

## MARKETING OF NANOBIOGARMENTS

Divya Christopher\*

Nidhi Maheshwari\*\*

Nitin Kapoor\*\*

### Abstract:

The amalgamation of science and fashion lead to the emergence of “Nanobiogarments”. As the market is at its recession, the growth of apparel industry is burgeoning year by year. The market of India is also affected by the overall growth rate of the apparel industry of the world and has been grown from 2008 to 2009 by 68.8%. This creates an opportunity for various companies to enter the Indian market with their innovative products in clothing and Nanobiogarments are such products.

Nanobiogarments are the garments having anti-allergic, anti-microbial and moisture retaining capacity. It also helps in improving the physical, mental and spiritual health. The garments are made up of organic fibres and herbal dyes, also it constitutes of various wellness properties like colour therapy, crystal therapy and obesity treatments.

The use of nanotechnology is the remarkable work in the area of garments making the cloth as Nanobiogarments i.e. inculcating nanotechnology and medicinal biology in the clothing. The nanoparticles used are silver, gold, copper, palladium, silicon etc. Its applications are in both the ways i.e. medicinal as well as technological.

Since the Nanobiogarments are new to the market and still R & D is going on, its position in the market is unpredictable as it can be a success if enthused in right direction or it can be a failure. This paper includes marketing mix analysis, product analysis, industry analysis and quality consciousness which provides an insight about the present and future market of the product.

**Keywords:** Fashion, Nanobiogarments, Nanotechnology, Organic fibres, Chromotherapy, Wellness properties, marketing

\* Assistant Professor, Amity Institute of Biotechnology, Amity University, Uttar Pradesh.

\*\* Student, MBA Biotechnology Management.

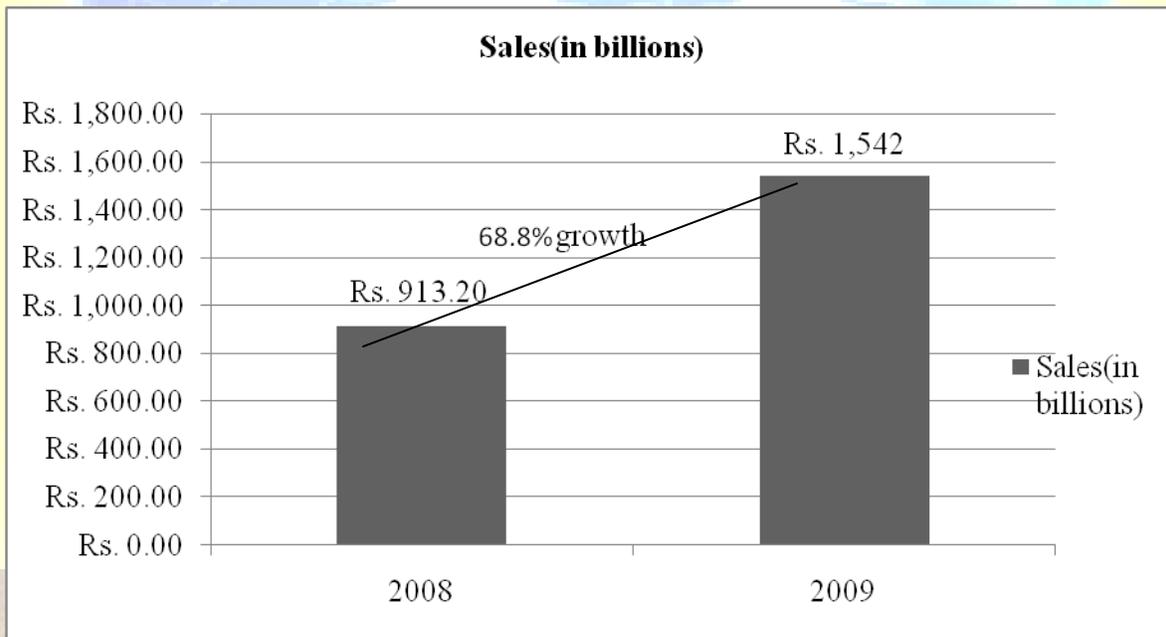
**Introduction:**

Fashion is the expression of our personality and culture. A famous quote by Quentin Crisp “Fashion is what you adopt when you don’t know who you are” that is, it reflects the way you are. It is all about the comfort.

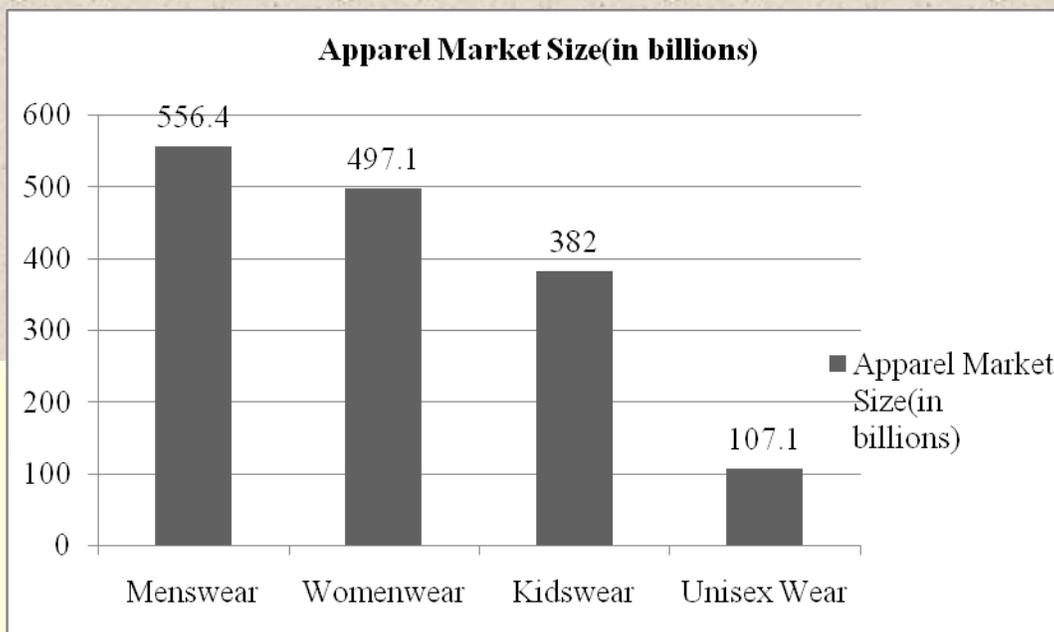
Fashion industry is the most progressive industry all over the world. The Indian Fashion industry is also experiencing hike due to increment in fashion consciousness in Indian consumers. There are various factors which influence the market such as globalization, ever changing consumer preferences, levels of disposable incomes, dynamic business practices, fashion trends, and technological developments in fabrics.

**Indian Apparel Market 2009:**

The total market size of apparels in India in the year 2009 was around Rs.1542 billion which had been increased from the year 2008 by 68.8%



(Source- Imagesfashion.com & Data monitor)



(Source- Imagesfashion.com)

This graph shows the market segmentation and market size estimation of the various customer groups in India in the year 2009.

The trend clearly depicts that market size of India is in its burgeoning state and there is a large area of opportunity for designers and manufacturers in India.

### **Nanobiogarments:**

Innovation is to create something novel from the existing one. Fashion always needs innovation. A famous quote by Jean Cocteau says “Art produces ugly things which frequently become beautiful with time, fashion on the other hand, produces beautiful things which become ugly with time”. So, for the designers and manufacturers to retain their existing market it is of utmost importance to sell the old stuffs in a modified and novel packing, i.e. to provide the wears in a style that would attract not just the cloth but also the usability and technology associated with it.

Nanobiogarmments are one of such new products that launched in the market. It is the blend of science and fashion. Biotechnology, Nanotechnology and fashion meets to give birth to new kinds of garments called Nanobiogarmments.

Nanobiogarmments are the garments having anti allergic, anti microbial and moisture retaining capacities. These garments are designed to improve physical, mental and spiritual health. It integrates the principles of Ayurveda and Nanoscience in clothes. It improves natural body resistance and balances the chakras. They are 100% organic or natural with the wellness properties.

Nanobiogarmments are made up of fabrics which consist of organic fibres and herbal dyes, with wellness properties like antimicrobial coating, imparting colour therapy and crystal therapy. It is also used for obesity treatments.

**Organic fibres:**

Organic fibres are the fibres, in which no fertilizers, pesticides or any other toxic chemicals are used during their growth. They are non genetically modified products. They are highly ecofriendly with no harmful effects. Nowadays people are shifting towards the use of natural products due to their concern towards their health and environment, which makes them to use organic fabrics.

Various fibres grown organically are:

Organic Cotton	Non allergenic properties
Organic Wool	Hypoallergenic, resistant to bacteria, mould, and mildew, natural flame retardant.
Organic Hemp	Hypoallergenic, Anti mildew, Antimicrobial properties.
Kapok (surrounds the seeds of Ceiba tree)	nonallergenic, nontoxic, resistant to rot, odourless
Buckwheat/Millet Hulls	non resistant to insects, insulating properties, relieves pains and restlessness
Silk	Insulating properties

These fibres are moisture absorbent and moisture gets evaporated quickly allowing our skin to breathe. It helps in maintaining the body temperature and body aura.

**Herbal dyes:**

Herbal dyes are those chemicals or pigments which are extracted from plants and insects. Since they are extracted from herbs, they have medicinal properties and therapeutic benefits. They are obtained from roots, stems, leaves, flowers, seeds etc. They are nontoxic unlike chemical dyes. The advantages of these dyes are that they are obtained from renewable sources, have biodegradable properties, have medicinal properties and they are ecofriendly.

Various herbal dyes used are:

Herbs/Vegetables	Colour obtained	Therapeutic benefits
Beet Root	Purple, Maroon	Skin disorders
Turmeric	Yellow, Orange	Inflammation, Leprosy, Swelling, Wounds
Catechu	brown(light), Katha brown (dark)	Parasitic infestation, Leprosy, Wounds, Leucoderma, Itching
Harad (Black Myroblan)	Yellow, Pale Yellow	Infections, Boils, Ulcers
Henna (Mignonette tree)	Rich red brown, Dark brown	Wounds, Ulcers, Burning sensations, Inflammations, Scabies, Leprosy, Leucoderma, Boils
Indigo	Indigo blue (dark & light)	Skin ulcers, Sore nipples
Kesu (Butea Monosperma)	Orange, Cream	Astringent, Eczema, Pimples

(Source: Bhusattva.com)

Along with these dyes coatings of various herbs are used to make it more beneficial like Neem, Tulsi, Sericin etc.

Neem contains various chemicals which are anti inflammatory, anti leprotic and heals wound & ulcers.

Tulsi (Basil) contains phytochemicals which are anti hyper-lipidemic and protects the body from harmful radiations.

Sericin (type of protein) is a sticky material obtained from silkworm. It traps the moisture and prevents wrinkling.

### **Other Wellness Properties:**

Colour Therapy:

Also known as Chromotherapy. It uses light or different colours for the treatment of various diseases associated with different organs of the body. It balances the energy of the body, be it physical, mental, spiritual and emotional.

Colours are often used to describe our emotions and moods. Along with the emotions it also has some healing properties. Every colour in the electromagnetic spectrum has its vibrational frequency. Higher the frequency, warmer the colour (red) & lower the frequency, cooler the colour (violet).

According to Ayurveda, there are 7 main chakras in the body located along the spine. The energy of all 7 spectrum colours resonate with the energy of the related chakras and that is how they balances the energy of the body.

Colours and their affects:

Colour	Chakra	Chakra location	Function	Associated organs
Red	First	Base of the <a href="#">spine</a>	Grounding and Survival	Gonads, kidneys, spine, sense of smell
Orange	Second	Lower abdomen, genitals	Emotions, Sexuality	Urinary tract, circulation, Reproduction

Yellow	Third	Solar plexus	Power, ego	Stomach, liver, gall bladder, Pancreas
Green	Fourth	Heart	Love, sense of responsibility	Heart, lungs, thymus
Blue	Fifth	Throat	Physical & Spiritual communication	Throat, ears, mouth, hands
Indigo	Sixth	Middle of forehead	Forgiveness, Compassion	Eye, pineal glands
Violet	Seventh	Crown of the head	Connection with universal energies, transmission of ideas	Pituitary gland, the central nervous system and the cerebral cortex

(Source- Chromo therapy Wikipedia)

#### Crystal therapy:

It employs crystals and stones as their healing tools. Crystal therapy and colour therapy, both are interrelated that is they are the 2 faces of the same coin. It is also related with the chakras and helps in balancing the energy of the body.

Each crystal imparts a specific colour which on placing to the specific place enhances the flow of energy. It reduces the stress and increases the confidence. It consists of healing properties like curing of various infections and disease.

Various crystals associated with it are Jade (green), Aquamarine (blue), Amber (yellow), Red coral (red) etc.

#### Obesity Treatment:

It helps in the reduction of the cellulite.

### Use of Nanotechnology in clothes:

Nanotechnology is the science or the technology that makes the product more precise, lighter, cleaner, stronger and more efficient.

The infusion of nanotechnology in the apparel designing is proved to be the revolution in fashion industry. The wellness property of nanotechnology makes this technique famous among customers as well as the marketers.

The clothes are coated by nanoparticles of silver, gold, copper, palladium, silicon and other noble metals. These particles can be applied to the textile substrates as a finish by exhaust, pad-dry-cure, coating, spray, and foam techniques, or the substances can be applied by directly adding into the fibre spinning dope.

It is beneficial to people in 2 different ways:

- 1) In Medical Point of view
- 2) In Technological Point of view

1) In Medical Point of view:

- It helps in counteracting the biological and chemical agents like viruses, bacteria and other microbes, and also various chemical agents like harmful rays coming from sun like UV rays, Infrared rays etc.
- Opening of pores of the skin leads various consequences
- Working of nanoparticles on microbes:

oThe nano-particles when comes in contact with microbes, will adversely affect their cellular metabolism and inhibit cell growth. The nano-particles suppresses respiration, basal metabolism of electron transfer system, and transport of substrate in the microbial cell membrane, it also inhibits multiplication and growth of those microbes which cause infection, odour, itchiness and sores.

•Applications

1. Useful for allergy sufferers and anyone living in an area with high air pollution
2. Form-fitting antimicrobial textiles which is based on silver-coated yarns used in the treatment of atopic dermatitis. It has been proved that if these fabrics are tightly worn for 2 weeks, it may reduce the nonphysiological colonization of the patients skin with the microorganism *Staphylococcus aureus*.( Gauger et al. 2006)
- 3.It is used in jeans to harness the power of photocatalysts to break down the air borne pollutants. When the light falls on the photocatalysts, the electrons are rearranged and become more reactive and causes pollutants to break down into non harmful chemicals (developed by a team at Sheffield University and another at the London College of Fashion)
- 4.It improves thermal insulation by blocking harmful UV rays which means we can go outside with a single layer of cloth on the body even at the extreme temperatures.
- 5.It can also be used by fire-fighters, military personnel and emergency responders as it blocks hazardous gases like mustard gas or nerve gas and other contaminants but allow air and moisture to sustain.

Note: In 4th and 5th point technology used is called “Smart Cotton technology”

- 6.One of its major applications is “Bio smart shirts”. These shirts are specially designed shirts which are used for the treatment of various diseases. The chips are integrated in these shirts as the sensors. When these sensors sense any change in the respiratory rate or heart beat rate, they send the signals to the satellite which in turn is deflected to the nearby doctors. These doctors detect the signals and treat the patients via electromagnetic radiations. The constraint of this technology is the range of the area of treatment as it is not so successful in longer distances.
- 7.It also deals with wrinkling and clears all types of infection.

## 2. In Technological Point of view

- It had revolutionized the clothes not only wearing it but also to put them to the technical advantages.
- The various technical advances incorporated in clothes are as follows:
  1. The piece of cloth is fully converted into the mobile phone with GPS technology, recording data for sports and health care, or even data exchange by using the fabric as the circuit board itself by weaving conductive particles into fabrics and transforming it into a chip. Such clothes are known as 'Communication Clothes'.(Source: BEANS)
  2. Water repellent clothing which consist of the coating of millions of silicon filaments. These filaments are hydrophobic in nature which prevents water droplets to soak in the clothes and clothes remains always dry. These filaments have tendency to trap air between the layers of clothes due to which water never comes in contact with the fabric and hence it always remains dry. This layer of air is known as plastron. Also these particles remains intact even after rubbing during daily wash, hence making clothes durable.
  3. The clothes can change colour by pressing the button. Technology includes the change in the molecular structure of the material of which the fabric is made of, which in turn changes the colour of the fabric.
  4. Now nanoparticles are also be used as identifying markers to identify the originality of products like brand identification of various apparels. It will reduce the counterfeiting of the products.

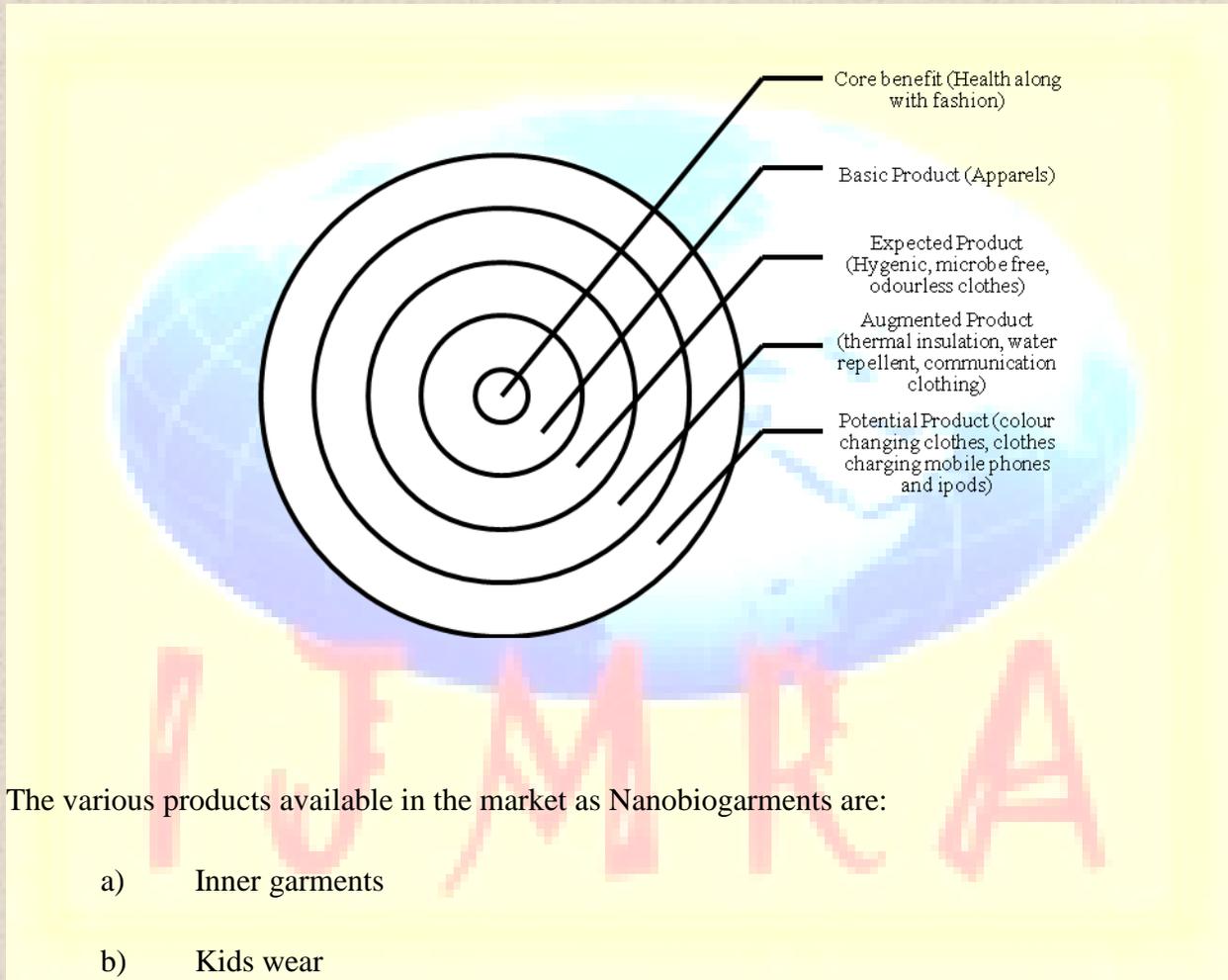
### **Marketing of the Nanobiogarments:**

Marketing can be defined as the introduction of the product which is desired by the customers in a strategic way so that the product can satisfy the customer making the venture a profitable customer relationship.

The essential component of a market plan is the understanding of the marketing mix, as it the basic tool to develop a market plan. It includes 4 P's of marketing i.e. Product, Place, Promotion and Price.

### **Product:**

Nanobiogarments are the offering to the market. The 5 levels of the product are:



The various products available in the market as Nanobiogarments are:

- a) Inner garments
- b) Kids wear
- c) Women and Men wear
- d) Spa Products
- e) Odourless Socks.
- f) Anti allergic bed clothing and pillows

- g) Yoga wears
- h) Hospital clothing

**Price:**

Nanobiogarmments comes under premium products i.e. the quality and price both are high for the product, so can be afforded by upper middle and high income groups.

The Nanobiogarmments launched in India are relatively of lower price than other countries, it costs Rs.500 a pair of socks and Rs.500 a pair of inner garments.

Since these garments are penetrating the market as the premium brand, they are acting as 'Question marks' to the firm which can be converted into 'Stars' by the proper investment and positioning in the market.

**Promotion:**

There can be various promotional strategies for the better positioning of the Nanobiogarmments. The effective use of promotion mix tools can increase the awareness and later on sales of these garments. Since it is the introduction stage of Nanobiogarmments, so the awareness of the product is the main concern because for the expansion of the market penetration of product in the market is must. Some of the strategies which are followed by manufacturers and can be followed by them in future are as follows:

1. **Advertising:**

The garments can be advertised through various ways:

- a) Print media: It includes Fashion magazines, Health magazines, News paper which provides the holistic approach to the target customers as the media covers every age group, gender and profession in the society such as men, women, kids, doctors, fashion designers.
- b) Fashion shows: This the best way to display these garments as the whole world is the fashion freak and wants to know about the various trends in the fashion, so to approach the people by this will create new markets in the global scenario.
- c) Discussion on news channel: It also provides a greater insight to this new area of clothing.

People will get to know about the Nanobiogarmments and its benefits to the mankind. It will

generate awareness in the people and also it will be more effective because of the expert opinions by the opinion leaders on Nanobiogarments.

d) Viral marketing: It includes marketing through internet. E-mails, Google alerts are some of the ways to make people aware about Nanobiogarments.

**2. Public relations:**

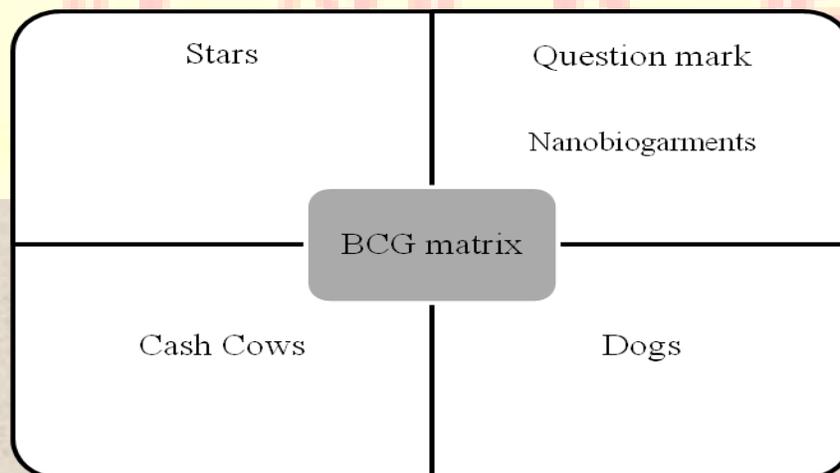
a) Buzz marketing by doctors: As the doctors are considered as the main source of information about health, they can be the opinion leaders for the promotions of Nanobiogarments.

b) Workshops and conferences: It is the wide platform for various health personnel and designers to come directly in contact of these garments, so that they can themselves realize the benefits and analyse the designing of these garments.

**Distribution:**

Since these garments are in their introductory phase and also it is a premium product so the distribution should be exclusive which means that first it should be given to some specific dealers to sell these garments in their zones and afterwards the distribution should be made intensive to increase the sales of Nanobiogarments.

**BCG Matrix**



The market growth of the Nanobiogarments are high while its market share is low, so these garments comes in the category of question mark, as their fate is not clearly defined. If invested properly in the right direction and prioritize, they can be converted into stars and later on to cash cows but if ignored and not positioned right leads to product failure and converted into dogs, which will ultimately leads to liquidation of the unit.

### **Industry Analysis:**

Potential Threat from substitute products: As consumers are already using garments so threat from substitute is high but availability of close substitute is not in market which is positive competitive force in market.

Suppliers Bargaining Power: Supplier bargaining power is high because suppliers are few, product is unique and not commonly available and substitutes of products are not commonly available. The high supplier bargaining power constitute positive feature for firm.

Buyers Bargaining Power: The bargaining power constitutes the ability of buyers, individually or collectively, to force reduction in price of Nanobiogarments. The bargaining power is low as alternate supplier is not present.

Potential Threat From new entrants: Any industry that is perceived to be profitable tends to attract new entrants so potential threat from new entrants is high.

Competition among Revelry Firm: Competition is game in which one player loses at expense of other. There is likely to be less competition so rivalry is weak.

### **Quality Consciousness:**

No Side Effect: Zero Defect approach helps to reduce the overall cost of product

Prevention and appraisal Cost Should be less to reduce the overall cost of product.

### **Flip side of garments:**

Sometimes nanoparticles can cause serious hazards to human which makes it downbeat in the market. Because of its small size it penetrates into the body and cause damage in chromosomes and DNA leading to genetic defects. It acts as carcinogen and cause various cancer like lung cancer, sarcoma etc. It also acts as allergen and sometimes causes eczema.

### **Conclusion:**

The science of nanoparticles and organic clothing are still in its initial stages. It has not been fully explored till now, but it is sure that it has tremendous potential to serve to the mankind in beneficial way. The need is to see the sights of these particles in positive manner so that consumers can get health along with fashion. Worldwide, we can find more than 800 products manufactured by 440 companies in more than 20 countries containing nanoparticles but integrating them into textiles is the new concept which has remarkable scope to grab the market. Researchers and companies are doing collective efforts to make it a giant success, which would be the great innovation of its times.

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