Plastic Pollution & Circular Economy Portfolio: Rethinking Pakistan's relationship to plastic waste

A. The Problem Space

More than 3.3 million tons of plastic is wasted each year in Pakistan and most of it ends up in landfills, unmanaged dumps or strewn about land and water bodies across the country damaging the environment and people's health. The figure below shows if we dump this waste collectively together, it reaches as high as 16500 m – that is the height of two K2 mountains, the world's second highest mountain in the world!

Figure 01: Pakistan produces 3.3 million tons of plastic waste each year

Pakistan has one of the highest percentage of mismanaged plastic in South Asia. During the Innovation-Accelerator's Lab Exploration stage we found that current municipal waste management is a major problem. Waste is picked from communal bins and disposed outside of cities without segregation, material recovery or recycling. Communities are not expected to take responsibility for the waste. The entire system of waste management is in effect a system of dumping waste without any management.

Pakistan has issued a Statutory Regulatory Order to ban plastic bags in the Federal Capital Islamabad and other cities including Lahore, and Hunza. However, over time we have seen plastic bags make a comeback because the policy framework does not address alternative, and the larger waste management system. Simply banning plastics in a struggling economy like Pakistan will put many people out of jobs and reduce customer footfall if no relevant alternative is available. The blanket ban is only addressing the symptom but not the root cause.

The issue of plastic pollution is a symptom of a larger system which is the linear *take-make-waste model*[1] in which products are designed to be used once and then discarded. Our Innovation-AccLab has deduced that the issue of plastic waste needs to be treated as a symptom of the larger linear *take-make-waste* system, which is essential for shifting towards a circular economy model. This system shift is what will ultimately be the sustainable solution. Therefore, our learning question that we aim to answer is, *can we reimagine our relationship with plastic waste in Pakistan?*

A core assumption for this work is to meaningfully address the plastic waste challenge. Creating a systems shift cannot be achieved through a traditional linear problem-solving project approach that features one (or a series of) single-point technical solutions. We need a holistic approach that uses systems thinking and tests a combination of solutions that creates the conditions towards a systemic movement into a circular economy. However, this shift is not simply possible with a set of policy solutions and development projects alone. We must also find approaches that fundamentally change the way communities, government, and private sector think about the problem of waste.

In sum, the Lab's learning portfolio of plastic waste and circular economy holds the following assumptions from its initial field exploration:

- **Not all plastic is bad**: it is a product that still holds merit and can potentially even be turned into a resource. As such, outright bans are an intervention that ignores the *intrinsic value* of the material and could do more harm by leading to the production and use of more unsustainable materials like nylon net bags.
- **Quality waste management is key:** Quality and dependable waste management features a series of interdependent steps. If one step is missing or compromised, the whole system is compromised (e.g. inadequate waste sorting procedures, unbridled consumption, antiquated recycling capacity, etc.)
- **Change how we think about waste:** Human behavior is not rational/predictable and cannot be stewarded through traditional communications approaches; There is potential to deploy interventions that *experiment with atypical areas for change*. For example, understand the motivations and behaviors that fundamentally drive how individuals, communities, private companies, and others interact with plastic waste management. Traditional approaches for this issue are ignoring this untapped potential.

---

[1] https://www.ellenmacarthurfoundation.org/explore/plastics-and-the-circular-economy

The Lab will explore further, what exactly entails reimagining our relationship with plastic waste in Pakistan, by testing whether *plastic waste* is the problem or *waste management?* Can we turn waste into a resource? Most critically - the heart of our experiment – we want to understand how we can change the way we think about waste, and the system around it, by understanding people's behaviours and incentives in the system.

B. Our Partners

Innovation-AccLab Pakistan, the Environment and Climate Change Unit (ECCU) at UNDP and Unilever are working together to develop systemic solutions to transition towards a circular economy for plastics waste.

We have partnered with the private sector, [including Unilever, Coca Cola, Nestle (core group)], the government (including Federal Ministry of Climate Change, and local Government of Rahim Yar Khan), as well as local innovators and the design community. Meanwhile, our regional and global alliances include the [Regional Innovation Center (RIC)](#) and the larger [Accelerator Labs](#) network.

C. Our Theory of Change

Learning outcome

Our key learning goal of the portfolio is to create a circular system of plastics management in Pakistan by testing new economic models, industrial and consumer behavior, policy shift and engaging with the private sector and other non-traditional partners. We are exploring and testing solutions to rethink supply chains, behavior and future policy simultaneously to effectively minimize plastic waste. Waste should not go out of mind even if it goes out of sight.

The Lab aims to address its learning questions by looking at plastic waste. Using its insights will help in creating policy and programming options that can further lead in creating movement and conditions to move towards a circular economy. This is the reason we are approaching this challenge space differently; by seeking to holistically understand the problem space and the cross-linkages between issues, and to experiment with a portfolio of experiments that are influencing multiple levers for change at the same time.

i.   *Human-centered Systemic Design*

This is a highly participatory approach bringing together stakeholders from the very beginning of the design process. Our experiment is bringing people, and the way we think at the core, from the initial exploration using ethnography to co-designing interventions with key stakeholders using design methods. No policy, project or innovative solution can work without people at the supply and demand side truly believing in it. Our first step is to understand the actors in the system and

employ agile design processes that include human-centered design, collective intelligence, and behavioural insights in combination of traditional baseline study and horizon scanning.

ii. Portfolio of Experiments

We are looking at creating experiments around key points of the system around plastic waste, policies, technology, industry, infrastructure, and behaviour. Specifically, this includes a suite of experiments that are looking to:

- Surface insight about the infrastructure needs of the plastic waste management system now and into the future;
- Understand the motivations of consumers regarding plastic consumption;
- Understanding both the potential and limits of technology investment/deployment in fundamentally addressing this issue;
- Understanding how public policy can be better designed and mobilized to curate the space for the system to improve towards desirable goals.

The systems diagram (Figure 02) below highlights our key findings from our Exploration studies. These findings have been categorized as problems under patterns/trends, structures and mental models (behavior and mindset) in order to understand the broken plastics system in Pakistan.
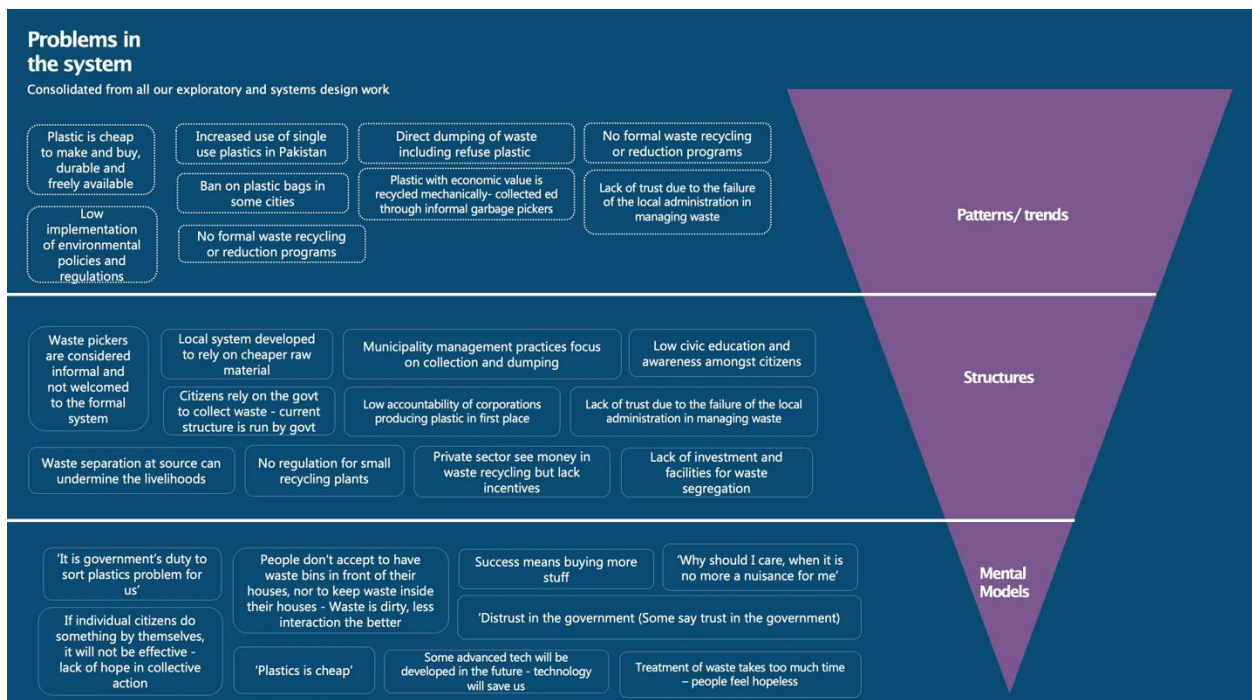

Problems in the system
Consolidated from all our exploratory and systems design work

Patterns/ trends
- Plastic is cheap to make and buy, durable and freely available
- Increased use of single use plastics in Pakistan
- Direct dumping of waste including refuse plastic
- No formal waste recycling or reduction programs
- Ban on plastic bags in some cities
- Plastic with economic value is recycled mechanically- collected ed through informal garbage pickers
- Lack of trust due to the failure of the local administration in managing waste
- Low implementation of environmental policies and regulations
- No formal waste recycling or reduction programs

Structures
- Waste pickers are considered informal and not welcomed to the formal system
- Local system developed to rely on cheaper raw material
- Municipality management practices focus on collection and dumping
- Low civic education and awareness amongst citizens
- Citizens rely on the govt to collect waste - current structure is run by govt
- Low accountability of corporations producing plastic in first place
- Lack of trust due to the failure of the local administration in managing waste
- Waste separation at source can undermine the livelihoods
- No regulation for small recycling plants
- Private sector see money in waste recycling but lack incentives
- Lack of investment and facilities for waste segregation

Mental Models
- 'It is government's duty to sort plastics problem for us'
- People don't accept to have waste bins in front of their houses, nor to keep waste inside their houses - Waste is dirty, less interaction the better
- Success means buying more stuff
- 'Why should I care, when it is no more a nuisance for me'
- If individual citizens do something by themselves, it will not be effective - lack of hope in collective action
- 'Plastics is cheap'
- 'Distrust in the government (Some say trust in the government)
- Some advanced tech will be developed in the future - technology will save us
- Treatment of waste takes too much time – people feel hopeless

Figure 02: Problems in the system; consolidated from all our exploratory and systems design work

The Lab will run its first learning cycle, by reviewing the learnings that will come out from the portfolio of experiments. This will be the basis to develop a full-scale programme with the Environment team and Unilever.

D. How will we do this?

For this portfolio, we have used methodological frameworks from Design Thinking, Systemic Thinking and Strategic Foresight. To organize thoughts, we have structured our approach and findings under two main headers; Ethnographic Inquiry and Systemic Design (ethnographic work feeds into the systemic work), and Portfolio logic.

Our learning Methodology

Our methodology focuses majorly on understanding the system as well as behaviours. We used ethnography for contextual inquiry to gain user's insights. Furthermore, we conducted systemic analysis and solutions mapping through community of practice that helped us to understand the context, policies and relevant systems (formal and informal) in place and how different categories of people experience it. We use a suite of techniques ranging from:

- **Exploration and contextual Inquiry;** identifying emerging trends and entry points in plastics management system
- **Solution Mapping;** identifying innovative solutions and experiment leads through System Design and strategic foresight
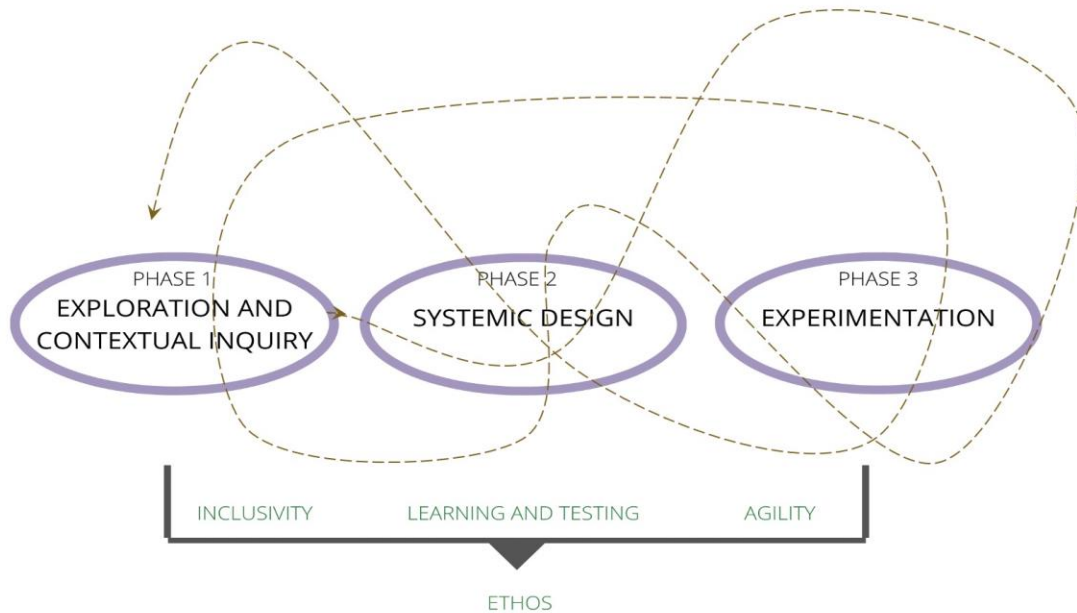- **Experimentation**; developing portfolio of learning experiments that will test multiple solutions

Figure 03: Learning methodology used to design the portfolio

Solution Mapping: Unpacking the system around plastic waste

To understand the extent of the problem, UNDP Pakistan, along with Unilever Pakistan explored the journey of plastics in Pakistan particularly in Rahim Yar Khan with the citizens, industry players, government, and academia. After the contextual inquiry stage, we deep dived into Systemic Design — an approach developed by [Alberta CoLab](#) that combines Systems thinking with Design thinking and strategic foresight work sessions which support heavily in informing the project at a strategic level by;

- Having an in-depth understanding of the current system using the intelligence of the collective,
- Being able to identify the stakeholders and hone out personas to know their motivations, influences and problems,
- Identify shortcomings in the current systems,
- Identify the roles of formal and informal influencers
- Being able to collectively brainstorm, ideate and envision the future of the system and multiple projected scenarios (desirable and undesirable),
- Identify gaps between the current system and the desirable futures
- Planning for the agents of change, with the right persons and develop a solid strategy with ready to experiment initiatives
- Identify experimental leads

Additionally, we used other techniques to explore and unpack the system;

- **Digital exploration:** In August 2019, the Federal Government banned single use plastic. During our conversation with a group of citizens in a digital exploration session, one of the major [insights](#) was that plastics is not going anywhere from our surroundings as till now, no end-of-life solutions for plastics management have been identified or brought to fruition.

- **Research drives:** Through our [ethnographic research work](#) with retailers, shopkeepers in Rawalpindi, one major insight was that the blanket ban on single use plastic will not solve the problem alone. We also found out that plastics are cheaper, durable, and accessible in the country. A blanket ban might put many small scale retailers out of jobs, or reduce their customer footfall if no alternatives packaging materials are provided.

- **Solutions Fest:** We curated a [community problem solving engagement](#) to address the issue of plastics waste. We brought together the community of designers, start-ups, architects, environmentalists, social scientists, and '*juggaris*' (improvisers). The idea was to bring together a community that can bring together multiple perspectives, and upcycle plastic waste into functions prototypes. Various prototypes came forward through this exercise; from solar thermal mechanics that turns plastic waste into green-gas, to a conveyer belt system with refused plastic.

Experimentation: testing the system

Creating interventions in this area are new, and thus require experimentation. As a result, we propose creating a portfolio with a wide range of stakeholders including the private sector, government counterparts and local community to experiment different solutions to see what can create shifts in the wider systems. **We are looking at creating experiments around key points of the system around plastic waste, policies, technology, industry, infrastructure, and behavior** (Figure (04) shows the experimentation portfolio). Being a complex problem space, the experiments designed are cognizant of the limits of its influence. As such, the focus of this work is to holistically understand what will work, in what context, and why. This will position eventual subsequent efforts to scale intervention better, so that they are properly designed to achieve the impact we collectively desire.

Figure (04) below shows the portfolio of experiments across policies/incentives, technology/infrastructure, participation and behaviours. These categories represent the key levers of change in the system that was mapped out with Unilever and through our field work. Each of the experiments within these categories will allow us to learn what combination of solutions, policies and behavior change tactics are needed for policies and programming for 'reimagining our relationship with plastics in Pakistan'.
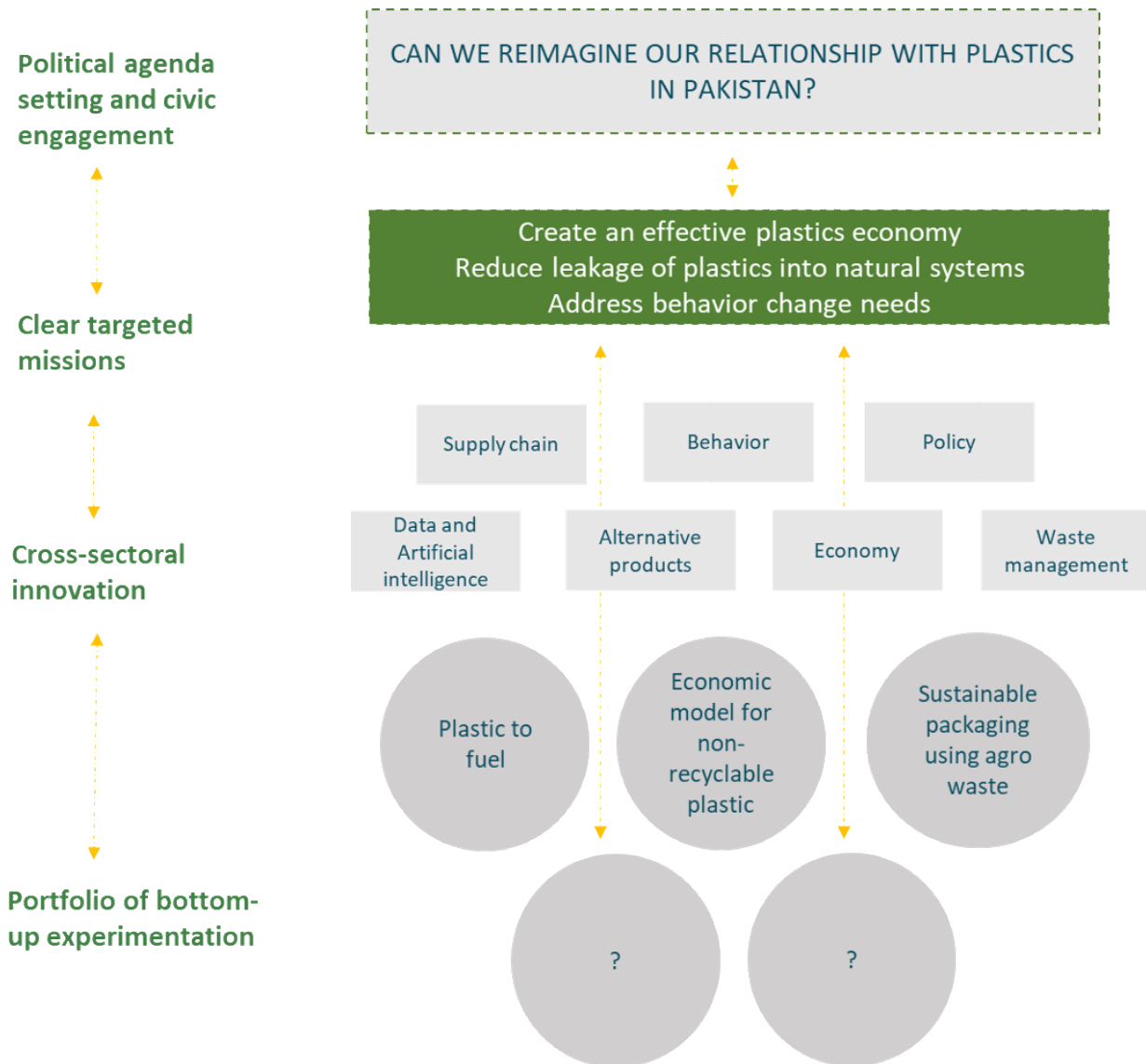
Figure 04: Experimentation & Interventions Portfolio

Key Experiment(s)

Sustainable Waste Cycle: Economic Model Experiment with Unilever Pakistan
Creating an economic model, where the cost of non-recyclable plastics is made through money earned from recyclables

We aim to create a collection and recycling system, in partnership with Unilever Pakistan, to maximize the segregation of useful and recyclable plastics as well as place in mechanisms (privately or local government managed) to sell reusable plastics in the market. The revenue will be directed towards managing the waste flows of non-recyclable plastics cost and effort tracking to find a sink point for such plastics i.e., heat recovery, cement kiln, LPG conversion, etc. The following visual elaborates on the '2 is equal to 4' model where double the amount of plastics

(both recyclables and non-recyclables) will be managed at the cost of managing just recyclable plastics in Rahim Yar Khan city.

Figure 05: Economy model where cost of non-recyclable plastic is made through money earned from the recyclables

This model entails some other interventions as well to stay true to our portfolio logic. It helps with pushing for systemic change as opposed to linear solutions where multiple points in the system are leveraged.

E. Implications for how we will work moving Forward

The Lab will be the connective tissue for the private sector, government and stakeholders to advocate learnings on rethinking plastic waste and using systems thinking to get the ground ready for a move towards a circular economy. After the completion of our first learning cycle, our next steps will be the following ;

- To create the shift in the system towards a circular economy, we will build a movement engaging communities, leveraging partnerships, and exploring sustainable financing to help push for plastics waste management agenda in Pakistan and beyond at regional level through our partnership with our UNDP offices,
- Provide insights on a circular economic model that can be expanded nationally for both the government and private sector,
- UNDP will have tested learnings to develop programmes on the issue of plastic waste for partners, development practitioners, private sectors and innovators,
- Demonstrate business opportunities for SMEs and investors for working on green-tech solutions,
- Develop scaling strategy for programmes,
- Explore financing models for rethinking this work,
- Explore new financing mechanisms for partners to fund portfolio over solo projects,

- Build new partnerships for funding further experimentation in the portfolio.

.

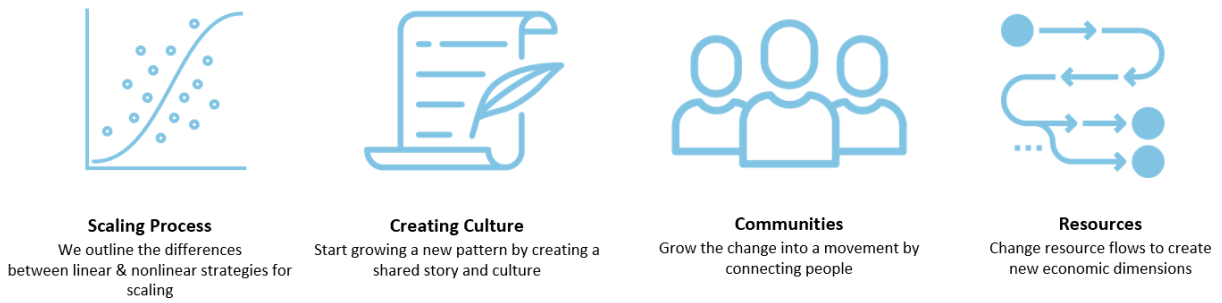| **Scaling Process**	**Creating Culture**	**Communities**	**Resources**
We outline the differences between linear & nonlinear strategies for scaling	Start growing a new pattern by creating a shared story and culture	Grow the change into a movement by connecting people	Change resource flows to create new economic dimensions

Figure 06: Key ingredients of our portfolio approach (Source: Systems Innovation)