



Faculty of Design

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Blockchain for Socio-Economic Impact: Financial inclusion by environment- centric service design

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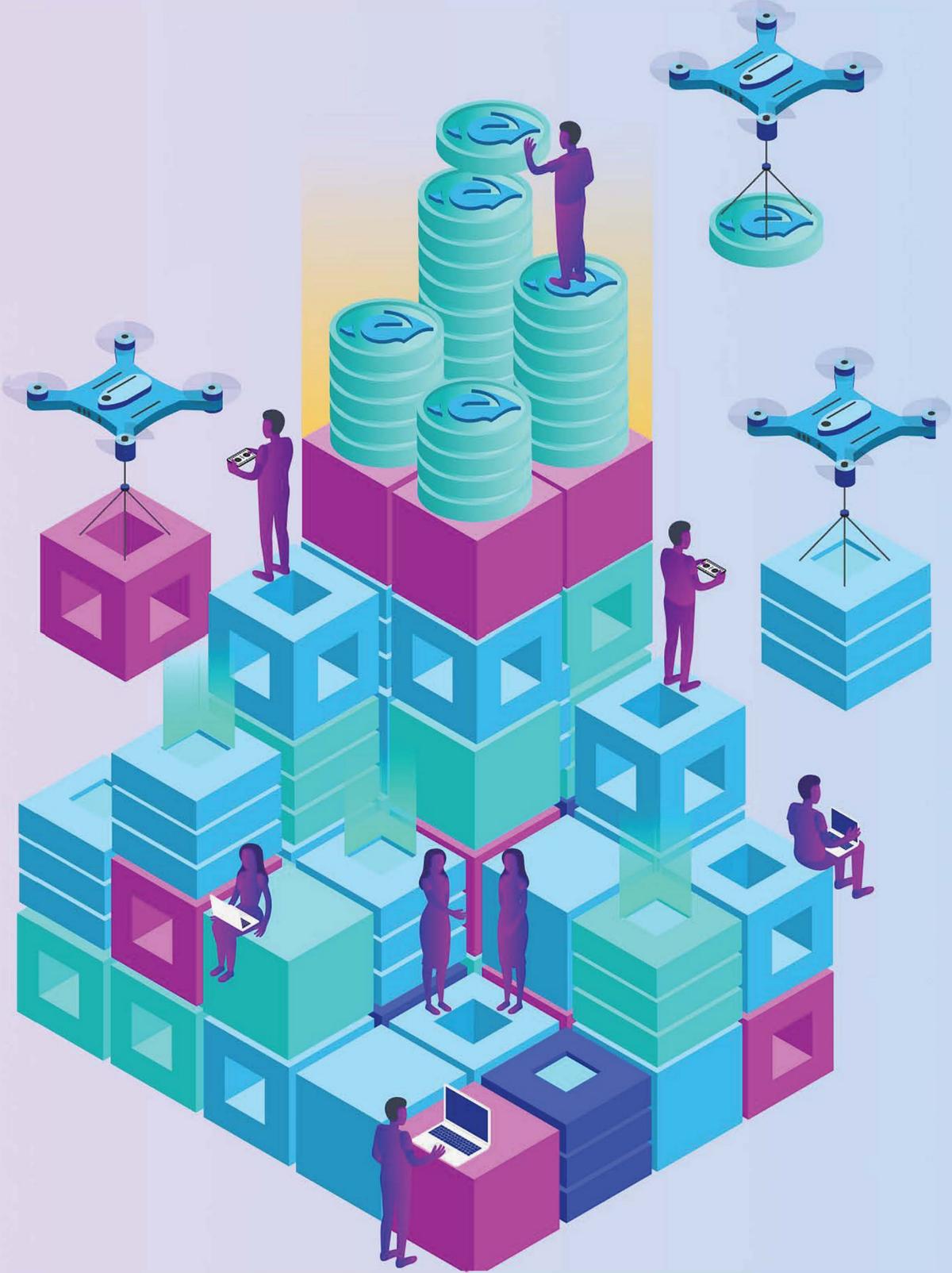
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Blockchain for Socio-Economic Impact

Building a decentralized inclusive economy to fight climate change

System Design Project
12 weeks
Faculty Guide :
Praveen Nahar & Sahil Thappa

The Team:
Mothilal Loganathan
Pavan Kalyan
Vishruth Kumar



Trigger

The change in the face of finance with the rise and fall of bitcoin caught our eye

The technology

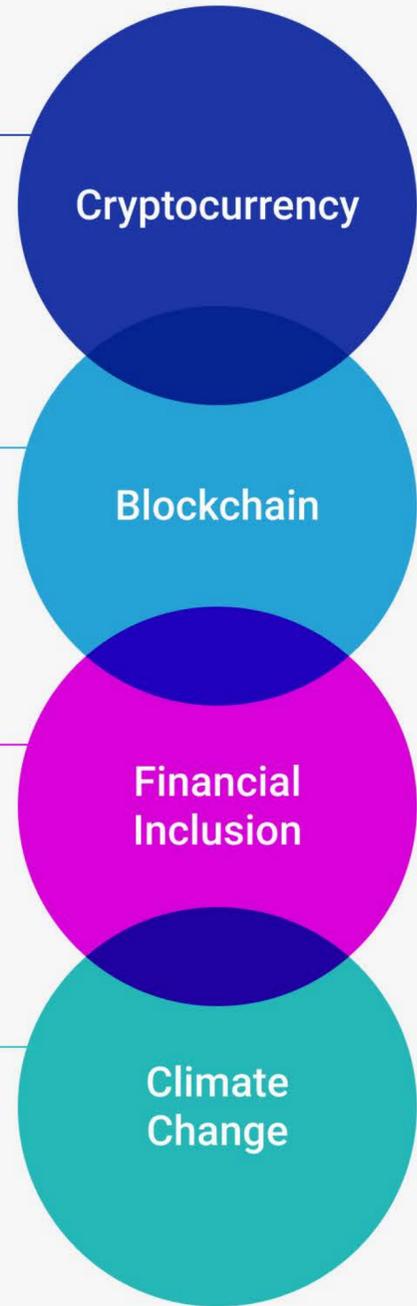
This project was initially technology driven with our curiosity to learn emerging trends.

Initial Cause

We wanted to use blockchain technology to distribute financial resources and not just for trading

Greater Cause

The positive cascading effect on climate change



Bitcoin sees a worst fall of 36%, highly volatile since a week



Elon Musk manipulates the market with a tweet, pumps and dumps bitcoin



Dogecoin, the first cryptocurrency made from a meme to used for Space X



Rising Environmental concerns of Bitcoin

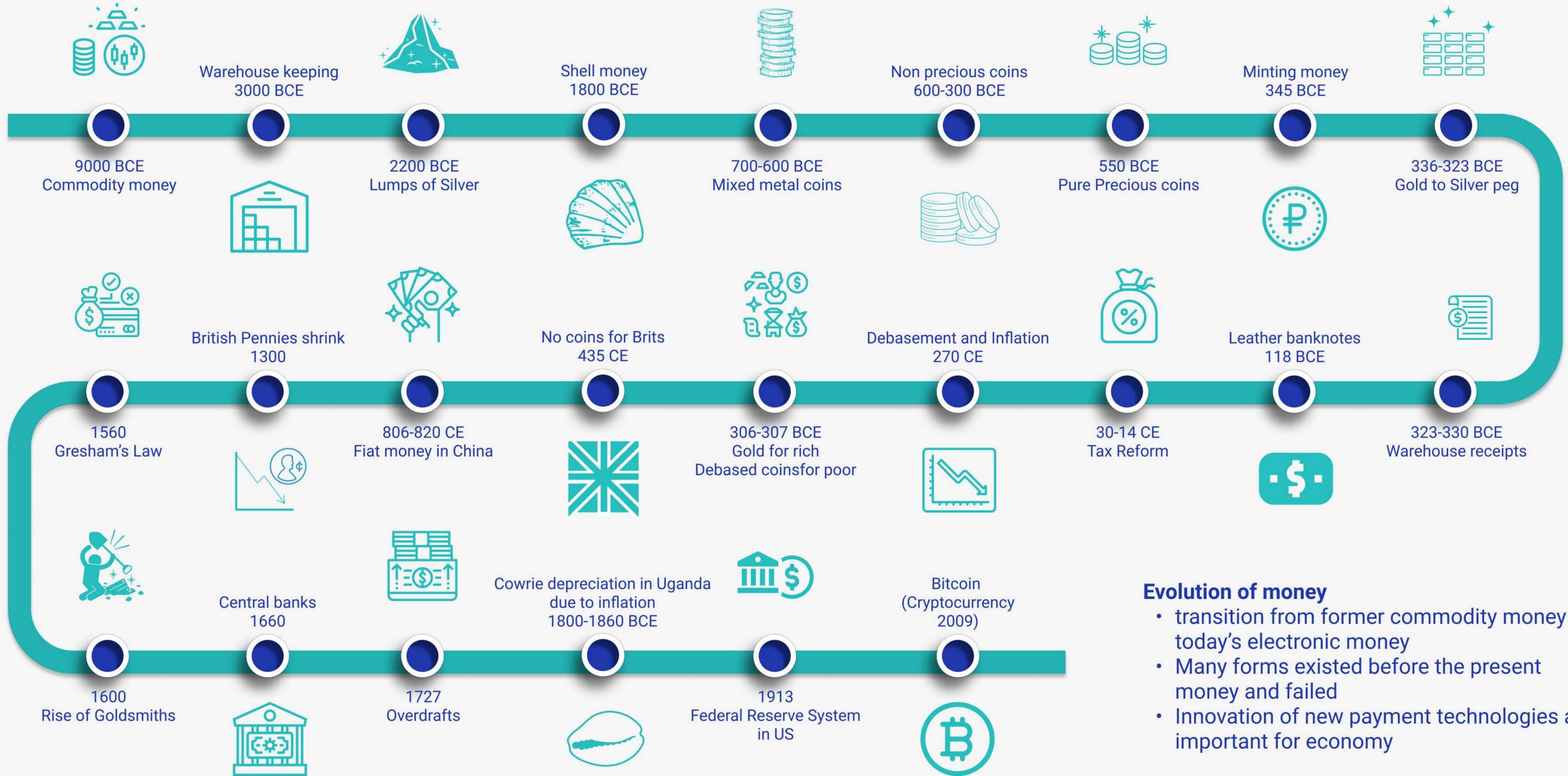


RBI to Launch CBDCs: future of cryptocurrencies



DogeCoin vs Ethereum, unbelievable rise in 2021

Money
Where did it come from?



Evolution of money

- transition from former commodity money to today's electronic money
- Many forms existed before the present money and failed
- Innovation of new payment technologies are important for economy

■ Hello Bitcoin

■ The First Cryptocurrency



Cryptocurrency

Bitcoin is a new form of money which is universal and completely digital. It can be used by anyone, anywhere in the world.

Bitcoin is just one of the many cryptocurrencies present in the world



Decentralized

Bitcoin is not controlled by any person, company, or government. It's run by the community of its users.

They can be used by anyone, anywhere in the world. There are no dollars, Euros, pesos, or Yen – cryptocurrencies are global.



No third parties

Most cryptocurrencies are not controlled or regulated by any single entity like a bank - which makes them "decentralized."

Hence this eliminates transaction and bank charges and even saves up a lot of time.



Secure

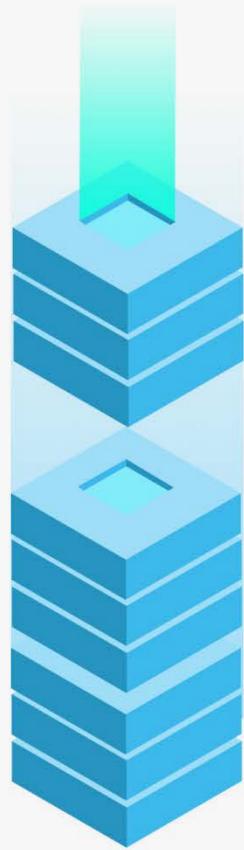
As the name suggest, cryptocurrencies are encrypted with advanced algorithms. Also the information is all around the web and not centralized which makes it almost impossible for any cyber attack.

- Blockchain
- Distributed Ledger Technology



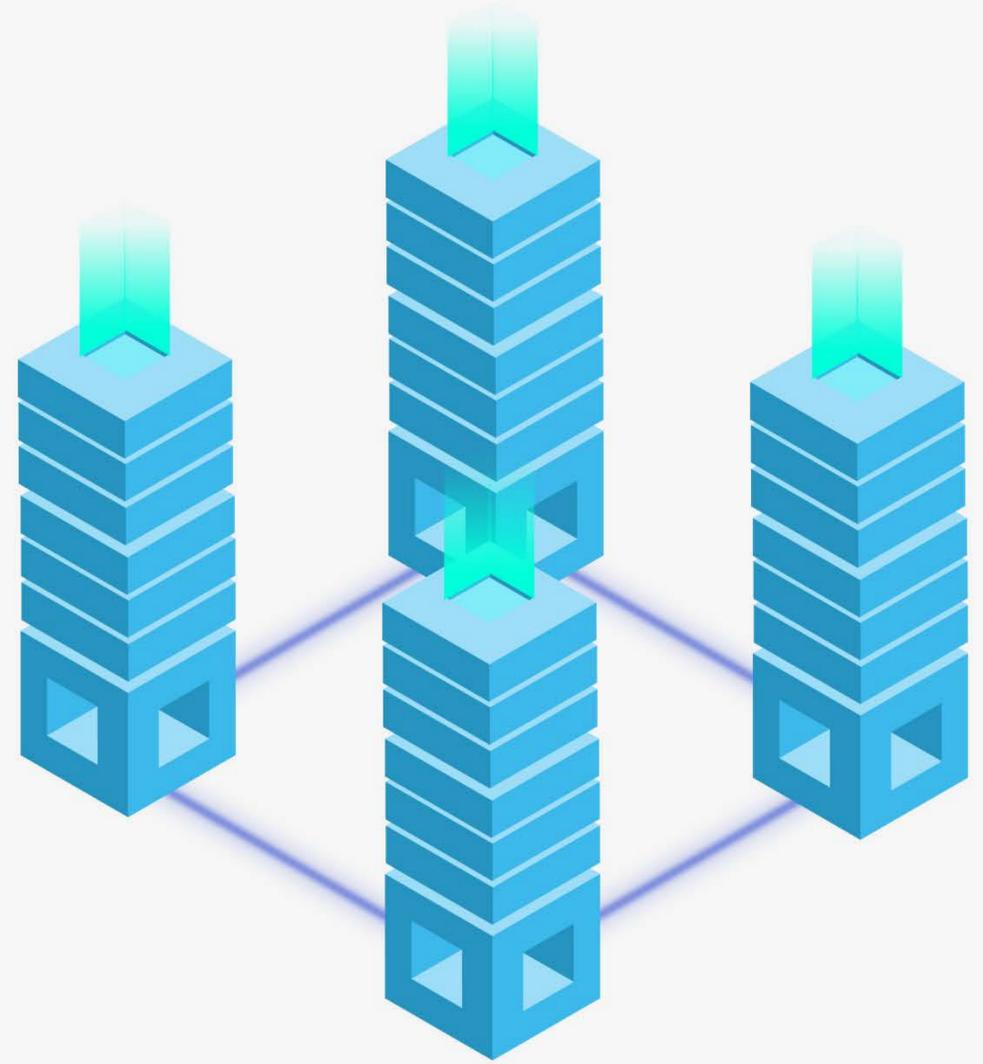
Blocks / Ledger

It basic virtual unit which contains data (transaction/record/contact details)



Blockchain / Distributed Ledger

A block is added to the network after each successful process



Decentralized Network

All blocks are linked to one another without a central body.

Blockchain features

Future of Record Keeping

Distributed | Transparent

All the participants have a copy of the ledger for complete transparency without involvement of third party

Immutable | Data cannot be tampered

Any validated data cannot be changed and is irreversible

Time Stamped | Effective time record

Transaction time-stamp is recorded on a block

Programmable | Can be changed with codes

Blockchain is programmed to automate a process effectively and efficiently.

Secure | Information is protected

All blocks are individually encrypted and cannot be infringed.

Anonymous | Privacy is maintained

Identity of participants are either anonymous or pseudonymous

Unanimous | Trust is maintained

All individual participants agree to the validity of each and every records



■ Initial User Study

■ Interview with Crypto Currency Traders

Persona 1

| NAME

Kushal Vala

| ATTRIBUTES

Geek | Tech Enthusiast | Football freak

| SHORT DESCRIPTION

He am working as a Data Scientist with an experience of nearly 2 years in the industry of Machine Learning. Graduate in electrical engineering



“ I feel centralized currency will be there. Decentralized currency will go side by side. Countries will come up with their nationalized cryptocurrency. (Hybrid mode of financial system). ”

Persona 2

| NAME

Jeet Chaudhuri

| ATTRIBUTES

Fitness freak | Money smart | Geek

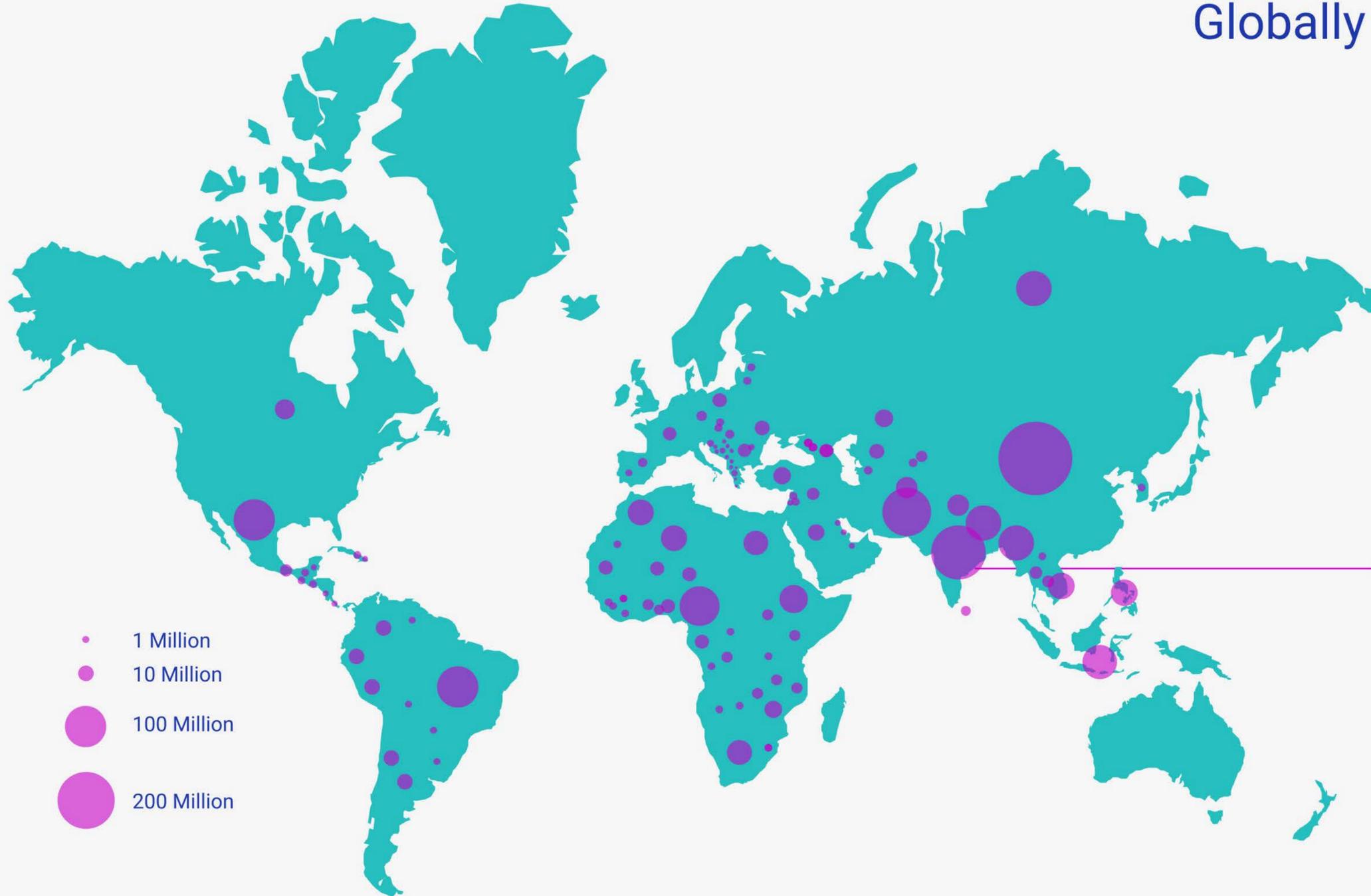
| SHORT DESCRIPTION

Jeet is a consultant with an experience of Business Analytics in Pharma industry of 2 years. Graduated as chemical engineer from NIT Jaipur

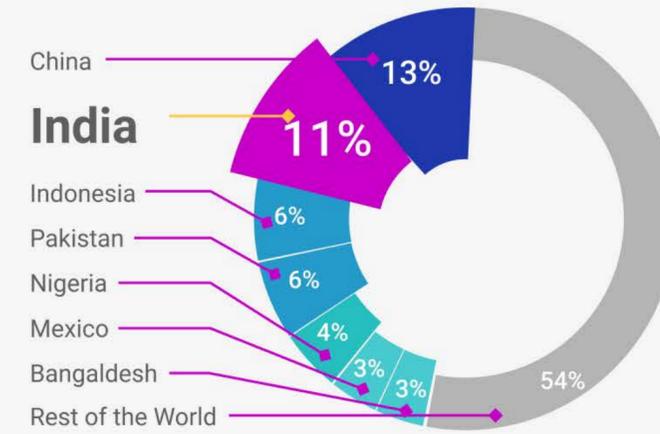


“ Cryptocurrency can never be a way of raising money and replace stocks. They are weird and highly volatile. A standardization of cryptocurrency is required for it to function effectively. ”

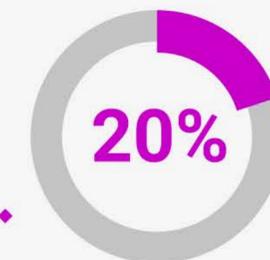
■ Financial Inclusion
■ **Unbanked Population of the World**



Globally , **1.7 Billion** adults are **unbanked**



Nearly half of the unbanked adults live in just 7 economies

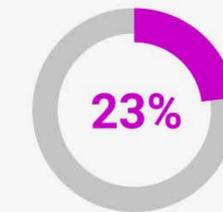


190 M

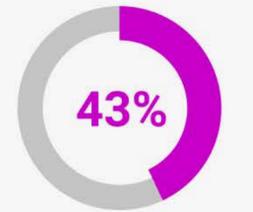
Unbanked population of India



Financial Literacy in India



Digital Transactions in India



Dormant Accounts in India

■ Financial Inclusion
■ Solving Inequality of financial resources

1 NO POVERTY

2 ZERO HUNGER

3 GOOD HEALTH AND WELL-BEING

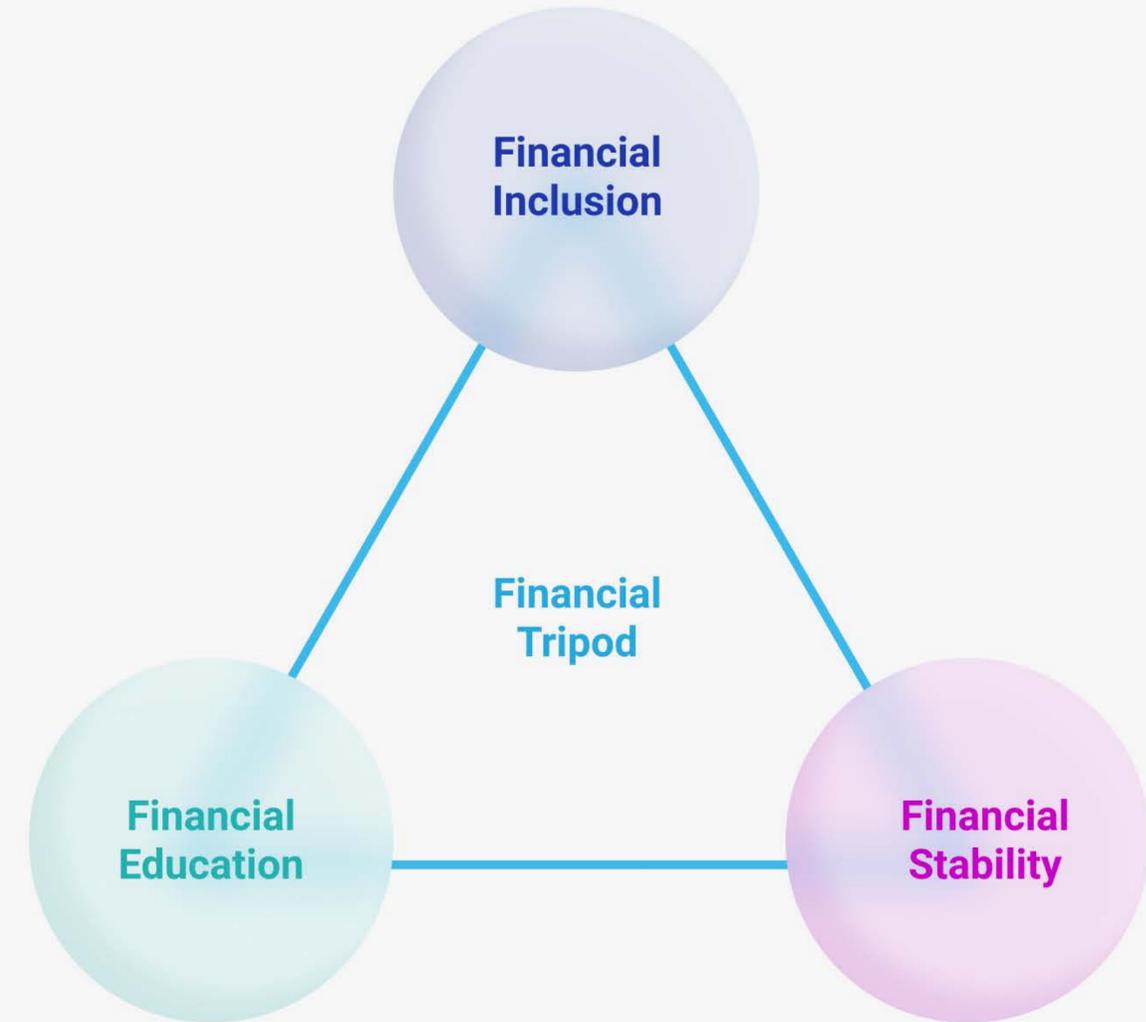
5 GENDER EQUALITY

8 DECENT WORK AND ECONOMIC GROWTH

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

10 REDUCED INEQUALITIES

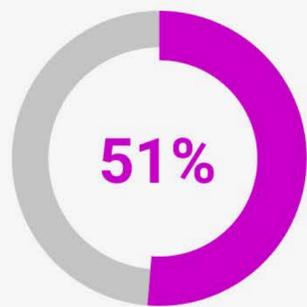
Financial Inclusion in the Sustainable Development Goals



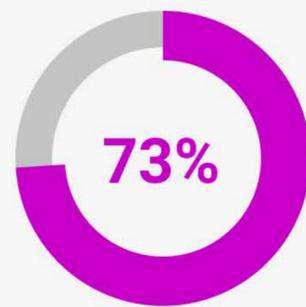
Financial education, financial inclusion and financial stability are three elements of an integral strategy, as shown in the diagram below. While **financial inclusion** works from **supply side of providing access to various financial services**, financial education **feeds the demand side by promoting awareness** among the people regarding the needs and benefits of financial services offered by banks and other institutions. Going forward, these two strategies promote greater financial stability.

Financial Inclusion Glance of India

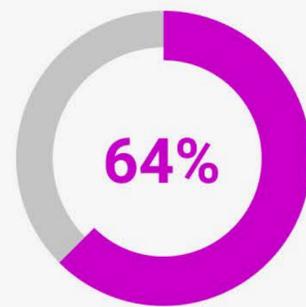
1. **The National Strategy for Financial Inclusion (NSFI)** was launched in January 2020 to boost job creation, reduce vulnerability to economic downturns and increase investments in human capital.
2. **Pradhan Mantri Jan Dhan Yojana (PMJDY)** was launched in August 2014 to extend universal banking services to unbanked households.
3. Atal Pension Yojana was relaunched in May 2015 to provide pensions for employees in the unorganized sector.
4. **Pradhan Mantri Suraksha Bima Yojana** was launched in May 2015 to provide financial coverage to people in cases of death or disability due to accidents.
5. **Bharat Interface for Money (BHIM)**, a mobile payment app, was launched in December 2016 and facilitates digital payments.



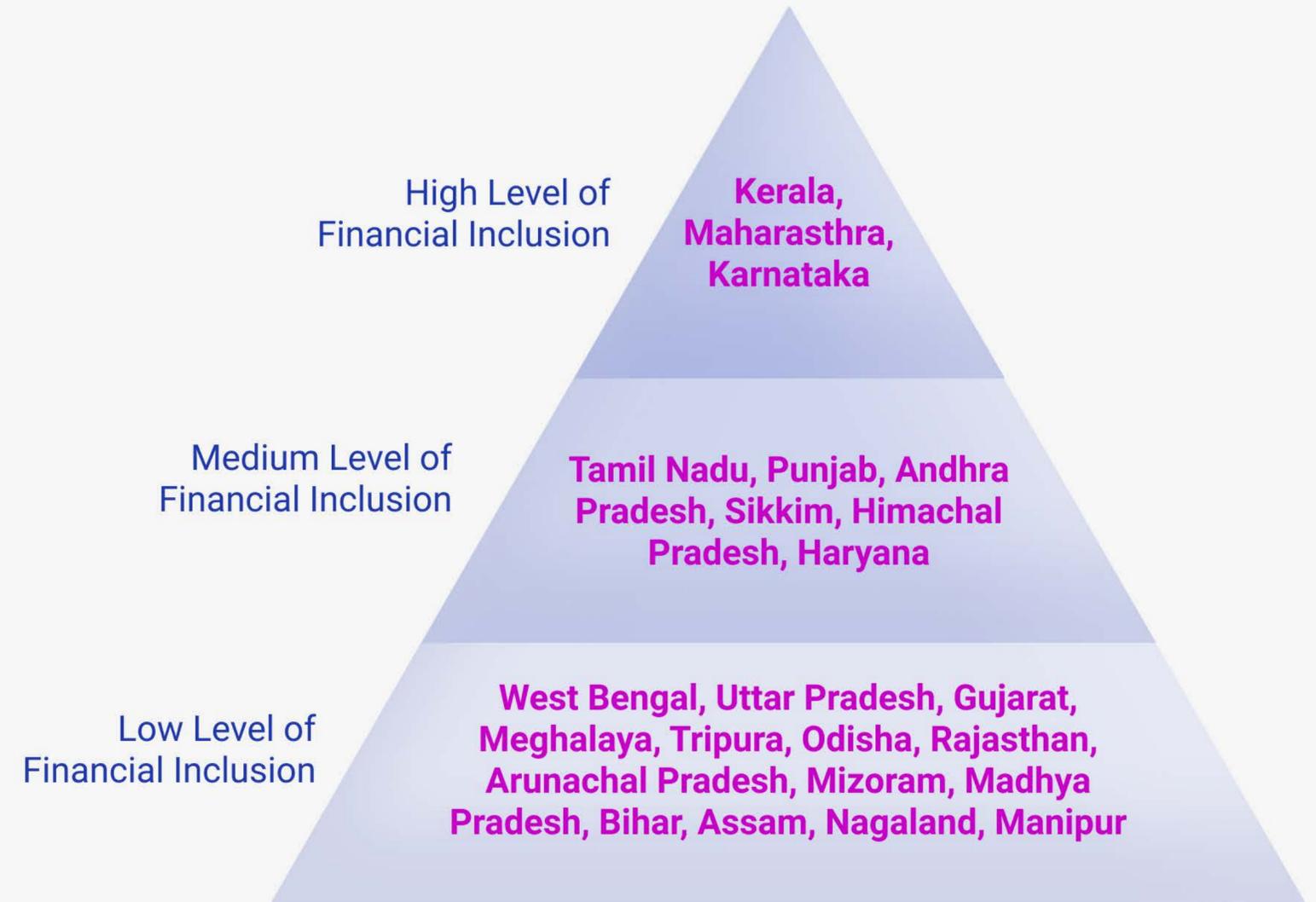
Exclusion of
farmer households
from
formal/informal
sources



Exclusion of
farmer households
from **formal credit**
activities



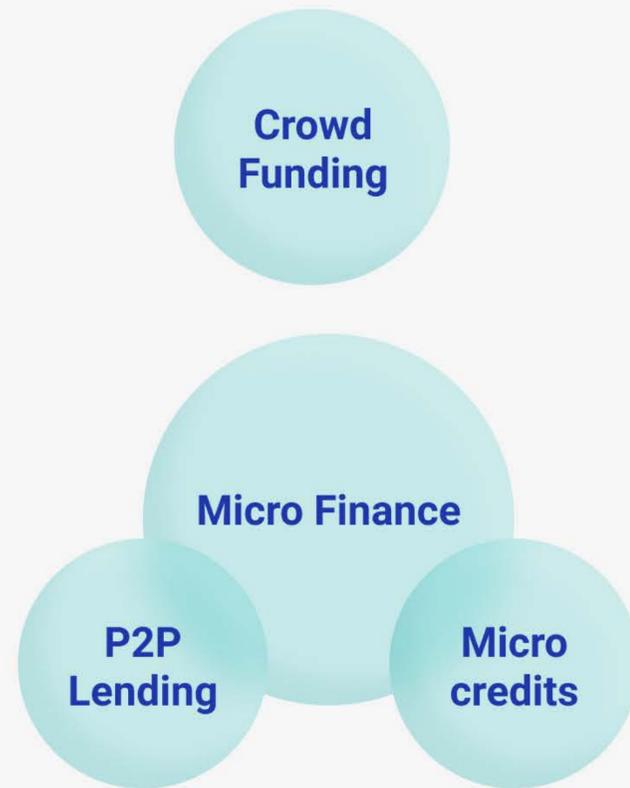
Percentage of
financial excluded
population in
Central, Eastern
and **Northeastern**
India combined.



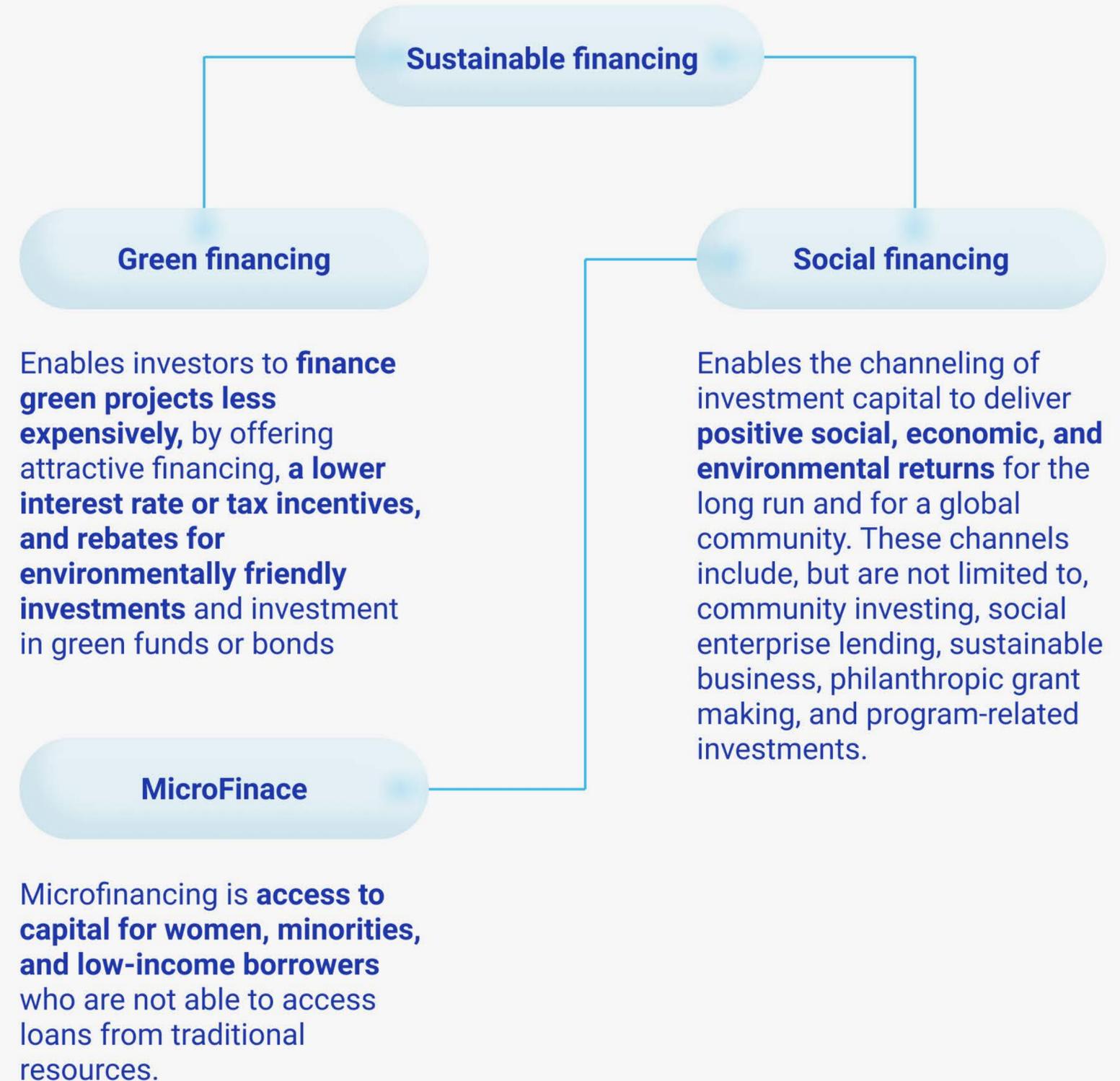
■ Financial Inclusion
■ Pillars



■ Financial Inclusion
■ **Microfinance - A Tool**



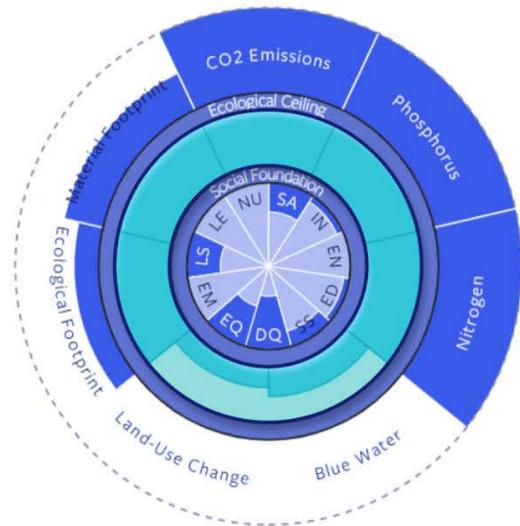
- Microfinance is a **banking service** provided to **unemployed or low-income individuals** or groups who otherwise would have no other access to financial services.
- Microfinance allows people to take on reasonable **small business loans safely**, and in a manner that is consistent with ethical lending practices.
- Like conventional lenders, microfinanciers charge interest on loans and institute specific repayment plans.
- The World Bank estimates that more than **500 million people have benefited** from microfinance-related operations.



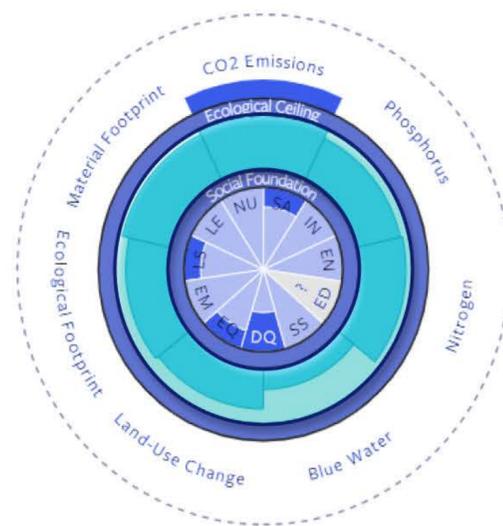
■ Doughnut Economy ■ A Visual Framework Tool

The Doughnut economics, is a **visual framework for sustainable development** – shaped like a doughnut or lifebelt – combining the concept of **planetary boundaries** with the **complementary concept of social boundaries**.

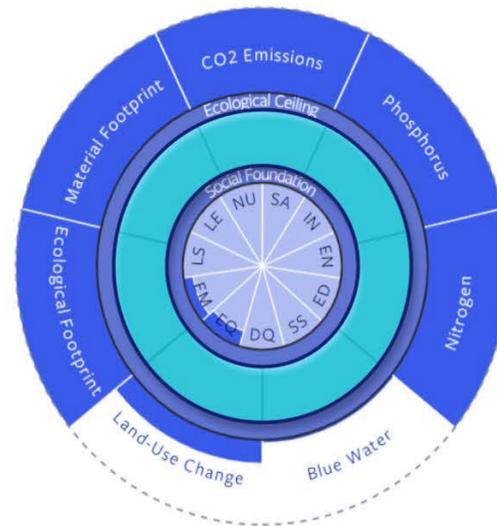
India is not surpassing the Ecological ceiling but the **social foundation is getting depleted**. The social needs in India are not fulfilled. **Human Centric Services needs to be designed** and then carried forward to environmental centric design.



In China the ecological barriers are surpassed as well as the social needs are not fulfilled.

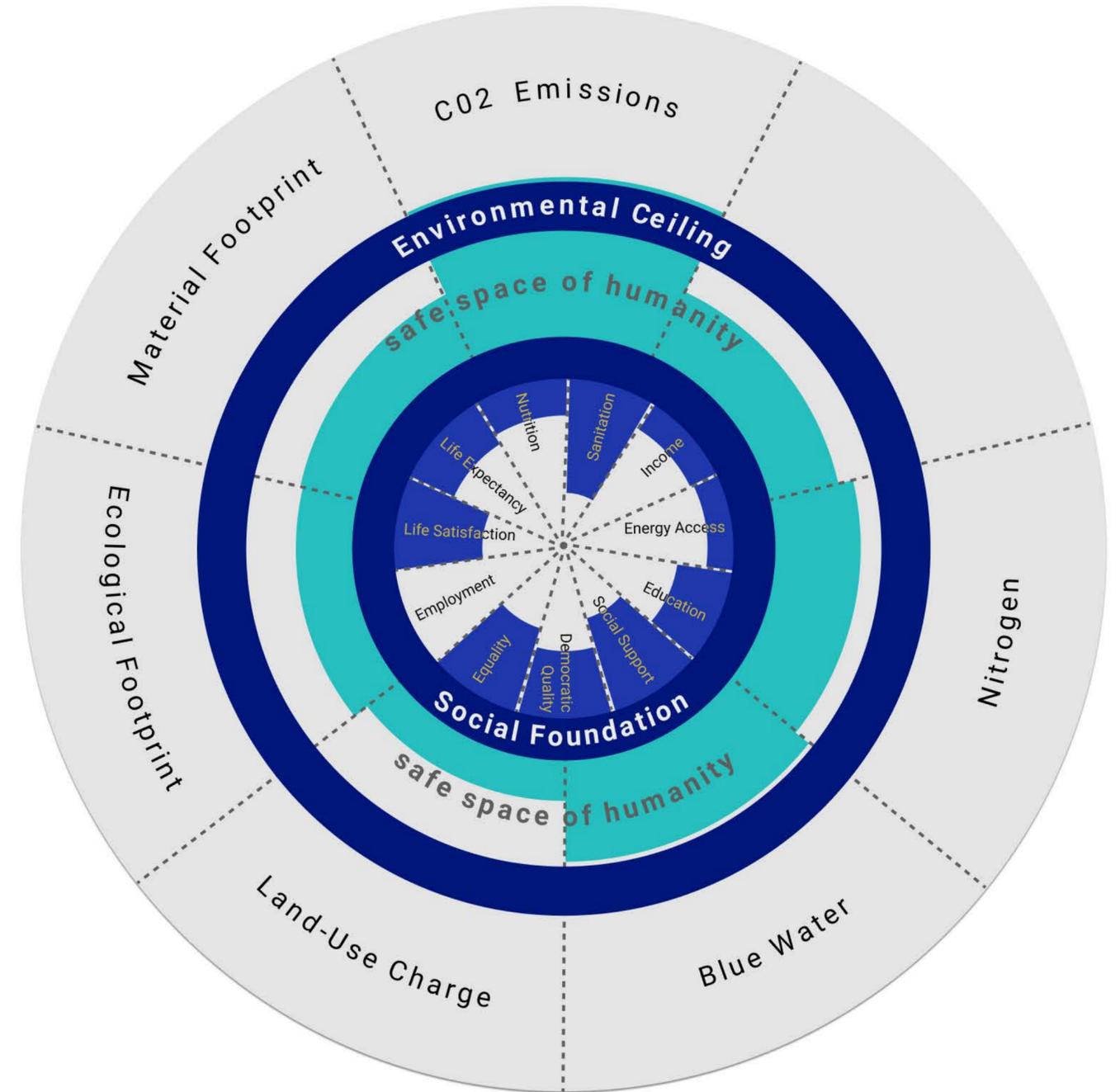


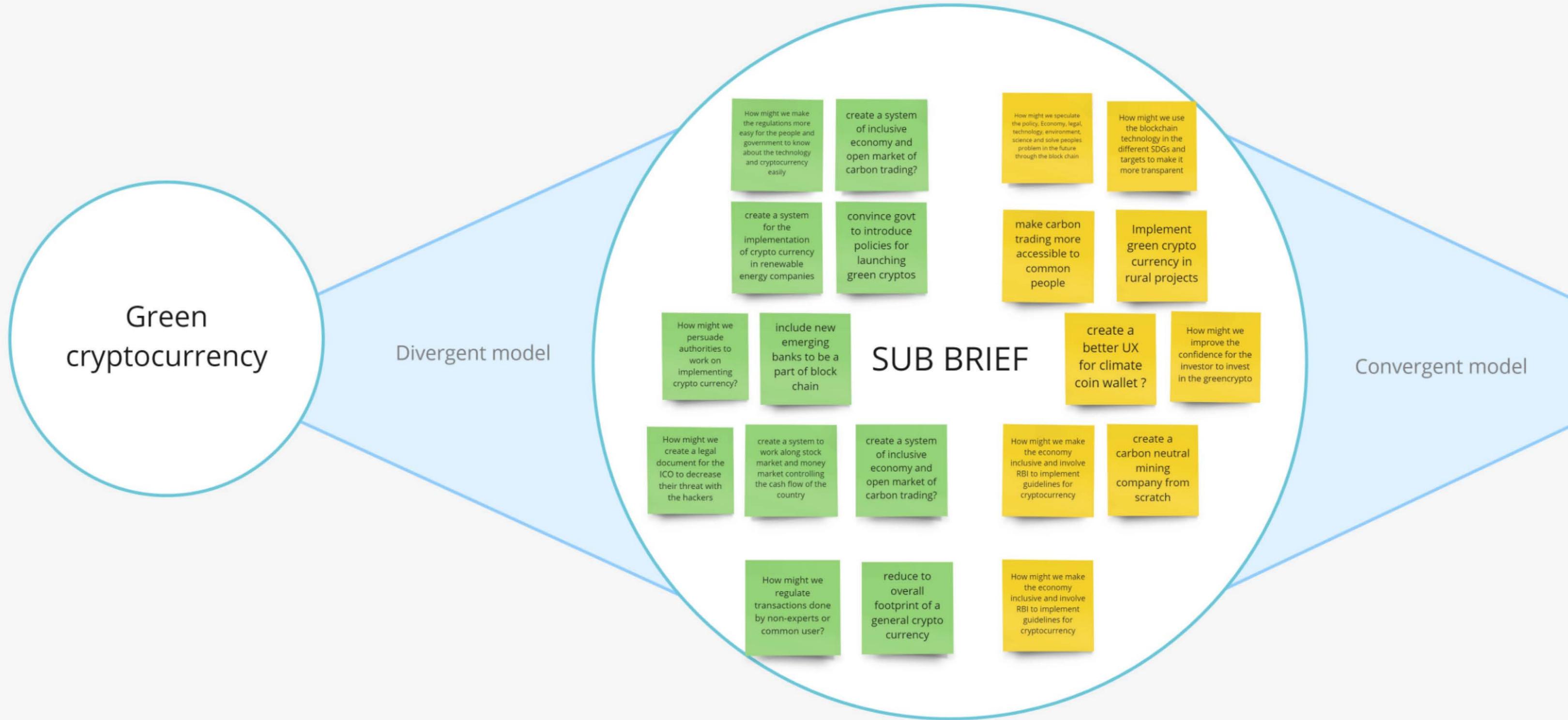
In Vietnam, the economy is balanced among the 4 countries residing primarily in the safe side of humanity



In USA the ecological barriers are surpassed in all areas to fulfill social needs.

Doughnut Economy of India

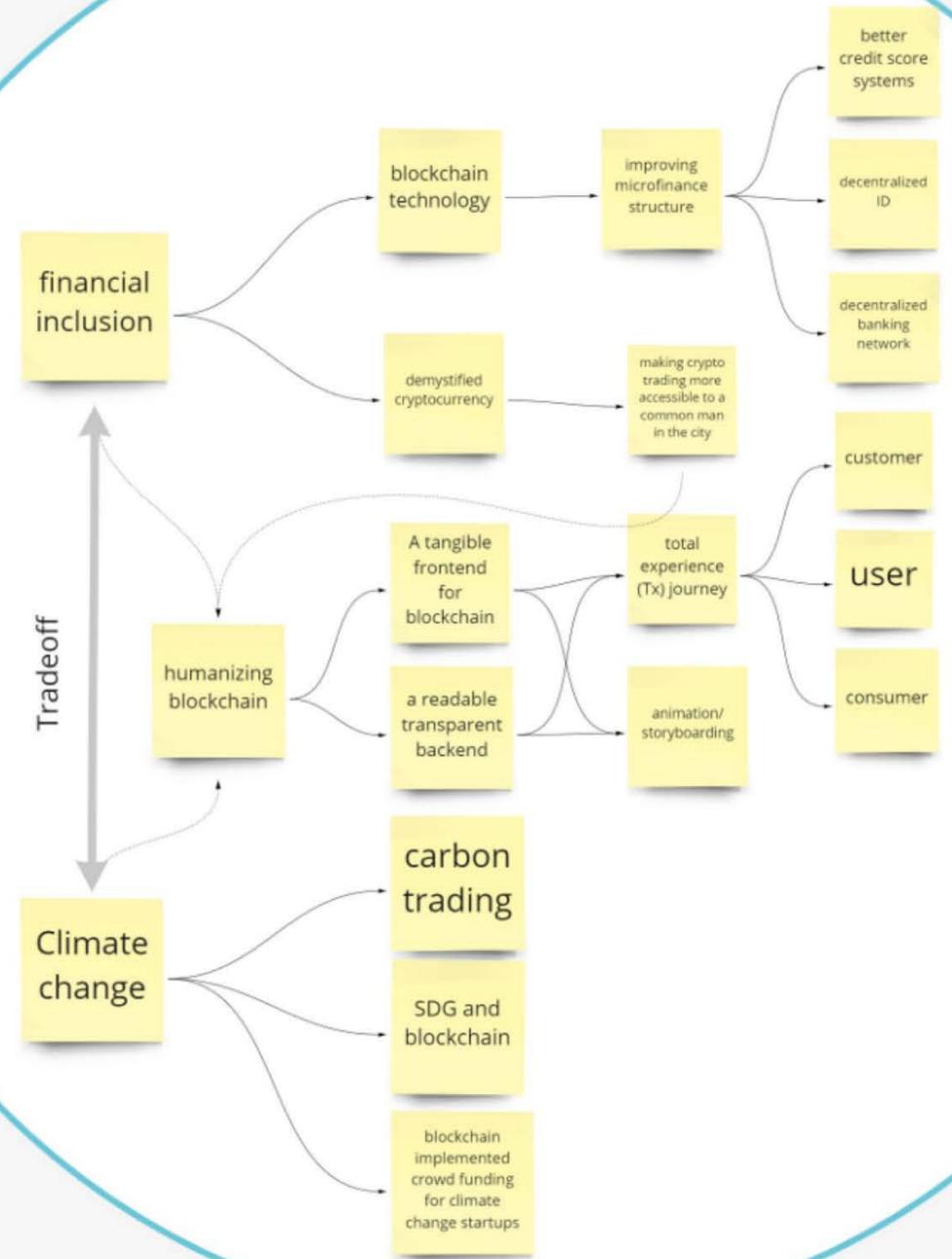




Convergent model

To create a speculative system of **inclusive economy** and blockchain technology of green crypto-currency in the country. The purpose of doing so is to **expedite sustainable and eco friendly activities to create a carbon neutral world.**

Divergent model



■ System Levels
■ Multilayered Structure

**Level 3 :
Climate Change**

**Level 2 :
Financial Inclusion**

**Level 1 :
BlockChain**

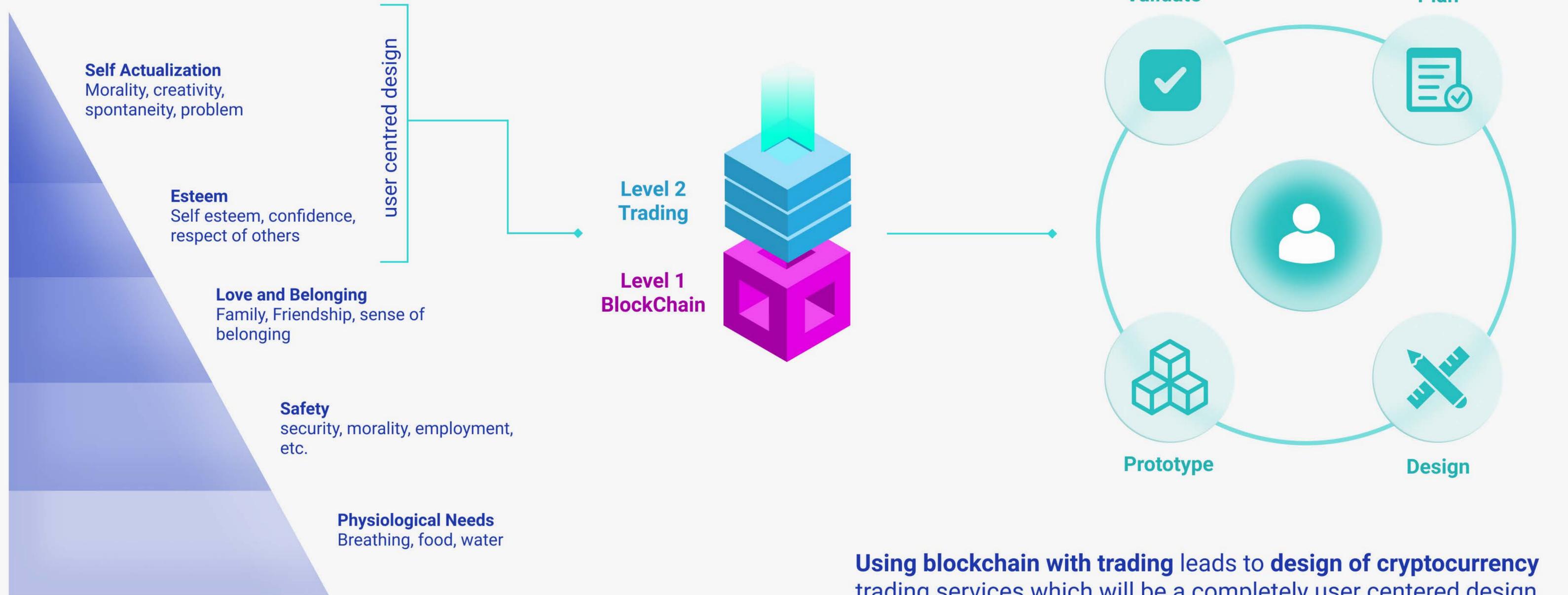


Preventing the activities leading to the **climate change** by providing financial services and access for all.
Creating a cascading positive effect on the environment by providing blockchain based financial services to the communities.

Financial Inclusion supported with block chain technology can revolutionize economic system.
Easily accessible financial service for all, low rate of interest, credit score calculation and decentralized ID for customers.

Using **Blockchain technology** by understanding individual financial problems of the micro level.
This would enhance **record keeping** and **information exchange** in **decentralized network** improving the services at micro level.

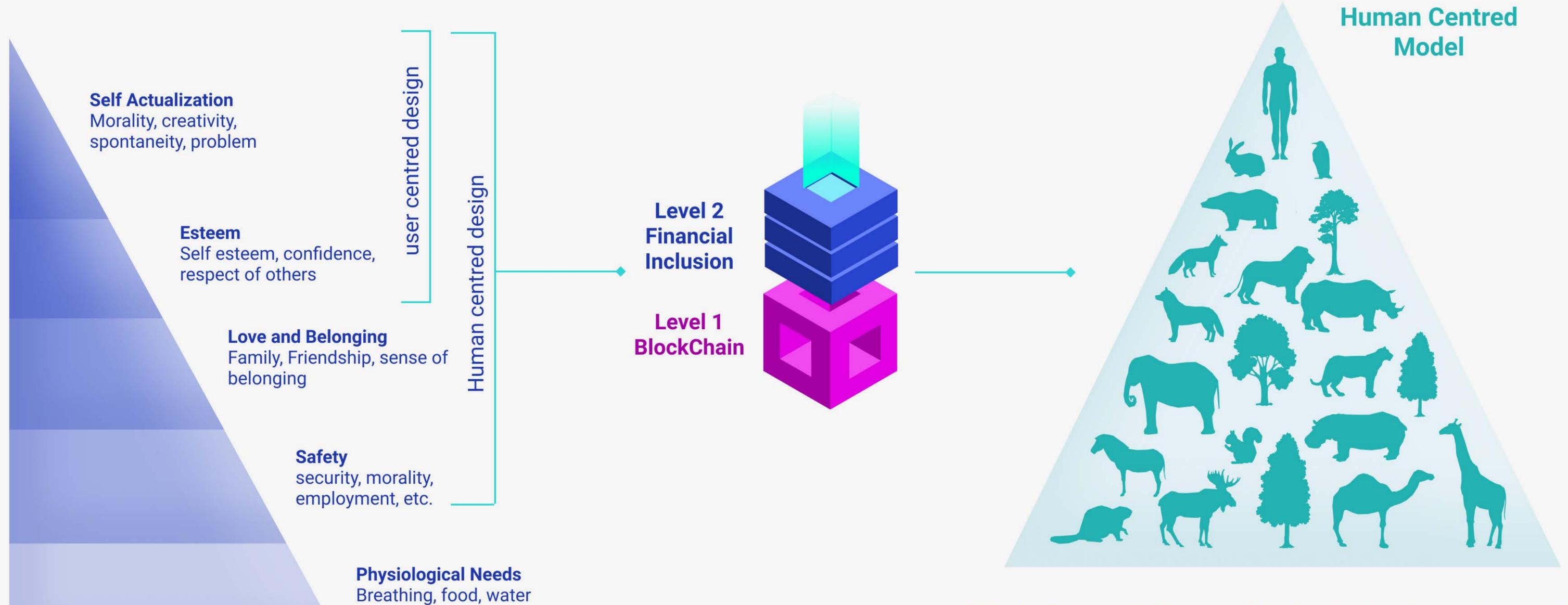
Blockchain technology in System Design
Current System



Marslow's Heirarchy of Human Needs

Using blockchain with trading leads to design of cryptocurrency trading services which will be a completely user centered design. We have a definite target audience (eg. crypto traders) and we will develop service around them.

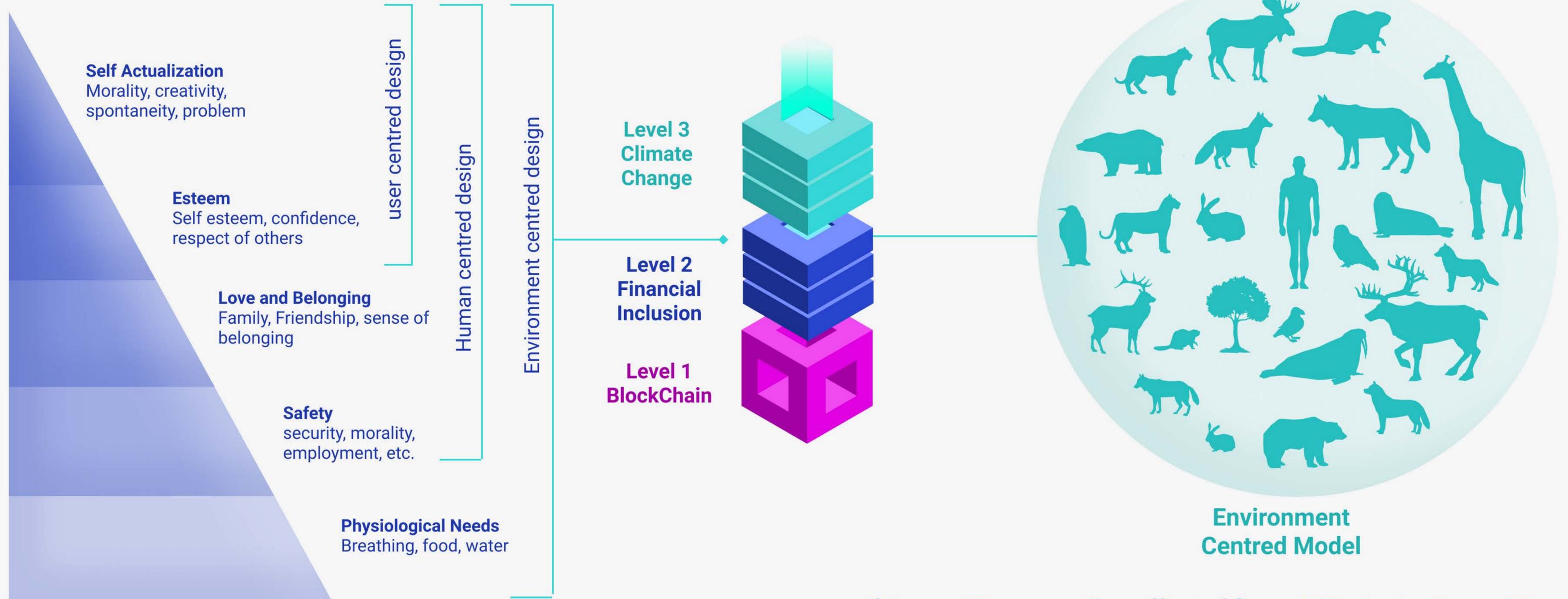
Blockchain technology in System Design
Speculative System



Marslow's Heirarchy of Human Needs

Using **blockchain with financial inclusion** leads to design of **financial services** to the **underbanked and underprivileged** community which will be a completely human centered design. Here, we are developing financial services to **involve all the citizens** of the country **into mainstream economy**.

Blockchain technology in System Design
Ideal Evolved System



Marslow's Heirarchy of Human Needs

If the **positive cascading** effect of **financial inclusion** is reaching the climate change, we will approach to an environment centered design where all the **stakeholders of the ecosystem will have equal role.**



Dr. Tia Kansara
CEO Replenish Earth and hon. FRIBA

Interoperability of government institutes and corporates should be established which will solve a lot of problems like easy system for digital identity (KYC)



Abhinav Gupta
Human Centred Designer in UNCDF

Focus on the converging points to address ground level problems of your focus group. Explore the area of Banking services through WhatsApp.



Sahithi Divi
Director of Mohanam (NGO)

Amul is one of the best established decentralized system where the company is micromanaged and it is achieved without blockchain.



Dr. George Alapatt
Consultant and Country advisor at Cambridge International Education Centre

Agricultural sector of India has a huge potential but very less certainty and security which needs to be addressed.

■ Case Study
■ Blockchain for Global Social Change

Shyft- KYC

Institutions face **lengthy compliance requirements** (such as KYC, KYB, AML and EDD), involving **collecting large amounts of customer data to assess risk**. Shyft's technology **streamlines data collection, reduces costs, and minimizes the cybersecurity risks inherent in traditional compliance systems**. Furthermore, Shyft's "Creditability* system" (Shyft Network, 2019) provides users with reputational scores based on compliance and historical transactions. In so doing, Shyft makes the global economy accessible to the approximately 1.1 billion invisible people (World Bank, 2018) without identities.

Everest

Everest is a decentralized platform incorporating a **massively scalable payment solution**, EverChain, with a multi-currency wallet, EverWallet, and a native biometric identity system, EverID. Everest delivers a complete solution for a new economy

Ibisa

Ibisa is a **risk-sharing service; an alternative to micro-insurance**, targeting small farmers worldwide. Based on a **peer-to-peer architecture supported by Blockchain** and Earth Observation technology, Ibisa reduces costs typically incurred by traditional **insurer-centric paradigms** making protection affordable and accessible to 500 million of small-scale farmers worldwide. The service is enabled by an ecosystem of stakeholders governed by a Distributed Autonomous Organisation

Agridigital

AgriDigital has used Blockchain-enabled technology **to create frictionless systems** for the grains and cotton industries globally. Formally launching in March 2019, **farmers are assured they continue to own their commodity right up until the moment they are paid**, solving the problem of matching delivery to payment and opening up flexible financing options

ID box

The IDBox is a solution for last mile populations but could be used worldwide. It **provides a network of identities that everyone can access, no one can control and cannot be shut down**. The core usergroup of the IDbox device is last mile populations where the electricity grid is non-existent and/or unreliable.

Hive online

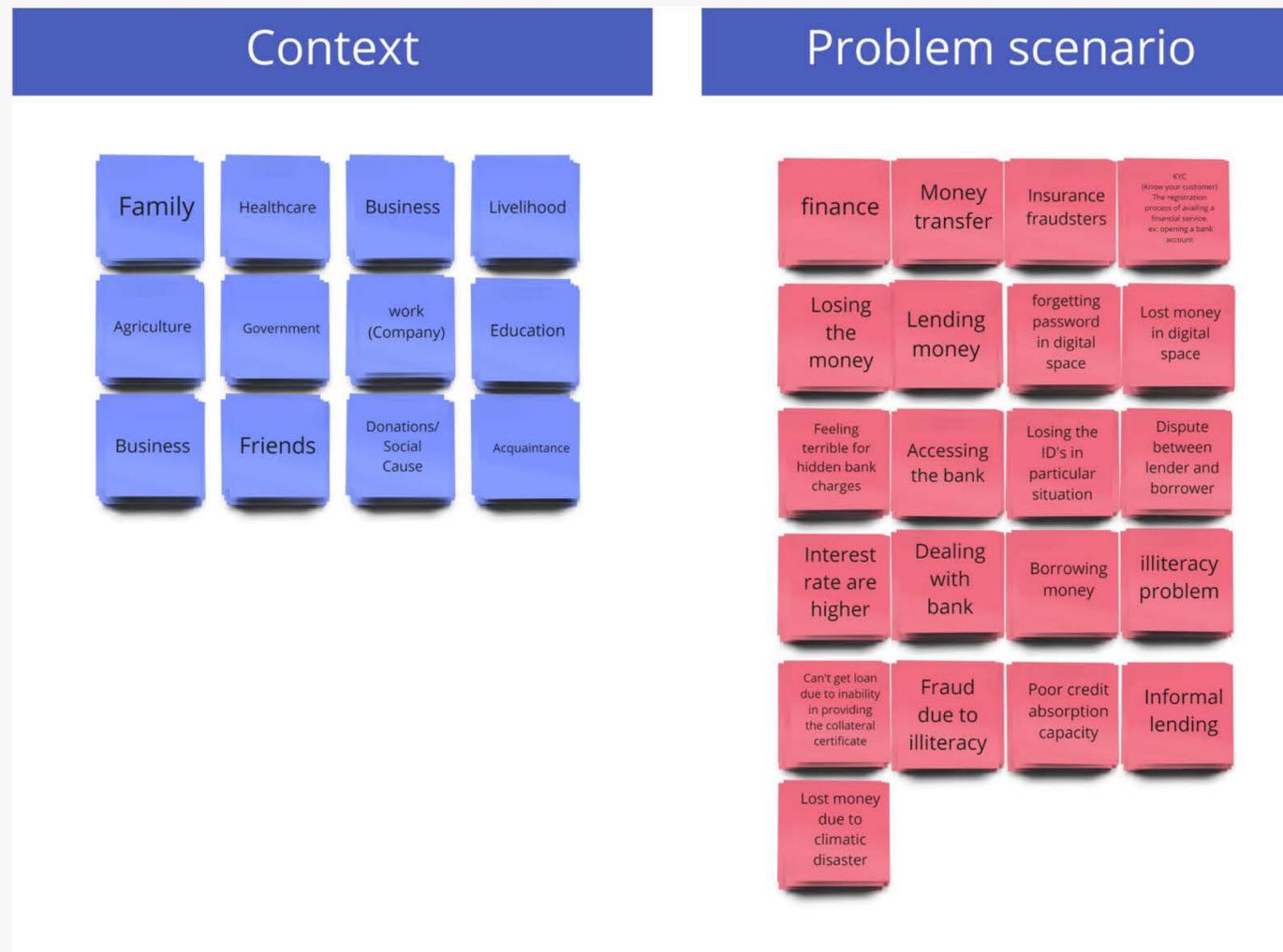
Hiveonline is building several **financial inclusion models**, beginning with the **Village Savings and Loans (VSLA) process**. VSLAs are small businesses with mini-funds – they (80% women) input a small amount into the savings pot each week and use the pot to lend at interest.

GIVIT

The Givit project is a scalable global platform which **shifts the paradigm of giving from charity to venture philanthropy, all powered by digital currency**. Using the concept of venture philanthropy, a new class of donors – who were previously unwilling or unable to part with funds – is engaged with the incentive of a possible return by creating a digital currency ecosystem powered by Blockchain.

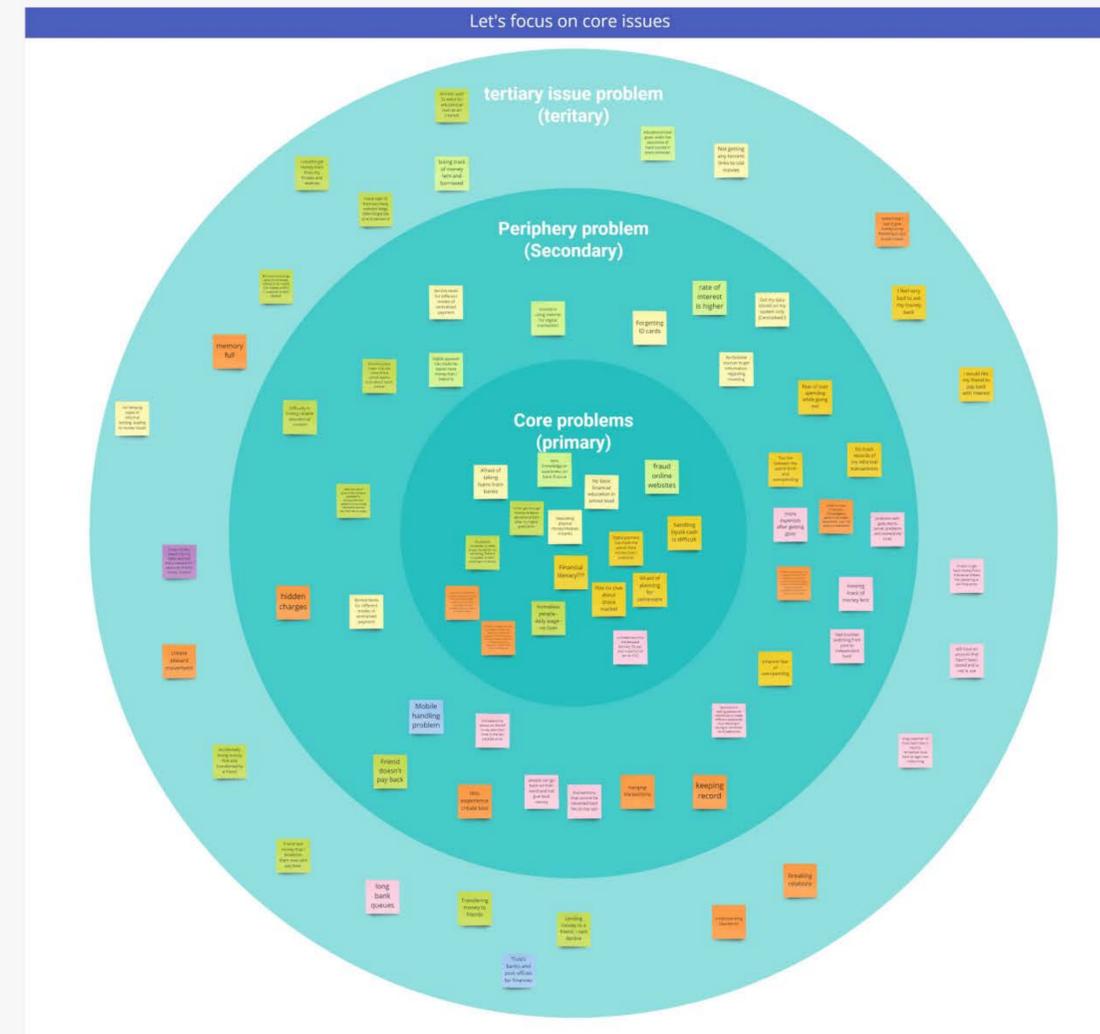
Design Sprint Workshops

Session 1: Their personal experiences with finance



Context and Problem scenario cards

- Participants shared their personal experience with finances
- Cards to trigger a memory



Identifying core issues of a common person

- Identified participants core, periphery and tertiary issues
- Identified problems that need urgent attention

Design Sprint Workshops

Session 2: Empathetic Brainstorming



It was a rainy night, most of the village of Kachipada in west Bengal had gone under the flood. Piyush lives near the riverbank of the river Ganga.

At the middle of the night, Piyush heard a howling alarm stating the flood warning "people of the village Kachipada, this is the flood alarm, those who live near the riverbank please safeguard your life and move to higher places". After hearing this, Piyush suddenly got up from bed and called his wife to get up. By this time, water covers half of his hut.



Both Piyush and his wife started panicking and Devika asked "What to do now?". Piyush asked Devika to fetch their savings and leave all other stuff there itself. Devika took all the money and left the place. While moving out of the house, they helped the neighborhood people around. Now due to sudden increase in flooding, they are forced to get out of their place. By the time they reach the highest place, their entire house is washed away with flood.



Next morning when everyone was stranded on the Highland and in the mountains, Piyush and Devika decided to stay with other people of the locality. The government had taken a lot of responsibilities by providing food and access to stay for the people of these localities. Then after 2 days the flood got reduced. People started to move from highland to their houses to see whether anything was left for them but it all went wrong. By watching all these situations, the Government and Central Bank decided to help people by giving some incentives to build their houses. Government officials and bank workers started reaching out to people to give their incentives.



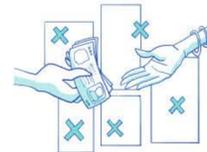
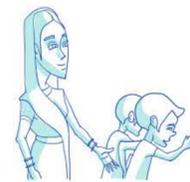
But the problem for Piyush and Devika is different: they lost their ID's and bank accounts in the flood. Now Piyush and Devika had started blaming each other for losing their ID's, they had lost all their incentives and their ID's in the flood which may help them in the future. They tried accessing the bank, but without any single document it is difficult for the bank to process their incentives. Now everything is set to waste, Devika and Piyush had no hope with the government and became unidentifiable and untraceable.



Aravind is newly married and moved to a new city to join his new job as a mechanical engineer. He receives his Salary regularly and has a track through salary slips and also employment contract to prove his work status hence his financial history is well managed. He will get his creditworthiness score through the Credit Bureau and so he can easily apply for loans from any financial institutions as they can decide his loan worthiness and provide him with the amount required.



Usha is a wife and mother of two who works as a construction helper in a metropolitan city and lives in the outskirts of the area. With the help of her husband, who is a Vegetable vendor needs to take care of two of her children. She receives her daily wage via cash payments and her employment is trusted upon verbal agreements only. Since she does not have any financial records or employment status records, she would not get her creditworthiness score and hence no financial institution is willing to provide any financial services to her.



Usha's son is severely sick and admitted to the hospital. He is not insured and a small surgery is required to treat him. She struggles a lot and somehow borrows the required money from a local loan shark by agreeing to pay back with 200% interest. Whereas Aravind is getting spam calls from all the financial providers to avail their credit/loan facilities for the rate of interest less than 10% but he does not need a buck now.



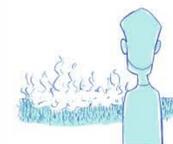
Ramu, A farmer in a village in North India, lives with his family. He dreams of growing tomatoes in his leased farmland. He takes an agriculture loan for his initial investments and spends all of it growing his crop. But still, there is one catch.



His village is monsoon-dependent and Ramu who is unaware of global climate changes is eagerly waiting for rains. But this time due to adverse monsoon effects, there was no rainfall and so his plants dried eventually.



Ramu was left with nothing as all his old savings are also dried out. Ramu knows that to do farming in the next season he only has a week.



He needs to stubble the old crops and needs to plant new seeds. He had no money to recover the loan that he has taken from the bank. But somehow he had a hope to lend his hands to his peers but that too went in fail. Now the bank blacklisted him as they are not receiving timely payments. At the same time without money, he has stubble fire the old crops, where he is pushed into emitting the CO2 into the environment.



Now Ramu is left with no other choice but to pray for his family. His financial records are completely damaged and he is being excluded from getting any financial facilities in the future. Whom should we blame here? The climate? Financial institutions? or The people/ourselves who were responsible for the destruction.



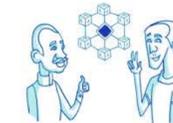
Sunil owns a handmade toy-making facility with a capacity of 20 handicrafts persons. They are known as one of the best handmade toymakers in India. They are extremely talented and dedicated to the craft. This business is confined to the local market. They don't prefer to sell their products online as there are many cut-offs such as listing fees, platform fees, transactional fees. Adding fuel to the fire, the unique toys have to compete alongside many cheap replicas and mass-produced items that eventually decrease the price of any potential offer.



This is Ashok, he appreciates unique and handmade items but it's difficult for him to be certain of their authenticity online.



The solution to both people is blockchain. Where a crafter's identity is verified, the authenticity of each item is guaranteed, eliminates all the unfair competition like mass-produced and knock offs.



But the craftsmen are not so good at managing complicated Technology-based applications. They require training, knowledge and all the stakeholders adapting to the new system is a troublesome task. How can we simplify the process?



As covid19 had put the entire world into a scourge for the past 9 years. The biodiversity of the entire planet has changed. The planet becomes healthier, both flora and fauna had been nourished. But the economy of the entire world had come down.



This didn't leave India too. There was a financial crisis everywhere and at the same time, the bitcoins had become more popular, where seventy-five percent of people started trading and holding the coins. So UN and UNDP come up together along with the global economic leaders to change the structure of the economy.



After the downfall of the 2024 economy, they see there is potential in cryptocurrency. So they announced the crypto coins as the official coins in the hope that it will benefit all layers of people in the universe. India which is socially unstable but climate potential wise becomes more stable has no choice but to take up the challenge of crypto coin. The Indian government had to accept the change where it also sees the elimination of the middle man in cryptos which may take the country to a utopian situation. They released a new set of coins called Indiacoins especially for the Indian people.



Gayathri who lives in the town of Pondicherry works as a teacher in a government primary school. During leisure time she works with her colleagues in the NGOs along with candle-making artisans. Sudden change in the monetary system put them all down. Meanwhile, a fintech startup company come up with a plan for the women's community and self-help group in maintaining the ledger and money. But as there is no experience among the people there is no trust in the fintech companies idea. And also it is very difficult for the community and peer-to-peer support to know the knowledge about crypto coins.



Empathising through story telling

- Created empathetic atmosphere through story telling
- Analysing the problems of financially excluded
- Brainstorming solutions in their perspective

Design Sprint Workshops- Deliverables

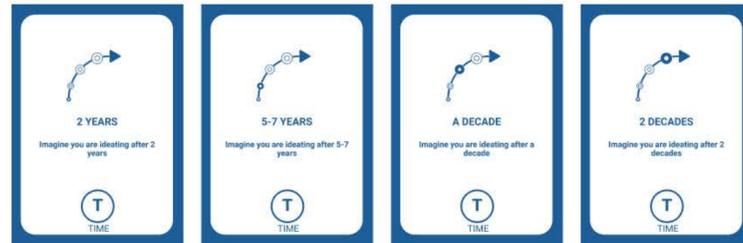
Session 3: Speculative thinking

ATOM Cards



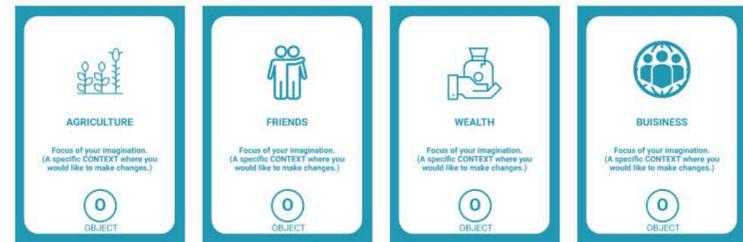
ARC Cards

- Indicates condition of society
- Ability to imagine different scenarios



TIME Cards

- Indicates time period to speculate
- Imagining oneself in the future time frame for solution



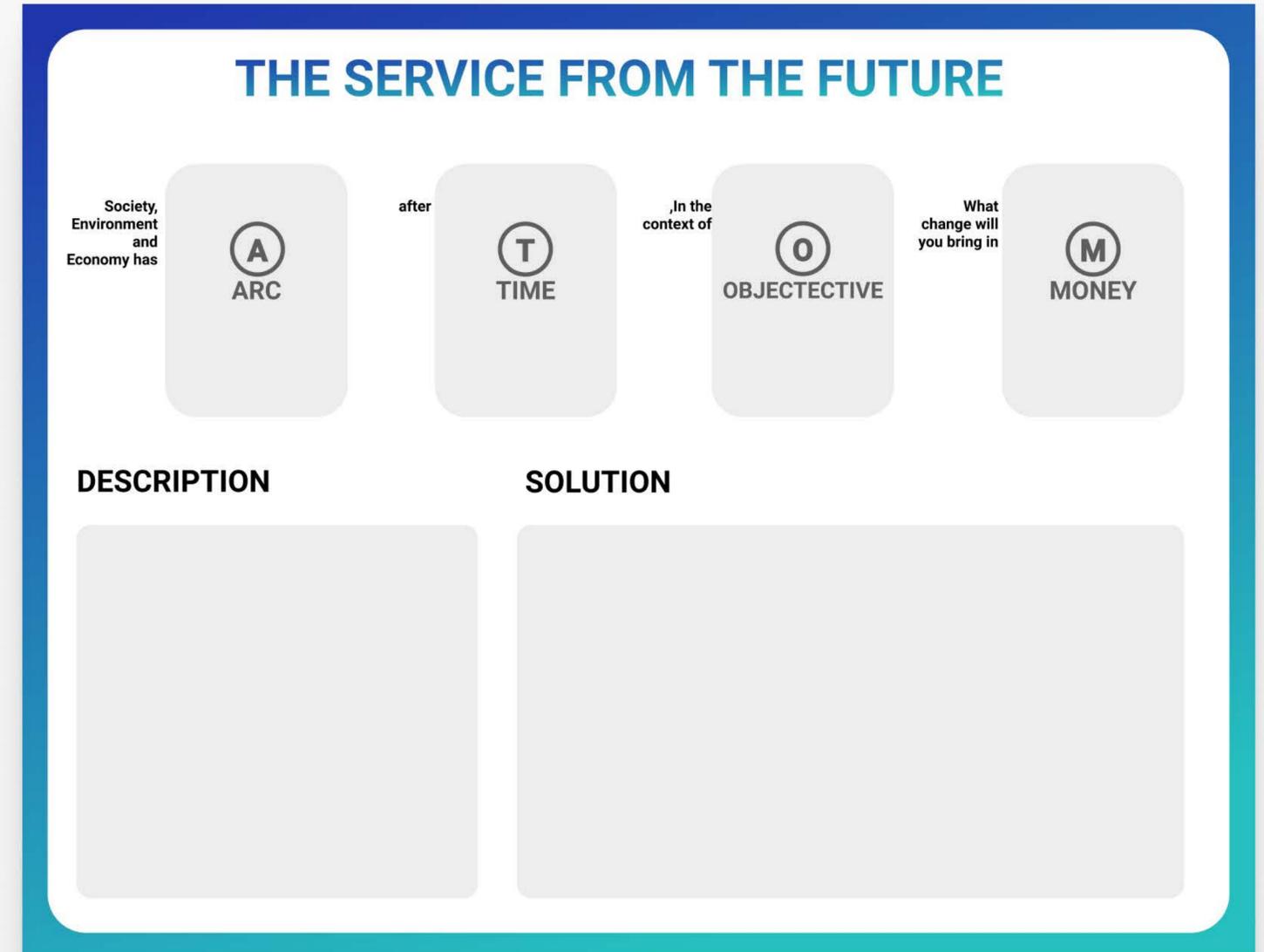
OBJECT Cards

- Gives a context where the service exists
- Easier to imagine a scenario where problem is identified



MONEY Cards

- Financial service involved in the context
- For identifying issues in particular service



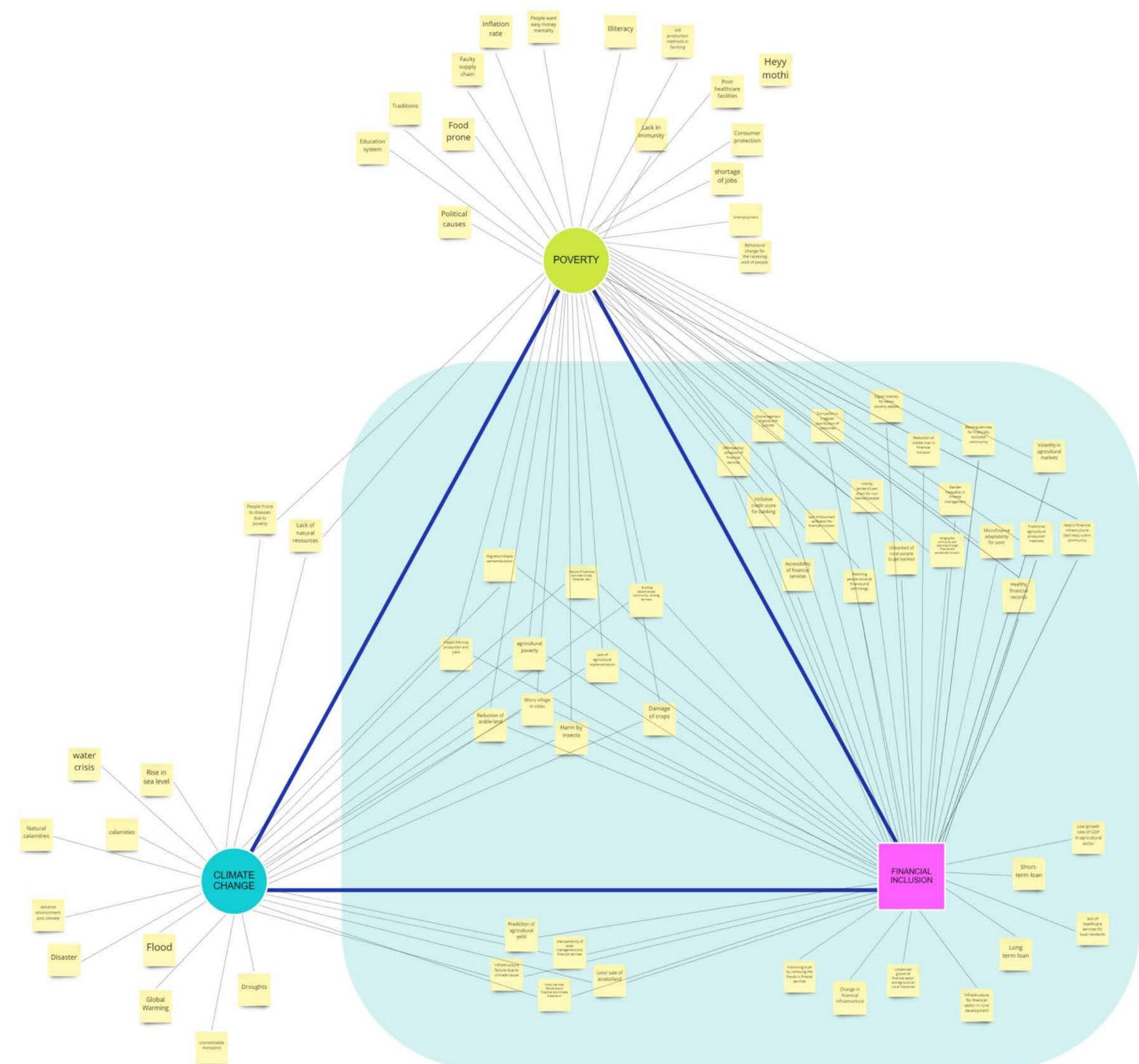
Speculating a service

- Arranging ATOM cards from the pile in card
- Describing participants problem area speculated
- Framing and ideating the solution with respect to selected service from the future
- Cards as deliverables for

- Problem areas
- Meso and micro level problems



Clusterizing the problems



Problem areas

- Micro level and meso level problem of the farmer is taken down by doing the research.
- These problems are the clustrised into three categories: Climate, povety and financial sustainability
- Climate and poverty are more concerned to social issue, financial stability and financial inclusion are one which is in need of concentration to tackle both social and ecological issue.

■ Key Areas

■ Evaluating Micro Problems



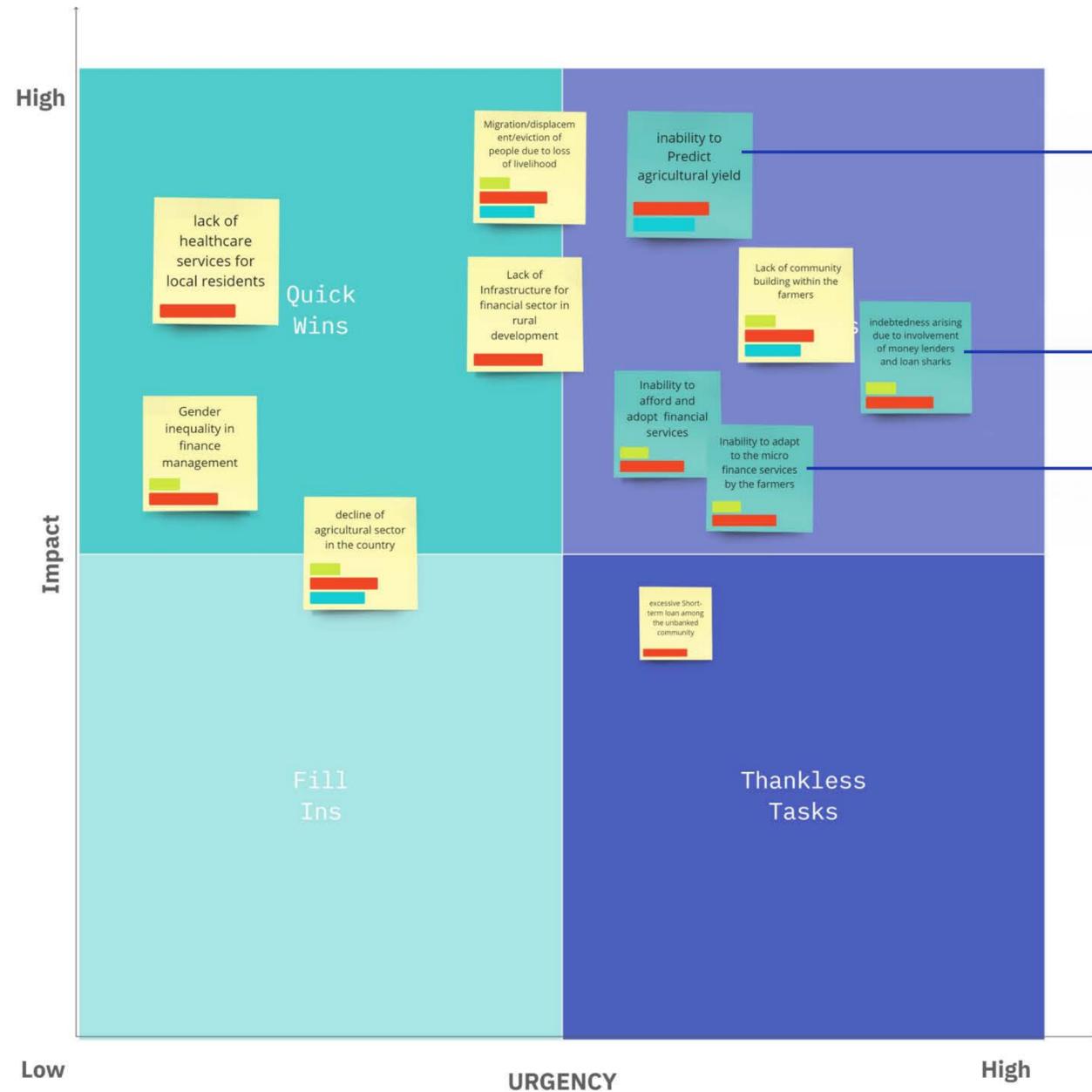
There were 84 insights that we got after the expert sessions. We divided the problems into areas of **Financial Inclusion, Poverty and Climate change**. To shortlist it, we created evaluation matrix and evaluated each problems against the following factors having respective weightage

1. Financial exclusivity (5)
2. Impact on Poverty (5)
3. Impact on Climate Change (4)
4. Feasibility to Solve (3)

Total Impact score was calculated by providing individual score against each variable. These are the shortlisted problems having the **maximum impact** and **urgency to solve**.

- Synthesizing the key areas
- Direction

Problem prioritization matrix



Farmers inability to predict the agriculture yield and inability to track the goods and economy once it is taken by the trader.why?

Why farmers are going to loan sharks and the middle man for money and to sell their goods?

Small scale farmers are unable to adopt the banks and microfinances.why?

Problem areas

- We then narrowed down these problems based on the urgency to solve and on the higher impact.
- Finally we took three direction which interest us more.

- Focus area
- **Loan shark and Middleman**

Why farmers are going to loan sharks and the middle man for money and to sell their goods?

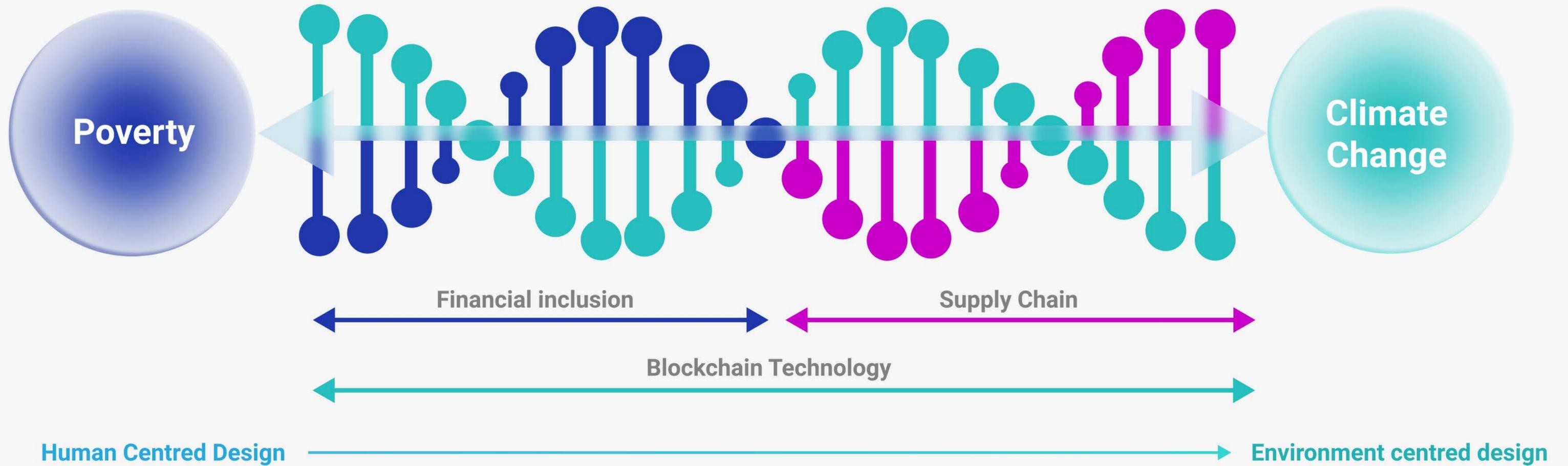
Why farmers are going to loan shark and not to banks?

- goals are short term and not long term
- easily gets urgent money from money lenders in village
- cash or physical money is easier to understand for them
- people trust people more than faceless organization
- low access to bank
- distrust of banks
- high fees
- confusing service
- Procedure is difficult
- better taking loans from community as they will help in daily life
- Takes time to process the loan
- aware of loan sharks due to word of mouth
- Need collateral to take more loan
- fearful to adapt new tech
- Banks wont promote small amount
- Personal loans have limits
- Loans available from banks do not meet their requirements
- Fear of bank process
- Need minimum education to go to bank
- money flows based on the season
- People don't have collateral to take loans

Why farmers are going to middleman while selling the goods and why are they not directly selling it in the market?

- Farmers didn't know how to sell goods in the market.
- Lack of forming the community
- Need quick money for their goods
- Need of selling the goods as soon as they get their yield
- Small scale farmers cant provide transportation
- middlemen provides human resources but farmers cant
- Middleman doesn't depend on yield but farmer depends on yield
- Trust on middleman
- Fear of market whether the goods will sell or not
- Middle man sometimes acts as a quick money provider
- Fear of technology
- Fear of the first quality goods.
- Knows the market but still depends on the price given by middleman
- Even uneducated know how to get the money from middleman
- No able to keep their yield as they need proper land and investment
- Have a taught that they will get money somehow
- If not going well farmer will change the middle man

- DNA Model of the system
- Visualizing the Wicked Problem



Poverty and climate change are cause and effect of each other. Solving this issue is as complicated as sequencing a DNA. We know that one helix is blockchain which can be used throughout the system. **Financial Inclusion** and **supply chain** can bring out the socio-economic impact of **blockchain technology** in the form of services.

Blockchain crowdsourcing system for climate change startup



A decentralized web services to provide funding to the startups who are working on climate change. Investors gets to monitor the carbon footprint and efficiency of the startup as well as have a stake in it



Sustainable financing system



There are lots of risks involved in technology of green projects. Hence, Investors and the revenue available for green projects at present is limited. Through financial inclusion, if we could include everyone to avail financial services and educate them financially so that we provide them financial services like micro insurance and pension fund schemes with nominal price . Since the pay off for these schemes takes decades, we could deviate the funds available to the green projects at present.



DApp for documents and KYC



Major problem in financial inclusion is that people do not have proper documentation or identity. If whole system of documentation of personal details and reports are decentralized using Apps which has decentralized network, they are secure, personal and will make the KYC process seamless not just for banks but also with lots of other institutions.



Involving Loan sharks in microfinancing



It is very important to eliminate the loan sharks from the system and hence there has to be strict rules over the credit system and they could be allowed to involve in the microfinancing schemes directly. A behavioral change has to be brought in the mindset of loan sharks.



AgriTech - Decentralized Supply chain



There are lots of risks involved in technology of green projects. Aggrotech is the modern solution in field of agriculture. But farmers are the least one to the minimum amount of wages. Decentralization of farmer and the consumer community can bring them to together and also increases the money flow easily.



Access to Knowledge to everyone



Open network has many capabilities. Open network means everyone has right to access the information from everyone. The community where inventions and technologies are shared with everyone, has lots of capabilities to grow faster. Hence economic growth will be high and more people can come together to share knowledge and share the resources



NFT Based Asset Management



Tokenizing farm lands by converting that into asset in NFT Marketplace. This will reduce the paperwork and time to trade lands and farmers are benefitted from this. The value of land can be quantified by its fertility and yields and it can go owner to owner. The IDs of each owners in that chain of purchases will be preserved hence creating a way to make farming land more liquid and create a decentralized ID for farmers and land owners.



Decentralizing the banks



If we could bring together all the banks and agree to convert their centralized system into decentralized by sharing it with all the other banks, it would make all the services seamless decrease frauds. This could happen all over the world to make global banking services available for everyone.



- First Pilot Service on Environ
- **The Final Brief**

WHAT

1. Building a new **structure for microfinance** for **last mile community** and adopting them to it
2. To create a **transparent supply chain** for farmers for yield to avoid volatility

HOW

Using **blockchain technology** for providing **microlending** services to the farmer
Using blockchain technology to provide **agricultural supply chain service**

WHO

To the **farmers and cultivators** of **non replenishable crops**.
Initially for study we took **paddy cultivators** with **<2 acres of land**.

WHERE

To be implemented in the **rural areas** aiding **agricultural practices**
Initially for study, we took the region of Thanjavur for paddy cultivation.

WHEN

In **different cropping seasons** throughout the year
Our prime objective is to **provide services** to **give confidence to the farmers** for **cultivation in non-cropping seasons**.

WHY

To create an **inclusive decentralized economy** and sustainable community.

₹ Farmer is in the need of the urgent money he approaches to environblock ICO



Farmer call/
whatsapp message



Farmer submits the
aadhaar and the land
document



Environ is a decentralized network company which works on the microfinance and the supply chain system

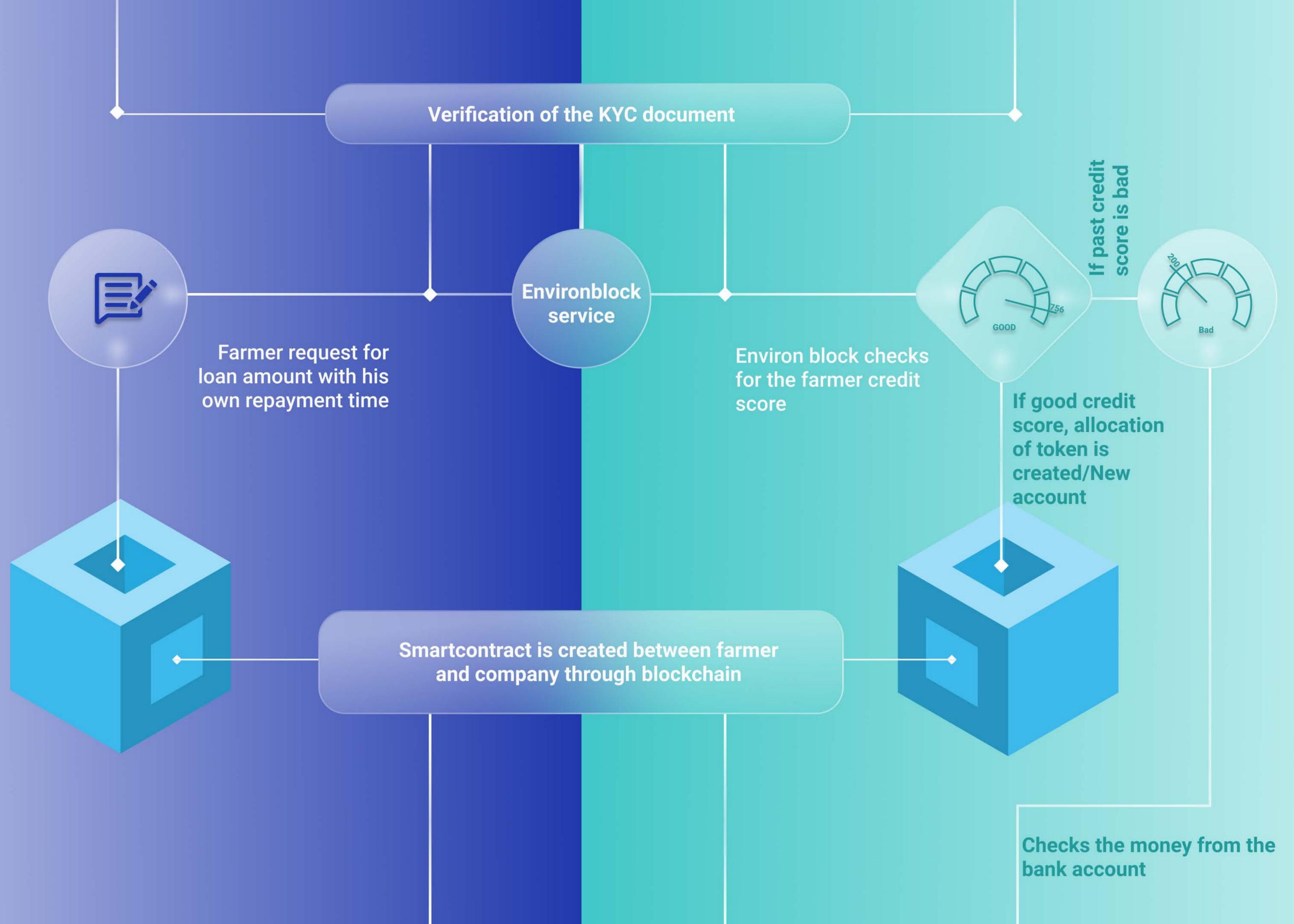


Ask for farmers details

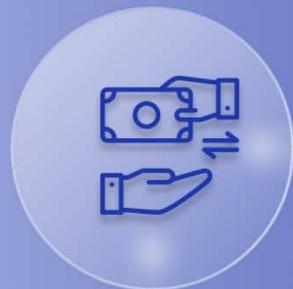
Gets the details of the farmer



Creating decentralised id



Farmer receives the payment from environblock through banks and bank accounts



Money collection

Farmer pays the money back automatically through local banks/ through bank account



Payment

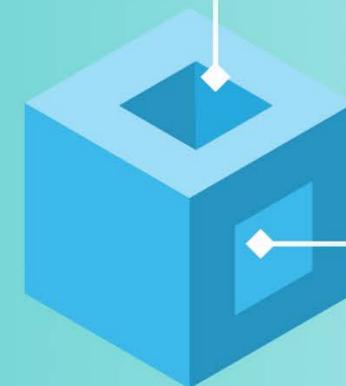
Remains for the next loan



No money, the mortgage amount is added in credit score and increases the interest rate for the next loan



Checks for the supply chain service data



Creates new smart contract for next loan

Stages	Registering	Uploading the docs	Requesting for loan amount	Getting the loan amount	Marketing update	Requesting for collection	Collection of money	Future investment
Physical evidence	Toll free number App		Decentralised ID	Receiving the token	Selects the repayment time	Nudge message is delivered		New nudge loan is delivered
Customer Action	Farmer call environblock Registering in app	Registering the aadhaar card number	Request for micro loan	Entering the otp and farmer receives the message about getting money in decentralised ID	Receives loan amount in messages	Customer will get alert notification and checks the due amount	Customer pays the money Customer doesn't pay the money	Asks for next loan Credit score is added and interest rate becomes higher for next loan <i>Line of interaction</i>
Front stage interaction	Support chat	Confirms the aadhaar number and phone number	Entering the loan amount	Order goes to bank and farmer gets the money through kissan card ATMs immediately.			Pays money through banking Time extension period can be chosen by customer	<i>Line of visibility</i>
Back stage interaction	Respond to chat in call/whatsapp Getting credentials	Searches for specific farmer related data like land revenue doc, pan etc from other websites to get other information	Checking for regularity of payments and credit score Checking for past block transactions	Smart contract is created and asks farmer for repayment time	Adding the data in the block		Debts will be increasing New time is added with new interest rate	Next loan is provided <i>Line of internal interaction</i>
Support process	Analysing the data about farmer/ seeking permission to collect data	Added datas in blockchain	Allocation of new ICO tokens and verification of tokens	Loan amount and time embedded in smart contract Contract decides the rate of interest though credit worthiness of farmer	Gets the market data and collaborates with the environ block		Update in smart contract and supply chain app	Stores datas in environ block

Farmers doesn't know how to sell goods in open market. He is unaware of where his goods are going

Middle man provides transportation and warehouse services to small scale farmers which farmers cannot be provided

Companies try to procure raw materials for cheaper prices. It tries to seek middlemen and traders to procure materials

Environ is a decentralized network company which works on the microfinance and the supply chain system



Farmer



Middleman



Company



Environ

Community forming through Dapps



Searches for the local farmers community

Connects through Environblock Dapps

Companies, open market, customer and whole saler



Searches for goods to procure



Collects the data of farmers supply and companies demand data updates in Dapp to show the trasparency in price to all



Provides Dapp services to the community

Bidding arena where bidding of goods takes place



Gets the data of bidding and provides the bidding space

Bidding happens between minimum and max selling price



Blockchain make the bidding transparent and makes each bidding in added in the block

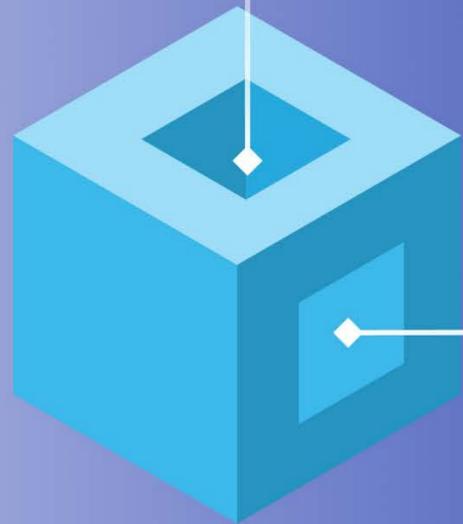
Yes, bidding is done

No bidding is lost

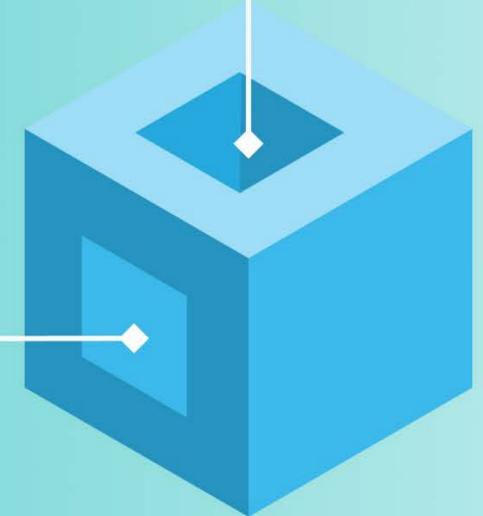
Looks for next bid



Company who won the bid will get the yield/goods.



Deal is made in smart contract on Environ blockchain



Farmer and middleman gets the money through smart contract



Smart contract gets cancelled once goods received in warehouse



Stages	Registration	Community forming	Deciding the price as community	Bidding arena	Creating smart contract	Distribution of goods to the company	Returning money to the farmers	Farmer gets paid	Delivering the goods to the company
Physical evidence	Sign in	Farmer check for trader data		Farmer and trader gets the notification of the bidding	Agreement of smartcontract and the company	Contract updated in the bid	Smart contract gets closed after verification	Money is transferred by trader	
Customer Action	Registering as the farmer Registering as the trader	Farmer check for local community Farmer joins the trader community of interest	Finalising the discussion about the price	Bidding starts in the app with trader and companies	Companies starts bidding Companies keep adding and bidding in the app	Win/lose the bid lose: check for the next bid win		Trader distributes the money to the farmer based on trust	Company will receive the goods
Front stage interaction	Creating new trader page in environblock	Discussion about the price through text/message in Dapp	Trader register for bidding	Bidding will be transparent where farmer and other stakeholder can view it through app		Checks for the update in smart contract	Money will be transferred	Farmer receives the money	The utility token gets verified
Back stage interaction	Collects data from farmer Collects data from trader Trader procure the goods from farmer	Stores data about the community	Environblock asks for minimum price of bidding	Environblock keeps adding the bid in blockchain	Environblock adds each bid in blockchain		Environblock adds the record in smartcontract Creates utility token for the company to receive the confirmation of goods	Environblock checks for the utility token verification	Smart contract closes the deal
Support process	Collects for existing data of farmer in banking and works with interoperability		Market data is generated based on the demand and supply of the goods from farmers end and companies end	Each bid is validated through proof of stake nodes Smart contract is created for the bid		Proof of stack verifies the smart contract Information is added to the supply chain blockchain	Goods will be tracked through each stage of blockchain	Utility token verified for the promise of goods for the company	Data stored in the environblock storage Farmer and trader data is collected by environblock.

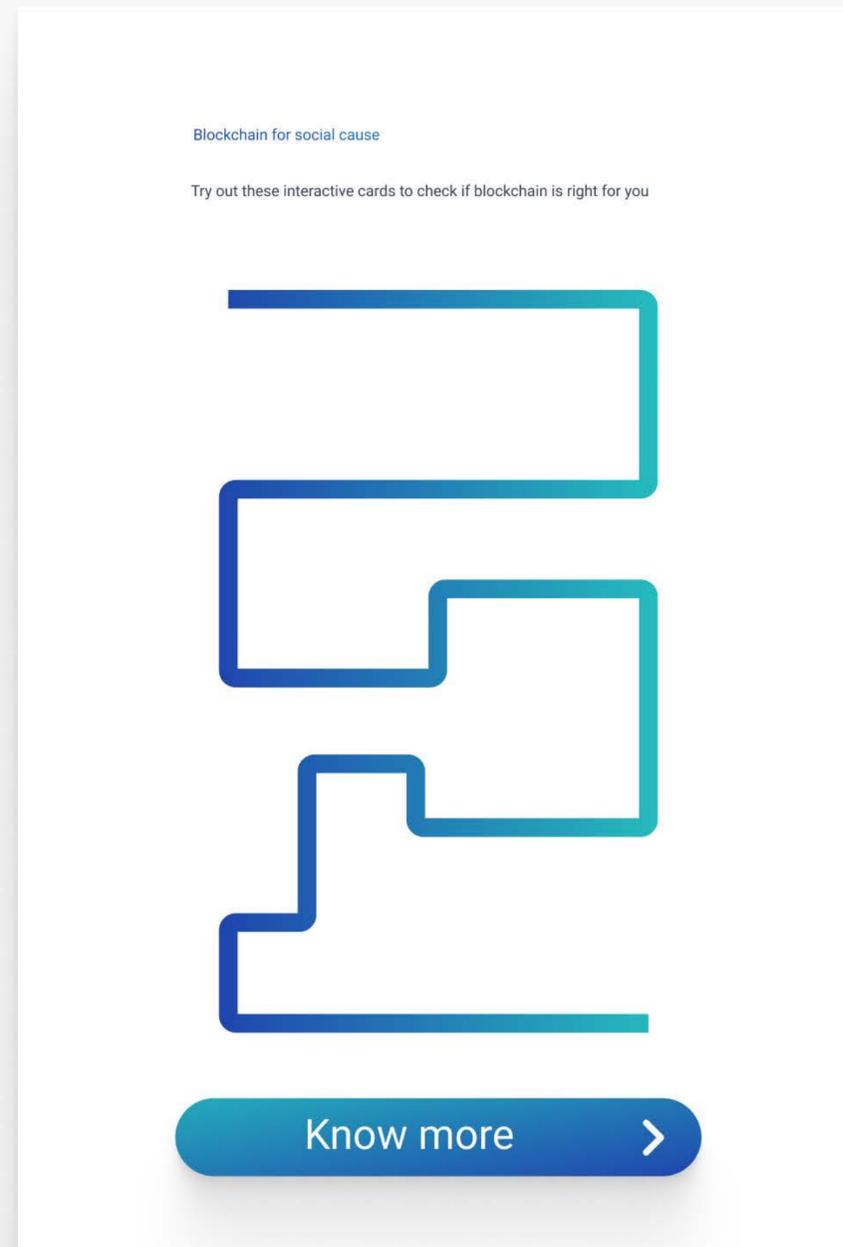
Line of interaction

Line of visibility

Line of internal interaction

Blockchain for social cause roadmap - Deliverables

-



Why you need these cards?

This card is for those who needs **to verify their solution/business model is adopted to the blockchain technology or not.** These questions will **help you to make quick initial assessment** whether blockchain is the right solution for the social problem that you're facing.

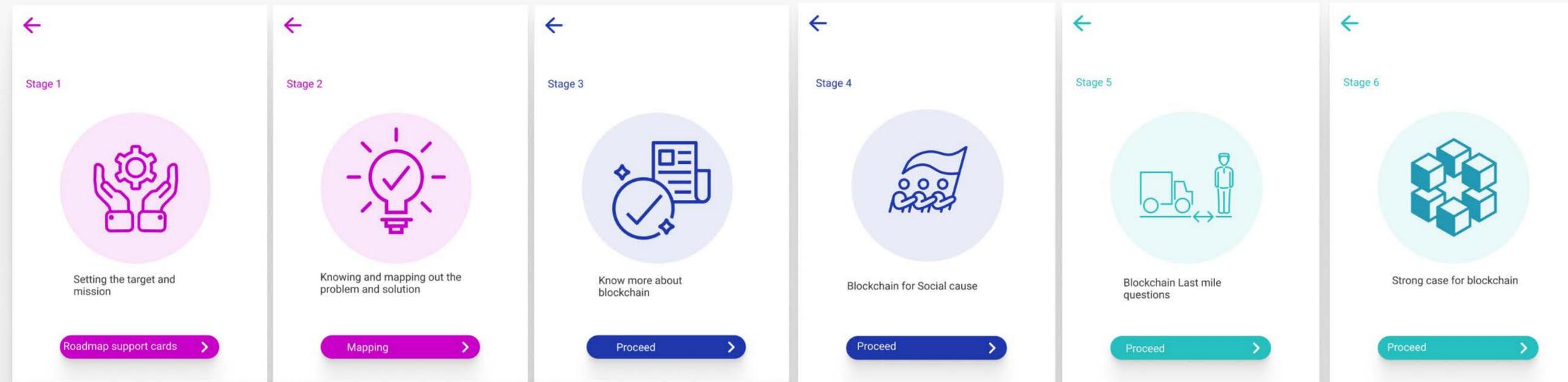
When to use these card?

This card should be used during the **initial stage of the design/ business development,** where you are checking that the particular hypothetical solution is efficient and effective to solve in blockchain. It is **not intended to provide a final authoritative answer but to assist designers and decision-makers in evaluating** whether to deploy resources in exploring a blockchain-based social innovation solution to a given problem space.

How to use the cards?

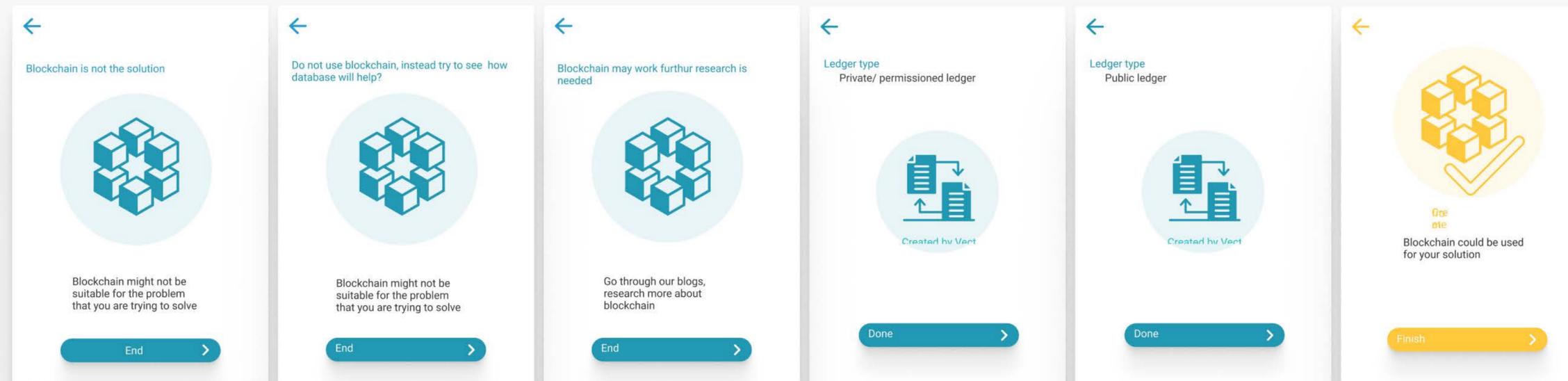
Use the blockchain road map to navigate through the questions. It should be a group activity where atleast one designer to be there in the team. Navigate through the cards one by one and think in those perspectives. Examples are provided in these cards which represents the detailed relations and similarities with that particular cards.

Stages and references



Stages

- Gives stages to navigate the project
- Each stage has 4-10 cards with yes/no questions which carries out to next stage.



Context

- Tells whether to use blockchain or not.
- Strategically navigates through the project and represents all the aspects which relates to blockchain and the social cause.

Learnings

- Different types of **economic systems** and models (doughnut economy, 21st century economics, Buddhist economy, **circular and regenerative economy**).
- Tools of **financial inclusion** including **microfinance**, microcredits, P2P lending, and crowdsourcing.
- **Technical aspects of blockchain**, and different services offered by blockchain based companies across the world.
- **Decentralized Finance** and **NFTs**.
- Initiatives of government for implementing financial inclusion in India.
- **Agricultural supply chain** and its multi level stakeholders.
- Financial issues faced by farmers in terms of **inclusivity and financial education**.

Challenges

- **Gaining the trust** of people in a volatile system like cryptocurrency.
- **Changing the perspective** of stakeholders that cryptocurrency is intimidating.
- **Finding an expert panel** to discuss the project.
- The projects covered in case studies are hypothetical / in a pilot stage.
Extrapolating the current system to speculative system.

Team Contribution:

Mothilal Loganathan : Research on SDGs, blockchain, agricultural finance and NGOs, opportunity mapping, tools for research, systems thinking tools, networking, workshop activity design, Service Design blueprint and flowchart.

Pavan Kalyan : Research on Cardano, Ethereum, Bitcoin and history of financial systems, networking, workshop layout and trigger card design, System Roadmap Design, documentation & file management.

Vishruth Kumar : Research on Financial inclusion, microfinance, cryptocurrency and smart contracts, user interview, Website & blog design, project pitch presentation, Visual assets & infographics for presentation, website and gigamap, Data Visualization for gigamap.

Outcomes

- **Blockchain Demystified**: Complex technology like blockchain was simplified and presented to workshop participants using interesting illustrations.
- **Design Sprint**: Interactive and playful Workshop designed for people to understand basic financial problems and come up with solutions.
- **Awareness Blog**: Systematic documentation of articles relevant to cryptocurrencies, blockchain, microfinance and agricultural supply chain.
- **Giga Map**: Visualization of our design process and research along with creative illustration of the final service design in 2 A0 sheets.
- **Interactive Roadmap**: An Interactive tool for Corporates, NGOs, and governments to build a service/product/business on blockchain technology. This tool can be used during the initial stages of project development
- **Microfinance service**: Service Blueprint and system flow of accessible microfinance service for moneylending activity built on blockchain network.
- **Transparent Supply Chain**: Service Blueprint and system flow of a transparent agricultural supply chain service from getting the yield to retail market built on a blockchain network.

