

FOOD SECURITY AND AGRICULTURE DEVELOPMENT

DEPARTMENT

INTRODUCTION

Agriculture is the main stay of majority of rural population of Sikkim. A successful rural economy will remain key to maintain the progress in the state as more than 60% of population of the state still live in villages. Due to adverse geographical situation and difficult terrain condition, the extension of area under cultivation appears to be difficult. With the increasing population the pressure on land has continued to increase resulting in low per-capita land availability and there is decreasing trend of farmers working on farms.

In Sikkim the best agriculture system is sustainable agriculture, which is economically viable for the individual farmers and environmentally sound. Being organic State the Department is propagating and advocating farmers to adopt new and modern technology of organic farming system to sustain the production and certification process in identified areas. The special emphasis has been laid by the Department on fulfilling the gap in availability and farmers requirement for improved seeds, plant nutrients, bio-fertilizers and bio-control agents which are necessary for sustaining the organic farming system in the State.

In spite of limited area of cultivated land, smaller land holdings, difficult hilly terrain, diverse agro-climatic condition prevailing at short distances, low farm income and lack of supportive infrastructures for agriculture development, the State has achieved to sustain a larger portion of its food requirement with its effort for improving agricultural production. It has become very important to spell out Agriculture policy for effective development in Agriculture section on a short and long term prospective.

STATUS OF AGRICULTURE IN THE STATE

Sikkim with a total geographical area of 7,097 squares kilometers, around 1,10,000 hectare is available for cultivation. The net sown area is estimated to be not more than 62,000 hectare including area under miscellaneous tree crops and grooves. Rain-fed agriculture is a predominant feature, having only about 15% area under irrigation. Main crops grown in the State are maize, rice, millets, buckwheat, pulses and oilseeds.

In view of hilly terrain and small size of holding the most suited farming system is integrated farming

The special project of Action Research and other related activities such as conservation and adoption of local cultivars has been proposed for standardization of agronomic farming practices to give fillip to the organic farming through sustainable farming system. Natural resource management being the priority area, the special emphasis has been imposed on natural resource management for a balanced ecology and farm economy.

LAND CLASSIFICATION

The State is wholly hilly state with no plain land. The agro-climatic condition ranges from Sub-tropical type in the Lower Valley to Alpine type in the upper reaches. No single crop or the variety of crop can suite to all the elevation. Less than 30% of the Land has been classified as the land of Capacity Class I. The cultivation is done in sloping topography with or without proper bench terracing which call for careful approaches and scientific system of farming. 50% of other lands are either improperly terraced or un-terraced.

VISION

To put Sikkim on an accelerated path of sustainable agriculture development by strengthening the production of organic crops and enterprises in a system approach with market potential for increased farm income to viable levels as well as ensuring food security through increase productivity combined with profitability. The emphasis would be on:

- Production of HYV seeds, enriched compost and bio-fertilizers
- Developing farmers' preferred local land races of field crops most suited to the region
- Promoting brand value of organically produced local products
- Broadening of knowledge of farmers for making informed choice
- Agriculture programme focusing on gender and human aspect

PRIORITY SETTING FOR THE DISTRICT

- Establishing, managing and usages of components of organic farming.
- Soil health improvement.
- Popularizing resource conserving technologies.
- Systematic shift from and/ or integration of single crop enterprises to multiple cropping and intercropping.
- Intensification of crop husbandry with vegetable and horticultural crop, animal husbandry, Mushroom cultivation and other other non crop based farming.
- Bridging yield gaps of crops, cereals, pulses, oilseeds.
- Human resource development of rural youths, farm women, other disadvantaged groups and field staff.
- Promoting spirit of cooperation and self help through dynamic amongst farmers.
- Strengthening the extension system.
- Focus on market oriented agriculture..

The paradigm shift from traditional farming towards market oriented agriculture in the district is aimed at creating a diversifying farming system with the high value component like floriculture, off season vegetables, vermicompost, and apiculture with more market network.

PERSPECTIVE PLAN

The main objective is to increase the farm income while assuring the food and nutritional security and enhancing the agricultural growth to 4%, a series of programmes are planned. During the year 2009-10, the food grain production target is estimated to be 112 tonnes. This will be achieved by transfer of technology and proper extension services, use of high yielding varieties and improved varieties of seed suited to organic conditions. Certified seed production programme will be given top priority to fulfill the seed requirement of the farmers. Emphasis will be given for soil reclamation and improvement of soil health. The massive programmes are being taken up for on farm composting, vermi-composting and green manuring. A farm mechanization programme, with emphasis on gender friendly implements is also being included in the crop production programme.

Mixed farming system is indigenous to Sikkim, the department has taken step to popularizing the integrated farming system approach for the sustainable agriculture. The use of organic alternative of nutrient and plant protection measures has already been incorporated in all crop production programme. The projects are being included for the efficient water utilization in the farming practices through construction of water harvest structure and sprinkler irrigation. More emphasis is given in capacity building by providing training and exposure tour to the officers as well as the farmers. The Department is putting its all efforts to increase the productivity of different crops for attaining self sufficiency in cereals, pulses and oilseed production.

STRATEGIES FOR AGRICULTURE DEVELOPMENT IN SIKKIM

- **Food and nutritional security by making the state self sufficiency in Food:**

The goal of making the State self sufficient in food grain production will be achieved by enhancing the agricultural growth to 4% with the adoption of improved and suitable crop management technologies, introducing intensive cultivation and changing food habit slightly.

- **Quality seed multiplication and distribution:**

Thrust of the programme is not only to achieve self sufficiency in seed production but to achieve so with quality seeds. The Department is looking forward to produce hybrid seed by signing MOU with **NSC and Zuari Seeds**. Seed Replacement Rate (SRR) is a major indicator on the state of agriculture, the programme target to achieve SRR for cereals:45%, Pulses: 15% and oilseed:30%.

SEED REPLACEMENT RATIO ACHIEVED IN MAJOR CROPS:

Sl. No.	Crop	2006-07	2007-08	2008-09 Target
1	Paddy	11.93	13.47	15.00
2	Wheat	39.68	41.08	42.00
3	Maize	15.45	46.98	50.00

- **Strengthening of existing Government Farm:**

The existing Government farms need to be strengthened for testing new technologies. These farms play an important role in the production of foundation seed and certified seed. It will act as the Training Centre for the farmers of adjoining areas.

- **Establishing Sikkim as Organic State:**

To convert Sikkim into an organic State absolute emphasis has to be given on organic farming. On farm organic manure production and recycling of the farm waste is the Focus of the programme. Organic alternatives of plant nutrition and plant protection are popularizing amongst the farmers.

- **Integrated farming System:**

Evolving and demonstrating appropriate crop-livestock based farming system by integrating traditional and improved practices. The system would generate more employment opportunities, increase farm productivity with minimum disturbance to the fragile ecosystem. The proposed farming system approach would ensure utilization of within farm renewable resources planned to be generated through the

integration of different components on one hand and promotion of organic input production like vermicompost, enriched compost, liquid manure, etc. which is expected to provide the needed technological backup to further the cause of organic agriculture, animal husbandry etc.

- **Construction of water harvesting structure:**

Main e crop grown in the State are Maize and rice in Kharif season. Almost 50 % of the Paddy field remains fallow_after the harvest of rice. There is enough scope in utilizing the winter fallow for cultivation of crops like mustard, wheat and buckwheat. The main objective of the Department is to increase the area and production under rabi crops thereby increasing the cropping intensity during the season. The department is emphasizing in repair of the damaged channels or creation of micro –irrigation system. Construction of water harvest structure is also the focus of the department.

- **Soil Health Management:**

The objective of soil health management programme is to sustain crop production while maintaining soil conditions. This focus on the harmonious use of nutrients through organic and biological sources.It promotes application of balanced nutrients on the basis of soil test to achieve targeted yield.

- **Adoption of economic practices by way of multiple cropping:**

Intercropping with legume and green manuring crops for economic purposes as well as improving the soil condition to be given prior importance.

- **Human Resource Development :**

Capacity building of extension officer/ officials and farmers are being done by regular training and exposure visits. The measures of transfer of technology would be carried out through ATMA. KVKs and the extension officers/ officials of the Department are involved in the farmer scientist interaction at village level.

- **Farm Mechanization:**

Agriculture mechanization is means to introduce improved implements and machines for different agricultural practices to increase productivity. Efforts are making to introduce simple mechanical device suitable for hill terraces to bring about improvement in farm operations. More emphasis is needed on the post harvest processing of farm produce.

- **Land development:**

For the conservation of soil, plant nutrient and soil moisture at optimum level, thorough land development programme should be undertaken with the participation of local farmers.

- **Strengthening of the existing Government Farms**

The existing government farms need to be strengthened for conducting Adaptive trials and research works and for testing new technologies before taking it to the farmers. Government farms will play an important role in the production of foundation seed and certified seeds and will conduct various demonstrations. It will act as a Training Centre for the area covered by it.

- **Large Scale Demonstration:**

Package technology involving HYV, organic fertilizers and IPM should be demonstrated on a large scale. The main emphasis will be given on organic cultivation by the use of various organic manures and fertilizers like vermi- compost, EM compost etc.

- **Development of Human Resource:**

Development of Human resource will be done by regular training of farmers, Field functionaries and Specialists.

- **Strengthening of Data Base**

- **Under taking High Yielding Varieties:**

Since High Yielding and improved varieties play a pivotal role in achieving increased productivity and production, the need to introduce High Yielding Varieties suitable for organic farming and also promoting local and developed varieties is seen.

- **Emphasizing Compost development :**

To make best use of the farm waste, rural composting through EM technology needs to be encouraged. Vermi- composting to be popularized too.

- **Adoption of economic practices:**

Intercropping with legumes and green manuring crops for economic purpose as well as improving the soil condition to be given prior importance.

- **Use of Bio-fertilizers:**

Application of bio-fertilizers should be promoted on a large scale.

- **Introduction of IPM:**

Prior importance need to be given for adoption of Integrated Pest Management since the state has been declared Organic. Chemical control of diseases and pest is to be replaced by Bio-pesticides.

- **Soil Amendment:**

To improve soil health, soil testing and necessary measures of soil amendments should be taken up.

- **Seed Production and Certification:**

The seed requirement of the State is being fulfilled to some extent from outside sources. The supply of requisite quantity of seeds to the farmers of the state taken from outside sources is not feasible due to high cost, hence there is a great need for production and certification of seeds within the State to meet the domestic requirement of the State. Simultaneously emphasis should be given to seed processing and seed testing for quality seed production.

- **Soil Conservation Measures:**

Out of the total cultivated land in the state nearly 58.18 % of the land is found to be under terraced cultivation and the remaining 41.82 % of land is being cultivated without any soil conservation treatment. These untreated land needs to be brought under suitable soil conservation treatments depending on the soil depth and land capability classes. Bench Terracing followed by reclamation of soil to conserve soil and soil moisture should be taken up. Biological conservation methods should be adopted where bench terracing are not applicable.

- **Multiple cropping systems:**

Multiple cropping by way of mixed cropping, intercropping and relay cropping practices needs to be popularized to increase farm income.

ANNUAL PLAN FOR 2009 -10

A. CROP HUSBANDRY (AGRICULTURE)

1. Direction and Administration: Rs. 80 lakhs.

2. High Yielding Varieties Programme: Rs. 80 lakhs.

The objective of this programme is to introduce and promote new high yielding and improved varieties of different crops in the State and to increase the area under the varieties suitable for organic farming and to maintain the high seed replacement ratio of different crops.

3. Seed Multiplication and distribution : Rs. 100 lakhs

Production and distribution of improved seeds of field crops constitute the primary activity of agriculture development. The main objective is to produce quality seeds and their timely supply to the farmers. The scheme has various components like seed production, testing, certification, storage and distribution.

4. Agriculture Farm: Rs. 400 lakhs.

The location of the government farms are in different agro climatic regions and sub regions. The main objective of these farms are multiplication and production of foundation and certified seeds, conduction of adaptive trials and demonstration of the latest crop production technology for adoption in the farmer's field. Two government farms – Nazitam and Mellidara have been converted to 'Center of Excellence' in organic farming system wherein production and trials of various organic manures and products will be conducted.

5. Manure & Fertilizer: Rs. 50 lakhs

After the declaration of the State as an 'Organic State' subsidy on chemical fertilizers have been discouraged. Organic cultivation has been taken up replacing all chemical fertilizers by other organic means to fulfill the plant nutrient requirement.

6. Organic Farming : Rs. 250 lakhs.

This includes demonstrations on organic fertilizers and soil conditioners, EM technology and production of organic manures, composts and bio fertilizers.

7. Plant Protection : Rs. 30 lakhs

Use of disease and pest resistant varieties are being grown. Bio agents produced in the IPM lab. are being released in the fields to control the pest attack. IPM technology is being practiced to replace chemical pesticides. The use of bio pesticides and other organic alternatives are being taken up in the State.

8. Extension & Training : Rs.200 lakhs.

Transfer of latest technology to the farmers by providing training, conducting field days, exhibitions and distribution of training material, literatures are the main objective of this scheme. Besides Capacity building of the officials to update technical knowledge is also equally important.

9. Planning, Monitoring & Evaluation : Rs.5.00 lakhs.

10. Agriculture Engineering : Rs. 50 lakhs.

Mechanized system of farming by introducing latest improved machines in the field and post harvest operations will be taken up. Distribution of improved tools and implements to make agriculture operations easier, strengthening of existing Agro service centres in the government farms are also some of the important components under this scheme.

11. Soil Testing :**Rs. 100 lakhs**

Soil testing is essential to determine the plant nutrient requirement. This is done in the Soil Testing Laboratory by collecting samples from the entire four districts of the State. On the basis of these soil tests, recommendations are given for balanced use of plant nutrients.

12. Assistance to Panchayati Raj.**Rs. 80 lakhs.**

After the government's decision of de-centralizing power, Block Development Office have been made functional this year for the development of the rural areas. To strengthen the institution at the grass root level, VLWs, Inspectors and officers of the dept have been attached to the Office of the Block Development Office. Accordingly funds will be diverted to the institution.

13. National Agricultural Insurance Scheme (NAIS): Rs. 1 lakhs.**14. RKVY :****Rs.1500 lakhs**

Rashtriya Krishi Vikas Yojna (RKVY) – the scheme has been launched in the state from last year(2007-08).During this year the Comprehensive District Agriculture Plan has been prepared and the project for both Stream I & II are being carried out in the state. The RKVY aims at achieving 4% annual growth in the Agriculture Sector during XI plan period by encouraging holistic development of Agriculture and allied sector.

This is a state plan scheme. The eligibility for assistance under the scheme would depend upon the amount provided in the State Plan Budget for Agriculture and allied sectors.

15. Tribal Sub Plan and Schedule Caste Sub Plan : Rs 260 lakhs.

This programme is being implemented by the department since last financial year 2007-08. The amount required for the implementation of the various program under the Tribal Sub Plan and Schedule Caste Sub Plan Plan has been enmarked for ever year

B. Soil & Water Conservation:**Rs. 160 lakhs.**

Both the Natural Resources namely soil and water, received inadequate attention in public as well as in private sector in Sikkim, resulting into soil and water erosion, landslides/slips and environment degradation. It has become ironic, and our available resource has not adequately regained the status of soil fertility, moisture retention capacity, soil and water erosion and prevention of ecological balance.

The various components under this include Direction and Administration, Soil conservation on agricultural land, reclamation of acidic soil, water conservation and establishment of nurseries.

With the de centralization of power to the Panchayati Raj in Sikkim, it has become prime necessity to extend administrative and technological support to the districts for Zilla Panchayats, Sub-divisions and Gram Panchayat Administrative Units for Gram Panchayats for sustainable Natural Resources Management.

One of the mechanical measures of soil conservation is bench terracing which is given top priority and is widely adopted in high steep land. The programme helps to prevent run-off with high velocity, soil erosion and moisture retention etc. The scheme helps to bring an additional area under cultivation and adoption of agronomical measures aiming at increasing per unit area yield of crops without any loss of top soil.

Reclamation of Acidic Soil: The soil of the State is acidic which varies with pH ranging from 4.5 to 5.5. Such soils are injurious to plant growth and adversely affect the soil microbial activities resulting poor crop yield. The acidic soils has to be reclaimed for improving the soil texture, structure, uptake of nutrient both native and added through organic manure and moisture retention capacity.

Water Conservation: Rain water of monsoon season and perennial spring water are the sources of water in the Hilly State like Sikkim. The main objective of the programme is to provide water storage through surface run-off/ rain roof water harvesting and water harvesting of perennial spring water sources for life saving irrigation to a limited area,

drinking water for human beings and livestock during dry period. Though the State experience sufficient annual rainfall, it's erratic and uneven distribution causes water scarcity. The rainfall between November to March is so low and the amount of rainfall is not enough to compensate the loss of soil moisture through evaporation. The loss of soil water is very high through both percolation and runoff due to steep slope and sandy loam texture of the soil. The scheme aims at construction of 10,000 litres capacity water tank through farmer's participation in individual or community basis.

Nurseries: For proper development and management of very steep slopes, landslides/slips area and barren and fallow land, there is a need to implement biological soil conservation measures. In order to meet up the requirement of seedlings of multipurpose trees, fodder trees/grasses, timber trees, fuel trees, fruits, tea etc., production of seedlings in Government nurseries is very essential for readily supply during the peak plantation season.

C. STORAGE & WAREHOUSING:

Rs.60 lakhs.

Scientific Storage facilities are proposed to be increased as certified seed production programme has been taken up in large scale. Therefore additional Storage facility shall be taken up for storing of seeds & other agricultural inputs.

D. AGRICULTURAL RESEARCH & EDUCATION:

Rs. 60 lakhs.

In this scheme adaptive research programme are taken up by introducing the suitable varieties evolved outside the state. The trials are conducted for identifying better varieties, improved agricultural inputs and improved technologies for the prevalent agro-climatic conditions of the state. Since there is a complete change in our agro-farming system with the introduction of Organic Farming, there is urgent need to identify suitable crop varieties, organic plant nutrients and bio-pesticides as well as to evolve technology suitable to the local condition. It is, therefore, required to project higher allocation for the purpose.