



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

*No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.*

## Agricultural Development in North-East India Challenges and Opportunities

B.C. Barah

### The Region

The North-East Region (NER)<sup>1</sup> is a land of magnificent beauty, possessing undulating hills, rolling grasslands, cascading waterfalls, snaking rivers, terraced slopes and thrilling flora and fauna. This picturesque scenario is contrasted by widespread poverty, low per capita income, high unemployment and low agricultural productivity leading to food-insecurity. With more than 98 percent international border (sharing with Bhutan and China in the north, Myanmar in the east and Bangladesh in the south-west), the region has several unique features: fertile land, abundant water resources, evergreen dense forests, high and dependable rainfall, mega biodiversity and agriculture-friendly climate. Yet it has failed to convert its strengths optimally into growth opportunities for the well-being of the people.

The region suffers from weaknesses such as subsistence agriculture with poor infrastructure like roads and markets. The high vulnerability to natural calamities like floods, submergence, land slides, soil erosion, etc. has resulted in low and uncertain agricultural productivity. The low utilization of modern inputs in agriculture has further reduced the ability of the farm households to cope with high risks in production and income.

The population of NER has quadrupled to about 40 million during the past 50 years, rendering land-man ratio highly adverse. The proportion of households living below the poverty line is 35 percent (13.6 million). It is exactly 10 percentage points higher than the national average. The lack of income



opportunities has perpetuated the worst form of poverty, the 'hidden poverty' in the region.

High growth of population (varying from 2.01% to 5.22% per annum, except in Assam and Tripura) with a large proportion of small and marginal farm households, traditional and low-input agricultural practices coupled with the problem of insurgency have affected the agricultural economies adversely in the region. The proportion of small farmers (possessing less than 2 hectare land) to rural households varies from 65 percent in Arunachal Pradesh to 84 percent in Nagaland and Manipur compared to 59 percent at the national level.<sup>2</sup>

As the pace of economic development in the NER is slow, a new regional model is needed considering the past development deficiencies and the extreme diversities.

### Agricultural Scenario

Agriculture is an important sector in the economy of the NER, with its share in State Domestic Product (SDP) ranging from 19 percent to 37 percent in different states (Table 1). This contribution of agricultural sector in SDP has declined during the past three decades. This is though considered a sign of development, population dependent on agriculture remains very high. As a result, agriculture in the region has not been able to generate surpluses for investment and augment purchasing power, not to speak of employment generation. Moreover, factors like natural calamities, large number of smallholders, low intensity agri-inputs and negligible seed/variety replacement are also threatening the livelihood-sustainability in the region.

<sup>1</sup> Comprising the states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim. Sikkim is, however, excluded from this study due to non-availability of data.

<sup>2</sup> Government of India, 2006, Livestock ownership across landholding classes in India, 2002-03, National Sample Survey Organization, Ministry of Statistics and Programme Implementation, New Delhi.

Table 1. Selected economic indicators of NER

	Arunachal Pradesh	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Tripura
Share of Agriculture* in SDP (%)	31.2	37.5	27.1	32.0	18.9	32.5	24.7
Rural poverty (%)	33.5	36.0	28.5	33.9	19.5	32.7	34.4
Cultivated area (%)	2	35	6	10	4	13	27
Annual compound growth rate (% , 1993-2003)							
SDP	2.4	2.3	6.2	7.1	NA	7.5	10.0
Agriculture	1.3	0.4	3.5	6.0	NA	14.4	4.4
Population	2.01	1.44	2.15	2.66	NA	5.22	1.10
Per capita income	1.3	1.5	3.1	4.0	NA	1.9	7.9
Total cropped area ('000 ha)	239	3860	347	174	116	216	303

\* include crops, livestock, fisheries, forestry and mining, Source : [www.mospi.nic.in](http://www.mospi.nic.in), NA : not available

Agriculture in NER is characterized by:

- Geo-physical conditions limit horizontal expansion of cultivable land. The percentage of cultivated area to total geographical area ranges from 2.2 percent (in hilly states like Arunachal Pradesh) to 35.4 percent (Assam), as compared to 43.3 percent at all-India level.
- Domination of a single crop of rice vulnerable to risk and low level of productivity.
- Prevalence of traditional agricultural practices and low productivity. The shifting cultivation (*Jhum*) is one such system.
- Agricultural diversification of crops, livestock-fish and silk exist in the region, but their contribution to economic development is negligible, as reflected in the low per capita income (Rs.7979 in 2001 at constant price, which is 17% lower than the national average).

**Dominance of rice:** Rice is the major staple crop commonly grown in the NER states. But the rice-based agriculture system has failed to provide required household income-security. Rice is a three-season crop, viz, autumn (*Abu*), winter (*Sali*) and summer (*boro*) in Assam. Although winter rice accounts for more than two-thirds of total rice area, but the average yield is 1.53 ton/ha, which is nearly half a ton less than the national average

during the triennium ending 2003. A notable change in rice-production system is the introduction of *boro* rice in Assam. *Boro* rice is a low risk option with yield 30 to 40 percent higher than the normal yield. It has increased cropping intensity, leading to a situation of surplus production in Assam. This successful venture should be replicated in other states also.

**Shifting cultivation:** This slash-and-burn system of cultivation (*Jhum* practice) is a unique feature of the region, which covers nearly 2 million hectares area (one-fourth of the total cropped area). The system faces criticism due to its low productivity and environmental diseconomies, but provides support to about 443 thousand *jhumia* households. On account of diversified nature of the system, the *jhum* cultivation provides not only food security but also household nutritional security. Most importantly, it has potential to enhance system productivity too. Being a socially-preferred practice, instead of banning, it needs a focussed system based R&D to improve the overall productivity and food security.

**Tea:** It is a commercial crop grown entirely by corporate sector, and occupies nearly half a million hectares in NER. But recently, the government intervention as in Assam, has enabled some of the entrepreneur farmers to undertake tea cultivation. It can provide ample scope for income generation but its impact is yet to be examined.

Table 2. Per cent area under various crops in NER (TE 1997-98)

Crop	Arunachal Pradesh	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Tripura	NER
Rice	49.9	65.3	45.4	59.6	66.8	62.6	82.3	64.3
Other Cereals	23.1	2.8	16.8	14.8	0	32.9	1.4	6.2
Pulses	2.6	2.3	6.1	0.8	3.5	1.0	1.7	2.5
Oilseeds	10.9	8.3	5.4	5.3	7.0	0.2	0.5	7.3
Fruits & Vegetables	11.2	13.3	8.5	8.6	14.3	3.1	4.8	11.9
Spices	1.8	2.2	2.4	10.4	6.6	0.0	1.5	2.4
Others*	0.5	5.8	15.4	0	1.6	0.1	47.8	5.4

\* include fibres, nuts, sugarcane, sericulture, etc.

**Crop diversification:** A large number of households in the NER practise crop diversification by growing multiple crops as well as livestock, fishery, piggery, etc. High-value crops like fruits and vegetables, oilseeds, spices and nuts are also widely grown in the region (Table 2). Fruits and vegetables occupy the second place (12% area share) next to rice. Interestingly, not only the area allocation is high, the proportion of households growing fruits and vegetables is also high.

Area under other crops is also growing and the notable gainer include fibres, sugarcane, rubber, sericulture, coffee, arecanut and coconut. Floriculture is also expanding rapidly. But, a huge potential remains untapped due to a number of constraints and institutional rigidities.

The growth in productivity of major staple crop, rice, has been slower than that of population, which may lead to food insecurity in the region (Table 3). Barring Assam, the entire region is foodgrain-deficit. The region produces nearly 5 million tons of foodgrains as against a demand of 6.7 million tons. This imbalance in food-security remains unabated due to slow growth in production as well as productivity of major foodgrains.

**Table 3. Annual compound growth rate (%) in rice production in NER: 1990-2003**

State	Area	Yield	Production
Arunachal Pradesh	1.30	0.10	1.39
Assam	0.21	1.54	1.75
Manipur	0.11	0.83	0.94
Meghalaya	0.14	3.90	4.04
Mizoram	-3.05	3.80	0.75
Nagaland	1.97	1.91	3.88
Tripura	-0.15	2.42	2.27

Source: NEDFi, NER Data Bank, Guwahati, <http://databank.nedfi.com>

## Untapped Potentialities

In spite of above binding constraints, the NER has huge and unique potentialities too, such as:

- Rich natural resources, biodiversity and high dependable rainfall (annual rainfall about 2000 mm)
- Congenial climate for agriculture
- Social commitment to equitable and sustainable use of land resources such as *Jhum* practice
- High potential to increase agricultural productivity; average rice yield is 30 percent lower than the national average
- High potential for crop diversification towards horticultural crops
- Low use of agro-chemicals indicates considerable potential for 'organic' agriculture

## Policy Perspectives

The NER needs development compatible with the comparable regions in the country. Hence, there is an urgent need for appropriate policy interventions to break the vicious cycle of underdevelopment, food deficit, poverty and regional imbalance.

## Specific Problems of Agriculture in NER

- Adherence to traditional agricultural practices
- Low adoption of modern rice varieties (HYVs) of rice. Barring Tripura it ranges from 23 per cent to 49 per cent as compared to 74 per cent at the national level
- Problems of property right
- Small size of operational holdings, ranging from 0.60 ha in Tripura to 1.33 ha in Meghalaya as compared to 1.42 ha at all-India level
- High vulnerability to natural calamities, and degradation of prime agricultural land
- Over-dependence on monsoonal rains with poor irrigation infrastructure. Proportion of irrigated area ranges from about 6 per cent (Assam) to 46 per cent (Manipur)
- Low use of fertilizers varying from 2 kg/ha in Arunachal Pradesh to 63 kg/ha in Tripura
- Weak institutional credit delivery system (per hectare credit disbursement is one-fifth of the national average)
- Negligible agro-processing and post-harvest management
- Poor transport and market infrastructure (road density 168-490 km/1000 sq.km. with exception of Assam, Nagaland and Tripura)
- Poor monitoring and accountability of public service delivery system

In a situation of extreme diversities and geographically-limited cultivable area in many parts of NER, vertical intensification rather than horizontal expansion is more relevant. To reap the benefits of the huge opportunities for societal welfare, the following strategies are suggested:

**Improve rice productivity:** To augment farm income and improve food security, the productivity of rice must be increased. Following strategies are suggested: (a) increase adoption of HYVs of rice specifically in Arunachal Pradesh, Nagaland and Mizoram; (b) increase agri-inputs in all the NER states; (c) develop small farmers-oriented technologies; (d) expand area under *boro* rice in Assam, Manipur and other states as far as possible; (e) promote aromatic rice like *kala joha*, or such varieties particularly in Assam, Manipur and Tripura; and (f) develop market incentives in the region.

**Rain-water harvesting:** The NER is endowed with high rainfall, but rain-water is neither conserved nor harvested to increase crop yields and intensify agriculture. Appropriate watershed programmes with people's participation need to be encouraged to harness the untapped benefits.

**Promote agricultural diversification:** The NER has high potential for agricultural diversification, particularly towards high-value crops. In conjunction with regional variation and land type, following strategies are suggested for promoting agricultural diversification:

- Rice-dominated states like Assam and Tripura should practise a synergized-mix of rice, pulses, oilseeds, horticulture, livestock and fishery. *Boro* rice grown in flood-free season, is promising and should be accompanied by



agricultural diversification. High-value crops such as pachauly, passion fruit, aromatic and medicinal plants have good potential in both domestic and international markets. These should be widely practised.

- Combination of food crops with livestock, fishery, piggery, forestry and horticulture are suggested for the states of Arunachal Pradesh and Mizoram, where the cultivable land is less than 10 percent of the total geographical area. The hilly terrains and slopes of these states may be used for plantation crops (such as fruits, rubber and forestry), flower and livestock to supplement food production and income generation.
- The strategy for the hilly terrains of Mizoram, Meghalaya and Nagaland is to promote production of staples (rice, maize and pulses) and high-value crops along with livestock and sericulture. As the climate is favourable to horticultural crops, effort should be made to improve their cultivation, specifically the off-season vegetables.

**Exploit the comparative advantage of production conditions:** The low chemical-inputs use in the NER should be converted into an opportunity by promoting the 'organic products' for which demand is fast rising in the national and international markets. A brand name may be evolved for marketing of these products. A suitable mechanism may be evolved for the certification of these products as 'organic' for their international acceptance. Also the international marketing opportunities under the "Look East" policy should also be exploited for the agri-products like aromatic rice, pineapple, passion fruits, ginger, spices, bay leaf, medicinal plants and flowers.

**Strengthen public-private partnership approach:** Appropriate strategy required to be formulated for promoting public-private partnership both for market and infrastructure development, and to attract private investment, including Foreign Direct Investment. Special Economic Zones (SEZs) may be established within the region to capture the economic advantage, especially for tea, coffee, aromatic and medicinal plants, and horticulture products.

**Streamline credit delivery system:** The existing institutional credit system is severely hampered due to certain institutional problems in the region. Therefore, strategy should be evolved to promote community-based collaterals for the effective credit delivery.

**Revitalize rural institutions:** Strengthening the rural institutions is yet another innovation suggested. Promoting high-value

agriculture through contract farming, reviving the village institutions like Field Management Committees, Water Management Committees and village panchayats and councils is important. These institutions are valuable social capital and can act as agent of change.

**Appropriate entrepreneurship development:** For efficient market system, entrepreneurship development is indispensable. Institutions like Krishi Vigyan Kendras, entrepreneurship development institutes such as Indian Institute of Entrepreneurship, Panchayati Raj Institution and other regional organizations can play a significant role in this venture.

**Increase investment in agriculture R&D:** A strong R&D support system is a *sine qua non* for generating demand-driven technologies, which are friendly to smallholders. Further, enhancing productivity of traditional *jhum* cultivation practised in the states of Arunachal Pradesh, Manipur, Mizoram, Nagaland and Meghalaya needs location-specific R&D.

**Strengthen regional database:** Inadequate database is a serious constraint in the NER; it needs to be streamlined for an effective analysis of the agricultural economy.

## Conclusions

It is envisioned that sincere attempts would revitalize agriculture in the NER, which will have the following characteristics

- Improved livelihood through enhanced productivity of rice and other high-value commodities
- Expansion of region-specific traditional and new high-value crops (including aromatic rice, orchids, pachauly, passion fruits, ginger, pineapple, turmeric, citronella, etc.) for enhancing economic development
- Global marketing of certified organic products of the region through strong public-private partnership in agriculture
- Well-developed infrastructure facilities like roads and markets through interactive dialogues among the regional stakeholders in a synergistic manner
- Strong integration of NER with the national economy for attaining high and inclusive growth; devoid of extreme inter-regional disparities

**Acknowledgement:** The author is grateful to A K Neog, R B Barman, P K Joshi and P S Birthal for comments on an earlier draft of this paper.

December 2006

B. C. Barah is Principal Scientist at National Centre for Agricultural Economics and Policy Research, New Delhi. email:bcbarah@yahoo.com  
NCAP has been established by the Indian Council of Agricultural Research (ICAR) with a view to upgrading agricultural economics research through the integration of economics input in planning, designing and evaluation of agricultural research programmes and strengthening the competence in agricultural policy analysis within the council.

NCAP Policy Briefs are intended to contribute to debates on important agricultural policy issues. Opinions expressed are those of the authors and do not necessarily reflect the views of the Centre.