



# Strategic Assessments and Development Pathways for Agriculture in the Semi-Arid Tropics

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## Overcoming Poverty through Dryland Agriculture: A Strategy for India

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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 heartland, 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 sustainable productivity growth in these regions. Agriculture must receive the priority attention it deserves. The second green revolution needs to be focused on the dryland areas.

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.

### 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 groups.

*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?*

- There is high correlation between poverty and proportion of agricultural laborers in many regions.
- The rural poor from the dryland region have had a relatively low utilization of anti-poverty programs, highlighting the issue of constrained access by these bypassed groups.

A synthesis of evidence and lessons learned from the ICRISAT Indian village level studies (VLS) conducted since 1975 provided empirical evidence on the vulnerability of the

SAT Futures and Development Pathways:

To inform future R&D strategies for sustainable development pathways for the SAT

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 nationwide poverty analysis using NSS data. These 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 and power to actually reflect their opportunity costs
- Government support for water saving options (for example, drip irrigation and dryland crops)
- Specification and 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 effective Public Distribution System (PDS), uninterrupted and flexible supplementary nutrition 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 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 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

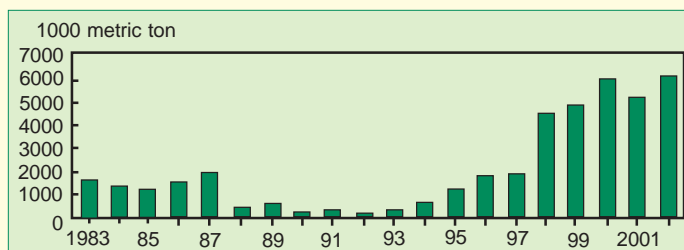
investment in infrastructure and technology in dry areas are higher than those in irrigated areas. Investment in rural infrastructure particularly will have a direct impact on food security through income, employment and wage impacts.

• **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, depends on their imports. 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 drylands. Development of dryland agriculture should receive a high priority to reduce the unnecessary imports of edible oils 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 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 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 more households under crop and 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.

*Agriculture in India remains the largest contributor to the well-being of the poor and sustains over 70% of the rural labor force. A large proportion of the cultivable land is rainfed and in the uplands land quality is deteriorating. These dryland areas have not experienced the agricultural transformation of the Green Revolution, but experience has shown that investments in improved water management and dissemination of improved technologies, along with appropriate policy and organizational innovations can have a significant impact on increasing the productivity of these lands.*



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

Source: Marketing year 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 subsidized premiums.

- **Cover more crops under the minimum support prices scheme:** Rainfed crops suffer substantial discrimination in the government's procurement and public distribution 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 rice and wheat market have further eroded the competitiveness of coarse cereals and altered market price ratios. Substituting the PDS with a food stamp system leaves beneficiaries the option 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 power (electricity) are three of 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, it is imperative that dryland farmers receive a higher priority in the allocation of funds for subsidies on farm inputs.
- **Facilitating migration:** Seasonal semi-permanent and permanent migration is a predominant coping strategy adopted by the poor to escape the poverty trap. An informal market for migrant labor has developed over time in India. Such informal markets play an important role in balancing the regional supply and demand for casual labor in India. The efficiency of informal migrant labor markets could be further improved, if an institutionalized system of collection and dissemination of information about supply, demand, and wage rates is provided in selected dryland regions India. Wage rates for female workers are also substantially lower (50%) than male workers and proper policies are needed to address this imbalance.
- **Coping with the challenges of globalization and marginalization:** Market reforms that encourage integration and liberalization of import and export markets, production efficiency and competitiveness of agricultural products within the domestic and international markets are becoming an important policy issue in the agricultural sector. Considering dryland agriculture's role as a means of livelihood for millions of poor people, enhancing its competitiveness through cutting the per unit cost of production is critical for the survival of many smallholder farmers.

### ***Diversification with a higher focus on crop-livestock development***

Diversification of agriculture is both a coping strategy against risk and an income enhancing strategy that allowed 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 may 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. ICRISAT has also developed improved technologies designed to facilitate double cropping in those regions which are endowed with deep Vertisol 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 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 should 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 information and communication 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 tie 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 NGOs.

- **Demand-Driven Agricultural Extension System - Knowledge is Power in Dryland Agriculture:** The main objective of the agricultural extension system should be to cater most cost-effectively to the emerging needs and demands of dryland farmers, especially small-scale and marginal farmers. **The adoption of the Training and Visit system during the 1980s was a bold step.** Similar innovative measures are required to be taken now.
- **Professionalisation of Management:** 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.



- **Securing Women's Participation:** Normally, women's rights to water and to the 'ownership' of water infrastructure is restricted because of their limited access to land rights or to their recognition as 'heads of households'. Government agencies should create and enforce women's rights to land and water either through legal or new institutional mechanisms.

### **Building partnerships, linkages and capacity**

Dryland farmers are vulnerable physically, economically, socially, and politically. They need to be empowered and their capacity built through education, training, provision of technical information, and institutional credit to enable them to participate in, and contribute to, the mainstream economic, social, and political activities. Besides the 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, commercially 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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