Introduction

- Agriculture along with fisheries, is the most widely prevalent economic activity in the territory. Almost all the households own small or marginal pieces of agricultural land.
- Over 87 per cent of the operational holdings are of less than 0.5 hectare size.
- Of the total geographical area of 3,200 hectares, the net sown area in Lakshadweep is 2,579 hectares, which works out to a little over 80 per cent of the total geographical area of the island.
Soils

- In spite of high rainfall, most of the rainwater goes into in situ infiltration in these sandy soils.

- Most of the soils being calcareous/sandy are well drained and can support good growth of plants and trees.
CLIMATIC CONDITIONS

- Rainfall is in the rage of 1255 to 1934 mm.

- June to September rainfall is 70 per cent of the annual in the north and only 56 per cent in the south islands.

- The southern island receives 20 per cent and northern 15 per cent of the annual rainfall during October and November. June is the rainiest month contributing 25% of the annual rainfall.
CROPPING PATTERN

- Coconut is the main crop in all the islands and has been grown for centuries.
- Owing to the rapid subdivision and fragmentation of holdings, the farmers practice very close planting and plant more seedlings on the boundaries or corners to mark their fields, thus creating overcrowding of palms in all the islands.
- An average of 400-500 coconut palms of all ages are available in one hectare of land as against 170-200 normally recommended for optimum yield.
• This has resulted in a **very low yield** even in the absence of any major diseases.

• Total number of yield coconut palms is –
  - 6,51,626 - 2001-02
  - 7,50,000 - 2011 (Approx)

• Average yield per palm - 81 nuts per year (2001-02)
<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Island</th>
<th>Nuts harvested (in lakh)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2009-10</td>
</tr>
<tr>
<td>1</td>
<td>Kavaratti</td>
<td>104.79</td>
</tr>
<tr>
<td>2</td>
<td>Minicoy</td>
<td>55.21</td>
</tr>
<tr>
<td>3</td>
<td>Agatti</td>
<td>82.40</td>
</tr>
<tr>
<td>4</td>
<td>Andrott</td>
<td>135.08</td>
</tr>
<tr>
<td>5</td>
<td>Kalpeni</td>
<td>77.42</td>
</tr>
<tr>
<td>6</td>
<td>Amini</td>
<td>100.83</td>
</tr>
<tr>
<td>7</td>
<td>Kadmat</td>
<td>56.44</td>
</tr>
<tr>
<td>8</td>
<td>Kiltan</td>
<td>52.65</td>
</tr>
<tr>
<td>9</td>
<td>Chetlat</td>
<td>27.45</td>
</tr>
<tr>
<td>10</td>
<td>Bitra</td>
<td>2.69</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>645.31</strong></td>
</tr>
</tbody>
</table>
Production of coconut

- 2001-02  - 531.00 lakh nuts
- 2009-10  - 645.31 lakh nuts
- 2010-11  - 698.94 lakh nuts
Recommendation of Report

- Thinning out of unproductive and senile palms
- Inter-cropping with vegetables and other crops
- Product diversification and value addition
- Control of pest and diseases
- Organic farming
- Discontinuation of Banana cultivation due to heavy rate of water consumption. (15 liters per day)
- Research for efficient water conservation by ICAR Minicoy and KVK Kiltan.
Plan Outlay for XIth FYP - Rs 2836 lakhs
(figure in lakhs)

<table>
<thead>
<tr>
<th>Plan year</th>
<th>2007-08</th>
<th>2008-09</th>
<th>2009-10</th>
<th>2010-11</th>
<th>2011-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outlay</td>
<td>254</td>
<td>420</td>
<td>647</td>
<td>715</td>
<td>800</td>
</tr>
</tbody>
</table>
Action as per XIth FYP

1. Coconut Development Programme- 525.65 lakh
   - Productivity enhancement, processing and product diversification and coconut crop insurance are the strategy mandated. The components are;
     1. Neera Tapping
     2. Financial assistance for coconut crop loss due to natural calamity
     3. Insurance coverage to coconut climbers
     4. Establishment of coconut processing unit
     5. Grant-In-Aid to Panchayat
II. Organic Farming Programme- 215.10 lakhs

- Establishment of model organic farms in the islands to ensure organic produce.

Components

1. Establishment of Model Organic Farms (20 farms already in existence and 30 are proposed for AY 2011-12)

2. Supply of Organic inputs like Neem Cake, Organic manure etc at 25% subsidized rate.

3. Green manure cropping – Recycling of green leafy wastes- incentive of Rs 3000/- per farmer for organic compost making granted during last year.
Livelihood Support Services Scheme – 1756 lakhs

- Home level processing and product diversification - Women employment and their empowerment
- Component:-
  1. Mushroom Cultivation in kadmat, Kavaratti, Agatii and Minicoy
  2. Coconut Value Addition units
  3. Free distribution of Vegetable seeds and fruit plants to farmers (70,000 fruit plant distributed – 2010-11)
Horticulture Development Programme- 712.55 lakhs

- To promote inter-cropping and vegetable/fruit cultivation on the Departmental Farms

**Components**

- Vegetable cultivation
- Fruit Cultivation
- Tuber crop cultivation
- Pulse cultivation
Natural Resource Management – 785.10 lakhs

- Costal tree belt plantation for soil erosion control
  - Plantation of casuarinas along with other littoral plants to check soil erosion.
  - 70,000 (Approx) Nos of casuarina planted during the previous years and the target for 2011-12 is covering 15 Km in all the islands
  - Supply of farm implements such as fencing material, shade net, Spade etc at subsidy of 20%.
Integrated Pest Management – 926.35 lakhs

- to prevent crop loss due to pest and diseases
- Component:
  - Rodent Pest management
  - Control of hairy caterpillar /mealy bug and other pest by organic bio-pesticide
  - Compensation to Bud rot affected coconut palms
Human resource development- 145.10 lakhs

- to conduct seminars, training and workshops to the farmers for awareness on latest technology and programmers.
- One seminar per island during last year
Although productivity of coconut cultivation in terms of nuts per hectare, stands the highest in the country, it can be improved in terms of size of the nuts.

The number of palms per hectare, which stands on an average at 241 and goes much higher in some of the islands.

This needs to be brought down to 180-200 as the existing high density reduces the availability of sunlight for the coconut palms as well as land for intercropping.

Efforts for intercropping in a scientific way need to be initiated on a pilot basis and popularised further after closely monitoring the effect of the pilot efforts.
The coconut tree is a very useful plant. Each part of the tree is useful. On an average thousand nuts yield one quintal copra, 60 Kg of fibre 1000 coconuts shells.
Value addition and product diversification

- **Vinegar**: a permanent natural preservative, ingredient for pickles, salads, soups, curry, etc.

- **Jaggery**: a colloidal sugary substance made out of coconut Neera (toddy) used for making a variety of snacks, a best substitute for jams, for making cool drinks, etc.

- **Desiccated coconut powder**: Powder made out of fresh coconut by mechanical processing. Used mainly for confectionery items, many other variety dishes, curries, etc.
• **Snowball tender coconut** - Eight to nine months old tender coconut is dehusked and shells removes using a machine without touching the kernel content, kernel ball is fixed in an ice cream bowl and served with a straw fixed in the eye of the kernel ball.

• **Ball copra** - It is conversion of raw coconut into copra without breaking it into two pieces, nuts allowed to dry till shell is separated from the kernel and dried, ball copra is comparatively clean, fetches good value in the market, long shelf life, north Indian’s prefer especially for religious functions.

• **Coconut milk** - Coconut cream is the processed milk extracted from fresh matured coconut.
• **Coconut fibre products** - curled coir fibre, coir rope, yarn, coir mats and matting, pressed board, fibre bush, geo-jute for soil erosion, etc.
• Extraction of coconut oil and Virgin coconut oil.
• Converting waste coconut pith into usable manure, briquettes.
• No unit of snowball tender coconut and ball copra is existing Lakshadweep.
Coconut shell for Handicrafts, activated carbon, shell powder, etc.

Coconut tree stem- construction material, quality furniture, boat making, etc.

Rib of coconut leaf-Broom and Handicrafts.

Other than DCP, Coconut milk/cream and Coconut fibre, other products mentioned above are not being produced in an organised manner in Lakshadweep.
Recommendations

- In order to be economically competitive and environmentally sustainable, alternative varieties, practices and better management of agricultural fields are called for.

- Hybrid dwarf coconut have become available and need to be promoted more vigorously among the farmers.

- Coconut plantations should be thinned by removal of unthrifty senile/uneconomical old palms. Other measures identified in this direction are as follows
Extensive intercrop management needs to be popularised by cultivating crop other than coconut, adaptable to the agro-climatic conditions of the territory in the interspaces of the coconut plantation such as papaya, fruits, vegetables, pulses, vanilla and tuber crops.

Encourage production and usage of organic bio-fertilisers and pith-plus compost and discourage the use of chemical fertilisers and pesticides, eliminating these altogether in a phased manner in favour of organic farming.
• **Control of pests** such as rhinoceros beetle, rodents, coconut mite which affect the coconut and other pests such as scales, whitefly, serpentine leaf minors, aphids, ladybird beetle, fruit borer and fruit flies which affect the intercrops.

• **Banana cultivation**, which was popularised by the department some time ago in all the inhabited islands, should be **discontinued** immediately in view of the heavy evapo-transpiration rate of banana trees (more than 15 litres per day per tree is required for irrigation owing to the sandy nature of the soil).
Rainwater harvesting and conservation for the development of rain fed areas and promotion of on farm water management, water saving technologies and devices (e.g., Sprinkler/Drip Irrigation) for increasing water use efficiency need promotion.

Greater partnership between Lakshadweep development agencies, ICAR in Minicoy and Krishi Vigyan Kendra (KVK) in Kiltan to lay special thrust on research for efficient water utilisation and conservation.
Promotion of water saving methods and devices such as drip/sprinkler irrigation, encouraging water conservation and recycling of household water should be prioritised. There is also a need for value addition to the fibre products, for which institutional support from various agencies is required.

The soil being highly porous and rainfall being high, there is the possibility of intense leaching losses of nutrients as well as pollution of water with nitrates.

To overcome this, promote only slow release nitrogenous fertilisers such as neem cake blended urea, urea formaldehyde, lac coated urea and applying the fertilisers in four splits for better fertiliser management. This should be pursued within the overall goal of a phased elimination of the use of chemical fertilisers.
• Foliar application of nutrients for vegetables, banana and other low canopy horticultural crops may be adopted to prevent leaching losses.

• Fishing waste at present is put back into the sea, which is environmentally undesirable and could also be used as manure.

• Use of bio-fertilisers, vermicomposts and green manure should be encouraged.
SOIL AND WATER CONSERVATION

- The topography is almost flat, soils are sandy, highly permeable and even local surface runoff marks are not seen.
- It is all in situ infiltration of rainwater into the ground.
- Since rainfall is high, soils are sandy and highly permeable with level topography, recharging potentials are extremely good.
• However, the floating fresh water zone is of limited thickness.
• Hence, extraction of shallow ground water for drinking is full of health hazards.
• Thus, the need for harvesting and extracting rainwater on a scientific basis has become very acute.
RAINWATER HARVESTING TECHNIQUES

- The traditional open wells, which are a type of subsurface fresh water skimming system, can be improved substantially.
- Their yield can be enhanced by laying filter pipes (collector pipe) horizontally into the fresh water layer and connecting it to the dug sump wells.
- In this way fresh water from 40-50 m horizontal distances can be collected into the open dug wells constructed with RCC rings.
Another option is **roof water harvesting**. The potential of harvesting rain falling on the roof is available for providing reliable drinking water. Fortunately sloping roofs of GI sheets are common all over the islands. Each storage structure can be filled and refilled many times during the rainy season and hence a system has to be designed for the fry season of five to six months.

The existing schemes for rainwater harvesting need to be integrated with this suggested approach. It is also desirable to make the rainwater harvesting structures mandatory for all future civil constructions. In respect of construction undertaken by private individuals, suitable financial subsidies may also be extended.
Soil conservation

- The conservation measures of the mainland such as trenching contour, field or compartment bunding are not required.
- Instead of these, solid block concrete rings or squares may be used and appropriate vegetation such as bamboo, casuriana or rapidly spreading or crawling type vegetation observed in Bangaram may be planted with in these concrete rings or squares. Such vegetation will provide better anchorage of concrete rings or squares and also provide a canopy to absorb waves.
- This will also provide additional energy (carbon) source for aquatic fauna and will enhance biodiversity, besides giving a pleasing appearance.
Product diversification

- Desiccated coconut Powder unit and Virgin Coconut Oil unit is operation at Kadmat under LDCL
- Coconut Milk Plant is at Andrott under LDCL
- Jaggery and Vinegar making unit at all the islands under Agriculture Department and V(D)P.
- Virgin coconut oil/coconut oil being produced by the Self Help Group in all the islands.
- Coconut fiber units for manufacturing of coir rope, coir matting and handicraft etc at seven islands under industries department.
Targets for XIIth FYP

- Inter cropping may be promoted
- Focus on coconut harvesting
- A study may be conducted from specialist for implementation of water harvesting
- Construction of cold storage at all the islands
- Private entrepreneurs should be encouraged to establish their units in Lakshadweep.
- Bio-fertilizer unit may be established.
- Rat menace