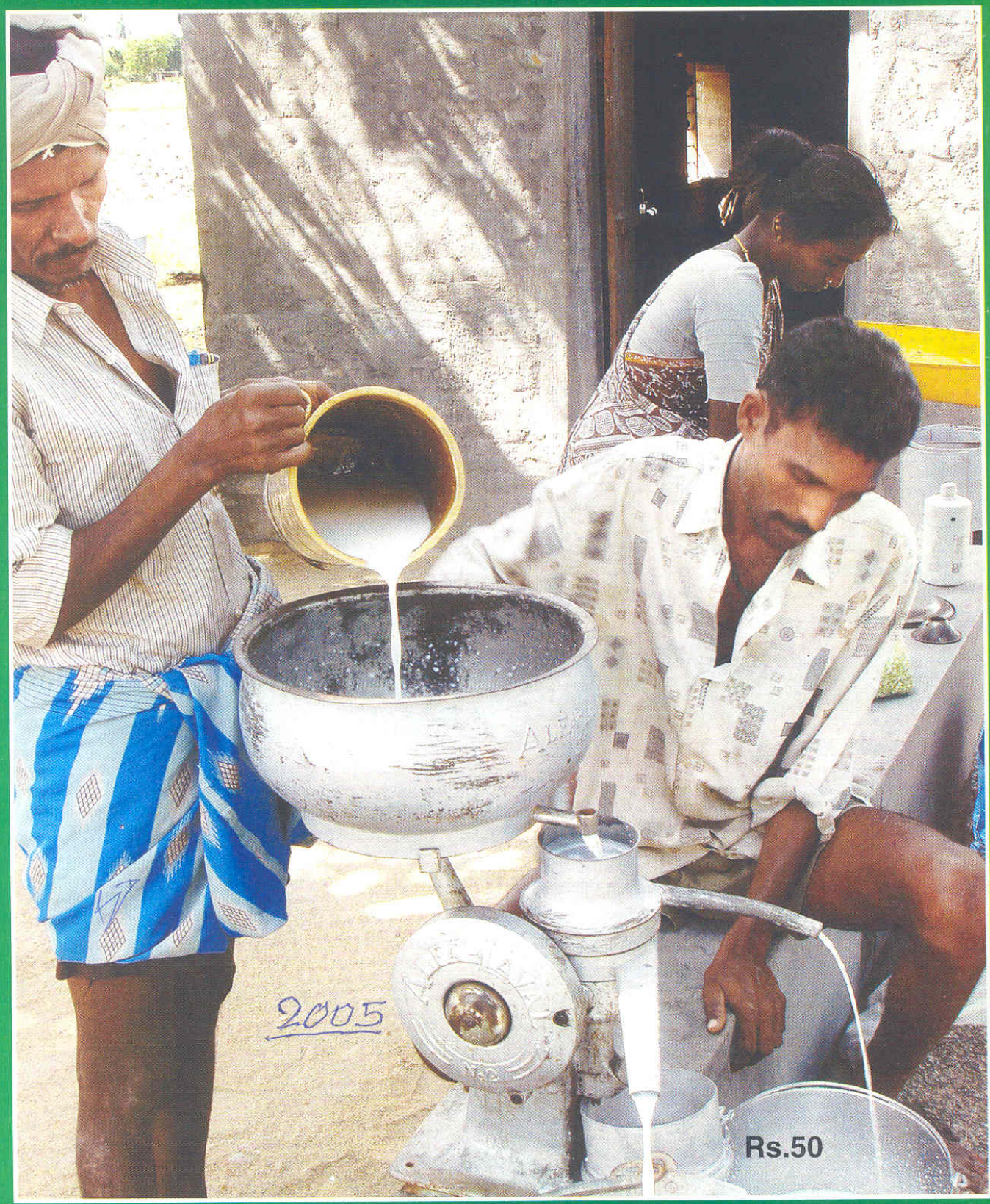
THE HINDU

Survey of Indian Agriculture



Rs.50

Can Indian farmers compete globally?

IRRIGATION

Green revolution's lessons

Our farmers can fight the global competition provided they are assured of infrastructural, financial, technological support and innovative and pragmatic policy matrix by the government says ***Bhavarlal H. Jain,*** Chairman of Jain Irrigation Systems Ltd., Jalgaon.

THE 1ST Green Revolution in India is acclaimed as a fine example of social and technical sustainability of agriculture. The agricultural outputs multiplied with support technologies such as irrigation water, hybrid seeds, and chemical fertilizers for boosting yields. Socially, the phenomenon enhanced the incomes, life-styles and comforts of the beneficiaries. Resultantly, even politically this form of development came to be accepted as 'sustainable'. All in all, in the post-independence era, this became the mantra for rural development and development of agriculture throughout the country.

In its wake, political compulsions eventually subsidised water, fertilizers and electricity, and also permitted extensive use of crop protection chemicals, necessitated by newer hybrid varieties, which were found to be susceptible to a range of pests and diseases. On balance, since this form of development ensured food sufficiency to the growing population, its long-term adverse effects on sustainability of agriculture were overlooked, if not compromised.

After four decades of the implementation of this form of development, the rate of increase in yields has now decelerated and the agricultural crop productions have stagnated. Arguably, this happened on account of indiscriminate use of irrigation water, chemical fertilizers, pest control measures, lack of crop rotation planning and paucity of soil fertility enhancement inputs. This led to exhaustion of soils and development of soil salinity.

Upsetting the natural order

In short, the said sustainable agricultural development upset the operation of the natural order or the natural laws and also, to some extent, socially widened the gap between the haves and have-nots. The islands of prosperity, born out of the green revolution development model, caused sufferings to those who were upstream. They were deprived of their legitimate rights in respect of water, which flowed from ridge to valley. This model also interfered, to an extent, with the ecosystem wherein forms of life other than human were also

Photo: M.V. Subramaniyam

Irrigation experts inspect a drip irrigation system in Cuddapah district.

subjected to hardship by the resulting ecological imbalance.

Thus, the 1st Green Revolution, which initially appeared to be techno-economically, socially and politically sustainable and successful, has now come to be perceived as environmentally harmful and a failure. As such, there is an increasing need being felt in the knowledgeable quarters for a 're-think' of this model. Agricultural sustainability, if it is to be long-term in its expanse and life-span, must also essentially cohabit with environmental sustainability. In other words, environment protection and advancement is critical to long term agricultural sustainability as well as greater social equity.

A model to address various issues

Presented below is a model, which attempts to address various issues in this perspective. This model is not location-specific or techno feasibility based, nor is it based on consideration of rate of return on investment. It is purely people and equitability centric. The author believes, it is pragmatic and addresses most of the issues from a long-term perspective. This model also envisages a certain degree of involvement of the people. It entails short gestation, ensures speedier returns, decentralised operation and authority. It leads to higher self-reliance and self-esteem leading to empowerment of the rural population at large. It is destined to increase yields, better the quality of the output through improvement in the fertility and moisture retention capacity of the soil. It encourages cultivation of live-stock, lesser mechanisation and finally tilting farmers towards organic farming. It also results in change in cropping pattern from the sustenance fibre and food crops to high value horticultural cash crops. This will happen because the user will have far more direct control, greater reliability and dependability of the water resource, which is at hand. The model would also more completely utilise the created water source/s.

The first issue is planning, development, implementation and management of water resources with a view to providing water for drinking, farm irrigation as well as other farm and/or non-farm activities.

The first issue is planning, development, implementation and management of water resources with a view to providing water for drinking, farm irrigation as well as other farm and/or non-farm activities.

The step by step priorities for planning, development, implementation and management of water are as follows:

Step 1 – Consider a village/habitation or a cluster of nearby villages as a hydrological unit for planning and implementation of micro watershed. Harness the rainwater where it first falls. Create percolation tanks, farm ponds, farm wells, nallah-bunds, other appropriate rainwater conservation and collection structures on rivulets and/or rivers in the vicinity of the village areas. This will be the first step in the direction of making the village self-sufficient in terms of its water requirements.

Simultaneously also consider waste-lands, revenue lands and/or forest lands in the proximity of village areas and provide for chosen engineering water and soil conservation structures at least for providing survival irrigation to afforestation measures. This represents treatment of the catchment area and protection of the environment or the surroundings.

Hand over the structures for purposes of upkeep, maintenance and management to the local Water User Associations (WUAs), which ought to be the Statutory Autonomous Entities created for the purpose with well defined rights and duties, and penalties and punishments for defaults. The statute would also provide for overriding rights to the Panchayat and/or concerned civil body such as Council or Corporation, as the case may be, for priority allocation of water for drinking purposes.

The WUAs should have the right to determine the pricing and distribution policies for all water users: domestic, agricultural and industrial.

Step 2 – The available surplus water from the micro watershed would then be stored in minor dams, which may be one or more and preferably many, taking into consideration expanse of the command area and density of the population en route or in the vicinity. Repeat conservation and collection structures on the stream created by the overflow of the minor dam/dams and the management practices and procedure as detailed in step 1.

Step 3 – The surplus from the minor dam/dams would then be dammed through a medium sized project only after rehabilitation of the affected population is completed. If need be, legislative authority should be sought and used for compelling the affected people to re-site themselves in the colonies specially equipped and created for the purpose. In the larger interest, certain measure of such coercion is just and justifiable.

The water stored in the medium projects/reservoirs must be conveyed only through closed piping channels. The on-farm distribution of such water should also be compulsorily through pressurised distribution network such as drip or sprinkler irrigation systems. These technologies alone will ensure efficient and cost effective utilisation of water resources, which have been created at a disproportionately high cost.

Management practices and procedures for Minor Irrigation water conveyance and distribution are same as in Step 1 and Step 2.

Step 4 - Surplus water available from medium irrigation projects may be stored by construction of a major irrigation dam only after rehabilitation of affected people or displaced population is completed. Even at the cost of repetition, the author wishes to emphasize that no effective steps, except survey and planning, should ever be taken for construction of the major irrigation dam unless and until re-sitement of the project-affected people is completed in the colonies specially created for them. These colonies must have all the required amenities including roads, electricity, drinking water, educational institutions, markets, health centres, other social infrastructure, and the agricultural lands of the type, acreage and quality each one of the affected families possessed prior to displacement.

Hydro-power generation

Wherever technically feasible, notwithstanding initial capital investment consideration, hydro-power generation and distribution in the vicinity must be made an integral part of planning and implementation of every minor, medium and/or major irrigation project.

WUAs should statutorily have two ex-officio members from the government on their bodies as part of their membership — one each from the department of irrigation and department of agriculture. They will act as watchdogs for monitoring the working and the sagacity of effective functioning of WUAs.

Such a model obviously calls for a paradigm shift in our

current thinking, policies and programmes. It would automatically integrate and co-ordinate development of ground water resources through recharging as well as their conjunctive use. The limited availability at almost every habitation will provide equal opportunity to as many farmers as is physically possible and also lead to its thrifty use. It will also appreciably reduce disparities in availability of water for head-rich and tail-end farms and also between large and small farms.

The model may, understandably, involve high initial capital investment. But it would invariably lead to long-term financial, physical and social sustainability through decentralised participatory approach.

Since the water structures envisaged under the scheme are small, the magnitude of the investment in each case may also be low. One can, therefore, depending on the specific situation, invite private participation of NGOs and others — for 'Build-Own-Operate-Lease-Transfer' schemes. In such cases the government may remain as a facilitator and may even consider issuing appropriate financial guarantees to the funding institutions.

Firming up policy

In addition to creation and management of water resources we also need to develop region based cropping patterns and firm up policy in regard to crop rotations. Secondly, we should also draw up a Soil Improvement Programme (SIP), which will gradually reduce, if not eliminate, the use of chemical fertilizers and replace the same with bio-organic inputs including manures, cultures and crop protection substances. Going green and organic will lend Indian agriculture helping hand because organic produce will fetch better prices at home and abroad.

The average crop productivity percentage in India vis-à-vis the world is not very poor. This is not to say that there is no scope for improvement. We should strive to move towards highest achieved in the world. Given favourable, diversified agro-climatic conditions, bountiful sunlight and cost-effective small farm private entrepreneur producer, the yield gap can be best bridged through integrated package of technology, best management practices, and paradigm shift in agricultural policy, particularly in rain-fed and other low productivity regions.

The world over agriculture gets high subsidies. Indeed, subsidy has come to be accepted as an over-ridingly important input for agriculture. For example, in the U.S., subsidy to 9 million farmers has increased 700 times since 1996. On top of that between 1998-2000, the U.S. provided $ 26 bn additionally to them.

In India, agriculture continues to be net-taxed rather than subsidised. We must, therefore, ignore the 'structural adjustment programme', (SAP), of the World Bank and IMF and provide at least US$ 10 bn worth of indirect subsidies to our 560 mn farmers to empower them under the 'Green Shoe Option' of WTO. Our small farmers, the largest private sector enterprise in the world, are better placed and motivated to manage the size, complexity and risks of farming.

Low cost producer

Most of our farms are managed by 3-4 workers belonging to the owner's family. The Indian farmer is, therefore, a low cost producer. Should we forfeit this unique set of matchless advantages and go after costly corporate farming? The author doesn't believe that Corporate Farming model can lead to sustainable agriculture in real terms.

In all, our productivity levels are pretty good, our cost of production is low and as such our farmers can fight the global competition provided they are assured of infrastructural, financial, technological support and innovative and pragmatic policy matrix by the government/s.