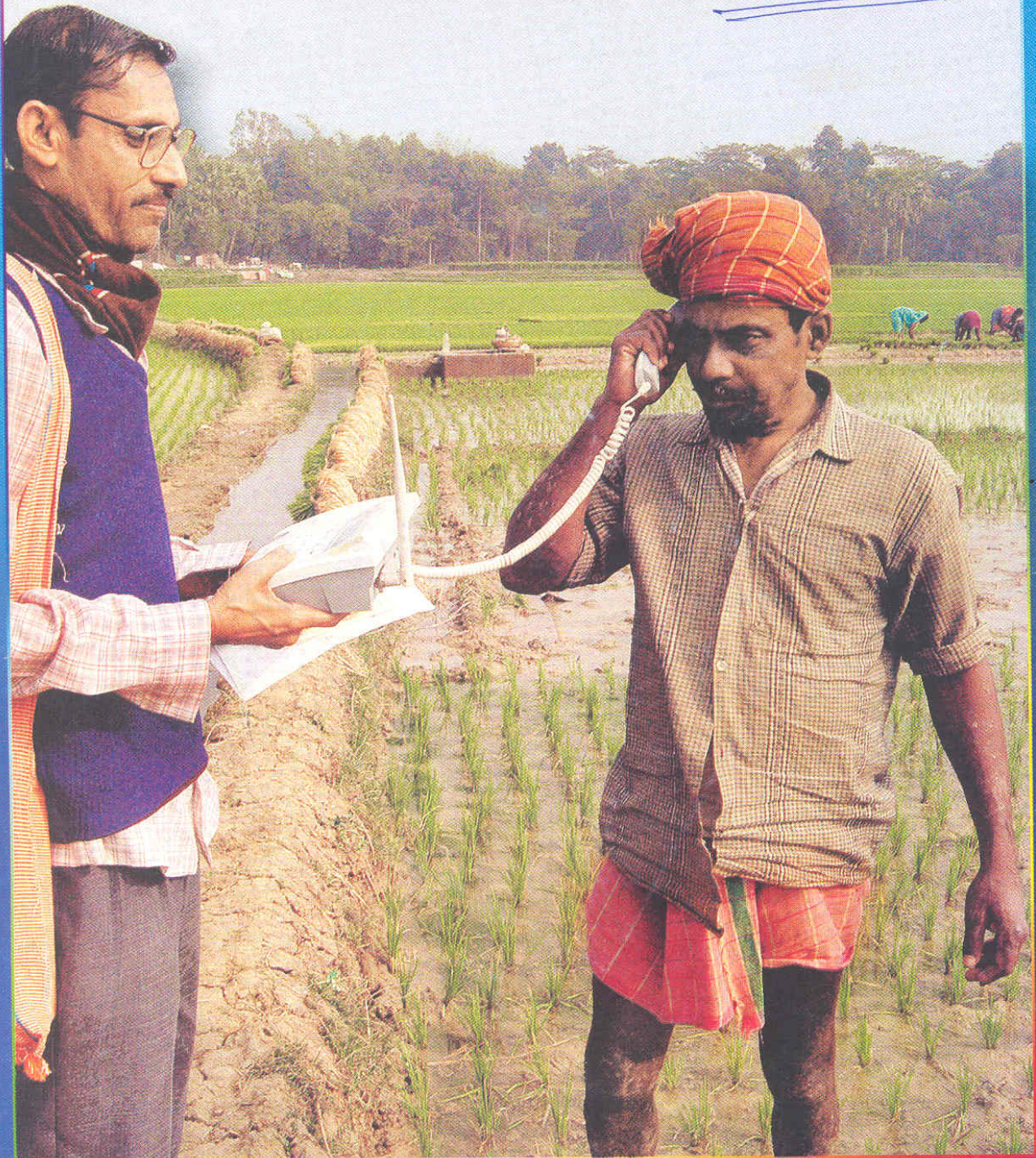


THE  HINDU

# SURVEY OF INDIAN AGRICULTURE 2004



Rs. 50



# Tapping nature's bounty

A thousand tonnes of water has to be used in agriculture to produce 1 tonne of wheat. Agriculture uses about 70-80 per cent of total available water. Micro irrigation is the ultimate solution for water shortage low crop intensity and other problems of irrigation says **Mr. Bhavarlal H. Jain**, Chairman, Jain Irrigations Systems Limited, Jalgaon, Maharashtra.

**I**NDIA IS a disadvantaged nation compared to many others when it comes to per capita availability of land and water. We only have 2.4 per cent of land mass and 4 per cent fresh water resources of the world.

We are, however, required to support 17 per cent of the world population. The population is growing at around 2 per cent annum. Since independence, therefore, per capita land availability has dwindled from 0.48 ha to 0.15 ha and water availability has been reduced from 5300 cum to 1500 cum.

To add to the cases there has been an increase in demand from the domestic and industrial sectors. So availability of irrigation water has been under pressure.

Notwithstanding our compulsion to maintain 'Food Security', it must be acknowledged that the economics of water use do not favour farming sector. A thousand tonnes of water has to be used in agriculture to produce 1 tonne of wheat. It can be used to expand industrial output to the extent of Rs. 3 to 5 lakhs as much as 30 to 50 times value addition. Agriculture uses about 70-80 per cent of total available water.

As such, there is a crying need for coherent, integrated irrigation water conservation and management policy and practices.

The concept suggested below is based on local area specific total land and water-use planning as against traditional command area crop-specific water-use planning. It assumes integration of various departments, boards, schemes, programmes and agencies and community involvement for successful implementation.

## Small watershed — a must

The unit of planning will be a village or a group of villages covered by a watershed. Taking into consideration the agro-climatic and geophysical conditions of the given watershed,

properly designed location-specific engineering water-harvesting structures should be constructed for harnessing rain-water.

These will include soil and water conservation as well as bio-mass generation measures. Once these harvesting measures are in place, the surplus run-off, if any, will be stored in medium/ minor dam(s).

These have to be preferred over large dams because, though costlier and less dependable, they dispense the benefits to the more needy land, have shorter gestation period and are easier to manage.

Large dam command area beneficiary farmers are a small percentage compared to the deprived ones. They tend to raise only water-hungry cash crops.

The continued flow irrigation in command area gives rise to increase in salinity and eventually causes decline in percentage yields, gestation periods about 10 — 20 years, the seepage, disuse, weeds, evaporation and conveyance losses. All of these add to the ever mounting cost of creation of such large dams.

We need to begin with watershed grid in the small watershed of individual village and integrate minor projects into the scheme and further use available water in dams and canals only through micro irrigation system.

Micro watershed will represent backward integration of the present drip irrigation practices and micro irrigation will be its forward integrating plank. Together, they will form a modern irrigation package. We have to work out a proper balance amongst mini watershed developments, minor dams and micro irrigation methods.

In micro irrigation water is applied at low pressure over a long period of time at frequent intervals directly into the plant's root zone through network of main lines, sub-mains and lateral lines with emission points spaced along their lengths. The emitter/ dripper/ orifice applies precisely controlled quantity of water, nutrient and other growth substances uniformly. Soil moisture is maintained slightly below field capacity. In this manner, with combined forces of gravity and capillarity, moisture and nutrients are replenished immediately and the plant does not suffer from water stress and/ or water overdose.



A field irrigated by drip irrigation.



### Benefits of micro irrigation

Micro irrigation ensures 30-70 per cent savings in water, 25-100 per cent increase in yields and 15 - 30 per cent reduction in operating and crop production costs. It economises

energy usage around 50 per cent by reducing pumping hours and frictional losses. Resultantly, it can double the area under irrigation as well as improve quality of end product.

It can transform problem/ waste land (hilly, undulated, sandy, water-logged and/or saline soils) into productive land. It also enlarges employment opportunities on sustained basis through higher crop intensity, expanded land use and enhanced yields, eminent possibilities of post harvest handling and processing. In a nutshell, it is a total plant support and management system which rewards the user with optimum utilisation of resources, higher production and higher returns on investment through premium quality and reduced costs.

When integrated with irrigation projects, micro irrigation can address the problem of grave disparities arising out of lopsided distribution of canal water. Only by such integration the irrigation potential can be reached to the maximum envisaged level at sustainable financial and social costs. It is, therefore, suggested that the conjunctive surface and

groundwater use planning should begin with micro watershed, integrate where needed, with minor irrigation dams and further be complemented by micro irrigation network.

### Need paradigm shift

Notwithstanding the fact that the Government have poured enormous sums of money for creating irrigation potentials in past over 40 years, the total number of people below the poverty line remain unacceptably high. Harnessing modern technology like micro irrigation and integrating it with conventional irrigation projects with bold policy initiatives can solve the problems. We need paradigm shift.

The approach needs to be total and not piecemeal: From micro watershed to micro irrigation. Dam is not a mere water holding structure. It is an infrastructural project which serves as storage of water, generates hydro-power, controls floods, provides drinking water and means prosperity for the beneficiaries in the command area.

Micro irrigation systems save water, increase yields per unit of water, energy and soil. It can lead to value added exports, result in greater social equity, conservation of precious natural resources, promote and protect environment and ecology and can transform agriculture.

Micro irrigation technology can ensure cost efficient and sustainable agricultural development in the country and result

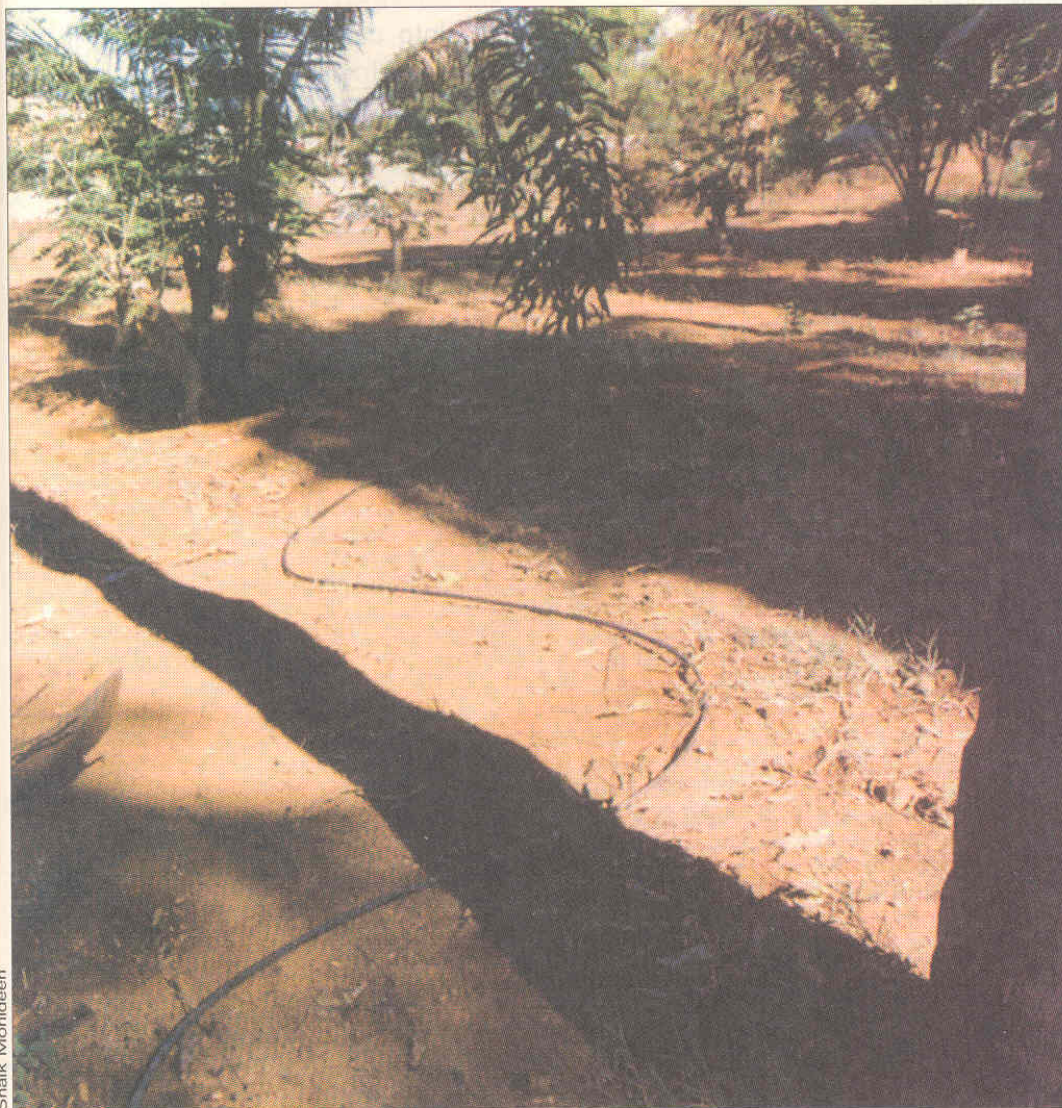
in higher addition to GDP.

It can reduce the burden of the Government in the long term by reducing capital, operational and maintenance costs of surface irrigation and storage structures. It ensures user participation and promotes self-sufficiency.

Indeed, the productivity and growth of the entire agricultural industry can be hastened with impetus to and integration of Micro Irrigation Industry with Irrigation Projects. Micro Irrigation generates higher employment at all levels and adds value to human efforts. It is difficult to imagine a second green revolution without micro irrigation and micro watershed.

None of the hi-tech agro inputs such as tissue culture plantlets, genetically superior planting materials and mediums, liquid fertilizers can be gainfully adopted without the help of micro irrigation.

Micro irrigation ranks near the top of the measures that offer great untapped potential and ensures more crop per drop.



Shaik Mohideen

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