071631
x_1 - Gender	0.207836	0.062784
x_2 - Knowledge	0.156589	0.072069

The regression equation for the above-mentioned model is -

$$\hat{y} = 0.29 + 0.21x_1 + 0.16x_2; \text{ where } \hat{y} \text{ is the decision of an individual to shift to a plant-based diet.}$$

The model has an R square value of 0.062, which translates to 6.2% implying that gender and knowledge do not play a very significant role in determining whether or not an individual switches to a vegan diet. Despite the knowledge about veganism and its benefits, many respondents did not make a dietary change. These decisions are impacted more significantly by other factors. However, from the results, we observe that given that the individual is a female and has knowledge about veganism, the probability of them switching to a vegan lifestyle is roughly 66% whereas for a male possessing the same knowledge, the probability of switching to a vegan diet is just 45%. We observe a difference in the likelihood of two genders possessing the same knowledge and their likelihood of opting for conscious diets. (This study does not intentionally exclude the third gender, however, our respondents belonged to the ‘male’ or ‘female’ gender and therefore the study has obtained results for only these genders).

Model-2: Individual will to switch to Veganism on the basis of Price and Income

Regression Statistics	Values
Multiple R	0.621221789
R Square	0.385916511
Adjusted R square	0.375931413
Standard Error	0.395071881
Significance F	4.33936E-25
Observations	251

	Coefficients	Std. Error
Intercept	0.140383535	0.043712436
x_1 - Income (0-3 LPA)	-0.017633181	0.093495801
x_2 - Income (3-8 LPA)	-0.003876463	0.075584227
x_3 - Income (8-15LPA)	0.048679265	0.060115152
x_4 - Price	0.627749567	0.052928809

The required regression equation is -

$\hat{y} = 0.14 - 0.018x_1 - 0.004x_2 + 0.05x_3 + 0.63x_4$; where \hat{y} is the decision of an individual to shift to a plant-based diet.

In this regression analysis, we observe an R squared value of 38% which implies that the price of the vegan products and the income of the consumers play an important role in the decision of switching to a vegan diet or not. The lower and middle-income groups, which form a majority of the Indian population take the price into consideration while buying the food products and planning their diet. Clearly, it's not possible for them to afford the high-priced vegan food products.

Model 3: Individual will to switch to Veganism on the basis of Age and Income

Regression Statistics	Values
Multiple R	0.296013173
R Square	0.087623798
Adjusted R square	0.061341356
Standard Error	0.484522334
Significance F	0.002
Observations	251

	Coefficients	Std. Error
Intercept	0.272456012	0.136111498
x_1 - Age Group (0-17)	0.562106752	0.177165938
x_2 - Age Group (18-25)	0.2179408	0.136798051
x_3 - Age Group (26-40)	0.169682521	0.180759606
x_4 - Age Group (41-59)	0.107138052	0.141859208
x_5 - Income (INR 0-3 LPA)	0.185276207	0.114786515
x_6 - Income (INR 3-8 LPA)	0.100939151	0.094352917
x_7 - Income (INR 8-15LPA)	0.128061493	0.075396331

The sample regression line designed through this model is -

$\hat{y} = 0.27 + 0.56x_1 + 0.22x_2 + 0.17x_3 + 0.11x_4 + 0.19x_5 + 0.1x_6 + 0.13x_7$; where \hat{y} is the decision of an individual to shift to a plant-based diet.

The model has an R square value of 8.76% which states that the variation in the dependent variable i.e., the decision of an individual to switch to veganism depends slightly on their respective age and income. We can see that this model is significant at 5% level of significance. People with higher income are comparatively more willing to shift their dietary preferences if they are young. It is notable to observe that no respondent from the age group of 0-17 years with an

annual family income of INR 0-3 Lakh is ready to switch to a plant-based diet. Moreover, as none of the respondents from the age group of '60 years and above' are ready to make the switch if their family income is less than INR 8 Lakh per annum; we can interpret that people with a minimum age of 60 years are less likely to shift to veganism if their annual family income is low.

CRITIQUES

Health effects

While Vegan diets promote healthy and sustainable living, long-term consumption of such diets has proven to cause certain deficiencies in the body. According to several studies, Vitamin B12 deficiency disorders are commonly seen among vegetarians and vegans, since this vitamin is present mostly in foods of animal origin (Sridevy and Prasanna, 2014) and can cause irreversible neurological damages. One of the major concerns about the vegan diet is the lack of protein intake which provides low energy for body functions when compared to vegetarians and meat consumers; the protein-energy status in vegans has been reported lower when compared to omnivores (Vegetarian Diet in Chronic Kidney Disease-A Friend or Foe. Gluba-Brzózka A, Franczyk B, Rysz J, Nutrients. 2017 Apr 10). Other deficiencies detected from individuals following vegan diets are iron, zinc, vitamin D, calcium, and omega-3 fatty acids deficiencies. Therefore, one cannot completely switch to a vegan diet on this basis or may be required to take extra supplements with the diet. However, similar deficiencies are also detected in non-vegan diets, so the argument of vegan diets producing deficiencies is subject to discussion. In this case, intentional and careful consumption that marginally caters to health requirements is preferable. This argument was indeed supported by one of the samples tested in this study, who experienced a B12 deficiency after following a vegan diet for over 6 months. Considering the overwhelming advantages of natural milk in human nutrition and wellbeing, those problems raised by vegans cannot or should not prevent the consumers from drinking dairy milk. In fact, the dietary issues raised by the vegans can be easily corrected by taking balanced and diversified diets with fermented or lactate added to milk and dairy products as the major parts of the diets (Ibrahim and Gyawali, 2013; Korhonen and Pihlanto, 2007; Park *et al.*, 2007; Park, 2009). Dairy milk, especially goat milk, contains high levels of short and medium-chain fatty acids (MCT), which are not in plant-based milk products.

Supply-side effects on the food industry

The plant-based milk demand, pushed by the advocates of veganism, has driven food manufacturers to opt for alternative sources of plant-based materials. By contrast, the aggressive promotion of scientifically uncertain claims that vegan milk is better for health than natural dairy, has led to a loss in revenues and business downfalls for the dairy industry in countries where vegan milk demand is high. This has resulted in bottleneck pressures on dairy farmers and the survival of dairy operations in the US and the western world.

We can expect similar economic losses and the closure of small milk businesses in India. With the strong concept of 'Milkmen' in India, this will result in a huge dent in the dairy industry and cause damage to the livelihood of related parties. Even with a rise in demand for plant-based milk, it will take the industry time and money to equilibrate the market demand and supply and adjust to the new trends. Similar impacts can be expected in the meat industry. In a recent incident that took place in Covid-hit India, the decline in demand for meat resulted in animal cruelty; hundreds of chickens were buried alive since there were fewer buyers of meat during the lockdown. This implies a certain degree of animal cruelty, economic downturn and unemployment, in case there is a significant shift to veganism. The food industry would have to undertake a certain fixed cost (which may be large) to shift to vegan demands by the population.

Demand-side Impacts

Minimising meat consumption, acquiring organic food items and consuming locally-produced vegetables and fruits are known to benefit the environment in several ways, but these plant-based sustainable diets are not financially accessible to a large section of India. As families across the country fight to lay food on the table, veganism is an alternative that only a few can afford. These products come at a price and are selectively stocked, making veganism an exorbitant dietary alternative in a developing country like India. Thus, the concept of veganism won't penetrate into under-developed cities because of the complexities involved including high-priced vegan alternatives, availability of vegan items in rural cities, among others. Owing to the fact that many Indians have been consuming cow/ buffalo milk and paneer for most of their lives, they often struggle while adapting to the taste of soya and tofu. Switching to a vegan diet might be healthier, but struggling parents in India, depend on staple food items that they know their children will eat rather than introducing alternative vegan options that might go to waste, because of their traditional mindset. In the real world, vegan is pitched as home food with minor modifications but in India, it's far from any easy change to make. With the ethnocentric and classist attitude of people towards their established tastes and preferences, such replacements come at the cost of disciplining their taste buds, which makes the process of shifting all the more strenuous in the country.

Feasibility to set up Vegan food industries

The kind of labour skills and machinery required to produce vegan products are different from the production of other food products. This is one of the main challenges that manufacturers face when they plan to expand production to meet the fast-growing demand for plant-based foods. The machinery required for producing meat-free sausages, almond milk, etc are not costly but are also not readily available.

The shift from the production of animal-based food products to plant-based food products also impacts the economy. In some countries, livestock plays a critical role in reducing poverty and improving livelihood. On the other hand, not all vegan foods have lower carbon footprints - 74 litres of water are needed to produce a single glass of almond milk. Soya, required to prepare tofu, is the leading cause of deforestation.

There is a lack of a legal framework defining what constitutes a vegan or vegetarian claim because of which consumers often find fake vegan food products in the market. This eventually means a loss of trust from the consumers' side and hence leads to a drop in the demand for vegan food products.

Environmental Impacts

Raising animals for food requires an unsurpassable contribution of land, energy, feed and water but the belief of veganism is not always green either. Vegetables and fruits often cannot be cultivated in specific locations or during certain seasons, so they must be transferred - often thousands of miles before they reach the final consumer. Studies related to the relationship between vegetables, fruits and GHG emissions proves that air-freighted produce is responsible for fairly high levels of GHG emissions. Furthermore, highly perishable items that are prone to spoilage add to a shocking statistic that nearly half of the vegetables and fruits produced globally are wasted each year, a total loss of all the energy lodged in their production, long-distance transportation and storage.

POLICY RECOMMENDATIONS

Green Contracts: "Green" and sustainable terms of exchange can be set between buyers and suppliers for products in the food industry. This may entail eco-friendly packaging on the supplier's end, efficient transportation and lowering the carbon footprint of the procurement and supply process in various aspects. Suppliers and manufacturers can be incentivised by the government to switch to these "Green Contracts" to ensure green and sustainable procurement and supply of foodstuffs. This would make public and private procurement more environmentally friendly as a whole.

Fat Tax: A fat tax is a kind of tax that is imposed on junk foods and street foods that increase body weight and lead to body-related problems. Increasing the taxes for unhealthy junk foods should encourage people to take healthier food options like fruits and vegetables especially among younger adults and make sure that they do not consume unhealthy food on a large scale. Moreover, the generation of revenue from taxation can be used for various health initiatives and programmes to prevent obesity, support improvement of nutritional status and food quality and encourage the practice of physical activity.

In 2016, Kerala became the first state in India to impose a 14.5 % fat tax on fast food items sold in branded restaurants. Other states in India are also deliberating on taking this important step for a healthy future.

Behavioural Nudges: Nudging is the concept of using indirect propositions and social reinforcement to influence individual preferences without persuasion or coercion. Policy recommendations that could use nudge marketing are -

1. *Nudging on Online Platforms:* As more and more people switch to the online mode of buying groceries, vegan brands can come on board with grocery-delivering apps to tap into a larger consumer base. Apart from ensuring their presence on these grocery apps, it would be beneficial to introduce a "Vegan Foods" section separately, making it convenient for consumers to access and surf. The branding of the products also plays a key role in conversion rates (whether consumers buy the product after viewing it).
2. *Nudging in Packaging:* Packaging drives consumer decisions as a customer is tempted to purchase a well-packaged good. Vegan companies can use sustainable packaging and attractive green packages for vegan products to not only promote the idea of sustainability but also to convince consumers to buy these products.
3. *Nudging in Government Events:* Changes need to be made while framing veganism and advertising vegan products. To begin with, the country needs huge shifts from the top. The central and state government should redesign their menus by adding multiple vegan items, for the official events and meetings. This would indirectly educate more and more people about the lifestyle and with intellectual public engagement, the state can share its green intent with the citizens and motivate them towards a renewable, more sustainable approach to living.

LIMITATIONS

This study has a few limitations attached to it. The concept and idea of “Vegan” foods may only be applied to Tier 1 urban cities by large and the number of samples conducted for this study might not be representative of the whole population in question. Results may also be skewed as samples collected May, in large, be collected from a single state due to lack of resources and thus may not be accurately representative of the population.

The regression models used entail certain assumptions such as no multicollinearity between factors that may not be practical or reasonable in real world application, which could lead to a deviation from the correct result.

Applying policy recommendations to encourage veganism can be democratically criticised and might not be feasible considering India’s political-economic structure.

CONCLUSION

The data collected by the survey clearly depicts that a number of factors act as a roadblock to the growth of veganism in India despite the number of advantages of this sustainable form of consumption. The analysis performed on the data collected shows that a few factors are more impactful than others in the decision-making process of the form of consumption of people from all across India. It is observed that price plays the most important role. Vegan products are expensive so the demand for them automatically falls and acts as a hindrance to the growth of the vegan industry. Price is followed by gender and knowledge.

Another important factor that comes to the surface is income. The paper talks in detail about the demand and supply side of the vegan industry as well as the health and environmental impacts. Several policy suggestions are included to encourage an ethical consumption pattern in the country.

The study also attempted to study other factors inhibiting citizens to adopt a vegan diet. From the results (Figure 7 in Appendix) we observe that Established Food habits and high prices of vegan foods are perceived to be the major factors preventing the adoption of vegan diets in India. However, Regional and Cultural reasons, as well as family resistance, also play a role in these decisions. Many cultures and religions heavily include dishes prepared using milk and meat dishes for consumption as well as ceremonies. For example, in Islam, on the occasion of Eid al-Adha, the ceremonies include animal sacrifice (usually sheep, goat, cow or camel). Many Hindu festivals include the making of milk-based sweets and milk offerings to gods as well. For older generations, the consumption of products such as ghee and milk has cultural relevance and thus cannot be excluded from their diets, resulting in family resistance to the adoption of a vegan lifestyle. Therefore, Regional and Cultural factors, as well as family resistance to vegan shifts, also play bold roles in the low rate of shifts to vegan diets.

Thus, executing veganism in its true sense would be strenuous and perhaps, a dreamy goal for India. The citizens of this dairy loving country cannot significantly reduce their carbon footprint by switching their current dietary preferences. People here have been consuming milk and other dairy products since their childhood, thus, shifting to a completely non-dairy diet would be a difficult milestone to achieve. This was also observed from our study, with “established food habits” being the number one reason restricting people from shifting their diets (204 respondents out of 251). Obtaining a state of pure veganism is therefore not feasible in the country. However, dietary preferences can still play a major role in reducing the carbon emissions upto some extent. This can be done by focusing on a more practical approach involving regulated consumption of certain dairy products and eliminating meat/ flesh from the diet. Being the second-largest country in terms of population, even a step towards veganism can significantly alleviate the country’s carbon emissions.

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APPENDIX 1: DIAGRAMS

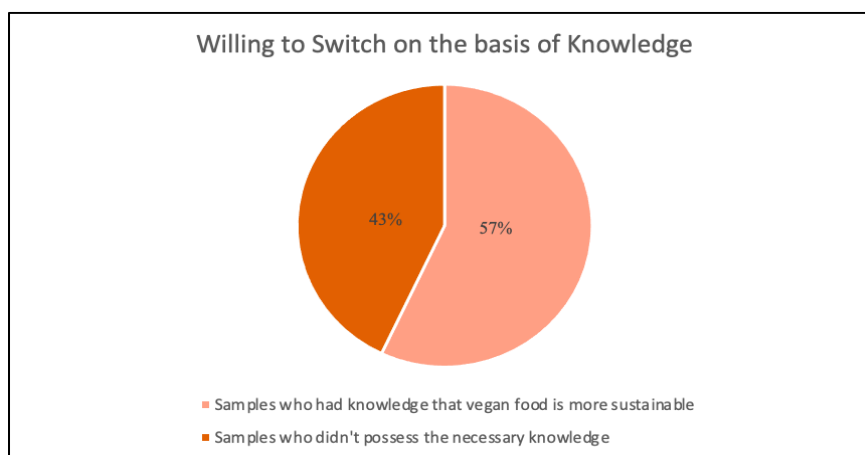


Fig-1

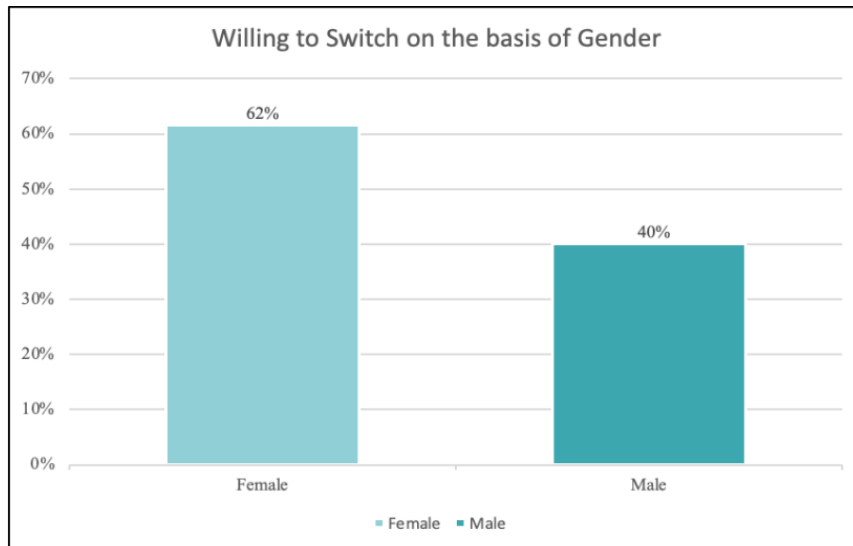


Fig-2

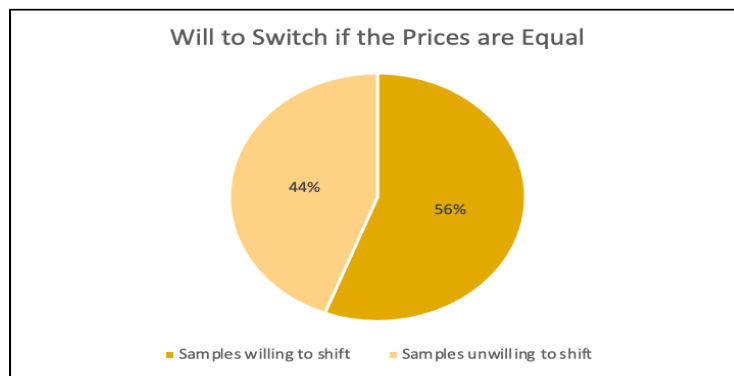


Fig-3

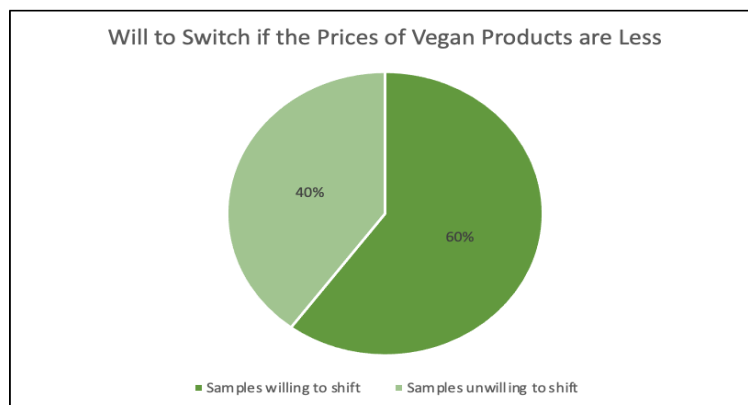


Fig-4

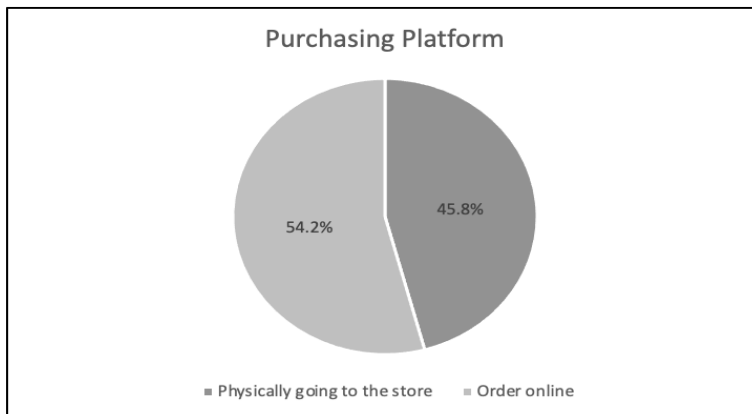


Fig-5

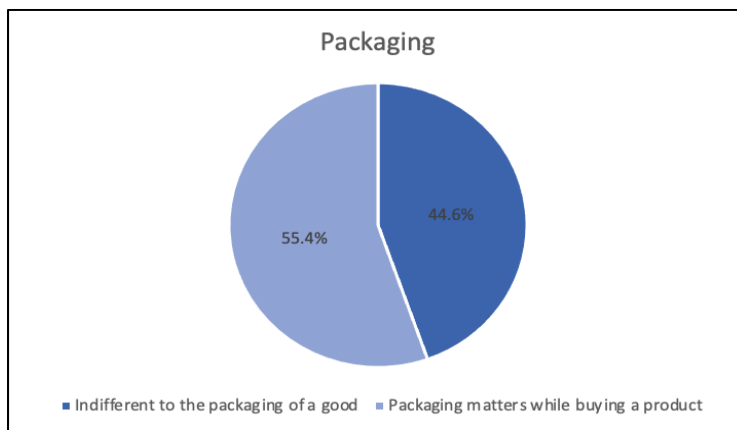


Fig-6

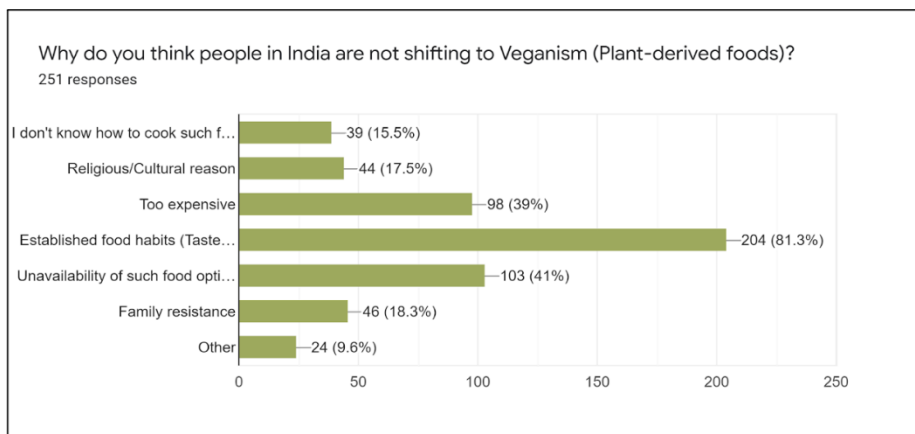


Fig-7

APPENDIX 2: SURVEY

Research on Sustainable Food Consumption

Hello!

We are a group of three economics students attempting to research about Veganism (Sustainable Consumption patterns) in the Indian context.

This form is anonymous and all questions are required to be answered.

Kindly only fill this form if you are an Indian citizen currently residing in India

Thank you for your cooperation and time!

1. Age
 - a) 0-17

- b) 18-25
 - c) 26-40
 - d) 41-59
 - e) 60 and above
2. Profession
 - a) Student
 - b) Housewife/ Househusband
 - c) Working
 3. Gender
 - a) Male
 - b) Female
 - c) Other
 4. Family Income (INR)
 - a) 0-3LPA
 - b) 3-8LPA
 - c) 8-15LPA
 - d) More than 15 LPA
 5. Number of Family Members (living in household)
 - a) 0-2
 - b) 3-5
 - c) 6 or above
 6. Do you know that Veganism and sustainable food consumption emits fewer carbons and uses less water for production?
 - a) Yes
 - b) No
 7. On a scale of 1-5, how much knowledge do you have around "Veganism" (1 being no knowledge and 5 being relevantly significant knowledge)
 8. If your answer was 3-5 in the previous question, have you switched to a Vegan diet?
 - a) Fully Vegan Diet
 - b) Partially Vegan Diet
 - c) Haven't Switched
 - d) Not Applicable
 9. "In dietary terms Veganism denotes the practice of dispensing with all products derived wholly or partly from animals. Veganism is a philosophy and way of living which seeks to exclude—as far as is possible and practicable—all forms of exploitation of, and cruelty to, animals for food, clothing or any other purpose; it promotes the development and use of animal-free alternatives for the benefit of animals, humans and the environment. "Knowing this, would you shift to plant-based/cruelty-free food/vegan options?
 - a) Yes
 - b) No
 10. What is your current dietary preference?
 - a) Non-Vegetarian
 - b) Vegetarian
 - c) Vegan
 11. Out of the following, which food options do you think are Vegan?
 - a) Dals (Pulses)
 - b) Rice
 - c) Cow, Goat, Buffalo Milk
 - d) Almond, Soy, Oat Milk
 - e) Honey

12. What is your preferred mode of buying groceries post covid?

- a) Physically going to the store
- b) Other

13. Which product is you more likely to buy based on the packaging?



a) Option 1



b) Option 2

c) Packaging does not matter to me

14. Why do you think people in India are not shifting to Veganism (Plant-derived foods) (multiple answers allowed)?

- I don't know how to cook such foods
- Religious/Cultural reason
- Too expensive
- Established food habits (Taste and Preference)
- Unavailability of such food options
- Family resistance
- Other

15. If prices were equal for both normal and vegan options, would you make the switch to the vegan option?

- a) Yes
- b) No

16. If the prices of vegan options were lower than your normal options, would you then make the switch?

- a) Yes
- b) No

17. Where did you first hear about the term "Veganism"?

- a) Friends and Family
- b) Social Media
- c) News Outlets/ Articles and research papers
- d) I didn't know about it prior to this survey

Is there any other reason you have for not switching? Do you have anything else you would like us to know?