

Identifying salient factors that influence the diffusion of low-cost sanitary products made by the small-scale production units in India: A social innovation study



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“We have learned to create the small exceptions that can change the lives of hundreds. But we have not learned how to make the exceptions the rule to change the lives of millions.”

- (Schorr, 1998)

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IDENTIFYING SALIENT FACTORS THAT INFLUENCE THE DIFFUSION OF LOW-COST SANITARY PRODUCTS MADE BY THE SMALL-SCALE PRODUCTION UNITS IN INDIA: A SOCIAL INNOVATION STUDY

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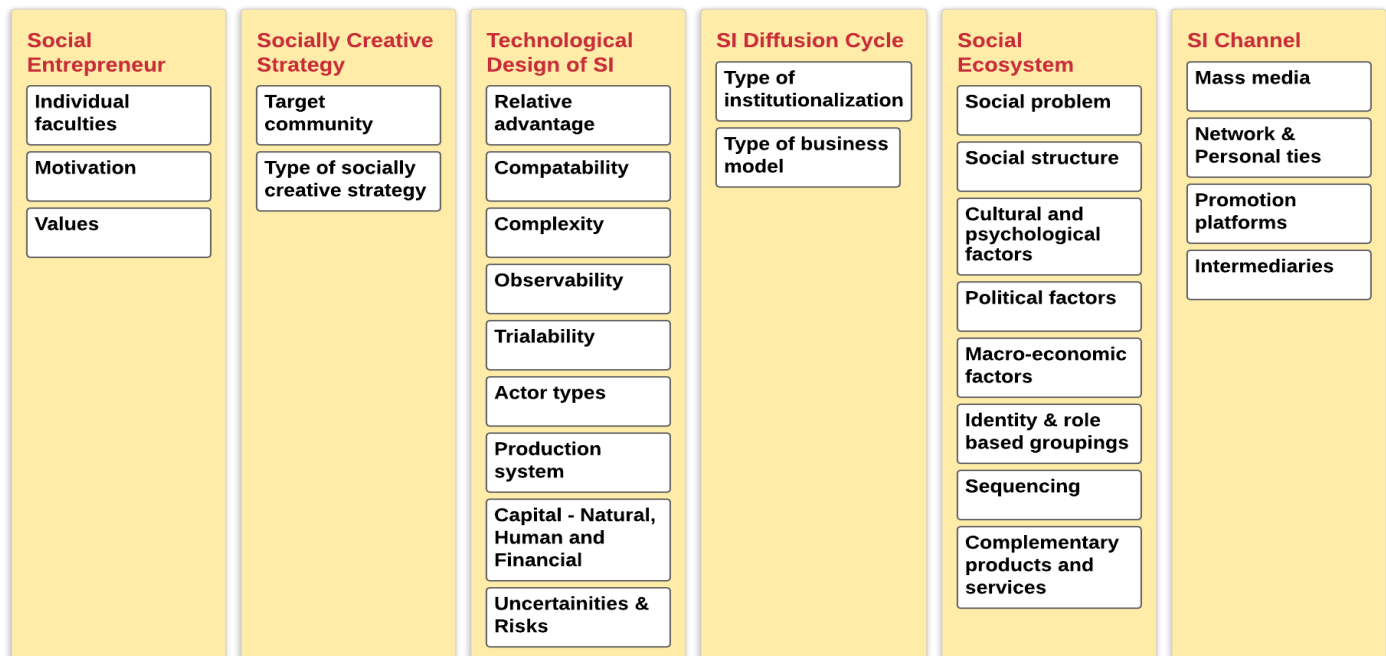
EXECUTIVE SUMMARY

Menstruation is a natural and healthy monthly phenomenon for women. However, many women across India struggle with it. Due to a number of barriers, these women are not able to use sanitary products resulting in a risk of contracting reproductive tract infections (RTIs), their self-esteem and self-confidence also gets affected. This has consequences: girls dropping out of school, women quitting work, reluctance to be part of social events and the infections leading to severe health related complications to name a few. Hence, social entrepreneurs in the field of Menstrual hygiene management decided to address this social problem by establishing small-scale production units that make low-cost sanitary products and run awareness campaigns. However, the diffusion of these low-cost sanitary products remains very low. Therefore, raising questions about the sustainability of these small-scale production units that have cropped up across India. Thus, the research focuses on understanding the social innovation process of making and selling low-cost sanitary products, and clearly identifies the salient factors that influence the diffusion of these sanitary products made by the small-scale production units for this complex market. This will be of assistance to the social entrepreneurs in better understanding and serving their constituents as well as help inform the Government of India on an appropriate policy for this subject.

The research started with first trying to understand the diffusion of social innovation. Therefore, existing literature in the field of conventional innovation and social innovation was studied. From the literature study, what happens during the diffusion of a social innovation process was understood and enough insights from all these different innovation theories was gathered to make the formulation of factors possible. A conceptual framework was built by primarily bringing all the factors from the social innovation model by Pue et al. (2015) together with certain factors identified from Rogers (2003) theory of Diffusion of Innovation, Strategic Niche Management (SNM) by Geels (2002) and the pattern of development and diffusion of breakthrough technologies framed by Ortt & Schoormans (2004) that was found lacking in the SI model. The goal of bringing together these factors is to understand the SI process. This resulted in establishing six components of the SI process to the framework namely: the social entrepreneur, the socially creative strategy, technological design of SI, the SI diffusion cycle, social ecosystem and the SI channel. The conceptual framework as a list of factors is illustrated in the next page.

This framework is then used in the context of menstrual hygiene management (MHM) in India to understand the SI process of making and selling low-cost sanitary products and more importantly identify the salient factors that influence its diffusion. Hence, a qualitative case study approach involving three small-scale production units making low-cost sanitary products in India was done. These cases were identified based on the recommendations of MHAI and Sukhibhava. From the extensive case studies that observed the SI process of the diffusion of these low-cost sanitary products using the conceptual framework, all the factors except for three - mass media, identity & role-based groupings, uncertainties and risks from the conceptual framework were identified in the three cases.

Table: Factors of the conceptual framework



Based on all the factors studied from the framework, eight salient factors were identified that influenced the diffusion of low-cost sanitary products among women in India: relative advantage, complementary product & services, network & interpersonal ties, promotion platforms, intermediaries, social structure, cultural & psychological factors, political factors.

The research identifies that the social enterprises running the small-scale production units have made significant progress in tackling the different barriers present. However, certain changes in policy and the social entrepreneur's strategy could further drive the diffusion of low-cost sanitary products among women in India. Thereby, solving issues related to accessibility, affordability and awareness related to menstrual hygiene. Based on the findings, it led to five policy recommendations and three recommendations to the social enterprises.

The policy recommendations are: i. Changes to GST exemption on sanitary products. ii. Central action committee to ensure consensus in promotion of sanitary products. iii. Revision in existing standards for sanitary products. iv. Sanitary waste management. v. Programming for menstrual health programs. While, the recommendations to the small-scale production units are: vi Develop environment friendly sanitary products with more size and colour variations. vii. To improve the accessibility of the sanitary products. viii. To collaborate with other actors to build and run awareness programs.

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1. INTRODUCTION

1.1 Background

In September 2000, World leaders met at the United Nation's headquarters to set Millennium Development Goals (MDGs) to solve the urgent but inefficiently addressed social issues by the year 2015. The MDGs focussed on addressing problems related to women's health and menstrual hygiene management (MHM) among other issues (Tjon A Ten, 2007). Yet by the year 2015, the job remains unfinished for the millions of women across the world, with women's health and MHM still remaining social issues that needs attention according to the newly formed Sustainable Development Goals (SDGs) that the United Nations sets to achieve by the year, 2030 (Lüdeke-Freund & Froese, 2019).

According to a UNICEF study in India, young men and women aged between 10 to 19 years comprise of nearly one quarter of the population i.e. almost 243 million (UNICEF, 2011). Such a huge segment constitute a crucial human capital that could not only contribute to the social and economic development of the country, but also to social harmony, gender equality, stabilization of population and improved quality of life (Bott, Jejeebhoy, Shah, & Puri, 2003). Young girl children are gradually investing more time in school, going through puberty, marrying and giving birth much later than before (Garg, Goyal, & Gupta, 2012). Not looking after this population has huge future consequences, since reproductive and sexual behaviours during adolescence have wide-ranging outcomes as they grow to become adults. One such vital necessity of adolescent girls is associated to menstrual hygiene and reproductive health (Bott, Jejeebhoy, Shah, & Puri, 2003).

The consequence of poor menstrual hygiene management is the prevalence of Reproductive Tract Infections (RTIs) among woman. RTIs are also linked with the incidence of cervical cancer, HIV/AIDS, infertility, ectopic pregnancy and a myriad of other symptoms (Ranjan & Sharama, 2002). Access to menstrual products that aid in addressing the above-mentioned issues in the western markets is easier and affordable. However, women in developing countries have no access to sanitary products. So, they make use of old clothes, rags, newspapers etc., to stop the bleeding (Patkar, 2015).

On an average, a woman uses 10,000 pieces of sanitary napkins in almost 30–40 years of her lifetime (Galhotra, 2011). According to these estimates, the annual consumption is estimated to be 58,500 million pads. However, the current consumption in India is around 2,659 million pieces (Galhotra, 2011). In terms of the usage of sanitary napkins among Indian woman, only 10–11% of the entire market is occupied, while in Europe and the United States of America it is between 73–92% (Galhotra, 2011). Menstrual hygiene awareness in the urban parts of India is at 21–25% because of the considerable amount of resources spent in advertising, while in rural parts of the country the awareness on menstrual hygiene and usage of sanitary napkins is virtually absent (Galhotra, 2011).

In the rural areas of the country that constitute 70% of the population, the biggest barrier preventing usage of sanitary napkins is its price. A sanitary pack of 10 pads produced by multi-national companies (MNCs) costs approximately between 30-40 Indian National Rupee (INR) (Garg, Goyal, & Gupta, 2012). Therefore, during every menstrual cycle, a rural woman on an average need to spend around 48 INR, which is expensive by Indian standards (Garg, Goyal, & Gupta,

2012). Water Aid Mission in Nepal conducted a study which identified lack of knowledge about the availability of sanitary napkins (41%) and high cost (38%) as the major reasons for not using sanitary napkins (Water Aid's Mission, Nepal, 2009).

In India, although the onset of menstruation in certain cultures is commemorated it is generally beleaguered. The existence of a patriarchal caste system in different parts of the country and the social-cultural stigmas results in taboos and fear of pollution associated with menstruation. Menstruation is considered a taboo in most households (Brockington, 1981). *“Women are often perceived as ‘polluted’, ‘impure’ or ‘dangerous’. They are not permitted to touch men, plants or food or to participate in daily activities such as visiting sacred sites or marriage ceremonies, doing household work or harvesting”* - (WaterAid, 2012). This fear of pollution has instilled a culture of shame which forces menstruating women to look for well-hidden places in their houses to dry the old-clothes. These places are often damp, dark and unhealthy (Bhomia, 2010). Schools in rural areas do not help the young girls in the current generation either as they generally abstain from discussing menstrual hygiene. According to a 2015 survey by the Ministry of Education, the teachers in 62% of the schools neither discuss menstruation nor instruct students on how to deal with it in a hygienic manner, thereby leaving girls unaware of these issues (Dutta, 2018).

All of this suggests that the prevailing socio-cultural and psychological barriers stop women from talking about menstruation and using sanitary products. Preventing women from using sanitary products has major consequences. It has caused young girls to drop out of school and women to quit work. In fact, 23 million girls drop out of school annually in India due to lack of proper menstrual hygiene management facilities, which include availability of sanitary napkins and logical awareness of menstruation (Patkar, 2015). This has resulted in women losing their right for equal opportunities (Garg, Goyal, & Gupta, 2012).

1.2 The role of social entrepreneurs

Newly arising literature has pointed out that employing an entrepreneurial approach is the way forward in solving social problems (Darabi, Nazari, & Emami, 2012). According to Dees (1998), *“A social entrepreneur combines the passion of a social mission with an image of business-like discipline, innovation, and determination commonly associated with, for instance, the high-tech pioneers of Silicon Valley”*. They are entrepreneurs with a social mission (Dees, 1998). The social mission to them is central and explicit. These entrepreneurs as inventors of the Social Innovation (SI) process have increasingly attracted attention as important players within sustainable development (Howaldt, Schröder, Kaletka, Rehfeld, & Terstriep, 2016). They are looking for market opportunities and novel innovations to solve social problems and to have a positive impact on the local communities (Mort, Weerawardena, Sargeant, & Bennett, 2015). The issues can be solved by the dialogue among businesses and citizens, who together aim at finding solutions to meet the needs of society (Dutta, 2018). Social Innovation is interpreted as a process *that can bring more efficient and sustainable ways for overcoming social problems by creating “scalable, sustainable, system-changing solutions”* (Christensen, Baumann, Ruggles, & Sadtler, 2006). Social entrepreneurs are quite often known to being locally embedded. Social Innovation on the other hand is often created to solve local problems and then spread to other places (Dacin, Dacin, & Tracey, 2011).

Hence, social entrepreneurs have made serious attempts to address the issue in menstrual hygiene by coming up with small-scale production units involving alternative technologies that produce

affordable solutions (Dasra, 2015). It seems fair to conclude that useful and cost-effective innovations like these are broadly accepted and sell fast because they fulfil consumer requirements. But this has not been the case (Ramani, SadreGhazi, & Duysters, 2012). Even after serious attempts taken in making the sanitary products affordable by social entrepreneurs it appears that so many other factors including the mentioned ones like lack of awareness, availability, lack of disposal facilities and not just affordability remain to be barriers for the diffusion of sanitary products in India (UNICEF, 2019). Hence portraying what Martinelli (2012) stated, that most social innovations do not overcome the pioneering phase and spread even less across broader scales causing many of these small-scale production units in India to shut down because of very low sales. Due to the low diffusion rates, questions are raised about the sustainability of these small-scale production units owned by social entrepreneurs that have cropped up across India which produces low-cost sanitary products.

Hence, the research focuses on understanding the SI process of making and selling low-cost sanitary products in India. This will help in clearly identifying the barriers on the demand side coupled with supply constraints that limit the diffusion of these sanitary products made by them, along with documenting other factors that aid these production units in making inroads into this complex market. This will assist the social entrepreneurs in better understanding and serving their constituents as well as help inform the Government of India on an appropriate policy for this subject.

1.3 Scientific Relevance

One of the prerequisite conditions for any innovation to be successful is that it needs to be adopted by the customers in the market. Adoption is generally perceived as the choice to implement and use an innovation (Rogers, 2003). There is no shortage of innovations by social enterprises that improve the quality of people's life in general like fuel and power generation from plant and animal matter, clean drinking water from solar powered desalination plants etc., The key characteristics being low-cost, simple and efficient, it appears sensible to accept that these social innovations are accepted broadly and straightaway. But these innovations fall short due to adoption being relatively small (Ramani, SadreGhazi, & Duysters, 2012). A systematic comprehension of all the factors that help or hinder adoption is essential. If the invention is not accepted by the consumer, any effort to scale up ends up being pointless. The benefits of an innovation eventually heading to an adoption are possibly to vary from those stated by an entrepreneur (Tolba & Mourad, 2011).

Academic focus in this respect is limited and it replicates the dilemma all the actors involved face. Social entrepreneurs launch their products in the markets relying on the excessively wide-ranging theoretical generalities rather than taking a comprehensive assessment on the diffusion of social innovation (Pathak & Pradhan, 2016). Thus, leading to sustainability challenges to the social innovation. Research on the adoption and diffusion of innovation is possibly one of the largest reported social phenomena reviewed in economics, and other fields (Mahajan & Peterson, 1985).

Even though, adoption of innovation has been investigated in length, there has been less focus on social innovation's adoption (Ratcliff, Doshi, & Doshi, 2013). Further, much lesser analyses are included into diffusion models (Peres, Muller, & Mahajan, 2010). Even though there are numerous findings investigating the approaches of adoption for these very markets (Prahalad & Hart, 2002), there seems to be no comprehensive theories to explain this phenomenon. There is no consensus on what social innovation is and isn't. Deprived of a clear idea of what the cause and effect in social innovation are, it remains hard to build interventions and scale up (Pue, Vandergeest, &

Brezn, 2015). As a first step towards addressing this gap, Pue et al (2015) have designed a framework towards a theory of social innovation. This framework is still an untested concept and doesn't give much insight yet on how to empirically research social innovation.

Hence, in this research an attempt is made to combine the factors from Pue et al.'s framework with factors identified from other conventional theories to develop a conceptual framework that is used to help understand the process of SI. The framework might support on-going research in the diffusion of SI and encourage practitioners to use the framework as a blueprint of SI. In the case of menstrual hygiene management in India, it will help understand the SI process of making and selling the low-cost sanitary products, thereby identifying the salient factors that influence its diffusion among women.

1.4 Research Objective

The objective of this research is to:

“To identify the salient factors that influence the diffusion of low-cost sanitary products among woman in India by understanding the SI process of making and selling these products by the small-scale production units.”

Investigation into the social innovation process of low-cost sanitary products will give an outline of the factors influencing its diffusion. Thereby, the demand side barriers along with supply constraints that prevent SI from reaching target consumers will be better understood. The research through its results, attempts to tackle the lack of diffusion of these small-scale production units by advising on the factors that need to be taken into account during the design and development phase of the social innovation process.

During the course of the research, a conceptual framework that combines the factors from Pue et al.'s framework with factors identified from other conventional theories, is used to the study the process of SI. In any innovation, significance of factors changes across time. In any new scenario, an innovation has its own characteristics. Finding all of these characteristics, including them and understanding the dynamics between the factors is a large undertaking. Similarly, a dynamic model is possibly complicated than being useful. Hence, identifying the factors with a static view affecting the diffusion of social innovation in its totality is an effective initial point. A framework like this is probably less detailed and accurate than a dynamic model but is always practical. The aim of the thesis is to not develop or refine an existing theory but to use the conceptual framework as a means to reach the objective of understanding the SI process of making and selling low-cost sanitary products among women in India and thereby identify the factors affecting its diffusion.

1.5 Research Question

From that line of thinking, the primary research question here would be:

“How can the low-cost sanitary products made and sold by the small-scale production units be understood as a social innovation process and what are the salient factors that influence its diffusion among woman in India?”

The research was initiated with the preliminary aim of trying to understand why such a low rate of adoption of low-cost menstrual products among woman in India exists. It starts with the rudimentary step of understanding the basic context and outlines of the menstrual hygiene

management in India. While further researching, it was found that there was inadequate academic literature on the various factors that facilitates or remains barriers for the diffusion of these products among women in India and that it is essential for the various actors involved in the process to investigate these factors. Hence, with the help of the conceptual framework an attempt is made to study the SI process in the field of Menstrual hygiene management, thereby identifying the salient factors that could further drive diffusion of low-cost sanitary products in India.

The sub questions that complement the above stated research question are:

1. *What factors influencing diffusion in both conventional and social innovation theories can help establish a conceptual framework that will allow in understanding the social innovation process of manufacturing and selling low-cost sanitary products made by the small-scale production units in India?*

It is essential to understand the existing literature in the field of different conventional innovation diffusion models and social innovation to identify the factors that influence both the supply and demand side of the market. This will be done by an intensive literature survey. Factors will be selected primarily based on the framework from Pue et al.'s (2015) on social innovation and what literature describes in different conventional innovation diffusion models. Factors which are found in every theory will be considered and discussed. The goal here is to understand what happens during the diffusion of a social innovation process and to gather enough insight from all these different innovation theories to make the formulation of factors possible. A conceptual framework will then be established based on the identified factors.

2. *To what extent can the factors from the conceptual framework be observed in the social innovation process of manufacturing and selling low-cost sanitary products by the small-scale production units in India?*

The social innovation process will be described using a qualitative case study approach involving the small-scale production units making low-cost sanitary products in India because it is considered appropriate for the following reasons - 1. The diffusion of social innovation is underexplored (Ratcliff, Doshi, & Doshi, 2013). 2. Real-world conditions that are hard to regulate are well examined with the help of case studies to understand the distinctions (Yin, 2003). 3. This type of research produces high internal validity mainly for the end users - the social enterprises and other actors (Dul & Hak, 2007). Furthermore, the context of menstrual hygiene management in India needs to be understood, to form a basis to later draw the salient factors from. This will therefore prevent this research from ending up with unusable, complex and entangled factors.

3. *What are the salient factors that influence the diffusion of low-cost sanitary products made by small-scale production units among women in India?*

Factors are generally ideas that help in understanding what potentially obstructs and aids the development and diffusion of a social innovation. Through the case study research of social entrepreneurs who own small-scale production units that make low-cost sanitary products in India, a list of salient factors will be identified that might further drive diffusion of low-cost sanitary products.

4. *What recommendations based on the identified salient factors could be given to the small-scale production units and the other stakeholders involved that could facilitate further diffusion of low-cost sanitary products among woman in India?*

Like mentioned earlier, the social entrepreneurs who attempted to solve the menstrual hygiene crisis attributed the low rate of adoption to the high cost of sanitary products by MNCs. While it remains one of the causes of the problem, it was found from their experience that lack of awareness is also a cause. So, it also an issue related to awareness. And, if lack of awareness is in fact a problem, is it then the poor campaign strategy that is the problem? Or, is it the lack of education on menstrual health and hygiene among woman in India? This portrays the fact that it is hard to narrow-down the challenges to one factor. A challenge or an opportunity can be articulated in many ways. Hence, the framework consisting of factors identified from the literature, needs to be examined in the menstrual hygiene management context in India. This will help in identifying salient factors that will be crucial for making recommendations to both the small-scale production units as well as the government which could aid in further driving the diffusion of low-cost sanitary products.

1.6 Research Overview

This research is focused on understanding the diffusion of social innovation in the menstrual hygiene management sector, resulting in an approach to find a set of factors that is elaborate and simplified.

The research begins with a theoretical part which answers the first sub-question. The conceptual framework is developed. To illustrate the framework and identify the factors, in-depth case studies are performed answering the second sub-question.

The three case studies of social enterprises that work in the field of menstrual hygiene management in India form the empirical part of the research. These case studies challenge and improve the factors that influence the diffusion of low-cost menstrual products, and the conceptual framework on social innovation. Even though a single case study is easier to do, a multiple-case study is far more valued since it will deliver added substantial confirmation (Yin, 2013). This holds true in the diffusion of social innovation in the menstrual hygiene management, where different cases having similar characteristics add to the reliability of the research as a whole, because these cases typically demonstrate the conceptual framework and attaches proof to the framework. The analysis of these cases answers the third sub-question.

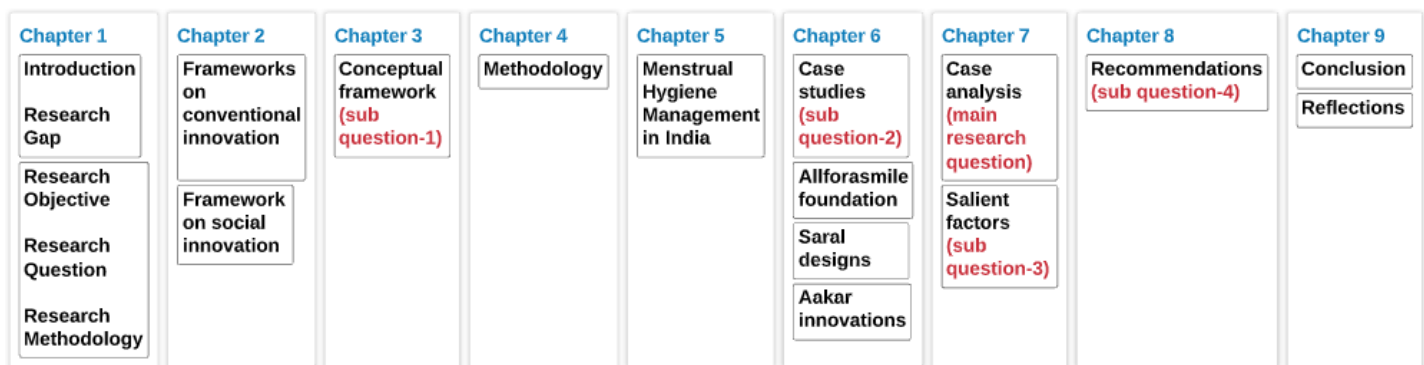


Figure 1: Research Framework

The research will meet its objectives categorically in accordance with Verschuren & Doorewaard, (2010)'s guidelines. This is illustrated using the research framework figure above. Research framework aids in understanding the gap to be addressed, the field of discipline which provides the essential information to attain the objectives, and the insights from other sources that is needed to build the framework.

The gap for this research is to identify the salient factors that could further drive the diffusion of low-cost sanitary products made by small-scale production units in India. The research framework is used to address the gap by portraying a clear picture of the arguments made. It further allows in understanding the different theories used in this research.

Different models on conventional innovation and the social innovation framework by Pue et al are discussed where different factors from each of these models are identified and are discussed in chapter 2. While, chapter 3 starts with building a conceptual framework that combines the factors from Pue et al. (2015)'s framework with factors identified from other conventional theories. Then the methodology is explained in detail in chapter 4. In chapter 5, the literature findings obtained from different NGOs is presented on SI in the field of MHM in India and the current challenges with regards to the usage of sanitary products. Thus, forming the basis on which the case study research is conducted.

Application of framework with the help of three case studies is the last phase in chapter 6. This illustration might lead to finding salient factors. Hence, the findings with all the salient factors are written in chapter 7 with the discussion on the final model that addresses the main research question, leading to recommendations for the social entrepreneurs and helping inform the Government on an appropriate policy in the chapter 8. While, the conclusions and reflection form the last chapter of the thesis.

2. FRAMEWORKS ON CONVENTIONAL AND SOCIAL INNOVATION

In this chapter, academic literature is reviewed to acquire necessary understanding of the studied phenomenon. Different theories that explain the adoption and diffusion of both conventional and social innovations are looked at. The key terms and their usage will be defined accordingly while studying the respective theory. Using the theories studied in this chapter, a framework will be built in the next chapter forming the basis of this research.

Although, there are many SIs tackling social problems, there seems to be lack of theories that helps in identifying factors that have an influence on the diffusion of social innovation except for the framework proposed by Pue et al (2015). However, Pue et al.'s framework still misses out on a couple of key factors that influence the diffusion of innovation like the innovation characteristics, communication channels, etc., Hence, these missing factors will be identified from three conventional models namely: Rogers (2003) theory of Diffusion of Innovation, the pattern of development and diffusion of breakthrough technologies by Ortt & Schoormans (2004) and Strategic Niche Management (SNM) by Geels (2002).

Approach for the literature review

There are many theories that explain the innovation diffusion. The theories for the literature research were identified in scientific journals available through search engines such as Google Scholar, Scopus, Elsevier, etc. by using the search term 'Diffusion of innovation' as well as looking for scientific journals and textbooks from the coursework.

The literature review starts with one of the most commonly used theories: The diffusion of innovation theory by Rogers (2003). The theory basically describes innovation as an s-shaped curve mentioning the key innovation characteristics. However, Ortt & Schoormans, (2004) argue that innovation cannot be described in one smooth S-shaped curve as mentioned by Rogers. They argue that a number of events happen in the timeframe between invention and large-scale diffusion which are not captured by the s-curve. Ortt and Schoormans categorized the entire pattern of development and diffusion rather in three phases and discuss the factors that are required for large-scale diffusion. Hence, it is the second theory discussed in this research work. The final theory on conventional innovation that is looked at, is Strategic Niche Management by Geels (2002). This theory mentions seven factors that are barriers for sustainable innovation diffusion. Geels proposes three mechanisms on niche formation. The innovation starts as a technological niche. Then due to the linkages between the different levels, technological transitions happen. This theory is important to look at, as it talks about key factors like government policy and regulatory frameworks that affect the progress of niches. After the conventional innovation models are studied, the SI framework by Pue et al (2015) is reviewed.

Definition of adoption and diffusion

Before stepping into the review of different theories, the key terms: Adoption and diffusion which are quite often mentioned in this work is first discussed. Adoption and diffusion are often synonymously used in academic literature, even though they are quite different from each other. Therefore, these terms are first clearly defined. Adoption is defined as "The stage at which a particular technology or product is selected for use by an individual or a group of individuals" (Carr, 1999), whereas diffusion is defined as "The stage at which the technology or product spreads for general use and application" (Rogers, 2003). Diffusion is a two-step method that begins with

individual adoption and then leads to a group or organization adoption which eventually leads to mass adoption and finally labelled as diffusion of technology or a product (Davis, 1989).

Adoption and diffusion of innovation are actually strongly correlated (Metcalf, 1988). While diffusion processes studies the dynamics that affect the spread of innovation in a social system, adoption has been described as “the individual process that an agent experiences from first getting across a technology, product, or idea to finally adopting it (Zanello, Fu, Mohnen, & Ventresca, 2015). Hence, an argument can be put forward that the diffusion process intrinsically environs the adoption process of several agents over time. Hence, this thesis uses the term diffusion, although adoption is sometimes referred to.

2.1 Frameworks on conventional innovation

The first part of this chapter will explore the relevant diffusion theories in the context of conventional innovation to identify the missing factors. *Because, the conceptual framework that is later built in chapter 3 is based on the SI framework by Pue et al (2015) however with the gaps addressed by the factors identified from the theories on conventional innovation.* The following diffusion theories on conventional innovation are studied:

Table 1: Theories on conventional innovation

Theory	Author
Diffusion of Innovation theory	Rogers (2003)
The pattern of development and diffusion of breakthrough technologies	Ortt & Schoormans, (2004)
Strategic Niche Management (SNM)	Geels (2002)

The detailed review of the literature on these three innovation models can be found in appendix A. However, the factors identified from these three innovation models that will be later used in building the conceptual framework based on Pue et al (2015) are mentioned below.

In the diffusion of innovation theory by Rogers (2003), the characteristics of innovation namely **relative advantage, compatibility, complexity, trialability, and observability** along with **mass media** are identified. While relative advantage is defined as “The degree to which an innovation is considered to be better than the idea it replaces.” Compatibility is the degree to which an innovation is considered as consistent with the existing values, past experiences, and needs of potential. Complexity is the degree to which an innovation is considered as relatively difficult to understand and use. Trialability is the degree to which an innovation may be experimented with on a limited basis. Observability is the degree to which the results of the innovation are visible to others. And finally, the risks and benefits of the innovation process are often discussed in the media and therefore first adopted by groups of people who have considerable access to mass media. It is the most influential channel that aids in the spreading of the innovation.

From the pattern of development and diffusion of breakthrough technologies by Ortt & Schoormans, (2004) the following five factors were identified for the conceptual framework: **production system, capital, uncertainties & risks, macro-economic factors and complementary products & services**. A production system is required to produce enough quantity of products with sufficient performance and quality that is required for diffusion of the

innovation. Absence of it might hamper the diffusion process. Capital is needed for the efforts put in the technological design and development and for challenging & changing the existing market. This requires natural, human, and financial capital. Risks and uncertainties like floods, trade bans, droughts etc., could be a potential threat to the innovation. They end up having negative impact on the adopters as well as the society. Macro-economic factors refer to the economic situation in a country like a recession or inflation causing the economy to slow down. If these economic aspects are unfavourable, it might affect the diffusion of the innovation and complementary products and services are required during the entire process of innovation for its design, production, distribution, adoption, use, maintenance & disposal.

While, from strategic niche management by Geels (2002), the following two factors are used in the conceptual framework. **Cultural and psychological factors** like beliefs, customs and rituals that influence the spread of the innovation and **political factors** that stimulate innovation or if a particular innovation hurts or aids the political agenda of the ruling party in a country, it might affect the diffusion of innovation.

2.2 Framework on social innovation (SI)

As mentioned earlier, even with so much social innovation happening across the world there seems to be no comprehensive theory that can study all these activities. Hence, Pue, Vandergeest, & Brezn (2015) developed a framework for the process of social innovation. They termed “*effectiveness in responding to a social problem; sustainability and empowerment; diffusion, scaling and replication*” as the framework’s three main objectives.

Like mentioned earlier, the model defines social innovation as “*a process encompassing the emergence and adoption of socially creative strategies that reconfigure social relations in order to actualize a given social goal*” (Pue, Vandergeest, & Brezn, 2015). The key characteristics of the definition is that: i. It states SI as a process; not a defined end state. ii. It emphasizes that socially creative strategies are a key reactant in the process of SI that aims to attain a social goal and that SI does not happen if the socially creative strategy is absent. iii. It underlines that the phenomenon is not defined by the outcome. In other words, it does not state that only actions that end with a social benefit can be termed as SI. iv. It includes social change as a compulsory result of SI (Pue, Vandergeest, & Brezn, 2015). However before getting into the process of social innovation, key terms are defined.

2.2.1 Social Innovation (SI)

Social innovation talks about innovative activities and services that are inspired by the goal of addressing a social need (Mulgan G. , 2006). SIs are mainly dispersed through establishments whose key purposes are social (Mulgan G. , 2006). Across the world, the impact of SI is visible; however, only recently the academic attention for this field has considerably grown. Compared to conventional innovation, SI still lacks strong foundational knowledge (Pue, Vandergeest, & Brezn, 2015).

Definitions of SI vary widely because of it being used in different fields of research such as business administration, economy, sociology, social work or political science. This has led to an incoherent body of knowledge and thus to a lack of clarity (Rüede & Lurtz, 2012). SI is about a profound understanding of competition and creation of economic value by inventing new solutions to existing social needs (Lin & Chen, 2016). The term ‘new’ does not only refer to novel

components, but to ideas that are perceived as new by the adopters (Rogers, 2003). SI can be profit-seeking as well; however, this is balanced with pro-social benefits and public-value creation rather than private-benefits (Rüede & Lurtz, 2012). Yet, SI distinguishes itself from definitions of conventional innovation because it is not solely about finding new products and services, but about “*changing the underlying beliefs and relationships that structure the world*” (Lin & Chen, 2016).

The fact that SI provides solutions to problems of societal groups that lack own possibilities to do so, can be considered as a special characteristic (Boons & Lüdeke-Freund, 2013). Taking a closer look at the definition of SI, scholars distinguish between societal innovation, which refers to larger social groups, and social innovation, which has a narrower focus on local communities. They reflect that such a solution can be achieved by dialogue and partnership between businesses and citizens. Therefore, SI does not only aim at promoting the well-being of a society or contributing to a better human life but simultaneously encourages social relationships and increases society’s capacity to act (Caulier-Grice, Kahn, Mulgan, Pulford, & Vasconcelos, 2010). Nevertheless, the most referred-to definition of SI in this field of research is the definition of Phills et al. (2008): “A novel solution to a social problem that is more effective, efficient, sustainable than existing solutions and for which the value created accrues primarily to society as a whole rather than private individuals.”

However, this thesis adapts the definition by Pue et al (2015) which states that:

“Social innovation is a process encompassing the emergence and adoption of socially creative strategies that reconfigure social relations in order to actualize a given social goal.”

This definition denotes social innovation as a process. And, it does not define SI as its own result. The authors also abstain from making the definition normative because it is easy to visualise a successful implementation of a social creative strategy which focuses on bettering social conditions and that which will bring significant social change, but only to later find that the result leaves the target community worse than before. Another benefit of defining social innovation as a process is that it makes it possible to easily possible to precisely portray the boundaries between the main actors, their institutional environment, and the interactions between them (Pue, Vandergeest, & Brezn, 2015). This will result in policies embedded in an understanding of the cause and effect, clear-cut investigation of restrictions, and an extended judgement on whether a policy will have positive effect or not (Pue, Vandergeest, & Brezn, 2015).

In SI, a lot of the actual research is about its features which appears uncomplicated but is essentially rather complicated: A product or a service needs to make sense locally (acceptance), the public needs to know about it (awareness), logistics need to work (availability) and that it is valued suitably (affordability). To put it differently, instead of enhancing technology-intensity and supplementing it with added complicated and cutting-edge characteristics, SI is about amplifying the impact and sustainability by reducing the complicatedness (Schmidt, 2015). Yet, the SI process has to fit the company’s business model, be economical and contribute to the society in order to lead towards sustainable development (Boons & Lüdeke-Freund, 2013).

2.2.2 Social Entrepreneur

A social entrepreneur “combines the passion of a social mission with an image of business-like discipline, innovation, and determination commonly associated with, for instance, the high-tech pioneers of Silicon Valley” (Dees, 1998).

The fascination towards social entrepreneurs arises from their function in tackling crucial social problems and their commitment towards bettering the welfare of the people (Zahra, Rawhouser, Bhawe, Neubaum, & Hayton, 2008). The society often embraces social entrepreneurs with good respect because of many social wants they fulfill and the better-quality life they bring to the disturbed people. They are entrepreneurs with a social mission. This of course influences how social entrepreneurs remark and evaluate prospects. “Mission-related impact becomes the main criterion, not wealth creation. Wealth is just a way to an end for social entrepreneurs. With business entrepreneurs, wealth creation is a way of measuring value creation. This is because business entrepreneurs are subject to market discipline, which determines in large part whether they are creating value. If they do not shift resources to more economically productive uses, they tend to be driven out of business” (Dees, 1998).

Therefore, Dees (1998) proposed that social entrepreneurs play the role of change agents in the social sector, by:

- Adopting a mission to generate and uphold social value.
- Identifying and persistently following new prospects to serve that mission.
- Involving in a procedure of constant innovation, adaptation, and learning.
- Proceeding confidently without being restricted by means currently in hand.
- Displaying sharp responsibility to the population served and for the results generated.

Abu-Saifan (2012) hence came up with a definition stating that, “*The social entrepreneur is a mission-driven individual who uses a set of entrepreneurial behaviors to deliver a social value to the less privileged, all through an entrepreneurially oriented entity that is financially independent, self-sufficient, or sustainable*”.

Based on the definition of social entrepreneurs, Abu-Saifan (2012) proposed the boundaries to precisely place social entrepreneurs in the field of entrepreneurship. As shown in Figure 2, social entrepreneurs function within the borders of two occupational strategies.

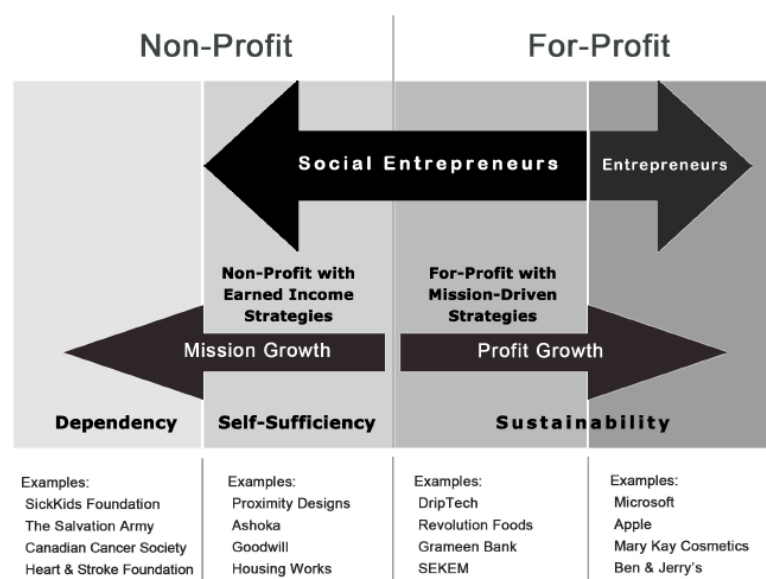


Figure 2: The range showing the borders of social entrepreneurs (Abu-Saifan, 2012)

1. *Non-profit with earned income strategies*: A social enterprise executing hybrid social and commercial entrepreneurial activity to achieve self-sufficiency. In this case, a social entrepreneur runs a firm that is social as well as commercial; profits made are further used to advance the delivery of social values (Abu-Saifan, 2012).
2. *For-profit with mission-driven strategies*: A social purpose business executing social and commercial entrepreneurial activities at the same time to attain sustainability. Here, a social entrepreneur runs an establishment that is social as well as commercial. However, the firm is monetarily independent so the owners and the stakeholders can gain from the profits. (Abu-Saifan, 2012).

2.2.3 The SI process

The framework to understand SI as a process is driven by the interrelation of its two engines: an agentic engine and a structural engine. The agentic engine of SI starts once a social entrepreneur develops a socially creative strategy to make a routine of the idea that reshapes society's tactics towards a certain societal challenge. The structural engine of SI relates to how society reacts: whether the acceptance of a socially creative strategy happens throughout the social environment and social structures. Acceptance happens through emergence and adoption, two halves of what the framework terms as the SI diffusion cycle. If the socially creative strategy finishes this SI diffusion cycle, two results are possible: social change and a reconfiguration of the social problem such that it, preferably, meets its social goal (Pue, Vandergeest, & Brezn, 2015).

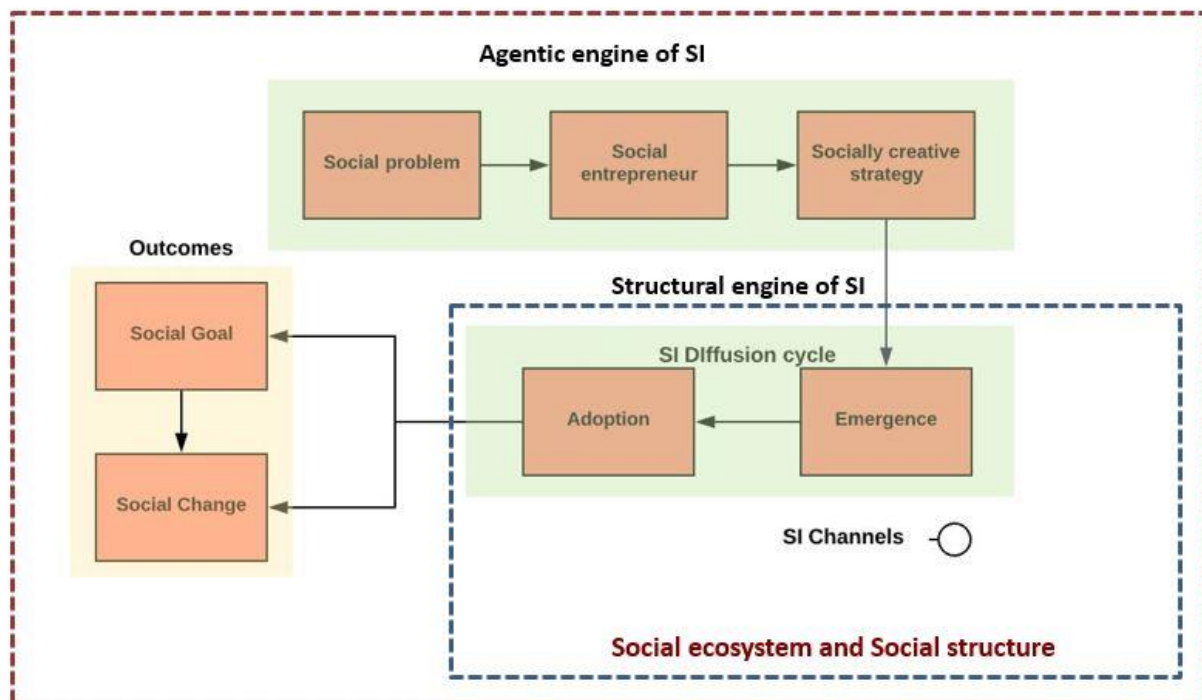


Figure 3: The Social Innovation Process (Pue, Vandergeest, & Brezn, 2015)

2.2.3.1 The Agentic Engine

The agentic engine of SI includes of the *social entrepreneur* formulating a *socially creative strategy* to reshape the society's tactic to a certain *social problem*. The Social entrepreneur is

affected by the social environment and the prevailing social structures which shape the available opportunities as well as the social purpose (Pue, Vandergeest, & Brezn, 2015).

1. Social Entrepreneur

The social entrepreneur is the prime mover of this process. It is the actor that builds a socially creative strategy to resolve a societal problem and help improve the socially creative strategy towards emergence and adoption. It is termed important to study the social entrepreneur as it accentuates the responsibilities of actors through the process as well as provides a unit of analysis for the concerned study. There are three factors that need to be studied to better understand the part of the social entrepreneur in the process of SI.

1.1 Motivation

An actor can be motivated by any purpose while designing a social creative strategy. Motivation consists of intrinsic motivation like interest, assertiveness, and supporting others and extrinsic motivation which is grounded on incentives like acclaim or reputation. Social entrepreneurs might be driven by one of the types or a combination of both. There is a need to understand how social entrepreneurs are driven; this might showcase one opportunity for inspiring the establishment of SI; particularly in the case of extrinsic motivation because in some cases it can be motivating, while in other cases it could also distract the entrepreneur from the creative process.

1.2 Values

According to Pue et al (2015), values are culturally defined standards which guide standards of behaviour which influences manners, faiths and norms. Values both shape the motivation of the social entrepreneur and the social problem towards which the entrepreneur aims his activities. Also, values maybe changed by social innovation.

1.3 Individual faculties

Individual faculties consist of skills, traits, macro-level features such as socio-economic reputation, administrative connections.

2. Socially Creative Strategy

It is a unique and creative concept, plan of action or policy devised to reshape the social relations towards the goal of creating a social benefit. It must pursue to transform or realign the regulations, functions or procedures applicable to a specific quest. It can either be a new intervention i.e. a new product, service or a directed change in customs. It can arise from a new concept or from a recombination or transmission of a prevailing concept based on the context the social entrepreneur faces. It is a crucial reactant in the process of SI that undergoes change throughout the process.

3. Social Problem

Socially creative strategies tackle social problems. The actor must be convinced a social problem is existent and a socially creative strategy will achieve the goal applicable to the social problem. Also, for the strategy to progress through the SI process, all actors need to agree that the problem exists. Therefore, it needs to be inter-subjectively identified as a problem.

2.2.3.2 The Structural Engine

After the identification of a socially creative strategy, it must be produced and reproduced over time to effect social change. The acceptance of the socially creative strategy happens through the

social structures within the *social ecosystem*. The acceptance happens through the *emergence* and *adoption* phases which are two-halves of the SI diffusion cycle. The adoption phase has a greatly dependency on the institutional context.

4. Emergence

It is the commencement of the SI diffusion cycle. It is the means through which social entrepreneurs collect initial support for their strategy by either being brokers or relationship builders. The entrepreneurs utilise their influence in the social ecosystem, and also use existing social structures to tactically seek support to obtain initial materials, participation to develop the socially creative strategy as well as build a platform to promote it and attract early adopters.

5. Adoption

Adoption is the implementation of a socially creative strategy more widely throughout the social system in a way that it reaches the target community. This is also labelled as institutionalization of the socially creative strategy (Pue, Vandergeest, & Brezn, 2015). It is the review of existing customs, knowledge and maybe internalization of innovative characteristics and benefits. Institutionalization happens in two ways: *top-down and bottom-up institutionalization*. In the top down institutionalization, the plan is implanted in the official agendas by appropriate establishments in the public administration. In the Bottom-up approach the strategy penetrates the public domain and informs public discussion and routine. Irrespective of it being a top-down or a bottom-up approach, adoption involves expanding model initiatives. If a socially creative strategy advances to adoption, it might ultimately accomplish a cascade, in which the strategy is socialized as every day normal routine. Ultimately, a socially creative strategy might be internalized, accomplishing a taken-for-granted position.

6. Social Ecosystem

A social ecosystem is made of an intricate web of individuals networking in a certain social space. A physical and cognitive space where interaction happens (Pue, Vandergeest, & Brezn, 2015). It is the collectiveness of interpersonal ties - *strong or weak* that affects diffusion. It also includes identity and role-based groups - groups of people serving a particular purpose. Social problems that arise within a social ecosystem are framed considering cognitive boundaries the social ecosystem. The target consumers of a socially creative strategy are discovered inside the social ecosystem, and the agents inside this very area enact a part to decide whether a socially creative strategy can progress to emergence and adoption (or not). Effective functioning of these networks forms the social capital of the social ecosystem; which can be defined as the ‘social glue’ that binds the society.

7. Social structures

Social structure portrays the social life that is influenced by the collection of material facilities, concepts, and establishments; thus, it focuses attention to power. It is a pattern of social interactions that can be identified at a given moment. The most studied within the social structure are the institutions. They are the rules of the game; which either enable or constrain actors. “These comprise of routines, characteristics, interests; constitutive, regulative, and bureaucratic norms; organizations, rules and routines; or other arrangement that prescribes, proscribes, and/or authorizes behaviour” (Pue, Vandergeest, & Brezn, 2015). Establishments give some actors more power to influence than others.

2.2.3.3 Outcomes of SI

When the process of SI arrives at an end state, it marks two consequences: *social change* and reshaping of the social problem so that it ideally, but not essentially meets a *social goal*.

8. Social Goal

A completed SI process might meet a social goal - an outcome of social improvement, but it is not a necessary condition. There are two reasons why a successfully adopted socially creative strategy might not improve society:

- i. “The propositions about the causes of a particular social problem may be mistaken; even if the new approach is uniformly undertaken, better outcomes will not materialize.” - (Pue, Vandergeest, & Brezn, 2015).
- ii. “Negative externalities might arise from the new practice or intervention. As such, while the process of SI results in the reshaping of a social problem it may not deliver a ‘social benefit,’ and might even make conditions worse.” - (Pue, Vandergeest, & Brezn, 2015).

To cite a case from a SI context; The concept of micro-credit loans was introduced by the Grameen Bank in Bangladesh, to help impoverished farmers with funds who could not otherwise afford bank loans due to absence of collateral or security. However, it was learnt that micro-loan programs impair the society, as many of these farmers end up with less incremental income after getting a micro-loan. Hence, it does not deliver a social benefit.

9. Social Change

Reshaping of a social problem not only ideally meets a social goal, but definitely changes the broader social environment. Social change is a necessary outcome of a completed SI process as a result of the interaction between the agentic and the structural engine of SI. For example, during the adoption phase of SI, it might gather and marshal groups to generate a new social role or modify existing role relations. Social change inputs the necessary rejuvenation required to significantly increase the elasticity of a particular social environment.

2.2.3.4 The Institutional Contexts of SI

The SI process needs to analyze the institutional setting in which it takes place, as the institutional context affects the process of SI itself. There are three variables that affect the process: *actor types*, *sequencing* and *the nature of socially creative strategy*.

i. Actor types

The social entrepreneur is not the only main actor in the process of SI always. There could be other actor types like the Government organizations, NGOs, academia, corporate firms etc. that could be equally involved and alter the tools available during the process of problem identification, solution design, emergence and adoption. The actor types can be different in the different stages of the process.

ii. Sequencing

The process of SI might not be linear. For instance, the social problem can be identified pre or post establishment of a socially creative strategy. This might look counter-intuitive. However, the possibility of implementing socially creative strategies from one situation to another makes it doable.

iii. Nature of socially creative strategy

The nature of a socially creative strategy is based on two aspects; the *target community* and the *type of socially creative strategy*. The target community can be narrow or wide, diffused or clearly defined. The mobilization of the socially creative strategy is planned based on the target community. The socially creative strategy can either be a service or a product; or a norm change. It could also be a combination of both. It depends on the social problem that the social entrepreneur is trying to address.

2.2.3.5 Review

Pue et al.'s framework talks about the socially creative strategy, the type and the target community it focuses on. However, the framework does not mention about the characteristics of the socially creative strategy. For instance, if the socially creative strategy irrespective of it being a product, service or a policy is considered to be better than the existing strategy it replaces. The expected benefits of using the socially creative strategy such as economic profitability, decrease in discomfort or social prestige, saving time and effort etc. are weighed against its cost.

The socially creative strategy also needs to be checked if it is consistent with the existing values the current strategy possesses, past experiences, and needs of potential. For instance, if it is incompatible with socio-cultural values and beliefs, then the socially creative strategy is eventually determined by how far it is compatible with a felt need. Also, how difficult or easier is it to put in use a new socially creative strategy needs to be understood. Can the socially creative strategy be trialled on a limited basis and are the results of implementing it observable to others? Because such visibility influences the target community's notion about the new strategy. Understanding in detail the characteristics of the socially creative strategy is vital as it influences its rate of adoption among the target community.

The framework also doesn't give much insight about the communication channels in the process of social innovation that is required to help drive the socially creative strategy forward. While the framework mentions about the use of intermediaries and mass communication platforms in general. It does not probe much into the different type of communication channels that could be used. As thorough understanding of the different communication channel could positively influence the rate of adoption of a socially creative strategy.

Finally, the framework by Pue et al is conceptual and lacks information on how to empirically research social innovation. Therefore, it requires an approach that allows the concepts identified by Pue et al to be empirically described. Doing so, would provide the material that allows the substantiation of the key concepts.

3. CONCEPTUAL FRAMEWORK

Pue et al (2015)'s social innovation framework like mentioned earlier has very little information regarding communication channels that are required to drive the socially creative strategy forward and misses out on the characteristics of the socially creative strategy itself. Therefore, these factors are identified from conventional innovation models like: Rogers (2003) theory of Diffusion of Innovation, the pattern of development and diffusion of breakthrough technologies by Ortt & Schoormans (2004) and Strategic Niche Management (SNM) by Geels (2002). All the other factors are primarily adapted from Pue et al (2015)'s SI framework. Thereby, the conceptual framework is built with factors from four different theories. However, not all these factors may be observed in a SI process. It depends on the cases identified for the research.

Hence, the conceptual framework is built in this chapter answering the first sub question: *What factors that influence diffusion in both conventional and social innovation theories can help establish a framework that will allow in understanding the social innovation process of manufacturing and selling low-cost sanitary products made by the small-scale production units in India?*

3.1 Rationale behind building the conceptual framework

The conceptual framework incorporates many aspects of chapter 2 because it combines the factors from Pue et al.'s framework with factors identified from the conventional theories mentioned above. This conceptual framework is used to study the process of SI.

The conceptual framework has six components: social entrepreneur, socially creative strategy, technological design of SI, SI channels, SI diffusion cycle and social ecosystem. While, the social entrepreneur, the socially creative strategy, SI diffusion cycle and the social ecosystem were primarily extracted from the SI framework, the components - technological design of SI and SI channels are identified from the conventional innovation models in particular the Roger's model, Ortt's theory on pattern of diffusion and development, and SNM. These two components are added to the framework because Pue et al (2015)'s model like mentioned earlier does not describe the characteristics of the socially creative strategy and information regarding communication channels that are required to drive the socially creative strategy forward is very little. However, this results in overlaps in the components.

The choice was made to have only six factors under the social ecosystem component namely: social problem, social structure, cultural & psychological factors, political factors, macro-economic factors, identity & role-based grouping, sequencing and complementary product & services. The social ecosystem according to Pue et al. (2015) is a physical and cognitive space where interaction happens. Social problems arise within the social ecosystem are framed considering the cognitive boundaries of the social ecosystem. The target consumers of a socially creative strategy are discovered inside the social ecosystem, and the agents inside this very area enact a part to decide whether a socially creative strategy can progress to emergence and adoption (or not). The social ecosystem can be termed as the 'social glue' that binds the society. Therefore, in theory social ecosystem comprises of all the factors not just the six factors. The notion of a social ecosystem does not fit with the more explorative scope of this research, which looks at factors as elements that *could* have an effect on the diffusion of social innovation. In line with this, only six factors have been included under the social ecosystem component in the conceptual

framework, as from the viewpoint of this research, the other factors could be fitted well into the other five components.

The four factors: cultural & psychological factors, political factors, macro-economic factors and complementary product & services are important factors which were gathered from other conventional innovation models that help understand the diffusion of SI better. Because Pue et al.'s SI framework missed out on these factors. The social problem, social structure, identity & role-based grouping, and sequencing were already part of the social ecosystem in Pue et al.'s framework.

Secondly, the conceptual framework terms diffusion as a SI diffusion cycle. This is because Pue et al. (2015) terms it is an iterative process. When a product or service is first introduced in the target community there might be challenges that hinders its adoption, so either the socially creative strategy needs to be redefined, or a complementary product or a service needs to be introduced to help in the adoption of the socially creative strategy. This cycle continues until the adoption rates of the socially creative strategy reaches a state where the socially creative strategy becomes the norm for general use or application. According to the conceptual framework, diffusion can be assessed by type of institutionalization and business model. The socially creative strategy can either be adopted in a top-down or a bottom-up process. In the top-down process the socially creative strategy is firmly planted in the relevant institutional framework while in a bottom-up process, the socially creative strategy gradually gets accepted by the community and then ultimately internalized (Pue, Vandergeest, & Brezn, 2015). There are challenges and benefits to both the approaches. The factor 'business model' decides if the socially creative strategy fits the existing business set-up and current resources or does it need a new set-up with complementary product or services. Therefore, the business model showcases the adoption rates achieved by the socially creative strategy. The success of the diffusion of SI directly also depends on an existing business's ability to adopt the SI process to its own conditions and to mobilize its capacities. However, the SI diffusion cycle is only one part of the SI process. And, *not all the factors studied in this framework have had an influence on the diffusion cycle as mentioned in Tables 3 and 4. However, all these factors are important to understand the entire SI process. Also, different factors may have influence on the diffusion cycle in different cases. Therefore, not necessary that the same set of factors need to have an influence on diffusion cycle in all cases.*

The social entrepreneur, socially creative strategy, technological design of SI constitutes the Agentic engine of SI while the SI channels, SI diffusion cycle and social ecosystem make the structural engine of SI as shown in Table 2. The redesigned framework of Pue et al (2015) deals with how social entrepreneurs, who invent socially creative strategies as solutions to social problems, can make an attempt to spread further. The essentials required are the technological aspects of innovation as with those inputs the production and reproduction of these solutions and practices in the diffusion phase leads to social change. The movement towards social change is influenced by the social ecosystem, where networks and personal relationships among actors are created. The social ecosystem can be defined as a space where social problems arise and where the social entrepreneurs invent ideas to overcome these problems. The social structure which comprises of rules and norms is part of the ecosystem therefore playing a significant role in the diffusion of SI. This process of diffusion is divided into effective supply and effective demand (Murray, Caulier-Grice, & Mulgan, 2010) as emergence and adoption jointly termed as the SI Diffusion cycle. During the emergence phase, social entrepreneurs put in efforts to propagate the

idea. Adoption represents the implementation of the strategy at other places which is termed as institutionalization. Adoption starts when the emergence phase is successful. During the adoption process, either bottom up or top down approaches or sometimes a combination of both are used. If this phase is successful as well, the SI can spread and probably lead to a social goal which evolves as a common practice (Pue, Vandergeest, & Brezn, 2015). Irrespective of achieving the social goal or not, social change is evident as a necessary outcome of a completed SI process.

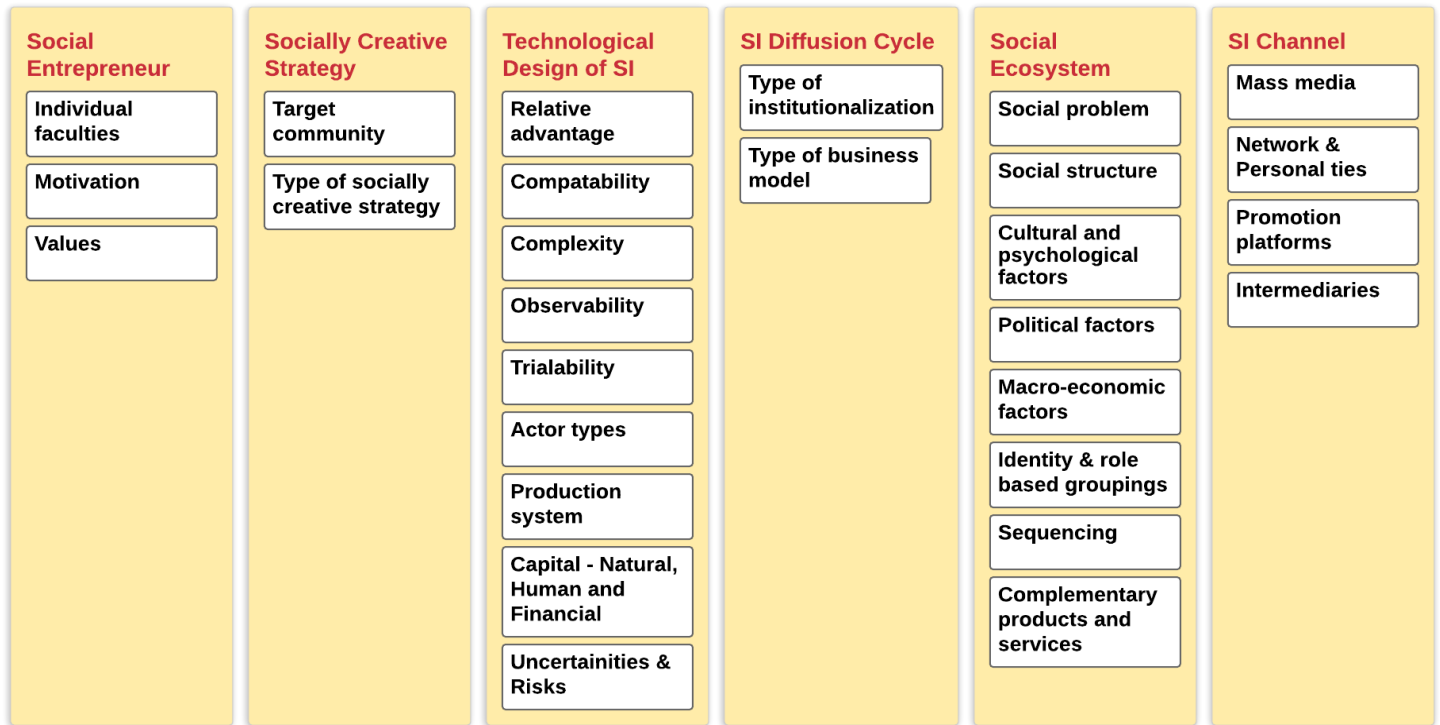


Table 2: Factors of the conceptual framework

3.2 Components of the conceptual framework

The first component within the SI process is the social entrepreneur. The social entrepreneur is the prime mover in the SI process identifying the social problem and coming up with a socially creative strategy to address it. Therefore, it is important to analyse the following factors: *motivation, values & individual faculties*. Motivation can either be *intrinsic* based out of curiosity and self-expression to derive self- satisfaction by contributing to a cause or *extrinsic* which is based on rewards or appreciation from others. Values are culturally defined standards which serve as guiding principles of behaviour. Values shape the motivation of the entrepreneur in solving a social problem which in turn shapes the socially creative strategy. Also, existing social values maybe changed by the SI process. Individual faculties refer to the skills, personality traits; the social entrepreneur possesses which come in good stead while designing the socially creative strategy (Pue, Vandergeest, & Brezn, 2015).

The requirements for a socially creative strategy differ along two factors: *type of socially creative strategy and target community*. First, a socially creative strategy can be a product, service or a policy. The design of SI process and the corresponding diffusion cycle will have different requirements based on the type of strategy. Second, the challenges of diffusion of a socially creative strategy will differ based on whether the target community is narrow or wide, diffuse or

clearly defined. The scope of the target community will impact the manner in which mobilization is best realized (Pue, Vandergeest, & Brezn, 2015).

The technological design of SI is the third component within the SI process. Initially, the design is influenced by a social entrepreneur who envisions a socially creative strategy. And, if the socially creative strategy of the SI process is to address the existing social problem with a product or a service, the technological design of SI comes into play. This is influenced by the *relative advantage, compatibility, complexity, trialability, observability, actor types, production system, natural, human and financial capital and uncertainties & risks*. The relative advantage, compatibility, complexity, trialability, observability is collectively termed as the characteristics of innovation which has been taken from the Rogers' theory. This describes the important attributes of an innovation irrespective of it being a product or a service. It is vital to identify the type of actors in the entire SI process as different actors are present at different points in the entire SI process and they alter the available tools to promote the socially creative strategy (Pue, Vandergeest, & Brezn, 2015). A good production system can produce enough quantity of products with enough performance and quality that is required for the diffusion of a socially creative strategy. The absence of it might hamper the diffusion process. One of the most essential components within the technological design of SI is include the necessary natural, human and financial capital to meet the SI process. Finally, to assess risk and factor uncertainties like trade bans, employee attrition, etc., during the design phase as there could be a potential threat to the SI process if incorrectly assessed. It can end up having negative impact on the adopters as well as the society (Dees, 1998).

The SI diffusion cycle component in the conceptual framework are: *type of institutionalization and business model*. The diffusion phase depends highly on the institutional context (Pue, Vandergeest, & Brezn, 2015). The socially creative strategy can either be adopted in a top-down or a bottom-up process. In the top-down process the socially creative strategy is firmly planted in the relevant institutional framework while in a bottom-up process, the socially creative strategy gradually gets accepted by the society and then ultimately internalized (Pue, Vandergeest, & Brezn, 2015). When it comes to the *business model*, to see if the socially creative strategy fits the existing business set-up and current resources or does it need a new set-up, and also to identify the new end users, customers, adopters etc., who are most likely to implement the product or service The success of the diffusion of SI directly also depends on an existing business's ability to adopt the innovation process to its own conditions and to mobilize its capacities (Murray, Caulier-Grice, & Mulgan, 2010).

In the framework, all components are placed within the social ecosystem which presents the physical place and the structures in which all the actors interact and therefore plays a critical role in the diffusion process. The social ecosystem in the conceptual framework consists of nine factors: *social problem, social structure - rules & norms, cultural and psychological factors, political factors, macro-economic factors, sequencing, identity & role-based groupings and complementary product & services*. Rogers (2003) discusses the social system as a set of units where individuals and organizations interact towards reaching the common objectives while diffusion is affected by social structure- the rules and established norms that exist. A SI differs from conventional innovation as its objective is to tackle social problems and to improve the well-being of society. Thus, the social problems are at the centre of the attention in the diffusion process. Additionally,

cultural and psychological factors might be barriers for the SI to spread (Kemp, Schot, & Hoogma, 1998). If a particular social innovation hurts or aids the political agenda of the ruling party in a country, this might affect the SI process. Similarly, government policies might stimulate SI and facilitate diminishing the barriers in the social ecosystem. Macroeconomic aspects denote the economic state of a country like a recession or inflation causing the economy to slow down. If these economic aspects are unfavourable, it might affect the diffusion of the socially creative strategy (Ortt, Langley, & Pals, 2013). Identity and role-based grouping are ideally arrangements of actors for a particular purpose as they are believed to facilitate co-operative action, related to trust. The Sequence of SI needs to be identified as the SI process may or may not be linear. A social problem can be identified before or after a socially creative strategy has been established. This is made possible when strategy is conceptual from one context to another. The last component of the social ecosystem is the complementary product and services, which often perform as catalysts to drive the diffusion process (Ortt, Langley, & Pals, 2013).

The crucial component in the conceptual framework are the SI Channels. SI Channels are the communication link between the social entrepreneur, other actors and the adopters. The factors within SI channels are: *mass media, networks and interpersonal ties, promotion platforms, and intermediaries*. Mass media is closely related to Rogers' (2003) communication channel. Mass media is mentioned as the strongest and most influential channel that aids in the spreading of the socially creative strategy (Voltan & De Fuentes, 2016). Risks and benefits of the SI process are often discussed in the media and therefore first adopted by groups of people who have considerable access to mass media. Besides mass media, network and personal ties such as community relationships, partnerships as well as observation of others can be influential (Bandura, 2001). Networks and interpersonal ties are also often discussed as important factors within the spread of innovation (Voltan & De Fuentes, 2016). The diffusion of SI can further be enabled through promotion platforms such as events, trade fairs, media, and intermediaries (Murray, Caulier-Grice, & Mulgan, 2010).

In the following two tables, all the factors mentioned above in the conceptual framework are split as agentic and structural factors. Further, all the factors are clearly explained, along with the operationalisation and their relationship to diffusion.

Table 3: Agentic factors of the conceptual framework

S. No.	Factors	Framework	Explanation	Operationalisation	Possible effect on diffusion
1	Individual Faculties	Pue et al (2015)	It is the faculties that the social entrepreneur possesses which stand in good stead while designing a socially creative strategy in the SI process.	Individual faculties are observed as skills, experience and personality traits .	Individual faculties by itself may not have an effect on the diffusion of a socially creative strategy. However, in combination with other factors like relative advantage, type of business model, etc., it could have an influence on the diffusion.
2	Motivation	Pue et al (2015)	Motivation is the need or the desire that drives an actor in designing a socially creative strategy that reconfigures the response to a social problem.	Motivation is distinguished as intrinsic motivation like interest, assertiveness, and supporting others and extrinsic motivation which is grounded on incentives like acclaim or reputation. Social entrepreneurs might be motivated by one of the types or both.	Motivation might not have a direct effect on the diffusion of a socially creative strategy. However, in combination with other factors like relative advantage, type of business model, etc., it could have an influence on the diffusion.
3	Values	Pue et al (2015)	Definition adapted in this research is from Pue et al (2015) which states that values are culturally defined standards which guide standards of behaviour in the social entrepreneur. Values influence the motivation of the entrepreneur in solving a social problem. Existing social values maybe changed by the SI process.	A social enterprise's choice of values is unique to itself . Values are measured by assessing the mission and vision of the social enterprise. Due to its uniqueness, the different values are observed in the cases where the framework is employed.	Values might not have a direct effect on the diffusion of a socially creative strategy. However, in combination with other factors like relative advantage, type of business model etc., it could have an influence on the diffusion.
4	Type of socially creative strategy	Pue et al (2015)	A socially creative strategy is an original or imaginative idea designed to achieve an objective relating to society or its organization. The technological design of SI process and the	A socially creative strategy can be a product, service or a policy .	Type of socially creative strategy might not have a direct effect on the diffusion. However, in combination with other factors like relative advantage, compatibility,

			corresponding diffusion cycle will have different requirements based on the type of strategy		complexity etc., it could have an influence on the diffusion.
5	Target community	Pue et al (2015)	The target community is the group of consumers that the socially creative strategy expects to have an impact on. Social enterprises decide on how to achieve mobilization based on the target community.	The target community can be narrow or wide , and diffuse or clearly defined .	Target community's influence on the diffusion is not known.
6	Relative Advantage	Rogers (2003)	Degree to which a socially creative strategy is perceived as better than the idea it supersedes.	Relative advantage in the case of a product/service is measured by comparing its features and pricing against the prevailing idea. While, in the case of a policy, it is measured by its features.	Relative advantage depending on the features and pricing can have a positive or negative effect on the diffusion of the SI process or sometimes both.
7	Compatibility	Rogers (2003)	Degree to which a socially creative strategy is perceived as consistent with the existing values, past experiences, and needs of potential.	It is measured by comparing how compatible the socially creative strategy is, to the prevailing socio-cultural norms in the target community as well as to an already existing idea.	Compatibility influences the diffusion process either positively or negatively as the socially creative strategy is adopted based on how consistent it is to the prevailing norms and ideas.
8	Complexity	Rogers (2003)	Degree to which a socially creative strategy is perceived as relatively difficult to understand and use.	It is measured by identifying if the target community experiences the socially creative strategy to be difficult or easy to understand & use.	High complexity has a negative influence on the diffusion and vice versa. As it is based on whether the target community finds the socially creative strategy to be complex or not.
9	Trialability	Rogers (2003)	Degree to which a socially creative strategy may be experimented with, on a limited basis.	It is measured by identifying whether the socially creative strategy was trialled or not in	Trialability has a positive/negative influence on the diffusion based on the number of trials made within the target community to get the

				the target community. And, the number of trials made.	consumers acquainted with the socially creative strategy.
10	Observability	Rogers (2003)	Degree to which the results of the SI process are visible to others.	It is measured as the level of visibility of the socially creative strategy in a target community.	The low or high levels of visibility of a socially creative strategy has an effect on the diffusion of a socially creative strategy.
11	Actor types	Pue et al (2015)	It is the different actors that are present at different points in the entire SI process.	It is operationalised by observing the different type of actors in the SI process.	Actor types' influence on diffusion is not known.
12	Production system	Ortt, Langley, & Pals (2013)	It is the technological elements required to produce sufficient number of well performing products or services.	A production system is measured by its performance, quantity and quality .	An adequate production system is essential for the diffusion of the socially creative strategy. Absence of it might hamper the diffusion process. Therefore, the production system has an influence on the diffusion process.
13	Capital	Ortt, Langley, & Pals (2013)	It is the assets held by the social enterprise. It is used for the technological design and development of a socially creative strategy.	Capital is observed as natural, human, and financial capital .	Suitable natural, human and financial capital is essential for the spread of a socially creative strategy. Therefore, it has effect on diffusion.
14	Uncertainties & Risks	Ortt, Langley, & Pals (2013)	Risks and uncertainties are a potential threat to the SI process. Risks mentioned here are the risks that the social enterprises face, which are prevalent in the society. It is not the risks that they undertake. For example, increasing production capacity. Even though it is a potential calculated risk, it is studied under the factor 'production system' instead.	They are observed as trade bans, employee attrition, raw material shortage , etc.,	Uncertainties & risks limit the spread of the socially creative strategy among its users. Therefore, influencing diffusion.

Table 4: Structural factors of the conceptual framework

S. No.	Factors	Framework	Explanation	Operationalisation	Possible effect on diffusion
15	Type of institutionalization	Pue et al (2015)	It is the process of placing the socially creative strategy within the target community.	A socially creative strategy can either be adopted in a top-down or a bottom-up process by the consumers within the target community.	The diffusion of the socially creative strategy depends on the institutional context.
16	Type of business model	Boons & Lüdeke-Freund (2013)	It is the social enterprise's plan to ensure that the socially creative strategy reaches the consumers in the target community and there are adequate resources to make it happen.	It is measured by the type of business set-up, number of adopters and the basic unit economics of the social enterprise.	The diffusion of the socially creative strategy is influenced by the type of business model employed by the socially creative strategy.
17	Social problem	Pue et al (2015)	In this thesis, a social problem is considered as a social state that is harmful to the society and a socially creative strategy is designed to address it.	A social problem is operationalized by identifying the degree of impact of the social issue, the number of people affected by it and the degree of urgency to address it	Existence of a social problem leads to a development of a socially creative strategy. Therefore, the social problem could have an indirect influence on the diffusion of a socially creative strategy
18	Social structure	Pue et al (2015)	Social structure portrays the social life which is a pattern of social interactions that can be identified at a given moment. They either enable or constrain actors.	It is measured as the norms that the target community is subjected to and not the social entrepreneurs. The norms that influences social entrepreneurs are studied as values.	Existing norms in the society have an influence on the diffusion of a socially creative strategy.
19	Cultural & psychological factors	Kemp et al., (1998)	These are a set of factors which dictates what is accepted, encouraged or rejected within the target community.	It is measured as beliefs, customs and rituals prevalent in the target community.	Cultural and psychological factors either aid or block the spread of the socially creative strategy. Therefore, they have an effect on the diffusion process.

20	Political factors	Kemp et al., (1998)	Political factors are government policies that have an impact on the SI process.	Political factors are observed as the policies implemented by the government that have an effect on the SI process.	Policies by the government have an effect on the SI process. It can either stimulate or hurt the diffusion of the socially creative strategy.
21	Macro-economic factors	Ortt, Langley, & Pals (2013)	Macro-economic factors refer to the economic climate of the country that has an impact on the SI process.	It is observed as the economic situation of the country. For instance, recession, inflation, economic slowdown, etc.,	The economic aspects can be both favorable and unfavorable to the SI process. Therefore, these aspects influence the diffusion of the socially creative strategy.
22	Identity & role-based groupings	Pue et al (2015)	It is the arrangements of actors for a particular purpose as they facilitate co-operative action, related to trust.	It is observed as groups of actors based on their roles in the SI process.	Identity & role-based grouping's influence on diffusion is not known.
23	Sequencing	Pue et al (2015)	It refers to the order in which SI process takes place. The social problem can be identified before or after a socially creative strategy has been established.	It is observed as a linear or a non-linear process.	Sequencing's relationship to diffusion is not known.
24	Complementary product & services	Ortt, Langley, & Pals (2013)	Complementary products and services are additional requirements needed for the design, fabrication, delivery, adoption, usage, upkeep & disposal of a socially creative strategy. Along with the socially creative strategy, they form the social ecosystem.	It can be a product or a service in addition to the socially creative strategy.	A complementary product and services when used, has an influence on the diffusion of a socially creative strategy.
25	Mass media	Rogers (2003)	It is the communication channel where risks and benefits of the SI process are often discussed. Internet services like Facebook, websites, etc., are a mass reach, but only to a population which can afford to have the required	It is observed by checking if the social enterprise promotes the socially creative strategy using television and radio channels .	If used to its benefit, it is the most influential channel that aids in the spreading of the socially creative strategy. Also, the risks of a socially creative strategy spreads through mass media. Therefore,

			technology to avail the service (Bansal, 2015). SI processes are built to aid people who cannot afford such technologies. And, also where impact of internet and social media services could be possibly low (Bansal, 2015). Thus, these services are studied as promotion platforms and not as mass media.		positively/negatively affecting diffusion in the SI process.
26	Network & interpersonal ties	Pue et al (2015)	It refers to the intricate web of individuals networking in a certain social space.	It is observed as strong or weak ties . The strength of the ties are measured by identifying if the social enterprises have established personal connections with the consumers in their target community or not.	The partnerships created within a social system in which peers influence each other is often used to spread the socially creative strategy. They sometimes result in competing structures as well. Therefore, they could either positively or negatively affect the diffusion of the SI process.
27	Promotion platforms	Pue et al (2015)	It generally refers to platforms that are used to promote a socially creative strategy . However, social media platforms provide the opportunity to discuss both the risk and the benefits of the socially creative strategy.	It is observed as events, trade fairs, conferences as well as social media platforms like Facebook, Instagram etc., that promote the socially creative strategy.	Promotion platforms aid or hinder in spreading the socially creative strategy. Therefore, they have an influence in the diffusion of a social innovation process.
28	Intermediaries	Pue et al (2015)	Intermediaries are a group of actors who are mobilized to spread the socially creative strategy when the target community is large and diffuse.	Intermediaries are observed as actors that are either employed by the social enterprise or have a contractual agreement with, to promote and spread the socially creative strategy on ground in their respective local communities.	Intermediaries aid in spreading the socially creative strategy, therefore impacting diffusion.

The goal of this framework is to improve the understanding of the factors that have an influence of the process of SI. This is considered to enable the social enterprise in building a sustainable business by taking into account all these factors and thereby generate sustainable social action. The conceptual framework gathers the factors from Pue et al.'s model along with factors identified from other conventional theories which was examined during the literature study. Combining different frameworks may provide some methodological issues, which will be reflected upon in chapter 8 of this thesis.

In both the tables 3 and 4, there are gaps in the last column as certain factors namely target community, identity & role-based groupings, sequencing and actor types' relationship with diffusion is not known from the literature studied. Suggesting that there are gaps in the literature about it. In the upcoming case study research, an attempt will also be made to see if these factors' relationship with diffusion can be identified or not.

Putting together the conceptual framework and operationalising all the factors is the crucial first step in this research work. There are four other steps that need to be carried out to successfully complete the research work. First, to trace the factors from the conceptual framework in the case studies. The step after that will be to identify which among these 28 factors can be termed as salient that influences the diffusion process in the context of menstrual hygiene management in India. Thereby, giving rise to recommendations that could further drive the diffusion of the low-cost menstrual products. And, the final step will be to reflect on the validity and the usability of the framework denoting up to which extent can the framework help in answering the research objective.

4. METHODOLOGY

4.1 Research design

In the theoretical part, the first sub-question is answered. The foundation of the research is set by the conceptual framework development (Yin, 2003). Following the framework development is the empirical part which is qualitative in nature. Empirical research has a contemplative and interpreting approach (Verschuren & Doorewaard, 2010).

There are two goals to the empirical work. First, there is a need to explore the usability of the conceptual framework which currently lacks the tools to research it empirically. Second, to identify the salient factors that influence the diffusion of low-cost sanitary products made by the small-scale production units in India and thereby provide recommendations to aid further diffusion. Hence, in this thesis a qualitative case study approach is employed to substantiate the key concepts in the framework by obtaining data from social entrepreneurs owning small-scale production units in the field of MHM. The case studies illustrate the usability the conceptual model of this research.

The approach of using case studies is considered to be appropriate for a number of reasons: - i. The diffusion of social innovation is underexplored (Ratcliff, Doshi, & Doshi, 2013). ii. Real-world conditions that are hard to regulate are well examined with the help of case studies to understand the distinctions (Yin, 2003). iii. This type of research produces high external validity mainly for the end users - the social enterprises and other actors (Dul & Hak, 2007)

The usage of multiple case studies results in analytic conclusions that are stronger than conclusions from a solitary case study (Yin, 2003). As a first step, the primary and secondary data is obtained from the selected three case studies covering all the factors mentioned in the conceptual framework. How the data is obtained, is mentioned below in the further sections.

Next, the collected data is then analyzed through a coding process. Where all the necessary factors from the framework are assigned as codes. The cases selected, first undergo a *within-case analysis*. This is the first step in the analysis process, where the factors from the conceptual framework are traced in the cases.

The second step is a *cross-case analysis* is done to search for patterns i.e., similar codes in all three cases where social entrepreneurs deem these factors as salient factors that influence the diffusion of low-cost sanitary products. Thereby, being able to provide recommendations to the stakeholders involved to further improve diffusion, in the end of this research work. The empirical findings as well as challenges observed during the data analysis will help in reflecting on the validity and the usability of the conceptual framework.

4.2 Unit of analysis

The unit of analysis for this research is the small-scale production units run by social entrepreneurs in India that make low-cost sanitary products. They are the problem owners in the field of MHM in India. The changes they bring to address the social problem, or their failure have an impact on women's health in India. Of course, there are two other prominent actors in this social ecosystem - the NGOs and the Ministry of Health and Family Welfare, India. However, like mentioned in the introduction chapter, it was the social entrepreneurs that first identified the social problem and they continue to be the major actor addressing this social problem with the NGOs and the different governments (States and Central) aiding them in the SI process. The view of the NGOs as to why

still low-diffusion rates exists are discussed in the next chapter via literature research conducted by obtaining different documentations from NGOs. This sets the precedent to eventually conduct case study research on the social entrepreneurs.

4.3 Case selection

Case study research utilizes purposeful sampling where cases are selected based on criteria prior to research. This is also due to the fact that only limited number of cases exist. Therefore, it is only logical to select cases that are noticeable and easier to reach. The research goal is to come up with an approach that allows the concepts identified by Pue et al (2015) to be empirically described instead of obtaining precise statistical proof (Eisenhardt, 1989).

The cases from the limited size of social entrepreneurs who run small-scale production units in the field of MHM were shortlisted and got in touch primarily with the help of the Menstrual Health Alliance of India (MHAI) and Sukhibhava. MHAI is a national-level inter-agency advocacy group of organizations working on menstrual health and hygiene. They bring together social entrepreneurs and other actors working in the field of MHM in India. MHAI focuses on joint advocacy, knowledge generation and evidence-based action in the country. While, Sukhibhava is an NGO working with marginalised women and adolescent girls, to enable them through awareness and improved access to healthy menstrual practices. Based on the recommendations by MHAI and Sukhibhava, three cases were shortlisted. These three cases meet the criterion of either being a non-profit with earned income strategies or for-profit with mission driven strategies.

Literal replication case studies method is used. This means that the cases selected are identical. This enhances external validity of this research (Yin, 2003). In order to strengthen external validity and the possible application of the results, the cases were shortlisted based on manufacturing and distribution to the different regions of the country. Also, the case studies were limited to three, due to a number of reasons:

- i. Among the limited population of social entrepreneurs who ran small-scale production units in the field of MHM only a few met the criteria of being being a non-profit with earned income strategies or for-profit with mission driven strategies.
- ii. Among the shortlisted social enterprises, not all of them had the necessary bandwidth to be involved in the case-study research. They were constrained by lack of time and people to be involved in interviews and share necessary secondary data.
- iii. Few social enterprises were also hesitant to be part of research that could be out in the open for anyone to access.
- iv. There was difficulty in establishing a connection with the social enterprises because of the geographical restrictions and time constraints involved.

Analysis of four to ten cases is preferred as it provides enough data to generate a complex theory (Eisenhardt, 1989). However, it would have been difficult to analyse the bulk of data within the specified timeframe. The cases will be introduced and analyzed in detail in the upcoming chapter.

4.4 Data collection

The research data supporting this research is based on qualitative data obtained through semi-structured interviews, news articles and audio recordings. Triangulation of data by using various sources of proof is required for a thorough case study research (Yin, 2003). The first round of

findings about the cases is obtained through secondary data and then the remaining information is obtained from primary data.

4.4.1 Secondary data: Documentation

As part of the empirical data, the respondents were strategically chosen by approaching the MHAI and Sukhibhava to find and get in touch with the right set of social entrepreneurs for the case studies. Once, the three cases of social entrepreneurs were identified, effort was made to get in touch with them. The commencement of data collection started at the websites of these social entrepreneurs. The websites had results on market research and user testimonials of their sanitary product. The websites of these three cases led to corresponding news articles in the Indian media about their products, the problem they're trying to address, the efforts made and the corresponding impact on the society. The use of the Google search engine helped in identifying additional press releases, excerpts of radio interviews on Soundcloud and other local streaming sites, YouTube videos and blogs both written by the social entrepreneurs and about them. Also, after the Skype interviews the social entrepreneurs provided further internal data.

4.4.2 Primary data: Semi-structured interviews

Semi structured interviews are conducted as an attempt, to get a deeper overview of the subject in the study. Through this approach, it is possible to create a valid foundation when trying to understand and answer the research questions.

The approach of semi-structured interviews reduces constraints and thereby encouraging the respondents to talk spontaneously. Besides, it enables them with an opportunity to reveal their deepest thoughts because they are not restrained by structured parameters. The open-ended questions will allow unexpected, relevant information to emerge, followed up with further questions or probing. Semi-structured interviews were conducted with the social entrepreneurs in order to confirm the findings and to more importantly close the gaps left from the secondary data.

The interviews are conducted in two stages. At the first stage, the social entrepreneur is presented with a brief overview of what the research is about. An informal and casual atmosphere is created allowing the social entrepreneur to freely talk about their current roles or projects in relation to improving MHM in India. It helps to get an understanding of where they stand in relation to the research questions.

The second stage of the interview, will have a more provocative approach, striving to find out the different salient factors that help or limit the spread of their sanitary products. Performing interviews helps in exploring the most relevant matters or unexpected interesting disclosures. It provides an as well insight into the social entrepreneurs' considerations in relation to the subject in study and an explanation of the various crucial factors. A provocative approach is taken because the literature obtained from NGOs already denote certain factors that affect diffusion. So, during the interviews, in case the social entrepreneurs do not mention them, these factors are touched upon to check whether or not they had an influence on diffusion.

Interview guideline

Prior to conducting the interviews, guidelines to the interview is set to secure the coverage of the desired information while generating the opportunity to uncover unidentified information based on the research questions.

However, creating interview guidelines is challenging, as there can be no prior guarantee that the interviewees will provide relevant data for the subject in study. Therefore, it is important to do a prior research on the social entrepreneurs and their work in the field of MHM in India. Since the interviews are conducted in a semi-structured manner, it creates the opportunity to deviate from the guidelines since the guidelines are created in a way that allows for adjustments along the way.

Based on the secondary data obtained, a set of questions are arranged for the interviews. These set of questions are aimed at the social entrepreneur making the sanitary products. The interviews were conducted via Skype and recorded. Before initiating the interview, the interviewees are asked if the interview can be recorded. If the interviewee agrees, the interview is recorded. All interviews with the social entrepreneurs are conducted in English. The interviewees also had the option to respond in their native language if required, to ensure that the respondents are comfortable and able to express themselves with no language restrictions as well as to avoid important point of views being lost in translation. The duration of the interviews is about 30 to 60 minutes. The interview questions are placed in appendix B. The following interviews were conducted with the entrepreneurs from the social enterprises in the dates as mentioned in the table below.

Table 5: List of interviewees

S. No	Social Enterprise	Interviewees & position	Date	Duration
1.	Case 1	Respondent 1, CEO	04/09/2019	45 minutes
2.	Case 2	Respondent 2, Co-founder & CEO Respondent 3, Head - Partnership & Research	12/09/2019	63 minutes
3.	Case 3	Respondent 4, MD and Founder	20/09/2019	42 minutes

Transcribing the Interviews

Transcribing interviews is a direct procedure though often time-consuming it sets the basis for the upcoming data interpretation process (Bailey, 2008). The audio data is transformed into text as soon as the interview is conducted, and the transcripts are structured in themes. The structuring is done by arranging the relevant questions, and hence avoiding redundant answers. Every written response is clarified and accepted by the interviewee after the transcript is finalized. This is primarily done to negate wrongful interpretations of what was mentioned during the interview and prevent bias.

4.5 Data management

The interviews conducted via Skype were downloaded and the copy of the transcripts was shared with the interviewees to make sure they agreed to everything that they said. All the transcripts and additional secondary data for instance raw material calculation sheet, etc., which are supposed to be confidential were stored offline in well-protected disks. Only relevant data that is required for the purpose of research is then coded using the Atlas.ti 8 software. No one except for the researcher had access to the data.

4.6 Data Analysis

Analysis is performed on the collected secondary data and interviews from the cases studies. Content analysis was initially intended to quantify qualitative data by capturing its presence, but

it is now broadly used to gather meaning (Lerman & Callow, 2003). It is therefore a coding process converting raw data into structured data (Babbie, 2013). This process of coding for this research is done using the Atlas.ti 8 software.

A line-by-line and in a cyclic coding approach is used to code the transcripts from the interviews and the secondary data (Saldaña, 2009). The coding process is done on all the three cases to distinguish the collected data to identifying the various factors involved in the social innovation process of making and selling low-cost sanitary products in the respective cases. To review the coding process, notes are written along the process.

A deductive approach is used which involves a top-down approach to coding qualitative data. With this approach, pre-set coding schemes are established. These schemes are based on emerging themes from the conceptual framework. This approach is also called provisional coding based on the work of Miles and Huberman (1994). They recommend a codebook with 12 to 60 codes. The factors from the conceptual framework based on Pue et al (2015) are setup as codes and defined. The codes from the conceptual framework during the coding operation, undergo changes where redundant codes are deleted, codes are changed or expanded. Finally, a codebook with 33 codes is established. The data from the all the three cases are analysed with the code list. For example, a quotation that stated that the *“Problem was identified 4-5 years ago while meeting Anshu Gupta from the Goonj foundation about how women were contracting RTIs, tetanus etc., and dying because of multiple issues around the lack of use of menstrual products. Therefore, it started with the fact to find an affordable, accessible solution to tackle this menstrual crisis.”* - (Respondent 2, 2019) is coded as a ‘*Social Problem*’. However, a single quote can not only generate one code but different codes. Therefore, simultaneous coding is required (Saldaña, 2009). Hence, the same quotation which is mentioned above as an example for the code ‘*Social problem*’ is also coded as ‘*Sequencing*’. As, it also portrays the sequence of this social innovation process, i.e. the social problem was first identified and then later a socially creative strategy was designed to tackle the social problem.

The codebook with the entire list of codes is mentioned in the table below.

Table 6: Codebook

S. No.	Code
1	Actor types
2	Capital: Finance
3	Capital: Human Capital
4	Raw materials
5	Compatibility
6	Complementary product & services
7	Complexity
8	Cultural & psychological factors
9	Identity & role-based groupings
10	Individual Faculties
11	Intermediaries
12	Macro-economic factors

13	Mass media
14	Motivation
15	Network & personal ties
16	Observability
17	Political factors: Lack of consensus in promotion
18	Political factors: Quality Standards
19	Political factors: Taxation
20	Production system
21	Promotion platforms
22	Relative Advantage: Features
23	Relative Advantage: Pricing
24	Sequencing
25	Social problem
26	Social structure
27	Target community
28	Trialability
29	Type of business model
30	Type of institutionalization
31	Type of socially creative strategy
32	Uncertainties & Risks
33	Values

In addition to simultaneous and provisional coding, magnitude coding was used to find whether these factors had an influence on the diffusion of sanitary products or not. Saldaña (2009) defines magnitude coding as “Coding that adds as supplemental alphanumeric or symbolic code or sub code to an existing coded datum or category to indicate its intensity, frequency, direction, presence, or evaluative content in order to refine or specify the code”.

Thus, in this research ‘+.’ symbols were added to the existing codes signifying that a factor either could have a possible positive or negative effect in the diffusion process. Whereas factors that had no effect on the diffusion process were left unmarked. For example, a quotation can be coded as ‘*Political factors: Taxation: -*’. Answers to the following two questions in the interviews were coded using magnitude coding.

“In terms of government policies, product & services, social, cultural and psychological factors macro-economic situations and other factors:

1. What has *helped* in getting the target consumers use their sanitary product?
2. What are the major *difficulties* they face in getting the target consumers to use their sanitary product?”

While, the first round of coding using provisional and simultaneous coding is to identify factors case-wise in the social innovation process, the goal of the second coding round using magnitude coding is to analyze the data in all three cases by looking for the salient factors that have influenced the diffusion process. This is simply done by numbering the frequency of a magnitude code to the

answers for the above-mentioned questions in all the three cases. The codes with higher frequencies are considered as salient factors that both have a positive and negative effect on the diffusion of these low-cost sanitary products. And, with the identified salient factors that have a negative effect on diffusion, recommendations will be made in the final part of the research to what the concerned stakeholders could change in this social innovation process to further drive its diffusion.

5. SOCIAL INNOVATION IN THE MHM FIELD IN INDIA

Before jumping into the case studies directly, there is a need to understand the complex nature of the existing socio-economic landscape in the country, the background of different social entrepreneurs involved and the conflict in values that the social innovation faces. Hence, this chapter will set the precedent for the case studies by going through existing literature published by different NGOs to showcase the background on the social innovation in the MHM field in India, and to gather empirical data on the different actors involved and also identify the already documented challenges to the diffusion of SI. Thereby forming the basis on which the case study research is conducted.

Issues already mentioned in the introduction chapter like lack of awareness, poor access to sanitary products and affordability in the MHM field led to the rise of a low-cost sanitary napkin-making technology; by making the most use of governmental schemes and policies and non-governmental aid to procure, produce and promote the sell low-cost sanitary products. Arunachalam Muruganantham also called, “The menstrual man” revolutionised the feminine hygiene industry by designing machinery that made low-cost sanitary pads. He effectively sold the pads to village women in different parts of the country. His firm, Jayaashree Industries made pads that are manufactured using wood pulp, thermo bonded non-woven fabric, polyethylene sheet, glue and release paper, and sold at an affordable cost (Pathak & Pradhan, 2016).

Soon it led to a number of social entrepreneurs that followed suit. Social initiatives like the Sodashi, a corporate social responsibility (CSR) venture by Jindal power and steel plant, Mukti Pads by the Society for rural industrialisation and Freedays, a Government of India project supply to the least accessible areas in the country. They have become important players in this sector. Green enterprises like Goonj and Eco-Femme make re-usable cloth pads while other enterprises make biodegradable or compostable pads that help women handle their periods in a hygienic way. These social entrepreneurs have been rather successful in attempting to change the current situation. However, there remains a number of associated problems that need urgent attention if the adoption of these low-cost menstrual products has to be improved (Pathak & Pradhan, 2016).

The menstrual hygiene management (MHM) is defined as: *“Articulation, awareness, information and confidence to manage menstruation with safety and dignity using safe hygienic materials together with adequate water, agents and spaces for washing and bathing, and disposal with privacy and dignity”* - (Patkar, 2015).

It additionally requires systems to handle and store. For instance, the sanitary napkins cannot be used more than the acceptable period, sustaining personal hygiene in contrast to dealing with everyday activities is a challenge. Therefore, providing affordable sanitary products is only a temporary fix to a larger problem (Pathak & Pradhan, 2016).

Constant repetition of TV and radio ads of sanitary products made by MNCs gives an impression to the rural women that products with a mild fragrance, bright in colour and packaged attractively provides immediate hygiene. However, this is not how real-world conditions are in the country. Majority of the units that make low-cost sanitary products units are fabricated and sold by these social entrepreneurs on a turn-key basis to self-help groups (SHGs). The social entrepreneurs provide a brief training session on how to handle these units. Post the installation of the production units and the training sessions, the SHGs are required to handle the production units as well instil awareness among its target consumers. Here is when another major problem arises. Due to the

absence of supervision of these production units run by the SHGs, most of these units are far from being hygienic. These units are put together in either a friend's house or at the town's all-purpose facility, which do not hold the right environment to produce sanitary products (Pathak & Pradhan, 2016). Therefore, the sanitary products which look neat and bright in colour, actually undergo rodent infestation, microbial attack and constantly dealt with unprotected hands (Pathak & Pradhan, 2016).

Post-use disposal of sanitary napkins is another serious issue that is being ignored. There is no structure to handle solid waste particularly in the villages (Garg, Goyal, & Gupta, 2012). The sanitary products are not disposed with the other wastes in the villages due to menstruation being a personal phenomenon. It is also not dumped outside villages due to the challenges associated with visual appeal. In communal toilets, lack of waste bins and disposal guidelines resulted in used sanitary napkins being stashed in toilet walls or thrown in toilets, leading to blockages and overflow. For households with sanitation systems, menstrual waste was often thrown in rivers, affecting the primary source of drinking water, or burned, affecting the air. For most women who lack household sanitation, menstruation is managed in open fields, posing safety risks. Inappropriate disposal of menstrual waste also exposes a vulnerable segment of Indian society i.e. manual scavengers, informal household waste collectors and sanitation system caretakers to potential health risks (Dargan, Selvaraj, & Singh, 2015). Therefore, methods to clear used sanitary products remains an unresolved problem. With the help of a government scheme, incinerators are installed in states like Tamil Nadu. However, Incineration has environmental and health impacts. Most disposable pads are made from low-density polyethylene plastic polymers, bleached wood pulp and super-absorbent polymer gel (polyacrylate). Burning these materials in informal, low-temperature waste incinerators can lead to toxic by-products. Long-term exposure to these emissions or resulting ash may adversely affect the immune, nervous, endocrine, and reproductive systems (Dargan, Selvaraj, & Singh, 2015). Additionally, frequent maintenance of the incinerators in the rural areas is a challenge (Garg, Goyal, & Gupta, 2012).

In short, affordable sanitary products have the ability to transform the needs of rural women, however diffusion of this social innovation still remains disturbingly low. The literature research further identifies a few challenges to diffusion namely post-use disposal of sanitary napkins and poor quality of the manufactured sanitary products. However, there is still no clear idea to the social entrepreneurs on the other related factors affecting diffusion. Hence, the SI process of making and selling low-cost sanitary products needs to be understood holistically using a comprehensive framework and thereby identify the salient factors that help or hinder its diffusion. Therefore, the upcoming chapter will focus on using the conceptual framework to do case study research on three social enterprises.

6. CASE STUDIES

The aim of the case studies is to answer the sub-question “*To what extent can the factors from the established framework be observed in the social innovation process of manufacturing and selling low-cost sanitary products by the small-scale production units in India?*” The case studies illustrate the usability of the conceptual framework applied in this research. The case studies result in identifying factors that are required and the factors that can be left out. This eventually is used for the improvement of the framework to be used for SI in the field of MHM in India.

The empirical data like mentioned earlier is obtained primarily through interviews and other forms of secondary data. The primary data can be found in the appendix: the interviews of the cases is in appendix C.

An important aspect is that in these case studies not all of the 28 factors from the conceptual framework may have an influence on the diffusion of the sanitary products among women in India. During the magnitude coding process, factors that could have an influence on diffusion are identified in each of the three cases. Only these factors are described based on its potential relationship with diffusion. While all the other factors are simply described as a part of the SI process because no effect on diffusion is observed during research. This is done so that the SI process of manufacturing and selling low-cost sanitary products by the small-scale production units in India is clearly understood. The empirical data is presented as factors within the 6 components of the conceptual framework: social entrepreneur, socially creative strategy, technological design of SI, SI channels, SI diffusion cycle and social ecosystem.

6.1 Case 1

The case is divided into six main parts with factors in it based on the conceptual framework based on Pue et al (2015).

1. The social entrepreneur

The social enterprise has been operational since 2010. Initially, the primary **motivation** was to generate work for the women associated with them, by making cloth pads. Eventually they found that making cloth pads could solve a bigger problem in the MHM field in India - The wider impact on the health of women as well as the environment apart from it being an opportunity for woman to make a living (Respondent 1, 2019). They’ve capitalized on the 9 years of experience of being in the MHM field since their inception as a social enterprise, to understand their strengths as well as our challenges better (Respondent 1, 2019). They’ve been initially mentored by another social enterprise named EcoFemme in making these cloth pads. (**Individual Faculties**). The enterprise **values** quality as an important value that they do not compromise on. In fact, this is sometimes a cause of attrition in their women workforce because they demand quality work. Hence, they provide rigorous trainings and do thorough quality check in all their products. Thereby, earning a reputation among their customers (Respondent 1, 2019). Another value important to them is the financial compensation that they pay the women for the work they do. They make sure to pay them at least government approved wages. One final value is flexibility. “*We understand that the women we work with face challenges of various types on a daily basis and their productivity varies significantly on a day to day basis.*”, says respondent 1 (2019). Hence, their processes allow for such variance in work productivity among women in their production units.

2. Socially creative strategy

The social enterprise's socially creative strategy is to make reusable, 100% cotton sanitary pads in their production units. Their target community is women in rural and semi-urban areas as the main target group specially focusing on adolescent girls in schools through their outreach program.

3. Technological design of SI

To understand the technological design of the SI process employed by the social enterprise, a number of factors is looked at. The first factor that is looked at, is relative advantage. There are a couple of key features of their sanitary product. First feature is efficacy. In terms of absorbance, the enterprise claims their product is at par with commercially popular disposable products. Second feature is that they are 100% soft cotton. So, their customers find it to be comfortable. The third feature is disposability: Since the product is made of cotton, questions of its biodegradability or compostability do not arise from its customers. While the product is comfortable, certain users who've used sanitary pads before, find it takes additional effort and resources. Because, it involves soaking the cloth pad in water for a while before cleaning them with detergent and water (Respondent 1, 2019). Also, they prefer it to be in different sizes, to make it more user-friendly and to accommodate different day's needs (Respondent 1, 2019). Women who heavy flow, prefer to not use these cloth pads as they only have limited absorption. Therefore, all of this suggests that these features influence the diffusion of the product. The cloth pads' price overview in comparison with alternative products available in the market as shown in the table below:

Table 7: Price overview of case 1

Selling price	1200 INR (pack of 6) Free (lower market)
Price of similar products in the market	40 - 80 INR (pack of 6)
Average spending on menstrual hygiene¹	= < 30 INR (pack of 6)

The retail price is very high. It's 40 times the average spending of consumers in their target group. At the time of purchase, the current household finances do have an impact. In this case, women postpone the decision (Respondent 1, 2019). However, these are reusable cloth pads hence the costs can be recovered and turns out economical in the long-run. Over a period of 3 years, the pads cost much less as compared to other disposable pads in the market (Respondent 1, 2019). Also, most pads are sold free of cost to their target consumers as the cost of these pads are borne by Government or CSR grants.

The **compatibility** of cloth pads is low Consumers feel different because of the pad being made in cotton. Respondent 1, (2019) points out that, *"if the target customer is used to a disposable product, there is a mental barrier that we work upon because of the washing and drying of used pads involved."* The **complexity** of cloth pads is high. *"Adopting reusable cloth pads involve behavioural change and requires imparting of awareness. This process is time consuming, resource intensive and costly."*, says respondent 1 (2019). However, women who use other type of clothes to manage periods, find it easy to adapt. **Trialability** is the fourth factor. Only few women have tried some kind of a sanitary product before because of the different government schemes and non-governmental organisations (NGOs) involved in creating awareness. For the rest, they are usually reluctant to try. Hence, trialability is low. **Observability** in this case is also low. This is because predominantly women in rural areas have no access to sanitary products. Therefore low

compatibility, trialability, observability and high complexity have an influence on diffusion of cloth pads as most women are often reluctant to try it.

The social enterprise collaborates with **actors** namely NGOs and individual consultants who specialize in menstrual hygiene awareness. They rope them in, when required for the implementation of awareness programs at different schools. While, the government and other corporates are involved in providing them grants. All these collaborations work well however collaborations with other social enterprises to design these awareness programs is missing. Their **production system** comprises of a women workforce who make these cotton pads. Each woman is able to make about 25 pads per day. Like mentioned earlier, they have been mentored by EcoFemme on production and raw-material processing of these reusable 100% cotton pads. The social enterprise has a **human capital** of 6 full-time employees in their office. While, they have a floating strength of about 50 odd women making cloth pads in their small-scale production unit. The **financial capital** are obtained as grants from major MNCs, Government and other grant providing non-profit organisations. These funds are utilized for the production of cloth pads and paying the employed women who make these pads. The funds also pay for the services of other individuals/ partner NGOs that they rope in, for the delivery of menstrual health awareness sessions. The social enterprise procures 100% cotton **raw material** similar to where Eco-femme gets their material from. Situations with **uncertainties and risks** have not been observed by the social enterprise.

4. SI Diffusion cycle

The social enterprise employs a bottom-up approach for **institutionalization**. They started with an attempt to tackle the menstrual hygiene crisis by themselves. Eventually, they now work with the Government as well which provides funds to run their programs and sell their products. The social enterprise runs a hybrid **business model** where they an NGO parallely. This NGO conducts menstrual health awareness programs which in turn generates the demand for the cloth pads made by the social enterprise. A program called “Pads for Daughters” is run in schools in rural areas and provides menstrual health awareness sessions along with reusable cloth pads. This is predominantly a grant-based model. These grants are basically obtained from the government, major MNCs and other grant providing non-profit organisations. They sell their products commercially through word of mouth as well. However, majority of revenue is generated through grants awarded for their awareness programs. The social enterprise also very recently started selling via e-commerce sites as well as through closed women’s special interest groups on Facebook for urban customers who are already accustomed to using sanitary products (Respondent 1, 2019). The revenue and the costs associated with the business model is mentioned below in table 10.

Table 8: Unit economics of case 1

S. No.	Unit Economics	Per Pad
1.	Total Cost of Production (Raw material, Packing material, salary, electricity, office rent + overheads, maintenance & repair, interest costs on loan, insurance)	100 INR
2.	Maximum retail price	200 INR
3.	Gross Profit	100 INR

4.	Initial investment (machine + Goods & Services Tax + infrastructure)	100000 INR
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However, sustainability with this model is a huge challenge because they give out products for no cost under certain schemes which is funded by grants and the actual number of sales is very less. Also, the frequency of customers buying your product back is very less because of its reusability. Respondent 1 (2019) says, *“the sustainability of your business is huge challenge because the unit economics do not work out (high customer acquisition cost, low per user business, less repeat business). I suggest that those who want to enter this market should know this beforehand and workout a strategy to counter it.”* This suggests that case 1 is in the diffusion phase, with the diffusion rates of the products being low. This is because women that come forward to trying their products or buying it the first time are still reluctant to come back to buy it again. The social enterprise agrees that 70 percent of the market is still untapped.

5. Social ecosystem

The **social problem** that the social enterprise is focused on is addressing the issue of menstrual health in India by creating sustainable cloth pads and solve the challenge of creating livelihood opportunities for women. Inability to speak openly about menstruation due to existing **social structures** is the biggest challenge.

“Social stigma stops them from opening up, from talking about periods. This is a great barrier. Because of the lack of conversations regarding menstruation, there is no awareness and hence no product choice. So, they adopt the first product that comes their way without any questions asked.” - (Respondent 1, 2019).

In almost 100% of the cases they’ve encountered, the girls, when they start their periods are not the decision makers. This coupled with the fact that her mother is ignorant too, results in a poor choice (Respondent 1, 2019). Any unhygienic practice leads to complications with health. The poor understanding of the phenomenon of periods causes a great deal of **psychological issues** and impacts the self-image of the girl (Respondent 1, 2019). This results in a loss of self-confidence, leading to absence from school and lower participation in social events. These social structures results in psychological issues which prevents women from trying sanitary products, because they often continue to use clothes or other means like the elders in their community without raising any questions about using hygienic products (Respondent 1, 2019). All of this suggests that social structures, cultural & psychological factors have an influence on the diffusion of the sanitary pads.

It is observed that a number of **political factors** also influence the diffusion of the cloth pads. The first political factor identified is the poor-quality standards. Most women, the social enterprise come across, prefer not to use low-cost pads in the market because of their very poor absorption limits. Also respondent 1 (2019) states that, *“While so far, there were no good standards or quality certifications for commercial disposable pads, suddenly, government wants to put all types of sanitary pads under certification regime”*. The social enterprise welcomes the move; however, they want the government to ensure a level-playing field.

The second barrier is the lack of consensus in promotion. Government policies favour procurement and distribution of disposable pads. The plastic disposable pads might be cheaper but there are costs involved in recycling or incinerating it further. It could also have environmental consequences.

“Government is today encouraging the use of small incinerators for sanitary waste management without looking at the serious hazards and without coming up with technical specifications for such devices. Incinerators which burn the used disposable pads below 800 degree celsius pose a very real health hazard as they release cancer causing gases in the environment.”- Respondent 1 (2019).

However, today there is a proliferation of such incinerators across the country. Therefore, the promotion of plastic pads by the government ends up being a bigger burden on the sanitary waste management system. Sanitary waste management is the third barrier. Because the currently used incinerators for sanitary waste management emits fumes carcinogenic in nature, so women questioned the use of sanitary products due to the issues raised by active campaigns against the use of the incinerators (Respondent 1, 2019). All of these political factors prevent women from buying sanitary products, suggesting that these factors have an influence on diffusion.

Macro-economic factors do not have a major impact on sales in rural areas. Since, Allforamile’s operations and sales were majorly based on grants. However, urban consumers were reluctant to buy sanitary products at higher costs during situations such as recession, economic slowdown, etc., suggesting that macro-economic factors have an influence on the diffusion of these cloth pads. **Identity & role-based groupings** effect on the diffusion of the cloth pads is not known. Because none of the actors are bound by particular role, they play different roles. The **sequence** of the SI process for case 1 started with first identifying the problem in the field of MHM, then eventually coming up with a solution of making cloth pads. They create a livelihood for women in the process. However, they soon realised that because of existing social and cultural stigmas, it was hard to sell their product. Hence, they started an NGO to develop a **complementary service** in the name of “Pads for Daughters”, awareness program in rural schools, which in turn generate the demand for the social enterprise. They also closely work with other entrepreneurs and NGOs in the field of MHM to create and run this program. However, no collaboration with either the social entrepreneurs or the government is observed in developing and running these programs. These awareness programs have actively addressed the social, cultural and psychological barriers that these women face. Thereby suggesting that these programs have an influence on diffusion as they have helped increase cloth pad sales.

6. SI Channels

The final component of the conceptual framework, the SI channels are observed as four factors. **Promotion** of the social enterprise’s cloth pads are limited to conferences or events that they attend. They also have social media channels that spread their word. Furthermore, interested people in the semi-urban and urban areas access their web-site and social platform channels. However, most of their consumers get to know about the cloth pads through their awareness campaigns in rural areas. The social enterprise is also in touch with several MHM activists and part of an ecosystem that pushes the usage of reusable products. They communicate in forums at a personal level. It has been useful in helping them understand the trends and policy status. Word of mouth helps in spreading more information about the product thereby bringing in more consumers. Thereby, creating a dedicated **network** consisting of patrons and well-wishers. MHM activists and NGOs that they partner with, for the awareness programs are the **intermediaries** in the process as these actors talk about reusable products to potential customers. All of this suggest that, Promotion platforms, intermediaries, network & interpersonal ties influence the diffusion of

the cloth pads because more women have adopted the cloth pads and the sales had increased. The social enterprise does not make use of **mass media** to promote or sell its cloth pads.

6.2 Case 2

The case is now further examined based on the conceptual framework of Pue et al (2015). The findings from the framework are used as background knowledge for presenting the case. This section is structured into six main parts of the conceptual model.

1. Social entrepreneur

The first component within the SI process of the social enterprise that is examined is the social entrepreneur. It deals with the motivation, individual faculties and the values of the social entrepreneur. The social enterprise's **motivation** is both extrinsic and intrinsic. Extrinsic because it stemmed from devising ways to increase the access of menstrual products to the parts of the country where the market was still untapped. They found two distinct ways to do it. Either set-up a high-speed production lines similar to what MNCs use, which make around 1 million pads and these lines costed 10 to 100 crore Indian National Rupees (INR). However, the challenges are that not everyone who are interested can afford such a line. Also, the distribution is quite long and expensive involving multiple intermediaries. Or, adapt the model of Mr. Arunachalam Muruganantham which eliminated the distribution and advertising costs. To basically sell products with minimal margin by handling production manually. However, the cost of production was very high. And, a lot of these units were shutting down because of the high costs involved. Hence, they came up with an automated machine that could make 16 pads/minute but involving lesser costs so that the pads could be sold at a cheaper rate. Also, the people working in the unit can focus on a much smaller geography for distribution with a lesser number of intermediaries (Respondent 2, 2019). And **intrinsic** because they identified that women were still wrapped around social-cultural taboos which were the major reasons for the problem with menstrual hygiene. Hence, the social enterprise also eventually created awareness of the problem along with making sanitary pads. There are four **values** that the social enterprise deem as important, namely efficiency, transparency, gender equality and empathy. They strive to change the existing landscape where menstrual crisis is not acknowledged as an urgent problem. With each passing day, they come across more women contacting diseases because of the lack of good menstrual hygiene. Internally, they have a strong process where they've implemented enterprise resource planning (ERP) systems for managing inventory efficiently and have weekly meetings with the entire team (Respondent 2, 2019). Transparency is another key value that the enterprise holds close. *"A lot of random corruption happens in this sector as well especially with government schemes. We do not take part in such activities."*, states respondent 2 (2019). The social enterprise recently underwent a culture exercise at the enterprise where they predominantly focused on gender equality and empathy. *"When we hire people to work for us, we filter people who are sexists. Also, we meet people across different sectors and not all of them have the same knowledge that we possess. So, it is crucial to make sure we hold their hands and walk them through the entire process."* - (Respondent 2, 2019). **Individual facilities** refer to the skills, personality traits that the social entrepreneur possesses which come in good stead while designing a socially creative strategy in the SI process (Pue, Vandergeest, & Brezn, 2015). In this case, the founder's possesses engineering degrees with relevant skills gained from being part of the Acumen fellowship and designing automated production units for packaging industries.

2. Socially creative strategy

The socially creative strategy differs along two factors: type of socially creative strategy and target community. The social enterprise's **socially creative strategy** was to make disposable sanitary

pads. Depending on the cost, motivation and consumer requirement in the particular geography their production unit is located at, they make compostable, bio-degradable, recyclable types of sanitary napkins. In the future, they might look into making sanitary cups as well (Respondent 2, 2019). The **Target community** is generally wide and diffuse. The production units are set up in tier-2 and tier-3 Indian towns. So, their pads gets sold mostly in semi-urban and rural areas. However, they also sell their sanitary products in the urban market through the e-commerce website, Amazon (Respondent 2, 2019).

3. Technological design of SI

To understand the technological design of the SI process employed by the social enterprise, a number of factors is looked at. The first is **Relative Advantage**. Rogers (2003) defines relative advantage as the degree to which an innovation is considered to be better than the idea it replaces. The pads made by the social enterprise are generally regarded as thin, long and with good absorbency by their users. However, the users also expect bigger sizes and different coloured pads apart from white. Women who have heavy flow during the monthly periods prefer to use clothes and other means and not use the pads by the social enterprise because they only have two variants in size which is not ideal. And, also white coloured pads showcase the stains. Women have inhibitions disposing these used pads due to the cultural stigmas. The low price of the pads is important for the diffusion in the market. Their users realize that buying the products is reasonable in the long-run. The pads are priced lower than the alternative products present in the market as shown in the table below:

Table 9: Price overview of case 2

Selling price	21 INR (pack of 6) Free (lower market)
Price of similar products in the market	40 - 80 INR (pack of 6)
Average spending on menstrual hygiene¹	= < 30 INR (pack of 6)

Therefore, low pricing and certain product features like pads being thin, long and with good absorbency has helped in improving sales of these sanitary products, while limited sizes and white coloured pads has prevented women in coming forward to buying the pads as they prefer to keep using clothes and other means. Therefore suggesting that relative advantage has an influence on diffusion. The second factor is **Compatibility**. The pads look similar to the existing pads in the market but much thinner. Because, generally women expect the pads to not be visible under their garments. Sara designs observes that only around 30 to 40% women have tried some kind of a sanitary product before. And, the rest migrate from using cloths and other means. Hence, the compatability is low. **Complexity** is the third factor. A small section of users find the pads easier. Because, of the possibilty to dispose the pads after usage, users find it convenient. However, most users find it difficult as they have to clean the pads before disposing them. This is due to the

¹ Based on the estimation of the Indian social enterprises in MHM among rural and semi-urban women.

existing social structures in place. So they feel uncomfortable to dispose them right away, hence defeating the purpose of disposability. Therefore, complexity is high. **Trialability** is the fourth factor. Like mentioned earlier, 30 to 40% women the firm has come across as users, have tried some kind of a sanitary product before because of the different government schemes and non-governmental organisations (NGOs) involved in creating awareness. For the rest, they are usually reluctant to try. Hence, trialability is low. It is observed that the **observability** is also low. This is because predominantly women in rural areas have no access to sanitary products. Therefore indicating that low compatibility, trialability, observability and high complexity have an influence on diffusion as it affected pad sales.

The **actors** who work with the social enterprise typically are Self Help Groups (SHGs), Small and Medium Enterprises (SMEs), NGOs and the Government. The SMEs and SHGs typically buy the machines from the social enterprise and set-up their own units. The social enterprise also works with the state governments of Maharashtra and Rajasthan where the district collector's funds were used to install the production units. It is observed that the collaboration with actors like SHGs, SMEs, NGOs work really well when it comes to setting up unit and selling pads. However, there is very little collaboration with other social entrepreneurs in the market and the Government considering the amount of resources the social enterprise utilises in developing their own awareness programs. The **production system** consists of three different type of machines that they fabricate to produce these sanitary pads. The most commonly used machine makes 16 pads/minute which is present in 22 or more small-scale production units. There are also two other variants, a faster machine that makes 35 pads/minute and a slower variant that makes 4 to 5 pads/minute. The social enterprise has a **human capital** of 33 people working full-time. Independently, the enterprise has contracted a lot of woman from the respective communities where units are set-up, they are involved in the effective distribution of the pads. In the last 4 years of operation, the social enterprise utilizes all sorts of **financial capital** from equity, debt, bank capital and CSR grants. When it comes to **raw materials** used, *“Most of the raw materials are sourced from the same place as Stayfree pads by Johnson & Johnson. Hence, this ensure 90% of our quality.”*, states respondent 2, (2019). In the case of making bio-degradable pads, raw materials like bamboo, banana fiber, etc., require some bit of processing before they go into the machine so that requires some kind of customization like changes in the temperature and pressure settings so that the sanitary pad can be sealed. According to the social enterprise, it is hard to factor **uncertainties & risks**. However, they prepare themselves in case of any such situations, by adapting to it and making changes to their approach.

4. SI Diffusion cycle

The SI Diffusion cycle of the conceptual framework is now examined. The social enterprise employs a **bottom-up approach** by identifying a solution to an already existing social problem. They closely work with MHAI and other entrepreneurs in the field of MHM to build a platform where they can bring changes in the existing policy framework on MHM in the country. In terms of its **business model**, the social enterprise calls its model a ‘business in a box’. They are self sufficient by primarily selling the sanitary pads, machines and the raw materials. The machines and the raw materials are typically bought by SMEs, SHGs and at times the state governments who set up their own production units. Their machines ranges from a price of 8.5 lakh to 30 lakh INR. The entirely automatic machine is at 18.5 lakh INR. The sanitary pads that the social enterprise make are sold to women in tier-2 and tier-3 cities across India primarily with the help

of women intermediaries that sell these pads at the customers' door step. In urban markets, they are sold through the Amazon e-commerce website and medical stores. They also provide technical support through their engineers to all the independent units owned by SHGs and SMEs that run their machines during working hours. They also have a buy back program where they buy back the pads from these independent units, and sell them under their brand. The revenue and the costs associated with the business model is mentioned below in table 10.

Table 10: Unit economics of case 2

S. No.	Unit Economics	Per Pad
1.	Total Cost of Production (Raw material, Packing material, salary, electricity, office rent + overheads, maintenance & repair, interest costs on loan, insurance)	2.5 INR
2.	Maximum retail price	3.5 INR
3.	Gross Profit	1.0 INR
4.	Initial investment (machine + Goods & Services Tax + infrastructure)	2600000 INR
5.	Months to break-even	18 months

Therefore, theoretically the units break even by the end of 18 months. There is however a delay often in sales and payment, so additional time may be required to break even. However, to run awareness and advocacy programs in the rural areas where their own units are set-up, the social enterprise primarily relies on CSR grants to keeps these programs running. It is observed that in a market estimated to have a potential customer base of 250 million women, the social enterprise in two years has only managed to attain a customer base of 25,000 women, selling 1 million pads from their 23 odd production units across India. Hence, even though they are in diffusion stage, their diffusion rates remain quite low. Women come forward to try their products or buy it the first time. However, most users in their target community are still reluctant to come back to buy it again. The social enterprise acknowledge that 70 percent of the market remains open.

5.Social ecosystem

To understand the social ecosystem around the social enterprise better, a number of factors are studied. Suhani Gupta identified the **social problem** almost 5 years ago when she met Anshu Gupta from the Goonj foundation, who told her about women contracting RTIs, tetanus etc., and dying because of multiple issues around the lack of use of menstrual products. The **Social structure** that they identified was that different social stigmas exists in different parts of the society. Because of these stigmas, there exists a serious lack of awareness among the women about safe and hygienic menstrual practices. So, women bound by these social structures are reluctant to try sanitary products. This suggests that social structures remain a barrier to more women adopting these products, thereby influencing diffusion. Respondent 2 (2019) mentions about the **cultural & psychological barriers** she saw among woman in parts of the country she's been to.

“The cultural-habitual barrier that exists are - when women say most of my family are accustomed to using a certain cloth, etc., why should I shift to something else like a pad. It is dirty. We have come across instances in the rural poorer parts of Maharashtra where women hate menstruation so much that they have their uterus removed because the Government hospitals offer free uterus removal surgeries to prevent cervical cancer. Women at the age of 24 do it, so

that they do not have to worry about missing work during periods and pay for sanitary pads. However, they are very ignorant about the health implications that arise due to the removal of uterus such as hormonal imbalance etc.,” - (Respondent 2, 2019).

The social enterprise acknowledges it as a major scary challenge. They also come across women washing the sanitary pads before throwing it away because they do not want other people to see the stains. There is adequate wastage of time and resources there. This defeats the purpose of using disposable pads. The perception on menstrual health is lacking altogether in these parts. The cultural & psychological barriers has resulted in poor sales and women still reluctant to try sanitary products. Therefore, having an influence on the diffusion of low-cost sanitary products (Respondent 2, 2019).

A number of **political factors** were observed. First was Quality Standards. The pads adhere to BIS (Bureau of Indian Standards) standards set by the Government of India. Most pads in the market adhere to it as these standards were set in the 1980s and are very basic. It states that pads need to have 30ml of absorption. Therefore, most women the social enterprise come across prefer not to use low-cost pads in the market because of their very poor absorption limits. Thereby, it suggested that quality standards influenced diffusion. However, the social enterprise's pads have around 80 ml absorption limit. *“We compare our products to standards set by high-cost products like Whisper and how close are we to that. If we are inferior, no one is going to buy our products.”*, states respondent 2 (2019). The BIS standards has to be much better than existing standards. Second barrier was the (Goods and Service Tax (GST) tax exemption. *“Last year the Government decided to give sanitary pads exemption from GST. But, if you actually notice the market, the cost of sanitary pads from different brands has not come down by more than 1 INR. The decision-making people were listening more to activists than the sanitary pad manufacturer. Earlier, the GST for raw materials was 18% while for the sanitary pads it was 12%. And, the 18% tax you would pay to the raw material manufacturer, you would get a rebate on that. But now you would not get reimbursement for the 18% tax because sanitary pads are exempt from tax.”* (Respondent 2, 2019). This especially affects low-cost sanitary pad manufacturers who have very little profit margin because there is hardly any difference in the cost of the pad unless they are allowed to claim the benefit of 18% like before and GST exemption on pads. The social enterprise admit that this is the major challenge at the moment significantly impacting usage of the pads. Because, if the production units are to be sustainable, they need to increase the price resulting in products not being affordable anymore. Therefore suggesting that, GST exemption influences diffusion. The third barrier is the lack of consensus in promotion. *“The Government is doing multiple things. While some state governments promote setting up of manufacturing units there are other state governments giving away free pads. If the Government of India promote setting-up of manufacturing units, how will the units sell if the same government gives away free pads? It is all uncoordinated.”*, states Respondent 2 (2019). Conflicting policies between state and the central government and within the state government has an influence on the usage of sanitary products because women are quite often expecting pads to be given away for free but in most states there are no such schemes. The fourth political factor is inadequate sanitary waste management. There are challenges with all the different types of pads available in the market namely plastic, compostable and bio-degradable pads. There is no consensus yet on which type of pad the government wants to promote. If these products are together sent to recycling, the plastic pads will be recycled while the compostable cannot be. This can cause environmental damage. Due to the environmental damage, campaigns against improper disposal solutions make women aware of the issues around sanitary pads usage as well (Respondent 2, 2019). Thereby, suggesting that sanitary waste management has an influence on diffusion.

Macro-economic factors like demonetization had an impact because of India being a cash-heavy economy. Retail stores, etc., had zero pad sales because people did not have money for basic amenities so sanitary pads and women's health became the last priority during that situation. Also, when there is an economic slowdown, people are not looking at opening new business ventures like a sanitary pad manufacturing unit. Hence, all of this suggest that macro-economic factors have an influence on diffusion. **Role based groupings** do not play a major role in this SI process. For instance, while the government at times acts as an intermediary promoting the use of pads, they also run their own production units. So, they do not have strict roles. Also, the **sequence** of the SI process with respect to this case is linear. The founders identified the social problem in the year 2015. They arrived at an affordable, accessible solution to tackle this menstrual crisis. The social enterprise eventually realised that an affordable and accessible sanitary product alone is not going to solve this crisis because they realised that there was a huge lack of knowledge among woman about the consequences of unhygienic menstrual practices. Hence they needed a **complementary service** in the form of awareness programs. With the obtained grant capital, they run awareness and advocacy programs in the rural and semi-urban areas where they have their small-scale production units running. It was observed that these awareness programs enabled more women to come forward and try the sanitary pads as well as keep using them because they are now educated on consequences of poor menstrual hygiene. Therefore, all of this indicates that awareness programs have an influence on diffusion of the low-cost pads made by the social enterprise. However, running these programs demand a lot of time and resources and no collaborations with the government or other social enterprises was observed in running these awareness campaigns.

6. SI Channels

The last component of the conceptual framework, the SI channels are observed as four factors in the case of the social enterprise. *"People first hear about our product in the direct consumer workshop and door to door pamphlet distribution."*, says respondent 2 (2019). Women involved in distribution of their pads establish **personal ties** with the potential customers, thus eventually building a strong **network** in the local community. Most common **promotion platform** is via pamphlet distribution to houses in the local community of our distributor. They also promote online on Facebook pages, blogs, PR activities etc., However, most of the social enterprise' sales happen through on-ground promotion activities like awareness programs, pamphlet distribution etc., The social enterprise also makes use of **intermediaries**. Intermediaries are a group of actors who are mobilized when the target community is large and diffuse to help spread the socially creative strategy (Pue, Vandergeest, & Brezn, 2015). The social enterprise focuses on finding community influencers and running awareness campaigns through them thereby eventually selling their pads. The other way to sell their pads are through the medical stores in semi-urban areas. However women prefer not to go to medical stores to buy pads as they are mostly run by men. *"Very little direct sales happen. Most of our sales happen by usually through a one woman intermediary from a particular community who are distributors of the sanitary pads and earn their margins from the sales."* - (Respondent 2, 2019) Along with these one-woman intermediaries, SHGs, NGOs, and the government also aid in selling their pads by being intermediaries in the process. The social enterprise has sold almost 1 million pads through these different intermediaries. Hence, all of this suggests that intermediaries, promotion platforms, network and interpersonal ties have an influence on diffusion of the low-cost pads made by the social enterprise as they help in promoting among more women and increase the sales of the sanitary products. There is no use of **mass media** to promote the usage of sanitary products among their target consumers.

6.3 Case 3

The case is now categorized into six main parts of the conceptual model based on Pue et al (2015).

1. Social Entrepreneur

The social enterprise started with the idea of respondent 4 whose **motivation** was to identify an affordable way to make sanitary pads commercial. Initially, he worked with Honeybee network trying to commercialize some of the innovations documented by them. One of it was the sanitary pad making machine made by Arunachalam Muruganantham. He tried to commercialize it, but it didn't work due to a number of reasons (Respondent 4, 2019). So, the social enterprise worked with MIT in the USA and other institutes in Africa to build their own sanitary pad making machine (**individual faculties**). According to the social enterprise, there are two **values** that the firm deems important. One is to be environmentally conscious by making green, comfortable and affordable pads that are accessible. Another value that they emphasise on, is to provide the right information to their consumers. It means to basically educate woman about menstrual hygiene and the consequences of not following hygienic practices. Jaydeep (2019) further says, *“We provide them the bucket of choices available; so there is freedom to help them make an informed choice about which product they want to use. Beyond that, they should know the science behind menstrual hygiene first and the importance behind following a hygienic practice.”*

2. Socially creative strategy

The socially creative strategy differs along two factors: type of socially creative strategy and the target community. The **socially creative strategy** of the social enterprise is to make high-quality, fully compostable sanitary napkins under the brand name “Anandi” made of bio-sap. Their **target community** have been primarily village women. However, they are also working on launching their product soon in the urban market. Thereby, a portion of the potential money made from the urban market will be reinvested in the rural market by giving village women free products and for running education programs.

3. Technological design of SI

The technological design of the SI process employed by the social enterprise is understood, by observing a number of factors. The first factor is **Relative advantage**. The features of the pads made by the social enterprise are generally regarded as low- priced pads with good strength, no leakage, good comfort levels, enough absorbency and retention capacity. However, these pads have limited size and colour variations. Therefore, indicating that relative advantage influences diffusion of the sanitary pads in the market. Consumers want products that are low-cost for long-term usage. The cost to make 6 sanitary pads is 24 INR. Anandi pads are usually sold as a pack of 8 pads. Anandi pads are priced lower than the alternative products available in the market as shown in the table below:

Table 11: Price overview of case 3

Selling price	30 INR (pack of 6) Free (lower market)
Price of similar products in the market	40 - 80 INR (pack of 6)
Average spending on menstrual hygiene¹	= < 30 INR (pack of 6)

Compatibility is observed to be low. As respondent 4 (2019) states, *“Most of our target consumers except for a few have not used sanitary pads before especially in the rural areas. They are used to using cloths and other means which are different to pads.”* However for a small section of users who’ve used sanitary pads before, the pads feel quite similar to other sanitary pads in the market in terms of how they look and feel. Also the **complexity** is high. Because, there exists an initial barrier as women find it hard to dispose it right away after use. **Trialability** is low because there is reluctance among these women in trying new products. **Observability** is low because women in their target community are from rural areas where there is no access to sanitary products. Low compatibility, trialability, observability and high complexity results in lesser women adopting the sanitary pads, suggesting that these factors have an influence on diffusion.

The social enterprise work with **actors** like the United Nations, the Government and MNCs. While, the role of MNCs are to provide funds for setting up of the small-scale production units, the Government plays a major role in the implementation of the production units. The social enterprise also works with NGOs that help in procuring funds through CSR (Corporate social responsibility) grants. While The social enterprise runs a lot of the production units, SHGs also buys machines from them, thereby running their own units financed by grants or bank loans. Therefore all these collaborations work well. However, when it comes to running awareness programs, collaborations with other social entrepreneurs and the government that run similar programs is missing. The social enterprise spends a lot of human, financial resources and time in running these programs. At the moment, the **production system** comprises of two types of semi-automatic machine models. One type can make 700-1000 pads/day while the other type can make 1500-2000 pads/day. They are soon about to launch an automatic machine that can make 15,000-20,000 pads/day. They have a **human capital** of 15 people work full time at their office in Navi Mumbai. However, 600 women make a livelihood across 30 production units set up by them across India. These units are managed by the women themselves with training, technical or other support provided from the office in Navi Mumbai. The social enterprise has raised a **financial capital** of 70 lakh (INR) through one round of seeding from multiple angel investors and Confederation of Indian Industries (CII). Apart from that, they have also received grants from Millennium Alliance and Grand Challenges Canada (GCC). *“In 8 years of our existence, they have only been profitable in years 7 and 8 by a small margin”*, says respondent 4 (2019). Hence, they’ve been managing their operations with the help of capital obtained from investors and grants. In terms of **raw materials**, the social enterprise has done some extensive research in indigenous material like bagasse, jute and others. These are used to make sanitary pads. Jute is commercialized and sourced from the eastern part of India and bagasse in the next few months’ time will be sourced from the western part of India. There is on-going work with hyacinth in Kenya. They are also working in India and Africa to incorporate banana fiber in the sanitary pads. **Uncertainties & risks** are not observed, however nothing much more than adapting to such a situation can be done says respondent 4 (2019). He further points out that, *“There is no recession in this market as 70% of the market is still wide open. By finding the right plugs, the problems should go away.”*

4. SI Diffusion cycle

The SI Diffusion cycle of the social enterprise is now investigated using the conceptual framework. The social enterprise employs a **bottom-up approach** by identifying a socially creative strategy to an existing social problem. They work with local women in their respective communities to set

up production units and other social enterprises in the field of MHM in India. The social enterprise being an hybrid organisation term their **business model** as a ‘hardware-software model’. The social enterprise is regarded as the hardware in the model where they manufacture sanitary napkin making machines that make fully compostable sanitary pads. They also sell these machines to SHGs. They have two types of machines while one costs 4.5 lakh INR, the other type costs 8 lakhs INR. Secondly, they also generate revenue by selling the raw materials needed to make pads. The social enterprise train SHGs on how to make the pads and run their own small-scale production units. They also provide them with the option of either selling the pads themselves or sell it back to the social enterprise. Finally, the social enterprise generates revenue by directly selling the finished product, the sanitary pads in the market. They do bulk sales by their own or they train rural women to sell their pads on a door to door basis for which the women involved obtain a certain percentage of revenue from the sales as commission. The Government at times also procures supplies from them to depending on the geography to run their own campaigns. On the software side, they have a social venture by the same name where they focus on creating awareness about menstrual hygiene among woman. They’ve termed it as behavioral change and communication program. The program covers aspects not only related to menstrual hygiene but also on sexual education, maternal health, life skills and other related issues.

The revenue and the costs associated with the business model is mentioned below in table 12.

Table 12: Unit economics of case 3

S. No.	Unit Economics	Per Pad
1.	Total Cost of Production (Raw material, Packing material, salary, electricity, office rent + overheads, maintenance & repair, interest costs on loan, insurance)	4 INR
2.	Maximum retail price	5 INR
3.	Gross Profit	1.0 INR
4.	Initial investment (machine + Goods & Services Tax + infrastructure)	800000 INR
5.	Months to break-even	12 months

However, like mentioned earlier, in 8 years of their operation they have been profitable by a very small margin only the last two years. They are primarily dependent on funds from investors, CSR grants to keeps them running. During these 8 years of their existence, they have had to close down a couple of units due to poor sales and rising operating costs with currently 30 production units in operation. They have only had 1 million customers in a market of around 250 million women in the last 8 years. And, only 70 percent of them remain to be repeat customers. All of this suggesting that they are in the diffusion phase with diffusion rates remaining low. This is due to the fact that there is a reluctance among women to come back, buy and keep using the product due to a number of barriers that stop them (Respondent 4, 2019). Therefore, the sanitary pads are quite far from being a norm for general use.

5. Social ecosystem

To understand the social ecosystem around the social enterprise better, a number of factors are studied. The **social problem** on the crisis related to menstrual hygiene is addressed by the social enterprise as a twofold approach. One is to provide women with sanitary products which are degradable, environmentally friendly and hygienic at affordable prices (Respondent 4, 2019). In

this process, creating a livelihood for women because the pads produced in the villages involve women as the workforce. These women also sell these pads and get a commission from it (Respondent 4, 2019). The other is to educate women about following hygienic practices and give them the right information to make the informed choice. This is executed with the help of awareness programs during which they do not promote their product but rather empower women to make an informed choice. The **social structure**, they encounter are that different women are accustomed to different practices and needs at different parts in the country which is a quite a challenging barrier for women to adopt sanitary pads. This suggests that social structure has an influence on diffusion. As stated by respondent 4 (2019), *“Some of our units have failed because of women not having the intent to bring change.”*. It is observed that **cultural and psychological factors** also have an influence on diffusion. Because, women often fail or stop using sanitary products because the shops are mostly run by men and that women don't feel comfortable going to these shops because of cultural stigmas. Due to the shame associated with menstruation there are no conversations had around safe menstrual hygiene practices, the consequences of it is felt among women dropping out from schools, workplaces, social events etc., A number of **political barriers** are also observed. The first barrier is the quality standards. The current standards are very poor resulting in women stopping to use low-cost pads as they have very poor absorption limits. However, the social enterprise is actively pushing to redefine the existing quality standards of sanitary pads. They are part of the Bureau of Indian Standards (BIS) advisory committee to define the standard for compostable sanitary pads. Second is the GST tax exemption problem. *“There is tax for the raw material incurred. However, there is no tax on the product output. Hence, there is no benefit.”*, says respondent 4 (2019). Because, of this GST tax exemption, small scale production units find it hard to continue making sanitary pads that are affordable. If the units are to sustain in the long-run, they need to increase the price of their pads. Currently, the production units are selling the pads at their older rates, however their revenue generation has taken a hit due to the tax rates (Respondent 4, 2019). The third barrier is the lack of consensus in promotion. *“Even though many State Governments are banning plastic usage. They are promoting oxo-biodegradable pads which are more harmful than plastic pads.”* - (Respondent 4, 2019). There remains a clear lack of consensus in which pads the Government wants to promote. The social enterprise stresses for the need to promote green sanitary products. The final barrier is that women find out about the disposal issues regarding sanitary pads and the harmful consequence. Due to the different campaigns like Green the Red, Red Dot campaign around the issues of disposal and environmental friendly products, women often question the product choice they make (WaterAid India, 2019). All these barriers limit sanitary pads sales. This indicates that political factors have an influencing on the diffusion of the sanitary pads.

Macro-economic factors like recession, economic slowdown, have an impact on sales because of India being a cash-heavy economy. Retail stores, etc., had zero pad sales because people during demonetisation as people did not have money for basic amenities so sanitary pads and women's health became the last priority during that situation, suggesting that the macro-economic factors has an influence on diffusion. Also, when there is an economic slowdown, people are not looking at opening new business ventures like a sanitary pad manufacturing unit. **Identity and role-based groupings** do not play a role in the diffusion of sanitary pads in the market. Because in this case, most actors do not strictly adhere to a single role or identity, they might have multiple roles. The **sequence** of the SI process is linear. The social enterprise initially started with the aim of making low-cost sanitary pads to tackle the menstrual hygiene problem. Hence, they fabricated sanitary pads making machines that made low-cost sanitary pads. However, they eventually realized just making low-cost pads wasn't helping address the problem because of the different social-cultural

stigmas. So, they established a social venture to run a **complementary service** - behavioral change and communication program among women in rural India. The program covers menstrual hygiene, sexual education, maternal health, life skills and other issues. These programs address issues related to socio-cultural and psychological barriers suggesting that these programs influence the diffusion of sanitary pads. However, running these programs are a resource intensive affair.

6. SI Channels

The final component of the conceptual framework, the SI channels are observed as four factors. The social enterprise has most units established in rural India where women both manufacture pads and are involved in the distribution, in their respective communities. Hence, they establish a strong **network with interpersonal ties** through door to door distribution of sanitary pads in the community. The social enterprise also has women employed in the rural areas where they run their production units as **intermediaries**. *“We either do bulk sales by ourselves or we train rural women to sell our pads on a door to door basis for which they receive a commission from us. Sometimes, the Government takes some supplies from us depending on the geography.”* says respondent 4 (2019). The e-commerce websites like Amazon will also soon be an intermediary to help sell their products in the urban market. In the urban market, they also focus on influencing potential customers through **promotion platforms** like Instagram. They are also currently working with influencers for instance the Miss World organization to help promote their products and create awareness. However, right now, at the rural market, the product is promoted by women through word of mouth and through the government awareness platforms. For people with internet access, there is more information available on the website. The social enterprise are also available through telephone call for people with no access to internet to obtain more information about their sanitary product and their campaigns. Strong network with interpersonal ties, intermediaries and different promotion platforms has resulted in the improvement of sanitary pad sales with more women coming forward to buy it. Therefore suggesting that, these factors have an influence on the diffusion of the sanitary pads. Even though, **mass media** is the most influential channel that aids in the spreading of the socially creative strategy. There is no use of it to promote or spread awareness by the social enterprise.

6.4 Concluding remarks

Among approximately 355 million menstruating women in India, these three social enterprises target a consumer base of around 250 million in the rural and semi-urban areas. In case 2, they only have a customer base of close to 50,000 women from their 23 odd production units across India. While the social enterprises studied as case 3, has 1 million customers from their 30 production units in 8 years of existence. While, case 2 targets to reach 20,000 customers in the year 2020. Case 3 had to shut down few of their production units due to poor sales while case 1 predominantly run its operations on funds obtained from grants and gives away cloth pads for free with very little actual sales. All of this suggests that the diffusion rates remain quite low.

All three social enterprises have had a good start-up phase primarily because of their low-priced sanitary products with good features. They are currently now in the diffusion phase. However, they are still far away from being the norm for general use. Because, there are problems with adoption of sanitary products among women which are mentioned in the following paragraphs and discussed in detail in chapter 7. All three social enterprises acknowledge that 70 percent of the market still remains open. The reason for low diffusion rates is that in all the three cases either women simply do not want to use sanitary products or they come forward to try the sanitary product for the first time but they're reluctant to buy it again.

The three social enterprises attempted to tackle two factors: *social structures, cultural & psychological barriers* that they identified which prevented women from buying their low-cost sanitary products with good features (*relative advantage*). They design and run awareness programs (*complementary product & services*) that educate women by providing the right information. These awareness programs are often run by the social enterprises themselves and sometimes with the help of other NGOs in communities where their production units are located. However, no collaborations with other social entrepreneurs and the Government was observed and these awareness campaigns turned out to be resource intensive affair. It was also observed that, one-woman *intermediaries* help as well by talking about these issues and selling the sanitary products at the target consumer's doorstep. They end up establishing a strong *network* within the community. *Promotion platforms* such as providing information pamphlets created a positive word of mouth and provide consumers with the right information to help address the social structure, cultural and psychological barriers. The awareness programs and the three SI channels influenced the diffusion considerably. Also, *high complexity, low compatibility, trialability and observability* which was observed during the course of research which had affected sales also improved over time due to these awareness programs and the three SI channels, therefore suggesting there are interdependencies between the factors.

During the course of the case study research additionally four political factors namely: quality standards, GST exemption, lack of consensus in promotion and sanitary waste management along with four other factors namely macro-economic factors, type of business models and relative advantage: limited size and colour also influenced the diffusion of the sanitary products. Macro-economic factors like recession, economic slowdown etc., cannot be addressed as the entire economy of the country is affected. And, the social enterprises' business model will only showcase its true potential when all the above mentioned factors except for macro-economic factors are addressed. Therefore, all these other factors can be addressed with recommendations provided during the course of the research work. These recommendations when taken into consideration might further help in improving the diffusion of these products. In depth analysis of all the factors observed in these cases and identifying salient factors is done in the upcoming chapter.

7. CASE ANALYSIS

The three case studies on social enterprises making low-cost sanitary products in India yields findings regarding the factors placed in six components of SI process as discussed in the conceptual framework based on Pue et al (2015): social entrepreneur, socially creative strategy, technological design of SI, SI channels, SI diffusion cycle and social ecosystem. This chapter starts with a cross-case analysis that helps in understanding the small-scale production units that make and sell low-cost sanitary products as a SI process using the conceptual framework. Further, the salient factors that contributed to the diffusion of these products are examined.

Thus, the aim of this chapter is to answer the main research question: ***“How can the low-cost sanitary products made and sold by the small-scale production units be understood as a social innovation process and what salient factors could further drive its diffusion among woman in India?”***

What sets the low-cost sanitary products made by the small-scale production units as a SI process and not as conventional innovation is that the social enterprises running these units are primarily driven by the immediate social need of addressing the menstrual crisis affecting the women in India. They are not driven by the market competition in the field. However, the fact that the majority of the market remains untapped provides the social entrepreneurs with an opportunity to still build a sustainable business and make a living out of it. These social enterprises are ideally either non-profit organisations with earned income strategies or for-profit organisations with mission driven strategies. Either way, any potential profit earned from the sales by these enterprises are put back into further solving the social problem.

7.1 The SI process

Based on the 6 components of the conceptual framework, tables are formulated in this section to explain the small-scale production units that make and sell low-cost sanitary products as a SI process. In the first column all the different factors from the framework are mentioned. In the next column, the comparisons and the similarities with respect to all the three cases are mentioned. In the third column, an argument is provided to show why certain factors when present in an innovation process qualifies it to be termed as SI while certain factors could be synonymous to conventional innovation as well therefore indicating that the factor is not exclusive to SI alone. The final column showcases if the factors have an effect on diffusion based on the empirical data.

7.1.1 Social entrepreneur

In the conceptual framework, the SI process starts with the very first component, the social entrepreneur. In all the three cases, the social enterprises that run small-scale production units making low-cost sanitary products in India are the social entrepreneurs. The social entrepreneur is the prime mover in the SI process identifying the social problem and coming up with a socially creative strategy to address it. In this section, the motivation, values and the individual faculties of the small-scale production units in this SI process are tabulated.

Table 13: Social entrepreneur

S. No.	Factors	Findings	Relationship to SI process	Effect on diffusion
1.	Motivation	Motivation of all three enterprises are both intrinsic out of intense desire in attempting to find a solution to the menstrual health crisis as well as creating a livelihood for women thereby attaining self-satisfaction and extrinsic because the social entrepreneurs acknowledge the fact that around 70 percent of the market for sanitary products in India is still open to run a business.	If the social enterprises are primarily motivated to build a socially creative strategy driven by the need to solve a social problem, then it is a SI process. In all three cases, the enterprises are intrinsically motivated to address the menstrual health crisis. And, also extrinsically motivated to run a sustainable business to earn a living due to the largely untapped market which could be common for other types of innovation as well.	Although motivation is essential for a SI process its relationship with diffusion of low-cost sanitary products was not found in the studied cases.
2.	Values	<p>The three social enterprises have different sets of values that drives their motivation:</p> <ul style="list-style-type: none"> i. Case 1 values quality, flexibility and financial compensation. ii. Case 2 deems efficiency, transparency, gender equality and empathy as important values. iii. For Case 3, it is environmental consciousness and providing right information. 	<p>If the values of the enterprises are socially inclined, they qualify to be a SI process. In the three cases, the socially inclined values are empathy, providing right information to women, gender equality and environmental consciousness.</p> <p>However, other values observed such as transparency, quality, flexibility, efficiency and financial compensation are relevant for any innovation.</p>	Values that the social enterprises hold, are vital for a SI process. However, its relationship with diffusion was not found in the studied cases.

3.	Individual Faculties	<p>It is the skills, personality traits which come in good stead while designing the socially creative strategy (Pue, Vandergeest, & Brezn, 2015).</p> <ul style="list-style-type: none"> i. Case 1: They've been mentored by another social enterprise, EcoFemme to run their operations and procurement of raw materials. ii. Case 2: One of the founders has experience being part of a Acumen fellowship that saw her take on global challenges on poverty by designing sustainable solutions, while the other founder had experience in designing and fabricating automated production lines. iii. Case 3: The founder is an engineer who has previous experience commercializing indigenous innovations working for Honeybee network. 	<p>In all three cases, the social entrepreneurs picked up relevant skills to address social issues by either being a part of fellowship programmes run by global NGOs or mentored by other social enterprises and working for them. Therefore, gathering the additional skills which are unique to design and develop a SI.</p>	<p>Based on the empirical data gathered about individual faculties, no effect on diffusion of the low-cost product among women in India was found.</p>
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Based on the motivation, values and the individual faculties studied of the social entrepreneur, it is safe to include that the process of making and selling low-cost sanitary products are a SI process. Because, unlike market innovations which is driven by the need to capture market, social entrepreneurs are observed to be driven by the social need and possess values and skills that are inclined towards instilling social change. Also, with the empirical data collected, no relationship between these three factors and the diffusion is found.

7.1.2 Socially creative strategy

The socially creative strategy in the SI process is designed to achieve an objective i.e., address the social problem in the society. It differs along two factors: type of socially creative strategy and target community. In this section, the type of sanitary products made by the production units along with their target consumer base is discussed.

Table 14: Socially creative strategy

S. No.	Factors	Findings	Relationship to SI process	Effect on diffusion
4.	Type of socially creative strategy	<p>The socially creative strategy is a sanitary pad in all three cases. However, they make different types of pads.</p> <ul style="list-style-type: none"> i. Case 1: Re-usable cloth pads. ii. Case 2: Biodegradable, compostable or recyclable plastic pads based on the geography. iii. Case 3: Fully compostable sanitary pads. 	The socially creative strategy employed by all three cases is to make different type of sanitary products. However, the socially creative strategy employed is not exclusive to SI. Other similar products are observed in the market as well from commercial players.	Type of socially creative strategy has no effect on the diffusion based on the empirical data.
5.	Target community	The target community of all three enterprises focuses on semi-urban and rural areas in India. However, case 1 and 2 already sells their pads in the urban market through e-commerce site, Amazon. Case 3 will also eventually sell their products in the urban market. The target community in general for all three cases is wide and diffuse .	Although the target community is open to both type of market players - social and commercial. It is the social enterprises that have managed to make inroads in the rural areas of the country, making sanitary products accessible there to women. Because, it is in the rural and semi-urban areas that the social problems related to menstrual health is highly prevalent.	Based on the empirical data gathered about the target community, no effect on diffusion of the low-cost product among women in India was found.

The factors - type of socially creative strategy and the target community are not unique to a SI process as other commercial players in the market have similar clearly defined products as well as a target group. However, what is unique about these social enterprises is that, they've managed to discover and focus on a target community that is least accessible to a commercial player in the market. Also, with the empirical data collected, no relationship between these three factors and the diffusion is found.

7.1.3 Technological design of SI

This is the third component within the SI process. A number of factors are observed, to understand the technological design namely the five characteristics of the socially creative strategy, their production system, actors involved in the SI process, the capital required to run the small-scale production units and the uncertainties & risks they face.

Table 15: Technological design of SI

S. No.	Factors	Findings	Relationship to SI process	Effect on diffusion
6.	Relative Advantage	‘Product features’ and ‘low pricing’ are the key components of relative advantage. Low pricing with good features such as comfort, light weight, thin and good absorbency are identified in all the three cases. ‘Limited sizes’ and ‘white coloured pads’ were also identified. This is because women often required larger pads with greater absorption to handle heavy flow. Also, the white coloured pads showcased the stains which caused shame in women due to the existing cultural stigmas. Therefore, women went back to using clothes.	‘Low pricing’ is one of the components that help understand this as a SI process as it is unique in the field of MHM in India. Because it made sanitary products affordable for rural and semi-urban woman in India. However, other features such as comfort, light weight, thin and good absorbency are observed in other products that arise from conventional innovation.	Low pricing with good features such as comfort, light weight, thin and good absorbency in all the three cases has helped in the sales of the sanitary products. While, limited sizes and white coloured pads restricted the product sales. Therefore, suggesting that relative advantage had an effect on the diffusion.
7.	Compatibility	Due to existing social-cultural stigmas, in all the three cases, the compatibility of these sanitary products is quite low.	Compatibility is not exclusive for a SI process as all the products in the market are influenced by the existing norms and values.	Since, the new sanitary product does not conform to the existing female norms and values. The adoption and sales of the low-cost sanitary products is affected, implying that compatibility has an influence on the diffusion of these products.
8.	Complexity	In the cases 2 and 3, most users have never used a sanitary product before. So the first time they try it, they still clean the pads before disposing them because of the existing social structures in place. Therefore, complexity is high. However, urban users who’ve used some kind of a sanitary pad before, find it convenient and easy to use	Complexity is not exclusive for a SI process as all the products in the market are affected by it.	In all three cases, social enterprises encounter a large number of potential customers who find the product to be complex, affecting the adoption of these products by these women. This suggests that complexity has

		In case 1, it is a resource intensive and a costly process requiring behavior change and awareness among those women. Hence, their complexity is high as well.		an influence on the diffusion of these products.
9.	Trialability	Trialability is very low in all three cases because women in rural areas where there is little or no access to sanitary products are reluctant to try it because of the different social-cultural barriers that exist.	Trialability is not exclusive for a SI process as all the products in the market are affected by it.	Trialability of these products is low, possibly affecting the adoption of these products. This indicates that trialability has an influence on the diffusion of these products.
10.	Observability	In all three cases, the visibility of the impact of sanitary pads is very low among women especially in the villages of the country because there is no or little access to sanitary products.	Observability is not exclusive for a SI process as all the products in the market are affected by it.	Observability of these products is low in all three cases due to no or little access in rural areas. Therefore, it seems to affect the adoption of these products. This implies that observability has an influence on the diffusion of these products.
11.	Actor types	Different actors are involved in the SI process with all the three cases: The Government, SHGs, MNCs and other NGOs . These actors usually assist the social enterprise in promoting awareness, buying their products and providing financial grants. These collaborations work well. However, there is no collaboration between different social enterprises and with the Government when it comes designing and running awareness campaigns.	In all three cases, the social enterprises collaborate with other actors mainly the SHGs and other NGOs to promote awareness and sell their products which is unique to a SI process. Because it is different from how commercial products are sold.	Based on the empirical data gathered about actor types, no effect on diffusion of the low-cost product among women in India was found.
12.	Production system	Both, case 2 and 3 have good production systems that include both semi-automatic and fully automatic machines making disposable sanitary pads. Hence, they are able to make a sufficient number of pads at lower rates. In case 1, the cloth pads are hand-made , this leads to higher labor costs. Hence, they have a higher retail	The production system is similar to the commercial players in the market. However, the cost of production and the operating costs are much lower than commercial players based on the	Production system has shown no effect on the diffusion based on the empirical data.

		price. However, they're reusable. So, in the long-run it turns out to be economical.	observations. Thus, making the products affordable. Therefore, making it a SI process.							
13.	Capital	<p>Human capital: All three social enterprises are different sized. They all have permanent employees working at the firm while a floating group of women work in their production units for monthly wages.</p> <p>The raw materials for the products they make are locally sourced. The raw materials used are mentioned below in the table, based on WaterAid India (2019) :</p> <table><tr><th>Disposable pads</th><th>Compostable disposable pads</th><th>Reusable cloth pads</th></tr><tr><td><p>Absorbent core: Wood pulp, Super absorbent polymers (SAP), typically sodium polyacrylate gel.</p><p>Top sheet: Polypropylene based non-woven fabric</p><p>Leak proof layer: Polyethylene</p></td><td><p>Absorbent core: Wood pulp, banana fiber, pine or other absorbent fibers.</p><p>Top sheet: Leak proof layer - polyethylene or compostable alternatives.</p></td><td><p>Top sheet and absorbent core: Cotton, polyester and other absorbent fabrics.</p><p>Leak proof layer: Typically, polyurethane laminate (PUL)</p></td></tr></table>	Disposable pads	Compostable disposable pads	Reusable cloth pads	<p>Absorbent core: Wood pulp, Super absorbent polymers (SAP), typically sodium polyacrylate gel.</p> <p>Top sheet: Polypropylene based non-woven fabric</p> <p>Leak proof layer: Polyethylene</p>	<p>Absorbent core: Wood pulp, banana fiber, pine or other absorbent fibers.</p> <p>Top sheet: Leak proof layer - polyethylene or compostable alternatives.</p>	<p>Top sheet and absorbent core: Cotton, polyester and other absorbent fabrics.</p> <p>Leak proof layer: Typically, polyurethane laminate (PUL)</p>	<p>The human capital and raw materials used by the social enterprises is similar to the commercial players in the market. Hence, not exclusive to SI. However, with regards to the financial capital, the social enterprises are observed to often rely on grants to operate which is different from how commercial players operate.</p>	Capital has shown no effect on the diffusion based on the empirical data.
Disposable pads	Compostable disposable pads	Reusable cloth pads								
<p>Absorbent core: Wood pulp, Super absorbent polymers (SAP), typically sodium polyacrylate gel.</p> <p>Top sheet: Polypropylene based non-woven fabric</p> <p>Leak proof layer: Polyethylene</p>	<p>Absorbent core: Wood pulp, banana fiber, pine or other absorbent fibers.</p> <p>Top sheet: Leak proof layer - polyethylene or compostable alternatives.</p>	<p>Top sheet and absorbent core: Cotton, polyester and other absorbent fabrics.</p> <p>Leak proof layer: Typically, polyurethane laminate (PUL)</p>								

		Financial capital: Cases 2 and 3 generate revenue by selling their sanitary pads, machines and raw materials and they depend on grants to run awareness programs. While, case 1 predominantly depends on grants to make both the cloth pads and run their awareness programs.		
14.	Uncertainties & Risks	All three enterprises have not encountered any uncertainties and risks. Even though, uncertainties and risks are not observed, all firms both are subjected to it. Hence social enterprises approach it by adapting to the situation. They acknowledge that nothing in prior could be done.	Uncertainties and risks is not exclusive for a SI process as all the other players in the market are affected by it.	Uncertainties & risks was not observed in the cases. Therefore, their effect on diffusion could not be determined.

While factors - relative advantage, compatibility, complexity, trialability, observability, actor types, production system, capital, uncertainties & risks are not exclusive for a SI process as these factors are adapted from conventional innovation models and is applicable to all the products in the market. However, factors - relative advantage, capital and production system when observed, showed how social enterprises have managed to produce and sell good quality sanitary products for a low price which other market players have not managed to do, in India. Also, the factor - actor types is unique for a SI process as often social enterprises often collaborate with NGOs and SHGs to make their products more accessible. While the empirical data suggests that relative advantage, compatibility, complexity, trialability and observability has an influence on diffusion, actor types, production system, capital, uncertainties & risks influence on diffusion is not found.

7.1.4 SI diffusion cycle

In the SI diffusion cycle, how the socially creative strategy makes its way to the target community is described. It is mentioned in the form of the business model and type of institutionalization.

Table 16: SI Diffusion cycle

S. No.	Factors	Findings	Relationship to SI	Effect on diffusion
15.	Type of institutionalization	All three cases have a bottom-up process, the socially creative strategy gradually gets accepted by	Type of institutionalization is not exclusive for a SI process. As other products in the market are often	Based on the empirical data gathered about institutionalization, no

		the society and then eventually internalized by the government.	institutionalized by either a top-down or a bottom-up approach.	effect on diffusion of the low-cost products among women in India was found.
16.	Type of business model	<p>When it comes to the business model, cases 2 and 3 generate revenue by selling their sanitary pads, machines and raw materials. They depend on grants to run their awareness programs. SHGs, NGOs and sometimes the government helps in promoting the products or buying their machines and setting up their own independent small-scale production units. Both, cases 2 and 3 provide the independent units with the choice of buying back the sanitary pads these units make and sell it under their brand. The units sell the products through different short distribution channels.</p> <p>While case 1 predominantly depends on grants to run their operations with very few direct sales. They run another NGO which conducts awareness programs, in which these cloth pads are distributed to their target group. However, it acknowledges that this model might not be sustainable in the long run due to a number of reasons: its reliance on grants, high customer acquisition cost, low per user business, less repeat business because of the product being reusable.</p>	<p>In the cases, primarily two different type of business models are observed. Although, most aspects in the business models in all three cases are pretty commonly observed among other players in market, there are few aspects about these business models that is unique to a SI process.</p> <p>Social enterprises often rely on grants to operate which is different from conventional innovation. And most importantly, they employ shorter distribution channels which is more focussed on personal connection with the consumers as opposed to longer distribution channels with lesser consumer contact that is employed by commercial market innovations.</p>	It could be found that business models had an effect on the diffusion based on the empirical data.

The factors - type of institutionalization and type of business model are not unique to a SI process as other commercial players in the market are bound by these factors as well. However, what is unique about these social enterprises is that, they rely on grants and operate shorter but cheaper distribution channels to make their products very accessible in rural areas of the country. Also, with the empirical data collected, while business model had an effect on diffusion, type of institutionalization's relationship with the diffusion is found.

7.1.5 Social ecosystem

The social ecosystem is the physical and cognitive space within which different actors in the SI process interact (Pue, Vandergeest, & Brezn, 2015). The social entrepreneur who comes up with a socially creative strategy gathers more details about the SI process from the social ecosystem. Therefore, to better understand the entire SI process of making and selling low-cost sanitary products, a number of factors in its ecosystem needs to be studied:

Table 17: Social ecosystem

S. No.	Factors	Findings	Relationship to SI	Effect on diffusion
17.	Social problem	The social problem all three social enterprises are trying to address is that women were contracting diseases because of multiple issues around the lack of use of menstrual products. Therefore, there was a need to find an affordable, accessible solution to tackle this menstrual crisis. However, women were still wrapped around the social-cultural taboos hence they wanted to create awareness of the problem as well, by providing the right information.	In contrast to conventional innovation which is driven by market competition, a social enterprise is driven by the need to address the social problem. In this case, it is observed that the social enterprises are trying to address the issues related to menstrual health in their target community.	Existence of menstrual health issues leads to a development of a low-cost sanitary products. However, social problem's influence on the diffusion of these products was not found from the cases.
18.	Social structure	The three enterprises observed social stigmas that are present in the social structure that stopped women from talking about periods and healthy practices.	Social structure is not exclusive for a SI process as the sales of all the products in the market get affected due to the social stigmas in the target community. However, the impact of the social structure on the SI process is much higher in rural and semi-urban areas than in urban areas where all other market players focus.	Existence of social stigmas has blocked the adoption of good menstrual products among women in rural and semi urban areas of India. Therefore, suggesting that social structure has an influence on the diffusion of these products.
19.	Cultural & psychological factors	A number of cultural and psychological barriers are observed. For instance, when women say most of them in the family are accustomed to using a certain cloth, etc., hence they don't shift to a pad. In certain rural	Cultural & psychological factors are not exclusive for a SI process as the sales of all the products in the market get affected due to the cultural & psychological barriers in the target	When women are bound by norms in the family or community to only use old rag clothes to manage periods, it is observed that the social

		poorer parts of the country, women even at younger ages hate menstruation so much that they have their uterus removed because the Government hospitals offer free uterus removal surgeries to prevent cervical cancer. However, they are ignorant about the health complications that could arise due to it. So, all three social enterprises run awareness programs to counter these social and cultural barriers.	community. However, the impact of the cultural & psychological factors on the SI process is much higher in rural and semi-urban areas than in urban areas where all other market players are present.	enterprises find it very difficult to sell their products in these areas. Therefore suggesting that diffusion of the sanitary products is influenced by the prevailing cultural and psychological factors.
20.	Political factors	Four political barriers that are observed in all three cases are: <ul style="list-style-type: none"> i. GST (Goods & services tax) exemption on sanitary pads. ii. Lack of consensus in the promotion of sanitary products. iii. Problems with disposing sanitary waste. iv. Absence of quality standards. 	Political factors is not exclusive for a SI process as all the products in the market are affected by the government policies.	Political barriers for instance like GST exemption have led to the increase in the cost of production of sanitary products. Thereby, resulting in social enterprises increasing the price of their products. Thus, the sales of the products take a hit among rural & semi-urban women. Therefore, suggesting that political factors have an influence on the diffusion of these products.
21.	Macro-economic factors	Macroeconomic situations like demonetisation, economic slowdown had an impact on all the three cases. However, the entire economy of the country is affected by it, not just the field of MHM.	Macro-economic factors is not exclusive for a SI process as all the players in the market are affected by economic situations.	When there is an economic slowdown in the country, the sales of the sanitary products are affected. Therefore, it indicates that macro-economic factors have an influence on the diffusion of these products.
22.	Identity & role-based groupings	Identity and role-based groupings do not exist in this SI process because actors do not conform to a certain role as they play multiple roles.	Identity & role-based groupings are not observed in this SI process.	Identity & role-based groupings are not observed in the three cases. Therefore, its effect on diffusion is not known.

23.	Sequencing	The sequence of the SI process in all three cases are linear . They first identified the problem and then eventually came up with a socially creative strategy: low-cost sanitary pads to tackle the social problem.	The linear sequence of the process of making and selling these low-cost products is termed as a SI process because the enterprises first identified the problem associated with menstrual health, then later came up with the products to address this problem. Which is different from conventional innovations as their priority is to capture market share as they are driven by competition.	Based on the empirical data gathered about sequencing, no effect on diffusion of the low-cost products among women in India was found.
24.	Complementary product & services	All three enterprises, however soon realised that the sanitary product alone is not sufficient to solve the social problem, and their diffusion rates remained low, so they needed a complementary service in the form of awareness programs to help address the problem by providing the right information. This helps further diffusion of sanitary products among woman in their target community.	In general, all types of innovations use complementary products and services to improve sales and service of a particular product. However, in this case, running awareness programs is unique to a SI process. As, these programs focus on educating women on the problems related to menstrual health and not on the sales of the sanitary product.	Awareness programs run by social enterprises although focusses on addressing menstrual health issues, it enables more women to buy sanitary products as they are now aware of the consequences of not using it. Therefore, indicating that awareness programs have an effect on the diffusion of low-cost sanitary products.

The factors - social problem and sequencing is exclusive to a SI process. As social entrepreneurs designed low-cost sanitary products to solve the problem related to menstrual health that they identified first. All other market players are subjected to these factors - social structure, cultural & psychological factors, political factors, macro-economic factors, identity & role-based groupings, complementary product & services and therefore not exclusive to a SI process. However, what is unique though is that the social enterprises are most affected by social structures, cultural & psychological factors as the effect of these factors are more prevalent in rural and semi-urban areas. Also, the awareness programs run by the enterprises to counter these two factors is unique. While empirical data suggests that social structure, cultural & psychological factors, political factors, macro-economic factors, complementary product & services have an influence on diffusion, the relationship of identity & role-based groupings with diffusion of sanitary products is not known.

7.1.6 SI channels

The crucial last component in the SI process are the SI Channels. The SI channels are ways through which different actors within the SI process interact and also how the socially creative strategy which is directed towards solving a social problem is marketed to the target community by the social entrepreneurs. Hence, the SI channels aid in the diffusion of the socially creative strategy. The four different SI channels employed by the small-scale production units are described below:

Table 18: SI channels

S. No.	Factors	Findings	Relationship to SI	Effect on diffusion
25.	Mass media	Social enterprises do not use mass media promotion as they are quite expensive and resource intensive. Social media is not considered mass media rather as a promotion platform because majority of the rural and semi-urban women have no access to it.	Mass media is not used by the social enterprises. However, it is definitely not exclusive for a SI process as most commercial products in the market employ mass media.	Mass media is not observed in the three cases. Therefore, its effect on diffusion is not known.
26.	Network & interpersonal ties	In all three cases, strong network and personal ties are established in communities where they run their awareness programs. Most women start buying sanitary products because of the positive word of mouth that spreads among their network.	Network and interpersonal ties are not unique to a SI process. As often different innovations which start out as a niche spread due to the positive word of mouth (Geels, 2002). As mentioned before, the awareness programs run by social enterprises focusses on addressing menstrual health issues, enabling more women to buy sanitary products as they are now aware of the consequences of not using it.	More women start using the products and the sales of the products is observed to increase due to the strong networks, indicating that these networks have an influence on the diffusion of the sanitary products.
27.	Promotion platforms	The sanitary products are promoted through promotion platforms such as conferences, social media, e-commerce platforms websites, etc., in the urban and semi-urban areas. While in rural areas, along with campaigns there is also distribution of information pamphlets on hygienic menstrual practices. While, case 3 also works with the Miss World organisation to run	Promotion platforms employed in urban and semi-urban markets are not exclusive for SI, other innovations using similar platforms as well. However, in rural areas these enterprises distribute information pamphlets about the issues related to menstrual health which is unique.	All three social enterprises have employed different promotion platforms to reach out to more women and have improved the sales of their sanitary products. Therefore, suggesting that the promotion platforms have an

		campaigns that help spread the use of sanitary products.	Because, these pamphlets do not promote the sanitary products rather make women aware of the issues.	influence on the diffusion of these sanitary products.
28.	Intermediaries	The network is further strengthened as both cases 2 and 3 depute one-woman intermediaries that do door-to-door distribution of these sanitary pads. In case 1, the NGOs act as intermediaries, promoting and distributing the product. These intermediaries aid in the diffusion of sanitary products.	Intermediaries are unique to SI as they aid in the promote and spread of the socially creative strategy. In the three cases, it is observed that the enterprises employ one-woman intermediaries form the local communities where the production units are located to both sell and educate women about the issues. Thereby, building a strong network.	In all three cases, employing intermediaries has resulted in more women buying the products in the local communities. This indicates that the intermediaries have on effect on the diffusion of these sanitary products.

The factors - mass media, promotion platforms, network & interpersonal ties are not exclusive to a SI process however intermediaries are unique to a SI process as in the case of the social enterprises studied, they employ one-woman intermediaries that focus on making sure they build a personal connection with the consumers and make the sanitary products accessible. While the empirical data indicates that promotion platforms, intermediaries, network & interpersonal ties have influence on diffusion, mass media's relationship with diffusion is not known.

7.1.7 Concluding remarks on the SI process

Using the conceptual framework, the process of making and selling low-cost sanitary products among women in India was studied, based on the above analysis, it indicates that this process is indeed a SI process as social entrepreneurs are driven by the social need and possess values and skills that are inclined towards instilling social change by making an attempt to solve a social problem. This problem is predominantly prevalent in rural and semi-urban areas of the country where women are still bound by social-cultural stigmas. Hence, the entrepreneurs make an attempt to reach out to them through different awareness programs, distributing pamphlets and more importantly making sanitary products that are affordable and accessible by establishing strong door-to-door sales networks. The social entrepreneurs are funded by grants to run these campaigns. All of this indicates how this SI process is unique and different from the innovation processes of a commercial market player. However, not all factors observed are exclusive to a SI process like mentioned earlier, as the social enterprises are also subjected to factors that conventional innovations are impacted by. Because, social enterprises are still expected to run a sustainable business by eventually becoming self-sufficient, which they are not at the moment. They are in the diffusion phase however their diffusion rates still remain low.

Out of the 28 factors, 25 were identified in the case studies of three social enterprises. The three factors that were not identified in the cases are: identity & role-based groupings, uncertainties & risks and mass media. With regards to these factors, although it was not identified in the cases, it does not mean that these factors do not exist. Therefore, a conclusion cannot be made that these three factors are irrelevant for this SI process. In all the three cases, 14 factors had an influence on the diffusion the sanitary products. The factors are relative advantage, observability, complexity, trialability, compatability, type of business model, social structure, political factors, macro-economic factors, cultural & psychological factors, complementary product & services, promotion platforms, intermediaries, network & interpersonal ties. The final list of factors observed from the conceptual framework in the SI process of making and selling low-cost sanitary products are tabulated below:

Table 19: Factors in the SI process of making and selling low-cost sanitary products in India

Social Entrepreneur	Socially Creative Strategy	Technological Design of SI	SI Diffusion Cycle	Social Ecosystem	SI Channel
Individual faculties	Target community	Relative advantage	Type of institutionalization	Social problem	Mass media
Motivation	Type of socially creative strategy	Compatability	Type of business model	Social structure	Network & Personal ties
Values		Complexity		Cultural and psychological factors	Promotion platforms
		Observability		Political factors	Intermediaries
		Trialability		Macro-economic factors	
		Actor types		Identity & role based groupings	
		Production system		Sequencing	
		Capital - Natural, Human and Financial		Complementary products and services	
		Uncertainties & Risks			

7.2 Salient factors influencing the diffusion of low-cost sanitary products

From the case study research, eight salient factors appear to have an influence on the diffusion of the low-cost sanitary products among woman in India based on the six components of the conceptual framework. The salient factors were identified primarily from two questions asked to the small-scale production units during the semi-structured interviews and other secondary data. In terms of government policies, product & services, social, cultural and psychological factors macro-economic situations and other factors:

1. What has helped in getting the target consumers use their sanitary product?
2. What are the major difficulties they face in getting the target consumers to use their sanitary product?

Like mentioned earlier in the methodology chapter, magnitude coding procedure is then applied to the data to corroborate that the factors either have an influence on the diffusion of sanitary products. This data is also confirmed with the literature obtained from the NGOs described in chapter 5. Then, the salient factors are identified by simply counting the frequency of a magnitude code in all the three cases.

The eight salient factors identified are: relative advantage, social structure, cultural & psychological factors, political factors, complementary product & services, network & interpersonal ties, promotion platforms and intermediaries. Thereby, answering the third sub question: *“What are the salient factors that influence the diffusion of low-cost sanitary products made by small-scale production units among women in India?”*

7.2.1 Relative Advantage

Rogers (2003) defines relative advantage as the degree to which an innovation is considered to be better than the idea it replaces. In the case of MHM in India, the research identified ‘product features’ and ‘low pricing’ as key components of relative advantage. While low pricing with good features such as comfort, good absorbency, light weight, thin and disposability are identified in the three cases. These components alone do not help these enterprises achieve high diffusion. Because, it was found during research that women often required larger pads with greater absorption to handle heavy flow. Also, the white coloured pads showcased the stains which caused shame in women due to the existing cultural stigmas. So, women often went back to using clothes and other materials. therefore, the colour and the size of the offered products needs to be considered in order to improve diffusion as all three social enterprises offer it only in one colour (white) and limited size variations.

7.2.2 Social structure

According to Pue et al (2015), social structure describes how social life is affected by the constellation of norms and rules in an institution. It is a pattern of social interactions that can be identified at a given moment. They either enable or constrain actors. With MHM in India, the three social enterprises observe different social taboos and fear of pollution associated with menstruation. These taboos on menstruation and fear are connected with the caste system (Brockington, 1981). The taboos present in the social structure appears to stop them from talking about periods and healthy menstrual practices. This suggests that it remains to be a major factor influencing the diffusion of good menstrual products.

7.2.3 Cultural & psychological factors

Social enterprises observe that women are familiar with a certain custom like using cloth, etc., in their families during periods so they don't shift to a sanitary product. In rural areas, women even at younger ages hate menstruation because of the leakage of blood onto their clothes they wear due to not using sanitary products and the ridicule that comes with it, that they surgically remove their uterus. This leads to further health complications like hormonal imbalance etc., However, once their uterus is removed women are not menstruating anymore. Therefore there is no need for sanitary products. Also in most cases, when the girls start with their periods, they are not the decision makers. This coupled with the fact that her mother is ignorant too, results in a poor choice of using clothes, papers or other means. Therefore they are also reluctant to make that switch to sanitary products. All these factors stop women from using sanitary products therefore influencing the diffusion of these sanitary products. Also the consequences are pretty severe. Any unhygienic practice leads to complications with health. Ignorance about menstruation leads to psychological issues and impacts the self-image of the girl (Respondent 1, 2019). This leads to absence from school, work and lower participation in social events.

7.2.4 Complementary product & services

Complementary products and services are required during the entire process of SI for the design, production, distribution, adoption, use, maintenance & disposal of a socially creative strategy. (Ortt & Schoormans, 2004). Along with the socially creative strategy, they form the social ecosystem. In the case of these social enterprises, they realized eventually that they needed to design and run awareness and behavioral change programs to help tackle the social, cultural and psychological barriers. They aim to provide the right information to their consumers by educating woman about menstrual hygiene and the consequences of not following hygienic practices. The enterprises usually collaborate with other NGOs, to run these programs. This appears to have an influence on the diffusion of sanitary products among woman in their target community.

7.2.5 Political Factors

From research, four political factors are identified that influence the diffusion of the sanitary products. First, is the GST exemption on sanitary products. The GST for raw materials was 18% and for the sanitary pads it was 12% earlier. The 18% tax paid to the raw material manufacturer, is applicable for a rebate. But, now there is no reimbursement for the 18% tax. This especially affects low-cost sanitary pad manufacturers who have very little profit margin because there is hardly any difference in the cost of the pad unless they are allowed to claim the benefit of 18% like before along with the GST exemption on pads. If they increase the price of the sanitary products to sustain, then it impacts the sales of these products.

Second, is the lack of consensus in the promotion of sanitary products. While some state governments promote setting up of manufacturing units there are other state governments giving away free pads. It is all uncoordinated. Conflicting policies between state and the central government and within the state government has influence on the usage of sanitary products because women are often waiting for free sanitary products. But, in most states no such schemes are implemented. There is also no consensus on the type of sanitary product they promote. Third, improper infrastructure for the disposal of sanitary waste. Currently available incinerators used for the disposal of sanitary pads, emit fumes which are carcinogenic. Hence, there are campaigns against the use of these disposal machines. It is observed that often women get to know about these

consequences and are reluctant to further use sanitary products. And finally, there is the absence of new quality standards. The present BIS standards for sanitary products are very basic which was set in the 1980s. Products that meet these existing standards are either uncomfortable or do not have enough absorbency as women expect of it. Thus causing women to drop out from using sanitary products.

7.2.6 Network & interpersonal ties

According to Pue et al. (2015), the social ecosystem is made of an intricate web of individuals networking in a certain social space. In this physical and cognitive space, the collectiveness of interpersonal ties - strong or weak affects the diffusion of the SI process. The networks created within a social system in which peers influence each other is often used to spread innovations, but it might as well lead to competing structures. In the case of three social enterprises studied, strong networks are established in communities where they run their awareness programs. Most women start buying sanitary products because of the positive word of mouth. Also, the network is further strengthened as these enterprises employ distribution channels through women who deliver sanitary products at the door step thereby eliminating the need for consumers to go to shops to buy the products. These strong networks influence the diffusion of sanitary products.

7.2.7 Promotion Platforms

All three social enterprises use some kind of promotion platforms to influence the diffusion of their products. Platforms they typically use are: attending conferences, through social media, e-commerce platforms, websites, etc., These enterprises also work with other NGOs to run campaigns that help spread the use of sanitary products.

7.2.8 Intermediaries

Intermediaries are a group of actors who are mobilized when the target community is large and diffuse. The social enterprises depute one-woman intermediaries that do door-to-door distribution of these sanitary pads. This reduces the costs spent on longer distribution channels for the social enterprises instead creates a strong network in the local community. These one-woman intermediaries also make a living as they earn a part of the sales profit as commission. At times, the social enterprises also employ other NGOs as intermediaries to help sell their products during their own awareness campaigns. Therefore, intermediaries seem to have an influence on the diffusion of a socially creative strategy.

8. RECOMMENDATIONS

As seen from the discussion presented above, the recommendations that are to follow will go in the direction of further driving the diffusion of low-cost sanitary products in India. Thus, answering the final sub question: *What recommendations based on the identified salient factors could be given to the small-scale production units and the other stakeholders involved that could facilitate further diffusion of low-cost sanitary products among woman in India?*

8.1 Policy recommendations

Based on the case studies, four political barriers are observed, that appear to influence the diffusion of the sanitary pads in all three cases. They are:

- i. Problem with GST exemption on sanitary pads.
- ii. Lack of consensus in the promotion of sanitary products.
- iii. Problems with disposing sanitary waste.
- iv. Absence of quality standards.

Hence, five recommendations to existing policies are drafted by undertaking further research in these areas of concern by trying to identify ways to address them. These recommendations if taken into consideration will further aid in the diffusion of low-cost sanitary pads among women in India.

8.1.1 Changes to GST exemption on sanitary products.

The Ministry of Finance, Government of India (GoI) launched the Goods and Services Tax (GST) two years back. Even with the phenomenon of menstruation being considered a taboo, this decision by the government attracted negative feedback for levying 12% tax on sanitary products. Although the tax rate had come down by 1.7% when associated with the previous tax rates, several social campaigners thought of it as an obstacle to promote menstrual hygiene. This led to protests, across the country. Following the protests, the GoI decided to totally remove GST on sanitary products.

However, even after the tax exemption, there is only a small margin of price advantage for the customers when it comes to sanitary products. Zero GST on sanitary product means there is no input credit to companies for raw materials. This is because tax on raw materials remains the same. Therefore, the change to the final selling price is very small (Mohan, 2019). The table below indicates the changes in the price of the sanitary product before and after GST exemption using an example of the products of case 2 retrieved from their blog:

Table 20: Effect of GST on sanitary products

	Before GST exemption (INR)	After GST exemption (INR)
Cost of Production (COP)	2	2
GST On Input Tax	0.36 (tax rebate available)	0.36 (no tax rebate)
Total Cost of Production	2.36	2.36
Gross profit for manufacturer	0.8	0.8
Net Selling Price to Customer	2.8	3.16
GST On Pads Charged	0.336 (12% GST)	0
Gross payable by customer	3.136	3.16

Before GST exemption:

The COP of one pad is 2.36 INR, which includes 0.36 INR roughly as GST on raw materials is 12% or 18%. So, the selling price is 2.8 + GST (at 12%) which is 3.136 INR which is paid by the customer. Thus, the production unit earns $2.8 - 2.36 - 0.36 = 0.8$ INR per pad because there was a tax rebate of 0.36 INR for raw materials.

After GST exemption:

The production units' COP per pad remains 2.36 INR inclusive of GST on raw materials. However, there is no tax rebate of 0.36 INR on raw materials. Hence, to earn a profit margin of 0.8 INR, the selling price of the pad is 3.16 INR. So, there is a 0.024 INR increase in selling price per pad.

In practice, this means that the small-scale production units are levied the input tax but are not eligible to get the rebate on raw materials like before. With no difference in the COP, the production units do not make any significant profits to be sustainable as they have to take a cut in the profit by selling the pads at rates before GST exemption came into existence. And, when the price of the sanitary products is increased, then the product sales is affected. Therefore, all of this suggests that GST exemption influences diffusion.

“The biggest challenge we face is the zero tax on sanitary products. Because there is tax for the raw material incurred. However, there is no tax on the product output. Hence, there is no benefit in that.” - Respondent 4.

Another problem is that it has boosted more imports of plastic based sanitary napkins. Such products benefit from this situation of zero tax because now they only pay custom duties to sell their products in India. A lot of the small-scale production units now find it hard to hold on to their position in the market due to the stiff competition they face from foreign products. Even though these foreign products have poor quality, cause potential environmental damage, their cheap prices have helped them penetrate the market comparatively easier. However, due to the poor quality and no comfort, women often stop using them (Mohan, 2019).

“It seems that the decision to exempt sanitary products from GST was not sufficiently thought through. It is time to relook at the GST on sanitary napkins. Did it really benefit the consumers and the Indian manufacturers?” - Respondent 2.

Hence the GoI needs to re-evaluate the effect of GST on sanitary products. Placing sanitary products under tax exemption would only be fruitful if the production units are allowed to claim rebate on the input tax of 12 or 18%. Because, this in turn would help the production units further reduce the product price and benefit their target consumer. This change in policy could speed up the amount of work the NGOs, social entrepreneurs, MNCs and other actors have put in the MHM field to resolve the menstrual crisis.

8.1.2 Central action committee to ensure consensus in promotion of sanitary products.

From the research, it was identified that most target customers in the semi-urban and rural areas predominantly use sanitary pads among other sanitary products. These pads have different variations.

1. A commercial sanitary pad like Whisper or Stayfree pad has two plastic layers between which there is wood pulp, sap and glue holding it together. Ideally, this can be recycled (Respondent 2, 2019).

2. In a biodegradable pad, additives are added to the plastic, so it accelerates the breakdown of plastic. When sanitary products are claimed to be biodegradable, it does not mean materials are organic or sourced from nature, it just aids plastic breakdown. However, the plastic breaks down into monomers and there are chances of it entering your food chain. This results in health complications and are also not good for the environment (Jain, 2019). However, it is slightly better than non-recycled plastic waste.

3. PLA (Polylactic acid) products made basically from corn starch which are also sometimes called as compostable products. There are big challenges with it. It does not compost in a landfill, home based composting pit but only in a composting environment at a certain temperature and pressure conditions. Manufacturers claim it decomposes in 6 months however there are no studies to the claims (Jain, 2019). While decomposing, it produces methane gas which is a green-house gas. Hence, it is not environmentally friendly.

When the entire lifecycle analysis of these sanitary pads is considered, there are challenges with all the different types of sanitary pads. Categorically, no pad is 100% compostable or biodegradable because even if sap is not used in the pads, the glue used is not bio-degradable. Some brands do have a fully compostable certification because the government definition of fully compostable is at 80% (Respondent 2, 2019).

There has to be a consensus on what the GoI eventually decides. If the government decides to promote plastic pads, then there must be strong recycling infrastructure that needs to be established. Because poor recycling infrastructure has a possible impact on diffusion which is explained in section 8.1.4. If it doesn't look like a viable option, then all the sanitary products must be compostable products. This has consequences, because the entire supply chain is going to change. If a product starts degrading in 6 months, it cannot be in the shelf for more than 2 months. Hence, the whole cycle must be much faster like the food industry. This will lead to increase in cost of the pads because a lot of the sanitary pads will go to waste if it stays in the shelf for more than 2 months (Respondent 2, 2019). All these factors must be considered before promoting one product over another and it has to be uniform. Because, now when the market is observed, some social enterprises make compostable products while larger players still make commercial plastic-based products. If these products are together sent to recycling, the plastic pads will be recycled while the compostable cannot be. There needs to be an agreement on which among these options is the least environmentally damaging solution.

Also, another identified problem is that some state governments promote setting up of manufacturing units while there are other state governments giving away free pads like Odisha's Khushi Scheme, Andhra Pradesh's Raksha Scheme, Chhattisgarh's Suchita, Maharashtra's Asmita Scheme and Kerala's She Pad scheme (Mahajan & Muralidharan, 2019).

"If the Government of India promote setting-up of manufacturing units, how will the units sell if the state government gives away free pads? It is all uncoordinated." - (Respondent 2, 2019).

Conflicting policies between the state and the central government, and also within different state governments has negative influence on the usage of sanitary products because often women are expecting free sanitary products however most states do not implement such schemes. So, there is a lot of chaos or confusion in the MHM field. A central action committee needs to be set-up by the GoI to ensure there are no conflict in policies between the central and state governments. And, that

they arrive at a consensus to promote the same type of sanitary product so there is least burden on the resources utilised for the waste management infrastructure and the supply chain of MHM.

8.1.3 Revision in existing standards for sanitary products.

At present, sanitary pads need to adhere to BIS standards (IS 5405) set almost three decades back which is pretty basic. It states that pads need to have 30ml of absorption (Respondent 2, 2019). Other type of sanitary products like cups, reusable cloth pads etc., do not have existing standards in place. As a result, sanitary products are more widely available through different channels, but their quality varies greatly (Mahajan T. , 2019).

Poor quality products are available in the market which do not provide the kind of absorption, leakage protection and hygiene standards as promised even though in the case of pads they adhere to IS5405 (Mahajan T. , 2019). Such products although low-cost, most women find it uncomfortable to use it. *This poses a danger as women go back to using clothes and other materials. Thus, not using sanitary products again.* Thereby, this suggest that poor standards have an influence on diffusion. The BIS standards set for sanitary pads require revision. And, not all type of sanitary products can fall under the same set of standards. So, care needs to be taken by the government to establish different standards with different tests done for disposable plastic pads, compostable pads, re-usable cloth pads and the other type of products in the market. And, to make sure all manufacturers adhere to these standards so that the poor quality products can be eliminated.

8.1.4 Sanitary waste management

Sanitary waste management is the last phase of the MHM value chain. The government policy on sanitary waste management has a direct impact on how social enterprises look at both awareness and access phases. Sanitary pads can ideally be recycled. However, this is not done yet because people don't want to handle this waste (Respondent 2, 2019). So, incineration is being advocated by many state governments. Plastic pads contain chlorine. This combination of chlorine and plastic, emit highly cancer-causing gases with polychlorinated dibenzo-p-dioxins and dibenzofurans when burnt (World Health Organization, 2017). The WHO has presented a report about these gases that have a damaging effect on human life and the surrounding environment. Burning pads below 850 degrees is toxic leading to cancer among humans.

However, in the urgency of solving the disposal problem, many state governments have installed incinerators across the country out of which some of them don't even pass basic standards. In Pune, a city in India, as study showed that the Pune Municipal Corporation (PMC) has 12 incinerators for disposal of menstrual pad waste which did not meet any of the safety requirements recommended by WHO (Sathe, 2019). These incinerators operate at 350-450 degree celsius temperature which is way less than the suggested temperature of 850 degrees (Sathe, 2019). Thus, causing threat to the people in the locality. Long-term exposure to these emissions or resulting ash may adversely affect the immune, nervous, endocrine, and reproductive systems (Dargan, Selvaraj, & Singh, 2015). *This issue has raised questions regarding the usage of sanitary pads among women who become about these issues due to the different campaigns in place against the usage of incinerators* (WaterAid India, 2019). So, there needs to be a clear mandate from the government to ensure that all incinerators installed, need to burn at 850-degree Celsius or above.

8.1.5 Programming for menstrual health programs

At the moment, the three social enterprises that were studied, and the NGOs associated with them run their own awareness campaigns that ranges from a conversation to a comprehensive education

around the physiology of menstruation, hygienic practices, and restrictive social norms to the use of a particular type of menstrual hygiene product. Also, certain state governments run their own awareness programs and provide education for girls in schools regarding it (Mahajan & Muralidharan, 2019). Therefore, this shows that while some states in the country benefit from these programs, most other states don't. All these programs remain disparate with no basis to compare one program with one another. The GoI needs to establish a uniform comprehensive program for menstrual health across schools in India. This could be one of the major paths to break the existing social and cultural barriers in the country.

Even though the social enterprises and NGOs have made significant inroads in breaking these barriers, they need to work together more with the government. Then, the scale of impact could be much higher, reaching a much-wider target group. Mass media remains a major channel that could possibly aid diffusion of any innovation (Rogers, 2003). At present, none of these social enterprises use mass media because it is resource intensive. If the government run television channels worked with these enterprises to run short awareness programs and advertisements, this could aid further diffusion of low-cost sanitary products.

8.2 Recommendations for the small-scale production units.

During the course of research, from the three cases, it was identified that there was no clear consensus in promotion of sanitary products. As mentioned in the discussion chapter, all three small-scale production units made different type of sanitary pads with limited sizes and colours and each wanted their own sanitary pad to be promoted by the government in the semi-urban and rural areas of the country. This has consequences which is explained below in the following subsection. Also, these production units have their own channels to reach their target consumers aided with their awareness programs. Hence, three recommendations are made to address the following critical factors:

Table 21: Critical factors and their corresponding recommendations

S. No.	Recommendations	Critical factors
1.	Environment friendly sanitary products with more size and colour variations	Relative advantage
2.	Improve accessibility of sanitary products	Promotion platforms, intermediaries, network & personal ties
3.	Better collaboration to run awareness programs	Complementary product & services

These recommendations are further explained in detail below.

8.2.1 Develop environment friendly sanitary products with more size and colour variations

The social enterprises need to develop sanitary products that have more range of sizes and colours. Women who have heavy flow during the monthly periods prefer to use clothes and other means and not use the sanitary pads because of the limited variations in size which is not ideal. And, also white coloured pads showcase the stains. Women have inhibitions disposing these used pads due to the cultural stigmas. Hence, more size variations and different coloured pads might improve diffusion. There are also challenges associated with all the different types of sanitary products that social enterprises make like pricing, reusability, disposability to name a few. Also, the different types of product require different infrastructure for them to be disposed or recycled. This infrastructure is however missing in rural and semi-urban areas of India. The most commonly used sanitary product is the disposable plastic pads. However, from further research on sanitary waste management, it was found that there is no proper infrastructure in place across the country to dispose these pads. The currently available system causes more harm to human health because of the toxic gas emissions (Sathe, 2019). Therefore, women start questioning the use of sanitary products thereby hampering the sanitary product sales (WaterAid India, 2019). Another, challenge is that both consumers and social entrepreneurs in the MHM field perceive green sanitary products to be more expensive than plastic pads. This is not necessarily the case. Both, cases 2 and 3 have managed to make sanitary pads that are either compostable or bio-degradable for prices that are cheaper than an average plastic pad. Hence, the social enterprises running the small-scale production units need to make the choice to develop hygienic, safe sanitary products that have also the least environmental impact.

8.2.2 To improve the accessibility of the sanitary products

From research, it was identified that in the urban and the semi-urban market, the social enterprises have made the choice to be available through e-commerce platforms. However, they need to be available through more offline channels like medical stores, grocery stores etc., where typically the more expensive commercial sanitary products are sold and also informally build networks so that more people in these areas have access to these low-cost products.

In the rural areas, these low-cost sanitary products are available via awareness programs and the door to door distribution network present in a community. However, these networks are limited to that particular community. So, the social enterprises need to ensure ways to broaden the network so that more women can benefit from these products.

8.2.3 To collaborate with other actors to build and run awareness programs

At the moment, designing and implementing awareness campaigns that focuses on education related to menstruation, menstrual hygiene, and the choice of available sanitary products are done by the social enterprises themselves. They at times also work with other NGOs and experts in the field of MHM that they know. In the same way, certain state governments also run their own awareness programs (Banka, 2019). Hence, the impact is limited to the areas of the country where they are present (Banka, 2019). Also, from the cases, it was observed that considerable amount of time and resources are spent by the enterprises and other actors to develop tools and materials to run their own awareness programs.

Therefore, the recommendation to increase collaboration within social enterprises and other actors is to build an open-source platform that will enable actors in the field of MHM to learn from each other and make the best use of existing resources instead of re-inventing the wheel. This will save the time and resources spent by these actors to develop their own awareness programs and also ensure that uniform programs are run to spread the right information to communities. Also, by collaborating with the Government of India and other actors, social enterprises could reach a much wider target community than they normally would. Thereby, benefitting more women across the country. This seems like an important step to take towards addressing this social problem and help improve the low-cost sanitary products' diffusion among women in the country.

9. CONCLUSION & REFLECTIONS

9.1 Conclusion

In conclusion, all the observations, findings and recommendations are put together to answer the research questions posed at the start of the research. As introduced during the initial phase, the research questions are answered from the perspective of the problem owner that face challenges with the diffusion of low-cost sanitary products: the social enterprises that run small-scale production units in India. These social enterprises are focused on solving issues related to affordability, access and awareness of menstrual hygiene.

Sub question 1: *What factors influencing diffusion in both conventional and social innovation theories can help establish a framework that will allow in understanding the social innovation process of manufacturing and selling low-cost sanitary products made by the small-scale production units in India?*

To understand the diffusion of social innovation, existing literature in the field of different conventional innovation models and social innovation was studied. A conceptual framework was built combining the factors from the social innovation model by Pue et al. (2015) and the missing factors from Rogers (2003) theory of Diffusion of Innovation, the pattern of development and diffusion of breakthrough technologies by Ortt & Schoormans (2004) and Strategic Niche Management (SNM) by Geels (2002). From the literature study, what happens during the diffusion of a social innovation process was understood and enough insight from all these different innovation theories was gathered to make the formulation of factors possible. It resulted in establishing six components of the SI process to the conceptual framework namely: the social entrepreneur, the socially creative strategy, technological design of SI, the SI diffusion cycle, social ecosystem and the SI channel. The conceptual framework consisting of the factors is tabulated below:

Table 22: Factors from the conceptual framework

Social Entrepreneur	Socially Creative Strategy	Technological Design of SI	SI Diffusion Cycle	Social Ecosystem	SI Channel
Individual faculties	Target community	Relative advantage	Type of institutionalization	Social problem	Mass media
Motivation	Type of socially creative strategy	Compatability	Type of business model	Social structure	Network & Personal ties
Values		Complexity		Cultural and psychological factors	Promotion platforms
		Observability		Political factors	Intermediaries
		Trialability		Macro-economic factors	
		Actor types		Identity & role based groupings	
		Production system		Sequencing	
		Capital - Natural, Human and Financial		Complementary products and services	
		Uncertainties & Risks			

Sub question 2: To what extent can the factors from the established framework be observed in the social innovation process of manufacturing and selling low-cost sanitary products by the small-scale production units in India?

The SI process was described in detail in chapter 6 using a qualitative case study approach involving three small-scale production units making low-cost sanitary products in India. The three cases were used in the research. These cases were identified based on the recommendations of MHAI and Sukhibhava. From the extensive case studies that observed the SI process of making and selling the low-cost sanitary products using the conceptual framework, the following three factors - uncertainties & risks, identity and role-based groupings and mass media were not identified in the case study research. However, a conclusion cannot be made stating that these factors are not relevant to the SI process of making and selling the low-cost sanitary products. While, all other factors from the framework were identified.

Sub question 3: What are the salient factors that influence the diffusion of low-cost sanitary products made by small-scale production units among women in India?

Based on all the factors studied from the conceptual framework, eight factors were identified that influenced the diffusion of low-cost sanitary products among women in India. The factors are briefly described below.

Table 23: List of salient factors

Factors	Explanation
Relative Advantage	Rogers (2003) defines relative advantage as the degree to which an innovation is considered to be better than the idea it replaces. In the case of MHM in India, the research identified ‘product features’ and ‘low pricing’ as key components of relative advantage. While low pricing with good features such as comfort, good absorbency, light weight, thin and disposability helped achieve more sales. It was also found that only white coloured pads with limited sizes hindered the sales of the sanitary products. Because, it was found during research that women often required larger pads with greater absorption to handle heavy flow. Also, the white coloured pads showcased the stains which caused shame in women due to the existing cultural stigmas. Therefore, it resulted in women not buying these products. All of this suggests that relative advantage is an important factor that influences diffusion.
Social structure	According to Pue et al (2015), social structure describes how social life is affected by the constellation of norms in a society. It is a pattern of social interactions that can be identified at a given moment. They either enable or constrain actors. With MHM in India, the three social enterprises observe different social taboos and fear of pollution associated with menstruation. These taboos on menstruation and fear are connected with the caste system (Brockington, 1981). The taboos present in the social structure appears to stop them from talking about periods and healthy menstrual practices. This suggests that the social structure remains a major hindrance towards more women coming forward to buy the sanitary products, influencing the diffusion of good menstrual products.

Cultural & psychological factors	In the cases, it was observed that women are familiar with a certain custom like using cloth, etc., in their families during periods so they don't shift to a sanitary product. In rural areas, when the girls start with their periods, they are not the decision makers. This coupled with the fact that her mother is ignorant too, results in a poor choice of using clothes, papers or other means. Therefore they are also reluctant to make that switch to sanitary products. All these factors stop women from using sanitary products therefore influencing the diffusion of these sanitary products.
Political factors	Four political factors are identified that pose challenges to the sales of the sanitary products, thereby influencing diffusion. First, is the GST exemption on sanitary products. Second, is the lack of consensus in the promotion of sanitary products. While some state governments promote setting up of manufacturing units there are other state governments giving away free pads, resulting in poor sales. Third, is the improper infrastructure for the disposal of sanitary waste. Currently available incinerators emit toxic fumes. It is observed that often women get to know about these consequences and are reluctant to use sanitary products. And finally, there is the absence of new quality standards. Products that barely satisfy these existing standards are either uncomfortable or do not have enough absorbency as women expect of it. Thus causing women to drop out from using sanitary products.
Complementary product & services	Complementary products and services are required during the entire process of SI for the design, production, distribution, adoption, use, maintenance & disposal of a socially creative strategy. (Ortt & Schoormans, 2004). In the case of these social enterprises, they realized eventually that they needed to design and run awareness and behavioral change programs to help tackle the social, cultural and psychological barriers. They aim to provide the right information to their consumers by educating woman about menstrual hygiene and the consequences of not following hygienic practices. This has an influence on the diffusion of sanitary products among woman in their target community.
Network & interpersonal ties	According to Pue et al. (2015), the social ecosystem is made of an intricate web of individuals networking in a certain social space. In the case of three social enterprises studied, strong networks are established in communities where they run their awareness programs. Most women start buying sanitary products because of the positive word of mouth. Also, the network is further strengthened as these enterprises employ distribution channels through women who deliver sanitary products at the door step thereby eliminating the need for consumers to go to shops to buy the products. These strong networks influence the diffusion of sanitary products.
Promotion platforms	Promotion platforms to used by the social enterprises to influence diffusion of their products. Platforms they typically use are: attending conferences, through social media, e-commerce platforms websites, telephone, etc., These enterprises also work with other NGOs to run campaigns that help spread the use of sanitary products.
Intermediaries	Intermediaries are a group of actors who are mobilized when the target community is large and diffuse. The social enterprises depute one-woman intermediaries that do door-to-door distribution of these sanitary pads. At times, the social enterprises also employ other NGOs as intermediaries to help sell their products during their own awareness campaigns. Therefore,

	intermediaries seem to have an influence on the diffusion of a socially creative strategy.
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Sub question 4: *What recommendations based on the identified salient factors could be given to the small-scale production units and the other stakeholders involved that could facilitate further diffusion of low-cost sanitary products among woman in India?*

While the social enterprises running small scale production units have made notable foray, changes in policy and social entrepreneur's strategy could further drive diffusion of low-cost sanitary products among women in India. Thereby, solving issues related to accessibility, affordability and awareness related to menstrual hygiene. Based on the findings, it led to five policy recommendations and three recommendations to the small-scale production units.

The policy recommendations are summarized in five short points below:

1. The GoI needs to re-evaluate the effect of GST on sanitary products. Subjecting sanitary napkins to GST, at zero rate would only be fruitful if the production units are allowed to claim rebate on the input tax. Because, this in turn would help the production units further reduce the product price and thereby improving the diffusion of these low-cost sanitary products.
2. A central action committee needs to be set-up to ensure there are no conflict in policies between the central and state governments. And, that they arrive at a consensus to promote the same type of sanitary product. At present, sanitary pads need to adhere to BIS standards set almost three decades back. Other type of sanitary products like cups, reusable cloth pads etc., do not have existing standards in place.
3. The government needs to establish different standards with different tests done for different type of products in the market. This will eliminate poor quality sanitary products.
4. A clear mandate needs to be set by the government to ensure that all incinerators installed, meet necessary standards and burn at 850-degree Celsius or above. to establish a uniform comprehensive program for menstrual health across schools in India.
5. At present, none of these social enterprises use mass media because it is resource intensive. If they worked with the government run television channels to run short awareness programs and advertisements, this could aid further diffusion of low-cost sanitary products.

The summarized recommendations to the small-scale production units are:

1. Develop environment friendly sanitary products with more size and colour variations. This will help women be assured of the choice they make, to start using sanitary products to handle menstruation.
2. Improve the accessibility of the sanitary products both in the urban and rural markets by devising more ways to broaden the network so that more women can benefit from these products.

- Collaborate with other actors in the field of MHM to build an open-source platform with all required resources needed that will aid in designing and running uniform comprehensive awareness campaigns. This could result in reaching a much wider target community. Thereby, aiding diffusion as it benefits more women across the country.

Main research question: *How can the low-cost sanitary products made and sold by the small-scale production units be understood as a social innovation process and what are the salient factors that influence its diffusion among woman in India?"*

The research started with the objective of trying to understand why such low diffusion levels of low-cost menstrual products among woman in India exists. While further researching, it was found that there was inadequate academic literature to study the social innovation process except for the SI framework that was put forward by Pue et al (2015) . However, the framework was not operationalized. Hence, a conceptual framework was built that was based on the SI framework by Pue et al (2015) with missing factors identified from the three conventional innovation models that were studied as part of the literature work.

Table 24: Factors in the SI process of making and selling low-cost sanitary products in India

Social Entrepreneur	Socially Creative Strategy	Technological Design of SI	SI Diffusion Cycle	Social Ecosystem	SI Channel
Individual faculties	Target community	Relative advantage	Type of institutionalization	Social problem	Mass media
Motivation	Type of socially creative strategy	Compatability	Type of business model	Social structure	Network & Personal ties
Values		Complexity		Cultural and psychological factors	Promotion platforms
		Observability		Political factors	Intermediaries
		Trialability		Macro-economic factors	
		Actor types		Identity & role based groupings	
		Production system		Sequencing	
		Capital - Natural, Human and Financial		Complementary products and services	
		Uncertainties & Risks			

Out of the 28 factors presented in the conceptual framework, 25 factors were identified in the case studies of three social enterprises. The three factors that couldn't be identified, its influence on the SI process of making and selling sanitary products cannot be concluded based on these cases. The conceptual framework is illustrated in the table above. Using the conceptual framework, the SI process of making and selling the low-cost sanitary products by small-scale production units in India explained in detail as factors in the first part of chapter 7.

All three social enterprises are at the diffusion phase however they exhibited low diffusion rates. It was observed that either women simply do not want to use sanitary products or they come forward to try the sanitary product for the first time but they're reluctant to buy it again. The three social enterprises attempted to tackle two factors: *social structures, cultural & psychological*

barriers that they identified which prevented women from buying their low-cost sanitary products with good features (*relative advantage*). They design and run awareness programs (*complementary product & services*) that educate women by providing the right information. These awareness programs are often run by the social enterprises themselves and sometimes with the help of other NGOs in communities where their production units are located. However, no collaborations with other social entrepreneurs and the Government was observed and these awareness campaigns turned out to be resource intensive affair. It was also observed that, one-woman *intermediaries* help as well by talking about these issues and selling the sanitary products at the target consumer's doorstep. They end up establishing a strong *network* within the community. *Promotion platforms* such as providing information pamphlets created a positive word of mouth and provide consumers with the right information to help address the social structure, cultural and psychological barriers. The awareness programs and the three SI channels improved the sales of the sanitary products considerably and more women came forward to buying it.

Also, four political factors namely: quality standards, GST exemption, lack of consensus in promotion and sanitary waste management along with two other factors namely macro-economic factors and relative advantage: limited size and colour also influenced the diffusion of the sanitary products.

Further, *high complexity, low compatibility, trialability and observability* which was observed diffusion during the course of research that had a negative impact on sales also improved over time due to these awareness programs and the three SI channels, therefore suggesting there are interdependencies between the factors. Among all these factors, only 8 factors had a major impact on the diffusion of low-cost sanitary products among women in India. They are: **Relative Advantage, Social structure, Cultural & psychological factors, Complementary product & services, Political Factors, Network & interpersonal ties, Promotion platforms and Intermediaries**. These factors are defined in the section above and explained in detail in second part of chapter 7. Using these identified salient factors, recommendations (explained in detail in chapter 8) were both provided to the Government of India and to the small-scale production units on the necessary changes that they could make to aid further diffusion of these low-cost sanitary products among women in India.

9.2 Reflections

9.2.1 Reflections on the conceptual framework

The research started with trying to understand the SI process of making low-cost sanitary products and why low levels of diffusion existed in the field of MHM. However, it was identified that no comprehensive theories are available yet to explain the phenomenon of SI. So, there is still no consensus on what social innovation is and isn't.

However, Pue et al. (2015) came up with a framework towards a theory of social innovation. However, the framework does have some lingering issues which are discussed in detail in the last part of chapter 2. The framework talks about the socially creative strategy and the target community it focuses on. However, the framework does not mention about the characteristics of the socially creative strategy. The framework also doesn't give much insight about the communication channels in the process of social innovation that is required to help drive the socially creative strategy forward. Finally, the framework by Pue et al is conceptual and lacks information on how to empirically research social innovation. Therefore, it requires an approach that allows the concepts identified by Pue et al to be empirically described. Doing so, would provide the material that allows the substantiation of the key concepts.

Therefore, a conceptual framework was built with six components: social entrepreneur, socially creative strategy, technological design of SI, SI channels, SI diffusion cycle and social ecosystem. While, the social entrepreneur, the socially creative strategy, SI diffusion cycle and the social ecosystem were primarily extracted from the SI framework, the components - technological design of SI and SI channels are identified from the conventional innovation models particularly from Rogers (2003) theory of Diffusion of Innovation, the pattern of development and diffusion of breakthrough technologies by Ortt & Schoormans (2004) and Strategic Niche Management (SNM) by Geels (2002). These two components are added to the framework because Pue et al (2015)'s model like mentioned earlier does not describe the characteristics of the socially creative strategy and the information regarding communication channels that are required to drive the socially creative strategy forward is not sufficient.

The conceptual framework relates to bringing different frameworks together, both conventional innovation models as well as a social innovation model. However, there are a number of key differences to these two types of innovation models. Literature identifies the capitalist system as the 'engine' of conventional innovation. The structure of the market system drives decisions by the firms, which lead to innovation (Baumol, 2002). Therefore, according to the 'evolutionary' logic of economics, conventional innovation is driven by competition (Baumol, 2002). However, social innovation is innovation that "is induced by some kind of social need and is aimed at solving a critical social problem" and not driven by competition. And due to the social nature of the outcome, the processes, metrics, models and methods used in conventional innovation are not always transferrable outside of it.

Since the missing factors in Pue et al.'s framework is identified from conventional innovation models namely theory of Diffusion of Innovation, the pattern of development and diffusion of breakthrough technologies and SNM and combined it with Pue et al.'s existing framework. This has resulted in overlaps in the components. These overlaps are explained in detail, in section 3.1 of the thesis.

And, also four factors namely - target community, identity & role-based groupings, sequencing and actor types' relationship with diffusion is not known from the literature studied. Suggesting that there are gaps in the studied literature about it.

In this thesis, no attempts are made to address these overlaps and gaps to the framework. Because the framework in its current state is sufficient to study the SI process even with these inconsistencies. Like mentioned earlier, the goal of this research work is not to develop a comprehensive theory, but to use the framework to understand the SI process of making and selling low-cost sanitary products by small scale production units in India and identify the salient factors affecting its diffusion.

9.2.2 Reflections on the case studies

Using the conceptual framework, the problem was looked from the angle of the social enterprises who are the problem owners according to the framework as explained in section 4.2 of the thesis. After the cases were selected, two shortcomings were identified:

- i. Only the CEOs/Founders agreed to take part in the interviews except for case 2 where the Head of Research & Partnerships joined the interview as well.
- ii. All three cases exhibited low diffusion rates when researched empirically. It was observed that these enterprises did not yet have a sustainable business as they heavily relied on grants.

With respect to the first shortcoming, it was mainly due to the fact that they could not afford to let other employees be interviewed, as all three enterprises had a small team of full-time members that were already busy with their commitments. Interviewing these employees could have provided a different view from that of the CEOs. During the interviews with CEOs/Founders, there was also a possibility to obtain socially desired answers in all three cases. However, the empirical data obtained from the existing literature on the SI process which is described in chapter 5 that was obtained from the NGO - Sukhibhava and MHAI. This data already pointed towards certain challenges faced with respect to the diffusion of low-cost sanitary products. Therefore, this empirical data set the precedent for the interviews. So, a provocative approach was used during the interviews, in case the social entrepreneurs do not mention the factors identified from the documents. These factors are touched upon to check whether or not they had an influence on diffusion. Also, the literature is used to crosscheck and confirm the data obtained from interviews. Therefore, negating any bias.

With the second shortcoming, all three cases turned out to exhibit low rates of diffusion. In fact, it was not possible to identify cases that successfully exhibited high levels of diffusion in literature in the field of MHM in India. If there was a case or two that exhibited high diffusion rates. These cases could have been compared with the cases exhibiting low diffusion rates to understand what could have been done differently to help improve diffusion. However, in this research a comparison of that sort could not be made.

Also, all three social enterprises clearly focused on women from the rural and semi-urban areas of India where the menstrual crisis is predominantly prevalent, they also acknowledged that the problem exists in the urban areas as well. Therefore, two of these three social enterprises were already serving the urban consumers as well while case 3 was still devising strategies to enter the urban market during the time of research. However, no distinction was made between older women

and adolescent girls. This was because the social enterprises were struggling to make that distinction. Hence, this research does not make that distinction among women as well, as this social problem is quite spread and cannot be made distinct towards a particular age-group of women.

9.2.3 Reflections on the empirical findings

i. Reliability

Reliability of the research undertaken was made sure by conducting the interviews via Skype, where both the interviewee and interviewer had the option to download the video transcripts. The copy of the written transcripts was shared with the interviewees to make sure they agreed to everything that they said. All the transcripts and additional secondary data which are supposed to be confidential were stored offline in well-protected disks. Only relevant data that is required for the purpose of research is then coded using the Atlas.ti 8 software.

However, all the data was coded by only the researcher. This meant that the research is not assured of inter-rater reliability. Different coders coding the same data gives the freedom to analyse the data independently and then compare it (McLeod, 2007). If the coded data is similar, then it is reliable and there is no bias. Because of the time limitations, working on the coding process with atleast two different coders was not possible. So, the data was coded primarily only by the researcher due to the time restrictions. However, during the coding process, reflective notes was gathered describing the coding process in detail. These notes were gone through by an official from MHAI and discussed in detail, to check if the description of codes and the method of coding was right. Therefore, counterbalancing the limitation of being coded by only one researcher.

ii. Validity

To make sure of the validity of the findings in this research work, literal replication case studies method is used. This means that the cases selected are identical and therefore, the predicted results are identical too. This enhances external validity of this research. However, the findings from this research are generalisable only to a limited extent, i.e. the framework that is developed can be used well to study the diffusion of low-cost sanitary products in the MHM field in India and to study social innovations in the MHM field in other developing/under-developed countries as well provided that the socio-economic conditions and characteristics of the innovation are similar.

Another method used in the research to ensure validity is to employ different sources like interviews, research documents, blogs, news articles to obtain data. Thereby, limiting bias and putting forward well-grounded prepositions. This method is called Triangulation. This method assures the research of construct validity. Construct validity describes how close the inferences from the case studies reasonably are, when compared to theoretical concepts in the framework (Trochim, 2006).

9.3 Future Research

Mintzberg (2019) states that, “*Social sciences has its central concept - power in political science, culture in anthropology, and markets in economics. Considered together, in balance, they open perspectives. Alone, they can become a dogma.*” So, during the course of research, the market for sanitary products was observed by analysing the business models of the social enterprises, existing GoI policies on MHM was studied giving rise to policy recommendations and the current behaviour of women was observed with the help of testimonials that the social enterprises had collected and having conversations with few users of their products. However, what could be interesting as future research work, is to conduct a baseline survey along with these different social enterprises and NGOs to assess the impact that these low-cost sanitary products have in women who use sanitary products for the first time and further understand whether there have been behavioural changes after they’ve started using these products.

During the process of conducting the case study research, the limited conversations with some women revealed that men are still the decision makers in most families, so there might need to be a different approach in devising these awareness campaigns and education programs that are usually focused on women. However, what was identified during those conversations was beyond the scope of this research. So, future research work could focus on assessing the impact that these sanitary products and awareness programs have on women, their behaviour and their families. Also, the current work which was qualitative in nature, showcased which factors had an influence in the diffusion of low-cost sanitary products among women in India and identified the salient factors in the SI process. Future work needs to examine through a quantitative approach, the weightage of these factors and whether these factors positively or negatively influenced diffusion. This will help in understanding the importance of these factors, so that steps can be taken to address them based on their relevance.

Further, this research could benefit from additional insights that can be gathered on the diffusion of these low-cost sanitary products from other actors in this SI process as well namely the Ministry of Health & Family welfare, GoI. Data from the Ministry officials could not be obtained due to the official’s unavailability to partake in interviews or written correspondence within the research time frame.

Also, as mentioned earlier the conceptual framework used in this research brought about methodological challenges. However, what could be helpful for further research in the diffusion of SI, is to address the inconsistencies in the framework, by finding an alternative approach that overcomes these overlaps and identify the four factors namely - target community, identity & role-based groupings, sequencing and actor types’ relationship with diffusion by studying different models and theories in other fields, and thereby validate the framework. This will encourage both practitioners and researchers to use the framework as a blueprint for the SI process.

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APPENDIX

The content in the appendix is withheld due to its sensitive information. For any information required, the author can be contacted.