



"I wish to double the income of farmers by 2022 when India will celebrate 75 years of its independence."

Narendra Modi (Prime Minister of India)

Strategy for Doubling Farmer's Income In Uttarakhand



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Inspiration and Guidance

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Hon'ble Prime Minister of India has given a call to all scientific community and government functionaries to double the income of farmers by 2022. To fulfill the aspiration of Prime Minister, G.B. Pant University of Agriculture and Technology Pantnagar has prepared a plan under the guidance of Hon'ble Chief Minister of Uttarakhand, Hon'ble Agriculture Minister of Uttarakhand, Secretary Agriculture Uttarakhand and all the Institutes of Indian Council of Agricultural Research located in Uttarakhand to double the income of farmers by 2022. Considering the diverse agro climatic condition of Uttarakhand 10 point strategy have been formulated to cover all four agro ecological zones of state. Detailed plan to enhance productivity, promotion of live stock, integrated farming system, reducing post harvest losses and value addition, waste land development and waste water management, reduced cultivation cost, off farm income, enabling policies, marketing and online management of plan have been prepared for all the 13 districts of Uttarakhand. The plan has been prepared for all four zones of state located at altitude of up to 1000 m, 1000-1500 m, 1500-2400 m and more than 2400 m in different districts. Complete packages of practices have been devised for all the crops and other agricultural activities up to block level.

I hope the plan prepared by university will be very useful for state planners, officials and workers of line departments and farmers for increasing the agricultural income in Uttarakhand.

(A.K. Misra) Vice Chancellor







Doubling Farmers' Income Based on Recommended Interventions/Technologies in Uttarakhand

Strategy 1: Productivity Enhancement

- A. Introduction, adoption and popularization of high yielding varieties for increasing productivity
 - 1. Promotion of high yielding varieties of major field crops, vegetable crops, fruit crops, medicinal crops, fodder crops and ornamental crops.
 - 2. Promotion of high yielding milk, meat, wool, egg & meat breeds of different cattle, buffaloes, sheep, goat and poultry birds.















B. Strengthening of traditional water storage structure

- 1. Strengthening of existing water storage structures like ponds, naula and check dam in most of the villages.
- 2. Construction of water harvesting check bunds to harvest the rain water.
- 3. Construction of rain water harvesting structures (LDPE tank, cemented tanks) in private as well as government buildings.
- 4. Construction of trenches for high percolation of water in valley area.
- 5. Promotion of water conservation techniques like mulch, sprinkler and drip irrigation system in juvenile plants in low or valley areas.
- 6. Efficient management of rain water harvesting with drip-fertigation system.



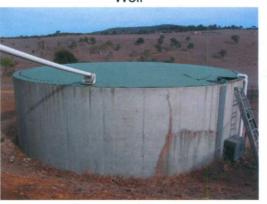
Roof top harvesting system



Well



Naula



Cemented Tanks







- 7. Strengthening of existing Hydrum system of irrigation.
- 8. Popularization of low cost lining material to check seepage in the region.
- 9. Establishment of roof top water harvesting structures in all households.

C. Adoption of cluster approach for holistic development

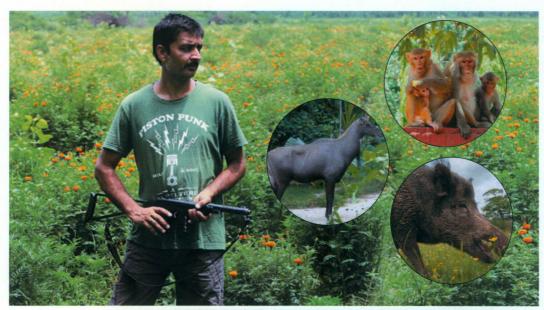
- 1. Strengthening of old fruit belt by introduction of new cultivars of fruits crops.
- 2. Popularization and promotion of zero energy cool chamber among farmer groups at Nyay Panchayat level.
- 3. Promotion of organic cultivation of ginger / turmeric in low valley areas.
- 4. Promotion of cultivation of off season vegetables (tomato, potato, capsicum, cole crops etc.).
- 5. Promotion of production of major area specific field crops.
- 6. Promotion of irrigated areas for seed production of rice and wheat.
- 7. Promotion of production of major area specific vegetable crops (tomato, vegetable pea, okra, French bean, onion, garlic with use of proper crop rotation.
- 8. Promotion of organic cultivation of different crops (Basmati rice, finger millet, barnyard millet, horse gram, bhatt, ginger, turmeric).
- 9. Fallow land development under agro-forestry in the region.
- 10. Promotion of common minimum programme technology in vegetables to reduce cost of cultivation and have quality produce.

D. Management of wild animal problem

- Promotion of live fencing of lime / lemon at larger scale in fruit crops, ginger or turmeric in shady areas, lemon grass to ward off wildlife in cultivated field.
- 2. Promotion of chillies, capsicum and okra as these are least affected by monkey menace.











- 3. Enacting legislative measures for protection of crops from wild animals.
- Promotion of protected cultivation of vegetables (tomato, capsicum, cabbage, cauliflower and cucumber) in blocks of the State.
- Promotion of cultivation of kafal, mango, hishalu, wild walnut, mahal and other wild fruits in different pockets in forest areas for wild animals.





E. Adoption of farm mechanisation

- Popularization of multi crop thresher and Power Tiller / Mini Tractor at Nyay Panchayat level in Uttarakhand.
- 2. Promotion of improved Naveen sickle, dung collector, maize sheller & peeler for drudgery reduction of farm women in the State.
- 3. Popularization of manually operated mini crop harvesters for rice, wheat and millets.





Hill Power tiller & Zero till ferti seed drill

F. Management of soil health in low or valley areas

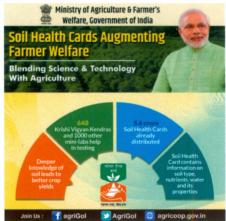
- Popularization of soil sampling and soil testing in intensive mode, and distribution of soil health cards to farmers for judicious use of manure and fertilisers.
- 2. Promotion of vermin-composting unit of this region and adoption of well decomposed FYM and other compost.
- 3. Promotion of cultivation of green manuring crops like sesbania, sunhemp, and lobia in Uttarakhand.
- 4. Popularization of bio-fertilizers like Rhizobium, Azotobacter, Azospirillum, PSB, PSM, K solubilising micro-organism, and use of these biofertilizers with FYM at the time of sowing.
- 5. Fortification of FYM with Pseudomonas and Trichoderma.











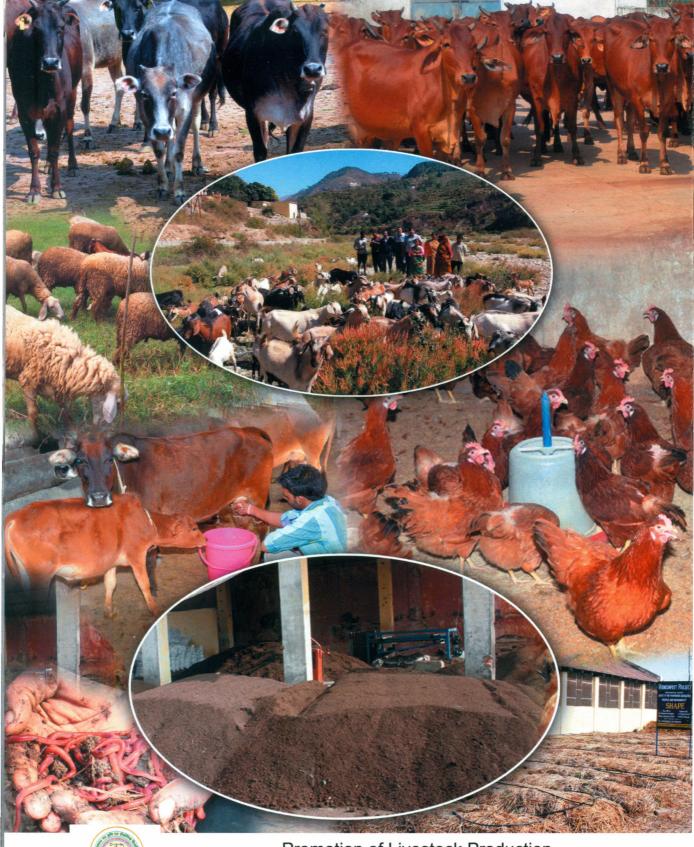
Soil health card scheme

- 6. Promotion of bio-fertilizer / soluble fertilizer based farming, especially in rainfed areas of Uttarakhand.
- 7. Adoption of integrated nutrient management in irrigated areas of rice and wheat.
- 8. Promotion of pulses crops in crop rotation to improve soil fertility and productivity.
- 9. Popularization of soil and water conservation measures by pulse based intercropping, contour farming and shoulder bunds in particular rainfed areas of Uttarakhand.
- 10. Organic cultivation of traditional crop viz., finger millet, barnyard millet, black soybean, horse gram, traditional rice of the State.
- 11. Promotion of soil testing kits in all blocks of the State.

G. Cluster approach for holistic development

- 1. Seed treatment through bio-agent strictly in the cluster.
- Promotion of timely and local availability of high yielding varieties of all the cereals, pulses, oil crops, high value crops like vegetable, fruits, spices, etc.
- 3. Protected cultivation in vegetable crops.
- 4. Cultivation of fodder and forage crops & medicinal plants





Promotion of Livestock Production



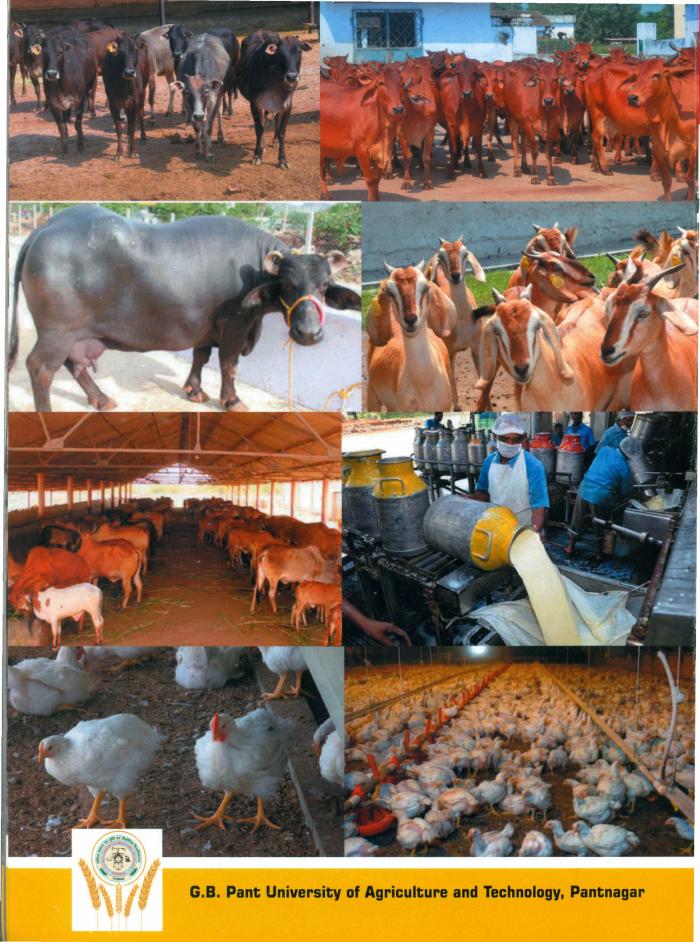


Green manure crops and Biofertilizers

- 5. Adoption of only well decomposed FYM / value added compost.
- 6. Promotion of efficient and timely use of IPM and IDM practices.
- 7. Adoption of moisture conservation practices.
- 8. Promotion to focus on timely sowing and weed management.
- 9. Promotion of biotic & abiotic stress resistance varieties, and alteration in cropping pattern.
- 10. Promotion of Pusa Hydrogel technology in cultivation of vegetables, pulses and cereals.
- 11. Compulsion of seed treatment through bio agent / chemical in the cluster.

Strategy 2 : Livestock-Goatry, Poultry, Fisheries

- 1. Promotion of high milk breeds of cows, buffaloes and goats while promotion of wool yielding breeds of sheep.
- 2. Introduction and promotion of cross-heifer by Artificial Insemination (AI) for increasing income of marginal farmers at block level in the State.
- 3. Development of good nursery of fishes and availability of good species of fingerlings is required; fisheries should be promoted through favourable policies.

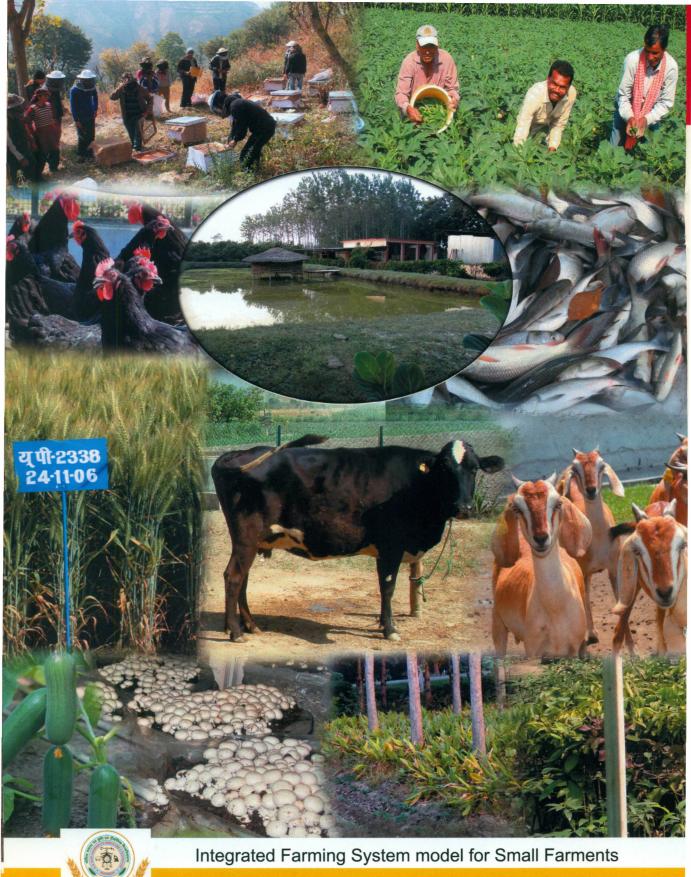




- 4. Establishment of Fodder Bank at each block / Nyay Panchayat level to meet fodder / feed block and mineral blocks requirement, particularly during lean period.
- 5. Establishment of milk chilling plant at block level in the State.
- 6. Development of grass land in different villages of the State.
- 7. Selection of more numbers of veterinary experts at Nyay panchayat level.
- 8. Promotion of urea, molasses, and mineral mixer blocks at Nyay panchayat level.
- 9. Establishment of hatcheries for need of broiler / layer at block level in the State.
- 10. Meeting need of broiler or croiler at district level to meet out requirement of chicks by the farmers.
- 11. Strengthening of traditional water bodies / rivulets with Mahaseer or carps at block level in the State.
- 12. Availability of feed material with low prices, and timely health check-ups of animals.
- 13. Introduction and promotion of cross bred milch breed of animal for increasing income of marginal farmers.
- 14. Planning for establishment of Gaushala at block level to rear unproductive cattle, to avoid damage to crops in cultivated areas.









Strategy 3: Integrated Farming system

Following Integrated farming system models may be developed:

- Protected cultivation + Composting + Goatry / Backyard poultry / Dairy
- 2. Fodder production + Mini dairy + Composting + Protected cultivation
- Seed production (lentil, radish, pea) + Planting material supply + Mushroom
- Vegetable based protected cultivation + composting and Goatry / Poultry
- Live stock based green fodder + Dairy, composting and Goatry / Poultry + Protected cultivation
- Crop based crop and vegetable + Dairy, composting and Goatry / Poultry

Strategy 4: Reducing post harvest losses and value addition

- 1. Establishment of mini fruit grading plant for fruits at block level in the State.
- 2. Establishment of food and processing units / value addition centre at fruit / vegetable belt for pickle, jam and jellies making.
- 3. Establishment of procurement centre for efficient marketing of surplus fruit, vegetables.
- 4. More refrigerating van / reefers for quick transportation for perishable commodities like flowers and vegetables.
- 5. Promotion of cluster approach for efficient procurement and disposal of surplus fruits and vegetables in all the blocks.
- 6. Promotion of common resources on custom hire basis viz. power tiller, mini thresher and other equipments at Nyay Panchayat level.
- 7. Establishment of packaging infrastructure at village level with packaging, sewing, sealing and labeling facilities.





Post Harvest Processing and Value Addition

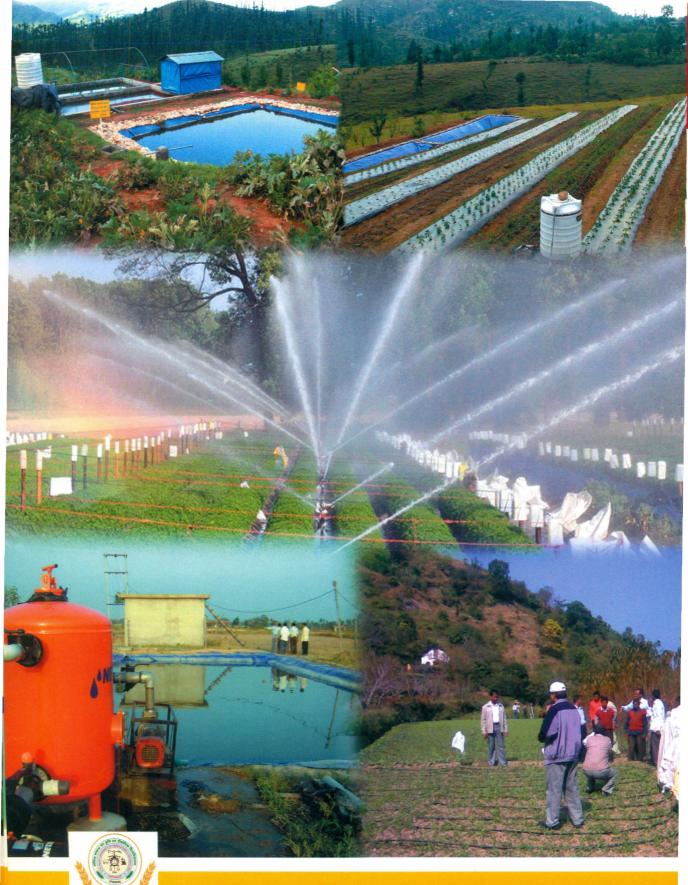


- 8. Establishment of marketing chain for efficient / timely supply of produce / product.
- Creation of larger facilities of infrastructure for reducing post harvest losses in horticultural commodities viz. long term storage, warehouses.
- 10. Development of cottage industries at village level for unfinished products.
- 11. Cluster approach is useful for small and marginal farmers to procure input and disposal of surplus in areas.
- 12. Establishment of storage facilities like warehouses, cold storage and cold chamber at each block level.
- 13. Gravity ropeways to be constructed to provide road head access to the farm produce need to be taken at a larger scale.
- 14. Private investment must also be encouraged in post harvest technology and infrastructure to bridge the gap in agricultural marketing.

Strategy 5: Waste land development and waste water

- 1. Contour bunding for arable purpose in waste land in high hills areas.
- 2. Afforestation of plants and perennial grasses in steep slope of more than 40% slope.
- 3. Need to develop more forest nurseries to supply fodder plants to farmers in rainy season.
- 4. Plantation of mulberry plants, wild fruit plants, fodder trees (bhimal, utees, oak etc.) may be promoted.
- 5. Popularization of soil bunds to save excessive loss of nutrients in wastelands of the State.
- 6. Popularization of trenches or silages for percolation of water to avoid surface run off in the State.





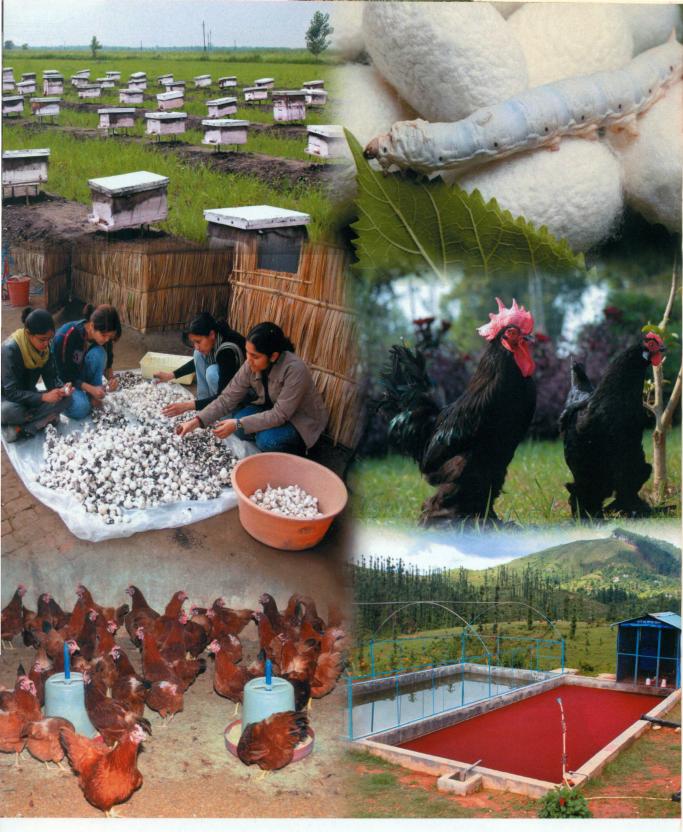
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- 7. Construction of check dams and artificial structures to reduce run off and maximize water percolation rate.
- 8. Construction of tanks for storage of water for lean season.
- 9. Establishment of storage system for rain water in monsoon season.
- 10. Popularization of roof water harvesting system in different villages in the State.

Strategy 6: Reduced cultivation cost

- 1. Judicious application specific fertilizers and micronutrients like zinc, boron, phosphorus etc. after soil testing in every block.
- 2. Promotion of custom hiring centres (CHC) for the use of power tillers, power weeders, paddy threshers, wheat threshers, mandua / madira threshers, maize sheller, wheel hand hoe, manual / power operated wheat / paddy reapers, power sprayer, mechanical fruit harvester at cluster or Nyay panchayat level.
- 3. Establishment of sales and community centres at each cluster for easy and timely availability of seeds, seedlings, fertilizers.
- 4. Promotion of zero tillage method of sowing in cereals.
- 5. Promotion of well decomposed FYM, vermin-compost and biofertilizers to minimize use of chemical fertilizers.
- 6. Promotion of line sowing and fertilizers application in crops.
- 7. Promotion of recommended seed rate, spacing and depth.
- 8. Promotion of timely availability of seeds, fertilizers, insecticides, pesticides etc. at Nyay Panchayat level.
- 9. Promotion of hand tools in agricultural and horticultural operations.
- 10. Promotion of mulching (bio or degradable plastic) to maintain moisture and reduce intercultural operation cost.





Off Farm Income generation through various components



- 11. Promotion of need based application of pesticides and other agricultural inputs.
- 12. Promotion & use of trichocard, light trap & pheromones trap for control of inspect-pests in different horticulture / vegetable / cereal crops.
- 13. Promotion of pressurized irrigation techniques in horticultural crops.
- 14. Implementation of Chakbandi of scattered land.
- 15. Minimization of rainfed condition.
- 16. Organisation of trainings to increase scientific knowledge.
- 17. Facilitation of farmers with weather updates.
- 18. Promotion of practice of IPM and INM by farmers.
- 19. Increase in number of sales and community centres for easy and timely availability of seeds, seedlings, fertilizers and required information in each block.
- 20. Avoid broadcasting of seeds and fertilizers in crop production program.
- 21. Use of modern techniques to use water use efficiency in horticultural crops.

Strategy 7: Off-farm income

- 1. Promotion of subsidiary occupations like poultry, fish farming and mushroom production.
- 2. Promotion of apiculture for small and landless farmers.
- 3. Promotion of sericulture in low hills or valley areas in Uttarakhand.
- 4. Promotion of cultivation and collection of medicinal aromatic plants in the State.
- 5. Emphasis on promotion of religious tourism for Panch Kedar Yatra to serve organic and local delicacy.





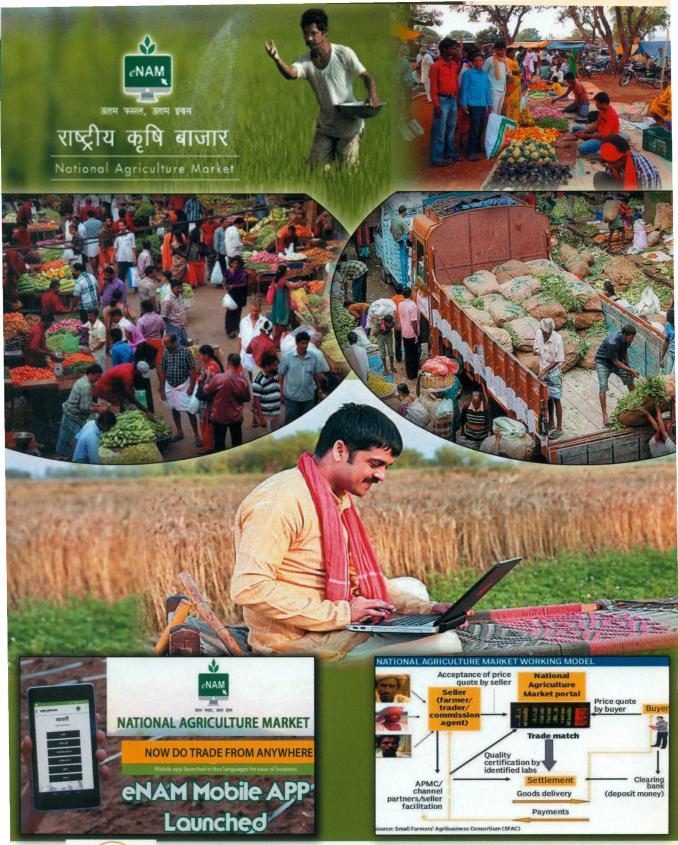
Protected cultivation of vegetables under Polyhouse



- 6. Promotion of skill development for nursery raising techniques in fruits and vegetables, handicraft, commercial dairy business, orchard management, processing methods for women and youth.
- 7. Encouragement to existing SHGs for collective farming, opening small scale enterprise like candle making, pickle making, jam & jelly making, spice cultivation, ghee making & packing, aipen, jute bags, woollen clothes, candle making, squash, pickles, mushroom production, homemade / value added products (bari, papad, namkeen, biscuit) etc. may be provided for better performance.
- 8. Promotion of SHGs for value addition and primary processing and linking them to market (buy back system).
- 9. Increasing awareness towards education which helps in getting employment to the rural youth, farm women.
- 10. Development of online advisory centres by trained youths.

Strategy 8: Enabling Policies

- Consolidation of land holding by either forceful implementation by govt or by mutual understanding at village level
- 2. Increasing institutional support by providing subsidises and incentives to small and marginal farmers.
- 3. Labelling of organic inputs and certification mechanism for various crops / fruits and vegetables.
- 4. Popularization of Udhyan and Krishak Cards for widespread use of government incentives / subsidies to farmers.
- 5. Establishment of mother orchard to meet the present and future demand of germplasm in horticultural fruit crops.
- 6. Implementation of effective and workable Nursery Act to avoid spurious or unreliable planting material / seedlings in the State.
- 7. Ensure sustainable agriculture through more efficient utilization of land, water and other resources.





Direct Marketing of Agricultural Produce for Greater

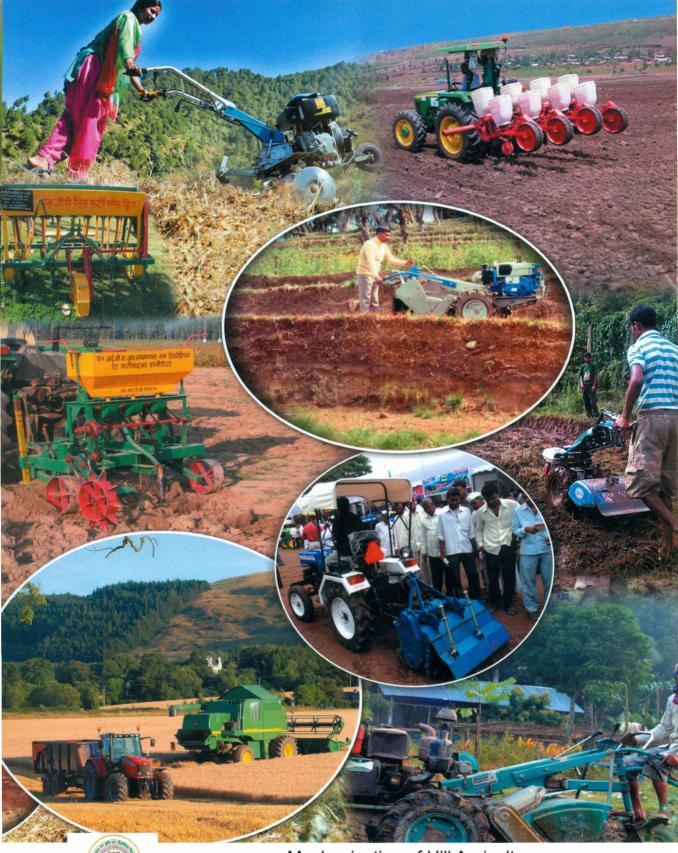


- 8. Promote mechanization through small implements suitable for hills; provide maximum subsidy for sprinkler and drip irrigation facility and protected cultivation of vegetables.
- Creating new market for purchase of farm produce, especially horticulture crops at block level and providing facilities for maintaining cool chain for sending produce from the State to distant markets within the country and abroad.
- 10. Floriculture has immense potential to boost the economy of farmers as well as the State, therefore potential floriculture crops like lilium, carnation, gerbera, rose, orchids and other bulbous flowering plants should be promoted in all the blocks.
- 11. Promotion and cultivation of marigold for meeting the demand of religious places of the State.
- 12. Implementation of Soil Health Card Scheme at Gram Panchayat level.
- 13. Implementation of policies for control of wild animal menace in agricultural areas.

Strategy 9: Marketing and value addition

- 1. Establishment of cold storage in all blocks of the State.
- 2. Creation of better transportation facilities with cold chain van at block level in the State.
- 3. Creation of direct linkages with food processing industries for better prices.
- 4. Establishment of strong linkages with various stack holders to furnish information on crop produce and surplus.
- 5. Establishment of procurement and collection centre at Nyay Panchayat level for agricultural surplus with proper labelling.





Machanization of Hill Agriculture



- Formation of district level committees of State line departments with KVK experts for field and as well as online monitoring, evaluation and feedback.
- 7. Installation of mini grading machines at village level in the State.
- 8. Establishment of mini mandis at block level in the State.
- 9. Creation of direct linkages with food processing industries for better prices.
- 10. Establishment of strong linkages with various stack holders to furnish information on crop produce and surplus.
- 11. Promotion of local hatt at tehsil level in the blocks.
- 12. Development of proper marketing network to check interference of middle men in marketing of agricultural produce of the farmers.

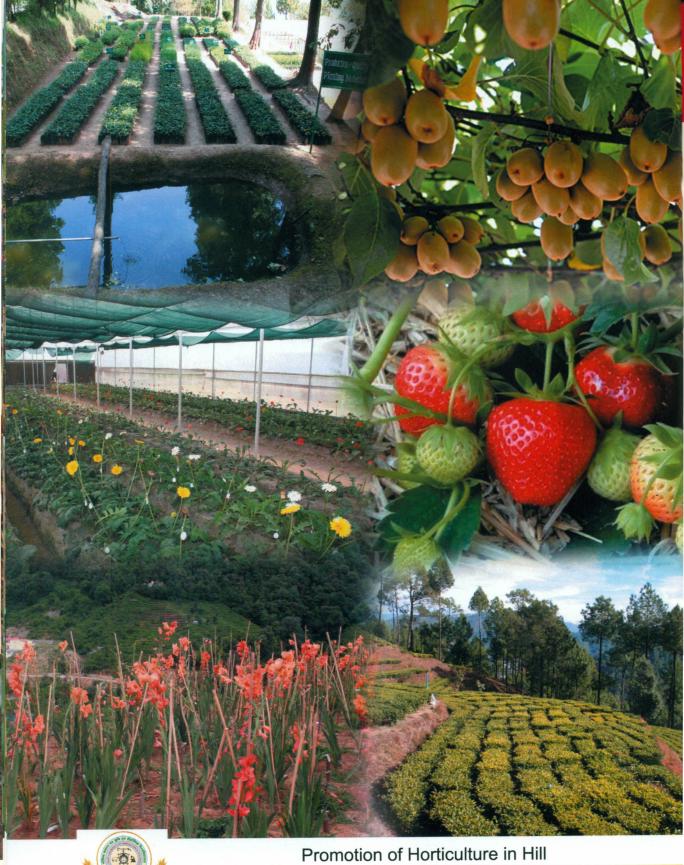






Food Processing Units







Strategy 10: Online Management and Evaluation

- 1. Development of mobile apps / software for online management and evaluation at district level.
- 2. Development of e-marketing and kiosk at district level to have information of surplus commodities at block level.







Different mobile apps for farmers





- 3. Organization of monthly review meeting at district level to solve problems related with farmers.
- 4. Promotion of use of community radio, TV talks and mobile app etc. for effective implementation of programme.
- 5. Weather forecasting and contingency planning.





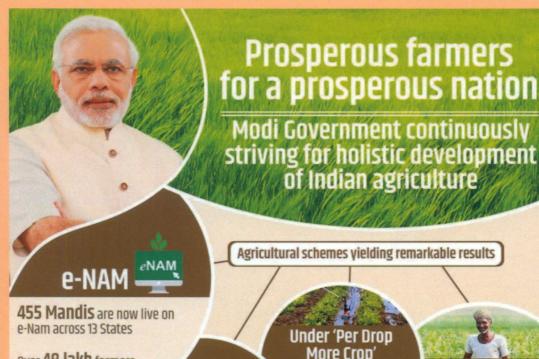




Trainings programmes for farmers







Over 48 lakh farmers registered on the platform



Soil Health Cards

More than 9 crore Soil Health Cards have been dispatched

15.94 lakh hectares brought under micro irrigation from 2015-

Doubling of farmers' income by 2022

*Rs.16,094.13 crore funds released to achieve this goal

*As on 3 August 2017

Doubling Farmer Income By 2022

