

**Minister
Revenue, relief & rehabilitation,
Agriculture, State Excise
Maharashtra State, Mantralay,
Mumbai-4000 032**

MESSAGE

It was decided by the National Development Council (NDC) to reorient the Development Strategies of Agriculture and allied sector to meet the needs of the farmer & to rejuvenate the agriculture sector. As per the guidelines and objectives of the scheme the natural resources are to be tapped to achieve 4% growth rate per annum for agriculture.

In the C-DAP document the main area of concern is crops like Cotton & Banana. Also agricultural mechanization, micro irrigation and processing is the future of agriculture.

To reduce the cost of production emphasis should be given on organic farming. Balance use of fertilizers as per soil analysis should be made. Watershed development, water conservation and judicious use of water for growing minimum one good crop are the need of situation.

To sustain the vagaries of nature farmers have to have secondary sources of income like dairy, poultry and fisheries.

The C-DAP document and scheme proposed will definitely help the farmer.

Ek Nathrao Khadse

Foreword

National Development Council (NDC) has great concern over the slow development in the Agriculture and allied sector, In order to accelerate the growth rate beyond 4% per annum, the District planning unit prepared a C-DAP of Nandurbar District, as per the guidelines and Objectives issued by the NDC through Government of Maharashtra. We have made an attempt to ensure available resources are fully utilized to formulated the new schemes and upgrade the existing schemes. For this we tried to establish the linkages with in various departments, organizations and stake holders.

We have tried to design a C-DAP plan that will achieve sustainable growth of agriculture and allied sectors, enhance Food security and improvement in farmers net income. We have given more stress on the crops like Cotton, Rice and Banana which have the main role in economic development of the district. While preparing the C-DAP of the District, different growth drivers were used within the expected growth simulations expected by the NDC in the Eleventh plan.

This plan is prepared by the district officers from department of Agriculture and allied departments, planning wing of the district, Scientist of the Mahatma Phule Agriculture University, Rahuri.

The collective and organized efforts of the officers of various departments to prepare this document are quite noteworthy. This document will help a lot in utilizing the resources and convergence of existing & new schemes. I hope this document will assist and guide the various departments to achieve and exceed the target of 4% growth rate of the district in agriculture sector of the next five year plan.

Mr. Pradip P.

Collector, Nandurbar

President, R.K.V.Y. District Level Committee, Nandurbar

INDEX

I	Introduction	1-4
1.1	Background	1
1.2	Comprehensive District Agricultural Plan	3
1.3	Methodology	4
1.4	Organization of report	4
II	General Description of the District	5-34
2.1	Introduction	5
2.2	District at a Glance	7
2.2.1	Location and Geographical Units	7
2.2.2	Demographic Profile	8
2.2.3	Topography and Agro Climatic Characteristics	8
2.2.4	Land Use pattern and Land holdings	16
2.2.5	Irrigation and Ground water	26
2.2.6	District Income	28
2.2.7	Intra-district growth differentials	28
2.3	Development Vision and Strategy	29
III	SWOT Analysis of the District	35-42
3.1	Introduction	35
3.2	SWOT analysis of the district	35
3.2.1	Strengths	35
3.2.2	Weaknesses	36
3.2.3	Opportunities	38

	3.2.4 Threats	40
	3.3 Accommodating SWOT	41
	3.4 Sectoral/ Regional Growth Drivers of the District	42
IV	Development of Agriculture Sector	43-85
	4.1 Introduction	43
	4.2 Land Use	43
	4.3 soil health	44
	4.4 Water Resources and Management	45
	4.5 Major Crops and Varieties in the District	48
	4.6 Input Management	49
	4.7 Farm Mechanization/ Farm Projects	53
	4.8 Special Programmes and the Ongoing Projects in the District	54
	4.9 Constraints Analysis	56
	4.9.1 Crop wise in-depth analysis of low productivity of principle crops	56
	4.9.2 Analysis of ongoing State centrally sponsored schemes	69
	4.10 Recommended interventions of the district with detailed action plan with costs	78
	4.11 Projected outcome and growth during the next plan period	82
	4.12 Researchable Issues	84
V	Allied Agricultural Sectors	86-148
	5.1 Introduction	86
	5.2 Horticultural development	87
	5.3 Animal Husbandry	99
	5.4 Fisheries Development	105

5.5	watershed development	111
5.6	Social Forestry Development	115
5.7	Food Processing units	121
5.8	Development of rural industries	124
5.9	Agriculture Marketing	125
5.10	Agriculture Credit	133
5.11	Constraints Analysis	137
5.12	Recommended interventions of the district with detailed action plan	144
VI	District Plan	149-216
6.1	Introduction	149
6.2	Growth Drivers	153
6.3	Innovative Schemes	154
6.4	Vision of the Next Plan	156
	6.4.1 Production Target	156
	6.4.2 Strateg For Bridging the Gap of Research and Extension	168
	6.4.3 Proposed Research Strategies	202
6.5	District Plan	206

List of Tables

Table No.	Title	Page No.
2.1	General information of Nadurbar district	8
2.2	Agroecological situation of Nandurbar district	9
2.3	Taluawise Rainfall for the Nandurbar District- 2003 to 2014	10
2.4	Area under different soil types in Nandurbar district	12
2.5	Talukawise land use capability classification	13
2.6	Taluka wise Soil fertility index	14
2.7	Soil Fertility Status	14
2.8	Talukawise soil sample analysis	16
2.9	Land utilization in Nandurbar District as compared to Maharashtra state	17
2.10	Land Holding Pattern in Nandurbar district (2011)	18
2.11	Taluka wise Land holding pattern in Nandurbar District (2011)	19
2.12	Land holding Pattern with respect to farmer's category and social category (2011)	20
2.13	General Distribution Of Area Under Different Crops	22
2.14	General Distribution Of Area Under Different Fruit Crops	23
2.15	General Distribution Of Area Under Different Vegetable Crops	23
2.16	General Distribution Of Area Under Different Spices	24
2.17	General Distribution Of Area Under Medicinal Crops	24
2.18	General Distribution Of Area Under Flower Crops	24
2.19	Talukawise and sourcewise irrigated area in the district	26
2.20	Sources of Irrigarion water	27

2.21	Irrigated area distributed under different crops cultivated in the district	27
2.22	Sectorwise total income and per capita income of the district	28
2.23	Development and vision strategies for different sectors	30
4.1	Talukawise nutrient status of soil	44
4.2	Talukawise irrigated area and per cent irrigated area	46
4.3	Irrigation projects Wise Benefited Area & Irrigated Area in the district	47
4.4	The major crops and varieties grown in Nandurbar district	48
4.5	Planning of Agriculture Inputs in the District Seed 2012-13	49
4.6	Crops wise NPK Consumption in the district	50
4.7	Planning of Fertilizer Requirement	51
4.8	Planning of plant Protection Chemicals Requirement (wt.kg)	52
4.9	Talukawise availability of traditional farm equipment	53
4.10	Availability of Improved Farm Equipments and Machineries	53
4.11	Taluka wise Area and productivity of jawar and bajara (kg/ha)	56
4.12	Taluka wise area and productivity of paddy (kg/ha)	57
4.13	Talukawise area and productivity of maize (kg/ha)	61
4.14	Taluka wise area and productivity of kharif pulses (kg/ha)	63

4.15	Taluka wise area and productivity of rabi crops (kg/ha)	64
4.16	YIELD GAPS (%) ANALYSIS	66
4.17	Projection of Overall Growth Rate (GVA) in Agriculture Sector Nandurbar District	82
4.18	Crop Diversification Plan in Next Five Years Nandurbar District	83
5.1	Horticultural crops and varieties grown in Nandurbar district	87
5.2	Taluka-wise livestock population of the district	99
5.3	The veterinary Institutes serving to livestock in Nandurbar district	101
5.4	Projected Annual Milk Production of the district	102
5.5	Proposed action plan for dairy for next five year	104
5.6	Taluka wise available water spread area, Optimum fish production, present fish stocking in Nandurbar district	106
5.7	Expected fish production in next five years	106
5.8	Requirements for fish seed production unit	106
5.9	Year wise funds required for Establishment of fish seed production unit	107
5.10	Funds required for training fisherman per year is as follows	110
5.11	Year wise total funds required for fishery development	110
5.12	Taluka wise area available for watershed Development and plan for next five years	113
5.13	Taluka wise Watershed selected / Started / Completed and plan for next Five years	114
5.14	Action Plan for Social Forestry for XII Plan	119

5.15	Information on Agro-produce available for processing in Nandurbar district	121
5.16	Projection Regarding Agro Based Units By NABARD PLP Plan	122
5.17	Information on Agro-processing facilities available in and outside the district but serving the need of the district	123
5.18	Details of Talukawise rural industries in the district	124
5.19	Taluka wise and Agency wise details of Beneficiaries under self employment schemes	124
5.20	Nadurbar District APMC s Ro Plant & Eco Toilet requirement	132
5.21	Bank Structure of the Nandurbar district	134
5.22	The Dhule district central co-operative bank ltd. Dhule Average crop loan distribution in the district	135
5.23	Last three year credit supply of the Nandurbar district	136
5.24	Projected Financial Credit Supply plan of Nandurbar District (DLB)	136
6.1	Projected production and productivity of important crops (Kharif,rabi and summer) of Nandurbar district	157
6.2	Gross value added from various crops at constant prices	159
6.3	Gross value added from different categories and growth rates	160
6.4	Present and Projected area, Production and Productivity of Horticulture Crops in Nandurbar District	161
6.5	Growth values added of Horticultural crop in Nandurber District at as per latest Year prices	164
6.6	Gross values added Horticulture crops in Nandurbar District	166

6.7	Compound growth rate (Rs in Lakhs)	167
6.8	Proposed Extension Strategies	169
6.9	Proposed Research Strategies	202

List of Maps

Sr. No.	Title	Page No.
1	Location Map of Maharashtra and Nandurbar District in India	6
2	Road map of Nandurbar District	7
3	AGRO ECOLOGICAL SITUATION (AES)	9
4	Land Capability Classification of Nandurbar district	13
5	Talukawise Soil Fertility index	15

Executive Summary:

Nandurbar district is in general oval in shape and part of the Deccan Plateau. The district is well known as “Khandesh” from ancient time. The New Nandurbar district was originated on July 1, 1998 by separating 6 tahsils from old Dhule district. The district comprises of 6 tahsils namely Nandurbar, Navapur, Akkalkuva, Shahada, Taloda and Akrani. The Satpuda mountain at the north forms the Natural border of the district as well as Maharashtra state. The district is located in the Northern part of Maharashtra state, lies between 21.00 to 22.03 degree North latitude and 73.31 to 74.32 degree Eastern longitude. Under the Nandurbar Zilla Parishad jurisdiction, 956 villages are covered through 6 panchayat Samities and 501 Gram Panchayats. The variation in relief ranges from the pinnacles and high plateaus of main Satpuda range having height over 3000 feet above mean sea level to the subdued basin of the Nira river in Phaltan tahasils with the average height of about 1000 feet above mean sea level. The climate of the district is hot and dry having average annual rainfall of 872 mm.

Nandurbar district is the 4th largest tribal district of Maharashtra. The population of the district is 16.48 lakhs of which 69.00 per cent population is tribal. The district has now been declared as most backward and undeveloped district of Maharashtra. The land holding pattern of Nandurbar district revealed that about 65 percent of farmers have land holding below 2 hectares (marginal and small farmers) but hold only about 37 percent of total land holding of the district. However, about 6 percent of medium and large farmers (4 and above) have about 21 percent of total land and remaining is with semi-medium farmers. Therefore, the average land holding of the marginal farmer and small farmer of the district is 0.67 and 1.42 hectares respectively.

Normal area under kharif crop is 252300.00 ha. Kharif season is the most predominant season. Kharif jawar, cotton, Bajara, kharif paddy are the main crops. Whereas tur, green gram, black gram, sunflower and groundnut are second important crops. Maize and Soyabean is fast emerging crop of the district. In rabbi season rabbi Jawar, wheat and gram are predominant crops. Groundnut, Bajara and sunflower are taken in summer season. In hilly area of the district vari and other hill millets are predominant crops. The productivity of hill millet is very negligible. Paddy is taken in both irrigated as well as rain fed condition.

The per capita income in Nandurbar district is below the state average. The sector wise distribution of income indicates that out of the total district income, about 28 percent comes from the Primary sector. It was noted earlier that about 75 percent of the workforce is engaged in the agricultural sector. However, the contribution of this sector to the District income is only 28 percent which is very low as compared to other sectors. This indicates that productivity in the primary sector is very low. The secondary sector contributed about 14 percent to District income and in case of tertiary sector it was around 59 percent. The overall picture leads us to conclude that half of the income of the district is derived from the tertiary sector.

From the SWOT analysis, it is clear that Nandurbar district has varying agro-climatic zones. The hilly tracts receive heavy rainfall about 1500 mm while the eastern talukas receive barely 380-400 mm rainfall. Thus heavy rains in the mountain ranges talukas sometimes lead to seasonal flooding and there is drought in the eastern talukas. The district must therefore make efforts to practice contour farming and prevent soil erosion in the hilly tracts. In drought prone areas of the district, soil conservation and rain water harvesting must be undertaken in the rainy days. Horticulture has great potential in the district and important fruit crops cultivated are mango, banana, papaya and strawberry. These crops have demand not only in urban markets but also export potential. Hence

all round efforts must be made to promote export of these crops so as to augment the incomes of farmers and give boost to the agricultural sector. Further, industrial growth is very limited in Nandurbar district and cultivation of horticultural crops can help to promote agro-processing industries. While this is already happening in certain talukas, there is further scope for value addition. Horticulture must also further promote secondary industries such as grading, packaging, transport etc. to generate employment in the district. Allied activities such as dairy, poultry, sericulture play a very limited role in Nandurbar. It is necessary to encourage these activities so as to provide supplementary incomes to the farmers. Wasteland in the district may be used for fodder. The productivity from oilseeds is very low. Thus efforts must be made to increase productivity from oilseeds. Overall, the SWOT analysis of Nandurbar revealed that water is a limiting factor because of which productivity of crops is low and cropping pattern is of low value cereals. The district also has hilly tracts which have their own limiting features. Appropriate cultivation must be undertaken on this undulating topography.

In order to capitalize on the potential of the agricultural sector in the state so as to improve the productivity in this sector and thus enhance the incomes of farmers, the following innovative schemes are being proposed for the 12th Five Year Plan.

Innovative Schemes:

A) Agriculture Department

- Establishment of Sugarcane Nursery with the help of sugarcane factory
- Well equipped van for pest monitoring team
- Well equipped meeting hall
- Promotion for Agril Tourism

B) Animal Husbandry

I. Infrastructure & Assets Schemes

- Establishment of Gokul Grams under Rashtriya Gokul Mission
- Establishment of Mobile Extension Centers for publicity of govt. schemes & creation of awareness among farmers at District level.
- Supply of Mini Setter & Hatchers of 5000 eggs capacity
- Mobile marketing units for poultry meat and eggs, subsidy ceiling Rs.3.75 Lakh per unit
- Facilitating market linkage for live birds, Animals, subsidy ceiling Rs.2.00 Lakh per unit
- Introduction of Power driven chaff cutter
- Supply of Veterinary Mobile Units cum Diagnostic Laboratories
- Modernization of Veterinary Dispensaries, Gr.-1 for online data entry.

II. Production Growth Schemes

- A.I. Delivery System Under RKVY
- Clean Milk Production through supply of Milking machines to farmers on 25% subsidy
- Assistance to farmers for promotion of Integrated Livestock Farming on 25% subsidy
- Distribution of Fodder seed
- Establishment of Silage Making Unit
- Fodder production From Fallow lands
- Establishment of Hydroponics fodder production unit
- Establishment of A Azolla production unit
- Distribution of 40 female & 2 male goat in DPAP area
- Stall fed 40+2 goat unit by Punyashlok Ahilyadevi Maharashtra Mendhi va Sheli vikas mahamandal

C) Dairy Department

- Strengthening of Dairy co- operative society of Nandurbar district
 - Bulk Milk cooler
 - Automatic Milk Collection Unit
 - Stanless still Can
 - Tranning (Farmer)
 - Tranning Secretary
 - Tranning management board
 - Addestration Kit

D) Fisheries Department

- Fish seed rearing in cage
- supply of fiber glass boat with out boat engine
- Development of retail fish marketing infrastucture
- Creation of rearing ponds near irrigation tanks for rearing fish seed

E) Zilla parishad

- Scheme for unliftment of small/bpl/tribal farmers by giving financial support to improve ageiculture

F) Agriculture Marketing Board

- safe driking water and community eco toilet
 - RO Plant
 - Eco Toilet

G) Social Forestry (Infrastructure & Assets Schemes)

- Van Purchases
- Divisional Building
- Other Taluka level Offices
- Office Furniture
- Computer Purchases

Special Programmes and the Ongoing Projects in the District-

The major Extension and developmental schemes in the district are executed by agricultural department, (state government) which receives funds from both state and central government. In the present system, the schemes are planned and designed at the state and central level and implemented at district level. The agricultural department Zilla Parishad also executes some of the state/central schemes. Part of cess funds available with Zilla Parishad is used for designing the schemes at district level as per the need of agriculture in the district.

Ongoing Schemes of Agriculture Department

1. Coarse cereal programme
2. Dense Cotton dev. programme
3. Sugarcane improvement project
4. Fodder dev project
5. Rice development programme
6. Hybrid tur production programme
7. Crop pest surveillance & advisory project
8. Prachar prasiddhi sahitya nirmiti
9. Soil fertility index programme
10. Soil health improvement programme
11. National mission oilseed and oilpalm
12. Maize Development (PPP Project)
13. centrally sponsored maize development programme
14. Strengthening Taluka seed Farm
15. Farm Mechanisation (NMAET)
16. Rainfed Area dev. Programme (RAD)
17. Sigatoka Disease Management in Banana
18. To purchase plastic crates
19. public private partnership for integrated agriculture
20. Special programme in Drought condition for save perennial Fruit Trees
21. National Mission on Micro Irrigation
22. National Horticulture Mission / Mission on Integrated Horticulture Dev.
23. Horticulture Plantation under EGS
24. Tribal Parasbag Yojana
25. Strengthening of Nurseries Sub plan (DPDC)
26. Horticulture Census

Ongoing Scheme of Animal Husbandry

- 1) Veterinary polyclinics at district level.
- 2) Taluka Veterinary Dispensaries.
- 3) District Artificial Insemination centre.
- 4) Cross breeding, artificial insemination & preservation of indigenous breeds.
- 5) Upgradation of rural backyard poultry by supply of day old chicks / hatching eggs.

- 6) Foot and mouth disease control Programme.
- 7) A S C A D – Assistance to State for control of Animal Diseases (H.S., B. Q., P.P.R., R.D.)

Ongoing Schemes of Fishery

- 1) Fish farming Development Agency.
- 2) Development of Fisheries Co-op. Society.
- 3) Fish farming in impounded water
- 4) Fisheries Requisites.
- 5) Fish seed farming.

Ongoing Schemes of Social Forestry

- 1) Small (Polythilin bag) plants
- 2) Highted Plant
- 3) Farmer's (Kisan) Nursery
- 4) Plantation on social Land
- 5) Plantation on Road Side
- 6) 'Harit Sena Shala'

The District Plan at a Glance

Sr. No.	Name of Department	RKVY Fund						OTHER FUND			Total Production and Growth	Total Infrastructure & Assets	Grand Total
		Production and Growth			Infrastructure & Assets			Production and Growth	Infrastructure & Assets	Total			
		Ongoing	New Proposed	Total	Ongoing	New Proposed	Total						
I	Agriculture Extension	2047.84	0.00	2047.84	0.00	95.00	95.00	257.80	748.47	1006.27	2305.64	843.47	3149.11
	Horticulture	296.66	0.00	296.66	0.00	0.00	0.00	2140.31	4355.08	6495.39	2436.97	4355.08	6792.05
	Soil Conservation	0.00	0.00	0.00	661.35	0.00	661.35	0.00	0.00	0.00	0.00	661.35	661.35
Agriculture Department (Total)		2344.50	0.00	2344.50	661.35	95.00	756.35	2398.11	5103.55	7501.66	4742.61	5859.90	10602.51
II	Project Director-ATMA	0.00	0.00	0.00	0.00	0.00	0.00	990.83	0.00	990.83	990.83	0.00	990.83
III	Animal Husbandry	553.61	1708.84	2262.44	550.00	1771.85	2321.85	0.00	0.00	0.00	2262.44	2321.85	4584.29
IV	Dairy Development	0.00	0.00	0.00	0.00	137.45	137.45	0.00	0.00	0.00	0.00	137.45	137.45
V	Department of Fishery	0.00	0.00	0.00	0.00	150.00	150.00	77.56	0.00	77.56	77.56	150.00	227.56
VI	Agriculture Development Office,(ZP)	0.00	400.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	400.00	0.00	400.00
VII	Agriculture Marketing Borad (MSAMB)	0.00	0.00	0.00	0.00	20.38	20.38	0.00	0.00	0.00	0.00	20.38	20.38
VIII	Department of Social Forestry	0.00	0.00	0.00	0.00	225.00	225.00	736.55	0.00	736.55	736.55	225.00	961.55
TOTAL		2898.11	2108.84	5006.94	1211.35	2399.68	3611.03	4203.05	5103.55	9306.60	9209.99	8714.58	17924.57

Conclusion:

The proposed plan aims at an overall growth rate of 13.00 percent in the agricultural and allied sector. Besides achieving this growth rate, the plan will also lead to improvement in infrastructure in all sectors. This will give a major boost for sustained development of the agricultural and allied sector.