

The image features a minimalist, line-art style illustration of lotus leaves. The leaves are depicted with simple, elegant outlines in a light purple or lavender color. They are arranged in two main clusters: one on the left side and one on the right side, both partially cut off by the edges of the frame. The central area is dominated by the word "padma" in a clean, lowercase, sans-serif font, rendered in the same light purple color as the leaves. The background is a solid, very light lavender shade, creating a soft and serene atmosphere.

padma

Week 3

DEP302 System Design Project

Sustainable Housing

Team Padma

Anagha Aneesh

18U130004

Drishti Das

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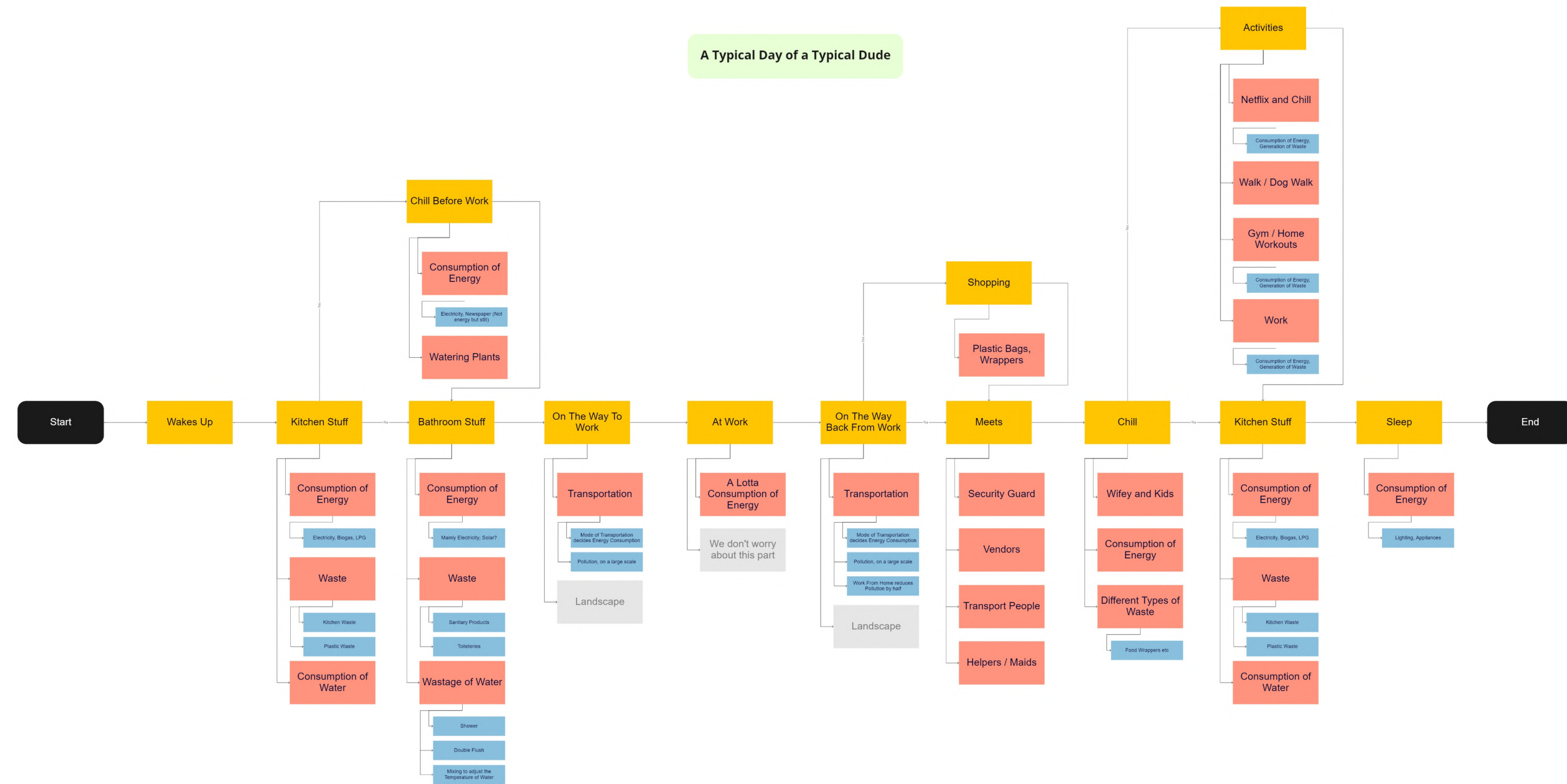
Prita Raut

18U130024



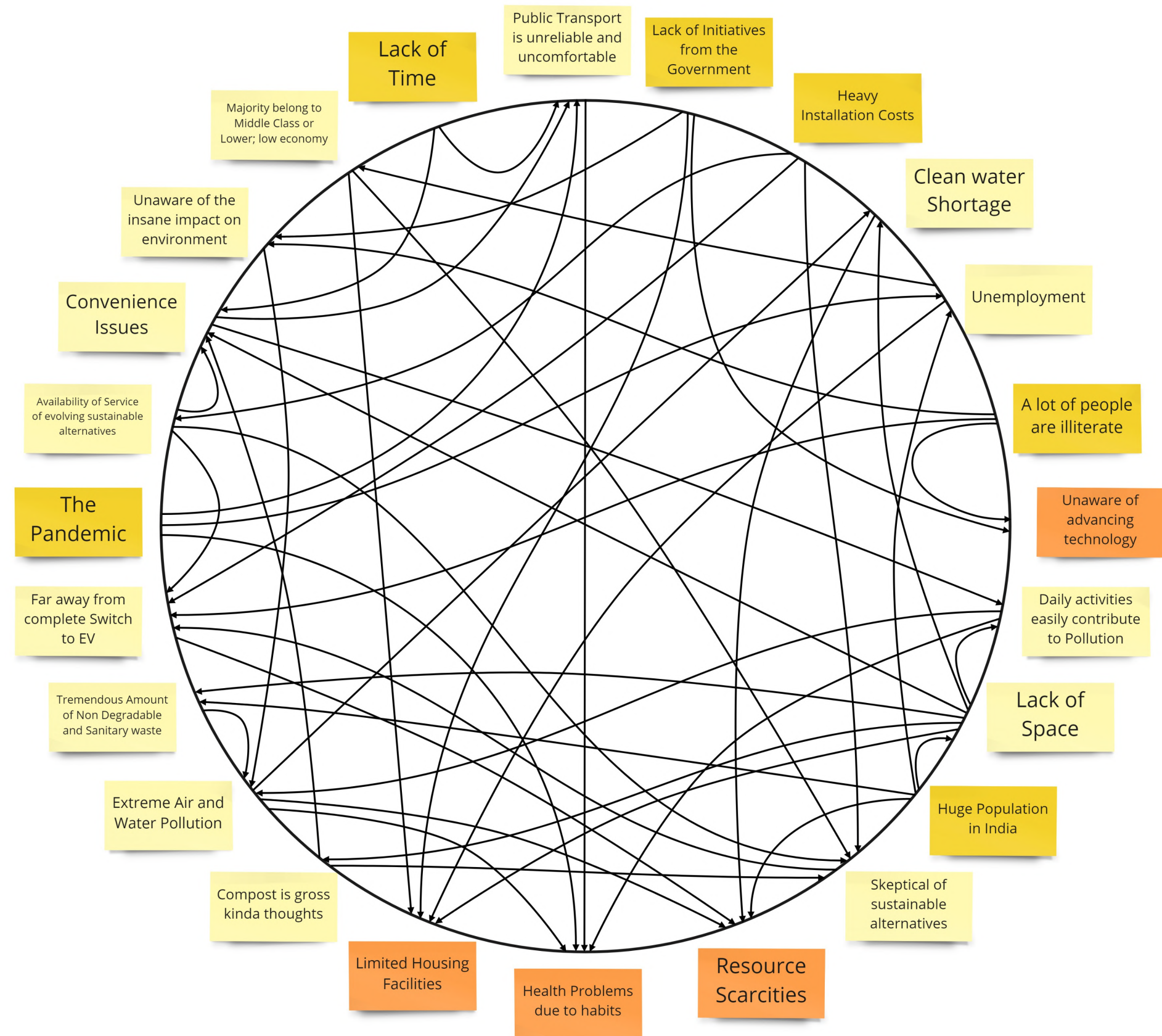
Recap Week Two

Daily life of an individual



Recap Week Two

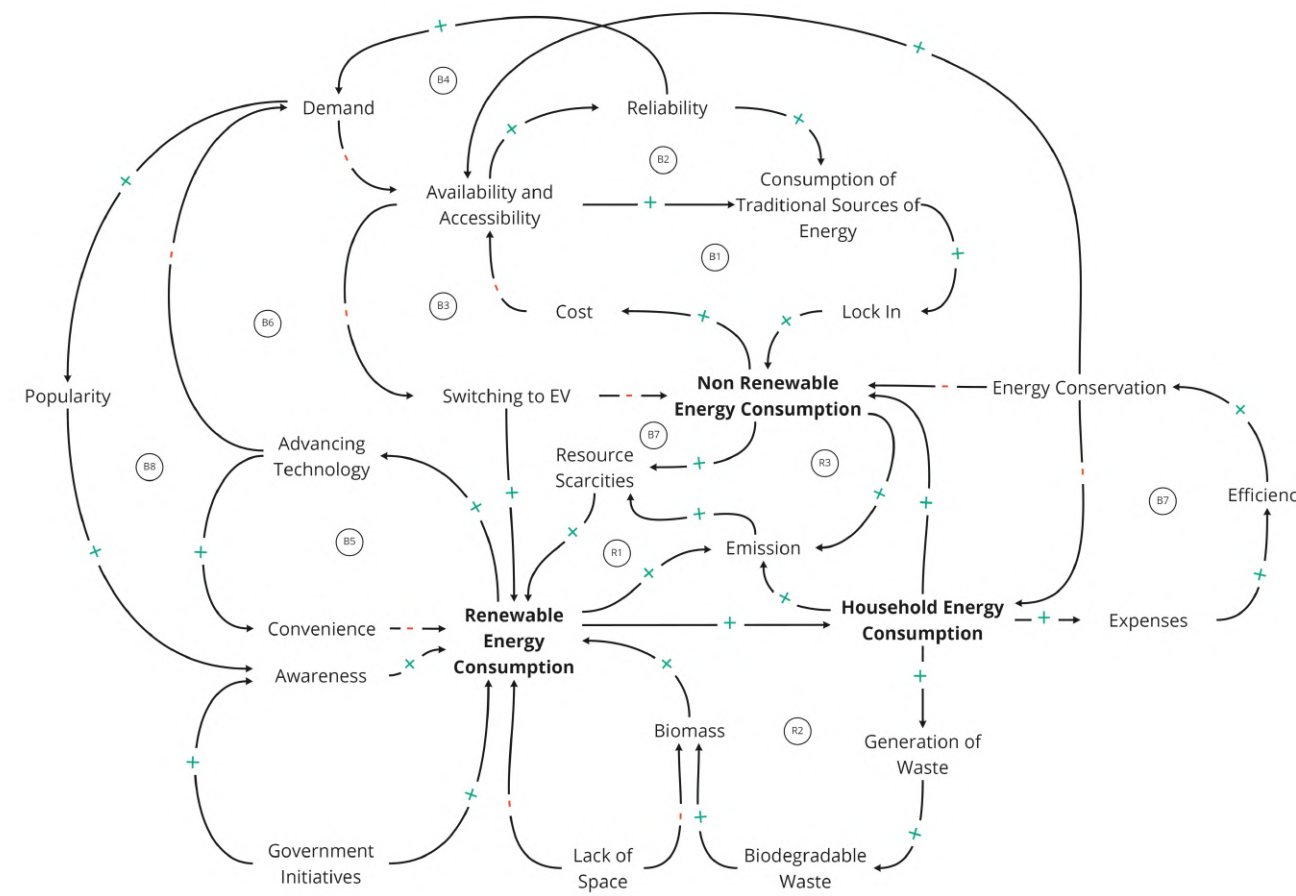
Connection Circle



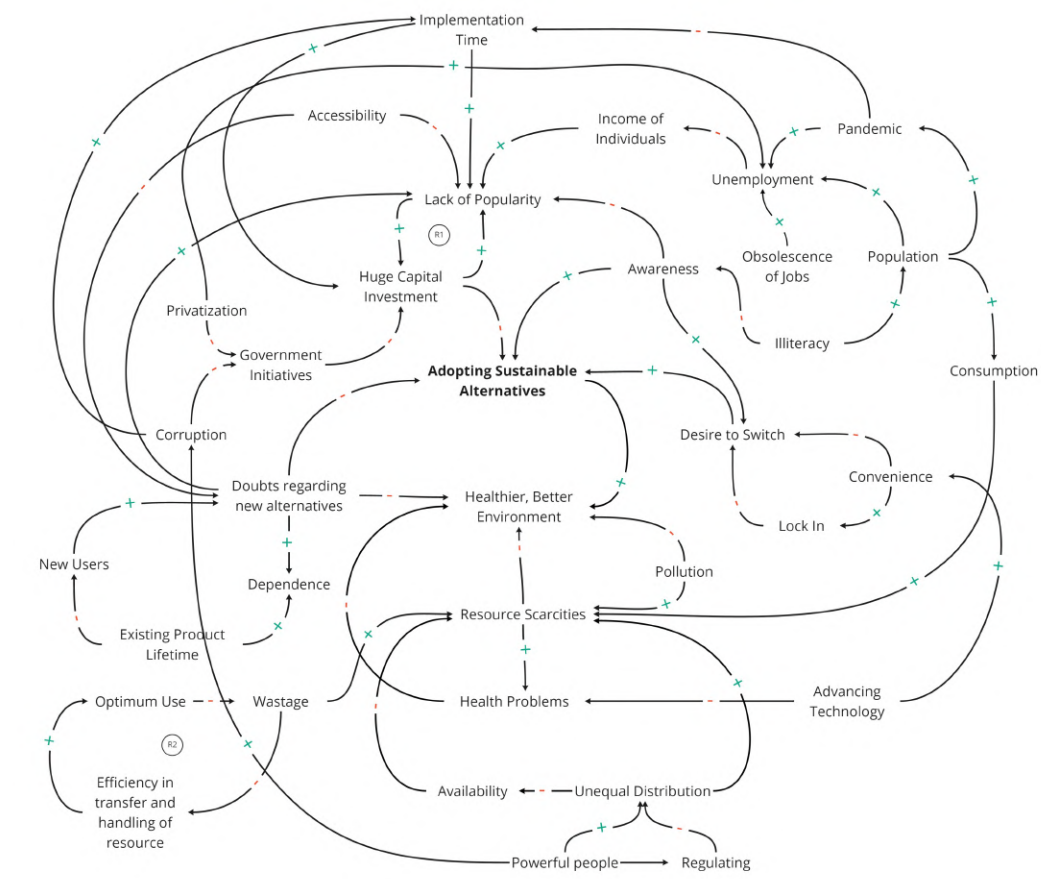
Recap Week Two

Causal Loop Diagrams

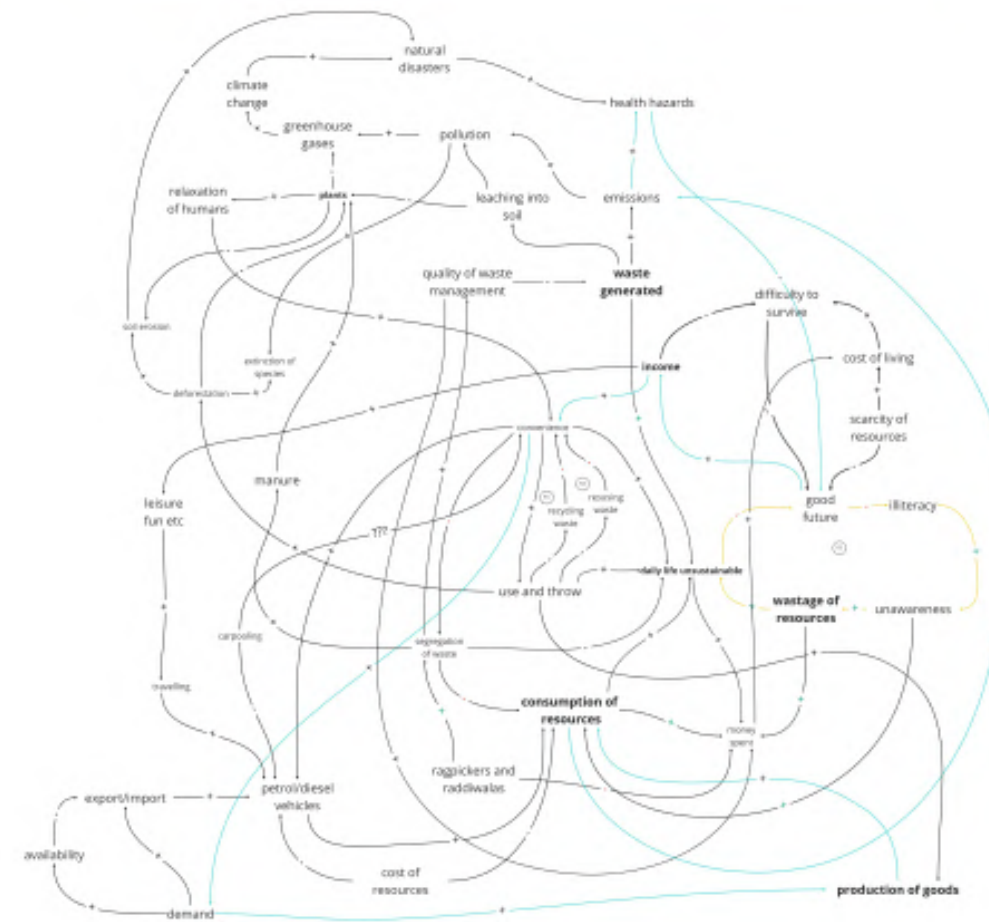
Causal Loop Diagram on Household Consumption of Energy



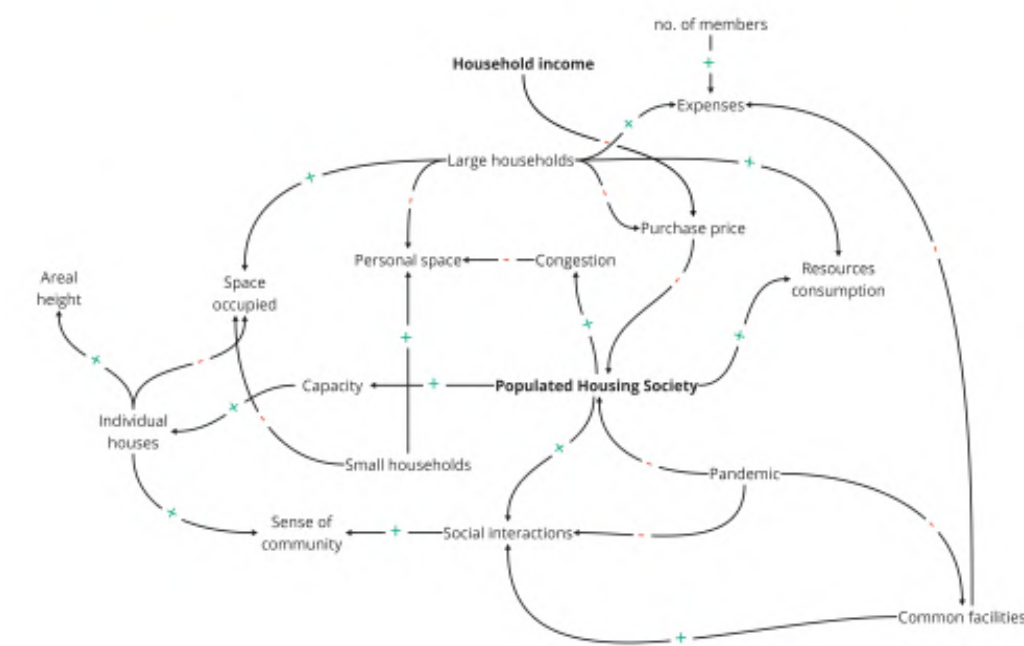
Causal Loop Diagram on why Sustainable Alternatives are not gaining popularity



Causal Loop Diagram on why daily life is unsustainable

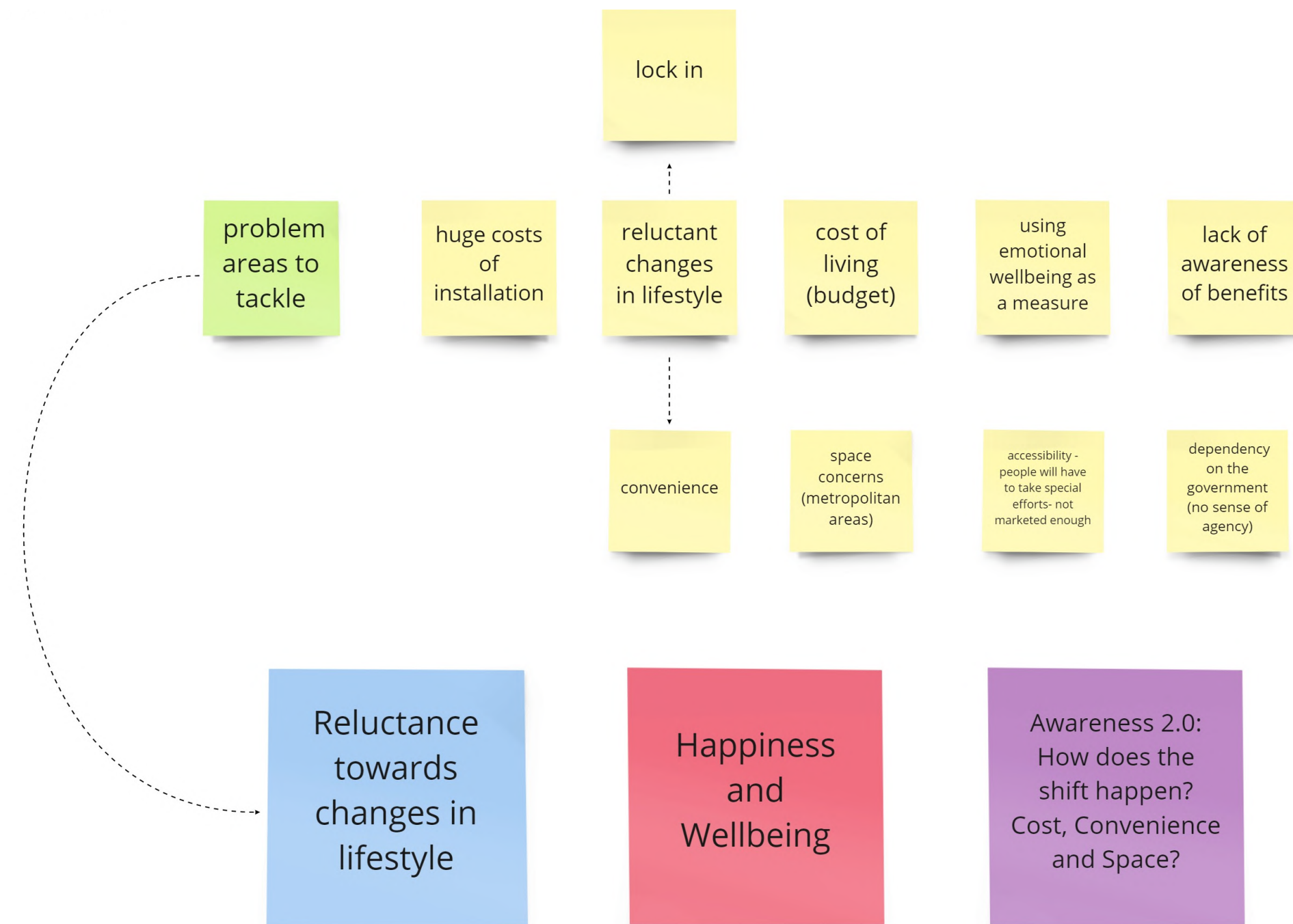


Causal Loop Diagram on why populated housing society are sought after today (and their downsides)



Recap Week Two

Finalized our Topic and did a surface level research to understand it better





Week 3 at a Glance



Aim: Focusing on Problem and its Sub-Parts

Housing Types and Research

Causal Loop Diagram of Problem Area

Do Goals and Be Goals

Brief

Possibilities of Intervention

Primary Research and Insights

Personas

Next Steps

Gross National Happiness

We looked into the GNH of Bhutan as suggested and discovered their four pillars

Four Pillars of GNH Bhutan

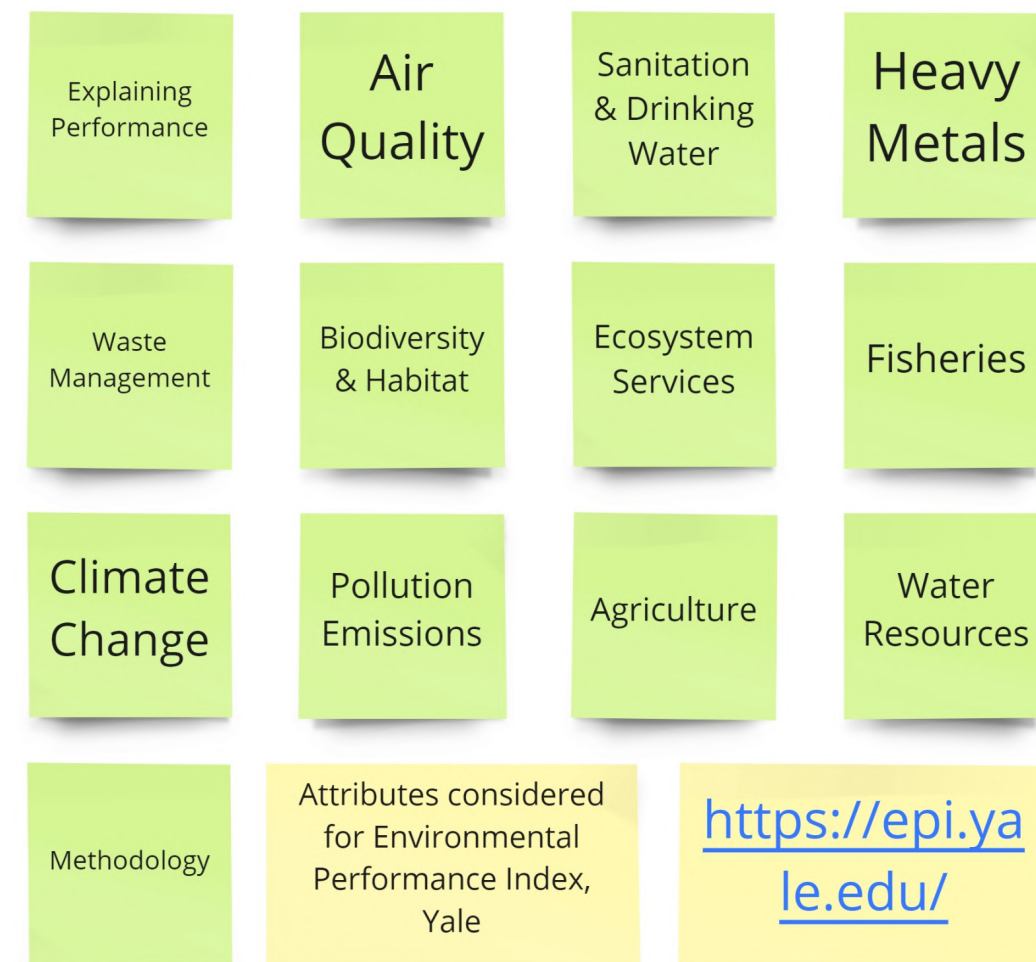


The EPI provides quantitative metrics for evaluating a country's environmental performance in different policy categories relative to clearly defined targets, and aggregates data on many indicators of sustainability into a single number – the EPI Score, which ranges from 0 to 100



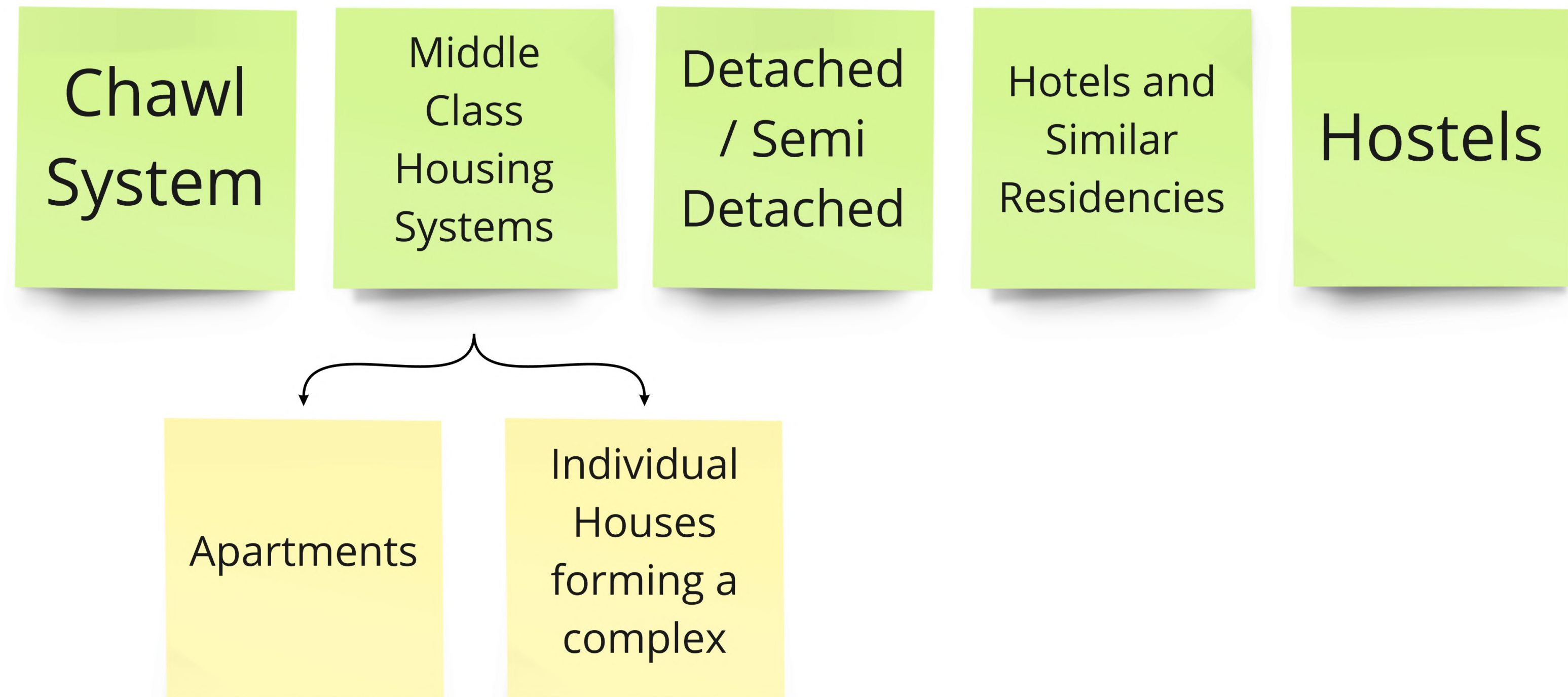
The term "Gross National Happiness" was first coined by the 4th King of Bhutan, King Jigme Singye Wangchuck, in 1972 when he declared, "Gross National Happiness is more important than Gross Domestic Product." The concept implies that sustainable development should take a holistic approach towards notions of progress and give equal importance to non-economic aspects of wellbeing

20th March is the International Day of Happiness
hueheuehuehue



Different Housing Types

Narrowing down on type of housing



Chawl System



- High density of people
- Limited use of resources
- Living in harmony with animals
- Internal courtyards are a good balance of inside and outside
- Common corridor is a very interactive space
- They have no other choice
- Sharing between families
- Close to the concept of co-living

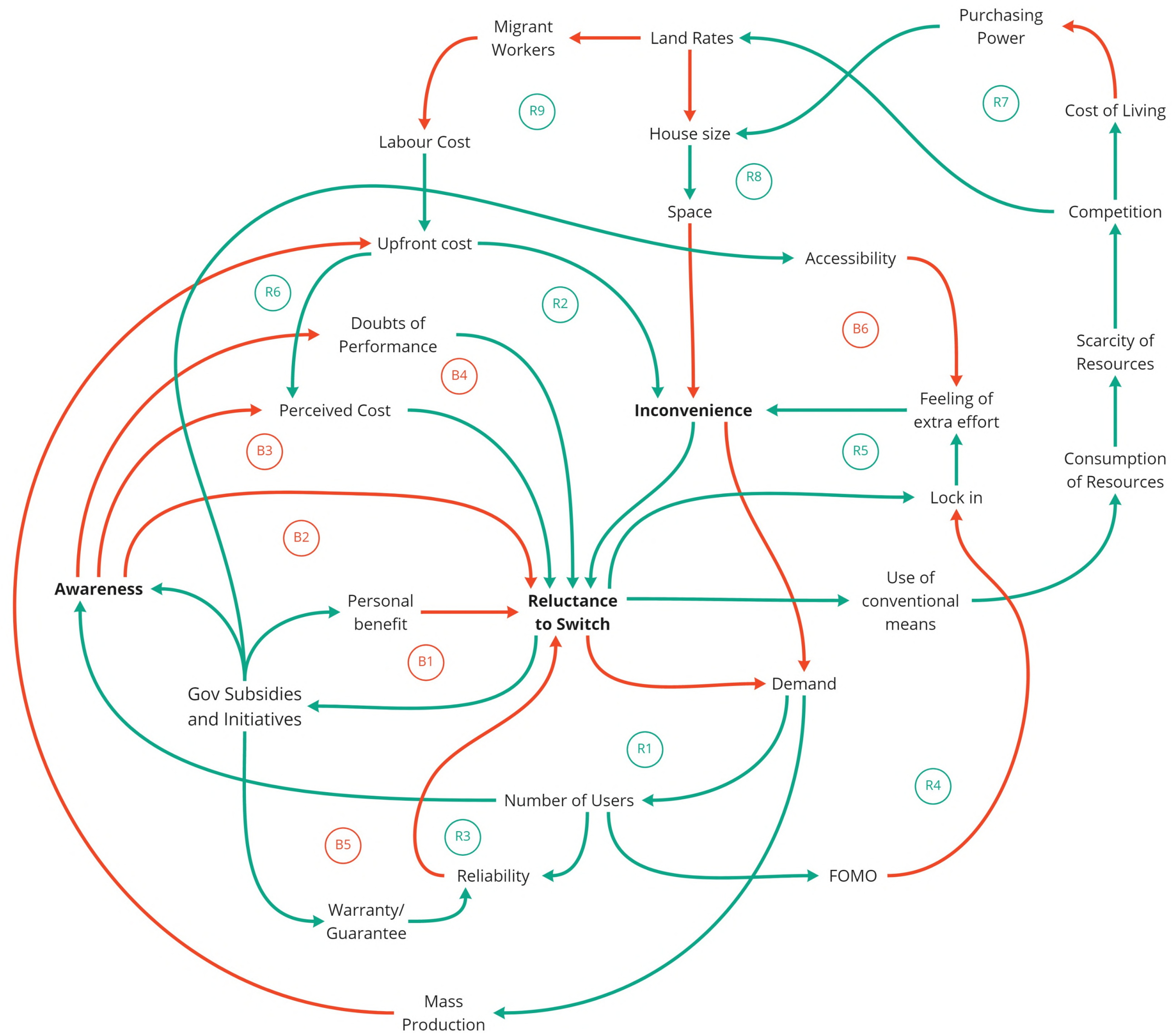
Apartment System

- Profit Maximising
- Little consideration for natural light and ventilation
- No inside-outside balance
- Maximising indoor living space
- Less shared spaces
- Financially in a better condition
- Have more choice



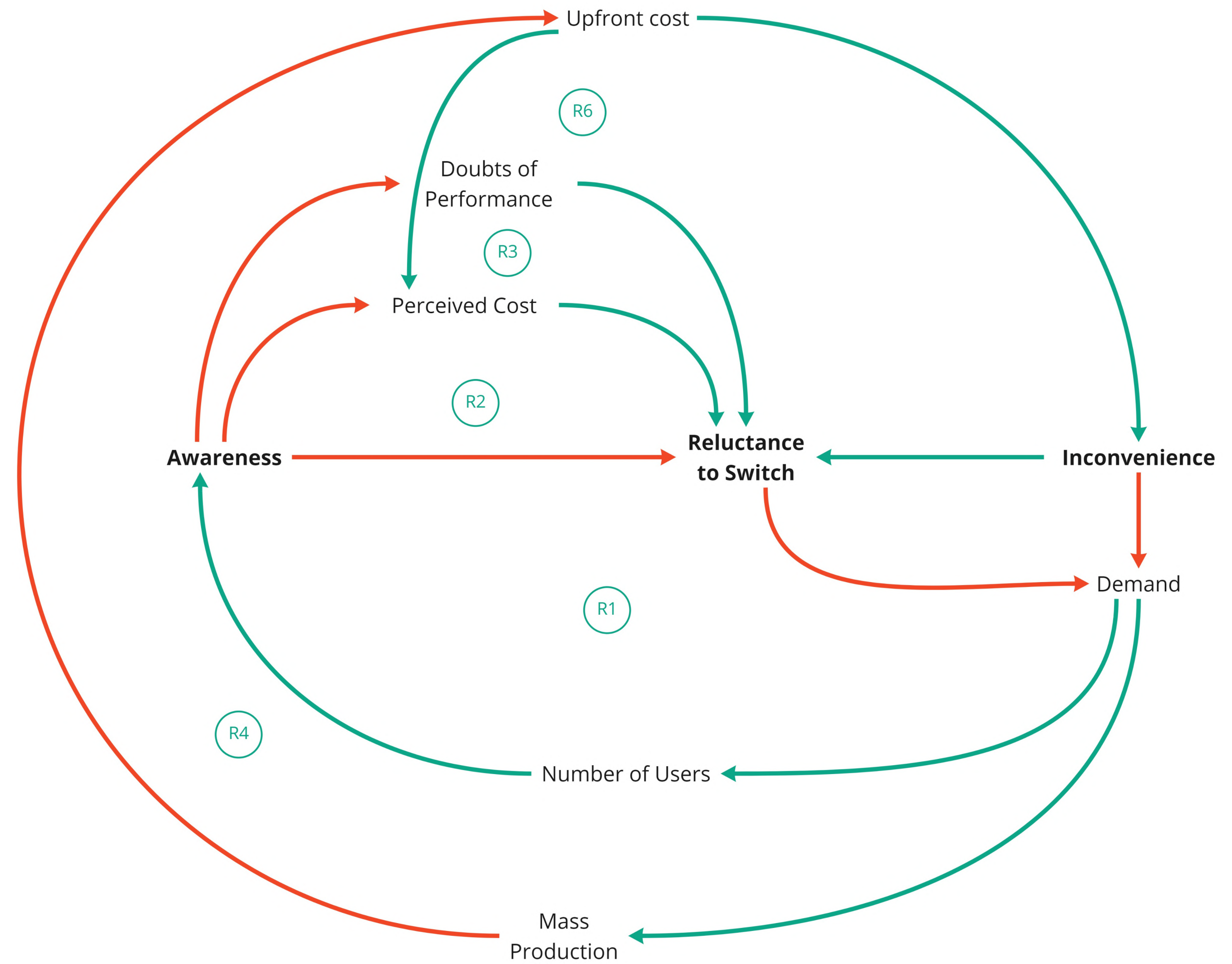
Causal Loop Diagram

Understanding the connection between Convenience, Awareness, and Reluctance to switch



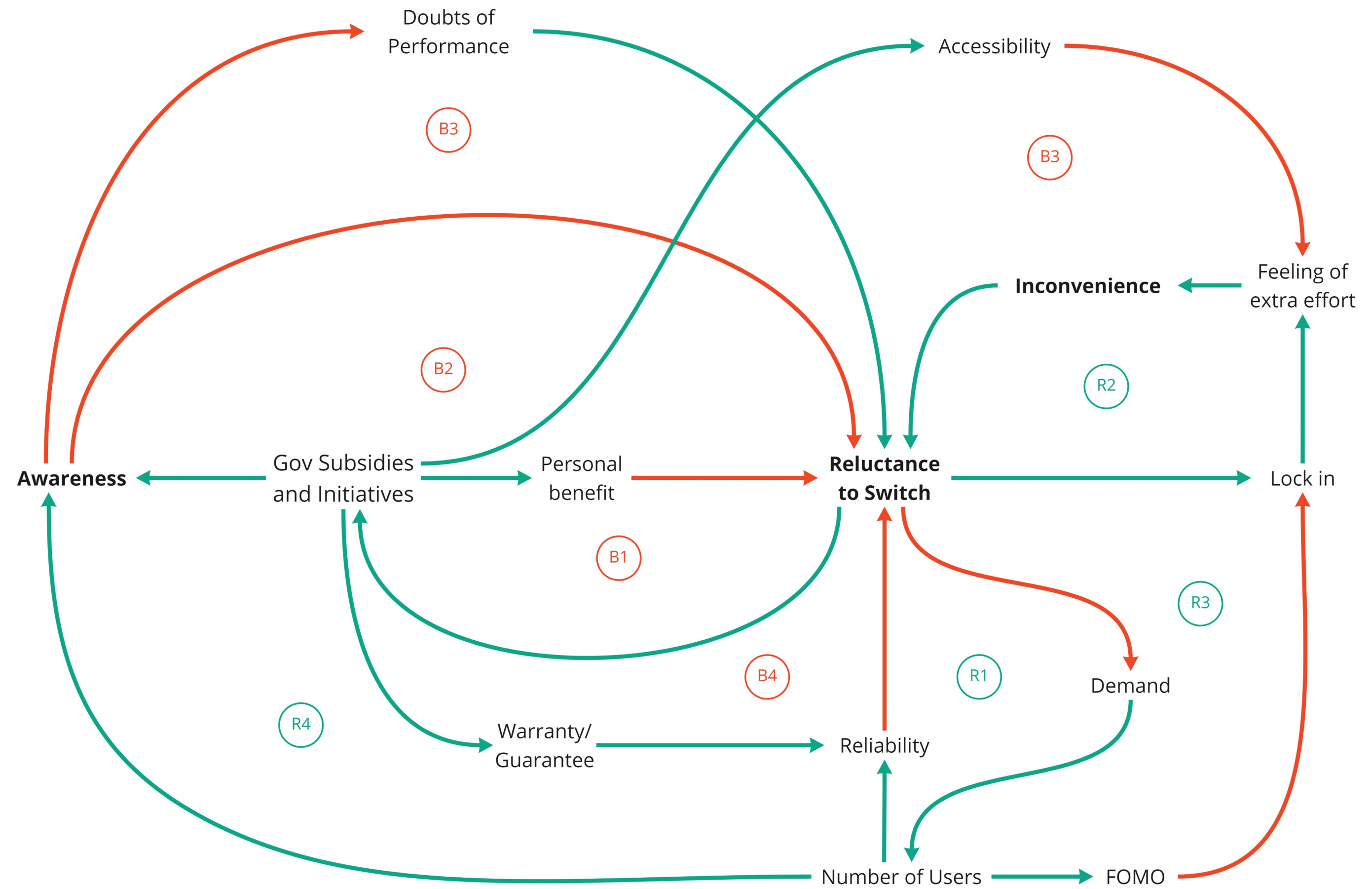
Parent Loop Diagram(2/3)

How the three major factors influence the demand, cost and the number of users involved.



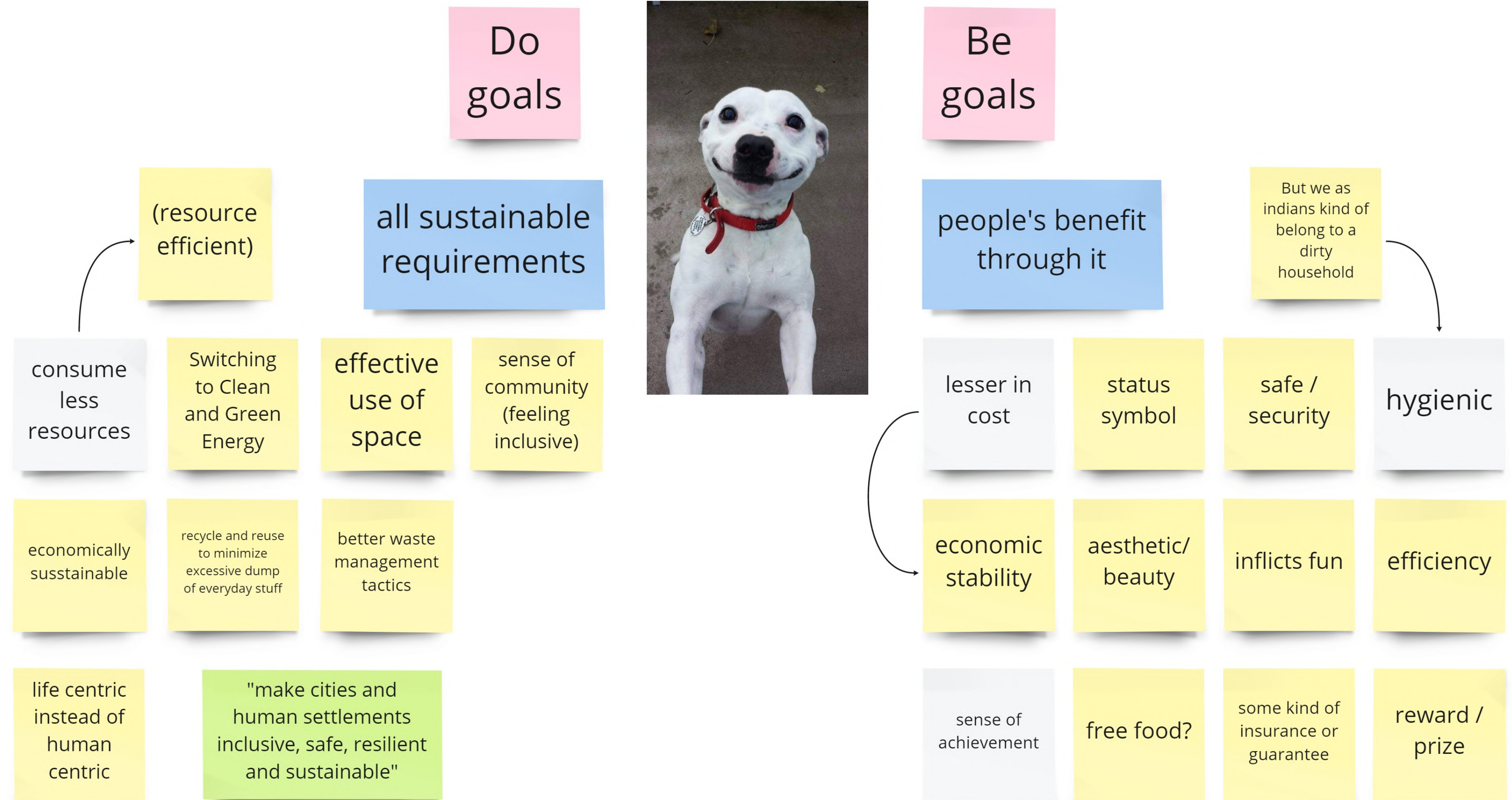
Parent Loop Diagram(3/3)

Involves effects of variables like Personal benefit, Accessibility, Lock in, Inconvenience, Reliability and Awareness.



Do-Goals & Be-Goals

Setting do-goals & be-goals based on sustainability and looking at how they relate to each other.



Do-Goals & Be-Goals

United Nations goals
into **Sustainable Cities
and Communities**
(Target for the next
10 years)

Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums

11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries

11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage

11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations

11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

11.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities

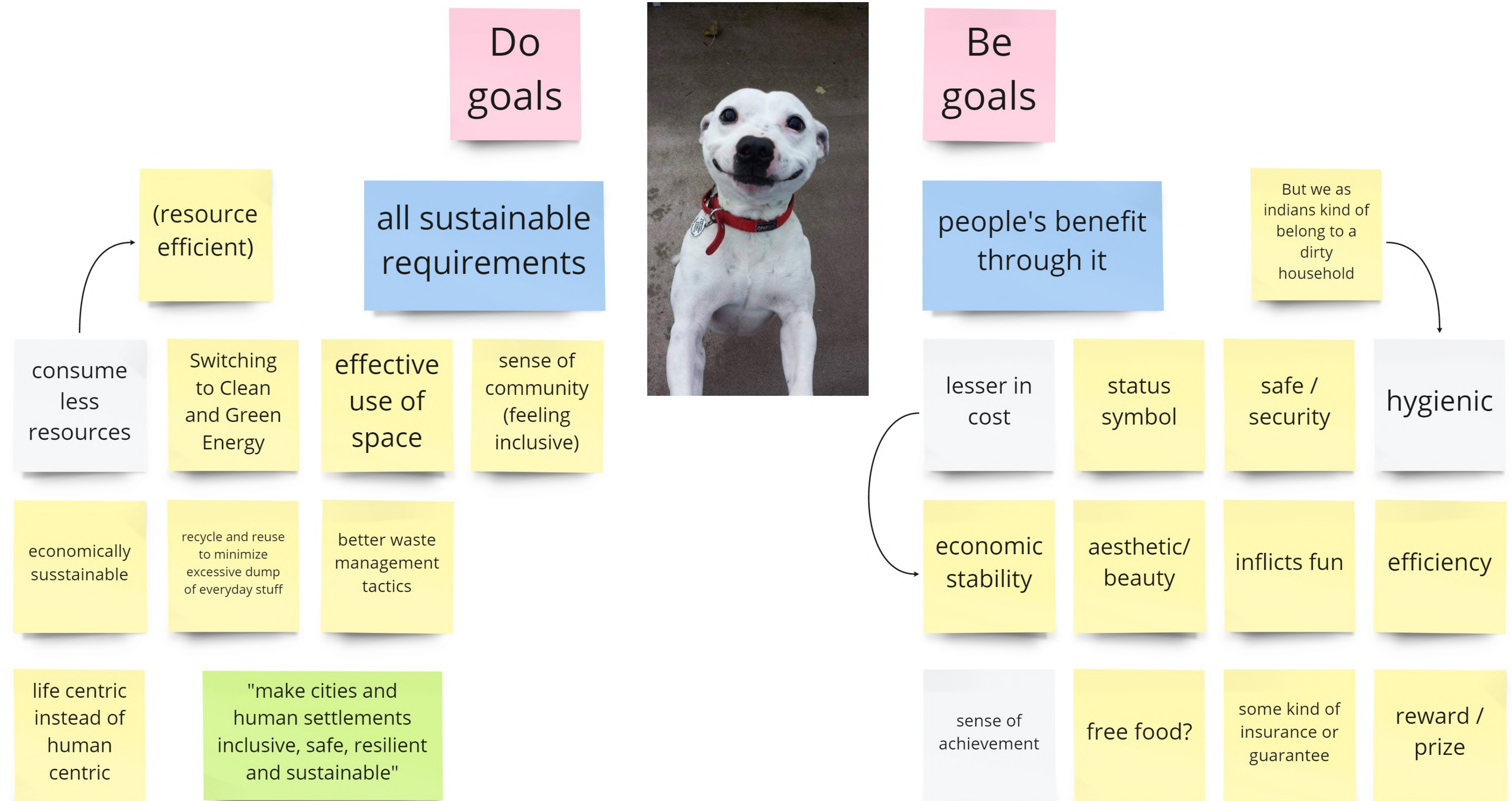
11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning

11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels

11.c Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials

Do-Goals & Be-Goals

Setting do-goals & be-goals based on sustainability and looking at how they relate to each other.





Brief

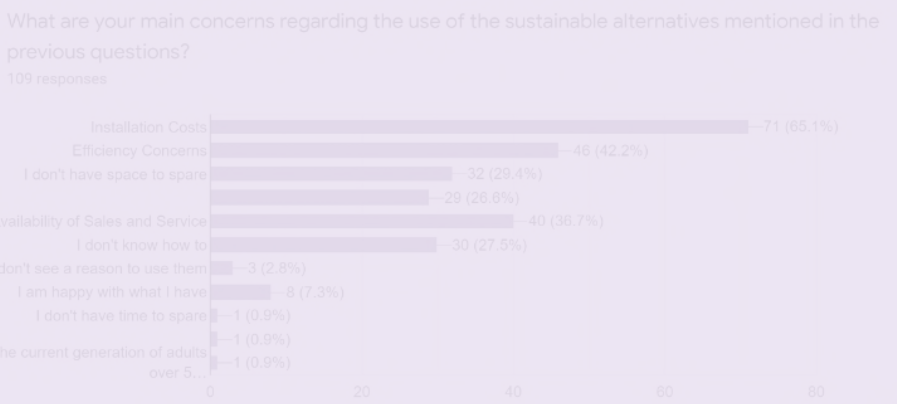
- Housing Systems in a Metropolis
- People belonging to the Middle Class in India
- Understanding the reasons for reluctance
- Making the transition smoother
- Incorporating Convenience
- Unlike the existing sustainable solutions
- Ultimate Goal being Happiness

Deriving Possibilities of Intervention



Deriving Possibilities of Intervention



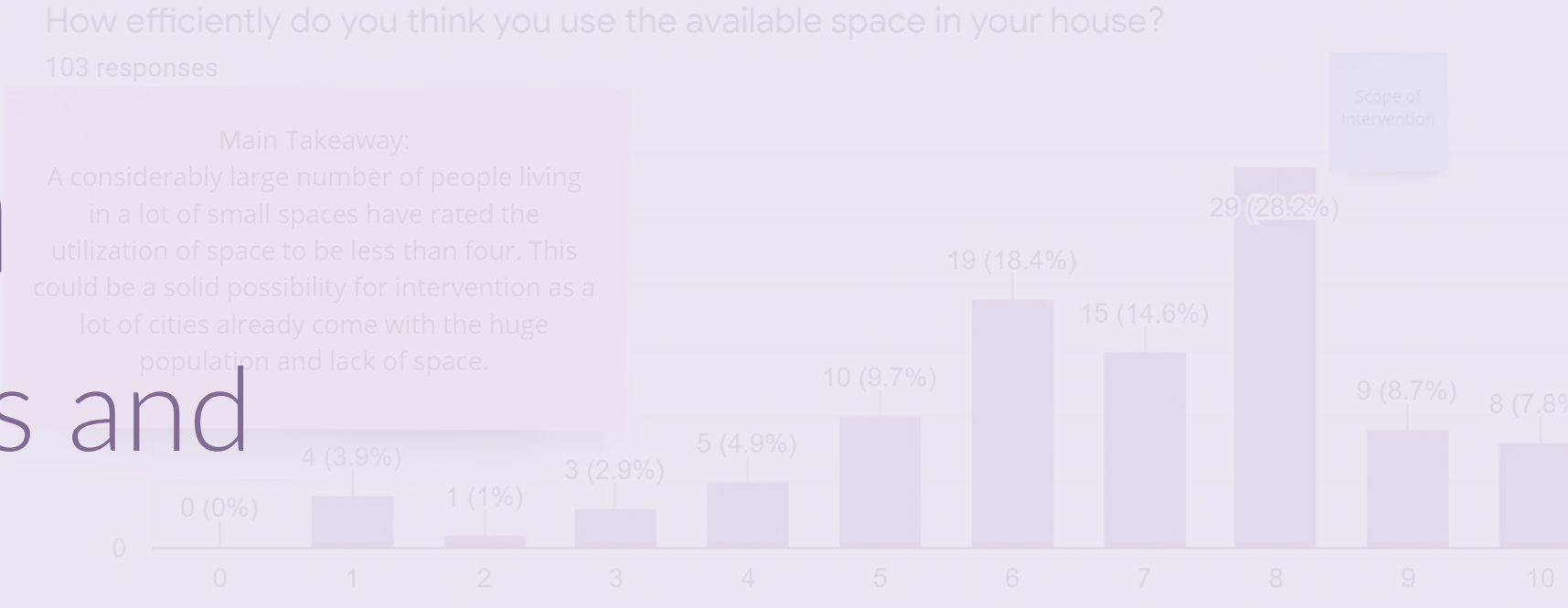
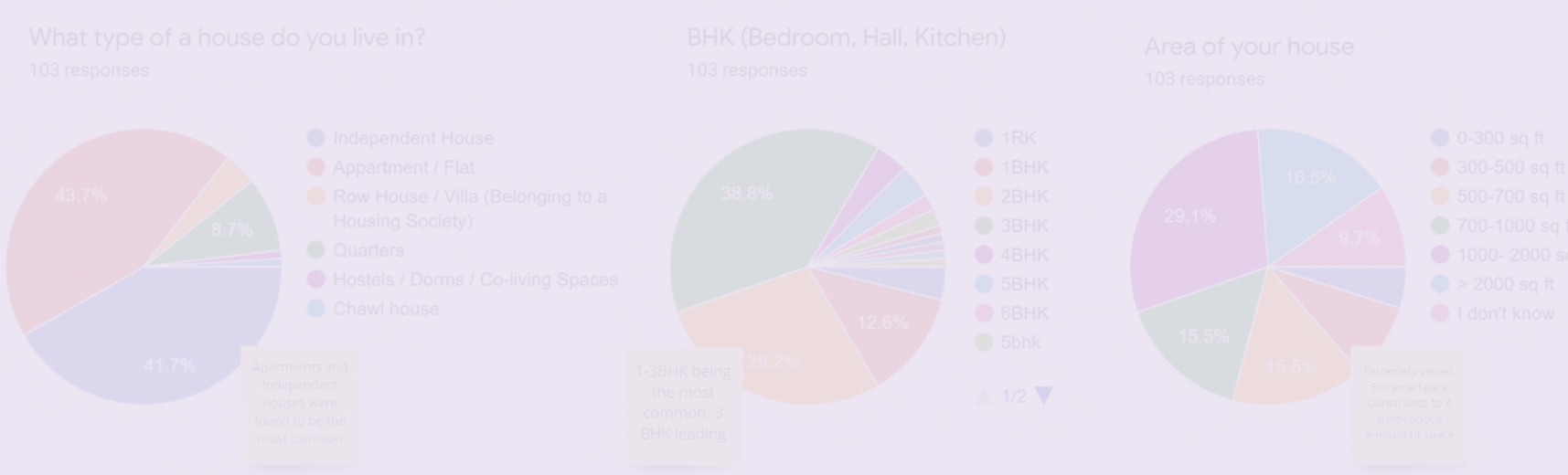


Main Takeaway:
It is clearly understood that the responders are not fully aware of what it is like to be a user of a sustainable product. They are mostly concerned about post-purchase efficiency and installation costs while, in most cases they are not exactly a big deal. For example, people are worried about installation costs when there is a possibility that in a couple of years they would have saved enough to reciprocate.

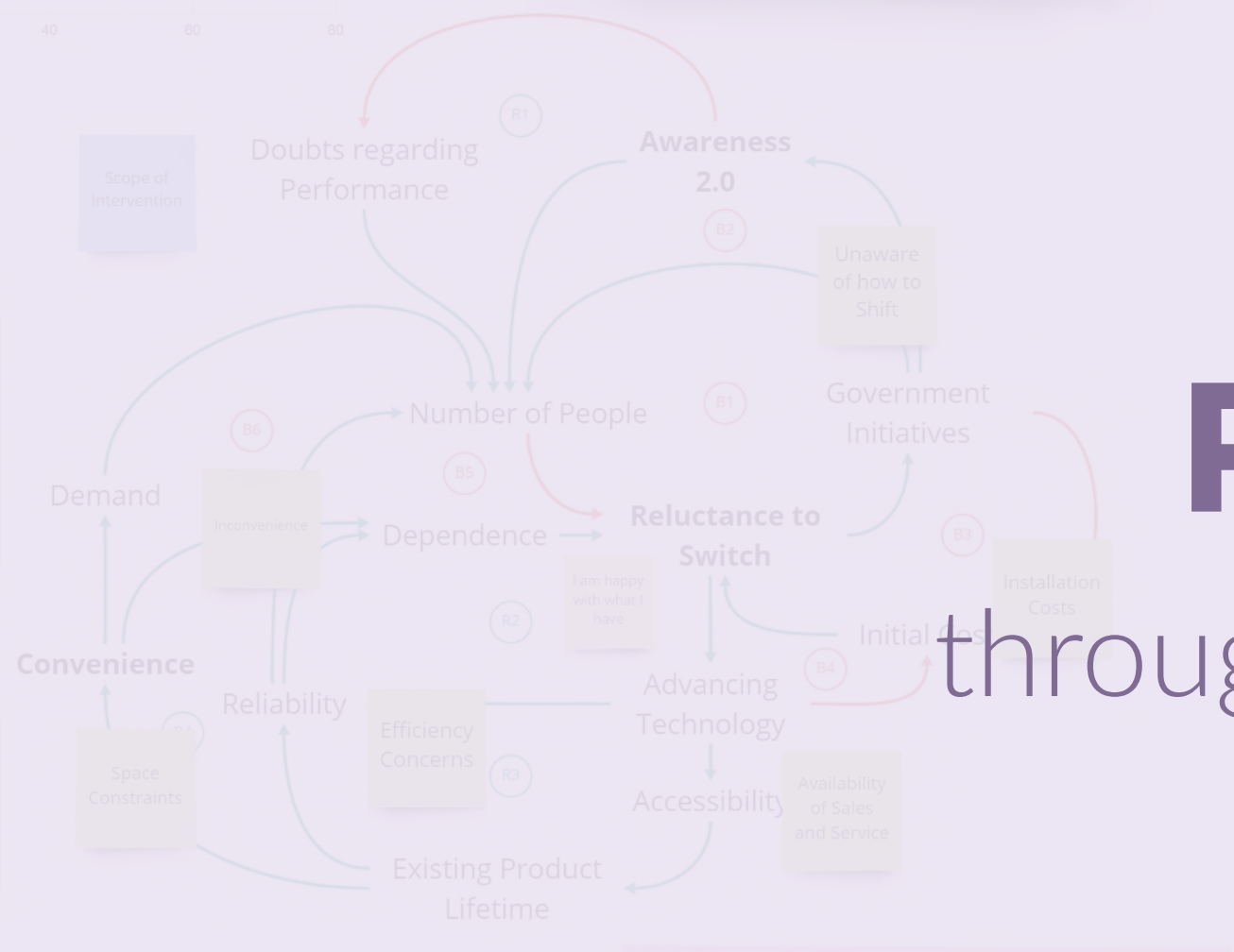
Understanding the Nature of Actions



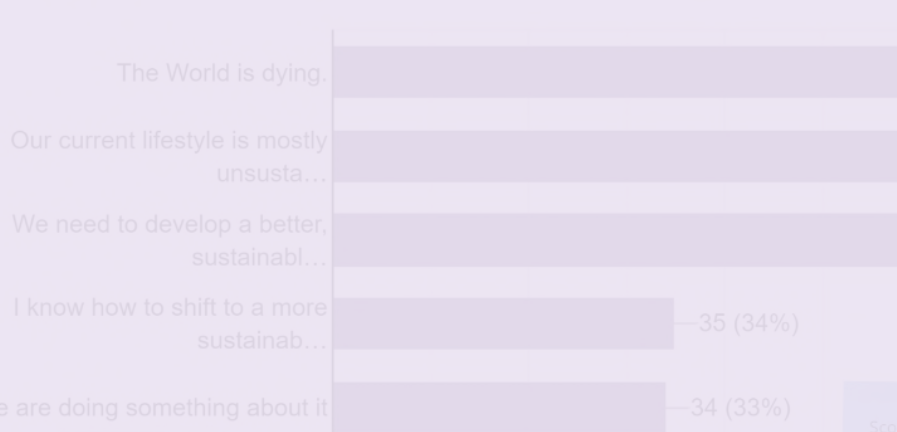
Understanding the Utilization of Space



Understanding the Role of Concerns

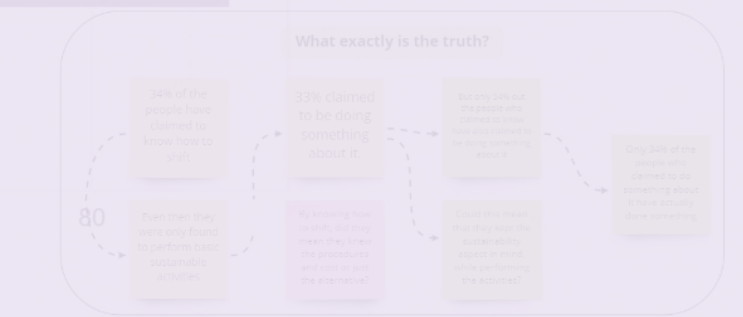


Tick the options you are aware of
103 responses

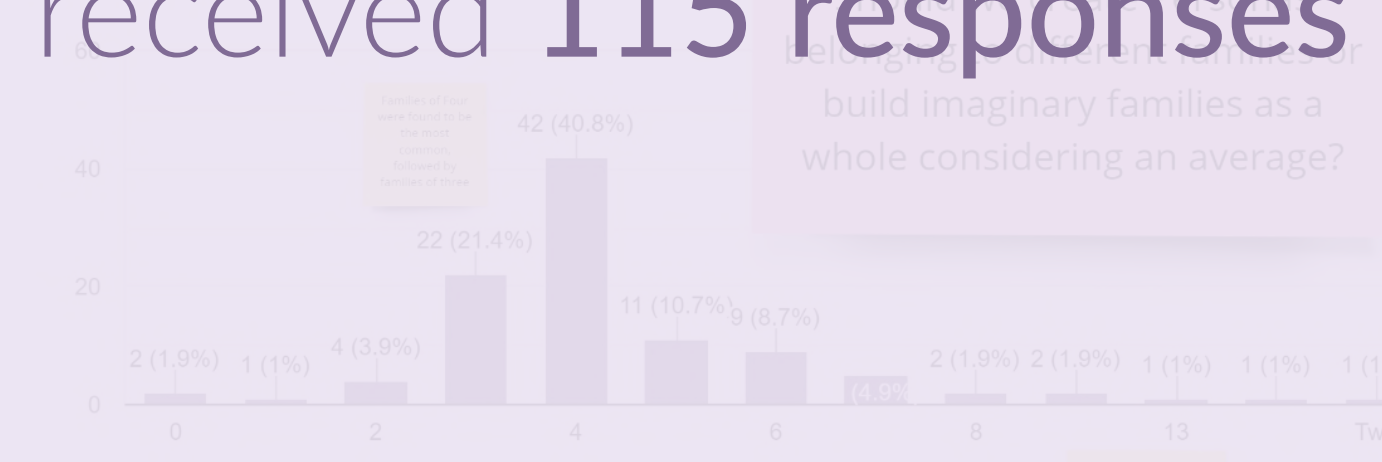


Awareness 2.0, A Necessity?

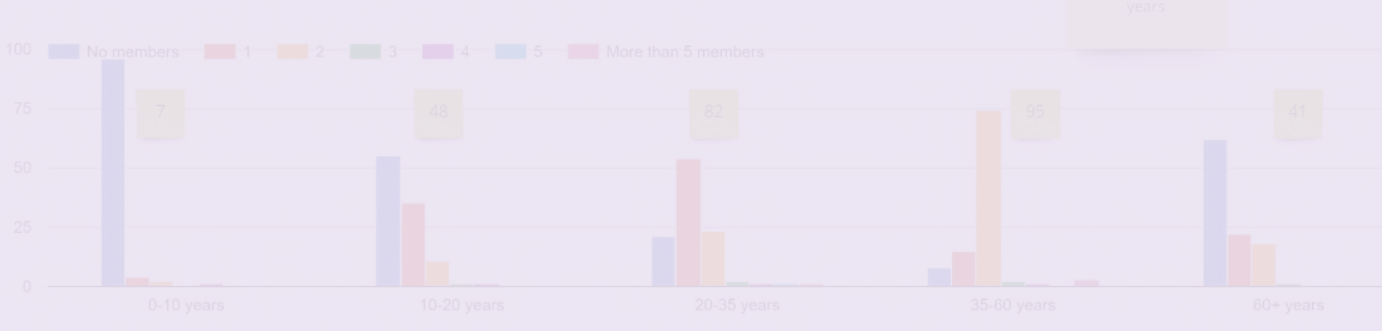
Main Takeaway:
People are aware of how our style of living affects our environment. They know how the alternatives. They also claim to know how to shift and a few even claim to be doing something about it. But the stats from the activities performed and alternatives used, prove this fact wrong.



Understanding the Nature of Actions



Choose the number of family members in the given age group.

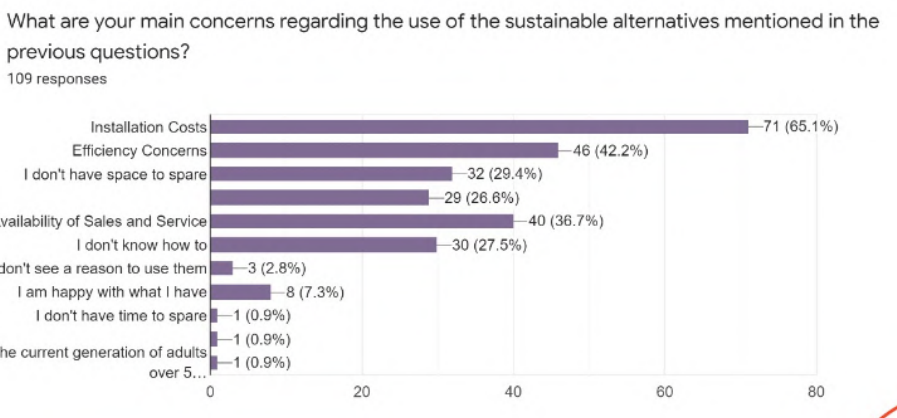


Condensing the specifications to identify the extremes

Smallest				Largest
1RK	0-300 sq ft	Apartment / Flat	Apparently Zero	2/10
1BHK	0-300 sq ft	Independent House	7 Members	1/10
2BHK	300-500 sq ft	Independent House	4 Members	1/10
3BHK	500-700 sq ft	Apartment / Flat	4 Members	1/10
1RK	300-500 sq ft	Apartment / Flat	5 Members	8/10
1BHK	700-1000 sq ft	Independent House	6 Members	10/10
2BHK	>2000 sq ft	Apartment / Flat	8 Members	9/10
3BHK	>2000 sq ft	Apartment / Flat	10 Members	9/10

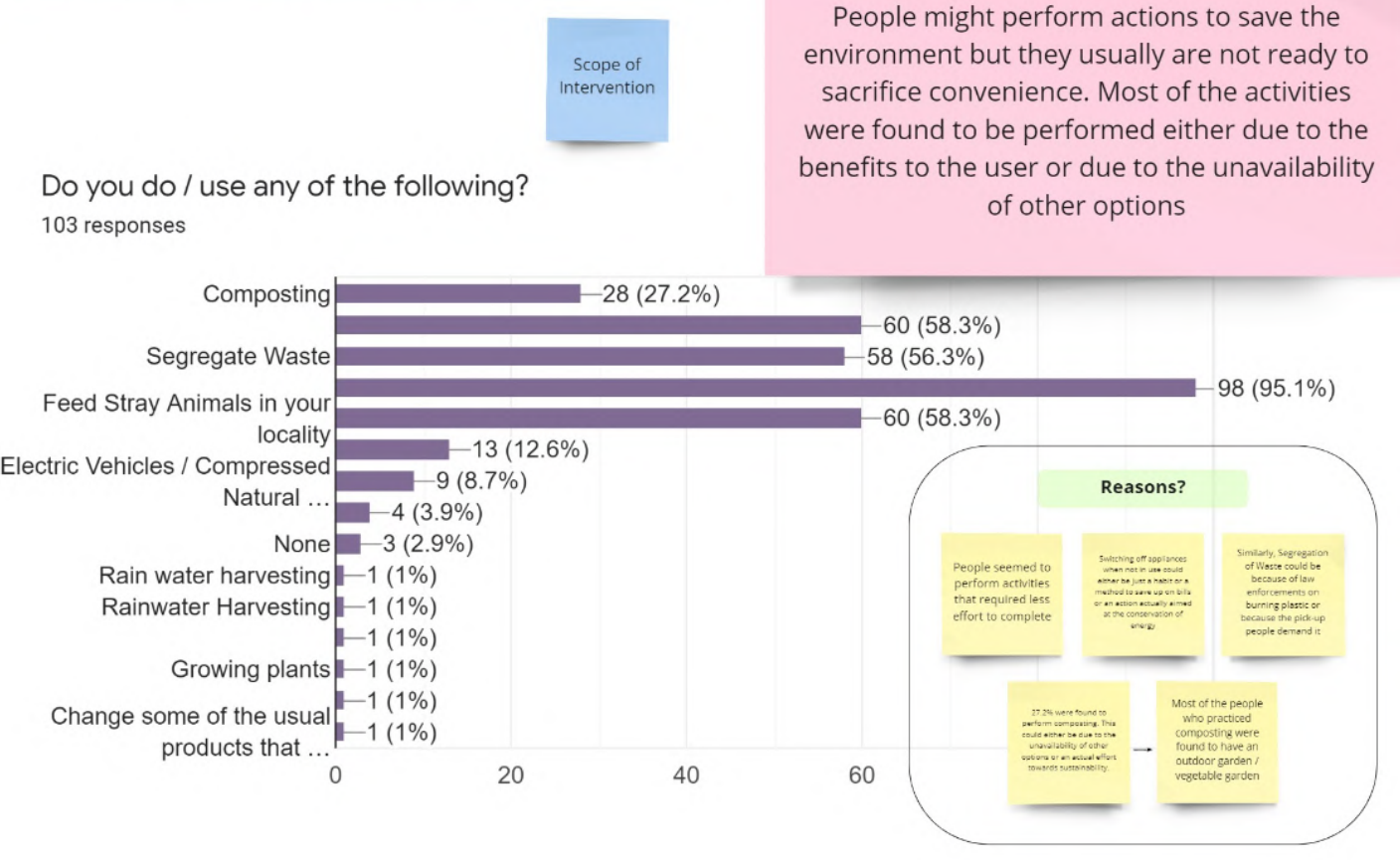
Primary Research

through a **survey** on Google Forms and received **115 responses**



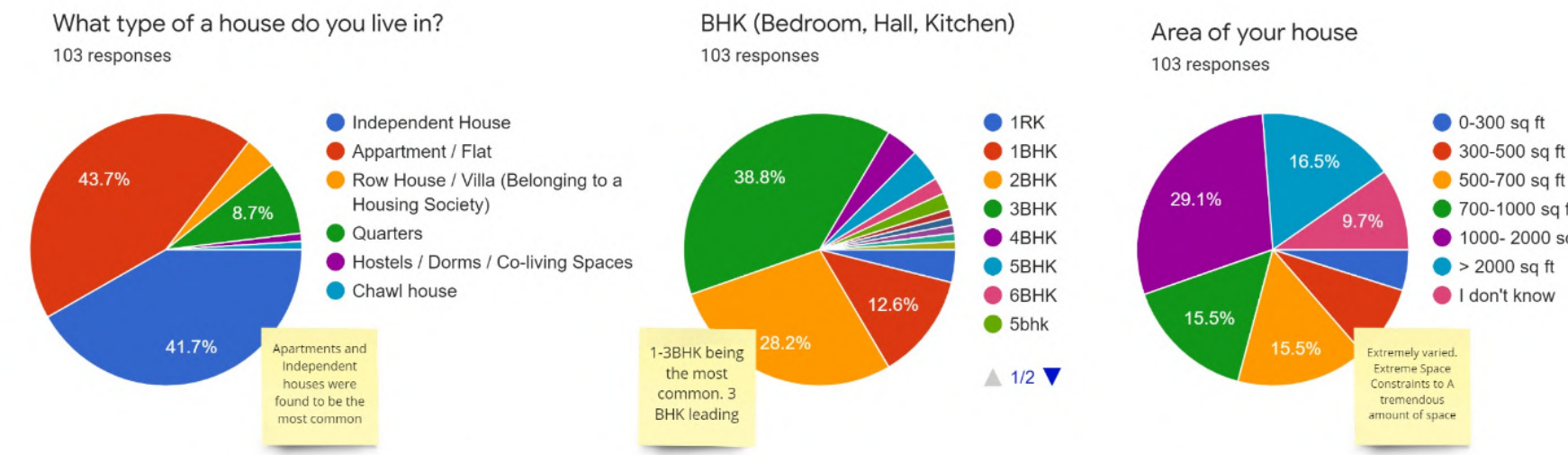
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Understanding the Nature of Actions

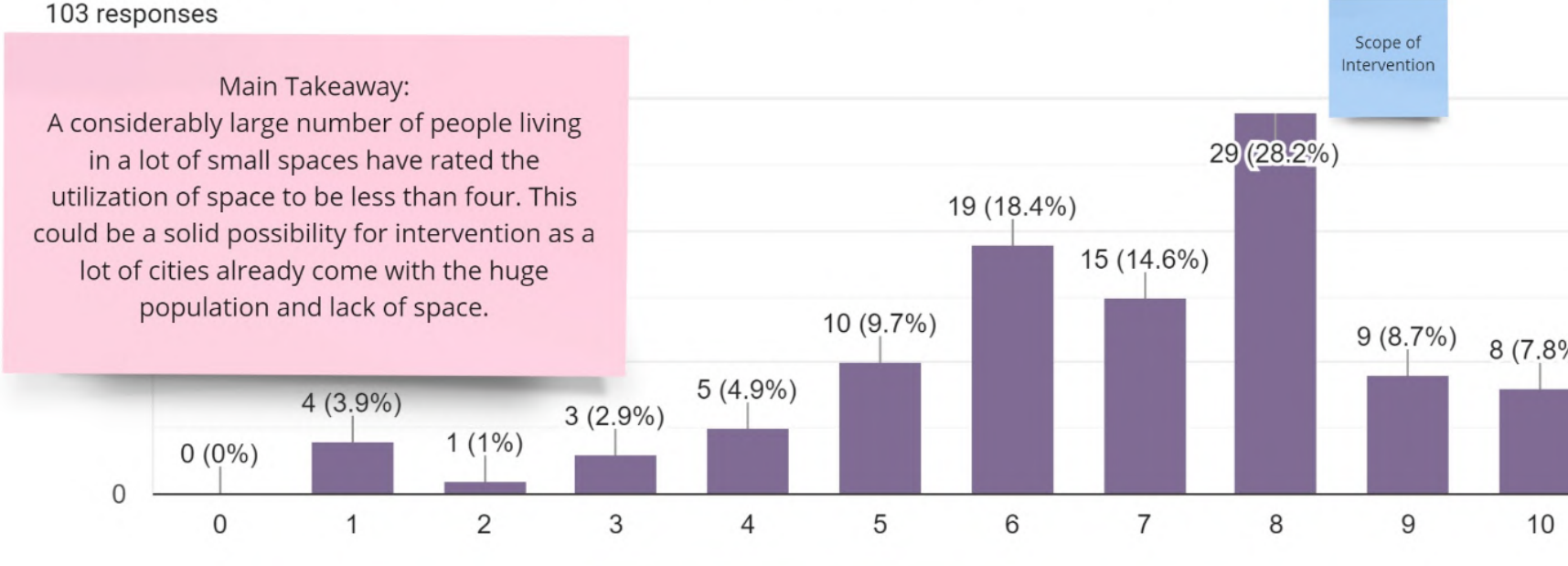


Main Takeaway:
People might perform actions to save the environment but they usually are not ready to sacrifice convenience. Most of the activities were found to be performed either due to the benefits to the user or due to the unavailability of other options

Understanding the Utilization of Space

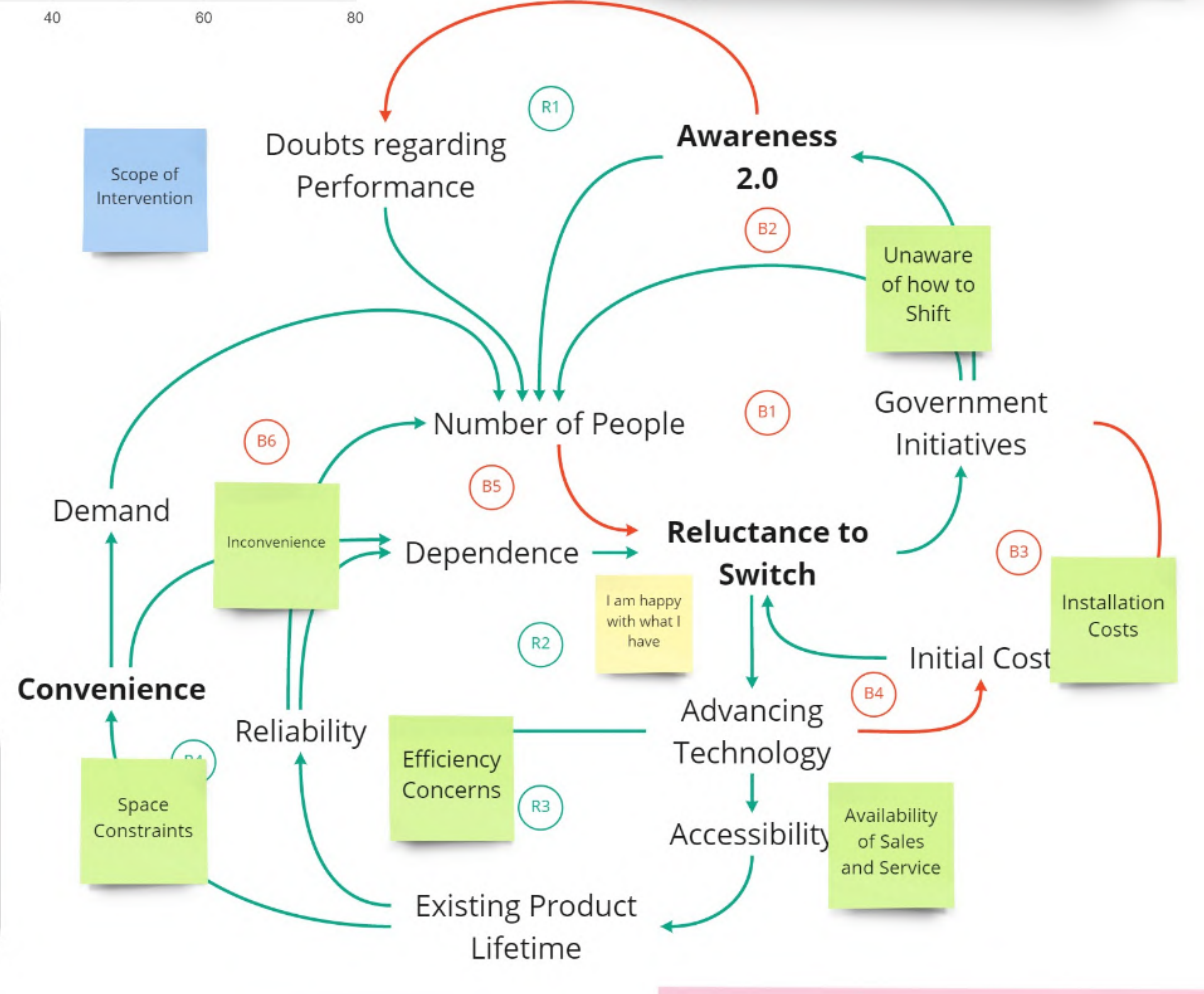
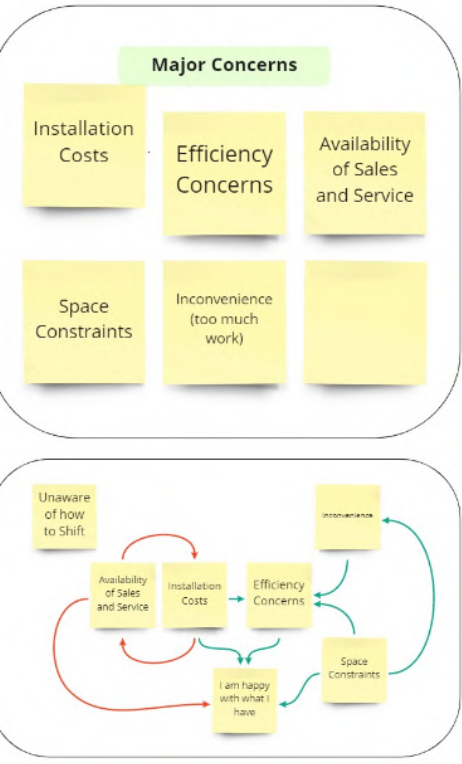


How efficiently do you think you use the available space in your house?



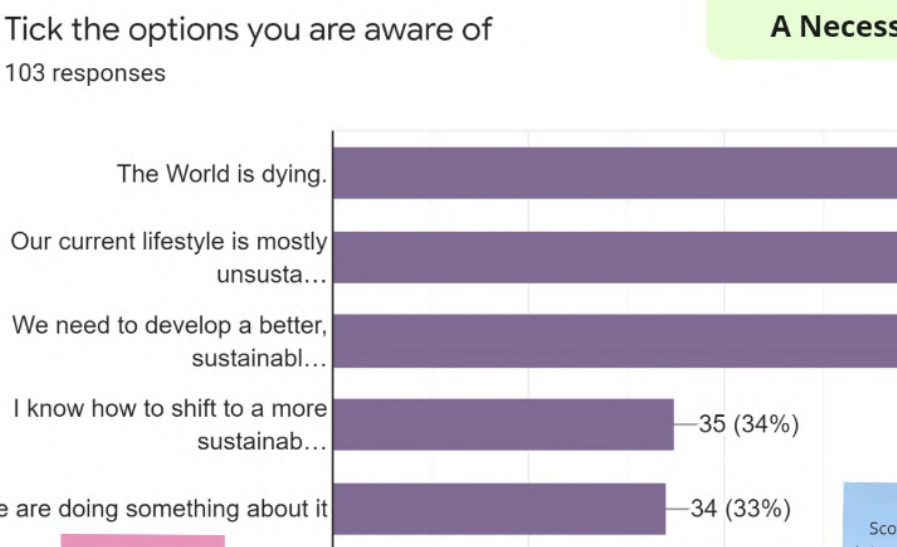
Main Takeaway:
A considerably large number of people living in a lot of small spaces have rated the utilization of space to be less than four. This could be a solid possibility for intervention as a lot of cities already come with the huge population and lack of space.

Understanding the Role of Concerns



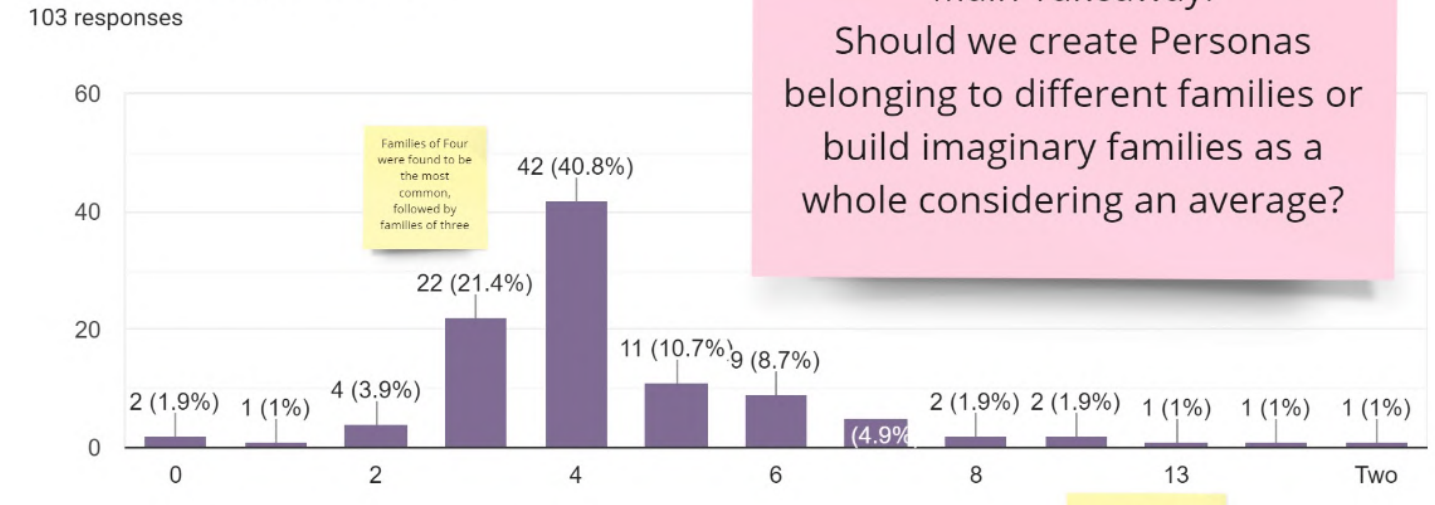
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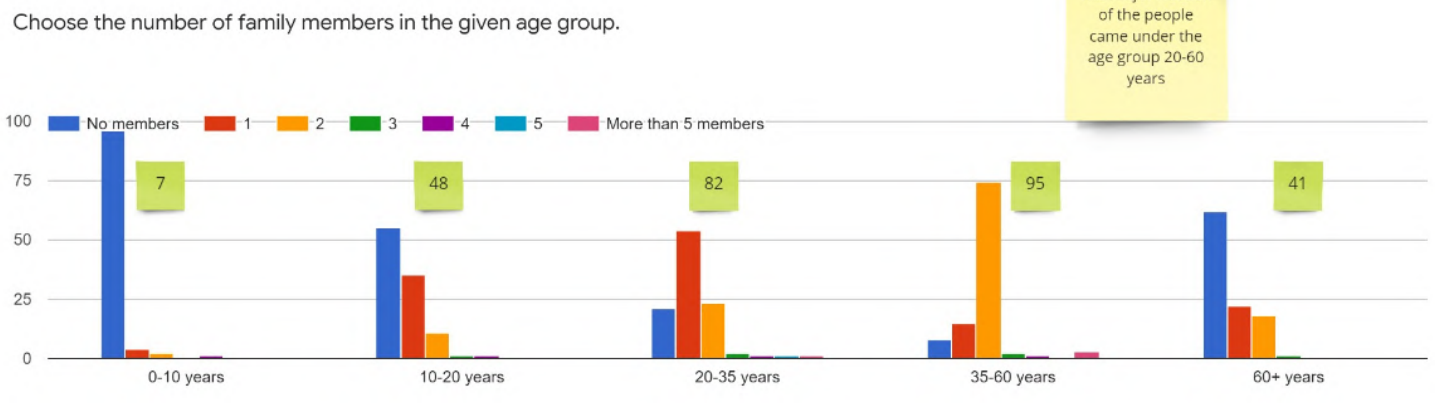


People are aware, period.

Number of Family Members



Main Takeaway:
Should we create Personas belonging to different families or build imaginary families as a whole considering an average?



Smallest

Condensing the specifications to identify the extremes

Largest

1RK	0-300 sq ft	Apartment / Flat	Apparently Zero	2/10	1RK	300-500 sq ft	Apartment / Flat	5 Members	8/10
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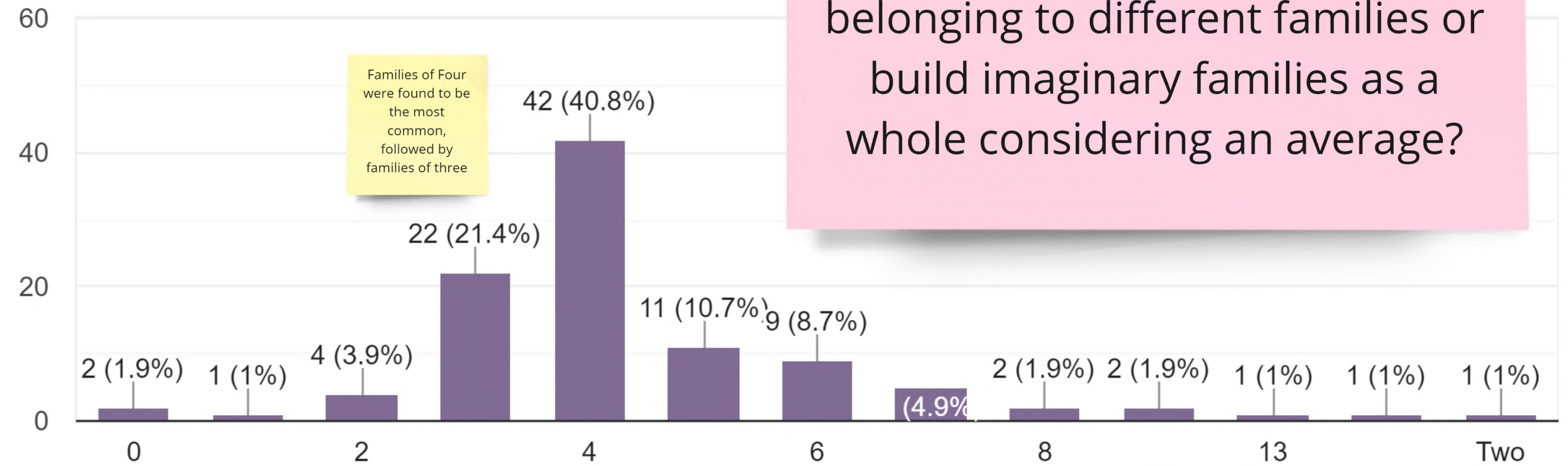
Primary Research

Understanding Demographics

Found the number of people living in a given household on an average, number of people belonging to each age group

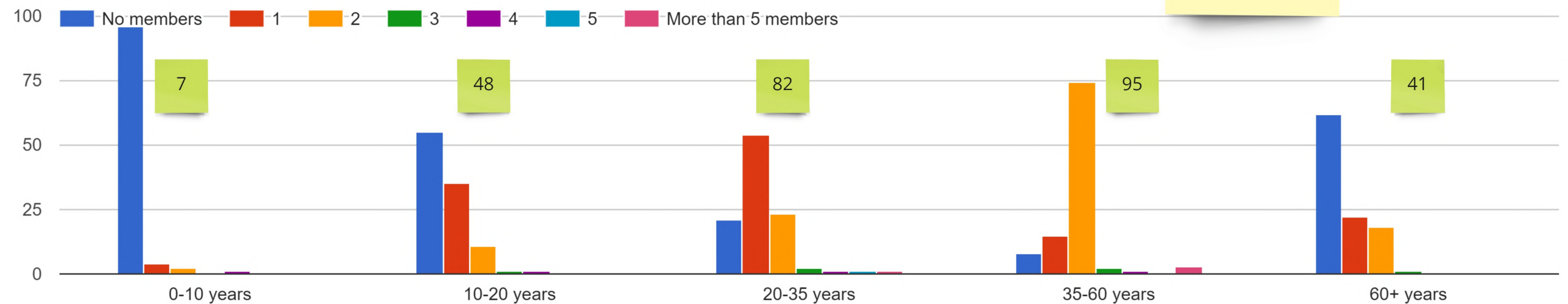
Number of Family Members

103 responses



Main Takeaway:
Should we create Personas belonging to different families or build imaginary families as a whole considering an average?

Choose the number of family members in the given age group.



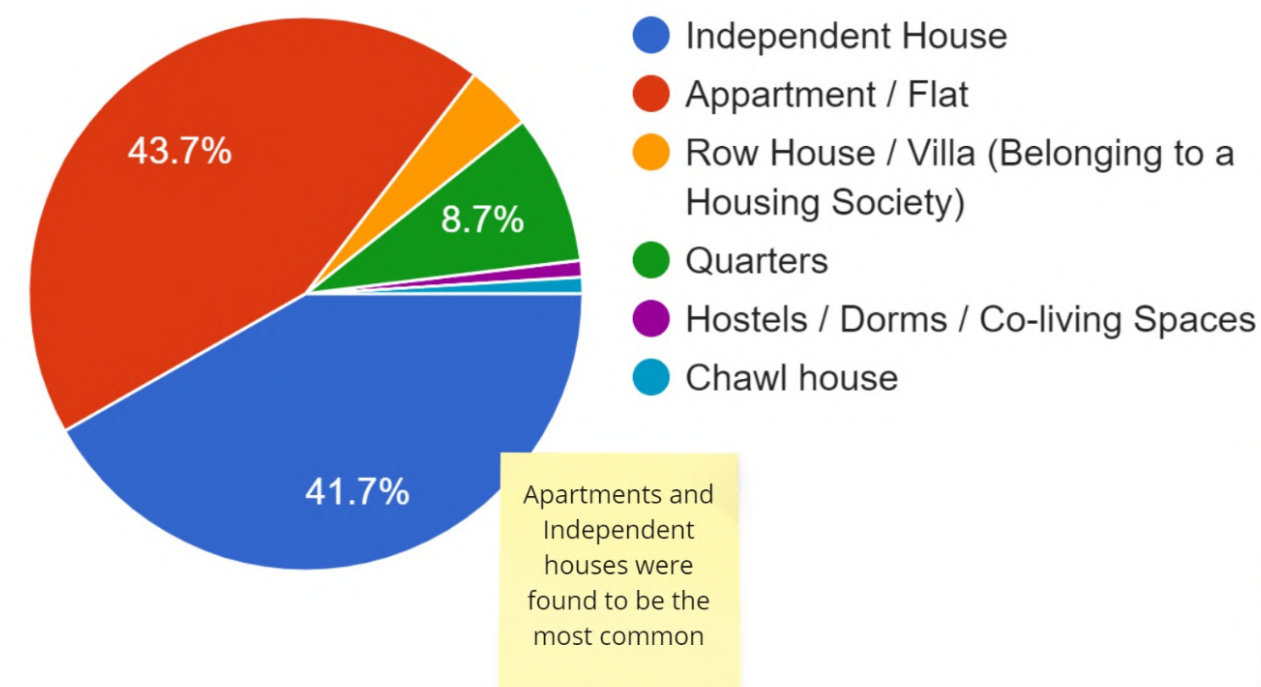
Primary Research

Understanding Housing

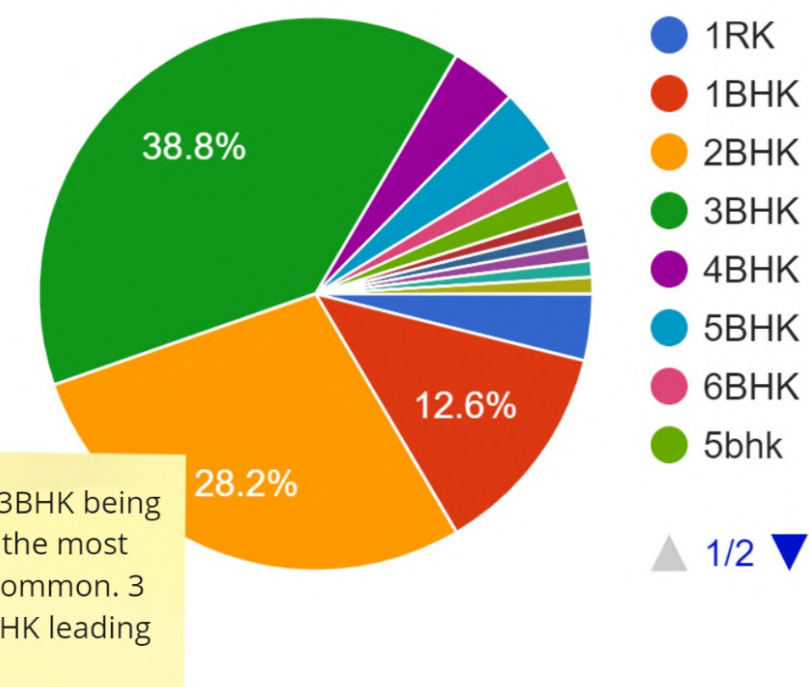
The type of housing, size and specifications of the house were found to be extremely varied

Understanding the Utilization of Space

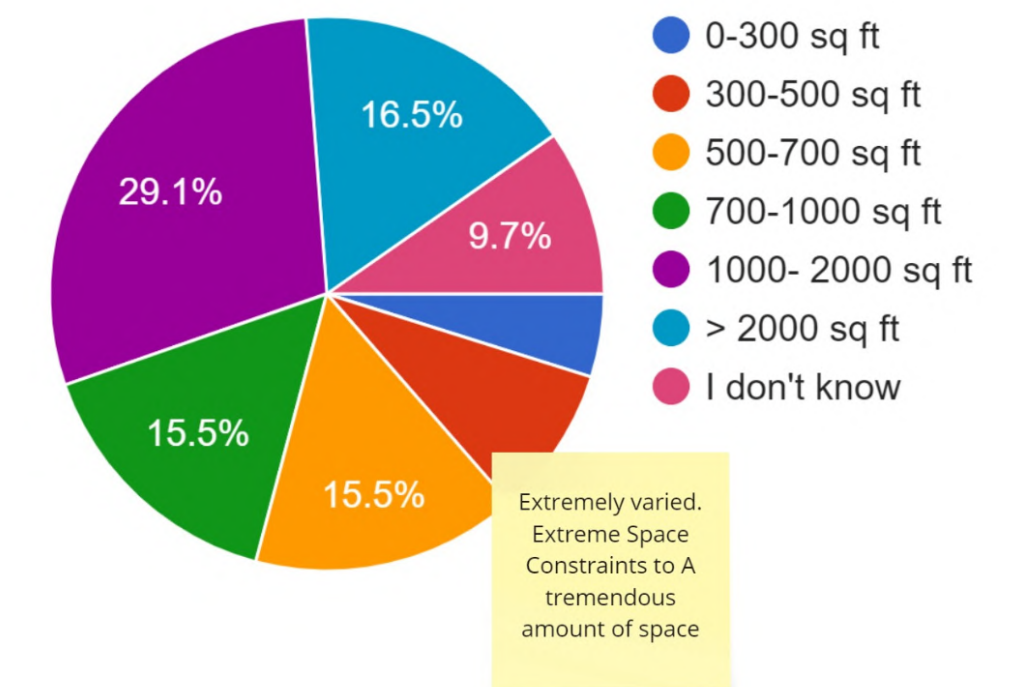
What type of a house do you live in?
103 responses



BHK (Bedroom, Hall, Kitchen)
103 responses



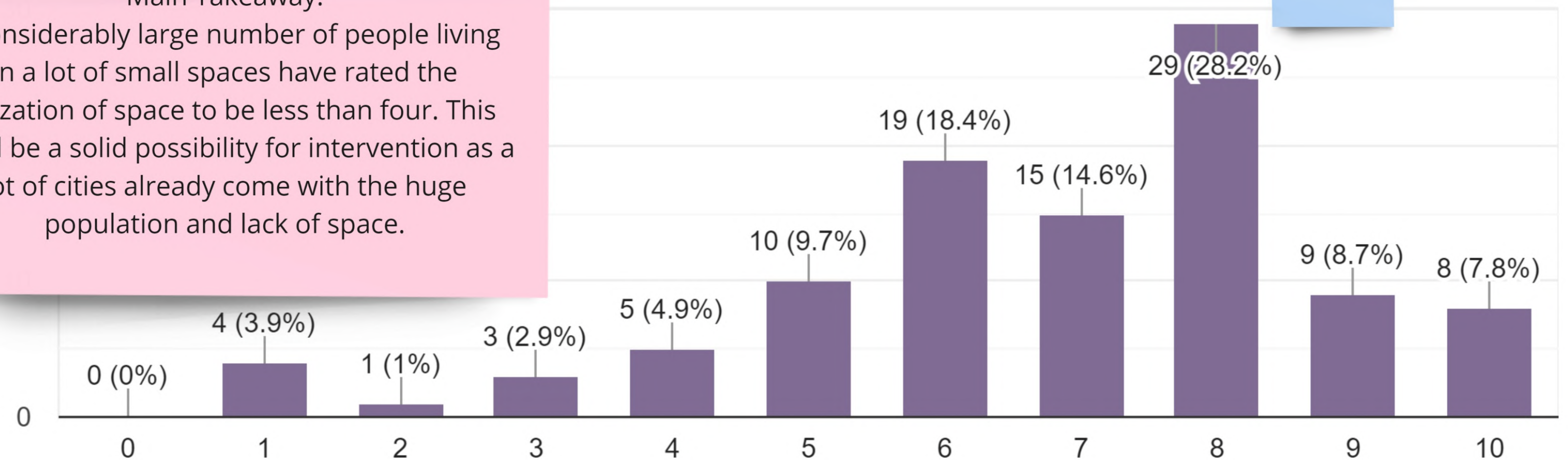
Area of your house
103 responses



How efficiently do you think you use the available space in your house?

103 responses

Main Takeaway:
A considerably large number of people living in a lot of small spaces have rated the utilization of space to be less than four. This could be a solid possibility for intervention as a lot of cities already come with the huge population and lack of space.



Primary Research

Understanding Housing

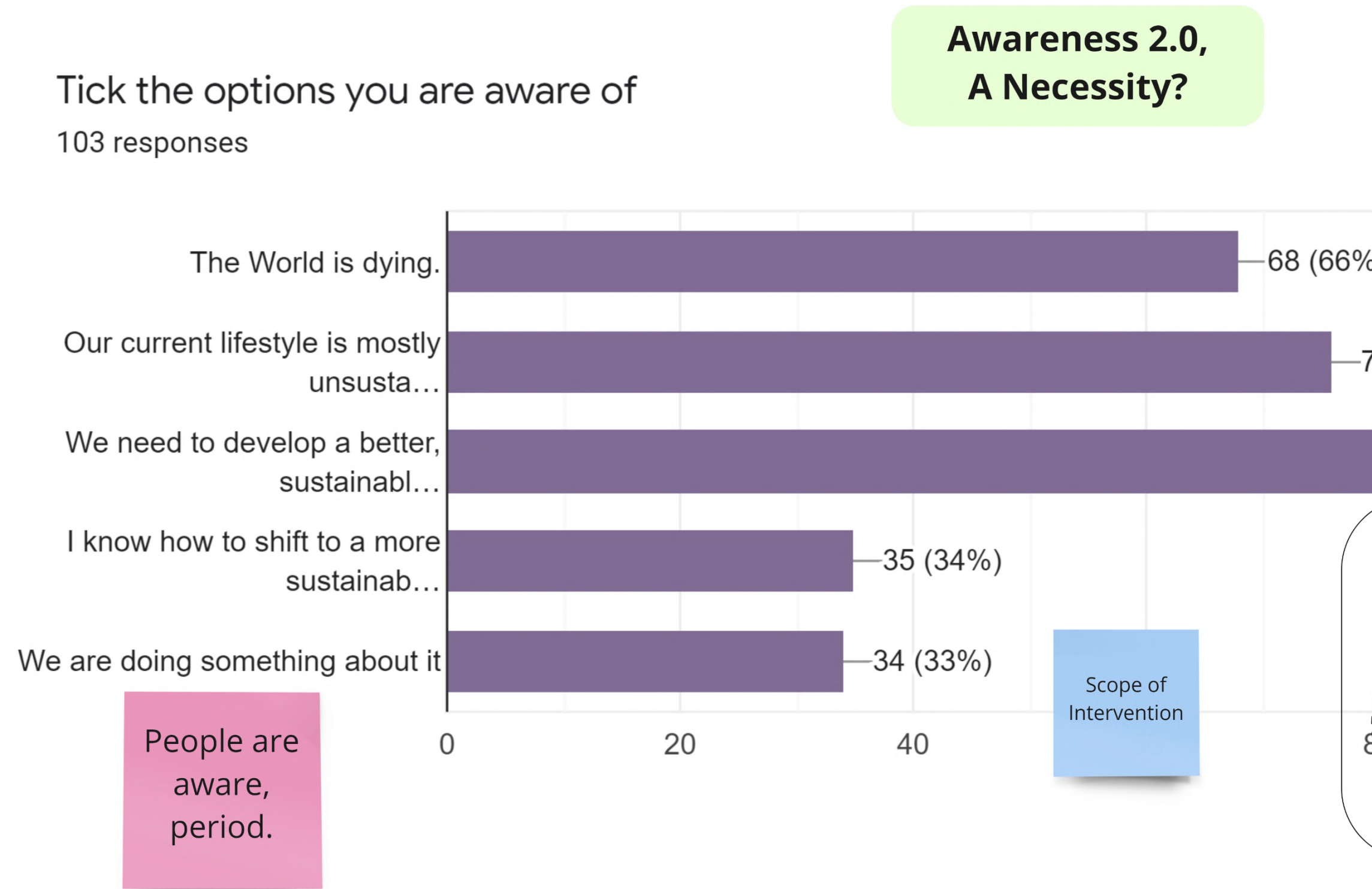
Picked out the extreme cases to help develop our personas

	Smallest	Condensing the specifications to identify the extremes			Largest				
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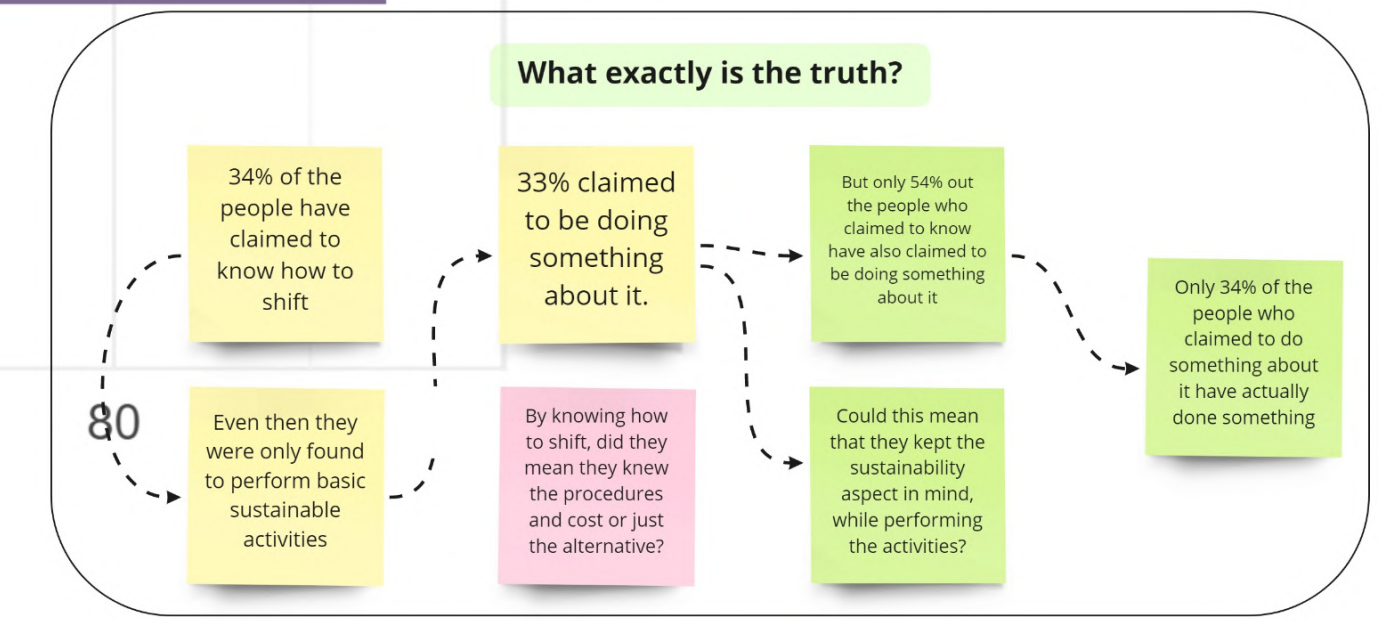
Primary Research

Are they aware?

This was intended to understand the nature of people's awareness regarding a sustainable lifestyle.



Main Takeaway:
People are aware of how our style of living affects our environment. They know how the alternatives. They also claim to know how to shift and a few even claim to be doing something about it. But the stats from the activities performed and alternatives used prove this fact wrong.



Primary Research

Sustainability in daily life?

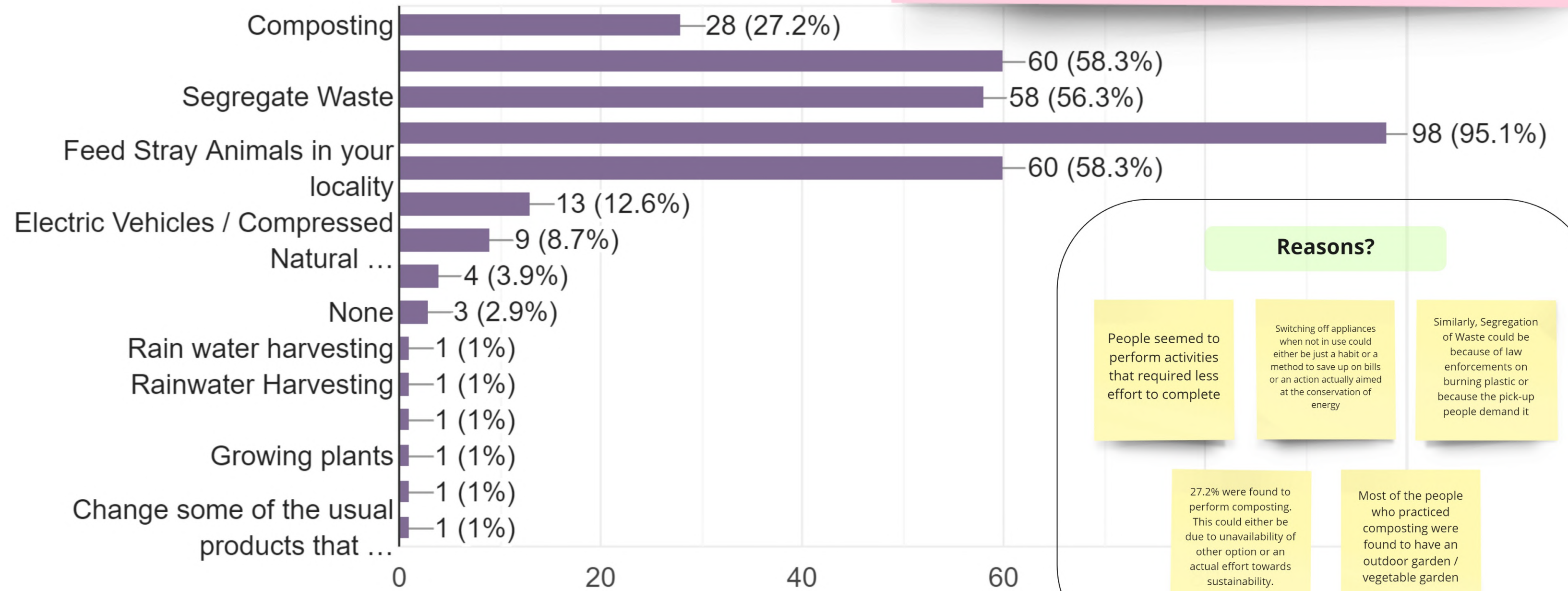
Do they actually do the things they claim to do? Well, No.

Understanding the Nature of Actions

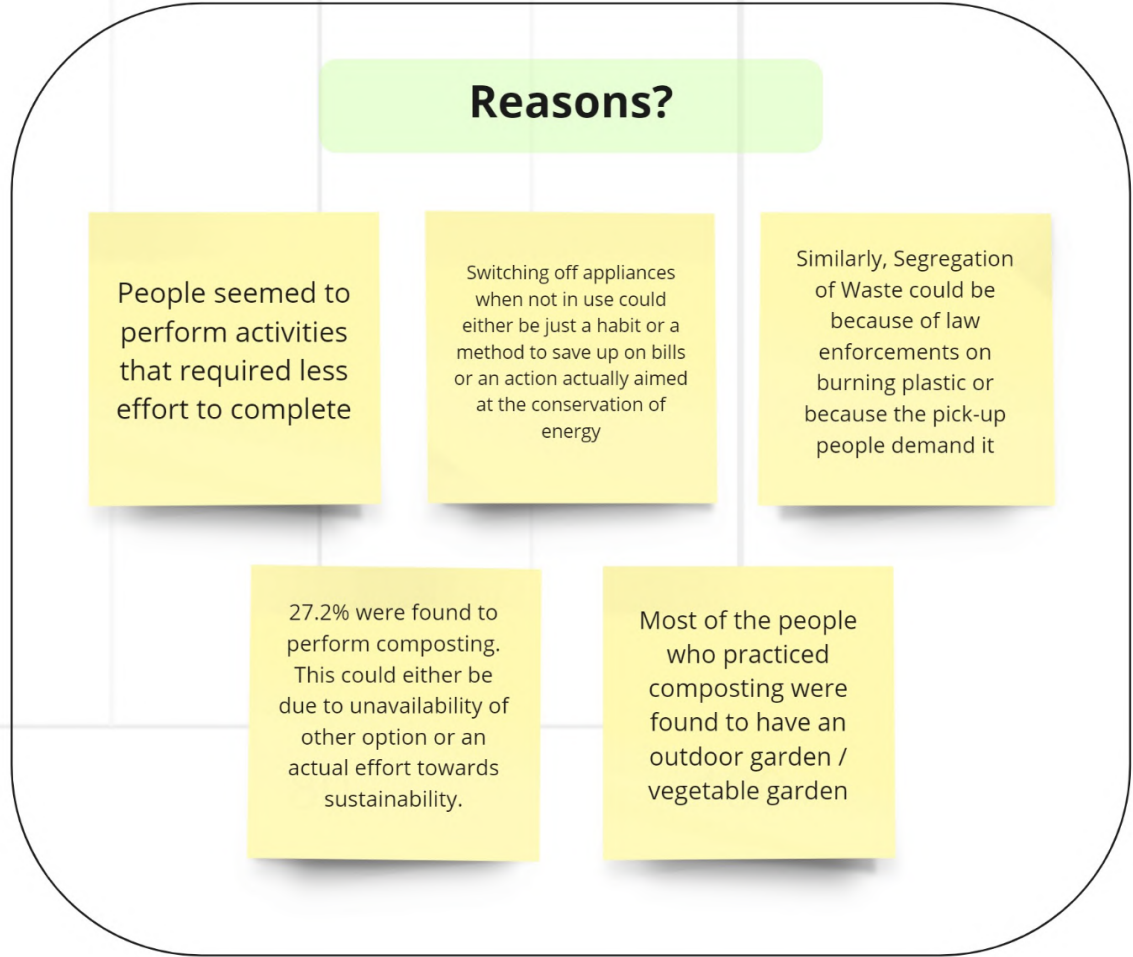
Scope of Intervention

Do you do / use any of the following?

103 responses



Main Takeaway:
People might perform actions to save the environment but they usually are not ready to sacrifice convenience. Most of the activities were found to be performed either due to the benefits to the user or due to the unavailability of other options

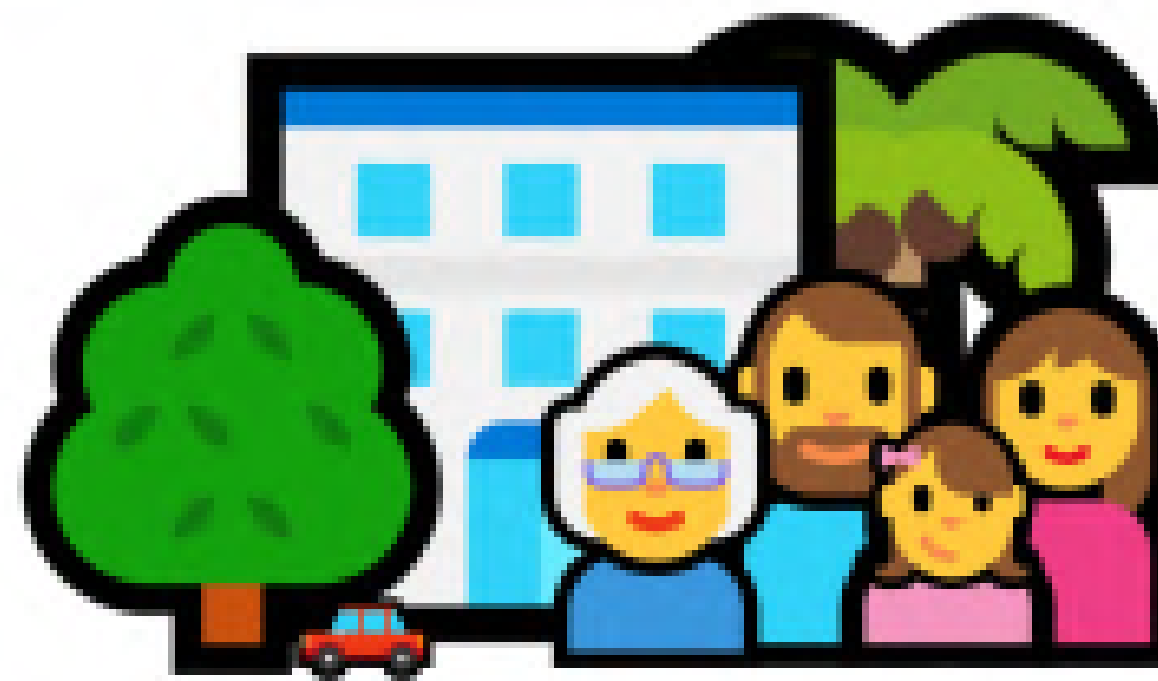


Personas

Household One

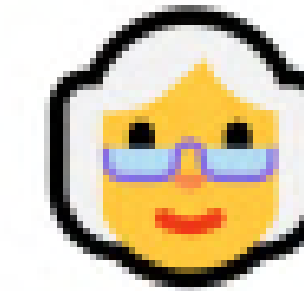
Upper-Middle-Class
family of four living in a
3BHK apartment

Creating Personas : Household One



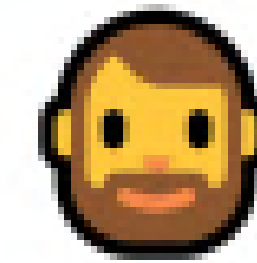
The Family

- Family of 4
- Have enough and a Little More
- **3BHK, 800sq.ft apartment** on the sixth floor
- Based in Nashik, but lives in Mumbai
- Has one Car for the whole family, parked in the common parking space
- Three Bedrooms, one for Grandmom, one for the couple (bath-attached), and one for the daughter
- Daughter's room doubles as a guest room
- There are two bathrooms in total
- Have a balcony which is also used as a mini garden and laundry space
- Three smartphones, one cell phone, a TV, a PC, a WM, a refrigerator and a microwave for the whole house



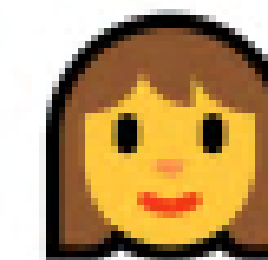
G, Grandmom, 75

- Retired Government School Teacher
- Entitled to Pension
- Mother to S and W and Grandma to D
- Capable of managing her own things
- Minor Case of Asthma, On medication for blood pressure
- Cannot travel a lot
- Knows how to make calls and use basic appliances
- Loves entertaining guests
- Interests : Gardening, Cooking, Watching Serials
- Insists on keeping switching lights and taps off after use as she is concerned about bills
- Wears Saree, day and night



S, Son, 52

- Owns a small Business
- Main income through profits made
- Sales depend on the season
- Sometimes brings a few products home from work for storage/quality checks
- Tries his best to not spend money on unnecessary things
- Husband to W and Father to D
- Owns the family car
- Almost never home, always on calls
- Loves to Order food and Eat Out
- Interests : Sports, Home Decor, Long Drives
- Has a lot of Relatives who keep coming over
- Prefers an ultramodern lifestyle. Has built a decent home



W, Wife, 47

- Teacher at a Primary School
- Earns a small amount, though enough to sustain basic monthly needs
- Have Virtual Classes these days
- Wife to S and Mother to D
- Has enough technological knowledge to operate smartphones, PCs and appliances
- Extremely busy, works only because she has no other choice
- Cares husband's attention but understands that he is busy
- Helps D with chores and gardening
- Hates catering to visitors, but always has to
- Interests : Home Decor, Traditional Fashion, Movies



D, Daughter, 16

- 11th Grade student
- Goes to a school 3km away, on a school bus
- Classes are virtual this year
- Daughter to W and S, and Granddaughter to G
- Good at Studies and has a room to herself
- Has to move into grandma's room if guest decide to stay over
- Helps her with medicines
- Likes to go on trips with friends and invite them over
- Doesn't like spending a lot of money
- Want a dog but the apartment is not dog-friendly
- Interests : Dance, Art, Indoor and Outdoor Games

Personas

Household Two

Three Employees living in a **2BHK** independent house along with a **pet**.

Creating Personas : Household Two



The Tenants

- Group of three colleagues
- Have just enough money
- **2BHK, 400sq ft, part of an Independent House**
- Lives on Rent, paid monthly
- From Delhi, Mumbai and Bangalore. Lives in **Pune** at the moment
- Three 23 - 25YO graduates, doing a one year programme with a company
- Has three two-wheelers parked on the side of the house
- There is only one bathroom
- Have a maid to clean up the place and cook food
- Three smartphones, one cell phone, an old TV, a PC, a single door refrigerator, LPG and a microwave for the whole house



A, 23, Delhi

- Just out of college
- First Job; have just started earning
- Architect, requires a lot of areas to work
- Owns a lot of Drawing Equipment
- Extremely Organised
- Likes clean spaces and everything to be in its place
- Prefers walking, also has a Scooter
- Have parents and a sister at home
- Doesn't care much about plants and animals
- Owns a two monitor setup and is very proud of it
- Barely knows cooking
- Interests : Cars, Art, Sunsets



B, 24, Mumbai

- Architecture Major, but interested in Dance
- Have done a freelance jobs in the past
- Has a earned small amounts of money used later for travel
- Does most of the cooking
- A people's person. Keeps bringing people over
- Has the habit of smoking
- Extremely Unorganised
- Likes making Tech videos
- Jealous of C, because he is in a relationship
- Sleeps on the sofa in the hall
- Complains about the fan in the hall
- Interests : Dance, Vlogging



C, 25, Bangalore

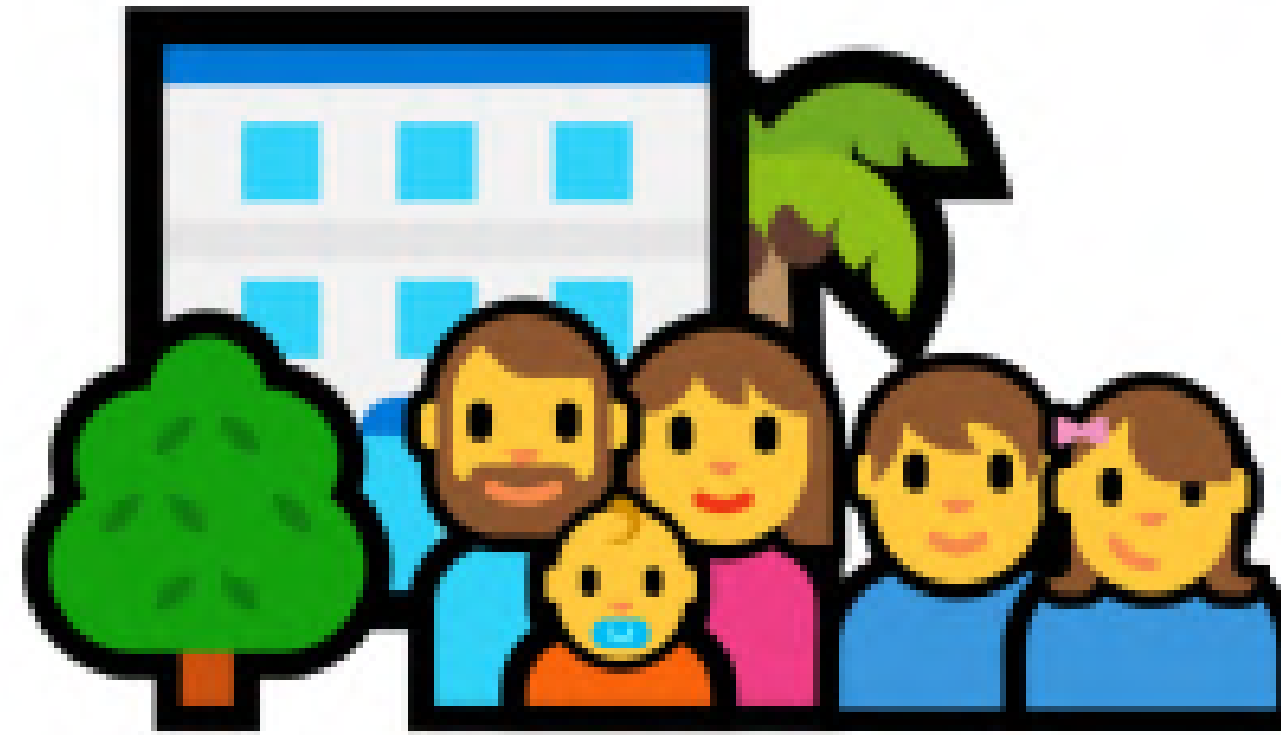
- Architect, has been working for 2 years
- Slightly financially stable
- Has a girlfriend and a dog
- The dog lives with him in the house
- Likes plants but has no time or space to maintain them
- Comes from a moderately wealthy family, lives an extravagant life
- Sleeps in the bedroom
- Organized, does laundry on a regular basis
- Most productive out of the three
- Has a lot of equipment
- Interests : Spending time with girlfriend, Cycling, Badminton

Personas

Household Three

A family of five which is not financially stable. They are **not well educated** and live in a small **1BHK** apartment.

Creating Personas : Household Three



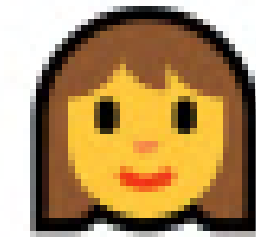
The Family

- **1BHK, 300sq.ft Apartment** on the third floor in Saki Naka
- Two single beds in the bedroom, a sofa and a gaddi
- Two couples
- Unaware of the consequences on the environment
- Have to work hard to make the end meet
- Most of the work is done in the hall
- Small Kitchen with just enough space to manage all the meals
- Have all the means in the hall
- Laundry is hung on the small grided balcony
- Have a makeshift Puja Room in Hall
- Two Smartphones, Two cell phones, one single door refrigerator, a CRT TV, LPG



L, Big Brother, 32

- Works at a construction site
- Gets Daily Wages
- Educated till 8th Grade
- Handworking.
- Does other work for additional money
- Moved to Mumbai for work
- Very Conservative
- Comes back late at night
- Main source of income for the family
- Very particular about paying rents and keeping the family debt-free



M, Big Brother's Wife, 30

- Used to work as a maid
- Stopped going because of baby
- Educated till 4th Grade
- Runs the house
- Like watching TV when alone in the house
- Does the laundry of the whole household
- Vegetarian
- Extremely Religious
- Not allowed to do things other than taking care of the household and going to temple
- Knows a little bit of natural medicine



N, Younger Brother, 30

- Carpenter
- Works under a contractor
- Gets paid depending on the work done each day
- Sometimes runs out of work and has to depend on brother
- Looks up to big brother.
- Works as a cleaner on free days
- Educated till 10th grade
- Vegetarian
- Knows a little bit of technology



O, Younger Brother's Wife, 29

- Works as a maid
- Goes to three different houses during different times of the day
- Educated till 8th Grade
- Likes to study, very bright student
- Interested in learning new things
- Likes little things that make the house pretty
- Interested in Fashion and jewelry
- Stitches clothes as a side thing, though not official
- Earns enough to take care of groceries for the household



P, Big Brother's Baby, 1

- Uses Diaper only when going out
- Needs attention at all times
- Tends to chew on things
- Minor health issues due to lack of hygiene and dust



Next Steps

Scenarios

Ideation

Final Solution

Evaluation

Revised Final Solution



thank you