Value Creation in post consumer apparel waste: a study of urban-rural dynamics in India

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‘Roti Kapada aur Makaan’ or ‘Food, clothing and shelter’ may have been coined keeping the basic needs of the human being and considerations which are existential, in mind; but over time, a multitude of factors have brought in elements of design and fashion into our lives and have impacted our demand for products that were otherwise treated as basic needs. The impact of globalization and growing access to information coupled with the rapid growth in Indian economy has greatly accelerated discretionary expenditure amongst the growing Indian middle class. The manifestation of this is seen in the increased per capita consumption and the amount of waste being generated.

The concepts of recycling, together with reduce & reuse have been ingrained in the social milieu of India. Traditional societies had in-built models of sustainability, through reuse & recycling. Such practices were ingrained into various aspects of their daily lives to such an extent that over time they had got interwoven into the social, cultural as well as economic fabric of their lives and eventually had evolved into art forms reflecting on handicrafts. Production and consumption remained in harmony with each other and remained largely need driven. However the industrialized society encouraged large scale production that also created mindless consumption. If all countries in the world successfully followed the industrial example, five or six planets would be needed to serve as mines and waste dumps (Sachs, W. 1992).

Today, it may be impossible to roll back the development brought about by industrialization. Urbanization and industrialization have together, encouraged mindless consumption and large scale production thereby upsetting the rural economy. Perhaps the future lies in models of sustainability that can address the imbalances created in the rural economy by industrialization and urbanization. Any such model will have to be built around the concept
of social responsibility, i.e. the model will not have to just address the waste management aspect, but will necessarily have to address the socio-economic aspects of the communities.

Recycling textiles is a process that affects many entities. It avoids the punitive costs of landfill, provides employment, helps charity, and moves clothing to areas of the world where it is needed (Hawley, J. 2006). Textile and Apparel waste can be clearly classified as post industrial and post consumer waste together providing a vast potential for recovery and quality recycling.

Case study approach has been used to study identified regions of India where small clusters are involved in utilizing post-consumer apparel waste to create useful products.

**Textile & fashion consumption**

The textile and fashion consumption in the world has been consistently increasing over the years. According to the World Apparel Fiber Consumption Survey 2005-2008 by Food And Agriculture Organization of the United Nations and International Cotton Advisory Committee, “Encompassing an annual average growth of the world gross domestic product (GDP) of 4.2% during 2000 - 2007, per capita world fiber consumption increased by nearly 35%, from 8.3 kilograms in 2000 to 11.1 kilograms in 2007. However, the economic stagnation in developed countries in 2008 resulted in a reduced rate of GDP growth for the world (3%), and a 6.4% contraction in per capita world fiber consumption, to 10.4 kilograms” (Food and Agricultural Organization, UN, 2011).

According to “The Fiber Year 2011”, the annual report of the Dutch manmade fibre manufacturer Akzo that provides a comprehensive survey on world textile industries, “The world textile industry in 2010 has experienced the most potent growth in twenty-five years. Manufacturing volumes of natural and manmade fibers rocketed upwards by 8.6%, or 6.4 million tonnes, at 80.8 million tonnes. This corresponds to an average per capita consumption of 11.8 kg” (The Fiber Year 2011).

The 'National Household Survey 2008 released by The Textiles Committee, Ministry of Textiles, reveals that Indians purchase 22.41 meters of textiles in a year. While the demand for sarees² continued unabated, the dhoti³ market has reduced by 8.59%, selling 11.7 crore pieces. Interestingly, jeans are bought more in the rural areas. (21.99 metres in 2008 as per
The issue of consumption and concomitant discard has been further accentuated by the societal behavior. With the availability of resources and the dynamics of consumption, the consciousness to utilize the goods to its full potential is reducing and economic growth came to depend on continued marketing of new products and disposal of old ones that are thrown away simply because stylistic norms promote their obsolescence (Claudio, 2007).

Globalization has made it possible to produce clothing at increasingly lower prices, prices so low that many consumers consider this clothing to be disposable (Claudio, 2007), some call it ‘fast fashion’, the clothing equivalent of fast food. Development of technology has enabled the industry to produce a plethora of products resulting in the depletion of natural resources and indiscriminate disposal habits (Gupta, 1995).

Consumers react to changes in fashion, both in clothing and household interior designs. Seasonal changes in fashion mean that clothes can become outdated very quickly, and this encourages the replacement and disposal of outdated, yet good quality garments (Katkar & Bairgadar, 2010). This results in issues of over consumption and disposal of unused clothes leading to burdening of the resources throughout the world (Hawley, 2008). This presents a double-edged sword, in that while at the same time it stimulates the economy, it also gives rise to the increased problem of apparel and textile disposal. Piles of unfashionable, unsuitable clothing, not yet worn out but no longer wearable are further wasted (Joseph, 2001).

The Policy document, “Indian Textiles & Clothing Industry: 2015” released by FICCI in Jan 2010 estimates India’s per capita consumption of fiber at 5-6 kg against a global average consumption of fiber at 10.8 kg. The industry body suggests the need to increase the per capita consumption and also improve the mix of Natural Fiber to Man-made Fiber from 40:60 to 60:40 in line with the global trends. As economic growth increases, the consumption is bound to increase. In 2009, US consumption of Fiber stood at 38 kg. There is a need to adopt policies which balance the growth imperatives aimed at improving the quality of life of
individuals and at the same time incorporate the learnings from the mindless consumption levels in the developed economies. (Indian Textiles & Clothing Industry: 2015, 2010)

As per a WWF Report, on an average to grow 1 kg of cotton lint, 8506 liters of water (irrigation and rainfall) are needed, with a range from 4710 lt/kg used in China to 20,217 lt/kg used in India. The textile industry is estimated to use 378 billion liters of water annually, using up to 200 liters of water to process, dye and finish each kilo of textiles (WWF Report, 2009).

Unless, we in India take this learning and adopt policies that promote the 4Rs early, we will have greater challenges to face than the developed world considering that while India accounts for a meager 2.4% of the world area, it accounts for 17.5% of the world population, while USA accounts for three times more area and approx one-fourth of India’s population (Provisional Population Totals, Census 2011).

*Post-Industrial and Post-Consumer textile waste generation and disposal*

Pre-consumer or Post-industrial textile waste consists of by-product materials from the textile, fiber, and cotton industries that are re-manufactured for the automotive, aeronautical, home building, furniture and other industries. Post-consumer waste is defined as any type of garment or household article made from manufactured textiles that the owner no longer needs and decides to discard (Hawley, 2008). These items are sometimes given to charities but often are put in trash and end in landfills (Textile Recycling Fact Sheet).

Together, the Post-industrial and Post-consumer textile waste provide a tremendous opportunity for recycling. Post-consumer textile waste is a largely untapped commodity with strong reuse and recycling potential (Domina & Koch, 1993). Approximately 4% of solid waste is primarily textiles (Council of Textile Recycling) and 90% of used textiles can be recycled (Hawley, 2006 b).

Post-industrial waste is easy to recycle due to the condition, ease in collection and many other factors. Willow waste, cut selvedge, apparel industry waste, low grade clothing waste, or tailoring waste are being recycled by the industries themselves or are being sold for recycling by other industries. Lot of research in the area has been done and a number of players are involved in the textile recycling industry around the globe.
Recycling of Post-consumer textile waste has complexities involved. In Germany only 50\% of the discarded clothes are collected and that of this fraction only half can be reused due to their condition or contaminations. The mixed collection hinders recycling rather than promoting it, since it is not possible to generate high purities of single fiber types which is necessary for a quality recycling (Seuring, 2003).

No accurate figures are available for the total quantity of Post-consumer textiles being discarded. It is estimated that all textiles entering the waste stream make up around 2-4\% of the MSW (Morley et al, 2006 a). Textiles make up 4\% of annual contributions to Canadian landfills (Flower, 2009) and 3\% of Indian Municipal Waste Composition (Pearce & Turner, 1994), 4.6 \% of MSW generation in 2006 in USA (US Environmental Protection Agency, 2007).

It is not known the degree to which consumers stockpile used clothes, but it is perceived that this is a significant factor in the mass balance equation for textiles as a whole. (Morley et al, 2006 a) As per a 2006 report by Oakdene Hollins for Recycling of Low Grade Clothing Waste in USA, 21\% of annual clothing purchase stay at home, adding to the ‘national wardrobe’ (Morley et al, 2006 b). Very little or no statistics is available on how much people purchase and add to the stock in India.

In one of the early documentation on textile recycling, Polk (1992) while discussing the issue of textile recycling in New York City and US, as a whole, has estimated textile material recycling to be about 13.6\% of the total textile discard/waste and has highlighted the need for pre-sorting and inadequacy of systems for segregated textile waste collection.

Domina & Koch (1993) explored consumer practices regarding textile waste disposal and findings revealed the use of several textile disposal waste options with significant relationships between options used and attitudes towards recycling. In another study, findings reveal that there is a contradiction between the public reaction towards products with recycled content and their awareness of environmental issues (Nakano, 2007).

A survey by Goodwill Industries, one of the largest textile collectors, found that half of the people making donations prefer door-to-door pickup, and more than half would not go more than 10 minutes out of their way to make a drop off. Textiles typically are not sorted at the
point of collection, but keeping them clean and free from moisture is important. Once clothes get wet, stained, or mildewed, they cannot be sold for reuse (US Environmental Protection Agency, 2010).

Post-consumer textiles are often resold by primary consumer to other consumers at lower price, exporting in bulk for sale in other countries or recycling back to raw material for manufacture of apparel and non apparel products (Claudio, 2007) or given away in charity but in India options available include handing on treasured pieces to family members, recycling within the home, giving to servants, bartering them for new stainless steel pots or burning them for their silver and gold content (Norris, 2004). In many countries on the African continent, over 80% of the population dress themselves in second-hand clothing. Western clothing is very popular and second-hand clothing is often of better quality than the new clothes offered (Ouvertes Project, 2005).

N.G.O.’s like Goonj, India also collect post-consumer textiles to recycle and provide clothes, sanitary napkins and many other basic amenities to people living in villages in different parts of the country depending on the need of the community.

Till date, textile wastes have barely featured in waste disposal authority waste management strategies. Clothing is second only to aluminum in terms of the CO$_2$ benefit from collecting it for recycling compared to landfill disposal. If nothing is done, the existing market will continue to operate but is likely to slowly reduce the availability of collection systems designed for reusable clothing (Morley et al, 2006 a).

Lack of awareness about the usefulness of textile recycling can be said to be the greatest barrier for this issue. In order to overcome these barriers: Consumer education is vital – to ensure that fact based information on the specific impacts of a product are available and understood. Increased emphasis on durability as a component of fashion would support a move (Allwood et al, 2006).

**Urban Rural dynamics in Indian Context**

Majority of India’s population still resides in rural areas. According to Census 2001, 72.2 percent of India’s population lives in rural areas. There has been a steady migration of rural
population to urban areas, as is evident from the steady decline of rural population from 89.2 percent in 1901 Census to 72.2 percent in 2001 Census (India 2009).

“….about 70 percent still lives in rural areas and major cities are already showing signs of ‘over-exhaustion’. In the coming decades, rural to urban migration is likely to become much more serious even in small cities. While migration is seen as a livelihood diversification strategy, it is also important to be seen as an economically and environmentally destabilizing process” (Baig & Baig, 2008)

Relevance of studying the urban-rural dynamics in the recycling industry in the identified region is also seen in a study by Purushothaman, Bandopadhyay & Roy where they suggested "Our studies show that a 10% increase in urban expenditure is associated with a 4.8% increase in rural non-farm employment. As supply chains strengthen across the country, growing urban demand could provide a significant boost to the rural economy" (Anonymous 2007). The real opportunity lies in moving the development paradigm away from treating rural and urban as separate issues, and in harnessing the powerful forces of localization and urbanization for rural prosperity (Ramesh 2005)

The impact of migration from rural areas to urban areas and their importance to be seen as an economically and environmentally destabilizing process in the future has been discussed by Baig & Baig (2008). Policy measures (in rural areas) should emphasize on the development of subsidiary activities and non-farm employment opportunities as well as other income generating activities, which are less dependent on land. (Bhide, 2010)

About 55% of India’s workforce consists of agricultural workers and with an estimated growth rate of 2.5% about 4 million new rural workers are added to the labour force annually imposing a serious challenge to policy makers to address the need for employment generation. (Kapoor, 2010)

Lack of employment opportunities in the rural framework, growth in urban incomes is causing migration of rural populace to urban areas in search of better income generating opportunities. This has led to social upheaval and is putting a strain on the social fabric of the country. There is a definite case for making policy frameworks that promote rural
employment and generate income for the rural households to provide better quality of life to
the rural people in their natural habitat, in other words, promoting sustainable development.

**Rural Clusters in India**
The design activity of any country cannot be well understood without knowledge of the
context in which it operates (Balaram, 1998).

Culture based practices might offer a way forward in socially responsible and sustainable
design and examples have been drawn of fashion designers from Europe and America who
have begun to establish design identities based on their indigenous roots. Projects like Coopa
Roca and Alabama Chanin use local resources, transparent production systems based on local
sewing skills in their focus on human factors and on materiality (Clark, 2007).

A solution to rural problems in India could be by combining the strengths of economic
energy of urban areas with the governance structures of rural decentralization to create a
more balanced spatial model of development, across rural and urban India, in a manner
consistent with the forces of localization (Ramesh, 2005).

Emphasizing the relevance of clusters in the complete value chain for development, a case study suggests that in an
increasing globalize economy, efficient local business systems (clusters or industrial districts) tend to play a major
role (Russo, 1999).

There are many Handloom Clusters in India which utilize
post-industrial and/or post-consumer textile and apparel to
create useful products and provide a vast potential for
recycling and development and a need is felt to study their
contribution to the society, in general and socio-economic
upliftment of the community and the region.

Moped a common mode of transport
Case Study of a rural cluster in India

There are around 1900 weaver families in the complete cluster which has a total of 8 mohallas (colonies) and both male and female and members of all age groups are involved in the weaving process. Field study was conducted in Malakpura which is one of the largest mohalla in the identified rural cluster housing approximately 600 weaver families. Out of the 37 families that were visited and interviewed, it was found that the involvement of women in weaving and other activities was higher as compared to men. Most families had only one loom in the house and almost all members of the house were directly or indirectly involved in weaving activities or other preparatory activities.

Most families make products only on thekedari as they cannot invest money on material and are dependent on job work only. There are many dealers who pick up orders from the nearby areas and distribute to these weaver families on contract. The dealer is able to make good money but the families are also happy as they get enough work providing them a decent monthly income.

Families are extremely proud of their daughters in the house as they all help in weaving and other preparatory activities as well as housework. Many girls go to school also and are still able to contribute in the house. The daughters not only contribute in weaving but also in cutting, winding etc. Many parents conveyed that girls contribute much more than the boys of the house. Some of the grown up boys help in collection of raw material and supplying finished goods but most boys do not provide much support.

Raw Material

The main raw material is post-consumer unstitched and stitched apparel like sarees, salwar kameez, dupattas, shirts etc. These are collected by going from door to door in the nearby
urban areas like Meerut, Dehradun, Hardwar, Saharanpur, Muzzafarnagar and Rishikesh, that fall within a radius of 100 km of the cluster and orders are booked to prepare products from collected material.

This also helps in recycling of post consumer apparel, which would have otherwise got discarded and would have ended up in landfills. There is better acceptability by the customers of these goods made from their own clothing as opposed to the ones coming from unknown sources. The mode of transport of the merchandise ranges from private low cost vehicles such as cycles, mopeds, to public transport like trucks, tempo and buses. Some weaver families pick up orders directly from nearby urban households but most families are dependent on dealers for the orders. There are many families who are able to work only on thekedari as that avoids any kind of investment from the weaver’s side.

**Process of rugs and blankets**

For Chaddars and Rugs, the apparel collected is cut into thin strips on a darati, often stitched together to get the desired length, twisted and used as weft. Generally a white or black cotton yarn is used as warp. Other than the planning of the single coloured warps not much time is spent in planning the designs get rendered directly on the loom by the different colours and designs of the raw material. The surface embellishments in the form of embroideries and sequin work on apparel provide excitement for the weaver and the many girls prefer to work with the salwar kameez or sarees as they carry these embellishments.
**Conclusion**

The supply chain of the process (from raw material to the finished goods) provides an insight into layers of economic, rural/urban factors that shape the complete dynamics thereby forming a symbiotic relationship between two extreme realities and presents a phenomenon that contradicts the existing perception in India of cannibalization of ‘urban’ on ‘rural’.

Collecting raw material from door to door from urban areas and recycling in the rural clusters establishes existence of a relationship between urban expenditures and employment generation. The model also highlights sustainable development in the region through commercially viable activity of weaving with zero carbon footprints and encouraging the existing social milieu of the families involved in the process especially the empowerment of woman through reaffirmation of her role in the complete supply chain.

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All visuals have been self photographed with the permission of the individuals concerned

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1. *Roti, Kapada aur Makaan*: A Hindi dialect term used meaning food, clothing and shelter
2. *Saree*: Most traditional to India, it is 6 yards rectangular fabric and draped by various communities in different styles by majority of Indian women
3. *Dhoti*: Is a rectangular fabric draped traditionally by men as a lower garment
4. *Mohalla* is a term used to refer to small colonies
5. *Thekedari* – a term used for work done on contract, ie an involvement of a dealer in the supply chain
6. *Salwar kameez* - A two piece dress commonly worn with a stole by many Indian women and girls
7. *Dupatta* – A type of stole but larger in size and worn with the salwar kameez
8. *Tempo* is a local vehicle like a mini truck and is used for carrying goods
9. *Chaddar* is a bed cover and at times used by the rural community as a shawl
10. *Darati*: is type of big curved knife also used for cutting vegetables in traditional households
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