FIXED ASSET LOANS FOR FARMERS

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Agriculture In India

Indian Agriculture Scenario

Land: Geographic area of **329m ha** ; sown area **140 m ha**.

Water: 70 m ha still Rain-fed. (50% Irrigation cover)

Land Holding: Less than 1.5 ha/ farmer,
one-hundredth that in the USA.

Productivity: Agricultural productivity one-third to half that of world best levels.

Against above, the government is now targeting 4% growth over the next two decades.

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Characteristics of Existing Agriculture

- Marginal Land Holdings
- Rapid and widespread decline in ground water table.
- Inefficient use of inputs e.g. fertilizers, irrigation and pesticides
- Wastage of agricultural produce due to inadequate Post Harvest operations.
- Lack of awareness among farmers for modern crop production methods
- Ineffective extension service
- Insufficient financial resources for investments.
- High level of consumption subsidies resulting in wastages
- Low per hectare income for farmers

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Demands of Future

PROJECTED FOODGRAIN DEMAND AND IRRIGATED CROP AREA				
	unit	2010	2025	2050
Food grain demand	million t	247	320	494
Net cultivated area	m ha	143	144	145
Total cropped area	m ha	193	204	232
Total irrigated crop area	m ha	79	98	146

Source: National Commission on Integrated water resources development, GOI

MICRO-IRRIGATION TECHNOLOGY

- ADVANCES IN AGRICULTURAL INPUT MANAGEMENT – WATER, FERTILIZER and SELECTIVE PESTICIDE

History of Micro-Irrigation

- Earlier attempts were made by German researchers in 1860 by simply pumping irrigation water into clay pipes of underground drainage system.
- The first work on MIS was a study by House in Colorado in 1913 who concluded that drip was too expensive.
- An important breakthrough was made in Germany in 1920 when perforated pipes were used for irrigation.
- In 1930, the peach growers in Australia, pumped water through 5 cm GI pipe laid along the tree rows with water emitting points made on to the pipe as small triangular holes.

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History of Micro-Irrigation

- In early 1940 Symcha Blass observed that a tree near a leaking faucet exhibited vigorous growth compared to other trees in the area. This led to the concept of MI where water is applied in very small amounts, drop by drop.

- The next breakthrough is in the material science, when polyethylene, a crack resistant and cheaper alternative was accidentally produced in a British laboratory. Later LDPE gave place to HDPE and in 1977 LLDPE was introduced.

- Thus micro-irrigation systems really got off the ground with the developments in plastic industry.

- Then the orifice emitters were developed to improve the consistency of " holes drilled into pipes"

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History of Micro-Irrigation in India

- During late 60s and early 70s some Drip systems were adopted.
- These systems failed due to poor quality material and little or no support services by manufacturers.
- 4 to 5 manufacturers were in field of Drip system sale when Jains entered the market in 1987.
- Approximately 2500 ha were under drip in 1987.
- Jains with their commitment for service and best quality material boosted the awareness in farmers and subsequent sales.
- Area under drip during 1987 to 92 doubled every year.
- Presently 500,000 ha is under Drip in India out of which about 400,000 ha are covered by JISL systems/services.

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Micro Irrigation Systems

- Frequent, slow application of water either directly onto the land surface or into the root zone of the crops
- Irrigating only the root zone of the crops rather than the entire land surface
- Maintaining the water content of the root zone at near optimum levels

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Principles of Micro Irrigation

- Water is applied to the root zone of the plant directly.
- Water is applied at frequent intervals (daily) in controlled quantities as per requirements of the plants.
- Water is applied through a low pressure network including main, submain and lateral lines with emitters/drippers spaced along the lateral lines.
- Water is essentially passed through a filtration system to prevent suspended impurities, which may block the emitters.
- Water soluble fertilizers and nutrients can also be applied along with micro irrigation through a fertilizer tank and/or ventury.

Progress In Technology

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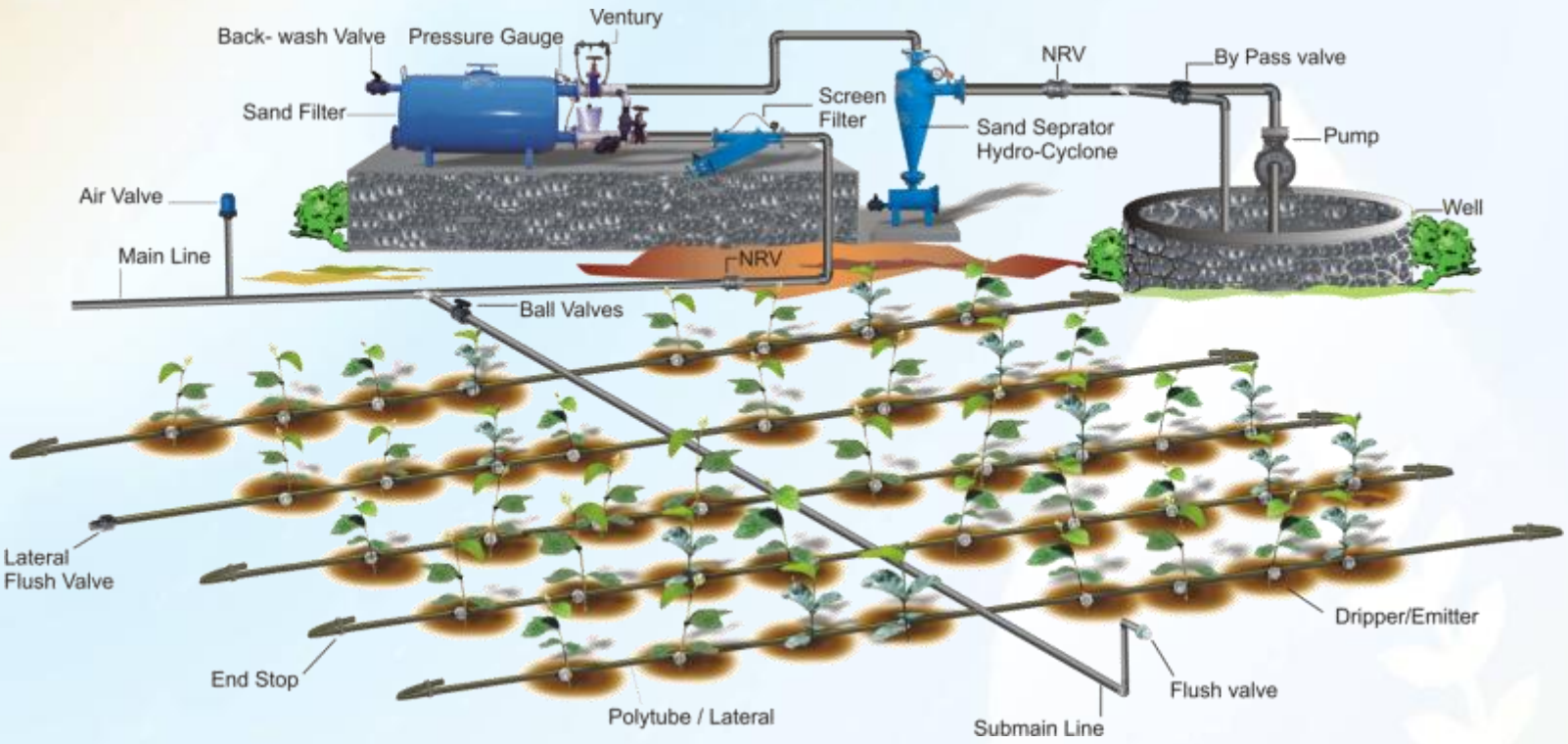
Micro Irrigation -The Solution

Application of water to root zone through custom designed system



Visible Benefits: Water Savings, Cost Savings & Productivity Increase

Suitable for Cash Crops, Horticulture Crops, Oil Seeds, Fruits & Vegetables and Agro-forestry

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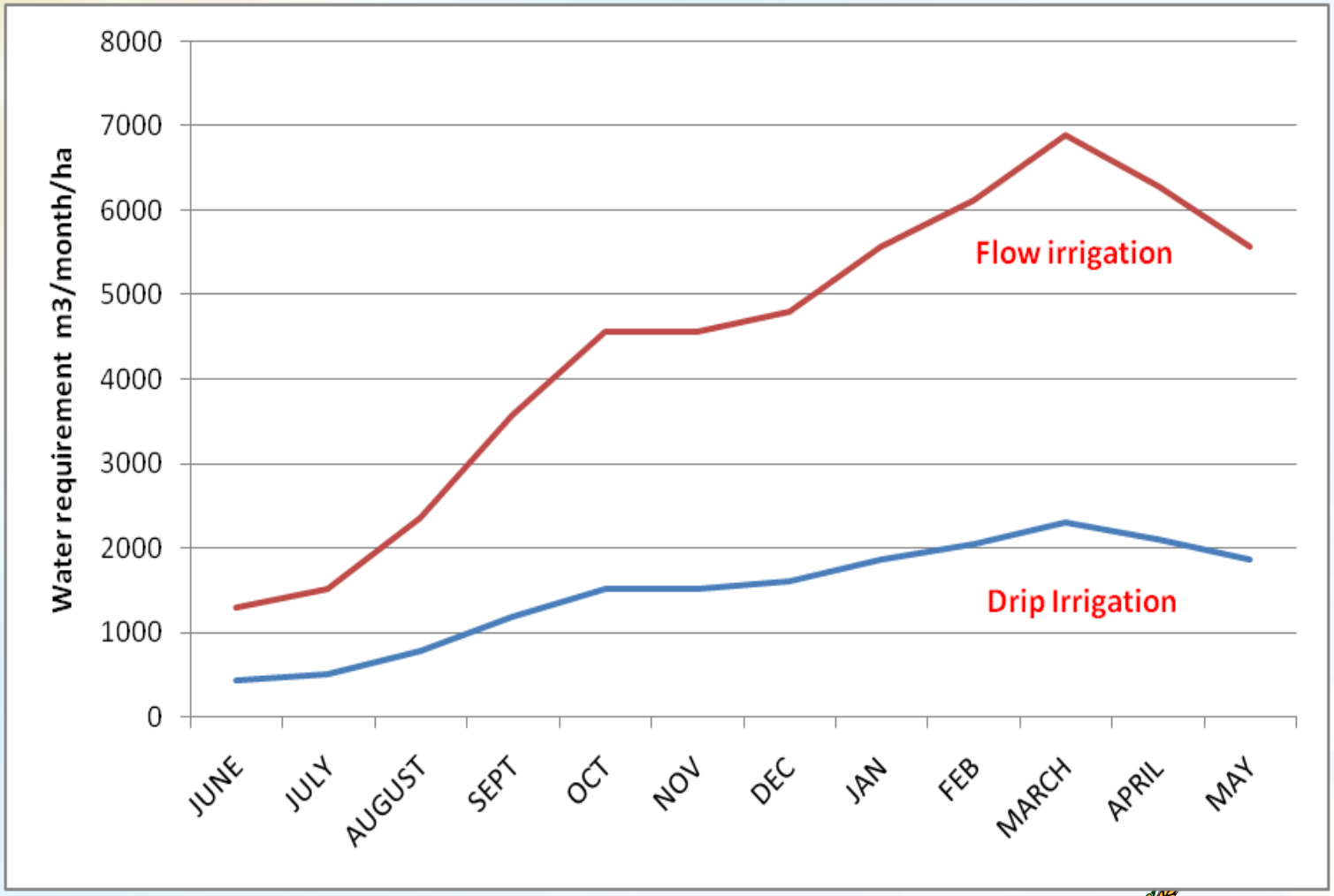
Water Use By Banana



Variety – Karpuravalli
at 2 x 2 m spacing , Krishna dist., AP

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Benefits Of Drip Irrigation

Crop	Saving of fertilizer (%)	Increase in yield (%)
Okra	40	18
Onion	40	16
Broccoli	40	10
Banana	20	11
Potato	40	30
Tomato	40	33

Source:-Patel & Rajput, 2001

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Benefits In Sugarcane Culture

Particulars	Drip	Flood	Gains over flood	
Productivity (t/ha)	85	55	54.50%	30 t
Water saving (mm)	1200	2200	45.5	1000 mm
Electricity Consumption (Kwh)	900	2160	58.3	1260 Kwh
Water used per t Cane (mm)	14.1	40	64.75	25.9 mm
Cost per t Cane (Rs)	379.4	541	29.9	161.6 Rs
Electricity used per t Cane (Kwh)	10.6	39.3	73	28.7 Kwh

Source: Narayanamoorthy, 2003

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Flower Crops

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Fruit Crops

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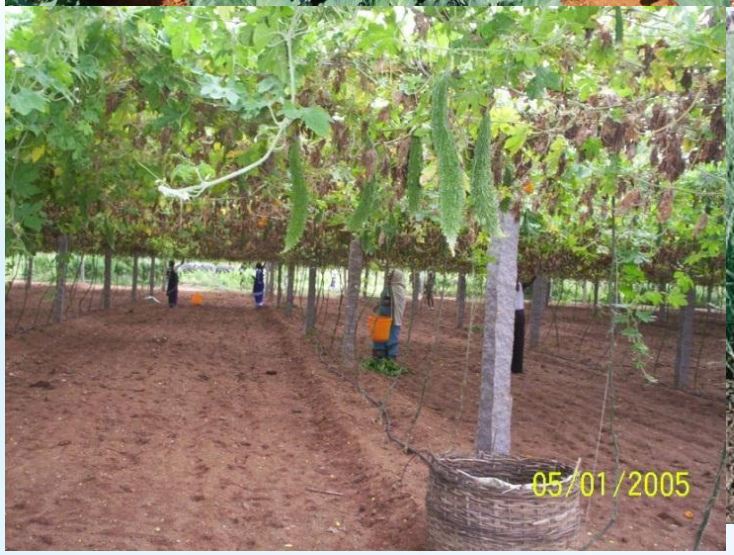
Drip Irrigated Vegetables



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Enhancement of Productivity Through Technology Intervention

Crop	National Average t/ha	Yield after Technology adoption t/ha
Tomato	17.35	**150.00**
Chilly	12.02	**35.00**
Brinjal	10.46	**130.00**
Okra	6.28	**16.00**
Onion	11.32	**21.00**
Cabbage	14.38	**110.00**
Cauliflower	14.22	**33.00**
Ash Gourd	11.91	**50.00**
Bitter Gourd	6.23	**15.00**
Ribbed Gourd	15.85	**35.00**
Bottle Gourd	12.21	**66.00**
Cucumber	6.48	**20.00**
French Beans	5.8	**12.00**
Beetroot	16.75	**35.00**

 # Data collected from adoptor farmers

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STUDY OF INDIVIDUAL FARMER CASES

Case Study On Chilly

Farmer	**Ravikumar, Kothagudem, Khammam, AP Mobile: 9440164800**
CROP	GREEN CHILLI; in 2 acre
DRIP SYSTEM	16mm inline ; 4 lph emission
COST OF PRODUCTION	$ 1965 / acre
YIELD	30 t / acre under drip
INCREMENTAL YIELD over flood irrigation	**18 t / acre**
RATE OF SALE	$ 159 / t
NET INCOME under drip	$ 2809 / 5 months
B:C Ratio	1.4:1 ; Payback period 1 season.

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Case Study On Potato

Farmer	**Ashok Varma, Hasalpur, Indore, MP Mobile: 9893427845**
CROP	Potato; in 1 acre
DRIP SYSTEM	16mm inline ; 4 lph emission
COST OF PRODUCTION	$ 545 / acre
YIELD	21 t / acre
INCREMENTAL YIELD over Flood irrigation	**11 t / acre**
RATE OF SALE	$ 173 / t
NET INCOME under drip	$ 3090 / 5 months
B:C Ratio	5.7:1; Payback period 1 season

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Case Study On Sugarcane

Farmer	**Mr. Mathivannan, Village Thamarakki, Sivagangai, Tamil Nadu, Mobile: 978662196**
CROP	Sugarcane; in 3.5 acre
DRIP SYSTEM	16mm inline ; 4 lph emission
COST OF PRODUCTION	$ 1305 / acre
YIELD	74 t / acre
INCREMENTAL YIELD over flood irrigation	**36 t / acre**
RATE OF SALE	$ 46 / t
NET INCOME under drip	$ 2059 / 11 months
B:C Ratio	1.6:1 ; Payback period 18 months

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Case Study On Wheat

Farmer	**Pannalal Kumarawat, Barud village, Khargone, Madhya Pradesh,Mobile: 9826405764**
CROP	Wheat; in 1 acre
DRIP SYSTEM	12mm inline ; 4 lph emission
COST OF PRODUCTION	$ 177 / acre
YIELD	2 t / acre grain; 2 t / acre fodder
INCREMENTAL YIELD under flood irrigation	**0.8 t / acre**
RATE OF SALE	$ 277 / t grain; $ 28 / t fodder
NET INCOME under drip	$ 435 / 4 months
B:C Ratio	2.5:1; Payback period 1.5 years with rotation crops

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Solar Powered Small Scale Drip Irrigation

- **Solar powered Drip model for small farms.**
- **Water is stored in a earthen sump or plastic tank.**
- **Water is collected by rain water harvesting.**
- **This model would be ultimate package for remote rural farms to ensure securities in food, water and energy.**

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Thank You