Detailed Project Report

DASPALLA BEE WAX AND HONEY CLUSTER
NAYAGRAH, ODISHA

Submitted to

Directorate of SFURTI
Ministry of MSME,
Government of India

Submitted by

JEEVAN REKHA PARISHAD

Prepared by

INTERNATIONAL MANAGEMENT INSTITUTE (TA)
Gothapatna, Malipada,
Bhubaneswar- 751003
Odisha

Contents

Chapter 1: Cluster Profile

Introduction

With Intent to Strengthen the Khadi and Village Industry in Terms of Quality, Output, Market, Finance and Infrastructure, Ministry of MSME, Government of India has revamped the Existing SFURTI Guidelines. The Ministry with the help of Nodal Agencies KVIC, Coir Board and IEDs is in the Process of Selecting Clusters across the Country.

Daspalla Bee wax and Honey Cluster situated in 10 Villages of Block Daspalla of District NAYAGRAH in State of Odisha is One of Such Potential Village Industries Cluster considered to be Developed under Cluster Mode. Project Steering Committee has already given In Principle Approval and made M/s Jeevan Rekha Parishad as Implementing Agency. Subsequently IEDO has appointed M/s International Management Institute, Bhubaneswar (IMI) as Technical Agency and Entrusted the Task of Conducting Preliminary Survey in the Cluster and Submitting **Diagnostic Study Report (DSR)** as the First Phase.

A Systematic Approach was followed in Preparation of Report. Desk Research, Design and Development of Study Tools, Kick – Off Workshop, Sample Selection, Primary Data Collection and Analysis, Preparation of Draft Report, Validation of Major Findings and Finalization of the Report are the Major Phases of the Exercise, which were Undertaken as per the Guidelines of SFURTI Scheme.

1.2. Regional Setting of the Cluster

The Cluster is located in Block Daspalla of District NAYAGRAH. NAYAGRAH District is one of the 30 Districts of Odisha State in East India. The Nayagarh District is located towards the west of Puri district surrounded by Cuttack district in the North, Kandhamal district in the West, Ganjam district in the South and Khurda district in the East. The District of Nayagarh lies between 190 54’ to 200 32' North latitude and 840 29' to 850 27' East longitude. This district is in the higher altitude than the sea level. The total geographical area of the district is 3890 sq. mtrs. as per land record.

The district has a rectangular shape stretching from north-west to southeast direction. This district is situated in the hilly ranges in the West and its North Eastern parts has formed a small well cultivated fertile valleys intersected by small streams. River Mahanadi flows through the district and other small rivers like Kusumi, Brutanga, Malaguni, Kuanria, Dahuka and Buddhabuddhiani also flows through the district. These rivers make the district a fertile area.

It was created in 1992 when the erstwhile Puri District was split into three distinct districts, namely Khurdha, Nayagarh and Puri. It is home to the Baisipali Wildlife Sanctuary. It is like a Hill station, so far as natural scenery is concerned.

NAYAGARH city is the Divisional headquarter of Nayagarh District. For administrative purpose the district has been divided into 1 Sub Division, 8 Tehsils (Nayagarh, Daspalla,

Ranpur, Khandapara, Gania, Bhapur, Nuagaon, Odagaon), 8 CD Blocks and 02 N.A.Cs (Nayagarh, Khandapara). There are 179 Gram Panchayats, 1531 Inhabited Villages and 164 uninhabited villages. Also 04 Nos. of Assembly Constituencies falls in the district namely, Nayagarh, Daspalla, Khandapara & Ranpur.

01. Sub Division-01
02. Tehsils-08
03. CD Blocks-08
04. Gram Panchayats-177
05. No. of NACs-04
06. Census Villages-1692(Both Inhabited & Uninhabited)
07. No. of Police Station including Mahila P.S-13

Birth history of Nayagarh in the thirteenth century is an important chapter in the political history of Odisha. Suryamani of Baghela dynasty came to Puri on a pilgrimage from "Rewa" of Madhya Pradesh and established his kingdom at Nayagarh. When British captured Odisha, Binayak Singh was the King of Nayagarh and the great Jadumani was his poet. Nayagarh district owes its name to its Hqr. Town Nayagarh. It was created in two phases. Firstly the ex-states of Nayagarh, Khandapara, Ranapur and Dasapalla were merged with the State of Orissa on 1.1.1948 enhancing the jurisdiction of Puri district by forming a separate sub-division with Hqrs. at Nayagarh. Secondly in the year1993 the Government of Orissa divided the erstwhile Puri district into three districts, namely, Puri, Khordha and Nayagarh. The present Nayagarh district was a part of un-divided Puri district consisting of one sub-division i.e. Nayagarh subdivision.

The land area under forest is 2,08,000 hectre in the district. The various minor forest produce of the district are - Babool seed, Sikakai, Talamakhan, Polas, Chakunda, gill, Nageswear seed, Mahua, sesum, Siali, Mango Kernel, Karanja, BenaChera, Neem seed and many others. Also teak, sal and other major trees are found in the forest of Nayagarh district.

1.3 Evolution of the Cluster

The district of Nayagarh is industrially very less developed district. The potential for service industry in the district is immense as the district has been bestowed with many beautiful scenic spots. Many people visits throughout the year scenic spots of the district like Kuanria, Kuturi, Tarabalo & Ranpur. Places like Sarankul, Kantilo, Odagaon and many other attracts a large number of pilgrims to the district. Service units like Small Hotels & Restaurants have very good scope to come up in the district .The State Highway No. 1 has been converted to National Highway and the work has been undergoing in a very fastest speed, once completed it will give a boost to industrial development in the district as communication to the State Capital and nearby areas will be more easier & faster.

As per report by MSME Development Institute, Cuttack on “Brief Industrial Profile of Nayagrah District, 2016-17, one of the potential areas for new MSMEs is Bee Keeping. During 2016-17 one training programme on Honey Processing was proposed by MSME

Chapter 2: Cluster Product and Production Process

Beeswax is a valuable product that can provide a worthwhile income in addition to honey. One kilogram of beeswax is worth more than one kilogram of honey. Unlike honey, beeswax is not a food product and is simpler to deal with - it does not require careful packaging which this simplifies storage and transport. Beeswax as an income generating resource is neglected in some areas of the tropics. Some countries of Africa where fixed comb beekeeping is still the norm, for example, Ethiopia and Angola, have significant export of beeswax, while in others the trade is neglected and beeswax is thrown away. Worldwide, many honey hunters and beekeepers do not know that beeswax can be sold or used for locally made, high-value products. Knowledge about the value of beeswax and how to process it is often lacking. It is impossible to give statistics, but maybe only half of the world's production of beeswax comes on to the market, with the rest being thrown away and lost.

WHAT BEESWAX IS

Beeswax is the creamy colored substance used by bees to build the comb that forms the structure of their nest. Very pure beeswax is white, but the presence of pollen and other substances cause it to become yellow. Beeswax is produced by all species of honeybees. Wax produced by the Asian species of honeybees is known as *Ghedda wax*. It differs in chemical and physical properties from the wax of *Apis mellifera*, and is less acidic. The waxes produced by bumblebees are very different from wax produced by honeybees. Pure waxes from different species of stingless bees are also very different from the other types of beeswax. It is much darker in colour – dark brown, and when it is warmed, it stretches without breaking. It is also sticky and much more difficult to break than beeswax from *Apis mellifera*.

2.1 BEESWAX PRODUCTION

Beeswax is made by young worker honeybees. It is secreted as a liquid from four pairs of wax glands on the ventral surface of the abdominal tergites (plates on the underside of a bee's body). The liquid wax spreads over the surface of these plates, and, on contact with air, the wax hardens and forms asingle wax scale on each tergite, which can be seen as small flake of wax on the underside of the bee. A worker honeybee produces eight scales of wax every 12 hours. The size of the wax glands depends upon the age of the worker: they are at their largest when the bee is about 12 days old and decline steadily after the eighteenth day until the end of her life.

About one million of these wax scales are needed to make one kilogram of wax. Bees use the stiff hair son their hind legs to remove the scales of wax and pass them on to the middle legs, and then to the mandibles (jaws) where wax is chewed, and salivary secretions become mixed with the wax. When it is the right consistency, the new wax is used for comb construction or used to seal honey cells**.** Bees are stimulated to produce wax when there is a surplus of honey to be stored and a lack of honeycomb in which to store it. Around eight kilograms of honey are consumed by bees to produce every one kilogram of wax.

When a swarm of bees settles to establish a new nest, the first thing they do is to start building bees waxcombs. To be able to produce the beeswax and build with it, the bees need a high temperature, and the production of the first comb takes place inside the congregation of bees, where the temperature is highest. The bees building a comb join together and make what are known as 'garlands' or 'festoons' –chains of bees. Hanging like this they secrete the wax. When the beeswax is ready on a bee, she moves up the chain to the place where the building is going on, fetches one of the wax scales with her hind legs and brings it to her mouth where it is chewed and mixed with secretions before it is used for building. This is repeated until all eight wax scales are used. During the comb construction, the building bees vibrate the comb by knocking it with their upper jaws. In this way, they seem to be able to judge the thickness of the comb and this guides them to know if some wax has to be gnawed off or if more has to be added.

COMB

The comb provides the structure of the bees' home, used for all the different storage functions needed in a bees' nest: to store honey, to store pollen, as a place to deposit eggs and for development of the young bees. The comb has a hexagonal cross-section. This shape is created by the worker using her antennae to maintain the shape of each cell during its construction. The shape and dimensions of the cells in comb optimise the ratio of size to strength of the materials used in its construction. The six sided cells and the pyramidal-shaped bottom of the cell also represent a highly efficient use of material with no wax being wasted. There are no empty spaces between the cells while at the same time the highest possible strength from the wax is achieved. The top row of cells that connects the comb with the ceiling of the nesting place (tree wall, hive, frame or the top-bar) can carry more than 1,300 times its own weight in honey plus all the bees working and living on the comb. Only if the inside temperature exceeds +35 °C, the wax will begin to soften and melt, and the combs loose their strength and may collapse. Understanding the properties of beeswax comb brings understanding of the great effort that bees have to make to maintain nest temperature. If a hive is situated without shade, bees will have to expend more effort in working to keep the hive contents cool.

BEE SPACE

In honeybee species whose colonies have multiple combs, the combs are a precise distance apart in order to enable honeybees to work in the combs, to move between them, and maintain temperature. If humans keep bees in hive boxes, then it is necessary to create an environment in the hive that imitates the way the bees build their nest in the wild. Therefore, frames in frame hives must be spaced at the same distance as the combs would be spaced in a natural nest. The distance between the centre of a comb to the centre of the next comb also varies between different races of bees: for example, the space is around two millimetres smaller in the combs of African *Apis mellifera* bees compared to the European races of *Apis mellifera*. The distance permits two worker bees to pass each other when they crawl in the space between the brood combs. In the honey storing areas of the combs, the cells are often built deeper so that only one layer of bees can pass between.

If space allows in a hollow tree or in a wall, the combs of *Apis mellifera* can be more than one meter long, and carrying several kilograms of honey in each comb. Normally a comb is built from the top to the bottom, starting with a small elliptical-shaped comb. A comb consists of a central laminate with the six-sided cells on each side. Each cell is angled slightly upwards, with the opening a little higher than the base. In naturally constructed combs, the dimension of cells also varies according to the species and race of honeybees. The typical dimensions for worker cells built by races of European *Apis mellifera* bees are between 5.13 mm (*Apis mellifera ligustica*) and 5.5 mm (*Apis mellifera carnica*). Europeanraces of *Apis mellifera* accept wax comb with 800 cells/dm2, which allows for cells with a diameter of5.4 mm. *Apis cerana*, the Asian hive bee, needs a smaller cell size. Cells built for drone brood are larger than are those built for worker brood.

BEEKEEPING FOR BEESWAX PRODUCTION

An important aspect of frame hive beekeeping is the recycling of empty combs (inside frames) to the hive after the extraction of honey, thus maximizing honey production and minimizing the production of wax. Therefore, beekeeping that uses movable-frame hives (for example, Langstroth hives and Newton hives) results in the harvesting of relatively little beeswax. Using these sorts of hives, the ratio of honey to beeswax production is approximately 75:1.

Beekeeping using local style, fixed-comb hives, or movable-comb (top-bar) hives results in greater yields of beeswax since the delicate honeycomb is broken to enable the extraction of honey, and cannot be returned to the hive. The ratio of honey and beeswax production using fixed comb or movable-comb hives is about 10:1. For this reason, countries in Africa where fixed-comb beekeeping and honey hunting may be the norm, produce significant amounts of beeswax, which provide a valuable export crop for some of these countries. In some situations, wax rather than honey can be the most valued product of beekeeping.

When there is good honey-flow i.e. plenty of nectar coming into the hive, bees are stimulated to make wax to build comb to hold the nectar. During dearth periods beeswax production stops: when necessary bees recycle wax from existing comb to seal their honey and brood cells. The wax-producing bees need plenty of food: as mentioned above, bees consume around eight kilograms of honey to produce one kilogram of beeswax. When the bees swarm from an old colony and have to build new combs, the wax production and building is undertaken by all ages of worker bees. The young bees have to start wax production sooner than they would in an established colony, and the older bees have to resume beeswax production.

BEESWAX QUALITY

Newly produced wax is clear white, but after manipulation by the bees, it soon turns pale yellow. New honeycomb is nearly white and if it is only used for honey storing it will retain its light colour. When the comb is used for brood it turns darker the longer it is in use. This is due

to the larvae's cocoonsspun inside the cell before pupation. Some excrement from the larvae is also sealed in the cells.

The colouration of beeswax (shades of yellow, orange and red through to brown) is due to the presence of various substances, especially pollen. This difference in color is of no significance as far as the quality of the wax is concerned, but subjectively light colored wax is more highly valued than dark colored wax. If wax is dark because it has been over-heated then its value is much lower. The finest beeswax is considered to be from wax capping's. *i.e.* the wax seal with which bees cover ripe honeycombs, because this fresh 'virgin wax' is pure and white colored. In the past, it was common to bleach wax (using bleaches such as sulphuric acid or hydrogen peroxide), but this practice is now considered unnecessary and damaging to the natural wax.

The main quality issues concern authenticity of origin, and contamination from residues of drugs used to control honeybee diseases, mainly the acaricides used to control mite predators. These acaricides are lipophyllic and therefore are soluble in beeswax, and accumulate in it. Other chemicals sometimes used in beekeeping may also accumulate in beeswax; these may include paradichlorbenzene, used to control wax moth, and various wood preservatives used to paint beehives. This contamination of beeswax can be minimized by avoiding the use of synthetic chemicals in beekeeping. The use of these chemicals in beekeeping in industrialized countries makes beeswax harvested from the disease-free colonies of Africa and other developing regions more attractive.

Pure beeswax has a good aroma, and when a wax block is broken, it shows a grainy surface. That is not the case if it has been adulterated with paraffin, fat or other oil. If pure beeswax is chewed, it does not stick to the teeth, and when rolled between fingers it softens but does not stick to the fingers. When paraffin wax is mixed with beeswax, it becomes more transparent and slightly greasy to the touch.

2.2 BEESWAX COMPOSITION AND PROPERTIES

Beeswax is a very stable substance, and its properties change little over time. It is resistant to hydrolysis and natural oxidization and is insoluble in water. It is a complex material consisting of many different substances, but predominantly of esters of higher fatty acids and alcohols, pigments mostly from pollen and propolis, as well as minute traces of bee material.

It is solid at room temperature, becomes brittle once the temperature drops below 18 °C and quickly becomes soft and pliable at around 35 to 40 °C, with a melting point of 64.5 °C.

USES OF BEESWAX
Beeswax has hundreds of uses, of which the following are but a few examples.

In cosmetics
Around 40 percent of the world trade in beeswax is used for the cosmetics industry, which requires first class beeswax that has not been overheated, is pure and free from propolis. The

world price is usually around US$4-10 per kilogram. At a local level, making skin ointment from beeswax can be one of the most profitable beekeeping activities.

In pharmaceutical preparations

Around 30 percent of world trade in beeswax is used by the pharmaceutical industry that, like the cosmetic industry, requires good quality wax.

Candle making

Around 20 percent of the beeswax trade is used for candle making. Beeswax candles are less common and more expensive than candles made from paraffin wax. In the past church candles had to be made of100 percent beeswax, and this is still followed in some societies.

Other uses

Around 20 percent of the world trade in beeswax is used for:

- Models and casting in industry and art. Wax is used for to make figures for decoration or sculptures and jewellery before they are placed in a mould for casting in silver, gold or bronze. This method is called lost-wax casting or *cire perdu*.
- To make polish for cars, furniture, shoes and for treatment of other leather products.
- In grafting waxes.
- In lubricants for industrial use.
- Electronics used as insulation in electronic components in the computer industry, and in the manufacture of CDs.
- In poor societies, beeswax is used as a sealant, for example to make air and water-proof sealing of bottles and containers, to repair of broken calabashes, for grafting on branches, etc.
- In batik dying of fabrics.
- In making drawing crayons.
- It is used for confectionery coatings.
- It is used to strengthen threads used in darning and sewing.

In beekeeping

- Beekeepers use large quantities of beeswax for making beeswax comb foundation. Beekeepers harvest, process and recycle their own beeswax and this use is not evident in the trade statistics. In many countries where frame hives are used, it may be the major use of beeswax. It is a common practice for beekeepers to render the beeswax from their own bees into lumps of pure beeswax, and to exchange this for a smaller weight of ready-made sheets of foundation, made by commercial foundation manufacturers.

- Beeswax is used to attract swarms to empty hives, or trap hives, and is one of the most effective attractants for bees.

2.3 INTERNATIONAL TRADE

It is not easy to obtain official statistics concerning beeswax production: for example, there are no official figures for beeswax production in EU countries. The EU imports around 6,000 tonnes of beeswax per annum, approximately 50 percent of this coming from developing countries. The main importing countries are Germany, France and the UK. These nations all have significant pharmaceutical and medical industries requiring beeswax.

Tropical countries dominate world beeswax production and export, with industrialized countries needing to import beeswax. This is because, as described above, in local styles of beekeeping both honey and wax are harvested.

DO NOT WASTE BEESWAX

In areas where most or all of the honey produced is consumed locally, and where there is no local use for beeswax, pieces of wax comb are often discarded. **The development of a wax collecting system can, by encouraging each beekeeper in the area to save beeswax and by organizing the sale of the combined crop, provide a source of income from an otherwise wasted resource. Both honey hunters and beekeepers should realize that beeswax is a valuable product in addition to honey. If old combs are stored without treatment, especially in the tropics, they will be eaten by wax moths within a few weeks. Old combs can harbor honeybee diseases and if left lying around can cause honeybee disease to be spread from one colony to another. Mice can chew the wax combs and make a lot of damage in a hive, but most animals cannot digest the wax**, it just passes thought the gut. Only the various species of wax moth larvae can digest wax, and maybe some birds that have the necessary bacteria in their guts to break down the wax, as ruminants do with cellulose.

ADULTERATION OF BEESWAX

Beeswax is relatively expensive, and there has always been a tendency for people to try to falsify or dilute it with cheaper materials. The melting point of pure beeswax is 64.5 °C, and adulteration of pure beeswax with paraffin wax reduces the melting point and weakens the material. This is important since one kilogram of wax in honeycomb supports 22 kilograms of honey, pollen and brood. It follows that using adulterated wax for the foundation used in frame hive beekeeping will cause unnecessary problems for the bees and the beekeeper.

BEESWAX RENDERING

Cappings (the white covering on sealed honey comb) are the best source of beeswax, but odd scraps of brace or burr comb (odd bits of comb built by the bees as part of the nest structure), old honey combs and old brood combs all yield valuable beeswax harvest. The beekeeper with a just few hives can produce blocks of wax of excellent quality from these sources.

Whatever beeswax is to be used for, it has to be melted and cleaned. As soon as it has been melted and turned to a solid wax block, it can be stored or transported without any problems. The wax block is not eaten by wax moths. There is plenty of expensive equipment available to achieve beeswax rendering. This includes stainless steel solar-wax-melters, steam-wax-melters, wax presses, wax and honey separators and electric melters. However, most beekeepers do not own such equipment and achieve excellent results without spending any money on equipment, and with no risk of it being stolen.

GENERAL RULES WHEN WORKING WITH BEESWAX

- Beeswax must never be heated with a direct flame: always heat it in a container of water. This water bath might be an oil drum or other large container. It is not necessary for the wax to be in a separate container in the water bath. Heat the wax enough to melt it: beeswax melts at62-64 °C. Heating above 85 °C causes discoloration of the wax, and boiling will ruin it. If beeswax is heated to such a temperature that it burns it is wasted completely.

- The best water to use when working with beeswax is soft, clean rainwater. Hard water contains lime that reacts with the wax and saponifies it.

- Beeswax is slightly acidic and containers made of aluminium, brass, copper, zinc, pewter, tinplate or iron must never be used with beeswax, as they will react with the beeswax and the wax will be stained. Suitable materials to use when working with beeswax are containers made from enamel, stainless steel, nickel, or plastic.

- Combs of the same type should be prepared together. Do not mix dark combs with light combs as this will lower the grade of the best wax.

- It is easy to make a filter for hot wax by completely removing each end of a clean can and stretching a piece of cotton cloth over one end. The string used to hold the cotton in place also serves as a handle.

- Whatever system is used to render and extract the beeswax, it will solidify once it cools down. Regardless of the system used, the recuperated wax will contain numerous impurities. Due to the difference in density between wax and water, the wax will rise to the surface of the water and any impurities will be trapped below it. If the beeswax cools too quickly, a large quantity of these impurities and water will be trapped inside the wax as the block sets and it will have to be rendered again. Once the wax hardens, impurities can be scraped off the underside of the block. To obtain the purest beeswax, the water-wax mixture should cool down as slowly as possible. An easy way to slow down the cooling process is to place the bucket with wax and water mixture in a heat-retaining box (filled with polystyrene pieces, or sawdust) covered with a thick lid. Once the wax has settled and completely cooled, the block is ready to take out of the mould.

- Many containers make convenient moulds for beeswax. Foil-lined drink cartons make convenient, disposable moulds of a useful size. When the wax has solidified completely, the carton can be simply torn away, leaving a lump of beeswax.

TRADITIONAL METHOD OF EXTRACTING WAX FROM COMBS

Materials needed: pieces of honeycomb, water, a pan for melting the wax, a rush bag, or any type of loosely woven bag, cloth material with a fine mesh, soap, a bowl for moulding the wax.

1. Remove as much honey as possible from the honeycombs and soften them by soaking in warm water: pollen and any honey remaining in the combs will dissolve in the water. Repeat this washing process three times.
2. Use clean rainwater if possible. If the water is very alkaline, add a little vinegar (one part vinegar to1,000 parts water).
3. After washing the combs, break them up into small pieces.
4. Place the pieces of comb in a pan and add clean water to the level of the combs or a little above.
5. Heat the mixture gently and keep stirring all the time, especially when the mixture starts to reach high temperatures. Wax is highly flammable.
6. After the combs have melted fully, pour the mixture into a long bag made of sacking, woven rush, nylon, jute or other heavy cloth, and tie it tightly. Holding the whole thing over a basin or bucket, squeeze the bag with two pieces of wood, to make sure that all the wax is squeezed out of the bag into the bucket underneath. Brood, pieces of wood, grass and other large particles will be removed by this process.
7. Leave the bucket with the mixture of hot water and molten wax to cool, placing it in an area sheltered from high winds and dust: preferably a corner in a clean and cool room. The wax solidifies as it cools, forming a disc of wax on the surface of the water. Any particles that have escaped through the bag will settle below the wax layer.
8. When the mixture is completely cool, remove the wax layer. Scrape off any material stuck to the underside of the wax disc, and re-melt the wax in an equal volume of clean water. This time use a finer cotton cloth to strain small impurities out of the wax. After filtering through the cloth, collect the hot mixture of wax and water in a bowl, preferably enamel, which has been smeared with a film of soapy water – only a very small amount to cover the surface. The bowl should not hold more than about two kilograms of wax. Even bowls made from wood or calabashes can also be used as moulds for beeswax. Do not use fat or oil instead of soap, as these would contaminate the wax. Do not use heavily scented soap.
9. Place the mixture in a cool place free from dust and wind. When the water and wax have completely cooled down i.e. about 12 hours after pouring the mixture into the enamel bowl, a mould of beeswax can be easily shaken out. Any impurities adhering to the bottom of the cake can be scraped off with a sharp knife.
10. Do not disturb the wax until it has cooled for 12 hours. Do not try to hurry the process or you may spoil the wax.

11. Beeswax purified carefully by this method should be in a suitable state for sale and export and does not require any other processing.
12. Store refined beeswax in a clean place, away from any strong-smelling substances.

Another traditional method is to simply put the broken combs into a hessian sack and drop it into a large cooking pot full of water, with the sack weighted so that it sinks. Heat the water. Wax is lighter than water, so that as it melts, the wax will filter through the sack and rise to the surface. Once the combs have all melted, turn off the heat and leave the pot to cool down.

SOLAR WAX EXTRACTOR

The solar wax extractor provides a simple and effective way of melting and purifying beeswax. It uses the sun's heat to melt the wax, and an effective solar wax extractor can be easily 'home-made'. The temperature inside the extractor needs to rise only to 68-70 °C to melt the beeswax sufficiently: if clean wax is used, just one melting in a solar wax extractor can produce a satisfactory block of top quality wax.

The solar wax extractor consists of a glass or clear plastic-lidded box containing a sloped sheet of metal. Pieces of honeycomb are placed on the metal sheet and as they melt, wax runs down the metal slope to a container. The sheet of metal can be bent at the edges to funnel wax towards the container. A screen of wire mesh prevents pieces of comb and debris from slipping down into the container. Impurities in the wax tend to remain on the metal, and others can be scraped off the final solidified block of wax.

The dimensions of the extractor can vary according to the container size used to make it. The bigger the overall container, the higher the temperature that can be attained inside the extractor.

To retain heat inside the box, the cover of the solar wax extractor is best made either of thick plastic or of two sheets of strong glass with a small gap between them. The rest of the inside of the box should be painted black for maximum heat absorption. Insulating material underneath the metal sheet will also help to retain heat. There must be no draught-creating cracks or gaps in the box, as they will encourage heat loss, and if large enough would allow robber bees into the box. Do not fix the collecting tray in the bottom of the extractor: it needs to be removable for cleaning.

Ideally, the solar wax extractor is positioned regularly during the day so that it is always facing the sun, and tilted so that the glass is at right angles to the sun's rays. If this is not possible, fix supporting legs under the extractor to achieve a slope of about 40_ to the horizontal, and face the extractor towards the sun. Shadows from trees and buildings or passing clouds soon lower the temperature inside the extractor.

HARVESTING WAX FROM VERY OLD, BLACK COMBS

Even very old, black scraps of comb can be of some value to obtain beeswax. However, bees wax cannot be obtained from them using a solar wax extractor. This is because such combs contain large numbers of cocoons and pupa cases discarded by successive generations of developing honeybees, and these soak up the wax as it is melted. Wax from such combs can be obtained by breaking them up, and soaking them in water for 24 hours, then tying the combs in a piece of sacking and boiling this in a container full of water. Some wax will float to the surface, but the bag of wax must be agitated to obtain the maximum harvest. If left to cool overnight, a round cake of solid beeswax will form on the surface of the water.

METAL FOIL METHOD

A very simple way to melt small scraps of comb is to place them on a piece of aluminium foil or other shiny metal foil, and leave in the sun. In strong sunlight, the wax will soon melt and can be poured into a container.

EXTRACTION WITH BOILING WATER AND A WAX PRESS

Pieces of comb are placed in a large container (around 100 litres), about one third full of boiling water and allowed to melt. When all the wax has melted pour the contents of the containers into a jute-lined wax-press. When pressure is applied, the wax runs out. After the first pressing, the content can be stirred and then pressed again, and this process repeated until all the wax is extracted. Once again, the water and molten wax run into a container, where, as the mixture cools, the wax rises to surface because of its lower density than water.

STEAM EXTRACTION

Steam extractors all work on the same principle: two connected tanks are fixed, one inside the other or one on top of another. The combs or cappings are put in an openwork metal basket inside the main tank. Steam extraction is a good method for cappings but is less suitable for melting down old combs as it yields only around 80 percent of the wax. Cleaning the wax in the ways described above will satisfy most wax users. If very pure beeswax is required for special purposes the wax has to be refined.

REFINING BEESWAX

The refining process is achieved by:

1. The wax is washed in hot water to remove honey and to allow dirt to settle out and fall to the bottom.
2. The wax is mixed with fuller’s earth (clay) and activated carbon: this starts a bleaching process.
3. The resulting mixture is filtered through a filter-press.
4. The wax is cooled before being formed into slabs or pellets.

The washing and refining process can take up to 30 hours at a temperature of 90 C.

SLUM GUM

Slum gum is the black residue remaining after the wax rendering process. It is composed of cocoons from the bees' brood cells, wax moth cocoons, excrements from larvae and some leftover wax. If the slum gum still contains a lot of wax, it will form a solid cake when cool. If it is low in wax, it crumbles when dry. Most often slum gum is discarded. It burns well and can be used for firewood in cooking, and to make firelighters. In daytime, it can attract many bees if too much wax is left in it, so if it is used for fires in the open, it is better to use it after dark.

MARKETING BEESWAX

Beekeepers are harvesting honey and beeswax from bark hives, with both commodities serving as a cash crop for export to Europe. In this system, farmers harvest the honey and the wax at the same time. When groups of beekeepers combine their beeswax harvests, they can accumulate enough quantity to sell. Beeswax for export should be clean and heated as little as possible.

Little processing is required: it can be moulded into blocks, the broken into smaller pieces, which can then be placed in hessian sacks for export. The wax is broken into smaller pieces to prove its purity and to show that no bricks are concealed in the center of the lump!

MAKING BEESWAX FOUNDATION

Tray-style foundation press

This is a press into which molten beeswax is poured and moulded on each side with the pattern of foundation. These presses can be made of metal, plaster of Paris, or plastic, and tend to produce rather thick sheets of foundation.

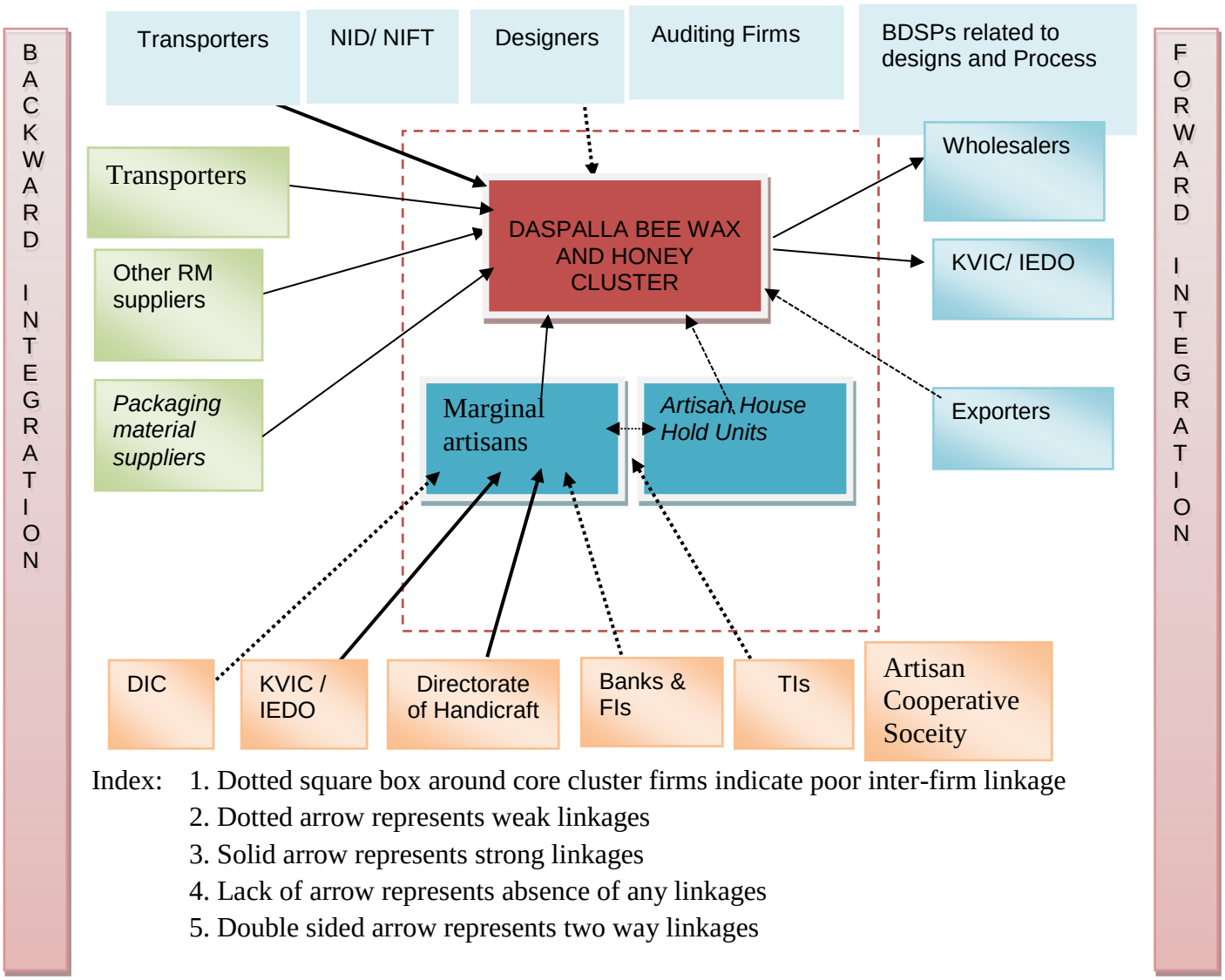
Roller methods

A flat sheet of wax is run through embossed rollers, resembling the clothes mangles used in laundries. Some commercial foundation manufacturers have sophisticated machines in which liquid beeswax is poured straight on to a water-cooled roller embossed with the hexagonal cell pattern. The wax is solidified and printed simultaneously. The sheets of embossed wax are then cut into the rectangular sizes needed for frame hive beekeeping.

2.4 Cluster Map

A detailed cluster map is given as below:

Figure 2.1 Present Cluster Map



Index:
1. Dotted square box around core cluster firms indicate poor inter-firm linkage
2. Dotted arrow represents weak linkages
3. Solid arrow represents strong linkages
4. Lack of arrow represents absence of any linkages
5. Double sided arrow represents two way linkages

Principle Stakeholders

There are 550 artisans active in the cluster. House hold and marginal artisans are considered as principle stake holders. All household units are totally dependent on society and traderswith no direct marketing. Even the artisans can be divided in to two types. One who are working under the society and traders and other who works at their houses taking the orders from the society and traders. Linkage among the artisans is not very strong but their linkage with the traders appears to be strong.

Backward Linkages

Raw material like boxes, honey bee colonies etc. is purchased from local traders at Nayagarh, Bhubaneswar. Other raw materials like cleaning and packing material are purchased from traders situated in cluster or at Nayagarh /Bhubaneswar.

Forward Linkages

As indicated above, marketing is totally taken care by the trader by their brand. Individual artisans are totally dependent on wages given by the society and traders and never attempted

for direct marketing. By market promotion the artisans will get orders through the SPV. By the Art gallery cum retail outlet the artisans bale to sale their product directly.

Support Institutions and Public Service Providers

There is a linkage with DIC and handicraft department. The linkage with MSME-DI is absolutely nil in the cluster. There is weak linkage with professionals. Linkage with market promotion agencies is found almost non-existent.

There is only one society in Daspalla but they have very limited exposure to the export market.

Chapter 3: Market Assessment and Demand Analysis

Implementing Agency is working in the Proposed Geography from 2001. The Cluster Project will cover DASPALLA area 550 Artisans. The honey bee collectors of the DASPALLA Region are Renowned for their Versatility in bee and wax. Locally it is very much in Great demand.

Traditionally, Industry is dominated by Buyers from USA & Germany etc. However, New Markets are emerging for DASPALLA honey and wax and they are Growing Fast. These are Basically Developing Countries or Lesser Developed Countries like Spain, etc. Growth in Income Level is the Major Driver for this.

Big Retailers like Wal-Mart, IKEA can drive the Growth in this Industry. These Players have Huge Network with a Large Customer Base. Low coat value added honey products and pure wax are Major Products that can be targeted by these Players.

NAYAGRAH being nearby to the places like Bhubaneshwar and Puri might turn up Good Demand as These Places are known as Tourist Spot of the State and Flourishing Hotel Industry can be a Potential Target to sell off the Product.

Chapter 4: SWOT and Need Gap Analysis

NAYAGRAHBEE WAX AND HONEY CLUSTER
SWOT Analysis

Strengths Generation of Self – Employment Utilization of Local Resources Product with Adequate Demand Good Road Connectivity to Villages Durable and Long Lasting Production	**Weaknesses** Lack of Finance Availability in Area Inadequate Rate of Raw Material Lack of Skill Enhancement Lack of Entrepreneurship Ability Inadequate Market Opportunity Lack of Facilitation of Exports Unorganized and Widely Disperse
Opportunities Artisans are Ready for Skills and Training Need for Common Facility Centres National Market to be Explored Brand Building and Promotion Establishment of Market Linkages Supply Chain Development Artisans Institution Building	**Threats** High Illiteracy Rate to Adjust Lack of Demand Oriented Designed Products

Need Gap Analysis:

1. Lack of Reforms in the Production System Hampering Productivity, Organized Production and Supply of Products.
2. Raw Material Prices of Honey Boxes and Honey Colonies shot up to by 50% in Last Few Years.
3. Shortage of Skilled Artisans, Due to Lack of Skilled Labour, the Labour Cost are Surging.
4. There is an Urgent Need of Training of honey and wax collectors to Fill the Gap caused by MGNREGA.
5. Another Fact is that the New Generation is not Keen to Learn Techniques. If Sufficient Efforts are not made then in Coming Years there is Threat of Extinction.
6. Upgrading and Maintaining Quality – since honey and wax is not a Full Time Job, most of the LabourInvolve in Unskilled and primarily depend on Agriculture, so they don't know the Importance of honey and wax collection and sales and Don't give much Attention to Quality Aspect.
7. The Need of Hour is to Initiate some R&D Activities in Terms of Material and Machine Development.
8. Facilitate Adequate Infrastructure, Communication Channels for Marketing, Proper Finance Assistance to Indian exporters for the Quantitative and Qualitative Improvement of Indian honey bee and wax Industry.

9. Search for New Potential Domestic and International Market.

10. Problems due to Decentralized and Unorganized Sector (Lack of Management).

11. Quality Consistency is essential to remain Competitive in the Overseas Market which can be maintained by Use of Required Quality bees, Proper Blend Proposition, collection by the Skilled Weaver and Improved Processing, Finishing etc.

12. To Rescue the Indian Honey bee and wax Industry from the Ongoing Crisis, the Government need to Undertake Important Initiatives and Introduce the Tax Exemptions on a Long Term Basis at Least till Industry make Full Recovery and Back on Track.

13. Financial Institution can help by Providing Adequate Finances to this Industry for Technology upgradation and put Low Interest Rate on Export Finance in Order to Help in Revive the Industry.

Chapter 5: Organization Profile

Name of the Organization	**JEEVAN REKHA PARISHAD**
Address of the Organization	Plot No 387 Damana Square, C.S.Pur, Bhubaneswar, Odisha.
Contact Person	**1. Mrs Madhusmita Mishra Secretary** **2.Dr(Mrs.)Usharani Panigrahi (President)**
Legal Status	Registered under Section XXI of Societies Registration Act 1860.
Registration No	CTC/12260/7/1993-94
Date of Registration	April 7, 1993
Contact detail	+91 7854872808/9668553309
E-mail	jeevanrekha@hotmail.com
Membership Particulars	**1. NITI Aayog NGO Partnership System** **2. Guide Star accredited NGO** **3. Accredited by Credibility Alliance as Transparent NGO.** **3. BeeKeeping Training Partner with OFDC,GoO.** **4. Enrolled with Rajya Mahila Kalyan Nigam,GoO.** **5. India Coordinating agency for MasterPeace India and Earth Guardian , India** **6. Affiliated to European Commission for Youth in Action /Youth Exchange/Student Exchange Programmes between Europe and India**

Bank Particulars

Name of the Bank	Canara Bank
Branch Address	Damana Square, C.S.Pur, Bhubaneswar
Account Number	2842101001776

Financial position	**Turn Over for last 3 years is as follows:**
Fixed Assets	5,30,638.00
Current Assets	2,35,,908.00
Current Liabilities	2,37,594.00
Revenue Trends of Last Year(17-18)	8973707
Profit / Loss	Not applicable

Introduction:

Jeevan Rekha Parishad – A Non-Governmental Organization; by origin with its Founder is Ms Madhusmita Mishra: JRP was established on April 7, 1993 with a view to promote the rural and backward society of Odisha. The Organization is registered under The Section XXI of the Societies Registration Act 1860, FCRA, and 12A of IT Act. With its 11 Members in Executive Committee and 12 Operational Staff the Organization commenced their work toward the

various Activities in welfare of Society. Organization has worked in various fields for developing the employment opportunities. In order of this Organization has conducted various schemes under the Ministries of Government of India for social welfare by conducting various programs. Organization has its Registration renewed and Audited its Account with Chartered Accountant at regular intervals. General Meetings are also conducted time to time or when-ever necessary in which various decisions are taken according to the rules under Article as well as Memorandum of Society.

Vision Statement:

A self-reliant society based on justice, equity and sustainability where every human being has the equal opportunity to maximize its potentialities.

Mission Statement:

JRP brings rural and tribal communities together to educate them on environmental justice, human rights and sustainable development.

Details of the office bearers of the NGO/Society.

Sl. No.	Name	Occupation	Address	Designation	Remarks
1.	Dr (Ms) Usharani Panigrahi	Government Service	Plot no 3423/8148 Palasuni,Kapileswar Bihar,Bhubaneswar	President	Chairperson
2.	Ms Madhusmita Mishra	Social Service	Plot no 387 Damana Square, C.S.Pur, Bhubaneswar	Secretary /	Chief Executive
3.	Ms Minaskhi Priyadarshini	Social Service	B/17,Shop Cum Residence, Indradhanu Market,Near Saraswati Sishu Mandir,IRC Village Bhubaneswar-751015	Joint Secretary	Responsible for - enterprenureship development programmes
4.	Ms Nibedita Swain	Social Service	N1/315, IRC Village , Nayapalli	Vice President	For Child Development
5.	Ms Sabita Behera	Agriculture	175/2720 Padmabati Bihar Bhubaneswar PIN-751016	Treasurer	For Finance, Audit, Tax returns
6.	Ms Manashi Patnaik	Social Work	5202, Gautama Nagar, Bhubaneswar PIN-751019	Member	For Social safty programmes like running old age home.

7.	Mrs. Sarmila Sahoo	Social Service	Plot no – 2198/A Near Badagada Hat,BJB Nagar, Bhubaneswar Odisha-751004	Member	For youth development

Main Development Objectives of JRP are as follows -

- To mobilize and build the capacities of rural communities in order to promote people¬ oriented development process.
- Promotion of human rights inside community.
- Development of entrepreneurship, confidence and trust for successfully undertaking¬ micro-enterprises for their poverty alleviation;
- Undertake child welfare activities along with pregnant women and mothers for their¬ integrated development.
- Educate, train in different kind of skill, technology, marketing, entrepreneurship,¬ leadership, organization of the beneficiaries for their holistic development.
- Undertake convergent plans of development in the field of agriculture, animal¬ husbandry, rural craft, family planning, literacy, adult education, thrift and credit, social education, drinking water, sanitation, hygiene enabling them to attain a quality of life with social justice;
- Inculcate scientific outlook, business expertise entrepreneurship and leadership¬ among women, youth and others in order to undertake activities with science and technology for higher production, productivity and efficiency;
- Develop entrepreneurship, initiatives, IGP activities among women and Initiate legal literacy, organization of women for securing their entitlement, protect¬ and promote their interest with awareness, concretization and organization.
- Undertake total package of agriculture, horticulture, village industries, water¬ harvesting, social forestry, environment protection and energy conservation, new and renewable sources of energy for integrated development of the rural people.
- Participate in KVIC and KVI Boards, development activities for income and¬ employment generation in large number of cottage and village industries.
- Initiate action for housing health and hygiene, drinking water supplies and other¬ health projects both in rural and urban areas; Promote and introduce new and renewable source of energy like biogas, solar wind¬ energies to be utilized for different developmental activities;
- Undertake health, hygiene, family planning, family welfare, prevention and control of¬ communicable diseases. HIV/AIDS, Cancer and other kind of prevention and treatment of dreaded diseases in cooperation and collaboration with official and nonofficial agencies for providing total health coverage.

Previous Sanctions

Details of grant received from O/o the Development Commissioner (Handicrafts) under various schemes during the last three years:

Sl. No	Name of Scheme Sponsorship	Year	Amount Sanctioned	Amount Released	Weather utilized or not	Remarks
1.						
2.						

Details of grant received from various Central/State/Any other Departments:

Sl. No	Name of Scheme Sponsorship	Year	Amount Sanctioned	Amount Released	Weather utilized or not	Remarks
1.	Appliqué and Embroidery	2010 - 11	5,70,000	5,70,000	Yes	Completed
2.	Entrepreneurship Development Training	2016-17	1,40.000	1,40,000	Yes	Completed
3	Jute handicraft Promotion	2015-16	2,25,000	2,25,000	Yes	Do
4	Lakha Bangle making	2014-15	3,67,000	3,67,000	Yes	Do
5	Beekeeping and Honey Processing	2012 – onwards	12,35,800	12,35,800	Yes	Do

Achievements / Experiences of the organisation

Jeevan Rekha Parishad accord greatest concern to harness process of capacity and capability of men and women as well as in people's organization and institution. It has been widely observed that many development programs could not march ahead above the take-off stage because the workers, farmers, businessmen, traders, entrepreneurs, managers have not been able to give a speed push to developments projects, programs and enterprises to the level of attainment of higher production, productivity and efficiency. While the need to the hour is to take up development with a speed, time bound and result based, it must change the status of the common man, community and the country. The same principles apply to the government, public institution, voluntary organization, private concerns and business houses. The indicators of their success are maximum production, highest productivity and greatest efficiency.

Therefore, the organisation has second priority to strengthen multidimensional capacity of CBOs SHGs, Association minorities, artisans, Youth and civil society. Such a strategy will lead to use to available resources, find out missing resources, mobilize individual, groups and community resources, and recycle such resources for providing development opportunities by creating Swarozgar (gainful employment and income). Jeevan Rekha Parishad has in the recent past has shown greater concern with the poor capabilities of the CBOs, SHGs, Association and

civil society as their physical and financial performance on the whole has been discouraging and dismal. There is no doubt one of the critical problem of the NGOs is the limitation of the fund and resources. It is well acknowledge that NGO community can take people's participation and involve them in the development process much more effectively and efficiently than any department of the government, political organizations, local self-government. Thus the strategy is simply to encourage the NGOs, CBOs and SHGs to become more active and vibrant.

Our strategy is to support small and emerging People organization, Association of minorities through networking alliance and cooperation, information and dissemination, trust and honesty, responsibility and accountability that shall continue for many years to come.

Agriculture continues to be a key sector for economic development in Odisha. It is a source of income of the rural people, contributes greatly to earning foreign exchange, assuring food security and providing jobs is increasingly important in an attempt to fight against poverty. In some parts of Odisha particularly the densely populated areas, agriculture production has been on the decline and the natural resource.

In this Region areas like Daspalla and adjoining areas in Kandhamal districts small scale famers today are looking for ways and means in farming enterprises that can enable them to earn reasonable and reliable incomes and improve the welfare of their families. Beekeeping is one of such farm enterprises that a sizeable proportion of the farming communities in Tribal areas of Nayagarh and Daspalla are practicing.

In Tribal Odisha the honey business is already booming with much of the honey from, however areas of daspalla, Daringibadi etc have a unique flavoured honey because of their vegetation. In this regards there is need to grow this Bee keeping enterprise owing to its low investment both in capital and labour besides being useful for nature conservation. It has the potential for becoming a fully commercialized enterprise; earning reasonable and reliable incomes for the community if the conditions for production; processing and marketing are favourable.

THE BUSINESS DEVELOPMENT SERVICE PROVISION ASSIGNMENT

The project

The project is to address the inter-related problems of poverty and environmental degradation within the cluster of Daspalla and adjoining blocks.. The immediate objective of the program is to increase livelihood opportunities based on sustainable natural resources and improve governance of these resources at local and regional levels.

The program uses an approach that emphasizes the creation of market linkages between poor micro-entrepreneurs in the informal sector, and the formal private sector.

Key principles of this approach include the following:

- Take a demand-driven rather than supply-led market development approach

- Formally engage the private sector, e.g. through forward contracts with buyers/suppliers;
- Support establishment of "gateway agencies" that aggregate supply and improve the efficiency and transparency of transactions between producers and the market;
- Formalize ownership of production and marketing organizations – making the poor genuine shareholders in the larger business.

JRP as Business Development Service Provider (BDS)

JRP – Jeevan Rekha Parishad is a small, but rapidly expanding innovative Odisha based private sector NGO in the honey sub-sector that packs & processes honey, propolis, supplies quality equipment, offers advisory services, trainings & consultancies aimed at benefiting the region. JRP seeks to develop synergistic partnerships between the private sector, rural communities in the region covering a cluster of blocks in Nayagarh and Kandhamal districts..

In this Assignment JRP will provide Consultancy and training services to improve and sustain livelihood of people in this community.
In terms of Market access JRP has ready market for Bee products especially Honey, wax and propolis in Odisha.

Bee House products is linked to big chain supermarkets by supplying honey in huge quantities like Nakummat, Uchumi, Hotloaf, Tuskys', Kenjoy Supermarkets and also in Kikubo where there is the biggest market for honey that later is circulated all over the country.

Feasibility of Beekeeping Business by JRP:

Details on the institution s strength and preparedness in implementing Beekeeping , Honey Processing, Marketing.:

- **Strength of JRP-**

(i) JRP- is a 25 years old NGO working on Livelihood promotion, Skill Development etc.

(ii) Broad activities are Education, Skill Development, Entrepreneurship Development,
   i. Livelihood generation and employment, Healthcare and sanitation, Agriculture and Rural Development This provides enormous opportunity to the youth for wage employment / self-employment which eventually helps them earning a dignified sustainable livelihood.

(iii) JRP has a lease land of one acres of land and builds up area of more than 1000 square feet in Daspalla. Also we have about one acre of land in Bhubaneswar.

(iv) Experienced faculty and trainers are present to provide quality training to the beekeepers.

(v) JRP provides own transport facilities at any point of time.

(vi) 24 hour uninterrupted power supply.(Having own 45 KVA DG set)

(vii) The institute is also a affiliated Training Partner of Skill man Italy, EYES- Eurasia for Entrepreneurship Development, France.

(viii) Various MSME training programmes such as Mobile Repairing training, Welding Training, Turner Training, Plumber Training, Boiler operation trainings and many more have been undertaken.

(ix) During the year 2016-17, 60 trainees have been trained in "Entrepreneurship Development in Food Sector supported through EDI, Bhubaneswar.

(x) Organization has already trained 350 beekeepers in Odisha on beekeeping, crop pollination and honey processing.

(xi) Two of our senior staff have been trained on beekeeping from OUAT.

(xii) The Odisha Forest Development Corporation has selected JRP as its technical agency for beekeeping training.

(xiii) NABARD has also recognized JRP as one of the resource agency of Odisha for beekeeping.

Problem Statement

The Daspalla and adjoining blocks of Daspalla Region has potential for producing large volumes of high quality honey. Several honey value chain studies in the region show that honey and other bee products have a ready market at local, national and regional level. The local market for table honey is significant, and demand outstrips supply with lots of honey produced is taken by many traders who come from Bhubaneswar and Cuttack to trade. Trade opportunities for other bee products are also growing.

While there are opportunities to improve people's livelihood through beekeeping, the way it is done currently indicate that significant benefits accruing from this activity are not reaching the poor beekeeping households and processors are not getting enough good quality products for their business. The currently production volume of Daspalla is high though the biggest volume of the honey comes from Kandhamal, Koraput, Nabarangpur, Malkangiri.

This is because there are a multiplicity of constraints such as decline of the bee population, environmental degradation, inadequate skills/best practices in the production of high yields of good honey , inadequate access to good quality inputs, poor entrepreneurship skills among producers, inadequate capital for processors and packers to invest in the sector, limited capacity of the producers to understand markets, lack of honey collecting centres, poor market linkages between the packers and producers and above all, absence of effective grassroots/village-based producer groups capable of producing sufficient honey for the market and absence of a strong private sector.

As a result of the above the beekeeping sector in the region has remained stagnant the groups are not yet empowered.

Most of the inefficiencies along different segments of the honey value chain are as a result of non-commercial approaches to beekeeping and honey trade.

Chapter 6: Project Concept and Strategy Framework

Project Objectives
The Major Objectives of the Project are as follows –
GOAL AND OBJECTIVES

The ultimate goal is to have an efficient, profitable and sustainable honey value chain in which all the actors in the cluster can maximize their potential and are able to relate to each other honey business.
The project has the following key objectives

1. To review the status of beekeeping in each of the Project sites in cluster like in Daspalla and neighbouring blocks.
2. To facilitate the putting in place of stronger producer associations/ Cooperatives into economic production units that will fully and fairly engage in the honey market value chain.
3. To facilitate processes that allow key players in the value chain have access to appropriate inputs /technology, advisory and financial services and ensure product diversification in Beekeeping i.e. Honey, Bee wax, Propolis, Honey wax ointment and Candles
4. To establish a business sustainable strategy using a private sector led approach that will enable the continuity of the project.
5. To recommend the appropriate market linkages and market outlets for honey and other products from Odisha,

6. To Organize the beekeepers and farmers especially women of Daspalla BEE WAX AND HONEY CLUSTER and Make them Competitive and Provide them support for their Long Term Sustainability in beekeeping and bee wax processing..
7.To Enhance Marketability of Final Production of Daspalla WAX AND HONEY CLUSTER by Providing Support for Making New and Better Designed Production with Improved Packaging and to Provide them a Better Channel to Sell their Products.
7.To Equip Traditional beekeepers of the Associated Cluster with the Improved Skills and Capabilities through Training and Exposure Visits on Scientific beekeeping and wax collection..
8. To open two Common Facility and honey collection Centre for both the Products and to Provide Better Tools and Equipment's to the beekeepers working in the Cluster;

Focus Products Services
New Product Profile in the Cluster

It is proposed to bring about Product Diversification in the Cluster both in Terms of Product Range and Product Designs in a Phased Manner. During the Initial Period the Original Products being manufactured will be diversified in Terms of Sizes and Designs. A Quick Market Survey shall be conducted by IA to Identify New Products/ Alternative Raw Materials that can be manufactured within the Local Condition subject to Availability of Raw

Materials and a Plan shall be chalked out to produce the same from the Second Year of Cluster Implementation. The Focus shall be to produce both High end Products to Cater to needs of High Profile Customers as well as Reasonable Range Products to reach the Middle Class Homes as well.

A Plan will be prepared to Increase the Visibility of Cluster Products on Internet through Tie up with Online Shopping Websites and Development of Own Website. For this Purpose Branding of the Products shall be done and Emphasis shall be given on Packaging and Gift Selling.

The Discounts during Festivals shall be made Largely Visible to Increase the Sales. Bulk Deals or Discounted Deals shall be made during off Season to keep up the Sales Flow during Lean Period.

Conceptual Framework / Project Strategy

The Cluster Development approach can be Best Described as Getting Together, Working Together and Achieving Together. The Cluster Development Approach sees the Key Problem faced by Enterprises as One of Relative Isolation rather than Size.

1. To empower beekeepers and Build their Capacity to Meet the Challenges of the Market Competition in a Sustainable and Self-Reliant Manner.

2. To Facilitate Collectivization of Beekeepers for Procurement, Production, Marketing and Other Support Activities to Promote Sustainable Growth and Diversification.

3. To Provide for Development of Beekeepers and Wax Collectors Cluster in an Inclusive and Holistic Manner in an Environment of Empowered and Participative Decision Making.

The Interventions are aimed to promote the Cluster as a Whole. The Major Hindrance is Dispersed Area of Cluster. There is No Existence of the Cluster as such which can Fit into the Classical Definition of the Cluster. The Project Strategy would take Place in Terms of Components i.e. Soft and Hard Intervention.

Soft interventions like General Awareness Programme, Skill Development for the beekeepers, Market Promotion Activities and Hard Interventions like Up-gradation of Production Centre, Show Room for the Finished Product will help the beekeepers to Promote their Product in a Better Way & Marketing Promotion Activities would Allow the Product of the Artisans to be Shown on International Platform through E - Commerce Websites dedicated to such Products.

Chapter 7: Project Interventions (CORE SFURTI)

A.	Soft Intervention
1.	**General Awareness, Counselling, Motivation and Trust Building**
1.1.	Awareness Programme (Counselling, Motivation & Trust Building)
1.2.	Stake Holder Workshop(Sensitisation)
2.	**Skill Development and Capacity Building**
2.1.	Training of IDE and IA staff on Cluster Development
2.2.	Skill Development training for 300 women and 200 male beekeepers.
3.	**Market Promotion initiatives**
3.1.	Organization of and participation in domestic exhibitions
3.2.	Training on Sales and Marketing
3.3.	Website development and maintenance
3.4.	Brand Building and Promotional activities
4.	**Design and product development**
4.1.	New Design Development
4.2.	Product Catalogue Development preparation

- ✓ **General Awareness and Counselling**

  Trust building is the Key of Success of Any Cluster Development Programme. This helps getting together the Cluster Primary Stakeholders and Other Strategic Stakeholders to participate in the Cluster Development Programme and its Process. It helps Cluster Development Executive to organize the beekeepers for Various Activity Implementations and Create Trust among Different Stakeholders so that they should Unite Win – Win Situation for Growth and Sustainability.

- ✓ **Conduct Skill Development Programme**

  In Order to Produce a Quality Product Developing Skills of beekeepers is an Essential Task to be undertake. A Skill Development Programme from the First Year is to be conducted to develop the Skills of the Artisans.

- ✓ **Market Promotion Initiatives**

  Marketing and Market Promotion is the Key for Success of Developing Cluster. In Undeveloped Cluster, the Artisans Lack of Proper and Strategic Marketing Efforts and Creating Market Linkages. They do not have Understanding and Exposure of Different Market Opportunities as well as Tends and Demand of Goods and Services they are Producing since they have very Limited Market Interface and that is to Very Localize.

- ✓ **Design and Product Development**

  Design and product development is a very necessary and unavoidable aspect of any product. It covers two main aspects i.e. developing new design of the product and implantation as well as product catalogue development.

H A R D I N T E R V E N T I O N

B.	**Hard Intervention**
5.	**Up-gradation of Production Centre**
5.1.	Construction of Common Facility Centre/Honey and Wax Collection Centre
5.2.	Supply of Machineries, Tools & Equipment's
5.3.	Raw Material for Working Capital Corpus

- ✓ **Up-gradation of Production Centre**

  Up-gradation of Production Centre consists of Activities like Up gradation or Newly Purchased Machineries, Warehousing Facility or any Other such Facility or Services. Up-gradation of Centre is very necessary as it Increases the Productivity of the beekeepers.

Chapter 8: Project Cost and Means of Finance (CORE SFURTI)

Detailed Project Cost (Rs.)	**Programme**	**Proposed Total Project Cost [INR]**				
	A. Soft Interventions	**Amount**	**SFURTI**	**IA**		**Total**
	Awareness Program	2,00,000	2,00,000	0		2,00,000
	Stake Holder Work	1,00,000	2,00,000	0		2,00,000
	Entrepreneurship Training	3,00,000	3,00,000	0		3,00,000
	Skill development Training	3,00,000	3,00,000	0		8,00,000
	Techno Managerial Training	3,00,000	3,00,000	0		4,00,000
	Training on Sales & Marketing	5,00,000	5,00,000	0		3,00,000
	Prototype Development	4,50,000	4,50,000	0		2,00,000
	Training of IA & CDE	80,000	80,000	0		1,00,000
	Total (A)	**22.30,000**	**22.30.000**	**0**	**22,30,000**	
	B. Hard Interventions	**Amount**	**SFURTI**	**IA**		**Total**
	Construction of CFC	65,00,000	58,50,000	6,50,000	65,00,000	
	Machineries & Equipment's	1,38.00,000	1,24,20,000	13,80,000	1,38.00,000	
	Raw Material	20,00,000	18,00,000	2,00,000	20,00,000	
	Total (B)	2.23.00.000	2,00,70,000	22,30,000	2,21,80,000	
	Total A+B	2,45,30,000	2,23,00,000	22,30,000	2,46,80,000	
	Cost of Technical Agency	17,84,000	17,84,000	0	17,84,000	
	Cost of Implementing Agency	17,84,000	17,84,000	0	17,84,000	
	Total Proposed Project Cost	2,80,98,000	2,58,68,000	22,30,000	2,80,98,000	

Source of Funds (Rs.)	#	Source of Fund	Amount	
	1.	Grant – in – Aid under SFURTI Scheme from Ministry of MSME Soft Intervention Hard Intervention Implementing Agency Cost Technical Agency Cost	 22, 30, 000 2,23,00,000 17,84,000 17,84,000	
	2.	Implementing Agency Share*	22,30,000	
		Total Project Cost	2,80,98,000	

Phasing of Project (Rs)

1st Year

A. Soft Interventions	**Amount**	**SFURTI**	
Awareness Program	2,00,000	2,00,000	
Stake Holder Work	1,00,000	2,00,000	
Entrepreneurship Training	3,00,000	3,00,000	
Skill development Training	3,00,000	3,00,000	
Techno Managerial Training	3,00,000	3,00,000	
Training on Sales & Marketing	5,00,000	5,00,000	
Prototype Development	4,50,000	4,50,000	
Training of IA & CDE	80,000	80,000	
Total (A)	**22.30,000**	**22.30.000**	
B. Hard Interventions	**Amount**	**SFURTI**	**IA**
Construction of CFC	65,00,000	58,50,000	6,50,000

1st year and 2nd Year

B. Hard Interventions	**Amount**	**SFURTI**	**IA**
Machineries &Equipment's	1,38,00,000	1,24,20,000	13,80,000

2rd Year

B. Hard Interventions	**Amount**	**SFURTI**	**IA**
Raw Material	20,00,000	18,00,000	2,00,000

Soft Intervention	**Total**			**1nd year [INR]**			**2nd year [INR]**			**3rd year [INR]**		
	Total	**SFURTI**	**IA**	**Total**	**SFURTI**	**IA**	**Total**	**SFURTI**	**IA**	**Total**	**SFURTI**	**IA**
Awareness Program	2,00,000	2,00,000	0	2,00,000	2,00,000	0	0	0	0	0	0	0
Stake Holder Work	1,00,000	1,00,000	0	1,00,000	1,00,000	0	0	0	0	0	0	0
Entrepreneurship Training	3,00,000	3,00,000	0	3,00,000	3,00,000	0	0	0	0	0	0	0
Skill development Training	3,00,000	3,00,000	0	3,00,000	3,00,000	0	0	0	0	0	0	0
Techno Managerial Training	3,00,000	3,00,000	0	3,00,000	3,00,000	0	0	0	0	0	0	0
Training on Sales & Marketing	5,00,000	5,00,000	0	5,00,000	5,00,000	0	0	0	0	0	0	0
Prototype Development	4,50,000	4,50,000	0	4,50,000	4,50,000	0	0	0	0	0	0	0
Training of IA & CDE	80,000	80,000	0	80,000	80,000	0	0	0	0	0	0	0

Hard Intervention	**Total**			**1st Year [INR]**		
	Total	**SFURTI**	**IA**	**Total**	**SFURTI**	**IA**
Construction of CFC	65,00,000	58,50,000	6,50,000	65,00,000	58,50,000	6,50,000
Hard Intervention	**Total**			**2nd Year [INR]**		
	Total	**SFURTI**	**IA**	**Total**	**SFURTI**	**IA**
Supply of Machineries	1,38,00,000	1,24,20,000	13,80,000	1,38,00,000	1,24,20,000	13,80,000
Hard Intervention	**Total**			**3rd Year [INR]**		
	Total	**SFURTI**	**IA**	**Total**	**SFURTI**	**IA**
Raw Material Bank	20,00,000	18,00,000	2,00,000	20,00,000	18,00,000	2,00,000

Chapter 9: Plan for Convergence of Initiatives.

A Cluster Advisory Group will be formed and all the Cluster Stake Holders will be included in the Group as Members.It will be ensured that during Discussions, Possibility of Convergence of Schemes and Programs of Other Departments of Central& State Government are explored.

Some Schemes of Different Departments which can be beneficial for the cluster are

- Handicrafts Marketing Support Scheme, National Handicraft Development Program, Ministry of Textiles, Government of India, New Delhi.
- State Award for Handicrafts Artisans through Central & State Government.
- Social Security Schemes of Office of The Development Commissioner (Handicrafts), Ministry of Textiles, Government of India, New Delhi.
- Participation in DilliHaat, Taj Mahotsav, Shilpgram Udaipur, Shilparamam Hyderabad and other Craft Bazaars through Office of The Development Commissioner (Handicrafts), Ministry of Textiles, Govt. of India.
- National Award for Handicraft Artisans through Office of The Development Commissioner (Handicrafts), Ministry of Textiles, Government of India, New Delhi.
- Linkage with Export Promotion Council / Sector Skill Council / District Industrial Centre / District Rural Development Agency / State Rural Livelihood Mission/ Skill Development Mission.
- Participation in Marketing Program of NIESBUD / MSME-DI.
- Linking the Artisans with Jan Dhan Yojana, PM Jeevan JyotiBimaYojana, PM Surekha Bima Yojana, PM Employment Generation Program & Atal Pension Yojana.

Chapter 10: Enhanced Project Cost and Means of Finance

(Rs. in INR)

#	Source of Fund	Amount
1.	Grant – in – Aid under SFURTI Scheme from Ministry of MSME	
	Soft Intervention	25,00,000
	Hard Intervention	1,66,35,000
	Implementing Agency Cost	20,00,000
	Technical Agency Cost	19, 74, 400
2.	Implementing Agency Share*	55,45,000
	Total Project Cost	2, 86, 54, 400

* In the above Table Cost of Land has not been Included in the Implementing Agency Share. It will be Provided / arranged by the Implementing Agency. Once the Details and Value of the Land is provided by the Implementing Agency, the Same shall not be Reduced from the Implementing Agency Share in Line with the Scheme Guidelines. This shall be taken into Account while Preparation of Detailed Project Report.

Chapter 11: Project Timeline

Illustrative Project Implementation Schedule

Soft Intervention Components	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	Q 7	Q 8
General Awareness Camp								
Stake Holder Workshop								
Training of IA, CDE & SPV Members								
Skill Development Training								
Techno Managerial Training								
Sales & Marketing Training								
Entrepreneurship Training								
Prototype Development								

Hard Intervention Components	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	Q 7	Q 8
Construction of CFC Building								
Machinery, Tools &Equipments								
Raw Material for Cluster								

Chapter 12: Tentative Business Plan

Key Operational and Financial Assumptions

(Rs. In Lacs)

Business Plan - Daspalla Bee Honey and Wax Cluster (Figures in Lakhs)						
Profit and Loss	**Rate**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**5th to 25th year at 5%**
Growth % in Sales			106%	60%	46%	37%
Quantity (KG)	Honey	7500	11000	13750	16500	19250
	Wax	2500	5500	8250	11000	13750
Price per KG		200.00	250	300	350	400
Sales		2000000	4125000	6600000	9625000.	13200000
Total Revenue		**2000000**	**4125000**	**6600000**	**9625000**	**13200000**
Expenses		-	-	-	-	-
Manufacturing Cost	20%	400000	825000	1320000	192500	2640000
Material Cost to Beneficiaries	50%	1000000	2062500	3300000	4812500	6600000
Marketing Cost	10%	200000	412500	660000	962500	1320000
Maintenance Cost	5%	100000	206250	330000	481250	660000
Admin Cost	5%	100000	206250	330000	481250	660000
Total Expenses	90%	**1800000**	**3712500**	**5940000**	**8662500**	**11880000**
Profit from Sales	10%	200000	412500	660000	962500	1320000
Job Work (KG)	50	5000.00	11000	16500	22000	27500.00
		250000	550000	825000	1100000	1375000
Total Profit		450000	962500	1485000	2062500	2695000
PROFIT / PERSON	550	818	1750	2700	3750	4900
PAT						10%
IRR for 25 years						11.72%

Chapter 13: Proposed Implementation Framework

A Cluster is a Sector Targeted Geographical Concentration of Micro and / or Small & Medium Enterprises, Service providers and Institutions faced with Common Opportunities and Threats. In other words, a Cluster of MSMEs is a Concentration of Economic Enterprises, Producing a Typical Product / Service or a Complementary Range of Products / Services within a Geographical Area. The Location of such Enterprises can Span over a Few Villages, a Town or a City and its Surrounding Areas. Thus a Cluster of MSMEs is Identified by the 'Product / Service' that the Micro and Small Enterprises Produce and the 'Place' where the Enterprises are Located.

Features of the Proposed NAYAGRAHBEE WAX AND HONEY CLUSTER

- Give Rise to Collective Benefits, for example through the Spontaneous Inflow of Suppliers of Raw Materials, Components and Machinery or the Availability of Workers with Sector Specific Skills.
- Favour the Creation of Providers of Specialized Technical, Administrative and Financial Services.
- Create a Conducive Environment for the Development of Inter - Firm Co-operation as well as of Co-operation among Public and Private Institutions to Promote Local Production, Innovation and Collective Learning.

SFURTI PROGRAM

India has a Rich Heritage of Traditional Industries. This sector not only Plays a Crucial Role in providing Large - Scale Employment Opportunities at Comparatively Lower Capital Cost, but also helps in Industrialization of Rural & Backward Areas, thereby reducing Regional Imbalances, Assuring more Equitable Distribution of Income and Wealth. The Eco-Friendly Products of Traditional Industries have Great Potential for Growth in Production and Export Developing Niche Products for Domestic and Export Markets.

With a view to Making the Traditional Industries more Productive and Competitive and Facilitating their Sustainable Development, in 2005-06, the Government of India launched, a Central Sector Scheme titled the "Scheme of Fund for Regeneration of Traditional Industries (SFURTI)". Very recently, with Some Modifications and Amendments, Ministry of MSME has launched Revamped SFURTI Program.

The objectives of the Scheme are as follows –

- To Organize the Traditional Industries and Artisans into Clusters to make them, Competitive and Provide Support for their Long Term Sustainability and Economy of Scale.
- To Provide Sustained Employment for Traditional Industry Artisans and Rural Entrepreneur.
- To Enhance Marketability of Products of such Clusters by Providing Support for New Products, Design Intervention and Improved Packaging and Also the Improvement of Marketing Infrastructure.
- To Equip Traditional Artisans of the Associated Clusters with the Improved Skills and Capabilities through Training and Exposure Visits.

- To make Provision for Common Facilities and Improved Tools and Equipment for Artisans.
- To Strengthen the Cluster Governance Systems with the Active Participation of the Stakeholders, so that they are Able to Gauge the Emerging Challenges and Opportunities and Respond to them in a Coherent Manner.
- To Build up Innovated and Traditional Skills, Improved Technologies, Advanced Processes, Market Intelligence and New Models of Public - Private Partnerships, so as to Gradually Replicate Similar Models of Cluster - Based Regenerated Traditional Industries.

SFURTI Cluster Development Project of NAYAGRAHBEE WAX AND HONEY CLUSTER

With a View to Organise the Artisans of Bee Honey and Wax Cluster of District Puri and provide them Option of Sustainable Development, It is proposed to Implement SFURTI Program in the Cluster.

Need Based interventions will be done for Holistic Development of Artisans of the Cluster. Apart from Establishing a Common Facility Centre & Raw Material Bank, Capacity Building Programs for Artisans and Staff of IA will also be organised.

Common Facility Centre will have Raw Material Bank, Auto CAD, Sample Development Facility, Modernised Machineries, Washing Facility, Display Centre, Packing Facility etc.
Capacity Building measures will Include Skill Up gradation Training Programs, Design & Product Development Programs, Exposure Visit and Marketing Promotion Initiatives.

Chapter 14: Expected Impact

The Proposed NAYAGRAHBEE WAX AND HONEY CLUSTER will play a vital role in Regenerating Scope for the Youth Artisans with Enhanced Income Level of the existing Traditional Hands in the Cluster.

Some of the Major Impacts are as follows -

- The Proposed Project will Organize the Traditional Industry, Artisans as well as Craftsmen into Clusters to make them Competitive and Provide support for their Long Term Sustainability and Economy of Scale.
- It will provide Sustained Employment for Traditional Industry Artisans and Rural Micro Entrepreneurs with Increased day of monthly working (30 Days a Month).
- It will Enhance Marketability of Products of such Clusters by Providing Support for New Products, Design Intervention and Improved Packaging and also the Improved and Diversified Marketing Channel.
- It will Equip Traditional Artisans / Craftsmen of the Associated Clusters with the Improved Skills and Capabilities through Training and Exposure Visits.
- Modernised Machineries, Improved Tools and Equipments for Artisans which leads to Up-gradation of Quality and Increase in Productivity;
- It will Strengthen the Cluster Governance Systems with the Active Participation of the Stakeholders, so that they are able to Gauge the Emerging Challenges& Opportunities and Respond to them in a Coherent Manner.
- It will Build up Innovated and Traditional Skills, Improved Technologies, Advanced Processes and New Models of Public- Private Partnerships, so as to gradually.

It will fulfil the Need Gap of the Beneficiaries for Various Schemes of Central & State Government under Convergence of Initiatives like Schemes of Development Commissioner (Handicrafts), Prime Minister Employment Generation Program, etc.