





# CLIMATE SWITCH: DESIGN LED SYSTEM RESPONSE TO CLIMATE CHANGE INDUCED BY CONSUMPTION

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## ABSTRACT

The paper looks at Climate Change as a wicked problem through the lens of Systems Thinking as part of an academic course. The aim of the research was to understand the underlying causes of climate change and find innovative ways to approach the problems caused by the existing consumerism driven industrialization and societal mentality. The resultant solution was the utilization of social movement and a framework of behaviour change models contextual to each individual for maximum impact. It would enable and nudge the common masses towards the path of sustainable consumption.
Keywords: Climate Change, Design for Behaviour Change, Systems Thinking

## INTRODUCTION:

The goal of Systems Design Course was to apply systems thinking and design thinking to real world problems and explore opportunities through an organic explorative manner. The course was carried out as a part of the course-work for Masters of Design (Product Design) at National Institute of Design (NID) Ahmedabad, India and had a duration of 12 weeks. The course usually culminates in a varied outcome right from methodologies to working prototypes. The result of the course is not governed by tangible or intangible outcome but focuses more on creation of new knowledge, methodologies and ways of tackling a wicked problem.

## RESEARCH PROBLEM AND GOALS:

The initial direction started with the problem of human generated waste, at close quarters in the city of Ahmedabad, India to perceive how a systemic intervention can play a role in the improving the situation. The problem shortly opened unto a macro level wherein industrialization, consumerism, climate change came into the radar of the research. The research problem started with the problem of waste in general, slowly divulging into waste and the ecosystems which generate it and are affected by it. The final research brief was to conduct extensive research that would help devise a framework that can bring about behaviour change in both consumers and producers, through education and awareness to combat climate change. In terms of the eco systems which are affected by waste, natural as well as man-made ecosystems (culture, economy etc.) were analysed. Waste is residue or by product of any process. In this context, the process of human progress over the years has created greenhouse gases leading to climate change along with polluting the earth's systems of water, soil and air. Whereas, there is no waste in nature which have inspired the concepts of cradle to cradle and circular economy. After studying varied sustainable options available as opposed to the wasteful way of linear economy, it was established they are not widely in practice to counter the climate change. The resistance was due to the economic risk which it poses by shifting the business models or company policies. It was hence ascertained, there is an urgent need to shift the way we produce, consume and dispose goods. This shift has to be initiated ideally by the industry and government. However, in the face of inaction and lack of consensus by these parties, the paper explores how consumers can bring about this change.

In this light, to develop an intrinsic motivation for consumers, theories and methods in behaviour change were explored. The solution ecosystem was drafted keeping in mind the prominent ongoing trends in fields of social, geological, political and economic fields. The goal was to create a conceptual ecosystem of solutions which would demonstrate how consumers could be nudged into sustainable consumption and in turn drive the government and industry to follow.

## THEORETICAL BACKGROUND:

Systems thinking[1] can be explained as a disciplined approach for examining problems holistically and accurately. It encourages insightful questioning and not superficial solutions. Systems thinking often involves observation of events and data, to identifying behaviour patterns, and finally surfacing the underlying structures that drive them. By understanding and changing structures that are not serving well (including mental models and perceptions), one can expand the choices available and create more satisfying, long-term solutions to wicked problems. In general, a systems thinking perspective requires curiosity, clarity, and the willingness to see a situation more fully, to recognize that everything is interrelated. If the problem is chronic, not a one-time event, if the problem is familiar and has a known history or else if people have unsuccessfully tried to solve the problem before. The principles of systems thinking suggest that there are no perfect solutions; and that the choices will have an impact on other parts of the interconnected system. By anticipating the impact of each trade-off, one can minimize its severity or even use it to one's advantage.

This paper aims at understanding the accelerated growth of industrialization and how it's altering Earth's surface, atmosphere, oceans and systems of ecological recycling at an unforeseen rate. In this Anthropocene age, the lack of firm commitment to reduce and reverse the effects of climate change have been rigorously discussed by several concerned groups ranging from NGOs, private organisations to governments. However, these efforts have been criticized for not meeting either the urgency of the crisis or the volume to which it needs to be addressed. In cases where they are successful, they seem to be insufficient to mitigate the problems. UN Report[2] (IPCC 2013) states an alarming evidence that with current efforts we are not only going to pass the amicable two-degree target but cross three degree change by 2100. The world stands at a crossroads of adopting sustainable choices for development or facing adverse climate changes with the current status quo. At the same time, the ever-growing middle class in India is being empowered for consumption, where 1/10th of the world population resides and effectively 1/5th of the world population will be middle-class consumers by the year 2030. Current annual expenditure growth will make

[1] Sytems thinking – Why, What, When, How by Micheal Goodman, www.systemsthinker.com (13th March, 2019)

[2] IPCC, 2013: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change[Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp.

India the third-largest consumer market by 2025[3]. The projection stands true for similar unprecedented expansion of the global middle class that will put a tremendous strain on the natural resources available. The situation arose as a result of globalization and improved technology which drives the masses for consumption.

In this light, the paper suggests an alternative to the ongoing burgeoning efforts being taken by industries and governments. It shifts the onus to consumers who are in a state of disavowal and aims to enable them to practice and spread sustainable consumption. This in turn will push the industries to respond to the demand of sustainable products by changing their wasteful linear setups. The framework designed to enable this switch in the consumer's consumption is based on BJ Fogg's Behaviour Model4 and design for behaviour change principles. The Fogg Behaviour Model shows that three elements must converge at the same moment for a behaviour to occur: Motivation, Ability, and a Prompt. When a behaviour does not occur, at least one of those three elements is missing.

## ACTION RESEARCH:

To deep dive into this problem, the case studies in India related to climate change were extensively studied both in-situ and through secondary means. These ranged from tanning factories in Kanpur*, India, land encroachment in Assam – Kaziranga, burning coal mines of Jharia in Jharkhand*. Some very interesting multidimensional linkages were uncovered. For example, the expanding tea gardens in Assam5 leading to deforestation; reportedly have very poor sanitation and hygiene conditions for women workers. This also causes them to be subject to verbal, physical and sexual abuse. Industrial tea plantation can causally be linked to poor social well-being of women. Another example studied how, green revolution ushered into India, increased sugarcane production. However, this led to stress on the local water resources and the local politicians accumulating wealth. More case studies6 unfolded throughout different regions in India - burning of forestlands in hill country, feeble electronic waste management systems in industries and instances of exploitation of cheap labour in slums where the workers had little to no idea what their means of livelihood was doing to their body. Most case studies were from the India, this more or less was a geographical system boundary for observation.

A few of such case studies which were in and around Ahmedabad, were taken up for slow ethnography to understand the nature and interactions within the micro-systems. Amongst them, Alang7 (Gujarat), world's biggest graveyard of decommissioned merchant ships witnessed a conversion of a peaceful agrarian village into a noisy and polluted industrial town. Few miles away from Ahmedabad, Pirana, a mountain of waste accepting 3600 tonnes of waste every day provides unfamiliar toxic jobs of rag picking to migrants as well as natives jeopardizing their health and hampering social development. Inquiring further, Indroda, a village based on the banks of river Sabarmati lost its agricultural cropland due to urbanisation which led to a wicked cycle of sand mining mafia, unemployment of farmers and destruction of river bed. The interview with the stakeholder's uncovered more aspects to these problems. It was observed at Alang and Pirana sites, the population of migrant workers from Bangladesh and Uttar Pradesh was alarmingly high, they reported their daily struggle of livelihood.

India amongst many other developing nations has experienced rapid unplanned growth in many sectors. This was driven by aggressive local or global policies for accelerating growth – leading to a sudden rise in consumption. This adoption of rampant global consumption in a local infrastructure which isn't capable of handling the consequences was devastating. An example for this could be how the fast food culture has been on a rise. Fast food is resource intensive compared to healthier fresh cooking practices. Initially introduced only for the higher class, the fast food chains soon were looked upon as aspirational symbols. Many years later with price tactics, a large population from the middle class affords and consumes fast food too. Leading to a drastic change in the food ecosystem.

Interviews with the stakeholders across public, industry, government and academia testified how all of them are connected to climate change. The first-hand experiences drove a very deep understanding and empathy to the research. A movie screening of the movie "Home "8 by Yann Arthus-Bertrand was held to garner reaction of people who are perhaps not subject to such intensive exposure to these case studies and gauge the reaction of the audience. A cinematic compilation of areal footages and strong narratives, this documentary is the depiction of how Earth's problems are all interlinked. Based on this learning, a questionnaire/survey was designed for mass circulation to gather more responses from users.

## SYNTHESIS & INFERENCES:

All of these studies revealed a generic pattern. This pattern was of disparity, wastefulness and turmoil, a resultant mainly of human wants. The ever-increasing wants and needs of consumers that thrusts the industry to produce

[3] Singhi A., Jain N.( 2017 March 17) The New Indian: The Many Facets of a Changing Consumer from https://www.bcg.com/en-in/publications/2017/marketing-sales-globalization-new-indian- changing-consumer.aspx

[4] BJ Fogg (2018) What Causes Behavior Change? http://www.behaviormodel.org

[5] https://www.academia.edu/12764834/The_Socio-economic_and_Health_Challenges_of_Labourers_in_the_Tea_Gardens_of_Assam

[6] Ghawde.P (2017 November 28) from https://climateswitch.wordpress.com/category/uncategorized/

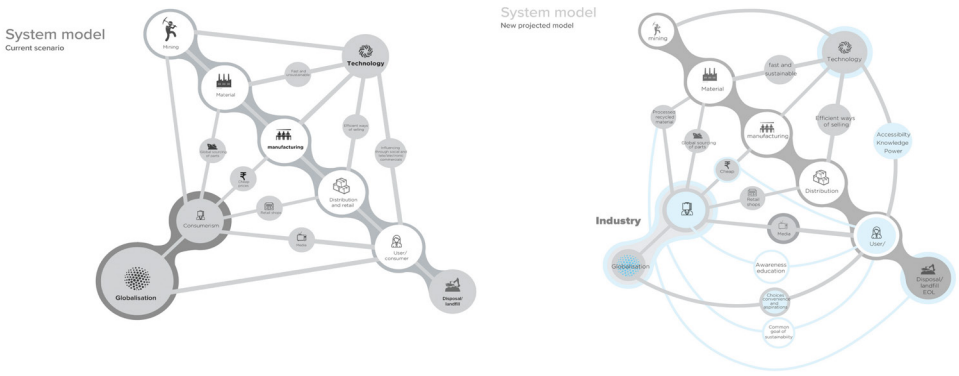
[7] Lloyds T. (2016 November 18) Breaking Bad? The Story of Alang Ship Breaking Yards https://www.tuscorlloyds.com/alang-shipbreaking-yards/

[8] Home documentary by Yann Arthus at www.culturechange.org/cms/content/view

cheaper, faster and more to meet the consumer demands. This was a trend identified in western countries too, during the Industrial age* wherein the ease of production of good led to reduced prices. This in turn increased the consumption of these goods driven strongly through improved media channels. Hence, Consumption was then targeted to be studied as a design problem, wherein the who, why, where, how were studied to understand how the consumerism movement gathered stronghold. Consumerism is a social and economic order that encourages the acquisition of goods and services in ever-increasing amounts. With the industrial revolution, but particularly in the 20th century, mass production led to an economic crisis[9]: there was overproduction—the supply of goods would grow beyond consumer demand, and so manufacturers turned to planned obsolescence and advertising to manipulate consumer spending

Synthesizing the above case studies through visual mapping and analysing inputs from different stakeholders, led to an organic process of inferences. A system of solutions emerged towards individual-level decision making. A paradigm was established, wherein there was a need to bring design-led reaction of these consumers. Linkages of current influences in consumer's consumption between globalization, consumerism, manufacturing and technology was understood. The above four being the major facets of the economy, a conceptual model around the process of manufacturing, logistics, production, marketing, consumption and disposal of the goods the world consumes was formulated. This resulted in the current system's map and helped in coming up with an ideal model where the users play an active role as in fig. 1.

The aforementioned exercise of the public screening of documentary led to three major insights. Firstly, the lack of in-depth knowledge about the climate change issue, secondly the inability to 'take action' (state of disavowal) due to lack of contextual information and thirdly, a state of willingness to change as expressed through post screening discussions. The above insights were validated by a survey taken with 200+ responses from varying demographics. Our observations derived a general willingness within the consumers to change their consumption habits but for them the process or the means were unclear. It was also identified that people are in a varying state of awareness or action when it comes to Climate Change. The categories could be described as: the nay sayers/deniers, ignorant, aware, empowered and ideal. It was established that a different strategy of behaviour change was required for each of these states of minds of user. The relevant actions and tasks were designed for people to make a switch from their current state to the next. (E.g.: A person who is currently aware but needs to know how to lead a more carbon neutral lifestyle). A need was realized for a tailor-made contextual program for every individual or a group of similar individuals to help them transition on their journey to a more sustainable behaviour.




[Figure 1]: Old and new system map

## RESPONSES:

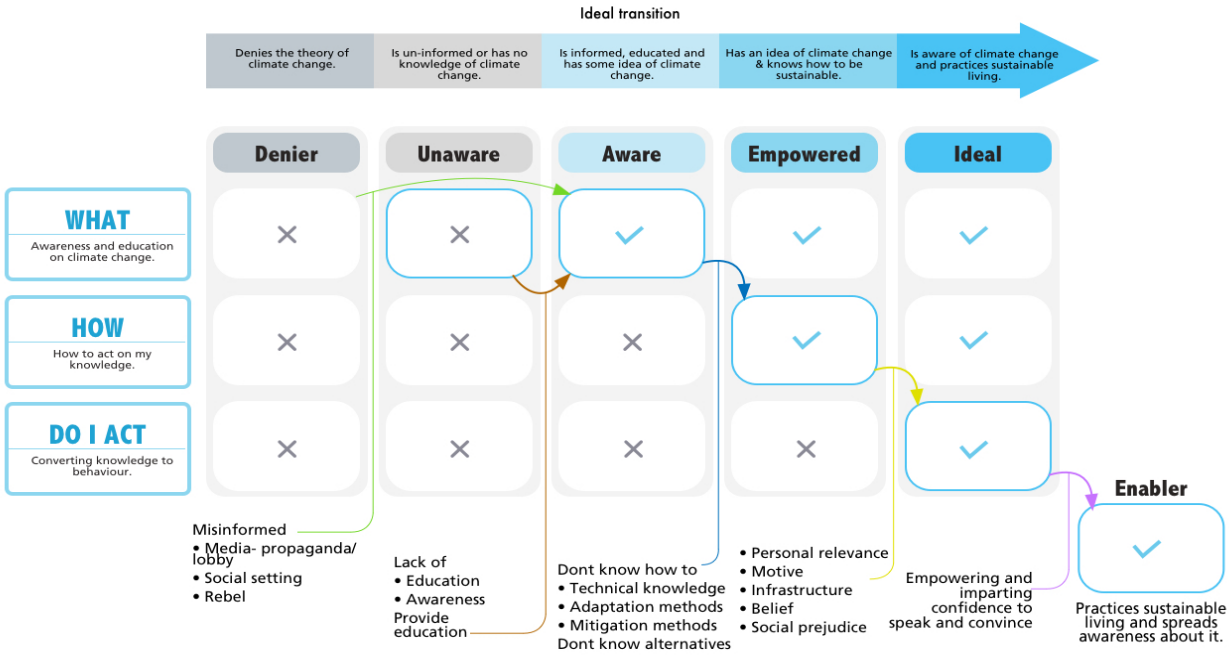
The solutions were developed after understanding and consulting various environment institutions initiatives in India[10] (CEE, AMC, ECS, NEERI, TERI). This gave a clearer idea as to which areas have been explored and which challenges need to be ironed out during execution. Consequently, data from behaviour change theory cast a light on new avenues to dramatically change the approach to tackle the man-made climate problem. In particular, the Fogg's Behaviour Model has inspired the design of a model of behaviour change- the Switchboard (fig.2). The switchboard is a tool for people to contextually interact wherein they can identify themselves based on their current behaviour and plan the transition (switch) to a more sustainable lifestyle. It will be accessed through the climate switch social challenge campaign.

[9] Fordism: Economic crisis and mass production by Micheal Husson at www.cadtm.org/Economic-crisis-and-global-disorder-An-increasingly-chaotic-globalization

[10] Institution for environment education in India, https://www.india.gov.in/people-groups/community/environmentalists/institutions-environment-education-and-research-india

For the young generation an interactive board game was designed to simulate the system complexities of the climate change scenario between the major stakeholders; the government, educators, common man (users) and industries. The idea was to educate them on the relations between the various stakeholders and effects they can have on each other, by letting each player taking up a stakeholder type and their journey throughout the game to win, either enhancing or diminishing another player's growth.

A system was designed through the lens of metadesign[11] to enable social movement to take action and promote sustainable consumption. The project compels users at an individual level, to introspect the present state of affair of climate change and speculate for a future which will be governed by conscious consumers, demanding sustainable products and solutions as a response.




[Figure 2] Switchboard tool

## IMPACTS ON SUSTAINABILITY:

Our interpretation of sustainability focused on meeting the needs of the present without compromising the ability of future generations to meet their needs. The paper looks at how this can be achieved by empowering them to bring a positive change in the environment they live in. It aims to impact and reverse the cycle of resource consuming and polluting industrial economy driven by consumption from the consumer end. The strength of consumer or market is believed to be the strongest in economics and it is here, where the research proposes the solution. If Climate Switch is to be implemented it will enable many transformations in people's mind and actions, more so it will help newly enabled consumers in developed countries to leapfrog to a sustainable living. This means it aims for a long-term change, not a short term measure or adaptive initiative (as widespread in current industry and government) but a mitigated approach. This is vital as the world population is on a steep rise and only adaptive measures will not suffice to control the climate change effectively.

## CONCLUSION:

In conclusion, the paper is an attempt for to design alternate policies to the shortcomings of ongoing initiatives. The policy here: 'by the people, for the people', is nothing but a designed social movement which utilizes social norms and nudges the consumer's behaviour to sustainable consumption or climate positive behaviour. It would eventually traverse towards an ideal system of procurement, manufacturing, marketing and sale. This meta-design structure of the solution involves the user in innovative and participative engagement towards a sustainable world and can be applied to other socio-economic issues. This is implied, given the fact that humans are central to most issues. Different institutions across the world all comprise of human beings and they all can be aligned towards the desired change if the behaviour of people driving them can transformed. Thus, the framework which is built around design for behaviour change will ensure the positive change for a sustainable future of the planet and all its ecosystem.

[11] Metadesign thinking as an emergent culture by Elisia Giacardi https://www.mitpressjournals.org/doi/abs/10.1162/0024094054762098?journalCode=l