Overcoming Poverty through Dryland Agriculture: A Strategy for India

The ‘New Deal’ to rural India is aligned with a ‘pro-poor people centred’ perspective for development. It underlines growth based on efficiency and equity and stimulates the agricultural economy to boost incomes, demand and growth across the vast rural handland, home to 72% of India’s population.

Increased intensification of agriculture through intensive use of irrigation, fertilizers, pesticides and high-yielding varieties in more-favored high-potential zones was the major driving force behind the Green Revolution success. However, many regions in less-favored areas like much of the drylands have not benefited from this agricultural transformation. Low productivity of dryland agriculture, widespread poverty, water scarcity and degradation of productive resources (land and biodiversity) are threatening to further marginalize dryland agriculture and livelihoods. If future agricultural growth is to benefit the poor and contribute towards equitable economic growth, it is important to recognize the untapped potentials of the dryland regions, and design suitable strategies and policies for stimulating rainfed and dryland agricultural productivity growth in these regions. Agriculture must receive the priority attention it deserves. The second green revolution needs to be focused on the drylands.

One lesson learned from the Green Revolution experience in Asia was that its benefits did not reach the poor and the less favourable dryland areas. These areas are likely to require approaches that differ from the green revolution strategy. This calls for an interdisciplinary and crosscutting approach to address poverty and design interventions for dryland agriculture that is long-term and sustainable.

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poor to various risks and shocks, as well as their capacity to access physical, financial, and social resources and networks in the risky environments of the drylands. The VLS captured welfare indicators involving the level of human development and the extent of vulnerability and insecurity among individuals or households. This was supplemented by a statistical survey and analysis using household data. The studies have provided the basis for identifying major policy issues that need to be addressed to strengthen livelihoods in the dryland regions.

Priority development interventions

**Water as an entry point - More crops per drop!**

Water scarcity is the most critical constraint in dryland agriculture. Priority water-related interventions include:

- Adoption of an efficient watershed management approach
- Reduce vulnerability to drought through harvesting and storage of rain water
- Recharging of depleted groundwater aquifers and strong regulations on groundwater extraction
- Pricing of water per drop to actually reflect their opportunity costs
- Government support for water saving options (for example, drip irrigation and dryland crops)
- Specification enforcement of clearly defined water rights in watershed communities
- Enabling stronger collective action for community development in agriculture and resource management
- Enhancing the scientific and technological support to watershed programs

Re-orienting public policies

Policies and programs need to be streamlined and refocused to be meaningful to dryland farmers, especially since they relate to the key factors constraining agricultural productivity, and hence poverty reduction.

- Ensuring food security through provision of wage-paid employment: Food security can be strengthened through a more efficient Public Distribution System (PDS), uninterrupted and well-supplied public distribution through Intensive Child Development Schemes (ICDS) and creation of food grain banks, which may also be linked with food for work schemes
- Organized women's self-help groups have a better capacity to manage household income, savings and credits. There is much evidence available to suggest that if appropriate training is provided, women's self-help groups could be a powerful tool to empower women and reduce household insecurity
- High public investment in technology and infrastructure: low levels of input use and low productivity levels characterize dryland agriculture. To get out of this syndrome, it is important to step up the level of public and private investment in improved technologies. Farm/non-farm incomes in the dryland regions are constrained by deficient infrastructure comprising roads, markets, hospitals, electricity, irrigation, means of transport and communication. Constraints in seed availability and other input supply also emphasize the importance of an effective public and private sector in reaching the rural poor. Results show that the marginal returns to investment in infrastructure and dryland agriculture are also higher than those in irrigated areas. Investment in rural infrastructure particularly will have an impact on food security through income, employment and wage impacts.

- Chronic trade deficit in India in pulses and oilseeds - the classic crops of the drylands: India faces chronic shortages of pulses and oilseeds and hence, dependence on arrivals. The Technology Mission on Oilseeds (1986) helped India to reduce edible oil imports for some years. But again, there is a steady growth in edible oil imports since 1993 (Figure 1). A renewed emphasis on oilseed and pulse production can help reduce the dependence on imports since these are predominantly grown in the drylands. Development of dryland agriculture should receive a high priority to reduce the unnecessary imports of edible oil and pulses.

- Higher inflow of institutional credit to dryland agriculture: The amount per hectare of institutional credit provided to dryland farmers is markedly lower than those in the irrigated areas. This is both anti-equity and anti-efficiency, given the higher incidence and severity of poverty. It has been observed that dryland agriculture is profitable over a period of 3 to 5 years even though in one year it may be a losing concern. In view of this, a new (cyclical) credit policy is required so as to meet the full credit requirements of the dryland farmer over the period of 3 to 5 years even if he becomes a defaulter in one or more years.

- Covering high/lower/large risk crop insurance: With the cost of cultivation going up, and given the risk and uncertainty involved in dryland agriculture, every farmer is concerned about the investment he makes and the returns he expects for his and his family’s labour.

**Figure 1. India’s edible oil imports**

Source: Market monitoring data, Production, Supply and Distribution database, USDA, March 2003

The Union Ministry of Agriculture has already launched the National Agriculture Insurance Scheme. Its coverage should be extended to all the farmers in the drylands at a reasonable premium.

- Cover more crops under the minimum support prices scheme: Rainfed crops suffer substantial discrimination in the pricing of Minimum Support Price (MSP) data. These stunt and public disperse policies. Although minimum support prices are announced for rainfed crops as well, they are seldom backed by procurement operations. The PDS and the heavily subsidized market in rice have further eroded the competitiveness of coarse cereals and altered market price ratios. Substituting the PDS with a food stamp system would significantly reduce the diversion of buying grains of their choice. Unless these policy initiatives to reverse the current policy bias are taken up vigorously, rainfed crops and farmers growing them may be marginalized further still, forcing them to seek livelihood options outside agriculture.

- Rationalize subsidies on agricultural inputs: Fertilizers, irrigation water and electricity (three are the farm inputs that are heavily subsidized at present in Indian agriculture. The existing policy of subsidies on agricultural inputs needs to be reviewed and its direct and indirect impacts on different categories of farmers carefully assessed. There is, therefore, a need to streamline the delivery system to ensure that the benefits from subsidies are widely and equitably distributed. To attain this objective, the incipient policies to increase the proportion of induced demand for seed, fertilizer, and food grains, and to increase the benefits to the farmers who grow high-yielding varieties and water saving technologies designed to facilitate double cropping in those regions which are endowed with deep, fertile soils, and which receive an average annual rainfall of over 750 mm.

**Marketing and commercial orientation of agriculture**

To keep up with the changing world trade regime characterized by globalization and commercialization of agriculture and the changing food habits of people in Asia, livestock products and fruits and vegetables, dryland farmers will need to have a clear market orientation in making decisions about crops they grow. Access to good markets, which can ensure fair prices to the producer, is essential for increasing the production and profitability of dryland agriculture. There is a need for a launch of a market information system designed to inform farmers about the prices prevailing in regulated markets and the facilities available to them, and stimulating creative interaction between farmers and agro-industries.

- Contract farming and other arrangements for vertical coordination are emerging as alternatives to open markets. Farmer groups or associations could be tied up with processing industries and thus share the benefits of value addition.

**Institutional innovations**

In the context of the proposed comprehensive development strategy for dryland agriculture for the next two decades, it is necessary to identify the best practices and institutional/ organizational innovations that are already being used by progressive farmers and N.G.Os.

- Drip Irrigation: Drip Irrigation is a method of applying water directly to the rootzone. It reduces runoff, conserves water and helps to increase crop productivity. A number of institutions and organizations are working on the development of drip irrigation systems for dryland agriculture.

**Figure 2. Drip Irrigation**

Most of the degraded/waste lands including fallow lands in the dryland regions could be brought under improved management with relatively low investment and could be used for agroforestry, community/social forestry, and horticultural crops. ICRI SAT has also developed improved technologies designed to facilitate double cropping in those regions which are endowed with deep, fertile soils, and which receive an average annual rainfall of over 750 mm.

The main objective of the agricultural extension system should be to cater most cost-effectively to the emerging needs and demands of rainfed and dryland farmers, especially small-scales and marginal farmers. The adoption of the Training and Visit System during the 1980s was a bold step. Similar innovative measures are also needed to be taken.

- Professionalism of Mangement: There is a need for professionalisation of the management of agricultural development to cope with the rapidly changing national and international economic and political environment.

**Better management of wastelands and common pool lands**

There is a positive correlation between the extent of fallow lands and poverty. The poor are also dependent heavily on the 'hidden-harvest' from the common pool resources. Most of the degraded/waste lands including fallow lands in the dryland regions could be brought under improved management with relatively low investment and could be used for agroforestry, community/social forestry, and horticultural crops. ICRI SAT has also developed improved technologies designed to facilitate double cropping in those regions which are endowed with deep, fertile soils, and which receive an average annual rainfall of over 750 mm.

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- Ensuring food security through provision of wage-paid employment: Food security can be strengthened through a more effective Public Distribution System (PDS), uninterrupted and accessible supplemental nutrition through Intensive Child Development Schemes (ICDS) and creation of food grain banks, which may also be linked through Intensive Child Development Schemes (ICDS).
- Organized women’s self-help groups have a better capacity to manage household income, savings, and credits. There is much evidence available to suggest that if appropriate training is provided, women’s self-help groups could serve as a powerful tool to empower women and reduce household food insecurity.
- Higher public investment in technology and infrastructure: Low levels of input use and low productivity levels characterize dryland agriculture. To get out of this syndrome, it is important to step up the level of public and private investment in improved technologies. Farm non-farm incomes in the dryland regions are constrained by deficient infrastructure comprising roads, markets, hospitals, electricity, irrigation, means of transport and communication. Constraints in seed availability and other inputs also emphasize the importance of an effective public and private sector in reaching the rural poor. Results show that the marginal returns to investment in infrastructure and technology in dryland areas are actually lower than those in irrigated areas. Investment in rural infrastructure particularly will have an important impact on food security through income, employment and wage impacts.
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- Higher inflow of institutional credit to dryland agriculture: The amount provided by institutional credit provided to dryland farmers is markedly lower than in the irrigated areas. This is both anti-credit and anti-efficiency, given the higher incidence and severity of poverty. It has been observed that dryland agriculture is profitable over a period of 3 to 5 years even though in any one year it may be a losing concern. In view of this, a new (cyclical) credit policy is required so as to meet the full credit requirements of the dryland farmer over the period of 3 to 5 years even if he becomes a defaulter in one or more years.
- Covering household livestock insurance: With the cost of cultivation going up, and given the risk and uncertainty involved in dryland agriculture, every farmer is concerned about the investment he makes and the returns he expects for his and his family’s labour. The Union Ministry of Agriculture has already launched the National Agriculture Insurance Scheme. Its coverage should be extended to all the farmers in the drylands at a subsidized premium. Further, if any of these farmers are sponsored with a part of their insurance fees, it would attract them to buy insurance.

**Marketing and commercial orientation of agriculture**

To keep up with the changing world trade regime characterized by globalization and commercialization of agriculture and the changing food habits of people in favor of livestock products and fruits and vegetables, dryland farmers will need to have a clear market orientation in making decisions about crops that they want to grow. Access to good markets, which can ensure fair prices to the producer, is essential for increasing the production and profitability of dryland agriculture. There is a need for launching a campaign using appropriate information technology, informing farmers about the prices prevailing in regulated markets and the facilities available to them, and stimulating creative interaction between farmers and agro-industries. Contract farming and other arrangements for vertical coordination are emerging as alternatives to open markets. Farmer groups or associations could be set up with processing industries and thus share the benefits of value addition.

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- **Demand-driven agricultural extension system - Education is Power in Dryland Agriculture:** The adoption of the Training and Visit Approach to reach the poor and sustainable strategies that allow more efficient utilization of land, labor and capital over space and time. Since the poor hold a major share of livestock, diversification towards milk and meat reduces interpersonal disparities in income.
- **Better management of wastelands and common pool lands**

There is a positive correlation between the extent of fallow lands and poverty. The poor also depend heavily on the ‘hidden-harvest’ from the common pool resources. Most of the degraded/waste lands including fallow lands in the dryland regions could be brought under improved management, with relatively low investment and could be used for agro-forestry, community/social forestry, and horticultural crops. ICRI/SAT has also developed improved technologies designed to facilitate double cropping in these regions which are endowed with deep Vertisol soils, and which receive an average annual rainfall of over 750 mm.
needs of farmers and weaker sections, especially women. The based water management policies are essential to address the highest priority. Innovative, cost-effective and community Depending upon the availability of resources, as many Pradesh, Gujarat, Karnataka, Andhra Pradesh and Bihar. Priority (geographical) areas for possible empowerment of the dryland dwellers, it is also equally important to build the capacity of supporting institutions and enable institutional learning and innovation.

Priority (geographical) areas for possible interventions

The priority could be determined on the basis of the incidence and severity of poverty, and the potential for agricultural development. Based on these two criteria, the priority geographical areas for intervention are the areas without extension and irrigation resources covering Maharashtra, Madhya Pradesh, Gujarat, Karnataka, Andhra Pradesh, Bihar and Rajasthan. Next in priority are the medium-irrigated areas covering parts of Rajasthan, Madhya Pradesh, Gujarat, Karnataka, Andhra Pradesh and Bihar. Depending upon the availability of resources, as many districts as possible could be selected for intervention.

Conclusion

Given the serious and persistent problems of water scarcity and drought in the drylands of India, using water as an entry point and as a catalyst of development should receive the highest priority. Innovative, cost-effective and community based water management policies are essential to address the needs of farmers and weaker sections, especially women. The major areas of intervention include harvesting, storage and conservation of rainwater, recharging of groundwater aquifers, ensuring efficient use of water, and improving the design and implementation of watershed management programs. Dryland agriculture should emerge as a market-oriented, economically viable, and ecologically sustainable means of producing food, fibre, raw materials and other commodities such that farmers find it profitable and fulfilling to do so for their livelihoods.

A broad vision for dryland agriculture is to reduce poverty, hunger, and malnutrition, and ensure sustainable livelihoods for everyone. This vision could be achieved through a multi-pronged strategy mainly comprising (i) water as a catalyst for development; (ii) re-orienting public policies (eg, rationalize subsidies on agricultural inputs and cover more crops under the minimum support prices scheme); (iii) diversification and selective specialization; (iv) marketing and commercialization; (v) institutional innovations; (vi) building and strengthening of basic infrastructure; (vii) better targeting of development interventions to the most needy people and the most backward geographical areas, (viii) ensuring access for the poor to resources, institutions, technology and markets via the build up of social capital and empowerment; (ix) focusing research on the most relevant and salient problems; and (x) building pro-poor partnerships and linkages.

Development of agriculture in the dryland areas requires concerted policy support and investments for developing the resource base to enhance productivity. Watershed development programs have demonstrated their potential to contribute to both these objectives. Participatory and knowledge-based watershed development programs led by ICRISAT in Andhra Pradesh, Madhya Pradesh, Rajasthan and Gujarat have shown that farmer and public investments can provide attractive social returns, which in turn contribute to poverty reduction and ecological sustainability. There is an urgent need to evaluate, re-energize and scale up such initiatives with a plan to cover all the dryland areas in the country. The program requires substantial public and private investments and technical support to create the desired impacts in a reasonably short period. Effective procurement policies for dryland crops, inclusion of coarse grains in the public distribution system, farmer-friendly crop insurance and credit delivery schemes can complement the watershed development programs in promoting the development of dryland agriculture.

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MCS Bantilan, KPC Rao, K Singh, P Parthasarathy Rao, B Shiferaw, and R Padmaja

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India’s agriculture has been described by many analysts as a gamble with monsoons. The Royal Commission on Agriculture (1929) found that the ‘Indian farmer is born in debt, lives in debt and dies in debt’. Fifty seven years of agricultural development in post-independent India has helped the country attain self-sufficiency in foodgrain production. Yet, the farmers in dryland areas continue to gamble with the monsoons and live in debt. The green revolution in the irrigated tracts of the country has largely bypassed the arid and semi-arid regions, which constitute the bulk of the dryland areas. What can we do about it?

Major issues affecting dryland agriculture

The developments in the dryland region reflect the pervasiveness of poverty, which remains predominantly a rural phenomenon, and which is demonstrated by the growing constraints on water, land degradation, continuing concerns about malnutrition, migration due to frequent droughts, lack of infrastructure, poor dissemination of improved technologies, and effects of government policies and further economic liberalization on the competitiveness of dryland crops.

The dryland regions form a vital and important sector upon which a large number of India’s poor depend.

• The total number of poor in rural India was estimated at 147.5 million during 1999-2000, of which 40.8 percent or 60.2 million poor were concentrated in the semi-arid tropic (SAT) regions.

• By and large, areas with low irrigation have the highest incidence of poverty in all the regions.

• The incidence of poverty is highest among the Scheduled Tribes followed by the Scheduled Castes. The less irrigated areas in the humid and the SAT zones have a high concentration of these social bypassed groups.

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