

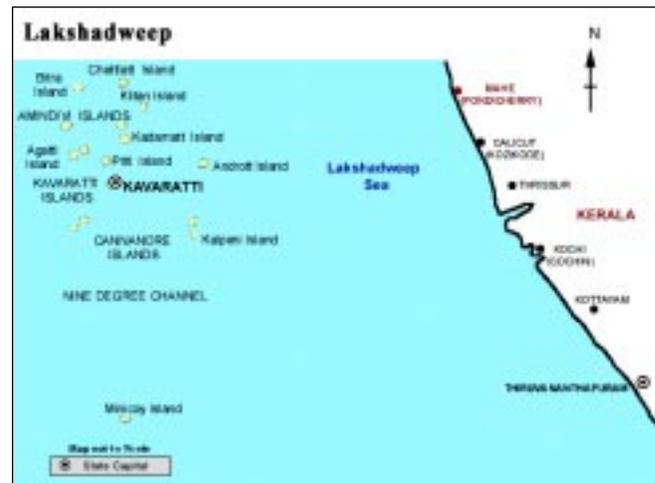
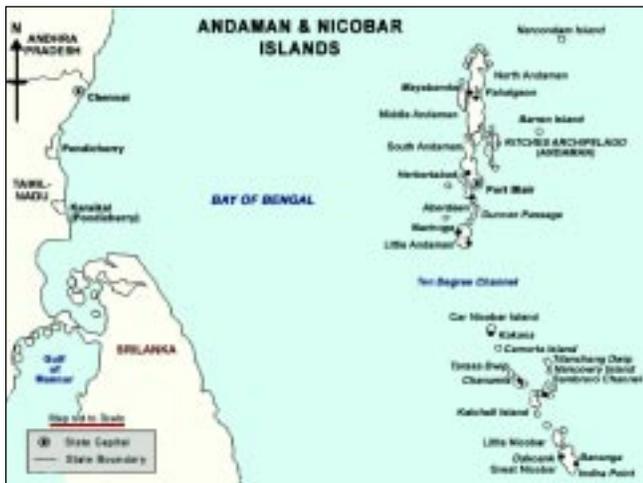
Long-term Strategies and Programmes for Mechanization of Agriculture in Agro Climatic Zone–XV : Island region

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1. NAME OF AGRO CLIMATIC ZONE : Island Region
2. STATES UNDER THIS ZONE : Union Territory of Andaman & Nicobar Islands,
Union Territory of Lakshadweep Islands



3. SUB-AGROCLIMATIC ZONE WITH THEIR CHARACTERIZATION

This zone comprises of Union Territory (UT) of Andaman and Nicobar Islands and Union Territory of Lakshadweep Islands. The sub-zones with their characterization are Andaman and Nicobar Islands (AN–1 Northern zone, AN–2 Central zone, AN–Southern zone) and Lakshadweep, Minicoy and Amindivi.

The agro-climate is typified by tropical condition with little difference between mean summer and mean winter temperatures. The annual rainfall of these two far seated areas varies from 1,600 to 3,000 mm which covers the annual PET demand except for small seasonal water deficit of 300–400 mm during the post-monsoon period (January–March). The length of growing period (LGP) is more than 210 days, which is long enough to support

double cropping system and plantation crops grown in the area. The area experiences Udic soil moisture and Isohyperthermic soil temperature regime (Sehgal, 1992).

Andaman and Nicobar Islands are a group of more than 3,000 islands in the Bay of Bengal, the great majority of which (about 2,650) are uninhabited being too small and with little or no fresh water.

The tiniest UT of India, Lakshadweep is also an archipelago consisting of 12 atolls, three reefs and five submerged banks. Of its 36 islands covering an area of 32 sq. km only 10 are inhabited.

The natural vegetation comprises tropical rain (evergreen) and littoral and swamp forests. About 2/3 of the Andaman is under native forest and agriculture is confined only to specific areas around habitations, where the dominant crop grown is rice. In general, plantation crops (coconut, arecanut, and oilpalm) dominate the land

use with or without intercultivation of pineapple, tapioca and pepper. Only six per cent of the islands' area is available for cultivation. Total cropped area is 15,827 ha. In Lakshadweep, rice is mainly grown under lowland conditions. Coconut is the main plantation crop with high yield. Besides agriculture, marine fishery is an important means of subsistence for the people.

Land holdings are usually small or marginal. The soil of Andaman and Nicobar Islands (in the East) greatly differ from those of Lakshadweep Islands (in the West). Soils of Andaman and Nicobar are medium to very deep red loamy soils including marine alluvium-derived soils along the coast. Soils of Lakshadweep group of Islands on the other hand are highly calcareous and sandy in nature.

The annual rainfall of Lakshadweep is 1,600 mm while that of Andaman Nicobar islands 3,000 mm. Rainfall pattern recorded at Port Blair show less rain (<50 mm) during December to April. The remaining months receive higher rainfall. January is moderately dry and February–March is dry months.

4. GENERAL TOPOGRAPHY OF THE ZONE WITH BRIEF HISTORICAL BACKGROUND OF AGRICULTURAL DEVELOPMENT OF THE ZONE

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5. OPERATIONAL LAND HOLDING PATTERN BY MAJOR SIZE GROUPS

Land holdings are small or marginal and fragmented.

6. IMPORTANT SOIL TYPES

The soil of Andaman and Nicobar Islands (in the East) greatly differ from those of Lakshadweep Islands (in the West). Soils of Andaman and Nicobar (A and N) are

medium to very deep red loamy soils including marine alluvium-derived soils along the coast. Soils of Lakshadweep group of Islands on the other hand are highly calcareous and sandy in nature.

7. ANNUAL RAINFALL AND PATTERN

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8. POPULATION OF THE ZONE

Table 1. Human population of Island region

Union Territory	Population			
	Total	Male	Female	Density (per sq. km)
Andaman & Nicobar Islands	3,56,152	1,92,972	1,63,180	43
Lakshadweep	60,650	31,131	29,519	18,994

Source: Census of India, 2001, Series-I, Registrar General and Census Commissioner, New Delhi

9. BRIEF SCENARIO OF AGRICULTURE SECTOR

Only 6% of Andaman and Nicobar Islands are available for cultivation amounting to a total cropped area of 15,827 ha. The principal crops are rice, coconuts and arecanuts. Other crops are sugarcane, pulses, fruits and vegetables. Species and rubber are being tried.

The flora of Lakshadweep includes banana, colocasia, drumstick, breadfruit and wild almonds. Coconut is the only crop of economic importance in this Union Territory.

10. BRIEF SCENARIO OF FISHERIES SECTOR

The extent of exploitation of aquatic resources remains quite low. Production of fish had been 27.02 thousand tonnes in Andaman and Nicobar and 13.65 thousand tonnes in Lakshadweep in 2001–2002.

Lakshadweep islands have immense potential for the development of fisheries. Two boat building yards are engaged in the construction of mechanized boats.

11. IRRIGATION AREA AND SOURCE OF IRRIGATION

Most of the area is rainfed. However in Lakshadweep, irrigation through tanks amounts to less than 500 ha while that from tube well, it is 1,000 ha.

12. INFRASTRUCTURAL FACILITIES AVAILABLE IN THE ZONE

There is a network of 866 km of black-topped roads and 5 wharfs and 41 jetties linking all inhabited islands of Andaman and Nicobar. Out of 511 villages, 508 are electrified.

There is no farm equipment market in the region. Farm implements are being distributed to needy farmers on subsidized cost by the developmental agencies. No facility available for farm equipment manufacture in the region. Repair is done by local craftsmen.

13. RESEARCH AND EXTENSION FACILITIES

Region has ICAR's CARI, Port Blair (UT of A and N Islands) and CPCRI Regional Station, Minicoy (UT of Lakshadweep). There are two KVKs in the region one each in UT's of A and N Islands and Lakshadweep. Department of Agriculture, UT of A and N Islands and Department of Agriculture, UT of Lakshadweep do address to mechanization. There are no major NGO playing roles in agricultural mechanization. Credit is available through nationalized and rural banks.

14. STATE POLICY, GOALS, TARGETS AND STRATEGY FOR AGRICULTURAL MECHANIZATION IN THE NEXT 20 YEARS

Agricultural workers, draught animals, tractors, diesel engines and electrical motors are the sources of farm power in A and N Islands. The basic requirement of a marginal farmer in Lakshadweep Islands is garden implements, farm equipment, farm machineries etc. Availability of farm power in A and N Islands is 0.29 kW/ha against the national average of 1.35 kW/ha, and therefore, there is further scope for farm mechanization in these group of Islands.

In Lakshadweep Islands, the government policy is to procure and distribute the most required farm implements and machineries at subsidized cost.

15. SWOT ANALYSIS OF MECHANIZATION PROGRAMME IN THE REGION

Strengths

- Region already has craftsman who could be trained on improved farm equipment.
- CARI, Port Blair (ICAR Institute) has a section of agricultural engineering which can play a lead role in mechanization.
- KVKs in the region can demonstrate and train farmers on improved farm equipment.
- Central and State/UT governments take due care

of the developmental issues because of their strategic locations.

Weaknesses

- Remoteness and poor access to the available markets.
- Too few farmers, small land holdings and capital constraints impede mechanization and domestic production of farm equipment.
- Mechanization in Horticulture sector has yet to take place.
- Poor extension infrastructure and scattered farms.
- Gender bias in farm equipment has not been addressed.
- There is poverty in the rural areas.

Opportunities

- Scope of increasing production and productivity through farm mechanization.
- Availability of farm power is very low which needs to be increased substantially.
- Opportunities for harvesting and processing coconuts and arecanuts into value added products in the island region of Lakshadweep.
- Hygienic smoked fish can be potential export commodity especially for Lakshadweep.
- Mechanization can help the people to earn more, make their life devoid of drudgery and attain socio-economic prosperity.

Threats

- Excessive dependence on mainland for food grains, a drain on the economy.
- Failure in maintaining the desired level of mechanization and post-harvest management can lead to overall losses.
- Educated youth will shun agriculture accentuating socio-economic issues.
- Failure in achieving modernization in agriculture and rural life.

16. STRATEGY FOR AGRICULTURAL MECHANIZATION IN THE ZONE

16.3.1 Farm Power

1. For intensification of agriculture, availability of adequate farm power for mobile and stationary farm operations should be increased from the present level 0.29 kW/ha to at least 0.90 kW/ha, by 2020 in A and N Islands. Accordingly, there is further scope for farm mechanization in these

groups of Islands. In Lakshadweep Islands, the government policy is to procure and distribute the most required farm implements and machinery at subsidized cost.

16.3.2 Improved Agricultural Implements and Machinery for Crop Production

2. For timely farm operations, reduction in cost of operations and saving energy in tillage and sowing/planting/transplanting operations, adoption of rotavators, conservation tillage technologies (zero till drills, strip till drills, roto-drills, till-plant machines, raised bed planters, ridger seeder etc.) and promotion of precision drills, planters and transplanters should be promoted and given high priorities.
3. For timely and efficient plant protection, Aero-blast sprayers, orchard sprayers and electro-static spraying equipment are required to be introduced.
4. Improved harvesting equipment like serrated sickles, fruit pluckers, Vertical Conveyor reapers may be introduced.
5. For threshing of rice, pulses and oil seeds, power threshers should be introduced.
6. For making farm ponds, bunds, farm roads, drainage channels etc. power operated trenchers, angle dozers, drudgers, buck scrapers and other earth moving machinery should be introduced.
7. For rational use of human and animal energy, improved, efficient and ergonomically designed hand tools and matching animal operated equipment for different operations like seed-bed preparation, sowing/planting, weeding/interculture etc. should be promoted and popularized.
8. Sufficient manpower in agricultural engineering should be assigned to the Central Agricultural Research Institute (CARI), Port Blair and adequate facilities created to undertake adaptive R&D for tailor fitting improved designs of hand tools, animal drawn and mechanically powered implements to the needs of the Island farmers.

16.3.3 Mechanization of Horticulture Crops

9. For fruit crops mechanization equipment for pit making, transplanting of saplings, pruning, spraying in tall crops, harvesting of fruits etc. need to be identified, introduced and popularized. Likewise equipment for vegetable production should be introduced.
10. Modern manual and power operated garden tools

and equipment will have to be introduced and popularized for promotion of raising of seedlings for growing of fruits, vegetables and flowers and for work in the gardens.

11. Use of plastic mulch reduces water requirement and checks weed growth. Equipment for laying plastic mulch, low plastic tunnels for cultivation of vegetables, cut flowers etc. will be required to be introduced and popularized.

16.3.4 Feeds and Fodders

12. Equipment for harvesting of fodder crops, making silage, straw baling, feed blocks, feed pellets need to be introduced.

16.3.5 Biomass Management

13. Equipment for clearing of shrubs, weeds, and grasses along the roadside are required.

16.3.6 On-farm Post Harvest Technology

14. Post harvest equipment and technology are needed for cleaning, grading, drying, cooling, storage, cold storage and handling of farm produce to improve their quality and shelf-life.
15. Agro-processing activities need to be promoted in the production catchments to reduce losses, primary processed products of local use, minimize transport cost and to increase income and employment opportunities in rural areas.

16.3.7 Infrastructural Improvements

16. Farm machinery exhibitions and demonstrations should be organized at important places in the region every year and groups of farmers taken to these exhibitions to see improved equipment and their working.
17. Facilities should be created for training of trainers, farmers, drivers/operators, mechanics, and manufacturers to support the agricultural mechanization programmes.
18. Training programmes should be organized for the entrepreneurs in manufacture/running of custom service centers/Agri-clinics/repair and maintenance workshops and providing contract services for different farm operations.
19. For creating awareness amongst the farmers and extension workers, Front Line Demonstrations and regular programmes on mechanization and improved farm equipment should be organized through print and electronic media.
20. To give benefit of improved high capacity

agricultural machinery to all categories of farmers, custom services of agricultural machinery by private entrepreneurs should be encouraged and promoted. They should be given incentives and long-term loans on concessional rate of interests.

21. Visit of selected groups of progressive farmers should be organized to other States/countries where they can see the modern farms and use of improved agricultural machinery.
22. Sufficient manpower in agricultural engineering should be assigned to the Central Agricultural Research Institute (CARI), Port Blair and adequate facilities created to test and evaluate improved farm equipment for introduction and undertake training and upgrading of the fabrication and general repair and maintenance skills of local artisans. For this purpose, Agricultural Engineering section of CARI should be strengthened and converted into a Division. KVKs of the region should train farmers in farm mechanization and on-farm post harvest technology and value addition.
23. The private workshops which undertake repair and maintenance of tractors, power tillers, engines

and other machinery should be encouraged and supported through training and information to improve their service.

16.3.8 Institutional Framework

24. The Islands are situated in high rainfall zones. In order to protect the land under agricultural crops against erosion, Directorates of Agriculture should have a strong programme of soil conservation utilizing modern and efficient equipment for land grading, contour bunding and other operations involving earth movement.

16.3.9 Policy Issues

25. For efficient use of stationary farm power units and equipment, the farmers should be provided electricity at subsidized rates but not free.
26. To encourage the owner of farm machinery to insure their farm equipment and to provide an insurance cover to the farm labour, group insurance scheme for equipment like tractors, power tillers combines threshers etc. should be started at the premium rate of 0.5% or less of the machine value insured.

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