

Management's Outlook Towards Environmental Performance

Environment is embodied in our mission - 'Leave this world better than you found it'. The same is being followed by all the business activities that are taken up by the organization. JISL's logo itself embodies the four colours of nature i.e. —yellow, green, blue and brown. Environmental excellence is part of our strategic thinking and it is in our best economic interest to do so. It plays a key role in providing value added, long-lasting solutions through our products and services for water security, food security and energy security.

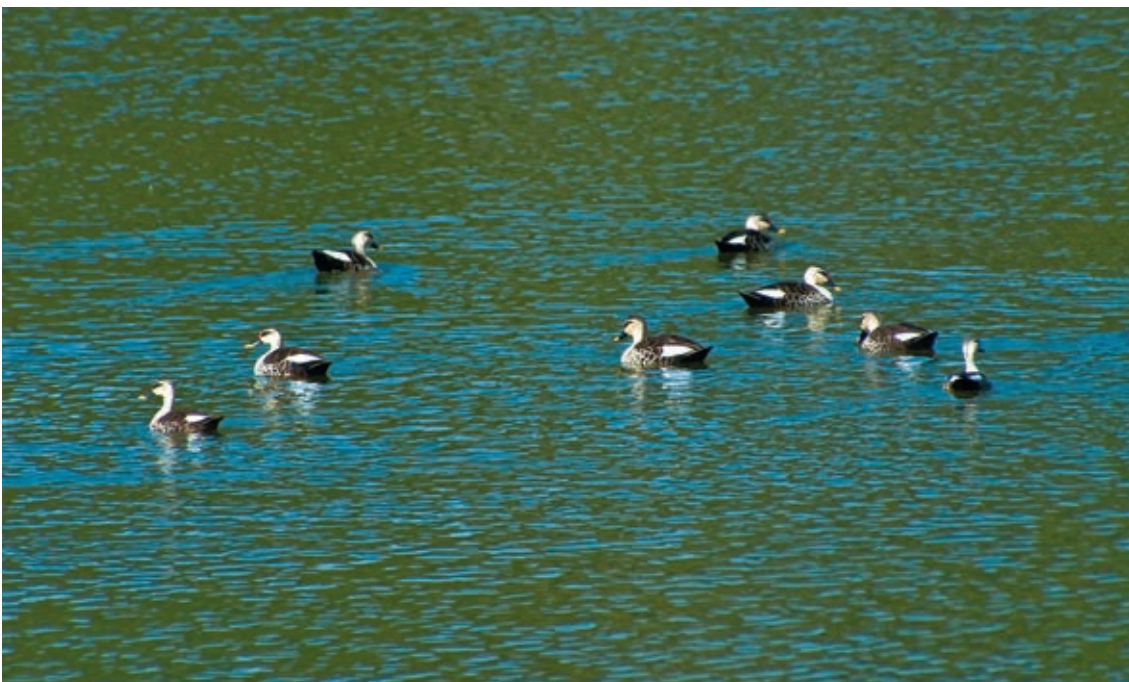
The organization has actively engaged EHS team which is committed to improve overall safety and environmental performance. All our plants in the report boundary are certified for ISO 9001:2008, ISO 14001:2004 and BS OHSAS 18001:2007. Also , we adhere to the IFC Performance Standard I, II, III, and IV to manage social, environmental and safety risks and impacts and to enhance development opportunities.

For JISL, environmental performance improvement is more than just following rules and regulations. Our approach towards environmental performance is to make it less material, less energy and water intensive, more efficient and more equitable in its impact.

Environment and Society

Protect, improve and develop environment

Cherish the symbiosis and nurture creative partnership between society and environment.



Only co-existence with nature will sustain our growth and prosperity

Environmental Performance Measures

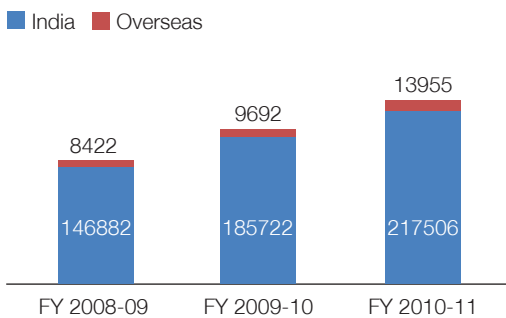
Material

The significant material used for Plastic Processing is resin. Mainly it includes PVC, PC, LLDPE, LDPE, PE and HDPE. The total consumption of resin is given below for India and overseas locations respectively. PVC has 40-50% contribution in total resin consumption. The organization recycles plastic, 10% and, 13% were recycled FY 10-11 and FY 09-10, respectively. Fresno plant has the highest percentage of recycled input material.

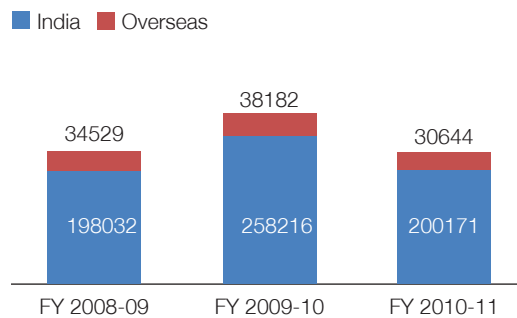
The raw fruits used for fruit processing sector is mango, guava, banana, amla, pomegranate, tomato, papaya and in vegetable processing sector it is onion. Out of the total raw fruit consumption, mango has a major contribution i.e. 54%, 71% and 71% for FY 08-09, FY 09-10 and FY 10-11 respectively in all our fruit processing locations in India. The onion dehydration plants in India have consumed 54,824, 53,030, 50,283 MT of raw onion in FY 08-09, FY 09-10 and FY 10-11 respectively. The raw material used for food processing in overseas operations is onion and consumption of onion is given below. There is no scope for recycling the material in food processing sector. We use the waste generated during food processing as input material for our biogas captive power plant and vermi-compost plant.

Raw material including components are 68% and 65% indigenous in terms of value for FY 09-10 and FY 10-11 respectively. The following graph shows the significant material consumption for India and overseas locations.

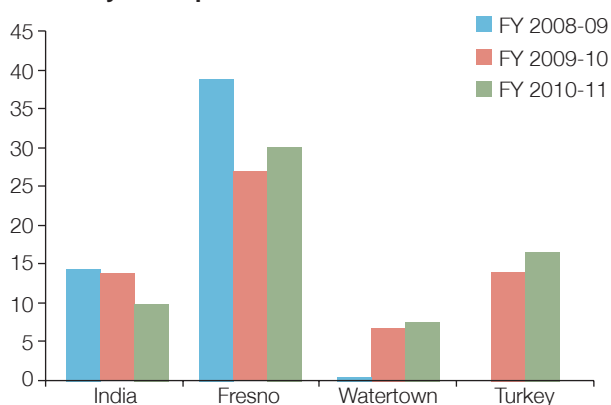
Raw Material Consumption of Plastic Sector



Raw Material Consumption of Food Sector



% of Recycled input Material India and Overseas



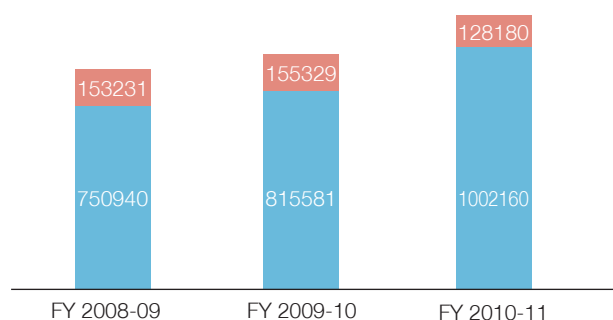
In India : Data include from Plastic Park as there is no raw material recycling in food processing.

Energy

The main sources of energy for the organization are electricity from grid and fuels. For India locations, fuels used are diesel, LPG, and coal, being the dominant fuel, whereas in overseas locations LNG, natural gas and diesel are used as fuel with LNG being the dominant fuel. In India as well as overseas locations fuel forms the major source of energy, as in India and overseas locations 62% and 89% of energy requirement is met by fuels respectively.

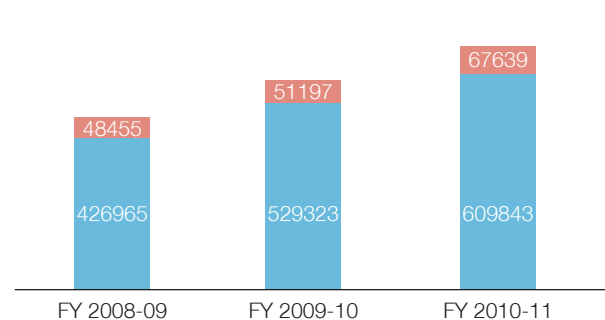
Direct Energy Consumption, GJ

India
Overseas



Indirect Energy Consumption, GJ

India
Overseas



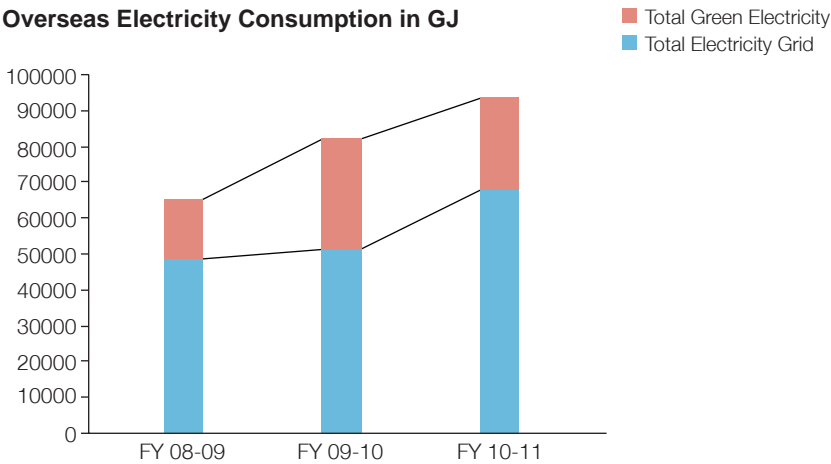
Green Electricity	
Total electricity consumption from biogas power plant in MWh, FY 2010-11	1331
Total electricity consumption from wind power plant in MWh, FY 2010-11	29861
Total electricity consumption of plants in India in MWh, FY 2010-11	200593
% Contribution of biogas power plant	0.66
% Contribution of wind power plant	14.8
400 TR WHR project on biogas power plants contributing to saving of MWh in FY 2010-11	3600
% 400 TR WHR project on biogas plant contribution to saving of electricity	1.79
Total electricity from green sources in FY 2010-11	34792
% Contribution from green sources in FY 2010-11	17.3

Green Electricity : Overseas

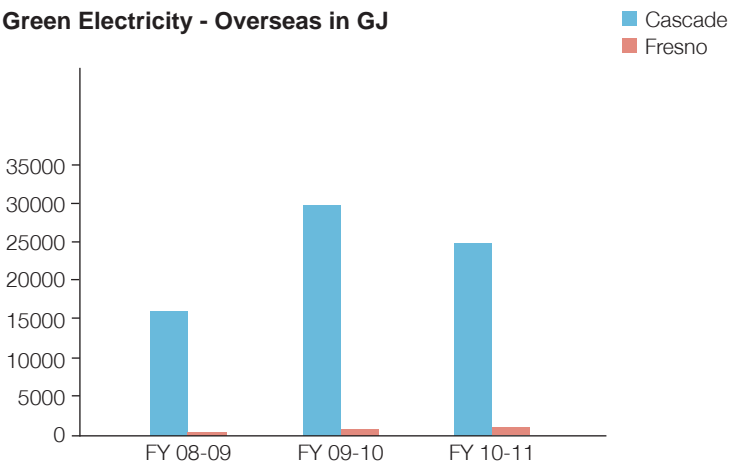
The following graph shows electricity consumption of overseas plants including green electricity from RE sources. The Cascade and Fresno Plants used electricity generated from biogas. The green electricity contributes up to 68.9% and 2.89% of total electricity

consumption in FY 2010-11 for Cascade and Fresno plants respectively. In total electricity consumption for overseas locations within boundary, green electricity contributes 25%, 59% and 27% for FY 08-09, FY 09-10 and FY 10-11 respectively.

Overseas Electricity Consumption in GJ



Green Electricity - Overseas in GJ



Energy conservation project

India:

We use mango stone for generating steam which is used in the food processing plant, Jalgaon, saving more than 5000 tonnes of coal annually.

Energy saving by replacement of fluorescent light by LEDs and also the heating effect generated by LEDs is beneficial for the growth of tissue culture plants.

Energy efficient lighting project

Solar pipe for lighting

Optimization of motor power by installation of VFDs

Energy saving by conversion of dehumidifier system from air cooled to water cooled

Project on condensate recovery.

Project on flash steam recovery from condensate tank of dryer in onion plant.

Overseas:

Heat Recovery System at Cascade Plant

Lighting/Boiler/Air-Compressor Retrofit/VFD fan control on Cold Storages at Cascade Plant.

Initiative to provide RE based products and emission reductions achieved

The following table shows quantity of power as well as emission reductions through these solar technology based products in FY 08-09, FY 09-10 and FY 10-11 respectively.

Energy Reduction through our RE products. (kW)			
	FY 08-09	FY 09-10	FY 10-11
Solar water heating system, kW	11336	11864	24735
Solar Photovoltaic systems, kW	411	605	7637

ER through our RE product, (t CO _{2e})			
	FY 08-09	FY 09-10	FY 10-11
Solar water heating system	3401	3559	7421
Solar Photovoltaic systems	481	706	8920

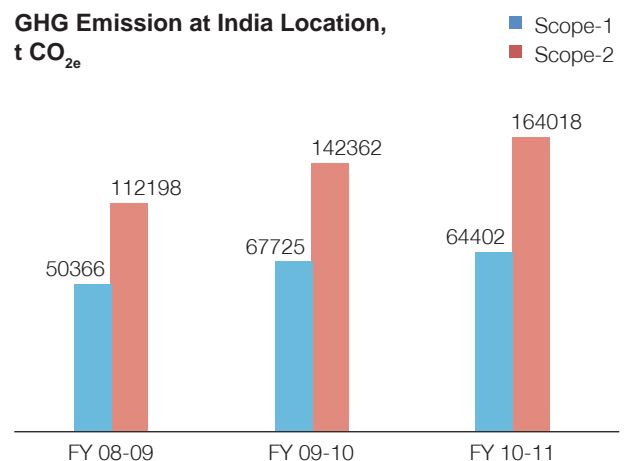
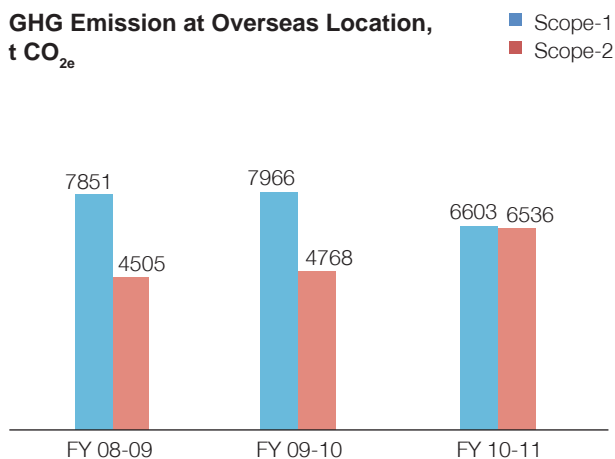
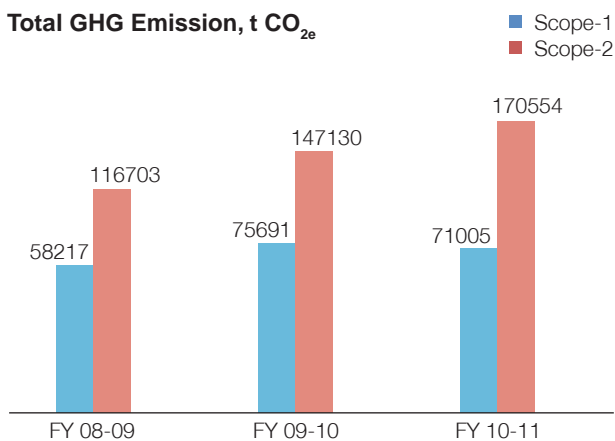
ER - Emission Reduction

Note : 100 litres of Solar Water Heating Systems = 0.45 t CO_{2e}/ annum and 1500 Watt/annum. For calculating Emission of Solar Photovoltaic system methodology used is = watt no. Of days in year no. Of hours used in a day emission factor. Assuming the system is operating 240 days a year and 4 hours in a day. For Solar photovoltaic system recurring ER are added.

Reference : MNRE

GHG Emission Scenario

The total GHG emission from India location contributes 92.9%, 94.2% and 94.5 % of total GHG emission within the boundary of report for FY 08-09, FY 09-10 and FY 10-11 respectively. The following graph shows the GHG emission scenario for the last three years. Scope 2 emissions are dominant for India locations and Scope 1 for Overseas locations.



The emission reduction project from India and overseas locations are: 1.8 MW biogas power plants, 13.2 MW wind power plant, Green electricity from Cascade Specialities and Fresno plant and tree plantation project in India. Total Emission Reduction due to these projects is 8%, 11% and 18% for FY 08-09, FY 09-10 and FY 10-11 respectively.

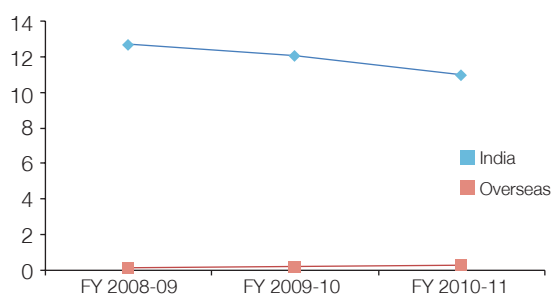
Sr. No	GHG emission scenario, (t CO _{2e})	FY 08-09	FY 09-10	FY 10-11
A	Total emission (Scope 1+ Scope 2)	174920	222821	241559
	ER- Biogas power plant			-1185
	ER- Wind power plant		-7676	-26576
	ER- Green electricity at Cascade Specialities	-1745	-3240	-2704
	ER- Green electricity at Fresno plant.	-32	-65	-71.9
	ER- Tree plantation at India location	-13837	-14529	-15255
B	ER- Total	-15614	-25510	-45791.9
C	Total emission (Scope 1+ Scope 2)(A-B)	159306	197311	195767.1

*ER- Emission Reduction.

Water

Total water used in FY 10-11 and FY 9-10 is 11,29,002 and 12,25,971 kilo litres respectively. 97 % of water consumption is by the manufacturing plants in India. The water sources are groundwater and water utilities. At the overseas locations Cascade Specialities uses ground water while other plants use water from water utilities. The food processing plant in Jalgaon is the dominant water user with 57% contribution in total water consumption in FY 10-11. Water recycled from India locations is 46%, 53% and 56% for FY 08-09,09-10 and FY 10-11 respectively and from overseas locations 16%, 25% and 31% for FY 08-09, 09-10 and FY 10-11 respectively. Water consumption from Indian locations is decreasing due to efficient usage and water recycling within the plant.

Total Water Consumption (kl)



Note : Water consumption for Chittoor 2, Hyderabad and Turkey plant for FY 08-09 is excluded.

Cascade plant data for overseas is partial for FY 10-11.

Water recycling data for India is not including Hyderabad Plant, Chittoor plant for FY 08-09 and the Baroda plant for FY 08-09.

Water recycling data for overseas plant only include Cascade Specialities.

We aim to include all data of water consumption within the boundary by 2014.

Overall Water Scenario

- Sources of water is groundwater and water utilities.
- Food processing facility in Jalgaon location is the dominant user of water.
- Total watershed area= 652 acres
- Jain Watershed + Jain Sagar= 2.5+1.2 = 3.7 billion litres
- Total rainwater harvested= 42.5 million litres/annum

CASE STUDY : “Water foot-printing”

Water foot printing of Onion Dehydrated Products and Drip Irrigation Systems Installed for growing onion was done in the year 2009-10. This was a joint work of JISL in-house team supported by IFC with the consultants LIMNOTECH and NATURE CONSERVANCY based in USA. This is a unique work in itself, as water foot-printing is a young science and growing with steady pace. Our work is a landmark in this science, as we have contributed to repercussions and after effects of the water foot-printing assessment. The real application of Water Footprint Assessment is for working out the sustainable strategies in the same river basin in which we are functioning. This report is the first of its kind in the preview of Water foot-printing Network (Jain Irrigation is also a member of Water Footprint Network {WFN} based in the Netherlands). The methodology of sustainability assessment was devised by WFN very recently and was pilot tested for own work. The work was applauded in the annual Forum of WFN held on 9th Sep, 2010 parallel to the WORLD WATER WEEK in Stockholm, in Sweden.

Water foot-printing (WF) study Pilot

Drip irrigated onion WF = 1800 litres/kg

Flood irrigated onion WF = 3000 litres/kg

Savings due to drip = 1200 litres/kg = 1200 m³/MT

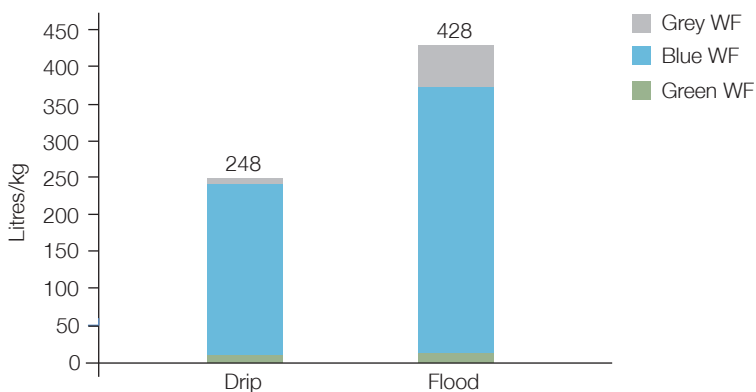
Virtual water trade reduced by Jain Irrigation

= 15000 MT x 1200 m³/MT x 30% (drip irrigated onion sourced)

= 60,00,000 m³

= 6 million cubic metre per annum

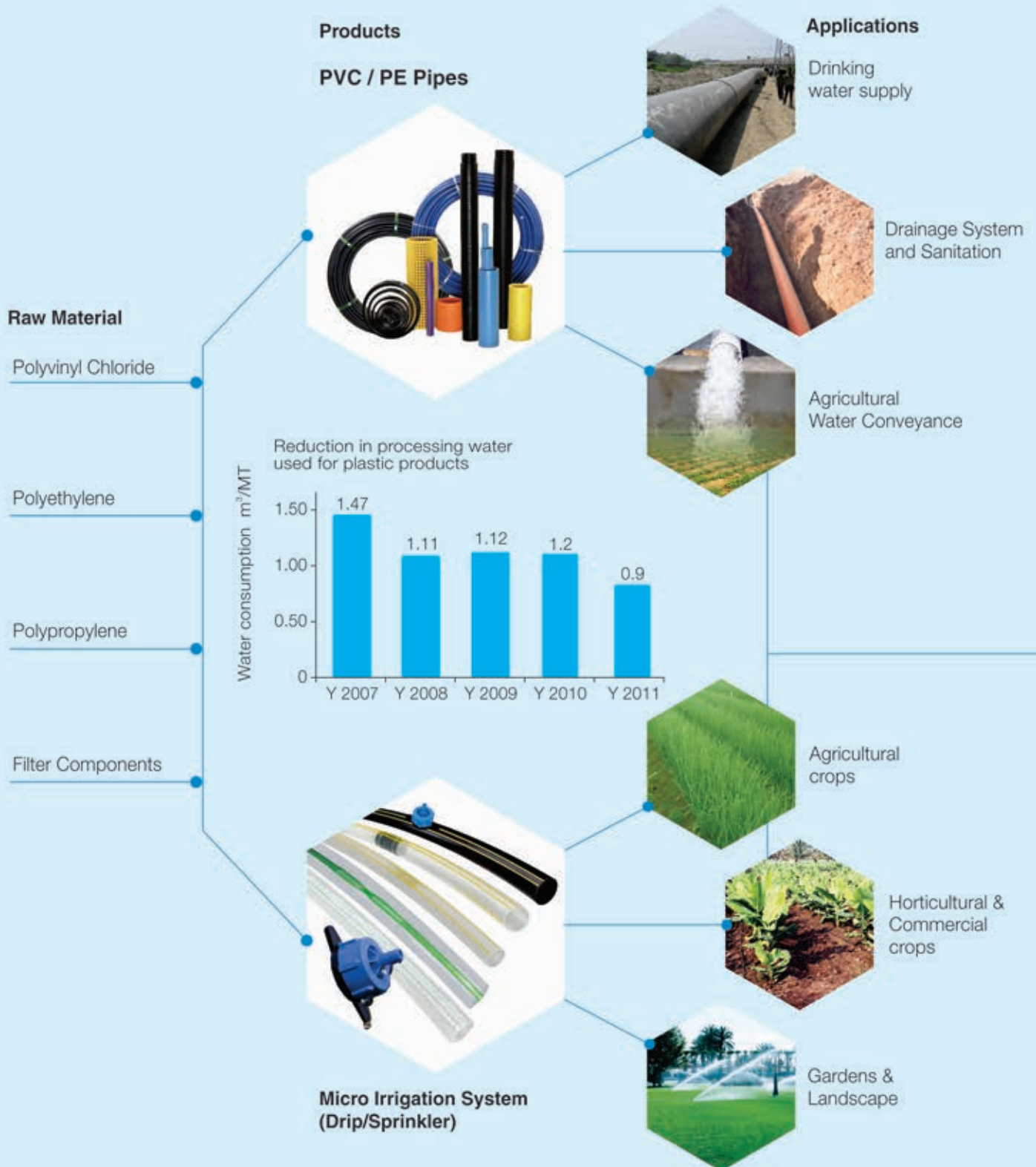
Water footprint of raw onion in drip irrigated and flood irrigated areas.



Water footprint of drip irrigated raw onion = 248 litres/kg

Similarly for flood irrigated raw onion water footprint = 428 litres/kg

This study was funded by IFC and Govt. of the Netherlands, and was presented in World Water Week in Stockholm. Also available on the website of : WATER FOOTPRINT NETWORK and at www.jains.com



Rainwater Harvesting : Plastic Park

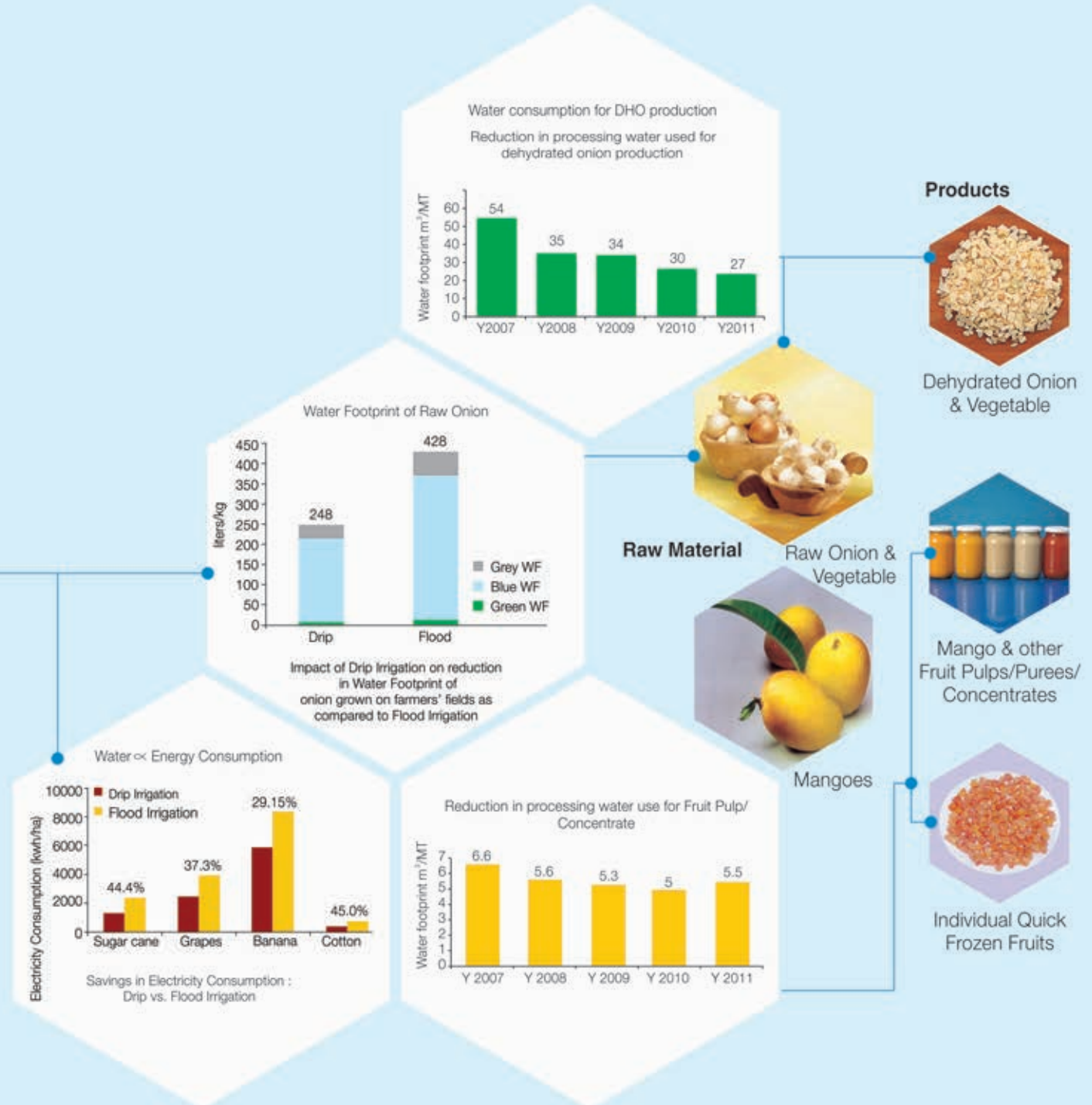
- Total area = 140 acres water harvesting methods : Rooftop collection and Percolation pond.
- The rooftop water is collected, filtered, and directed to open wells which is nearly 40% of total 28 acres of rooftop.
- The polyline percolation pond drains 40 acre of total area.
- A total of 42.5 million litres is collected annually through these methods (10.5% of annual water withdrawal), Ultimate target of 88 million litres (23% of annual water withdrawal).

Treated waste water is utilised for gardening : approx : 6 lakhs litres per day

Food Park

Jain Water Shed

- Total area = 512 acres
- Water harvesting is done through soil and water conservation methods
- Total water harvested = 2.5 billion litres
- Jain Sagar Dam = 1.2 billion litres



Waste water is utilised for generation of biogas and then treated waste water is used for lawns, gardens and horticulture plantations : approx : 12 lakhs litres per day for six months duration

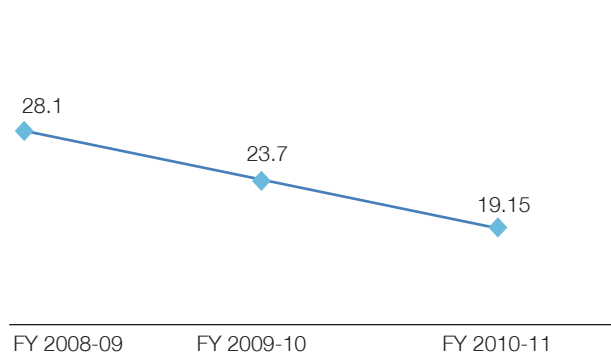
Reducing Ozone Depleting Substance (ODS)

The Government of India (GOI) became a signatory to MP in 1992 and hence is obliged to assure phase out of such substances in India. Following its commitment, the Government of India has initiated rules and regulations to ensure strict adherence to the phase out. An ODS (Regulation and Control) Rules, 2000 has been already enacted. The ODS Rules fix time frame to phase out ODS. JISL also developed and implemented an ODS phase out plan which includes the following,

- All newly purchased equipment to be free of chlorofluorocarbons (CFC), halons and methyl chloroform (MCF)
- Replace all the existing equipment using ODS well before the phase out stipulation.

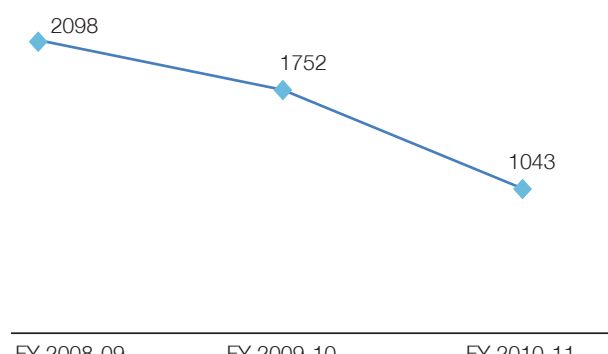
The implementation of phase out plan is already started. As a result total consumption of R-22 is decreasing as shown in the following graphs. According to Scheduled-IV, regulation on consumption of Ozone Depleting Substances on end use basis the use of methyl bromide (group VII) except pre-shipment and quarantine will be phased out by 1-1-2015. In JISL plant we use methyl bromide for quarantine process. The total consumption of ODS of CFC-11 equivalent and methyl bromide is as follows:

R-22 in kg of CFC-11 Equivalent - India



This ODS data includes India locations within boundary of report

Methyl bromide in Kg CFC-11 Equivalent - India



This ODS data includes India locations within boundary of report.

Air Emission and Effluent Discharges.

The sources of Emission of NOx, Sox, and TPM in plant are from DG set, boiler stack and vehicles commuting inside factory. The Air pollutant data is given as follows:

	FY 08-09	FY 09-10	FY 10-11
Air pollutant, Kg/year	1074	1827	3832

This data is only for India locations including Plastic Park in Jalgaon, Hyderabad, Udumalpet, and Food and Energy Park Jalgaon and excluding Baroda and Chittoor plants. We aim to include this total data within boundary by FY 2014.

The organization adheres to the regulations of state pollution control boards of the respective locations of the plants. The emission level and waste water quality from our divisions are well below the permissible limits stipulated by the state control boards of respective plants. We recycle 100% of water which is used for in-plant use, plantation and gardening within the premises.

Significant Spills

There were no significant spillages inside or outside the organization premises during 2009-2011. Further, the organization is not transporting, importing or exporting any hazardous waste internationally as specified under the Basel Convention.

Defining the Significant Spill :

1. Unpermitted spill, release or discharge of oil, chemical or other substances that passes the boundaries of organization property, or enters surface water (on or off the property).
2. Unauthorized release of any chemical into atmosphere exceeding government mandated reportable quantity or 220 kg over 24 hr period whichever is less.
3. Transport related spill or release of fuel, oil, and chemical or product greater than 400 lit. or 30 lit (in case of chemical) involving an organization owned vehicle.
4. Regulatory violation or alleged violation that results in a forced or mandated disruption to operation.

Waste Generation

Total waste generated in India :

Two types of waste are generated during the processes namely hazardous and nonhazardous. The hazardous waste generated during plastic and food processing and during Solar PV and appliances manufacturing are : used oil, oil soaked cotton, paint soaked cotton, used batteries, empty containers of chemicals, waste chemicals and solvents. The Nonhazardous wastes are fruit and vegetable peels, plastic bags, plastic scrap, metal scrap, paper bags and empty barrels etc.

The following table shows the quantity of waste generated during the various manufacturing processes :

Year	Nonhazardous waste	Hazardous waste
FY 08-09	Solid waste, Tonnes= 19997	Solid waste, Tonnes= 6.7 Liquid waste, Litres= 24121 Waste in Nos.=15
FY 09-10	Solid waste, Tonnes= 24338 Liquid waste, Litres= 1410 Waste in Nos.=1419879	Solid waste, Tonnes= 10.7 Liquid waste, Litres= 20275 Waste in Nos.=55
FY 10-11	Solid waste, Tonnes= 23813 Waste in Nos.=2710720	Solid waste, Tonnes= 11 Liquid waste, Litres= 32995 Waste in Nos.=181

Note: This data includes all locations in India within the boundary. No data for liquid waste in FY 08-09 and FY 10-11 and waste in Nos. for FY 08-09.

Total waste generated Overseas :

At Sleaford and Cascade plants there have been no hazardous waste generated. Inspections performed by "Provincial Environment and Forestry Directorate" in Turkey plant for "Hazardous waste control regulation" state that Turkey plant is exempted from regulation of hazardous waste. Fresno plant has 411,429 and 552 Tonnes of nonhazardous waste and 0.27, 0.24 and 0.62 Tonnes of hazardous waste for FY 08-09, FY 09-10 and FY 10-11 respectively.

Watertown plant has 1268, 1199 and 1211 litres of nonhazardous waste for FY 08-09, FY 09-10 and FY 10-11 respectively.

Exclusion : Hazardous waste data for Watertown and hazardous and nonhazardous waste data for the machine is not included.

Waste Management :

All the hazardous waste is sent to authorized recyclers for safe disposal. All the biodegradable waste generated during the Food Processing at Jalgaon is utilized in waste-to-energy project.

CASE STUDY : Waste-to-Energy Project

The raw materials brought from agriculture fields are used as input raw material for fruit and onion processing. The solid waste generated in processing i.e.

- Fruit peels and stone,
- Skin, spoiled onion and vegetables
- Sludge waste from onion and fruit ETP is utilized in biogas plant as an input material and output of biogas plant i.e. Methane gas is used as fuel for power generation. The waste heat generated during the process is utilized for refrigeration purpose by using VAM (Vapour Absorption machine) and other output from biogas process i.e. waste is utilized for preparing the green organic manure by vermi compost activity. Details are as follows:
- Biogas power project 1.68 MW, Jalgaon, India.
- Green electricity utilized in FY 2010-11 is 1331317 kWh used in same processing plant
- VAM (Vapour absorption machine) of 400 TR used for refrigeration purpose
- 10 ton/day organic manure is prepared from 120 ton/day waste with organic carbon content 22 %. Used as valued input material for our agriculture fields.

This project is a closed loop cycle that starts with raw fruit from agriculture and ends as valuable input material for agriculture.



1.6 MW Bio-gas power plant

Compliance with Statutory Requirements

All statutory requirements pertaining to environment management have been identified as part of the Integrated Management System. Regular monitoring ensures strict compliance with the statutory requirements. In 2008-09, Cascade plant was fined \$5000 for noncompliance with environmental laws and regulations. For other plants no monetary or nonmonetary fines or sanctions were imposed on the organization on account of any environmental issue.

Products and Biodiversity

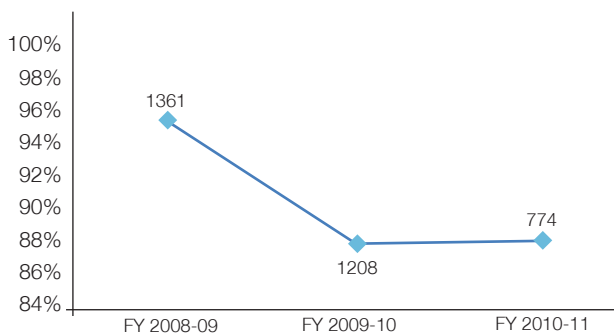
As far as our product range is concerned, they are not impacting the biodiversity in any way, neither is the location of our manufacturing plants near any rich biodiversity areas nor has it access to a high biodiversity protected area. Our products do not hamper biodiversity in any way.

Percentage of Products sold and their packaging material reclaimed

The organization recognizes that the disposal of products and packaging materials at the end of a use phase is a steadily growing environmental challenge. Establishing effective recycling and reuse systems to close product cycles can contribute significantly to increased material and resource efficiency as well as mitigate problems and costs related to disposal. JISL reclaims most of its packaging material in food processing from its customers.

In Food Processing operations in India we reclaim the drums used in packaging of fruit product. The following graph shows number of packaging drums reclaimed in last three years.

Nos. of packaging Mateial Reclaimed by Food Park, India



At Cascade plant we recycled fibre boxes 5.2%, 8%, 24.8% in FY 08-09, FY 09-10 and FY 10-11 respectively. Other products sold by JISL have virtually no scope of reclaiming the product or its packaging and hence, no reclaiming is done in other areas of business.

CASE STUDY: Biodiversity Conservation Project

Knowing the importance of biodiversity and its associated ecological processes, we have conducted ecological assessment of Jain Hill and Jain Valley area. Under the guidance of our respected Chairman, we have developed and implemented a Biodiversity conservation action programme.

Much work has been done in Jain Hills for soil and water conservation, resulting in increased green cover. Eighty per cent of area is under some kind of plantation which includes, horticulture, agriculture and non-agricultural plantation.

Various works undertaken through Biodiversity Conservation Action Plan

1. Seed bank,
2. Herbarium conservation,
3. Wild crafting
4. Khandesh Virtual Herbarium Project,
5. Apiculture for biodiversity (beekeeping)
6. Bird conservation programme,
7. Native Botanical Garden

Under this project listing of various species is carried out throughout our farm areas mainly Jain Agri Park area which is known as "Jain Hills". In this project listing is of native and other species and it includes forest areas and natural conservation areas which are adjacent to our farm areas.

Flora / Fauna	No.	Flora / Fauna	No.
Herbs	33	Fruit crop	54074
Shrubs	18	Ornamental Flora	10223
Climbers	14	Agro-forestry	45416
Grasses	10	Medicinal	564
Birds	91	Flower plants	4253
Insects	19	Natural forest species	1691
Reptiles	11	Trees	75
Mammals	20	Total	1,16,221

Afforestation and Biodiversity

Total number of trees planted : 1,16,221.

Quantum of plant and animal species protected : 150 species of flora and 131 fauna

Biodiversity Indexing, Nutrient mapping

Each year 25,000 planting work is done and 10-12 % is survival rate, we are trying to improve the survival rate.

Plants are irrigated with drip irrigation, on slope they are allowed to grow naturally.



Ladybird Beetle (*Coleoptera coccinellidae*) on flower



Langur (*Presbytis entellus*) are in abundance at Jain Hills, India



Peacock (*Pavo cristatus*) at Jain Hills



Kingfisher (*halcyon*) is a common bird found at Jain Hills, India



Chameleon (*Chamaeleonidae*) at Jain Hills



Bulbul (*Pycnonotidae*) at Jain Hills



Cormorant at Jain Hills