

---

# Research and Understanding the Problem

DEP302 : Systems Design Project

**Padma | Report 02**

---

This report summarizes the work that we have done and the progress that we have made regarding our Systems Design Project over the past two weeks (22/03/2021 - 04/04/2021). The main focus was to research and understand our topic better and map out the main variables involved in our system.

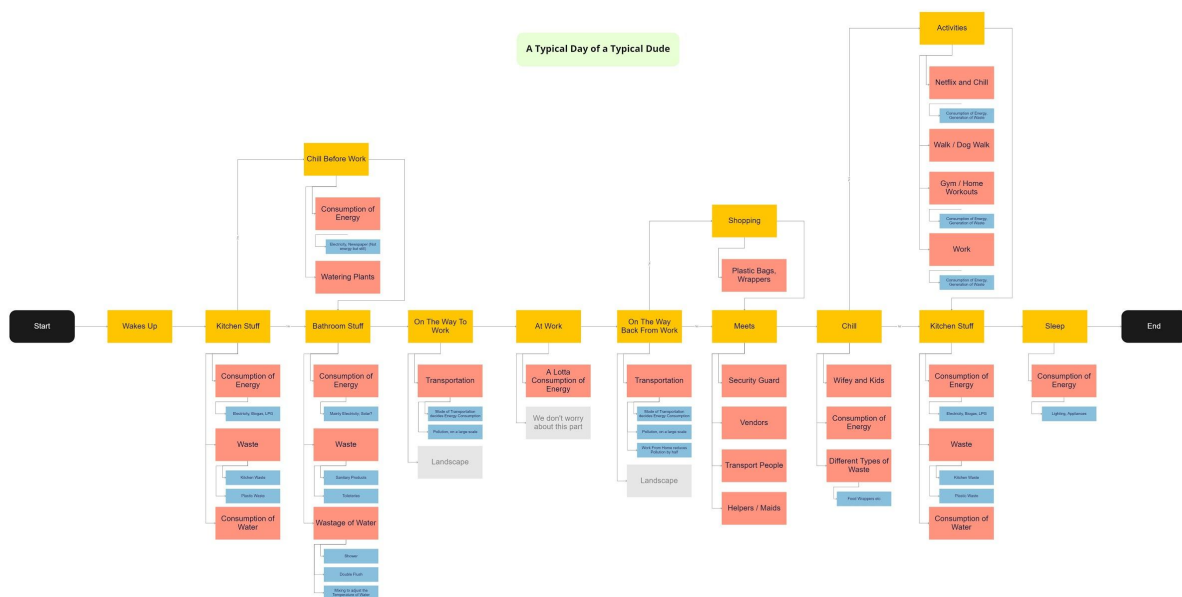
## 2.6 Feedback received after Week One Presentation.

- (fluctuating between) micro-macro interactions
- (intangible and regulatory rules for sustainability)
- Research on creating sub-systems and built-in environment
- Look at practices theory - Elizabeth Shove and Davide Nicolini
- Eg Segregation of wet and dry waste
- Practices at the level of community
- Set of proper mappings expected by Thursday
- Map variables one on top of the other - sustainability + housing societies
- Put down the main variables, eg Housing society
- Mapping of the variable on the independent
- Include ATMs (money-related), Dog walking zones in our thought process
- Could get in contact with sustainable housing facilities (stakeholders)

## 3. Mappings

### 3.1 Mapping interactions within a household during a Typical Day

We started out by mapping the activities a middle-aged individual could perform during a typical day from morning to night and the things they would be interacting with, what areas are not sustainable and can be made, where there is a consumption of resources, where there is the generation of waste, etc.



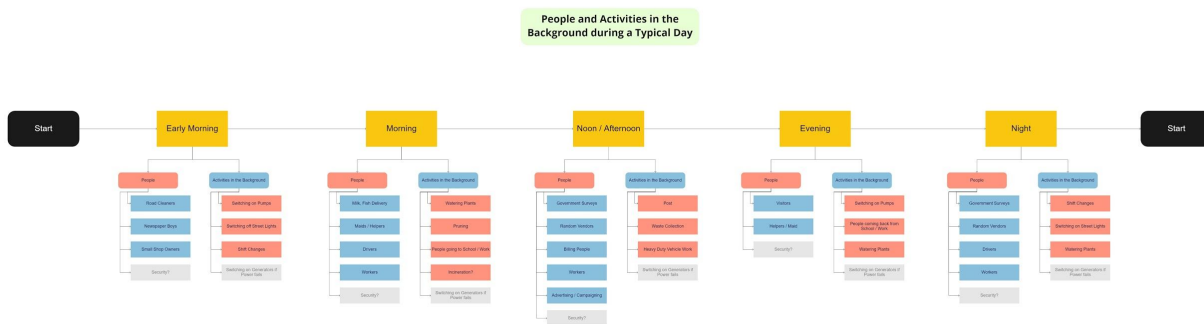
In the morning people would wake up and use the washroom and after that the kitchen, maybe do some exercise, some leisure activities before going to work. Take their pets outside. There are multiple places where resources are consumed and some waste is generated and in the whole process waste from one activity can be used as a supply in some other.

After that they would go to work. Now after the pandemic there are more people working from home, interaction between people is reduced and there are issues related to mental wellbeing. There is an increase in use of some services like getting things delivered to your home instead of going out to purchase it. So there is a shift in the way people live. When people physically go to the office they tend to purchase things on the way back home so multiple tasks are completed in the same round.

After work, they want to relax so evenings and weekends are spent in leisure activities like watching movies, spending time with their family, playing with their kids, and some people like going to the gym. People have dinner and then sleep which is equally important for wellbeing.

### 3.2 Mapping interactions with people within at a Society Level during a Typical Day

Here we mapped out an average person's interactions with the outside world at a society level and have also considered daily activities that run in the background which are essential.



In the society during the morning, activities like cleaning, collecting waste from houses, turning on the pump for getting supply of water etc. take place.

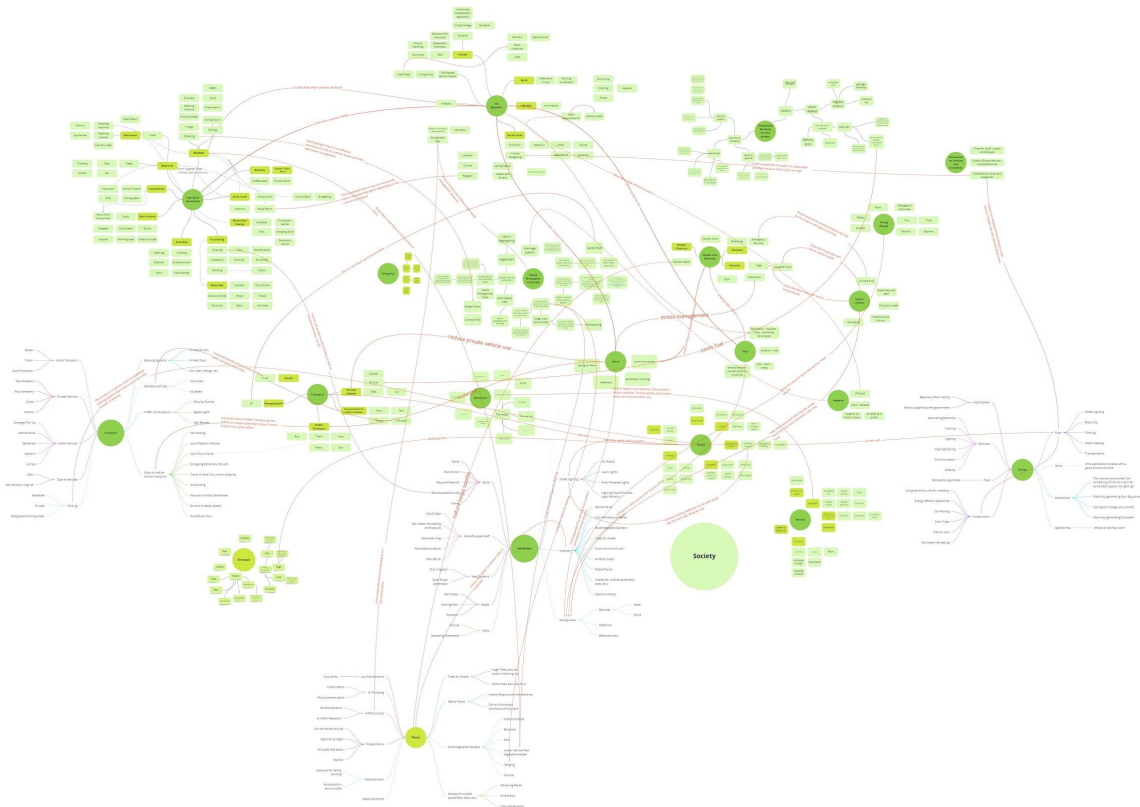
There are a number of people visiting the housing complex for work, like maids, security guards changing their shifts, milkman, newspaper man, and some other people providing different services and earning a livelihood from that.

In the evening and night there are activities like switching on street lights, there is more movement of people in the society during this time as they return back home from work. At night there are also increased security concerns.

### 3.3 Giga Map - Mapping interactions considering the Society as a whole System

Before starting out we tried understanding the importance of creating a Giga Map on a large scale, the methods used to create one, and how that would be relevant to our topic. We realized how mapping out micro-interactions would help us understand problem areas and identify areas of intervention.

We started out by listing down the immediate subsystems of a society, considering it as a unified system. We further listed down the individual elements of each subsystem and tried to establish connections between the elements. This helped us understand certain variables, the factors deciding how they change with time and changing trends, and why the country is not moving forward, at a society level, in terms of sustainability.



#### 3.3.1 Inferences from the Giga Map

- People don't follow proper waste management practices like segregation or burn waste because it is convenient, and that's what they've been following for ages.
- Work from homemade the home space of work and not just relaxation. Plants can help in maintaining mental health apart from being good for the environment - people go to

green spaces to relax and relieve stress and anxiety. Vegetable gardening can also be considered.

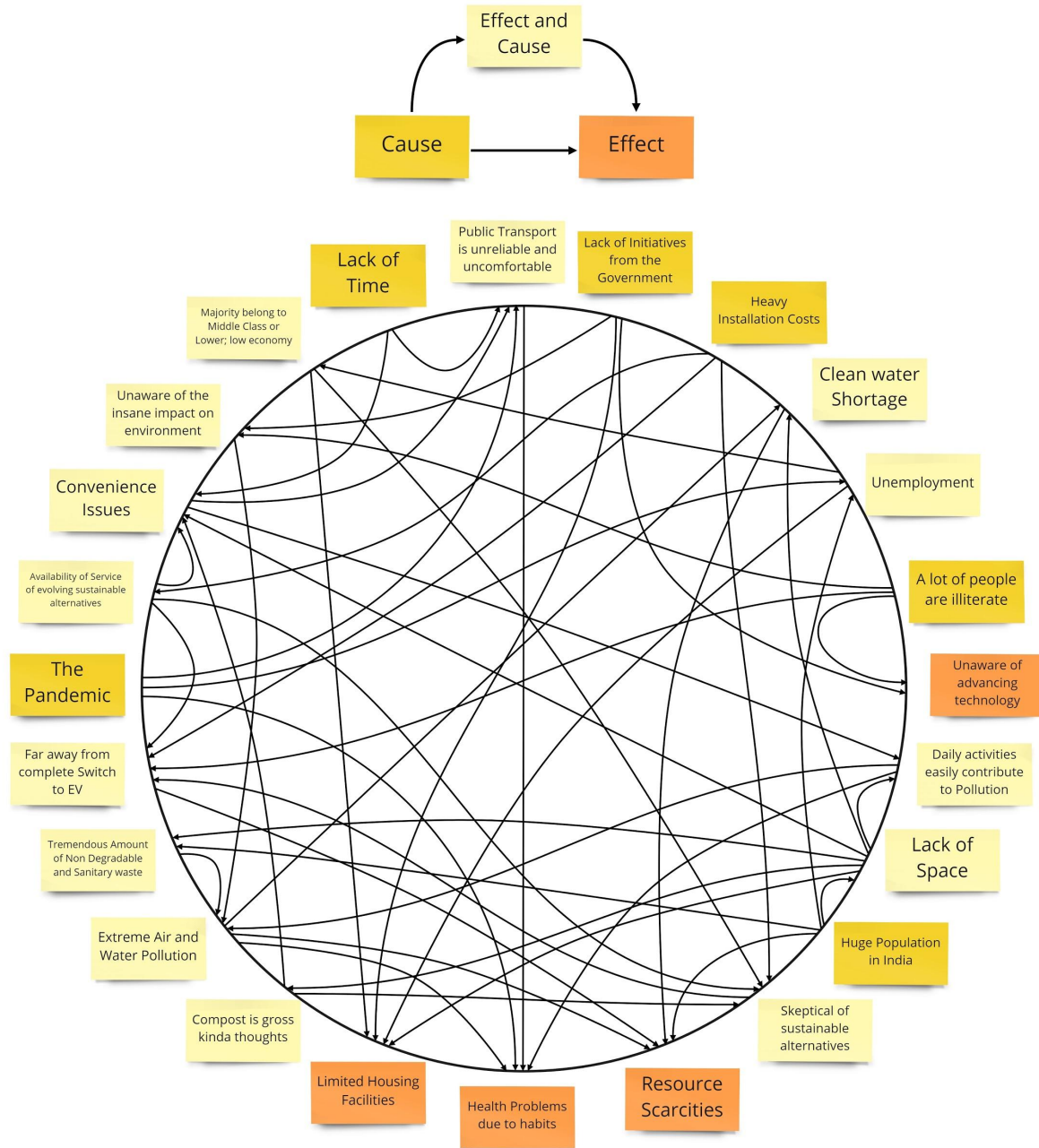
- Lack of Space is an important issue faced in today's societies. Terrace spaces are used for multiple purposes. Similarly, garden areas can be put to multiple uses. Making spaces have multiple purposes can be helpful.
- Systems like solar energy or biogas plants require space and can cause hindrance in the existing way of living and using space. Is there a possibility of adding modularity to it, and make them fit better in existing ways of using space or have an added value to it?
- It is generally difficult to implement sustainable options in an existing space and it is easier if it is planned from the beginning. Can there be an intervention to solve this?
- Some places face water scarcity during summers. And hence have no option but to depend on the private supply of water which is not sustainable economically and also environmentally and also can be hazardous to health. At times, the problems aren't fixed because some people in positions of power may have larger ulterior motives. Can we reduce this dependency and help societies have more agency?
- Sustainable solutions are not accessible enough for them to become a common thing. People need to take efforts, go out of their way and someone would do this only if they really want that thing and that intrinsic motivation is not present.

### **3.4 Feedback received on Thursday**

- Identifying a connection and identifying how a connection works - what influences what - large systems difficult to handle hence think in terms of subsystems and find connections and influences between subsystems
- Causal loop diagrams
- Select a focus - one subsystem to start with (do not ignore other things) and see where it connects and expand
- Some connections are stronger - some are weaker - one way to look at subsystems
- Some strategy to focus on certain issues - solvable issues - need more solving than other issues - prioritize some of these
- Try out systems tools on smaller systems to get the experience of it and then apply them to our project
- Behavior of system over time

### 3.5 Connection Circle

We created a connection circle on why Sustainable Solutions are not becoming popular in India. For this, we listed out the factors that could be the reason for our statement and tried understanding what could be the cause and the effect.



In some cases, the effect of a particular cause was the cause of another effect. So from the circle, we separately mapped out the root causes and the final outcomes. These individual root causes were again interrelated in terms of cause and effect, one leading to the other, so we further mapped that out.



### 3.5.1 Inferences from the Connection Circle

- Most of the people are **not literate** enough to realize the hazardous impact of the exhaustion of resources and pollution.
- **Lack of initiatives from the government** to raise awareness regarding the exploitation of nonrenewable resources and the conservation of existing ones lead to tremendous pollution.
- **The Pandemic** has deemed public transport unsafe and people are still skeptical. It has also led to unemployment on a large scale which has, in turn, put the quality of housing at stake.
- **The huge population of India** leads to the production of a tremendous amount of waste every day. This is not properly managed and hence leads to activities like burning plastic and dumping waste in rivers etc., and hence pollution.
- **Unemployment** has put the quality of housing in the country at stake. People unable to afford sustainable solutions.
- Even if someone wants to install a sustainable alternative, most of them come at **heavy installation costs** at the sacrifice of convenience even though it benefits them in the long run. No one wants to pay for extra effort.
- Since Sustainable alternatives are not blooming in the country, **Service facilities** are scarce which in turn makes people reconsider the choice of the sustainable alternative leaving the whole switch in a chicken and egg situation.
- **Lack of space** is a serious concern in the country mainly due to the humongous population and low economy of the people. It is hard to install alternatives that take up space. This, in turn, makes people question the choice of switching to a sustainable alternative.
- People, in general, have no time to spare for anything that has a **faster alternative**. This applies to everyday environment-friendly solutions like carpooling, composting, etc.
- Everyday activities that will contribute to saving the planet that people are unwilling to perform due to the **lack of convenience and time**.

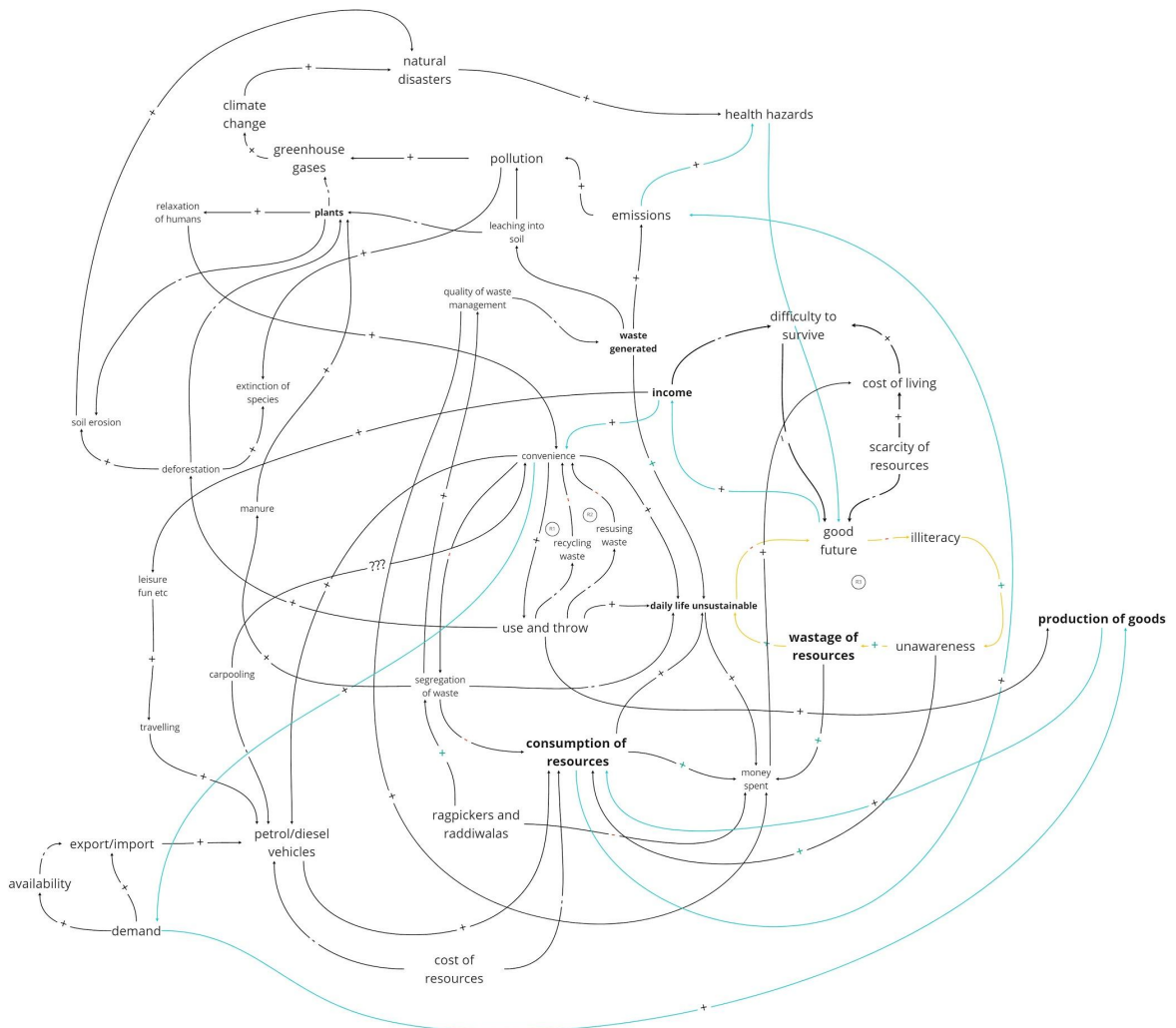




### 3.6.2 The factors that make our existing daily life unsustainable

We created a causal loop diagram to understand why our daily life is unsustainable and what affects what.

Causal Loop Diagram on why daily life is unsustainable



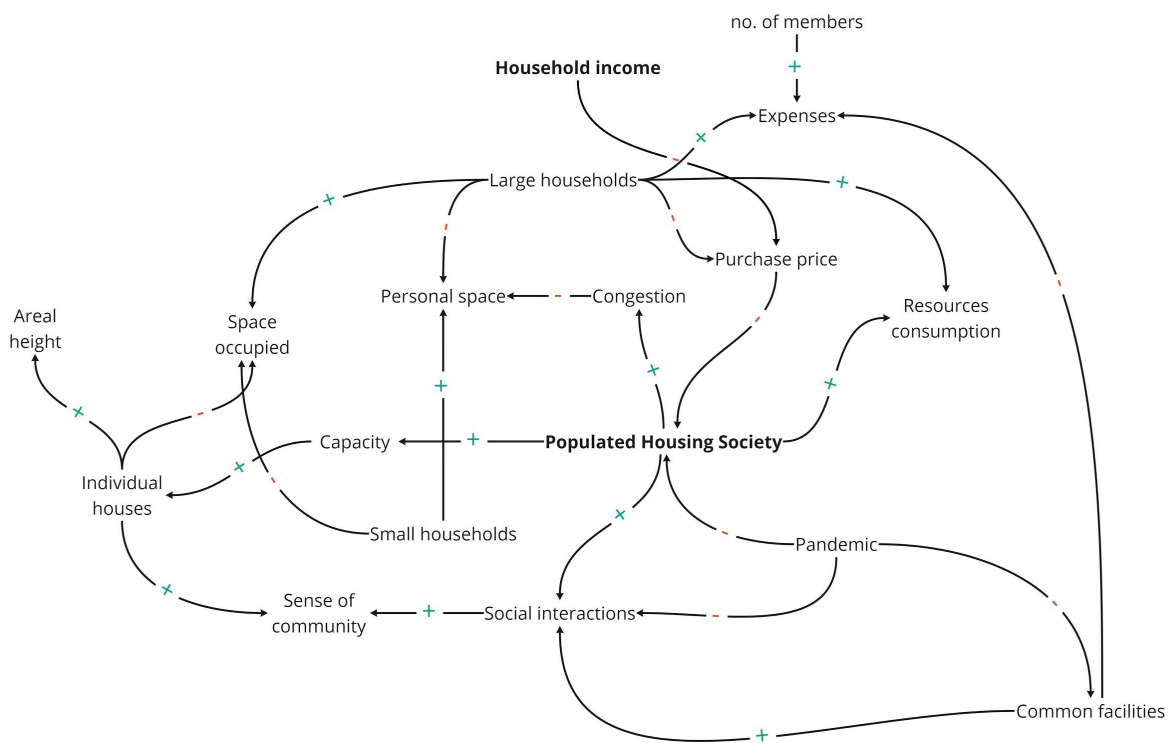
#### 3.6.2.1 Inferences

There are a number of things that lead to the consumption of resources and at times this leads to pollution, health hazards which in turn affects the quality of future life. If people's income increases, they have more purchasing power and so demand for goods increases which

decreases their availability and increases export which increases the number of vehicles used for transport and so hence the fuel consumed also increases. Practices like segregation of waste can be encouraged if they are incentivized and would help in better management of waste and decreased costs and reducing soil, air, and water pollution.

### 3.6.3 Reasons (and downsides) for going for populated affordable housing societies.

#### Causal Loop Diagram on why populated housing society are sought after today (and their downsides)



#### 3.6.3.1 Inferences

These kinds of housing societies with high capacity come under the term affordable housing as they are ideally targeted towards households with minimal, basic income (lower middle class). Space occupied is a major factor while considering these living conditions, especially households with more members, which leads to higher expenses, resource consumption, and reduction in our personal space.

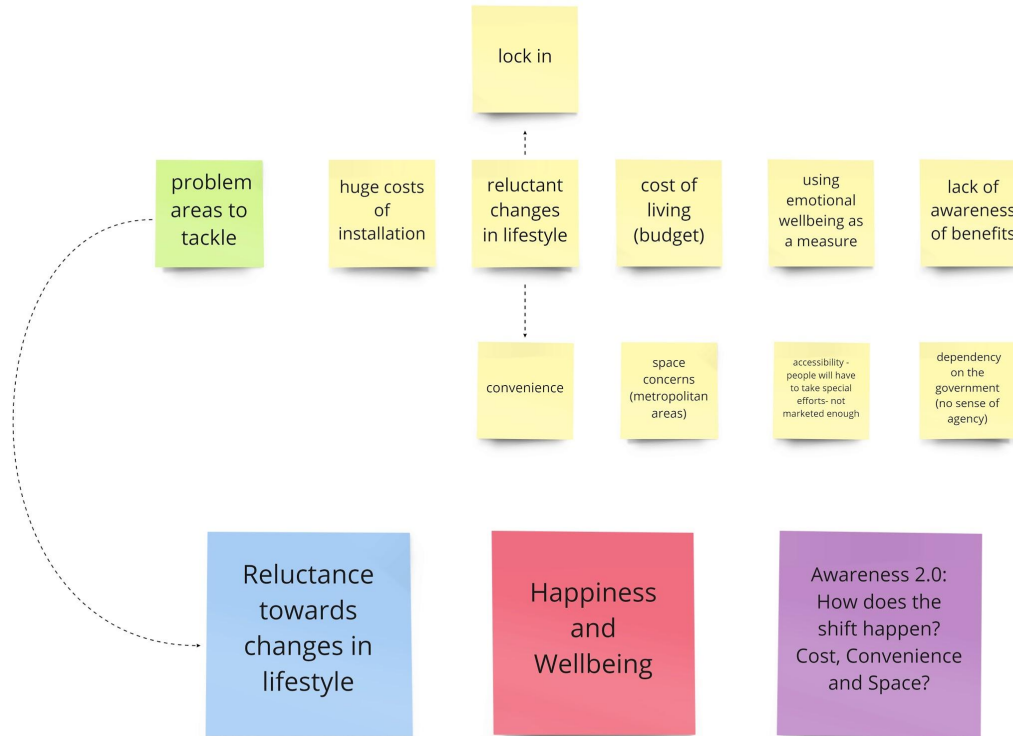
Also considering the current pandemic situation, the structure and livelihood could be affected as the common facilities are closed and hence, social interactions have decreased.



## 4. Figuring out our Area of Focus

### 4.1 Listing Down Areas with Possibility of Intervention

We narrowed down possible problem areas to focus on, from the macro-level research that we had done so far.



#### 4.1.1 Happiness and Wellbeing

A lot of times when we think of sustainability we consider environmental and economic sustainability but not social sustainability and the wellbeing of people. Happiness is what is the ultimate goal for people and happiness is different from the small fleeting emotion that we feel when we buy a product, It is much more on a deeper level. Happiness and wellbeing can actually be used as a driver for bringing about change.

Due to the pandemic life has changed a lot and working from home has become like a normal thing. Earlier the home space was solely meant for relaxation but now people work here and people need to get into the mindset of working and after that, they should be able to switch off from work and relax. There are multiple stress and anxiety-related issues created because of this and there is a possibility of some intervention in the future home systems to address these things.



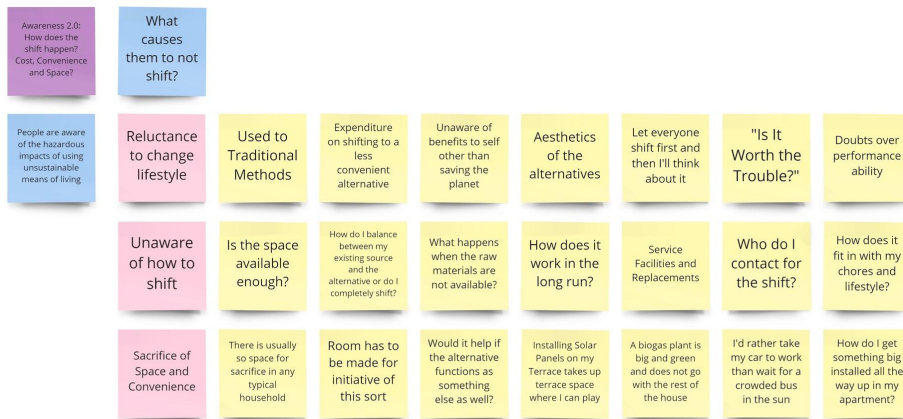
While considering a more psychological perspective of why we resist change, the term "I'm in a rut"- mindless behavior comes up often, and hence the need for understanding habitual behaviour and how it could be influenced. We then looked into certain reasons, in a more sustainability context, as to why change is yet to come out.

Then we also considered current measures and studied papers on how people have tried to enforce change, and certain terminologies as well like Value type universalism and habit discontinuity hypothesis from some papers and even considered areas like marketing having an impact in this process.

### 4.1.3 Spread the right kind of Awareness

#### Factors hindering the Shift

Common Customer Reaction when it comes to switching to a new alternative



#### Common Concerns

Common to all Alternatives



#### Main Concerns in case of each alternative

What do they not know but don't try to know? What are they not told about?



#### How can this be tackled?

What are the Companies and Government doing wrong?



#### Ou, Customizability of Alternatives?

Have to figure out more in this case



People are aware of the hazardous impact of the existing unsustainable methods in practice and are aware of the ideal sustainable solutions that are available but they don't exactly know how to



shift. Here, we have listed down the possible reasons that may raise questions regarding a shift to a sustainable alternative. We further looked into the most common sustainable alternatives and listed down the tiny details that concern the user but are unaware of.

We found that a few aspects were common to all of the alternatives, namely Space, Cost breakdown for installation in a particular household, Benefits for the individual rather than the planet, Durability, Balance between the alternative and the existing methods, Maintenance, and Expenditure in the long run. We further gave a quick look at how this can be tackled.

#### **4.2 Feedback received post Week Two presentation**

- Individual vs community; small city vs big city; housing complexes vs individual housing
- Human/ Life centric (initial mapping) Don't let go
- GNH - Bhutan (limit your needs) (carbon neutral)
- Recategorize => initial map as a blueprint (along with reluctance and awareness) and happiness as ultimate principle (goal)
- Under Housing complexes Governance structure and social dimension (behavioural change theories)