A Conceptual Model for a Sustainable Future

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The complexity and interconnectedness of current times demand the designing of policies, systems, and services—addressing sustainability challenges and enabling actionable changes for the future—using a systems approach. This paper proposes a conceptual model for applying a systems approach to design interventions, including policy development, to create a sustainable, actionable future. The conceptual model builds on the core features of systems thinking to understand the existing context and analyse gaps for sustainable, systemic interventions through design interventions.

Systems mapping and modelling play a key role in understanding systems dynamics and feedback loops, identifying gaps, analysing principles of balance and inter-relating perspectives. Design projects carried out in this area and written as case studies keeping these aspects in mind are further reflected upon in terms of possible design directions and analysed. The analysis and reflections on the practice form the basis for constructing a framework connecting design approaches, systems thinking and sustainability factors.

The conceptual model is expected to help designers navigate the complexities of sustainability challenges and provide a roadmap to apply a systems approach to developing design interventions: policies, systems, and service models for a sustainable future. It can also help establish feedback mechanisms to monitor policy outcomes and enable policymakers to respond to changing circumstances through an iterative process. This systemic, generative, creative approach is expected to help build a resilient, flexible, hopeful future.

KEYWORDS: design intervention, policy-systems-service-product, systems approach, actionable future, sustainable

RSD TOPIC(S): Mapping & Modelling, Socioecological Design

Introduction

Policies are intended to achieve specific goals and often provide a framework for decision-making and preferred actions. Policies refer to a set of principles and guidelines that guide actions and decision-making towards fulfilling a certain goal. As such, policies have widespread implications and have the capacity to influence change. Policies involve formulation or development, implementation and evaluation, which often informs future policy development and modifications. In practice, it is often found that policies are made based on heuristics and past experiences. Bounded rationality challenges this traditional perspective that people make rational decisions based on perfect information. (Simon, 1990). In real-life scenarios, there are many limitations and challenges, including individual constraints, lack of information and limitations of time. How can we design interventions keeping in mind the complexities of the present realities?

Human intent plays a critical role in decision-making when setting goals and arriving at design directions. Human intent, in turn, is influenced by values, belief systems and the socio-cultural context of the decision-makers. Since policy and systems-level interventions have a broad macro role to play across many stakeholders and diverse groups, it becomes important to understand and bring in the diverse perspectives of often contrasting groups to systems study and intervention.

With its human-centric approach and ability to understand and empathise with diverse human perspectives, design is ideally suited towards bringing in a better understanding of society. Design can bring about change and transformation. As Simon (1990) said: “Everyone designs and devices courses of action aimed at changing existing situations into preferred ones” (p.111). Design has the power to transform the world and solve complex macro problems, and therefore, designers need to address broader issues

through innovative approaches and come up with impactful design solutions. (Mau, 2004). As such, design has a critical role to play towards developing a sustainable future.

Designing Sustainable Futures

Designers have been designing futures through the designing of products, services, and systems. Design is futuristic in its approach and is concerned with envisaging the future and making it tangible (Archer, 1992). Designers are concerned with the future in everything they do. And yet, in the current context, designing futures has another connotation. Designing futures with sustainable concerns involves adopting a forward-thinking approach which considers the long-term implications of design decisions at various levels: social, economic, and environmental. It involves holistic thinking with the awareness that action taken in one area can have a positive/negative effect on a completely different domain. (Manzini, 2007)

By integrating sustainable concerns and focusing on sustainable development goals, designers can design policies, systems, services, and products which contribute towards creating futures that are environmentally sustainable, socially inclusive, and economically viable.

Systems Approach

The challenges of a sustainable future require a systemic approach due to the level of complexity embedded in it and the need to identify and resolve root causes, identify leverage points, develop long-term approaches, and balance multiple objectives from various perspectives. The need to collaborate and integrate various approaches through policies is equally important. We would require systemic approaches to build robust strategies and build resilience and adaptability into the system.

The systems design approach involves understanding the complexity of interconnected systems, identifying cause and effect patterns, leverage points and potential unintended consequences to design better systems. Different from the rational model of policy design, which considers things to be finite and within a known boundary, a systems approach to policy design recognises that there could be many unknown factors and that effects may only sometimes be easy to predict. It also recognises that a long-term

life cycle assessment may be required wherein the impact can be studied through the entire life cycle. Keeping in mind the sustainable development goals, it would also consider aspects of social equity and inclusion to ensure that the design addresses the needs of diverse communities with a special concern for the marginalised sections of society and for future generations. (UN General Assembly, accessed 20 June, 2023). Designers often use such systemic approaches while working on complex projects involving sustainability concerns, thus bringing in a layered, nuanced understanding of the context and a creative response to it. How can this approach help develop a bottom-up, human-centred approach to policy design?

Research Inquiry and Methods

Case study approach

Just as reflection helps designers to develop their designs in an iterative manner, it also helps designers to bridge the gap between theory and practice. (Schon,1983; Menon,2015). The primary stance taken is that reflecting on design practice could lead to a theoretical framework, which in turn would help in furthering the practising profession. (Creswell & Plano Clark, 2006). A case study method was proposed to observe and analyse the points related to research inquiry. (Yin, 2009). The case study was written based on a study assignment carried out by a group of 18 postgraduate textile and apparel students on the theme of sustainability as part of a system thinking course undertaken by the author. It involved understanding sustainability concerns and inquiring further about them using a systems approach. Primary and secondary research studies were done as part of the inquiry. The study broadly covered two aspects:

- Prevention of textile waste through frugal practices and increasing the longevity of the garment to prevent it from being thrown away and to encourage repurposing and upcycling, and
- Post-consumer textile waste and ways of managing it.

Systems modelling in the form of giga maps helped to visualise and build connections between diverse information collected. Two gigamaps were made by the students: one

on the understanding of the necessity of frugality to increase the longevity of garments and the other on post-consumer textile waste.

Each group further came up with their own design directions from possible solutions in the areas of products, services, processes, and systems. Seven of these design interventions were elaborated and analysed here to understand aspects related to inspiration for the ideation and generate possible policy formulation based on the idea.

Design direction 1: repairing and repurposing

Inspiration: Indigenous practices of repairing, repurposing, and collecting used garments

Design ideas:

- Repair cafes: A service model where people can meet and mend. People can sit and repair together. The café will provide tools and materials to repair and mend clothing. Damaged clothes can be brought from home and repaired with the help of professionals. It is also possible to come for tea/coffee and help someone else with a repair job.
- Revamping services: old clothes are revamped and restyled by professionals, thus giving them a new life.
- Clothes care: a platform that allows skilled, experienced, and trained professionals to connect with users looking for specific garment care services.
- Possible policy: Encourage businesses and services focusing on repair/ upcycling/ recycling, etc., through incentives and support.

Figure 1. Gigamap for textile waste prevention.

Note: Practices for preventing garment waste through understanding frugal behaviour and practices that increase a garment's longevity.

Figure 2. Indigenous traditional practices studied repurposing old garments by converting them into quilts, collecting old clothes, and bartering them with old utensils. *Note:* Repurposing old garments by converting them into quilts, collecting old clothes, and bartering them with old utensils.

Design direction 2: industry/brand responsibility

Inspiration: Brand responsibility to be introduced in the textile sector, like some other sectors

Design idea: The brand will follow criteria for the longevity of the garment in terms of textile material and construction and also provide a marketplace/platform for customers to sell their old clothes (belonging to the brand) to other customers.

Possible policy: Regulation and incentives to make brands responsible for collecting back garments.

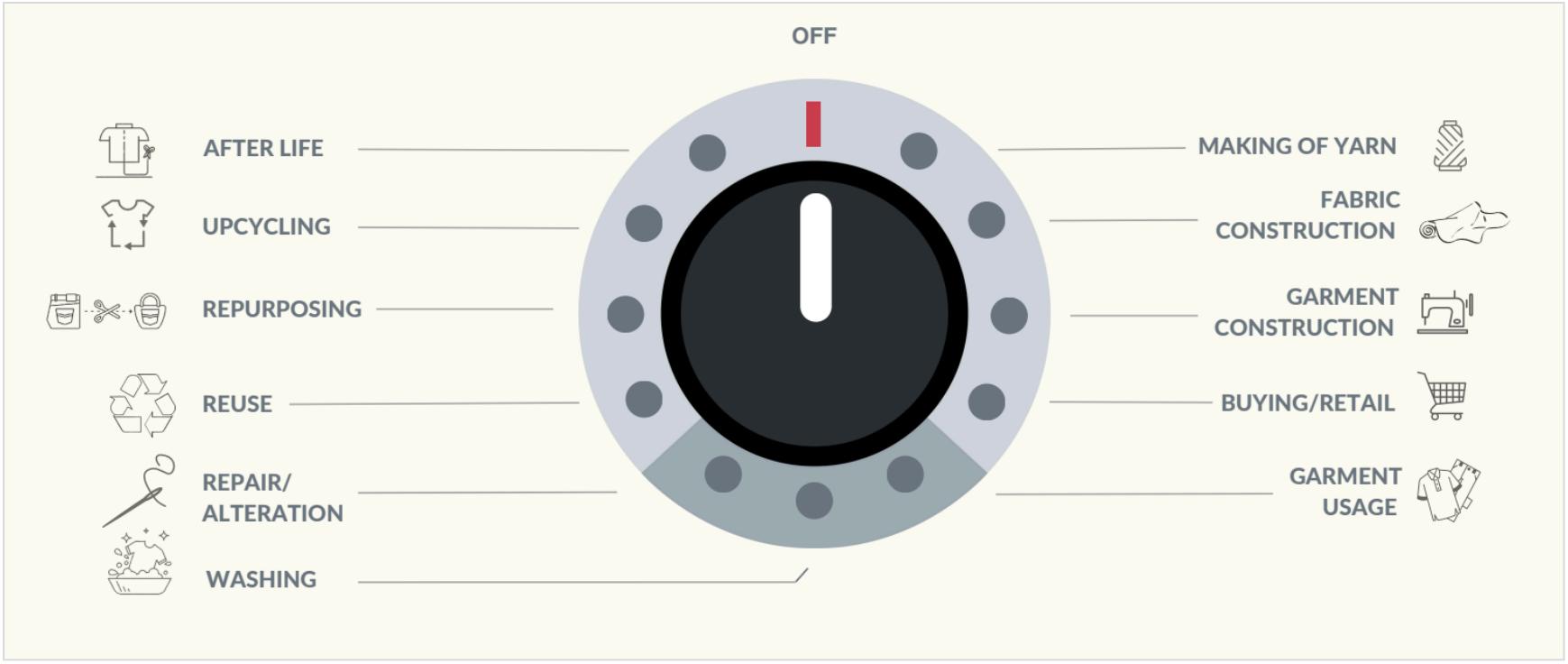

Figure 3. The garment's life cycle. Note: Identify concerns at each stage of the life cycle.

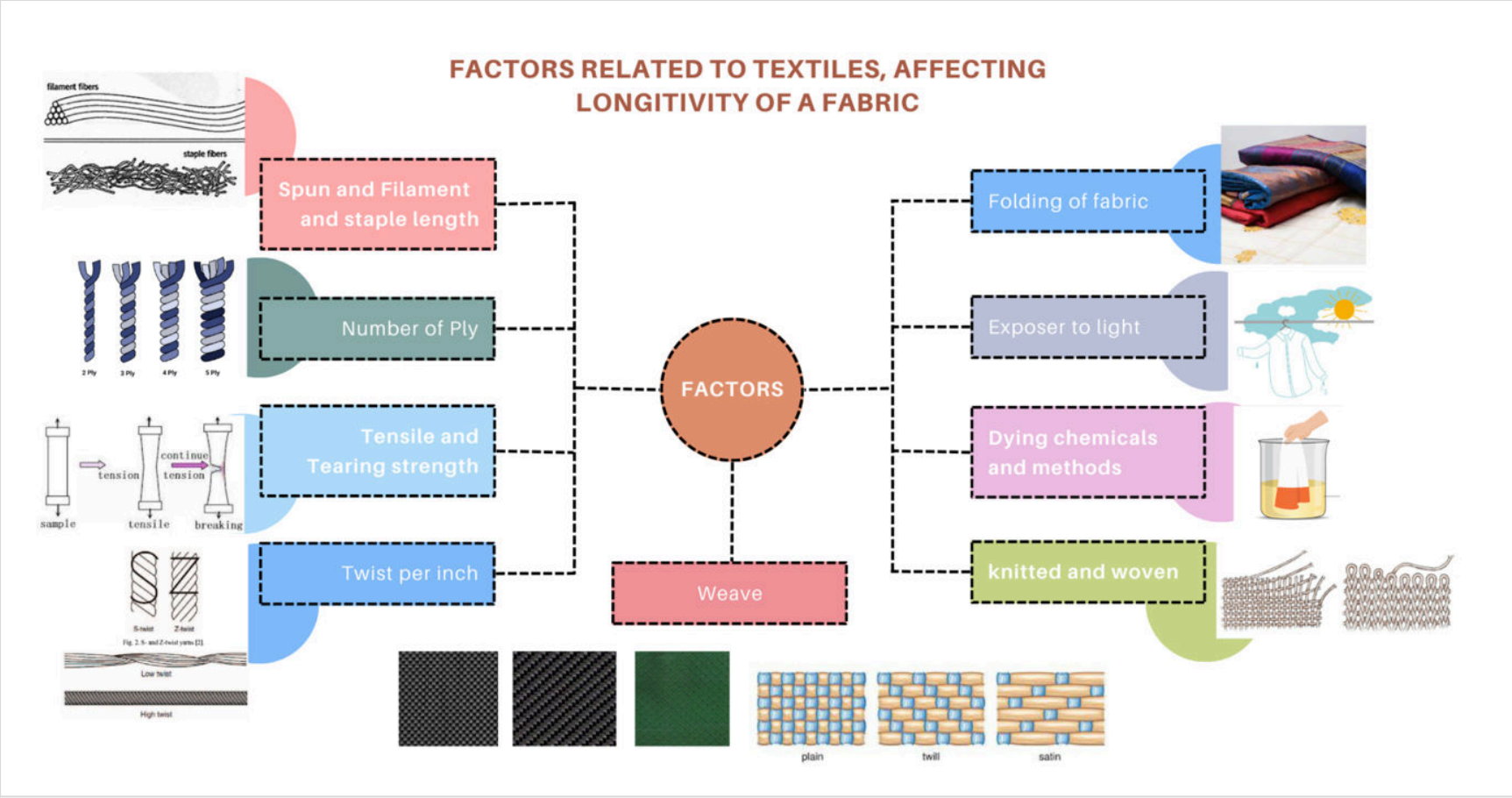

Figure 4. Factors related to textile fabric affect the longevity of the fabric and ultimately affect the quality of the garment and garment waste.

Note.Identifying concerns at each stage of the life cycle.

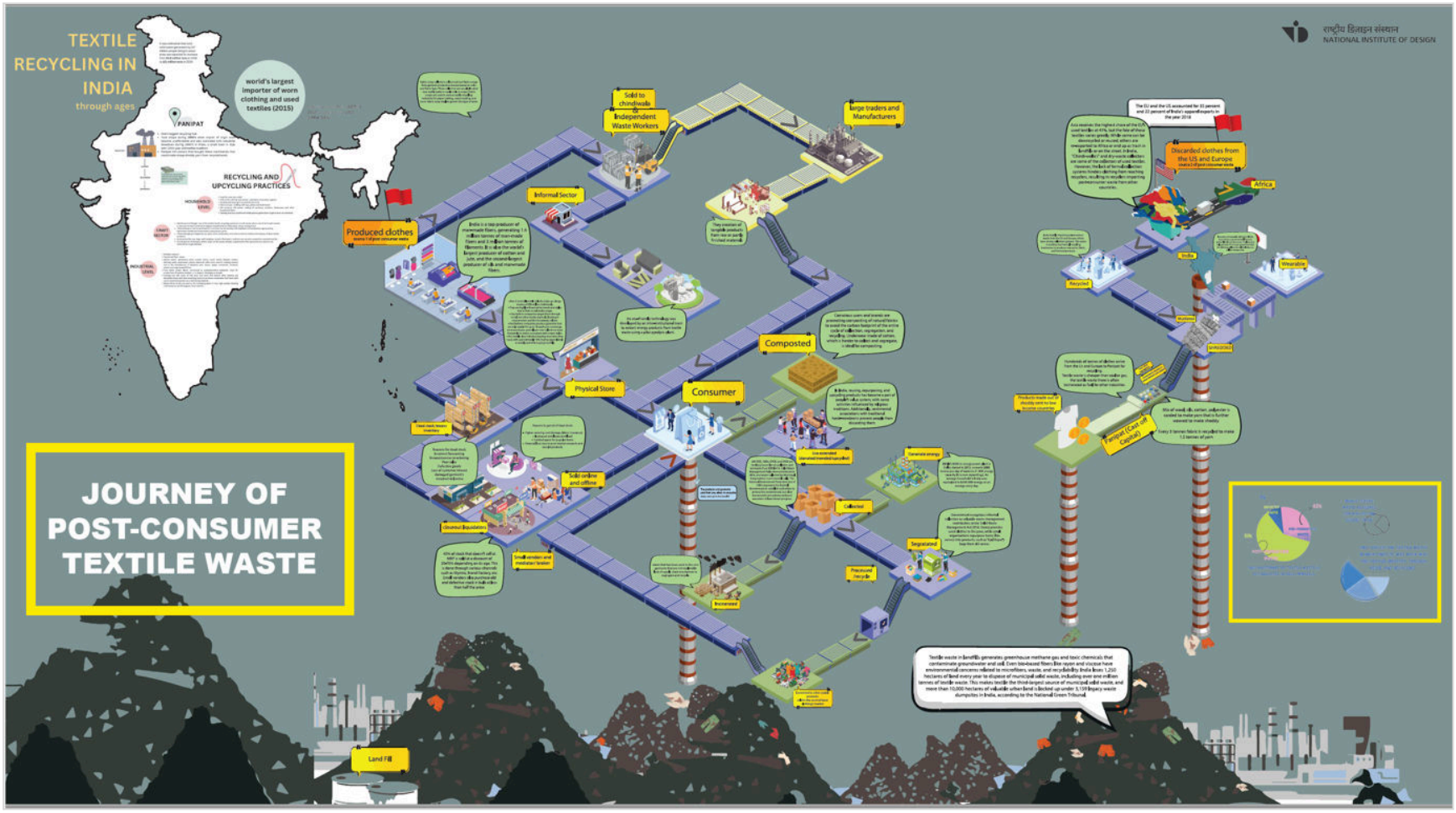

Figure 5. Gigamap depicting the journey of post-consumer textile waste.

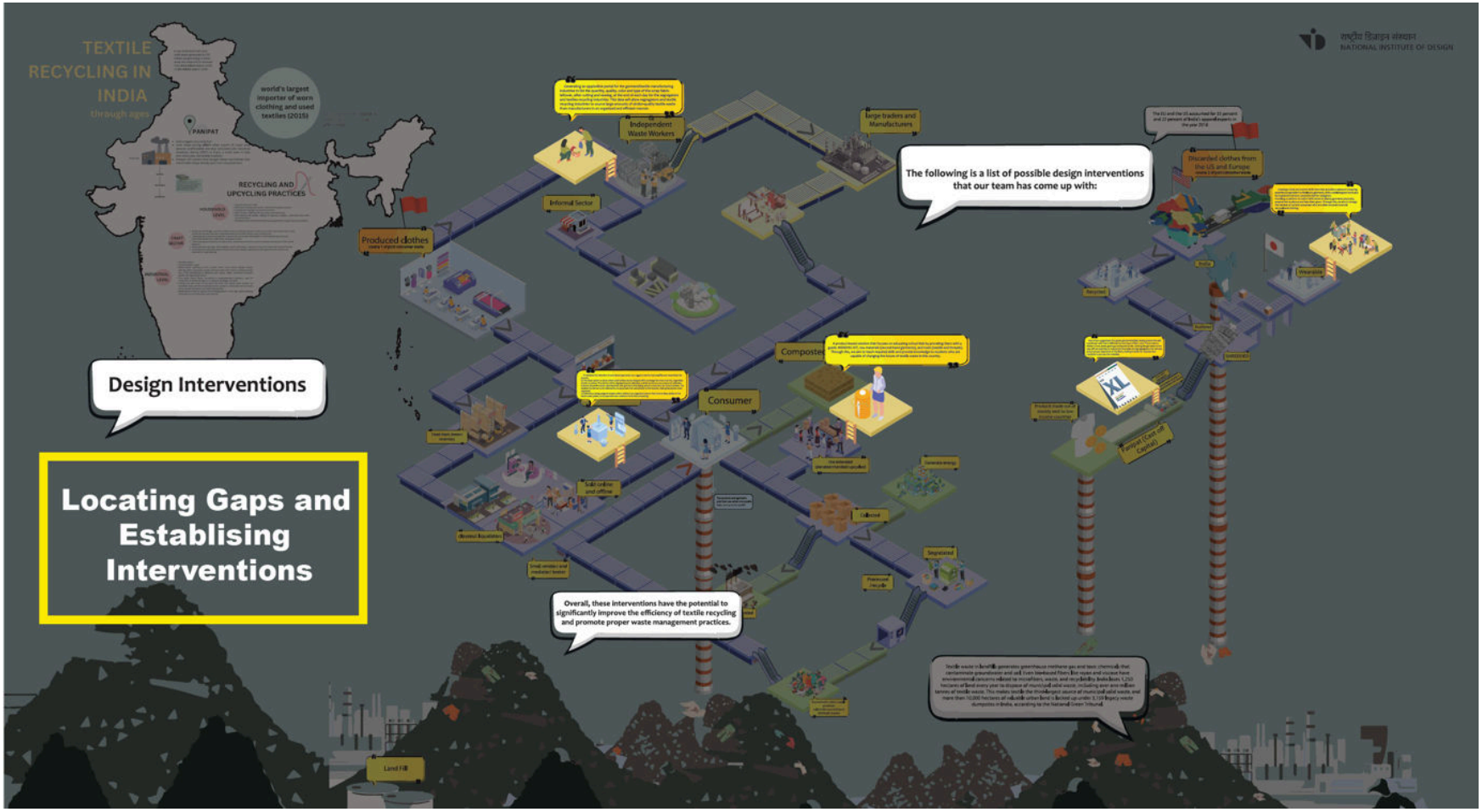

Figure 6. Locating gaps within the post-consumer textile waste to establish design directions and intervention possibilities.

Design direction 3: collection of second-hand garments

Inspiration: Gap identified / no organised service for the collection of garments

- The token system: Used clothes to be dropped off against an incentive.
- Brand drop-off: Brands collect their own garments after they are used by consumers for some incentive, thus making the process more organised
- Collectors: Assigned people collect clothes from time to time (like traditional practice followed earlier)
- Possible policy: Incentivise brands and businesses to collect used clothes and formulate a policy so that local municipalities may assign people to collect used garments, such as waste collection.

Design direction 4: educational kit

Inspiration: Gap identified / no training for self-repair of garments

Design idea: A mending kit containing raw materials and basic tools to be given to school kids. Through this, they can be taught basic skills for repair work, thus educating them to take care of their clothes.

Possible policy: To incorporate skill-based / life skills training as part of the educational system.

Design direction 5: grading/coding system for garments

Inspiration: Gap identified / no organised system for segregation of garments

Design idea: Grading garments/ textiles during production with a colour that is different for each type of fibre used. (Similar to how plastic grading and disposal works). Grading will help in reducing the time taken for segregation but will ensure proper separation of fibres, making it easier for recyclers and machines to process the materials.

Possible policy: Introduce a coding system to identify fibre.

Design direction 6: classifying industrial textile scrap.

Inspiration: Gap identified / no organised system for classifying industrial textile scrap

Design idea: An app/ online platform for the garment industry to list the quantity, quality, colour, and type of scrap fabric left after cutting and sewing each day for the recycling industry. This data will allow textile recycling industries to source large amounts of similar scrap materials from manufacturers in an organised and efficient manner.

Possible policy: Regulation to enforce the garment industry to classify textile waste and incentivise businesses to collect it.

Design direction 7: thrift store for garments

Inspiration: Gap identified—a lack of high-end thrift stores for garments

Design idea: A thrift store provides a pleasant shopping experience with a well-designed store and hand-picked inventory. Providing a platform for online thrift stores to display garments physically and expand their audience. This may also change the mindset of current customers, who may be reluctant to buy second-hand clothes.

Possible policy: Incentivise business for setting up thrift stores.

Findings

Some of the learnings resulting from the analysis of the ideation process for sustainable futures were as follows:

1. The longitudinal analysis helped in understanding the sustainability trends over a period of time, and then indigenous practices were used as inspiration to come up with opportunities for the current context.
2. Co-relating the socio-cultural aspects with the environmental and economic factors helped in arriving at ideas and opportunities for sustainability which could be easily adapted by people.
3. Studying the life cycle/ journey of the garments helped in identifying gaps/problems related to each stage of the garment journey. Visualisation of the

model further helped in identifying the gaps clearly. Gaps could also be easily identified based on the macro circular economy factor.

This further resulted in reflections on the various factors attributed to conceptualisation for design intervention for sustainable futures, critical aspects related to each and the nature of ideation. Some of these reflections are put forth here.

Sustainability

Considering sustainability as a critical factor for ideation for the future helped towards meeting sustainable development goals covering socio-cultural, economic, and environmental factors. It covered elements of responsible design.

Systems approach

- The systems approach helped arrive at design directions that were both systemic- holistic and systematic, through detailed consideration of various processes that are a part of the larger system.
- Systems modelling /giga maps further helped to visualise and tangibly map the information, thus aiding in identifying gaps.
- It also helped arrive at ideas at various levels: products, services, systems, and policies.

Design thinking

- The design approach to systems and sustainable futures helped direct the study towards a more humane approach that considers the co-relations between human beings and their environment.
- Design through its practice-oriented, action-oriented approach also ensures that a systems approach to a sustainable future is not limited to the study and understanding of it but also ensures that the understanding is taken forward towards actionable design directions and ideation.
- Based on the understanding derived from the learnings and reflections, a conceptual model was proposed for bringing together sustainability factors, systems approach, and design thinking.

An understanding of the above factors resulted in formulating the conceptual model (Figure 7).

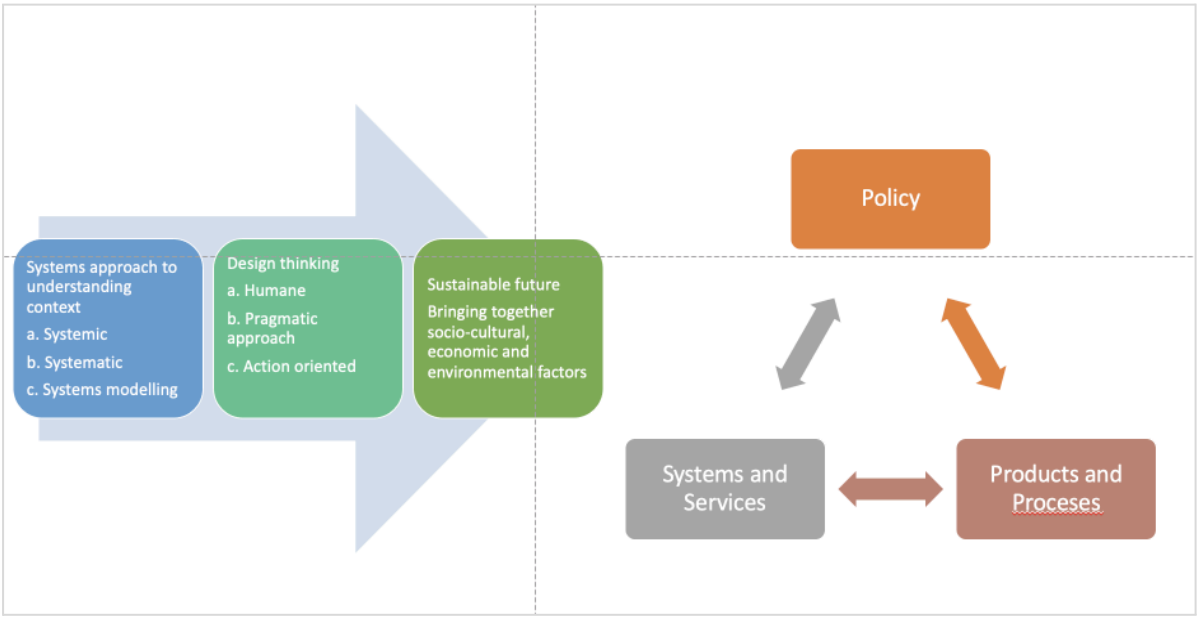

Figure 7. Conceptual model. Note. Using systems approach and design thinking for products, processes, systems and policy.

The proposed conceptual model recommends a systems approach to understanding the complexities of the current context and a design thinking approach to arrive at pragmatic, action-oriented, creative approaches for a sustainable future. It is expected to help designers arrive at design interventions which are forward-looking and navigate the sustainability challenges to pave the way for a sustainable and actionable future. It also helps designers use systemic thinking as part of their design process to address the complexities and dynamics of system scenarios. Systems model or visual mapping of system scenarios further contributes towards the understanding of complex information patterns and identifies gaps related to circular economy, identifying dynamic patterns of increase/decrease, and addressing the challenges from multiple perspectives.

Conclusion and Discussion

The findings and the conceptual model bring forth interesting insights towards conceptualising ideas at various levels: products, processes, services, systems and policies. Furthermore, it brings forth the way in which they are interlinked with each other.

Conceptualisation and ideation for design intervention

- Conceptualisation could be in terms of ideas for policies, systems, services, products, processes, etc.
- The process of ideation is often organic, going from macro to micro and micro to macro. Product ideas could lead to process ideas and policy formulation. Similarly, systems ideas can result in a design direction and many service models.

Implications of policy design

The conventional policy design approaches based on heuristics and past experiences are not able to cater to the needs of dynamic realities and the challenges emerging from multiple stakeholders and perspectives. Systems thinking can play a critical role in developing a holistic understanding of the context. This bottom-up, designerly approach towards understanding ground realities through the study of multiple stakeholders and perspectives can result in an interesting approach to policy design. The link between policy and the design of products, services, and systems, which has emerged from the study, can also help establish a bottom-up approach to formulating policies. Designers have largely followed a top-down approach of considering the existing policies in order to develop their ideas—this bottom-up approach rooted in ground reality adds an interesting dimension to the design of policies and systems.

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