Chapter-1

INTRODUCTION

Since independence our country has seen many stages in agricultural development through different approaches in time-slots to develop resources for their optimum utilization. Initially the focus was on human and community development, then to specific crops and fertilizers, treating the state as a unit of planning and lastly on development of resources and their optimum utilization in a sustainable manner within the frame work of resource constraints and potentials of each region. In India food grain production more than quadrupled since the early 1950s from 51 million tons to over 209 million tons in 2000, while population nearly tripled from 350 million to one billion during the same period. Potentially high production areas (Eastern and Central States) are still lagging behind in productivity increases and in research there is a growing disparity between the actual and the potential yields which points to a crucial gap between research and extension.

The changing economic scenario in India and the need for appropriate agricultural technologies and agro-management practices to respond to food and nutritional security, poverty alleviation, diversifying market demand, export opportunities, and environmental concern is posing new challenges to the technology dissemination system. It is expected that future agricultural growth would largely accrue from improvements in productivity of diversified farming systems with regional specialization and sustainable management of natural resources, especially land and water. Effective linkages of production system with marketing, agroprocessing, and developing an army of trained Private Extension Service Providers, other value added activities would play an increasing role in the diversification of agriculture.

The past approaches of agricultural development were top-down in nature and had considerable success in resource rich and irrigated areas where profitability of new technology was high and management condition in farmers field were not very different as compared to that of research farms. How ever, these approaches resulted in limited success in rain fed areas due to large heterogeneity and complexity in farming conditions. It was also realized that farmers had a wealth of indigenous technological knowledge, which were being practised and upgraded through informal research inputs to meet the needs of changing agricultural scenario in rural areas as per need of climate, soil, inputs and economy. Thus within a broad agroclimatic region local conditions may result in several agro-eco systems, each with its own environmental conditions, however, similar agro-eco systems may develop on comparable soil landscape positions. The agro-ecosystem pronounced variations in climate is expressed in vegetation and reflected in soils.

The agro-climatic regional planning approach was intended to take an integrated view of the agricultural economy in relation to resource base and linkages with other sectors implying future agricultural development specific to agro-eco regions with a multi disciplinary approach. Several key system constraints such as multiplicity of technology transfer system , narrow focus of agricultural extension system, lack of farmers' focus and feed back ,inadequate technical capacity within extension system lack of local capacity to validate and refine technology ,limited research by KVK/ZRS, weak research extension linkage ,poor communication capacity ,inadequate operating resources for extension etc were identified .

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It is becoming increasingly evident that public extension by itself can no longer respond to the multifarious demands of farming systems. There is need for reappraisal of the capacity of existing agricultural extension system to address, effectively, contemporary and future needs of the farming community. Public funding for sustaining the vast infrastructure is also under considerable strain. Meanwhile, in response to market demand the existing public extension network is inexorably being complemented supplemented and in some instances replaced by private extension.

Based on this fact, Agro-Ecological Situation (AES) approach evolved under National Agricultural Technology Project (NATP). This farmer's participatory approach is crucial not only to increase the relevance of a programme but also to make best use of available indigenous knowledge. The qualitative difference to other existing projects lies in the fact that NATP is based exclusively upon bottom- up approach. Under NATP, seven states covering 28 districts i.e. 4 districts from each state (Andhra Pradesh, Himachal Pradesh, Bihar, Jharkhand, Maharashtra, Orissa and Punjab) fairly representing each Agro-climatic Zone(ACZ), have been selected where Agricultural Technology Management Agency (ATMA) as an autonomous body at district level has been established for pilot testing of new institutional arrangements moving towards integrated extension delivery, adopting bottom up planning procedure, establishment of linkage among research –extension-farmer-NGO's/Corporate sector market, making the technology dissemination farmer driven and farmer accountable, ensure women participation in agriculture and create information connectivity to all blocks with district level ATMA with an ultimate aim of economic emancipation of farming community.

There are state government organizations in the district like DOA, DOH, DOAH, DOF, Cooperatives, Dairy development, Plant Protection, COMFED, DRDA, where as the State Agricultural University has two of its colleges for Veterinary Sciences and Dairy Technology located in the district along with a Agricultural Research Station and a Krishi Vigyan Kendra in Patna and Barh respectively. These institutions are directly or indirectly involved in running a parallel extension system. In addition to Governmental organizations the district has a number of Non Governmental Organizations (NGO's) registered, primarily involved in agricultural development. These forces would be organized and coordinated through ATMA, Patna under pilot testing of new institutional arrangement. ATMA Governing Board (AGB) and ATMA Management Committee (AMC) have been constituted with representation from different departments, farmers, livestock producers, horticultural farmers, women, scheduled caste farmers, banks, input suppliers, NGO's, Marketing Associations and fishermen farmers, at the district level. Similarly, at block level Farmers Advisory Committees (FAC) and Team of Farm Advisors (TOFA) have been constituted. At Panchayat and village level, Farmer Interest Groups (FIG), Commodity Associations (CA's), Self Help Groups (SHG's) and Farmers Organizations (FO's) are being organized to introduce a new form of extension delivery system which is decentralized, demand driven, farmer accountable, location specific, system based, participatory, well integrated with Research-Farmer-Market linkage and technically and financially sustainable in its orientation.

It is planned to involve persons responsible for extension delivery either directly or indirectly in capacity building towards new technologies so as to meet not only the challenges emerging out of globalization but also to explore newer and novel ways of developing the agricultural sector in general and farmers economic

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well being in particular. This is proposed to be done through exposure visits, training in information technology to all the stake holders through R.A.U., Bihar and MANAGE, Hyderabad, workshops and interface at district level .The members of FAC / FIG / FO / SHG would be linked with management of marketing boards locally known as Bazaar Samiti to minimize the role of middle men and brokers and to make remunerative prices available. Better communication and stay facilities to the farmers. The general and common requirements of the farmers would be met by developing unemployed youth in the villages as Para-technicians by helping them develop their skills in areas of seed production, artificial insemination, graft and gootee preparation, fish-fry production, plant protection equipment handlers, etc. They can work through Agri-clinics at reasonable user fee. Similarly, some farmers can be encouraged and developed for diversifying in allied agricultural activities like bee-keeping, mushroom production, medicinal and aromatic plants, floriculture, Agri-horti systems, rural godowns and marketing etc.. Finally, success stories from different fields of agriculture emerging out of the working arrangements and endeavours would be identified and documented for their replication in other similar conditions of the district.

This document has emerged through participatory rural appraisal from all the five agro-ecological situations of the district by selected and trained research and extension officers of the district. The programmes proposed to be undertaken are demand driven, agro-eco situation specific, and multi-disciplinary in system envisaging bottom-up approach with practical implications. This bottom-up approach cares not only for the production system but also about the other stake holders of the farming system like market information about demand and supply, input, credit institutions, etc. who were earlier left out when top-down approach was in vogue. Sustainability of bottom-up planning would however depend not only on the active interest of bureaucracy in general and Chairman of ATMA in particular but also on the general agreement of all the stake holders who have the benefit of farming community in the core of their hearts.

According to some experts higher degree of efficiency, quick decision, starting of activities without delay are some of the positive aspects of Planning from Top. They also see certain disadvantages in the participatory planning process like it is time consuming, discussion and decision making process within large and heterogeneous group on different levels is difficult and complicated. The negative side of planning from above is low social acceptance as transparency is not ensured and people are less willing to participate in the implementation process. The long tradition of development planning from 'outside' and from 'above' is in itself not too impressive. People's involvement in planning is now being recognized by all as essential and must for rural development. The true essence of Participatory planning and Participatory Monitoring & Evaluation (PM&E), lies in total involvement and decision making by people at every stage of Project Formation, Implementation, Monitoring and Evaluation.

Chapter-2

METHODOLOGY

Patna district was selected as a fifth phase district for pilot testing the ITD component of National Agricultural Technology Project in the state of Bihar after the bifurcation of the state. An autonomous society under the name of Agricultural Technology Management Agency (ATMA) was registered on 30thMarch, 2002 to carry out the project activities in collaboration with different line departments like Agriculture, Horticulture, Animal Husbandry, Fisheries, along with the local Krishi Vigyan Kendra, Barh, the Agricultural Research Institute of Rajendra Agricultural University, Bihar located at Patna, COMFED, NGO's, and representative of various stake holders of the agricultural production system. The strategic research and extension plan for Patna was prepared following the participatory methodology to reflect the issues, needs and expectations of farming community. The main steps followed for preparation of Strategic Research and Extension Plan (SREP) are as follows:

SELECTION OF MEMBERS OF TEAM OF FARM ADVISORS

The selection of TOFA (Team of Farm Advisors) representing different government development departments like Agriculture, Animal Husbandry, dairy, Fishery, Cooperative and scientists of Rajendra Agricultural University from Agricultural Research Institute, Patna and Krishi Vigyan Kendra, Barh working in Patna district was done to provide them with basic training/orientation about the concept of NATP for preparation of SREP.

TRAINING OF TOFA

The Training of Team Of Farm Advisors (TOFA) Patna leading to SREP preparation was conducted successfully at ICAR (Eastern Region) Research Complex, WALMI, Phulwarisharif, Patna in which thirty two (32) participants comprising block level officers from line departments viz. Agriculture, Animal Husbandry, Dairy, Fishery, representatives from Krishi Vigyan Kendra, Agwanpur, Barh, ZRS (Agriculture Research Institute, Patna), RAU, Pusa & NGO's had participated. The training programme was designed with the help of MANAGE facilitators. Inductive method of learning was followed as a training process. Besides conceptual clarify on ITD relevant management tools, of techniques and methodological approaches were discussed at length. For each and every tools brainstorming, group discussions and dummy exercises at village was taken to make the participants very clear on the subject so that the SREP could be made more meaningful. These selected officers and scientists of TOFA were trained on various theoretical aspects by the resource persons from MANAGE, Hyderabad on the following :

- A. -Management tools and techniques such as:
- a. A Systematic Approach (ASA)
- b. Team Building
- c. Participatory Rural Appraisal
- d. Farming Situation Based Extension (FSBE)
- e. Integrated Nutrient Management (INM)
- f. Gender Participation
- g. Integrated Pest Management (IPM)
- h. Indigenous Traditional / Technical Knowledge (ITK)

- i. Documentation of Success story
- j. Discussion on different formats and questionnaires
- k. Steps and Participatory Procedure for preparation of SREP
- B. The Workshop was having the following objectives:
- 1. To orient ITD component of NATP to the participants.
- 2. To know about roles and responsibilities of Team of Farm Advisors (TOFA).

3.To delineate the major Agro Ecological Situations (AES) of Patna district.

4.To build up the TOFA team for participatory probing and collection of primary issues and information from the representative AES villages.

During the workshop in addition to giving inputs on basic concepts of NATP and expectations from the ITD component of the project; task cycles were taken up to sensitise the members and take stock of the following:

- 1. Present organisational structure and personnel available at district, block and village level.
- 2. Major roles and responsibilities at each level.
- 3. Infrastructure available, with the line departments.
- 4. Various schemes implemented by line departments along with budget and specific objectives.
- 5. Existing coordination mechanism and linkages among line departments.,
- 6. Present role, expected role and expectations of different actors under NATP were also classified.
- The participants suggested the effective organisational structure and co-ordination mechanism for achieving the overall objectives of ITD component of NATP.

IDENTIFICATION OF MAJOR AGRO-ECOLOGICAL SITUATIONS (AES)

Patna district falls under the Agro Climatic Zone III-B. On the basis of important factors like topography, type of soil, rainfall, types of crops grown, the sources of irrigation and flooding characteristics five different Agroecological Situations (AES) were identified within Patna district for preparation of situation specific, farmers-demand oriented SREP.

IDENTIFICATION OF REPRESENTATIVE VILLAGES FOR EACH AES

During the course of the training five major Agro Ecological Situations (AES) were identified and representative villages based of various agro-ecological factors were identified.

IMPORTANT INFORMATION FOR DIFFERENT TEAMS DURING FIELD VISITS FROM 3RD JUNE TO 15TH JUNE 2002.

Initially it was thought that during the course of field exercises if any village was found to be lacking in any particular enterprise the relevant information from the another representative village could be collected for carrying out SREP field exercises, but in the final round the number of selected villages was kept to one from each agro-ecological situation. The details are as follows:

Table 2.1: AES and village selected for participatory data collection.

S.No.	Name	Name of AES	Name of Block	Representative
	of ACZ			Village
1.	ACZ-III	1.Tal,	Ghoswari	Ghoswari
	В	(Water logging, heavy textured soil)		
2.		2.Diara,	Danapur	Habaspur
		(Undulated light textured land)		
3.		3.Jalla,	Patna Sadar	Sonama
		(Peculiar situation, water stagnation problem)		
4.		4.Irrigated plain	Naubatpur	Chiraura
		(Well irrigated plain land)		
5.		5.Rainfed plain	Phulwarisharif	Mahuli
		(Unirrigated plain land)		

FORMATION OF MULTI DISCIPLINARY GROUPS

For each AES, multi-disciplinary group consisting of 5-6 members from trained TOFA were drawn from different line departments and these groups were entrusted with collection of primary information from the representative villages using PRA techniques and participatory methods for the preparation of SREP. For each of the representative village an agro-ecological team, comprising of the following officers were constituted:

- 1. Scientists from ARI, Patna, KVK, Barh and Harnaut.
- 2. Block Agriculture Officer
- 3. Block Animal Husbandry Officer
- 4. Horticultural Development Officer
- 5. Fisheries Extension Officer
- 6. Block level Dairy Development Officer

The formats devised by MANAGE for the collection of field data through participatory method were also given to each AES team members.

COLLECTION OF SECONDARY INFORMATION

Secondary information used for preparing the SREP were collected from different governmental publications, and also from the records of the District offices of Agriculture, Horticulture, Animal Husbandry, Dairy, Fishery, Cooperative Departments, Lead Bank Office, NABARD, Regional Office, DRDA, District Statistical Office, NIC, and office of the Agricultural Production Commissioner, Bihar.

COLLECTION OF PRIMARY INFORMATION

Field exercises were conducted in the selected representative villages of each AES of Patna district where members of the multi-disciplinary group identified issues, collected data and information during 3^{rd} to 15^{th} June 2002.The five AES team took altogether thirteen days in collection of field data up to presentation of initial findings. The team spent seven days in the villages in two phases (4 + 3 days) and judiciously used the participatory tools for

the collection of field data. The primary data collected during field practicals was checked with various groups in the villages through triangulation as well as verified with other sources like secondary data collected from the departments.

Two days review, verification and sharing of data among the all five AES team members were organized at S.G.Institute of Dairy Technology, Patna. During field practical AES teams were facilitated by a team of facilitators from MANAGE, RAU and line department officers.

All AES teams adopted a procedure to present the data/information collected by them to the villagers in the village before coming out from the village for final consolidation and sharing of information with the villagers

The collected data was summarized and presented by each AES team in presence of senior level scientists of RAU, Pusa along with the senior officers from all concerning departments, district heads of all departments, consultants from MANAGE and farmers representatives from each selected village. Some of the AES teams again visited the villages for rechecking the data and missing links.

CONCURRENT REVISION AND VERIFICATION OF DATA

The primary data collected during field practicals were checked with various farmer groups in the village through triangulation and verified from information available from published sources and from different governmental departments. Some of the critical issues were also discussed with scientists and other villagers. During the field practicals the group members were facilitated by an able consultant from MANAGE, Hyderabad and also by the officers of different line departments and Scientists from Rajendra Agricultural University, Bihar.

SUMMARIZATION AND PRESENTATION OF DATA

A core team comprising of ten members from the AES teams facilitated by the State Consultant, MANAGE and RAU facilitators undertook the job of tabulation, analysis of data collected by various AES teams and preparation of first draft of SREP to be presented in AGB, Patna and MANAGE, Hyderabad completed in two weeks.

The data from each of the representative village collected by the respective group were discussed in detail with the scientists of RAU, Bihar before their summarization and draft conclusions were prepared for presentation before the farmers, scientists, officers of different line departments and the AGB and AMC members of ATMA, Patna. During the presentation of SREP, emphasis has been given on diversification, value addition, agro-processing, post harvest management of the produce, public-private partnership, formation of FIG, developing a committed army of service providers and marketing aspects so as to make the SREP for Patna a useful document not only for the different stake holders but also for all the others who are interested in the overall development of agriculture in Patna district.

The District Core Team and Facilitators involved in SREP drafting with a vision and mission of leading Patna district farmers included the following:

- 1. Dr. Brajesh Shahi, Scientist, Rajendra Agricultural University, Pusa.
- 2. Sri Birendra Kumar Sharma, Block Agriculture Officer, Patna
- 3. Sri Chakreshwar Sharma, Block Agriculture Officer, Patna
- 4. Dr. Manoj Kumar, Block Animal Husbandry Officer, Patna

- 5. Dr. Vivek Kumar Sinha, Touring Veterinary Officer, Patna
- 6. Dr. K.K.Krishna, Touring Veterinary Officer, Patna
- 7. Sri Manoj Kumar, Senior Input Supervisor, Dairy Development Department, Patna
- 8. Sri P.K.Gupta, Field Assistant, Dairy Development Department, Patna
- 9. Sri S.K.Verma, Fisheries Extension Officer, Patna
- 10. Sri Udai Prakash, Fisheries Extension Officer, Patna
- 11. Dr. K.M.Singh, Project Director, ATMA, Patna
- 12. Sri N.R. Hayagreeva, State Consultant, MANAGE

Developing Activity Schedule by District Core Team

While strategies are long-term in nature, activities are systematic steps to achieve these strategies. On going departmental activities were dovetailed and the missing links were to be supported by ATMA. Each Strategy is translated into a set of activities, which spell out the size of unit, total units required, cost per unit and total cost in respect of each activity.

Approval of SREP

After thorough scrutiny by the ATMA Governing Board with constituent official and farmer members the SREP is submitted for approval as authenticated plan document. This document forms the basis for agricultural development in the district. Further it helps ATMA to put forth its demand before Government of India to release funds.

Preparation and Implementation of Action Plans

Keeping in view the strategic thrust in SREP, annual / seasonal block action plans are prepared by TOFA to facilitate technology dissemination using innovative process like exposure visits, trainings both technological and managerial, demonstrations, field days, IT support etc. through the farmer groups. Simultaneously a research action plan consisting of on-farm trials is prepared and carried out in support of the research strategies spelt out in SREP by the Scientists of ZRS and KVK to assess and refine the existing generalized technologies.

Re-Visiting of Strategies

As Winston Churchil, the famous premier of Britain quoted "For improvement you visit once, for perfect-ness you visit several times". The SREP development is a dynamic process, the issues emerged during course of implementation in coming days and suggested by the active partners viz. members of AGB/FAC/FOs will be included from time to time and efforts will be made to address them through Block Action Plan.

As in the first phase of NATP districts, where the project activities have been implemented since last three years, and it was felt necessary to take a re-look at the areas of strategic thrusts identified in SREP to meet the challenges of National and International market demands. With the advent of WTO, the challenges and opportunities of liberalized markets, location specific comparative advantage has set a priority to re-visit the strategic plan document.

Hence, necessary steps would be initiated to revise and redress the SREP in light of the challenges and issues coming across during implementation of Block Action Plan in the future.

Information and Communication Support

A conscious effort has been promulgated to promote information and communication support to the farming community to keep abreast of latest developments regarding weather, market intelligentsia, and package of practices and sharing of success stories. Hand on trainings on computer application is being provided to the extension functionaries and farmer representatives through ATMA information kiosks at block level Farm Information and Advisory Centres (FIAC).

Success Story

Implementing the action plan in consonance with SREP have generated "Centre/s of excellence" among farmer groups and innovative farmers. With support of relevant technologies, inputs and markets; this epoch making initiatives in the NATP pilot districts have brought about a sea change in working pattern and attitude of farming community, who are able to enhance their farm income with diversification and intensification of farming system. The cascading effect of such innovations would go a long way in replicating the same among other farmers.

Role of MANAGE, Hyderabad

National Institute of Agricultural Extension Management (MANAGE), Hyderabad the premier institute in the field of agricultural extension has been providing technical back up to the ITD component of NATP. Further, continuous interaction with National Consultants through video conferencing and frequent telephonic conversation has been beneficial for preparing the manuscript. The constant efforts put forth by State Consultant and Project Directors of ongoing ATMA's has been source of inspiration.

Chapter-3

BACK GROUND INFORMATION OF THE STATE AND THE DISTRICT

3.1: General Features of the state

The State of Bihar with an area of 93.60 lakh hectares lies in between latitudes N.24° 20' 10" and 27° 31' 15" and longitudes E 83° 19' 15" and 88° 17' 40". The state is bounded on the north by Nepal, on the east by West Bengal, on the west by Uttar Pradesh and on the south by Jharkhand. The state lies between 35 to 85 metres above the mean sea level.

The state comprises of two distinct zones viz. North Bihar and South Bihar. The river Ganges separates the state into North and South .The state is divided into three agro-ecological zones.

The natural resource endowments of the state are dominated by land and water. Also these resources are vital for the development of Agriculture in the state. After the bifurcation of state, Bihar is left with few industries. Agriculture is the mainstay of the people of Bihar. Basic economic features of the state have been compared with the national figures in the table 3.1.1, below.

Item	Bihar	India
Agriculture as % of GDP (1997-98)	43.8	26.5
Rural population as % of total population (2001)	89.5	72.2
Human population density (per sq.km) 1991	685	267
2001	880	324
Live stock density (per ha.)1992 census	2.85	1.84

Table -3.1.1: Basic economic features: Bihar vs. India

The table above explicitly shows high population pressure on Agriculture with population density at 880 for Bihar against the 324 for India. With the fewer industries in the state the share of rural population at 89.5% is very high. Agriculture contributes 43.8% of state GDP against the national figures at only 26.5%. These statistical figures reveal the importance of Agriculture in the state economy.

The preponderance of Agriculture in state economy imply low per capita income and high incidence of poverty. This tendency is best explained in the table 3.1.2:-

		· /
Particulars	Bihar (Rs.)	India (Rs.)
Per capita Income (at 1993-94 prices)	3574	8941
Per capita Agricultural Income (at19 93-94 prices)	1508	2552
Value of output from Agriculture per ha.	5939	11839
(at 1993-94 prices)		
Rural Poverty (1999-2000)	40.07%	27.09%
Literacy	34.73%	52.21%

Table – 3.1.2: Income, Poverty and Literacy status in Bihar vis-à-vis India. (1998)

The table 3.1.2 proves beyond doubt the need to modernize agriculture in the state with the value of output from Agriculture (per hectare) at only 5939 against the national average at 11839.

A cursory look at the land utilization statistics in the state would further reveal high population pressure on land and an urgent need to increase production and productivity of crops. Land utilization statistics rival that sixty percent of the reporting area is put under cultivation as compared to 47% is the country as a whole. Marginal lands are also brought under cultivation. Cropping intensity at 142 percent compares favourably with 189 percent in the Punjab, which has 94 percent gross irrigated area against 55 percent in Bihar.

	Table – 3.1.3: Lar	nd use statistics in	Bihar.(Area	, 000ha.)
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Reporting Area	1981	1999
Reporting area	9360(100)	9360(100)
Forests	580(6.39)	616(6.59)

441(4.71)	437(4.66)
1177(12.54)	1616(17.27)
2198(23.64)	2669(28.52)
103(1.11)	51(0.54)
35(0.37)	19(0.21)
160(1.68)	233(2.49)
192(2.04)	152(1.63)
903(9.65)	632(6.76)
3562(38.05)	3756(40.13)
5797(61.83)	5652(60.38)
8237	8015
2440(25.95)	2363(25.25)
142.09	143.05
	441(4.71) 1177(12.54) 2198(23.64) 103(1.11) 35(0.37) 160(1.68) 192(2.04) 903(9.65) 3562(38.05) 5797(61.83) 8237 2440(25.95) 142.09

Source DOS, GOB, (figures in parentheses indicate the percentage to total reporting area).

Land utilization figures above reveal that horizontal and vertical expansion of area for crop cultivation is only marginal and necessitates measures for increasing productivity.

3.1.2: Water resources of the state:

The State of Bihar is endowed with vast potential of surface and groundwater resources. A summary of envisaged potential and water utilization through completed and ongoing Major, Medium and Minor irrigation schemes are given in table 3.1.4:

S.No.	Name of Basin	No. of schemes CCA Potential envisaged in ha		Potential envisaged in ha	Water utilization in MOU	
	North Bihar	Major	Medium			
1.a	Ghaghra-Mahi-western Gandak	1	0	449080	554460	3230.00
1.b	Upper Eastern Gandak – Upper Burhi Gandak	2	0	406700	578800	3128.00
1.c	Lower Eastern Gandak Baya lower Burhi Gandak	0	0	175700	210850	1274.40
2.	Bagmati - Adhwara	1	-	118300	134900	659.00
3.	Kamla Balan	1	2	252122	309921	1525.00
4.	Kosi	1	0	464058	504890	4787.00
5.	Mahananda	0	0	-	-	-
	Total	6	2	1865960	2293821	14603.40
6.	Ganga Stem	1	1	60850	72025	454.41
7.	Cental Bihar Karamnasa	5	4	259739	363412	2070.00
8.	Sone & Kao-Gangi	1	13	411495	627225	5506.40
9.	Punpun	3	15	345515	397225	2384.04
10.	Harohar	7	31	199441	167406	1249.12
11.	Kiul	3	7	96125	96286	453.30
12.	Badua- Ballana	2	11	79049	67273	388.40
13.	Bilasi-Chandan-Chir	2	8	136554	137885	796.00
	Total - Grand Total-	23 30	89 92	1527918 3454728	1856712 4222558	12847.26 27905.07

Table-3.1.4: Envisaged potential and water utilization through completed and ongoing Major and Medium schemes:

Source:- Department of Minor Irrigation, Govt. of Bihar 3.1.3: Minor Irrigation schemes.

Minor irrigation schemes, which utilize surface water, comprise the Minor Irrigation Reservoir/Weir schemes, Lift Irrigation schemes and ahars. Bihar has 255 M.I. and 1240 L.I. schemes. Annual Irrigation potential envisaged through these completed and ongoing minor irrigation is about 3.90 lakh hectares. The Basin wise potential and water utilization is given in table 3.1.5 below: -

Table-3.1.5: Envisaged Potential and water utilization through completed and ongoing Minor Irrigation surface water schemes:

SI. No.	Name of Basin	Potential in hectares				Water utilisation in MCA			
	North Bihar	Reservoir	Lift	Ahars	Total	Reservoir	Lift	Ahars	Total
1.A	Ghaghra-Mahi-	-	12236	708	12944	-	42.9	2.50	45.40

	western Gandak								
1.B	Upper Estern	-	19875	1172	31595	-	69.6	11.70	81.80
	Gandak-Upper								
	Burhi Gandak								
1.C	Lower-Estern	-	21432	775	22207	-	75.0	0.80	75.80
	Gandak-Bayi								
	LowerBurhi Gandak								
2.	Bagmati-Adhwara	6200	21119	1293	28612	21.70	73.9	1.30	96.90
3.	Kamla Balan	6103	9042	-	15145	14.20	31.6	0.00	45.80
4.	Kosi	1285	11650	328	13263	4.50	41.1	0.50	46.10
5.	Mahananda	1136	5636	139	6911	4.00	19.7	0.10	23.80
	Total:-	14724	100990	14963	130677	44.40	353.8	16.90	415.1
6.	Ganga Stem	6521	12543	5912	24976	22.80	43.9	5.90	72.60
Centra	l Bihar								
7.	Karmanasa	13524	7199		20723	47.30	25.2		72.50
8.	Sone & Kao Gangi	2768	7621	50995	61384	86.50	26.70	51.00	164.20
9.	Punpun	13551	5625	-	19176	47.00	197	-	244.00
10.	Harohar	54286	6000	-	60286	190.00	21.0	-	211.00
11.	Kiul	16400	3052	-	19452	57.40	10.68	-	68.08
12.	Badua-Behhama	10545	6325	-	16870	36.90	22.10	-	59.00
13.	Bilasi-Chandan-	23924	12662	-	36586	83.70	44.30	-	128.00
	Chir								
Total (Central Bihar	134998	48484	50995	234477	548.8	346.98	51.00	946.78
Grand	Total	156243	162017	71870	390130	616	744.68	73.8	1434.48

Source: - Department of Minor Irrigation, Govt. of Bihar.

3.1.4: Agro climatic zones of Bihar

The table above shows that Zone III has highest gross Irrigated area followed by Zone II and Zone I. It is significant to mention here that canal Irrigation is readily available in Zone III. Zone III has highest area under canal Irrigation followed by Zone I and Zone II. Zone-wise Details about the Ground water potential is listed in the table below.

Table- 3.1.6	: Ground water	resources and Ir	rigation j	potential	in Bihar(1995)	
S No	Doutionlong		Zono	T	Zono II	7

S.No.	Particulars	Zone-I	Zone-II	Zone-III	Bihar
1.	Total Groundwater resources	10714.15	6544.33	10791.46	26049.94
	(MCM)				
2.	Utilizable groundwater resources	9107.34	5562.72	9323.77	23993.83
	(MCM				
3.	Net Annual Draft (MCM)	2414.85	1093.72	1837.28	5345.85
4.	Groundwater Balance (MCM)	6692.49	5459.00	7486.49	18647.98
5.	Stage of Groundwater	56.51	19.66	19.70	22.28
	development and category	(White)	(White)	(White)	(White)
6.	Net Irrigation requirement (M)	0.65	0.65	0.45	1.75
7.	Potential created upto March,95	371510	170537	389198	931243
8.	Additional Irrigation after full	1029575	705981	1670023	3405579
	exploitation (ha)				
9.	Ultimate Irrigation potential	1401085	876518	205922	4336824

The above table show the immense reservoirs of both surface and ground water resources in the state. Concerted efforts have been made to make use of the Irrigation potential of the state for the benefit of Agriculture with the created irrigation potential. The table below gives a look at the zone-wise Gross Irrigated area in the state.

S.No.	Source	Zone-I	Zone-II	Zone-III	Bihar
1.	Canal	277.26	159.79	840.77	1277.82
		(20.49)	(17.17)	(37.35)	(28.18)
2.	Ponds & Tanks	102.24	5.63	38.3	146.17
		(7.56)	(0.60)	(1.7)	(3.22)
3.	Electric tube wells	56.47	15.31	309.85	381.64
		(4.17)	(1.65)	(13.77)	(8.64)
4.	Diesel tube wells	801.59	687.62	561.26	2050.47
		(59.24)	(73.90)	(24.94)	(45.22)

5.	Wells	7.33	1.44	15.82	24.58
		(0.54)	(0.15)	(0.70)	(0.54)
6.	Other sources	108.26	60.72	484.86	653.84
		(8.0)	(6.53)	(21.54)	(14.42)
7.	Gross Irrigated Area	1353.16	930.51	2250.86	4534.52

Source: - DOS, Govt. of Bihar.

3.1.5: Agro-ecological characteristics of Bihar

The state falls in the middle-Gangetic plains region. The state is sub-divided into three agro-ecological sub-zones. These are, Northwest Alluvial Plains (Zone-I) North-East Alluvial Plains (Zone-II) and South Bihar Alluvial Plains (Zone-III A and III B). <u>Fig-3.1</u> displays these zones and the salient features of the Agro-ecological zones have been described below. **Table – 3.1.8: Agro-ecological characteristics of Bihar.(Area in '000 ha.)**

Agro- ecological	Geogra- phical	Net sown	Croppin g	Rain fall	Soils and topography	GIA To	Populati on	Animal density	Literacy	Poverty
Zone	Area	Area	Intensity			GCA	density	j		
						(%)				
Ι	3261	2153	142.17	1122	Heavy textured sandy	42.03	1073	2.73	45.20	50.83
					loam to clayey, medium,					
					acidic, flood prone.					
II	1986	1255	158.43	1387	Light to medium textured	4.97	518	1.52	37.98	53.35
					slightly acidic sandy					
					loam to salty clay loam					
					with saline/alkaline in					
					patches.					
III	4112	2195	135.11	1104	Old alluvium sandy loam	76.35	1065	3.83	55.01	42.07
					to clayey, large tal and					
					Diara area. Slightly					
					alkaline patches.					
Bihar	9360	5603	143.05	1234		54.16	880	2.83	47.42	48.05

A close look at Agro-ecological map of Bihar would reveal that the Zone I and Zone II corresponds with North Bihar whereas the Agro-ecological Zone III comprises of the districts of South Bihar. Net sown area as percentage tof Geographical area is higher for Zone I at 66% and lowest for Zone III at 53% against the state average at about 60%. A very high percentage of land area is under agricultural use and the investment is required to bring more area under Zone II under cultivation. The average rainfall is highest in Zone II followed by Zone I and Zone III. Most of the rainfall is received in the months of June to September bringing in with them the problems of recurrent flood. The highest Gross irrigated area as percentage of Gross cropped area lies in Zone III with 76.35% under assured means of Irrigation. Zone II and Zone I follow with 44.97% and 42.03% Gross irrigated area. Despite high Gross irrigated Area with 76.35% in Zone III it is low in cropping Intensity at only 135.11%. water stagnation for long hours during Kharif season hampers crops cultivation during Kharif. An integrated approach to develop crop culture with efficient water management will ensure higher cropping intensity and could be raised in Zone I & Zone I with the creation of more Irrigation facilities and with the adoption of short duration high yielding varieties.

Population density is highest in Zone I followed by Zone III and II. The population density is relatively low in Zone II. Hence population pressure is low in Zone II despite that there is high incidence of illiteracy and poverty in Zone II. It has highest poverty with 53.35% followed by Zone I and Zone II. Literacy percent is lowest in Zone II followed by Zone I and Zone III, which needs special care to bring it at par with other zones.

3.1.6: Cropping Pattern in Bihar

More than 60 % of land is used for crop production. There are three cropping seasons, Kharif, Rabi and summer (Zaid). Area under different crops have been shown in the table below :-

1		
S.No.	Сгор	Area (in lakh ha.)
1.	Paddy	36.77
2.	Wheat	20.98
3.	Maize	6.30
4.	Jute	1.34
5.	Sugarcane	0.93
6.	Sesame	0.17
7.	Gram	0.74
8.	Arhar	0.40
9.	Potato	1.48
10.	Lentil	1.77
11.	Pea	1.28
12.	Moong	1.79
13.	Rai/Sarson	0.91
14.	Sunflower	0.31
15.	Onion	0.14
16.	Chilli	0.059

Table-3.1.9: Area under major crops in Bihar (Year 2000-01).

Source, DOS, GOB

The table 3.1.9 show that about 90 per cent of cultivated area is occupied by food grains. Paddy alone accounts for 46 percent of the cropped area followed by wheat with 26 per cent area. In fact Rice and Wheat account for nearly 70 percent of Gross Cropped area. Pulses account for only about 10 percent of the cropped area. Oilseeds have a minor presence and non food crops (Sugarcane, Potato, Jute etc.) which generate higher value of output per hectare are grown only on about 4 percent area.

The table 3.1.10 below shows the charge in cropping pattern over the years.

Table- 3.1.10	: Change in	Cropping	Pattern(in %)
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S.No	Сгор	1999	1981
1	Rice	44.37	45.11
2	Wheat	24.82	19.85
3	Maize	7.51	8.35
4	Barley	0.02	1.20
5	Mandua	0.03	1.10
6	Jowar	0.36	0.09
7	Gram	0.52	1.90
8	Arhar	1.16	0.74
9	Other Kharif pulses	6.68	1.24
10	Other Rabi pulses	0.73	9.04
11	Rapeseed & mustard	1.17	0.79
12	Linseed	0.63	0.99
13	Castor	0.01	0.03
14	Sesamum	0.05	0.07
15	Jute	1.79	0.38
16	Sugarcane	1.29	1.38
17	Tobacco	0.23	0.20
18	Potato	1.66	1.26
19	Onion	0.18	0.15

Source : DOS, GOB

The table 3.1.10 above shows that a few crops like Wheat, Arhar, Other Kharif, Pulses, Rapeseed and Mustard and Jute have gained prominence in the cropping pattern in 1999-2000 over the last 2 decades. Whereas a few other crops like Rabi pulses, Mandua, Barley, Linseed have been marginalized in the cropping pattern. This also reveals a tendency of persistence in cropping pattern and share of food grains crops still predominant in the cropping pattern. In fact small farm Agriculture Compelled with the tenacity of cropping pattern in the State hinders agricultural development in Bihar. There is an urgent need to bring in diversification in Agricultural Production and cropping pattern.

3.1.7: Input use in agriculture

Fertiliser, quality seeds & Irrigation coupled with the scientific management of crops facilitated green revolution in

the country. Bihar has followed the national trend. Input consumption has grown over the years.

3.1.7.1: Fertiliser consumption: Fertilizer consumption has grown from a modest 61.20 NPK/ha in 1993-94 to 85.00 kg/ha in 2000-2001. The table below gives an account of the Fertilizer Consumption per hectare.

Table. 3.1.11: Consumption of Fertilizer (kg/ha)

S.No.	Year	Consumption(Kg/ha.)
1	1993-94	61.209
2	1994-95	62.50
3	1995-96	65.00
4	1996-97	68.00
5	1997-98	69.00
6	1998-99	72.00
7	1999-2000	78.50
8	2000-01	85.00 (Estimated)

Source- DOA, GOB

The table 3.1.11 above shows that there has been an appreciable increase in fertilizer consumption from 61.20 kg/ha in 202.04 tr 85 kg/ha in 2000.2001

93-94 to 85 kg/ha in 2000-2001.

3.1.7.2: Zone wise Fertilizer Consumption in Bihar

The table 3.1.12 below shows Zone wise trend in fertilizer consumption in Bihar.

Table. 3.1.12 Zone wise Fertilizer	Consumption in Biha	ır <u>(Kg</u> /ha) Year- 1998
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Zones	Nitrogen	Phosphorus	Potash	Total N+P+K
Zone I	51.75	12.98	4.52	69.25
Zone II	57.13	12.40	8.71	78.24
Zone III	87.95	13.76	2.16	103.87
Bihar	63.99	13.01	5.23	82.23

Source- Report on development of Bihar by Istt. of Human development, N. Delhi.

The table 3.1.12 above shows that fertilizer consumption for Zone III at 103.87 kg NPK/ha is highest followed by Zone II and Zone I at 78.24 kg NPK/ha and 69.25 kg NPK/ha conservatively. This table also shows that farmers in Bihar still have a very high tendency to use Nitrogenous fertilizers and the proportionate use of phosphorus and Potash is lacking. Lack of uniform pattern over the three Zones in respect of fertilizer consumption focuses the area of potential development as well as Agriculture in the State. Much of the potential of Zone- I and Zone -II remains unexploited.

Despite the fact that fertilizer consumption per hectare has grown substantially yet it is far below the fertilizer consumption per hectare in states such as Punjab(178.6 Kg), Haryana (141.6 Kg), Uttar Pradesh(108 Kg), West Bengal(120 Kg/ha), Tamilnadu (152 Kg) and Andhra Pradesh(153 Kg). Basic resources for the development of Agriculture are in plenty in the state and hence there is immense scope for increasing the fertilizer consumption in the state. Even with the present level of consumption of fertilizer there is much needed to guarantee the balanced use of fertilizers.

Table -3.1.13: Item wise fertilizer Consumption from 96-97 to 2000-2001.(Unit – lakh MT)

S.N.	Item	96-97	97-98	98-99	99-2000	2000-01
1	Urea	12.92	12.98	12.87	13.49	14.27
2	DAP	1.54	2.78	3.03	3.89	3.17
3	SSP	1.82	1.55	1.45	1.26	1.28
4	Complex	0.34	0.46	0.37	0.53	0.69
5	Potash	0.69	0.86	0.86	1.01	0.82
6	CAN	0.42	0.37	0.33	0.24	0.28
7	Ammonium Sulphate	0.27	0.32	0.26	0.29	0.50
8	Total	18.00	19.32	19.17	20.71	21.01

Source, DOA, GOB.

The table 3.1.13 above shows that Urea still remains the most popular fertilizer with the farmers. Its consumption has grown by nearly 10 percent since 1996-97. DAP has gained maximum usability and its consumption has risen by nearly 105 percent in the last five years since 1996-97. The use of potash is far below the desired level and needs to be taken care.

3.1.7.3: Consumption of quality seeds.

Quality seeds have played an instrumental role in the development of Agriculture in the state bringing forth green revolution. The consumption of quality seeds has been given in the table 3.1.14.

Table 5.1.14. Consumption of quality seed (in Thousand Quintar).					
S.N.	Year	Paddy	Wheat	Maize	
1	1997-98	34.77	26.43	1.67	
2	1998-99	68.65	102.34	2.45	
3	1999-2000	77.71	130.43	17.02(Kharif +Rabi)	
4	2000-2001	82.23	128.36	41.40(Kharif+Rabi)	

Table 3.1.14: Consumption of quality seed (in Thousand Quintal).

Source, DOA, GOB.

The table above shows the rising trend in respect of consumption of quality seeds in the state. Consumption of Paddy seeds has risen up by 142 percent whereas consumption of wheat seed has risen by 392 percent. Despite this rise in the consumption of quality seeds of major crops, seed replacement rate has not been satisfactory.

Table 3.1.15:	Seed Replacement rate.
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S.N.	Crop	2000-01	2001-02	X th Plan Target
1	Paddy	6.25%	5.10%	10%
2	Wheat	8.00%	8.00%	10%
3	Oilseeds	0.35%	0.11%	10%
4	Maize	10%	22%	10% + Hybrid 100%
G D	OL COD			

Source, DOA, GOB.

The table 3.1.15 shows the seed replacement rate in the 2000-01 & 2001-02. The achievement in respect of seed replacement has not been satisfactory. The target for the 10th five year plan has been kept at 10% seed replacement rate. This specially calls for our urgent attention and the project has been designed to give a boost to the seed replacement rate with better and easy availability of quality seeds to the farmers.

Bihar has great promise for the future growth of agriculture in the country. The Agricultural resource of the state in under utilized and with scientific resource management crop production and productivity could appreciably go up. Productivity of major crops have been compared in the table below,

|--|

Year	Paddy		Wheat		Pulses		Oil Seeds	
	State	National	State	National	State	National	State	National
1993-94	14.15	18.88	21.30	23.80	7.99	5.98	7.05	7.99
94-95	13.52	19.11	21.08	25.50	7.38	6.10	7.07	8.43
95-96	12.18	17.97	20.06	24.83	6.15	5.52	6.84	8.51
96-97	15.95	18.82	22.09	26.79	8.35	6.35	6.85	9.26
97-98	14.90	19.00	19.61	24.70	7.29	5.67	7.38	8.16
1998-99	14.54	19.28	20.91	25.96	9.10	6.22	8.55	9.44
1999-	16.42	19.85	20.33	22.55	7.96	6.08	9.27	8.55
2000								

Source : DOA, GOB

The table 3.1.16 shows that productivity of major crops has risen since 1993-94. Rice and wheat which accounts for more then 70 percent of gross cropped area, the productivity level of which is below the national average. For pulses & oil seed the productivity level compares well with the national average. Growth rates of major crops of Bihar have been listed in the table 3.17.

Table 3.1.17: Growth rates of major crops in Bihar.(Area in 000'ha,Production in MT and Yield in Tonnes /ha.)						
Crops	Particulars	1980-90	1990-99	1980-99		

Rice	Area	0.56	-0.89	-0.56
	Production	4.06	6.75	2.87
	Yield	3.48	7.71	3.45
Wheat	Area	1.01	3.13	4.38
	Production	3.74	4.92	2.15
	Yield	2.70	1.74	0.72
Maize	Area	-2.65	3.70	0.72
	Production	3.83	3.13	5.42
	Yield	6.66	-0.55	4.66
Potato	Area	0.88	1.58	1.30
	Production	3.17	-1.75	2.05
	Yield	2.27	-3.29	0.74
Sugarcane	Area	0.68	-1.63	0.41
	Production	6.23	-5.03	2.51
	Yield	5.50	-3.45	2.09
Moong	Area	1.40	-2.49	-0.16
	Production	0.54	-3.46	-0.58
	Yield	-0.85	-0.99	-0.42
Pigeonpea	Area	-4.80	-0.98	-2.87
	Production	-2.87	-4.04	-3.20
	Yield	2.03	-3.08	-0.34

3.2: Patna District

3.2.1: - General Features of the District:

Patna district is situated in the south Bihar alluvial plains (Zone III B) among the three agro-climatic zones of divided Bihar. The district is bounded in north by river Ganga, in south by Jahanabad and Nalanda districts, in the east by Lakhisarai district and in the west by Bhojpur district. The district is situated between 25 ° 13 ' North and 25° 45 ' North latitude and 84°43' East and 25 ° 44' East longitude with a height of 67 meters from M.S.L. (**Fig-3.2**).

The geographical area of the district is 317236 ha. with 4.13 % land not suitable for cultivation. Patna, besides being the state capital, is also the biggest urban centre of the state. It has highest literacy rate as well as awareness level among the districts of Bihar. It has a ready market for almost all farm and non-farm sector products and is well connected by rail, road and air with almost all the district headquarters and the major cities of the country. (**Fig-3.3**).

Administratively the district is divided into six subdivisions, twenty-three blocks, 344 Panchayats and 1433 villages (1294 inhabited and 139 uninhabited). (**Fig-3.3** and Table 3.2.1) Three tiers Panchayat system is working in Patna since 10/06/2001.

Table-3.2.1: Administrative set-up of Patna district

Tuble 3.2	Tuble 5.2.1. Hummistrative set up of 1 atha district					
S.No.	Subdivisions-	Blocks attached to them				
1.	Patna Sadar	Patna Sadar, Phulwarisharif, Sampatchak				
2.	Patna City	Fatuha, Khusrupur, Daniyanvan				
3.	Danapur	Danapur, Bihta, Maner, Naubatpur				
4.	Masaurhi	Masaurhi, Dhanarua, Punpun				
5.	Paliganj	Bikram, Dulhinbazar, Paliganj				
6.	Barh	Bakhtiarpur, Athamalgola, Belchi, Pandarak, Barh, Mokama, Ghoswari.				

The local self-governing bodies in Patna district have been given in table 3.2.2:

Tuble 5.2.2. Elocal sell government boards in Fatha district					
S.No.	Local Bodies	Number	Location		
1	Nagar Nigam	1	Patna		
2	Nagar Palika	4	Mokama, Barh, Danapur and Khagaul		
3	Notified Areas	6	Bakhtiarpur, Khusrupur, Fatuha, Masaurahi, Phulwarisharif, and		
			Maner blocks.		

Table-3.2.2: Local self-government bodies in Patna district

Patna district is surrounded by two river systems namely Ganga in the north and Sone in the west, which falls into Ganga at its northwestern boundary. The river Punpun traverses to a significant stretch from southwest to northeast. .(Fig-3.4-A)

The district has the distinction of three agro-ecological situations based on the **nature of flooding** by these rivers besides two irrigated and unirrigated agro-ecological situations (AES).Fig-3.5.

3.2.2: Agro Ecological Situation:

Agro-ecologically South Bihar Alluvial Plains Zone III B is spread south of river Ganga. Physiographically it is almost plain alluvium, but south of the natural levee of Ganga, there is a parallel stretch of Diara land receiving flash floods. At the eastern end of the district there are stretches of Tal lands where backwaters of Ganga river stagnates in low lands during Kharif season floods between September-December every year. Tal lands extend from Fatuha to Mokameh blocks in the district, here most natural drainage systems i.e. rivers from south simply vanish.

The district has mainly four types of soils ranging from moderately well drained to poorly drain, acidic to slightly alkaline and medium to heavy textured. The climate is of moderate type characterised by quite hot in summers to mild cold in winters. Rainfall is moderate and erratic during Kharif season. The net area sown in the district is 65.16 percent of the total geographical area. The land use classification for the district is detailed in table-3.2.3 below.]

The remaining area (34.85 percent) in the district is divided between non-agricultural uses (21.45%), current fallow land (8.55%), barren and uncultivable land (0.11%), permanent pastures and other grazing land (0.04%), plantations (0.15%), gross cropped area is 256694.99 ha. and net area sown is 201103.63 ha. indicating cropping intensity of 127.64 % in the district, which is a bit low as both Tal and Diara areas are mostly mono cropped.(Table-3.2.4).

Total irrigated area in the district is 60545 ha. Out of which canal irrigation accounts for the highest being as high as 60% but some areas do not receive irrigation water at proper cropping time particularly at the tail ends. Sometime this sone canal system does not provide irrigation during entire year. Block wise areas under different AES have been given in table-3.2.5.

S. No.	Block	Tal Land	Diara Land	Jalla Land	Irrigated	Unirrigated	Total Craltizate d
		AECI					
		AES-I	AES-II	AES-III	AES-IV	ALS-V	Area
1	Patna Sadar	Nil	277.00	2108.50	Nil	Nil	23285.50
2	Phulwarisharif	Nil	Nil	Nil	4485.00	3798.44	8283.44
3	Fatuha	Nil	1840.00	1400.00	2000.00	15523.62	20763.62
4	Masaurahi	Nil	Nil	Nil	4000.00	13168.28	17168.28
5	Dhanarua	Nil	Nil	Nil	1200.00	11291.59	12491.59
6	Punpun	Nil	Nil	Nil	1300.00	6739.75	8039.75
7	Danapur	Nil	1242.06	Nil	1420.70	1579.30	4242.06
8	Maner	Nil	4392.30	Nil	2170.40	4417.30	10980.00
9	Bihta	Nil	Nil	Nil	7025.60	4941.44	11967.04
10	Bikram	Nil	Nil	Nil	17008.39	3450.49	20458.88
11	Paliganj	Nil	Nil	Nil	13560.33	5811.57	19371.90
12	Naubatpur	Nil	Nil	Nil	10166.82	4357.21	14524.03
13	Barh	4972.09	1364.93	Nil	3900.00	3412.35	13649.37
14	Bakhtiarpur	3855.80	2142.11	Nil	2000.00	570.55	8568.46
15	Pandarak	7219.60	1666.06	Nil	1300.00	921.42	11107.08
16	Mokameh	10261.57	3420.52	Nil	(2400.00)	3420.54	17102.63
17	Patna District	30209.06	16344.98	3508.50	67637.24	83403.85	201103.63

Table-3.2.5: Block wise Cultivated Area (Ha.) in Different AES of Patna District (in ha.) (2001-2)

Source- DOA, GOB

Figure in parenthesis show the irrigated area from other situation

N.B.-1.Dulhinbazar Block has been carved out from Paliganj and Bikram Blocks.

- 2.Sampatchak block has been carved out from Phulwarisharif.
- 3. Daniyawan and Khusrupur blocks have been carved out from Fatuha.

4. Athmalgola and Belchi blocks have been carved out from Barh block.

5. Ghoswari Block has been carved out from Mokameh.

Groundwater sources of irrigation depend on ground water recharging and alluvial deposit are best reservoir of ground water. In the district alluvial thickness ranges to a maximum of 700 m. Shallow tube-wells tap shallow aquifers whereas deep tube wells, the deep aquifers .As per recommendation of the "Over Exploitation Committee" the ground water potential has been worked out through hydrographs which is 81.15 (in '000 Ha. m) for ground water recharge (net) and 29.70 (1000 Ham) for ground water draft for the district . Block wise long term potential for ground water structure has been presented in table-3.2.6.

Table-3.	2.6: Block	wise long T	erm Potential f	or ground	d water ir	rigation structure	

S.No.	Name of Block	Utilizable	Net Yearly	Balance Irrigation	No. of feasible
		Recharge in	draft in Ha. m.	Potential at 85%	Structure (STW)
		Ha. m.		of Development	
				Ha.	
1.	Patna Sadar	5763	1476	265.46	2106
2.	Phulwarisharif	2776	1906	697.85	279
3.	Sampatchak*				
4.	Fatuha	6769	3538	3408.69	1363
5.	Khusrupur*				
6.	Daniawan*				
7.	Bakhtiarpur	5012	3025	1900.31	760
8.	Barh	3657	2689	645.31	258
9.	Belchi*				
10.	Athamalgola*				
11.	Pandarak	5352	3123	2194.15	878
12.	Mokama	6748	3023	4173.54	1669
13.	Ghoswari*				
14.	Naubatpur	3839	2864	614.08	246
15.	Bihta	3357	2968		
16.	Paliganj	6354	3162	3444.46	1378
17.	Bikram	6843	3407	3707	1483
18.	Dulhinbazar*				
19.	Maner	3725	2406	1169.62	468
20.	Danapur	2555	1986	285.77	114
21.	Dhanarua	3372	2574	449.54	180
22.	Punpun	3130	1633	1580.77	632
23.	Masaurahi	3788	3177	65.85	26
24.	Total	73040	42957	29602.38	11841

Source-NABARD, RO, Patna

1. Dulhinbazar Block has been carved out from Paliganj and Bikram Blocks.

2.Sampatchak block has been carved out from Phulwarisharif.

3. Daniawan and Khusrupur blocks have been carved out from Fatuha.

4. Athamalgola and Belchi blocks have been carved out from Barh block.

5. Ghoswari Block has been carved out from Mokameh.

The farming situations in the district are mainly dependent as soil, topography and irrigation systems prevalent in the

area. Climatogically the district by and large is homogenous; the rainfall and temperature variations are not large. From the farming point of view only four types of soils may be recognised as light to heavy in texture. The five farming situations may be summarised as below (Table-3.2.7):

Table-3.2.7 : Summary of agro-ecological situations.

S. No	AES	Soil characteristics	Principal Crops as % of Gross cropped area in the AES	Major cropping system
1	AES-I	Heavy soils, clay loam to	Maize-1.2	Fallow-Lentil
	Tal land	clay in texture. Deep	Paddy-0.1	Fallow-Gram
		cracking in summers.	Lentil 70.08	Fallow-Lathyrus
		-	Gram- 2.6	Fallow- Oilseeds

	1			
			Oilseed-5.3	Fallow-Wheat
			Wheat-9.2	Maize / Paddy-Wheat
			Lathyrus-10.3	
2	AES-II	Rain fed /irrigated light	Maize –50.5	Maize-Wheat-Fallow
	Diara land	soils	Arhar-9.7	Maize-Potato-Fallow
		(Sandy loam to loam)	Cucurbits-15.3	Maize-Vegetable-Cucurbits
			Wheat-45.3	Cucurbits-Wheat
			Maize-21.8	Cucurbits-Maize-Oilseeds
			Potato-12.6	
			Vegetable-5.2	
			Linseed- 3.2	
3	AES-III	Medium heavy to heavy	Paddy –20.1	Paddy-Wheat-Onion
	Jalla land	soils, clay loam to clay in	Maize-10.3	Maize-Potato-Onion
		texture.	Vegetables-8.8	Vegetable-Wheat-Onion
			Wheat-20.2	Paddy-Gram-Potato
			Lentil-19.8	
			Gram-10.3	
			Onion-40.5	
			Potato-35.2	
4	AES-IV	Medium to heavy soil.	Rice –95.2	Paddy-Wheat
	Irrigated plains		Wheat-35.33	Paddy-Lathyrus
			Lathyrus- 9.73	Paddy-potato-Moong
			Gram-3.32	Paddy-Wheat-Paddy
			Lentil—25.52	Fallow-Potato-Paddy
			Potato-12.36	Maize-Oilseed-vegetable
			Vegetable-1.36	Vegetable-Wheat-Vegetable
			Maize-2.88	Paddy-Berseem
			Linseed-1.36	
			Mustard-1.2	
			Baseem-2.5	
			Pea-5.0	
5	AES-V	Medium to heavy soil.	Rice -95.0	Paddy-Wheat
	Rainfed plains		Wheat-50.5	Paddy-Lentil/ Gram / Lathyrus
			Lathyrus- 2.3	Paddy-Maize
			Gram-3.7	Paddy-Mustard
			Lentil 39.7	Paddy-Linseed
			Maize –2.7	
			Linseed 1.2	
			Mustard-2.7	

Source- District Core Team, ATMA, Patna

3.2.3:General features of different AES: As detailed in table-3.2.5 given above.

3.2.3.1: Tal:This is basin shaped low-lying area separated from the river Ganga by its natural levee. This area gets inundated on the on set of monsoon, as the riverbed swells backwaters of the river pond this area. After late September water starts receding from higher niches to drain completely by the middle of December. The soils are grey, medium heavy-to-heavy in texture and very poor in drainage they crack widely on drying. Major crops in Tal lands are mostly Rabi season crops like lentil, lathyrus, and gram with no crop possible during Kharif due to submergence. The cultivated land under this segment is 30209.06 ha. Contributing 15.02 % land to the district.

3.2.3.2: Diara: These are natural levees of river Ganga or its abandoned channels near by. These are subjected to flash floods during monsoons, resulting in either erosion or deposition of soil every year. As such the soil is light in colour and texture, well drained and crops are mostly taken during Rabi. Kharif (liable to washed off) and summer (mostly vegetables) crops choice depend upon type of Diara. Enterprising farmers are developing irrigation facilities on stable diaras for crops whereas some have even gone for orchards like mango, guava etc. Parval is an important vegetable crop among cucurbits and farmers are earning from selling their root cuttings as planting material. On marginal lands, near to stream sachharum growth fetches farmers a handsome price. This area is about 16344.98 ha. in the district contributing 8.12 % to the cultivated land.

3.2.3.3:Jalla: These are similar to Tal lands but a bit shallower getting partial and short duration inundation in parts by the river Punpun and its tributaries. Due to its proximity to Patna town, it also receives drainage water of the city. Though it is rich in

fertility, it carries some harmful chemicals along with heavy metals entering the food chain. This area is mostly known for its vegetable cultivation besides pulses and more recently for potato and onion. Besides meeting the requirement of the city it also supplies vegetables to other districts. One peculiar phenomenon is excessive use of agro-chemicals ignoring the safety aspects. This constitutes only 1.74 % i.e. 3508.50 ha. of cultivated area in the district. As a vegetable bowl for the Patanites it needs special care in IPM.

3.2.3.4: Irrigated Plains: These areas have assured irrigation facilities either through Sone command system or through state or private owned tube wells. This part of the district has good, well-drained soils and the farmers follow predominantly Rice-Wheat rotation. The private tube well owners seldom irrigate rice crop. Some vegetables, spices and flowers are also grown in this area. The cultivated area under this AES is 67637.24 ha. constituting 33.63 % of the Net cultivated area. Although, this area is most affected by extremism and class wars, it has highest potential in terms of number of enterprises possible.

3.2.3.5:Rainfed plains:These have climate and soils similar to irrigated plains and mostly follow the same cropping sequence by and large; but they lack assured irrigation facility. Availability of water mostly decides the choice of Rabi crops. This covers a significant 83403.85 ha. I.e. 41.47 percent of the cultivated area. Extremist violence is gaining ground in this area as well. The AES has immense scope for diversification.

3.2.4: Agro climatic Information: The normal annual rainfall in the district is around 1075.91 mm. The mean annual and monthly distribution of rainfall has been presented in the tables **3.2.8. to 3.2.12**.

Year	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
1992	0.0	5.4	0.0	0.0	41.0	90.1	170.3	253.8	48.8	31.6	2.3	0.0	643.8
1993	0.0	2.1	22.0	24.3	24.0	152.1	107.4	274.0	336.7	44.6	15.6	0.0	1010.8
1994	15.2	25.8	0.0	16.0	46.0	100.0	311.9	275.7	171.4	10.2	9.8	0.0	982.0
1995	12.8	24.6	1.0	0.0	0.0	126.2	368.4	281.0	176.7	26.5	45.4	56.2	1118.8
1996	31.5	9.2	0.0	0.0	0.6	247.5	276.6	367.7	139.8	63.2	0.0	0.0	1136.0
1997	16.6	0.0	1.2	28.2	49.0	201.6	683.2	356.4	285.2	39.6	31.2	33.5	1725.7
1998	9.2	22.0	7.6	2.6	9.6	58.0	355.2	249.6	393.5	59.3	49.8	0.0	1196.9
1999	0.0	0.0	0.0	0.0	123.6	160.4	300.0	242.8	93.3	171.4	0.0	0.0	1091.5
2000	2.8	4.7	2.8	20.6	73.0	367.1	131.2	193.9	197.0	0.0	0.0	0.0	993.1
2001	16.0	0.5	7.0	3.7	16.3	255.1	112.5	207.3	308.8	87.2	0.0	0.0	1016.4
2002	9.8	10.8	0.0	3.4	126.7	146.4	257.8	204.1	73.3	87.7	0.0		920.0
Avg.													1075.91

 Table3.2.8-:
 Rainfall Data for Patna District (1993-2002)(in MM)

Source:ARI, Patna

Table-3.2.9-A: Monthly Maximum Temperature In °C in Patna

Year	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1998	-	-	29.9	34.4	36.4	38.7	32.3	32.4	32.1	32.0	29.6	24.2
1999	21.1	26.8	3.5	38.2	35.0	34.5	32.0	31.4	31.5	30.6	29.4	24.9
2000	21.1	23.5	30.3	33.0	34.7	33.3	32.5	32.6	30.5	32.7	29.5	25.1
2001	21.4	26.4	31.3	36.6	34.7	33.0	32.8	33.3	32.3	31.4	29.4	22.6
2002	23.0	25.6	31.2	34.9	33.2	34.1	33.8	32.0	32.0	31.5	29.0	

Source: ARI, Patna

Table-3.2.9 -B: Monthly Minimum Temperature In °C in Patna district

Year	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1992	7.7	8.6	15.5	20.7	22.1	25.3	24.9	25.1	24.2	20.6	13.9	9.3
1993	8.5	12.4	14.0	19.9	23.9	25.8	25.7	24.8	23.8	21.2	15.2	9.6
1994	9.7	10.7	15.2	20.6	24.0	25.8	25.1	24.8	23.3	20.2	14.3	9.6
1995	7.9	11.2	15.5	20.3	25.5	26.3	25.1	25.1	13.0	21.5	15.3	10.5
1996	10.1	11.2	16.7	20.0	19.7	24.9	25.2	24.7	24.1	24.0	12.9	7.3
1997	7.3	10.3	14.1	19.7	23.8	26.1	25.4	25.2	24.5	20.6	14.7	11.7
1998	8.5	12.3	14.7	21.9	25.6	27.7	26.1	26.0	25.3	24.0	18.3	11.1
1999	9.0	13.3	16.2	22.9	24.9	26.3	25.9	25.7	25.7	22.3	16.0	11.9
2000	9.7	11.6	15.4	21.1	25.4	25.9	26.4	26.6	24.7	23.1	16.7	10.3

2001	8.7	12.4	15.5	21.7	25.1	26.4	26.1	27.0	26.3	23.7	19.4	10.5
2002	11.3	13.5	17.7	20.8	24.1	25.9	27.0	26.4	25.2	20.3	16.9	

Source: ARI, Patna

Table-3.2.10: Monthly Humidity In % at 6.49 hrs. in Patna district

Year	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1992	88	82	65	55	72	76	84	89	88	89	81	76
1993	84	73	75	68	79	77	83	88	91	86	87	83
1994	87	82	76	62	65	81	89	87	84	87	81	84
1995	85	82	76	59	58	84	93	88	89	86	81	81
1996	88	96	75	57	67	70	89	90	86	85	83	79
1997	85	73	77	77	73	76	91	89	88	86	88	92
1998	93	82	74	74	73	74	90	91	89	89	86	90
1999	90	87	66	66	81	81	89	90	88	91	88	90
2000	88	79	70	69	76	86	87	87	90	88	89	85
2001	86	82	74	64	75	86	87	88	90	93	90	94
2002	92	89	75	75	80	84	86	87	88	88	86	

Source: ARI, Patna

Table-3.2.11: Monthly Humidity In % at 13.49 hrs. in Patna district

Year	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1992	47	39	32	29	43	52	65	72	67	57	48	52
1993	53	43	38	46	53	55	68	76	81	59	53	47
1994	52	51	40	33	42	63	73	74	72	60	49	60
1995	58	54	46	29	36	62	77	75	78	61	57	54
1996	58	64	40	36	37	65	72	77	81	66	47	48
1997	54	47	41	48	41	50	80	75	73	56	53	65
1998	61	46	38	42	47	47	76	77	73	67	55	51
1999	53	47	25	27	52	63	75	76	71	70	42	50
2000	52	46	31	39	53	67	73	72	75	53	48	44
2001	47	44	39	31	51	66	73	73	73	63	49	63
2002	62	61	41	42	61	63	66	73	71	57	47	

Source: ARI, Patna

Table-3.2.12: Sunshine (hrs/day.) in Patna district.

Year	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1999	6.0	8.4	10.1	10.1	9.7	5.8	4.4	4.3	6.0	6.3	8.4	8.0
2000	5.8	7.6	9.2	9.5	7.4	6.0	4.8	5.4	4.5	8.8	8.1	7.5
2001	7.1	8.8	8.9	9.6	9.1	6.3	6.0	5.9	5.8	6.9	7.5	5.0
2002	6.6	8.2	9.1	6.8	8.2	7.1	3.9	6.3	5.5	7.7	7.8	
a												

Source: ARI, Patna

The annual rainfall was above normal in 5 years during past 11 years (1992-2002). Table3.2.8. The timely and welldistributed rainfall during Kharif and Rabi has a deciding influence on the land use and cropping pattern of the district. The day temperature generally ranges from 21.1 ^oC in January to 38.7 ^oC in May and night temperature from 7.3 ^oC in December to 27.7 ^oC in June.Tables-3.2.9-A and 3.2.9-B. The relative humidity ranges between 29 % (peak summer) to 90 % (extreme wet Kharif). Tables-3.2.10 and 3.2.11.

3.2.5: Information on Land Based Systems:

3.2.5.1.1: Agriculture:

Agriculture is the main occupation of people of Patna district. Cultivation is practiced in all the three cropping seasons i.e. Rabi (66.62%), Kharif (57.8%) and Jaid or Summer(2.38%) in its net cultivated area. Bhadai-Kharif (June-Sept) crops are usually taken under unirrigated conditions (93.09% of total crops in this season), whereas Aghani Kharif (June-Dec) crops under irrigated conditions (99.39% of total crops in this season). Rabi crops are taken under irrigated as well as unirrigated conditions but summer (Jaid) are grown mostly under irrigated conditions only (89.91%). Table 3.2.4 above shows the season wise cropped

area in different blocks of Patna district during 2001-02, whereas Table 3.2.11 below shows the area, production and productivity

along with exploitable potential for different crops in Patna district.

Crop	Area	Production	Productivity	Potential	Total	Exploitation of Total
-	(000ha.)	(000Tons)	(q/ha.)	(q/ha)	Production	Production (%)
Cereals						
1. Wheat	96.31	314.84	32.69	42.50	409.32	76.90
2. Kharif Maize	6.88	27.34	39.75	50.00	34.39	79.5
3. Rabi Maize	8.00	26.11	32.64	40.00	32.00	81.60
4. Summer	3.00	9.79	32.64	40.00	12.00	81.60
5. Rice (Kharif)	84.793	288.89	34.07	45.00	38.57	75.71
Oilseeds						
1.Rapeseed/	7.10	7.10	10.00	14.00	9.94	71.40
Mustard						
2.Sunflower	0.20	2.00	10.00	14.00	2.80	71.40
Pulses						
1. Arhar	1.57	1.92	12.27	25.00	39.14	49.00
2.Chikpea	12.30	13.14	10.68	25.00	30.75	42.70
3.Lentil	50.00	45.00	9.00	20.00	100.00	45.00
4.Pea	2.25	2.25	10.00	15.00	3.75	60.00
5.Moong	0.50	0.85	8.00	12.00	0.96	88.50
(Summer)						
6. Others Pulses	9.68	11.48	11.86			

 Table-3.2.11 : Area, Production, Productivity , Potential per unit area, Total Production Potential and Percent of Exploitation of Total

 Production Potential of Crops in Patna District

Source: DOA, Patna

Table-3.2.12 below shows that among the cereals area under wheat is highest followed by rice and maize. The low area under rice clearly reflects the significance of acreage in the mono-cropped Rabi areas of the district, whereas productivity shows a wide gap to be filled between actual and potential yield per hectare in different blocks of Patna as evident from the Table.

Among the pulses, area under lentil (Masoor) is maximum followed by gram but this was in reverse order earlier, the reason for it can be attributed to the pest and theft problem in gram crop leading to uneconomical yields, ultimately leading to a major shift of the area under gram towards the lentil crop.

Lathyrus is another important crop of the mono-cropped Tal areas as evident from the above Table 3.2.13. Block wise area under pulse crops proves that the Tal areas have appropriately been named as the 'pulse bowl of Bihar', though the yields are very low at present; there is immense potential to increase the same.

Oilseed crops in the district are grown economically in irrigated areas along with rainfed and in Tal areas but their yields are quite low. As evident from table 3.2.14 below:

	Table-3.2.14	: AREA PRODUCTION AND PRODUCTIVITY OF RAI-TORIA IN PATNA (2001-02)
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Tuble 54				
S.No.	Name of Block	Area (Ha.)	Production (M.T.)	Yield (Kg/Ha.)
1.	Patna Sadar	Nil	Nil	Nil
2.	Phulwarisharif	Nil	Nil	Nil
3.	Fatuha	715	543	760
4.	Masaurhi	400	340	850
5.	Dhanarua	Nil	Nil	Nil
6.	Punpun	Nil	Nil	Nil
7.	Danapur	Nil	Nil	Nil
8.	Maner	Nil	Nil	Nil
9.	Bihta	Nil	Nil	Nil
10.	Bikram	680	816	1200
11.	Paliganj	400	730	1825
12.	Naubatpur	Nil	Nil	Nil
13.	Barh	Nil	Nil	Nil
14.	Bakhtiarpur	Nil	Nil	Nil
15.	Pandarak	Nil	Nil	Nil
16.	Mokameh	910	670	737
17.	Patna district	6860	3099	452

Source: District Agriculture Office, Patna N.B.-

1. Dulhinbazar Block has been carved out from Paliganj and Bikram Blocks.

2.Sampatchak block has been carved out from Phulwarisharif.

3. Daniyawan and Khusrupur blocks have been carved out from Fatuha.

4. Athmalgola and Belchi blocks have been carved out from Barh block.

5. Ghoswari Block has been carved out from Mokameh.

3.2.5.1.2: Seed:

The present supply of quality seeds in the district is met by the private seed agencies, which have their seed production farms mostly outside Bihar. This causes a problem of selection of suitable varieties from outside vis-à-vis multiplication of promising varieties of the state for different crops. There are 334 Agriculture farms in the state out of which 207 farms have been transferred to different Govt.agencies rest 127 are lying idle as the agency Bihar Rajya Bij Nigam using it has become a non-viable venture. Under the circumstances seed production by the farmers on co-operative basis in small units called **seed villages** in the district will ensure production of required quality seeds of recommended varieties of crops for different agro-ecological situation. Table3.2.15 shows the block wise Seed Multiplication and Production Farms (SMP) available in the district but presently non-functional. These farms may be leased out to the agencies, which have the required capability and willingness to produce recommended variety seeds for the benefit of the local farmers.

S.No.	Name of Block Nature of agricultural farms		Total Agril. Of	Current
			Farms in acres	Status
1.	Patna Sadar	Seed multiplication farm	25	Farm under
				SCADA control
2.	Phulwarisharif	Seed multiplication farm	25	-do-
3.	Fatuha	Seed Multiplication & Production Farm	25	do
4.	Masaurahi	S.M.P farm	25	do
5.	Dhanarua	Sub-Divisional Agril farm Sabajtuna	40	do
6.	Punpun	Sub-divisional Agril.farm Pothahi	40	do
7.	Danapur	-do-	25	do
8.	Maner	Seed multiplication farm	25	do
9.	Bihta	-do-	25	do
10.	Bikram	-do-	25	do
11.	Paliganj	-do-	25	do
12.	Naubatpur	-do-	25	do
13.	Barh	-do-	25	K.V.K
14.	Bakhtiarpur	-do-	25	Farm under
				SCADA control
15.	Pandarak	-do-	25	Land view to
				NTPC
16.	Mokameh	-do-	25	Farm under
				SCADA control
17.	Patna district			

 Table –3.2.15:
 Block wise Government Agricultural Farms in Patna District.

Source: District Agriculture Office, Patna 3.2.5.1.3: Farm Mechanization

Farm mechanization is done with an objective of minimizing cost by adopting multiple cropping, increasing income, minimizing loss, reducing drudgery in operation etc. where as post harvest machinery helps in value addition and is also a source of employment. The growing labour problems in rural areas, increased maintenance cost of draft animals and big area of heavy (Kewal) soils in Patna district, the tractorization is only of the tune of 16.28 percent. Table3.2.16 shows the number of tractors, power tillers and draft animals in Patna district .The farmers of the district in general lack in skill on proper use of many farm machinery like threshers, zero tillage equipments, sprayers etc.

Table-3.2.16 : Level of tractorization in Patna(Year 2001-02) C. N.

S. No.	Particulars	Units

1	Working population of tractors	2931			
2	Power tillers	900			
3	Plough animals	187175			

Source-NABARD, RO, Patna

3.2.5.1.4: Fertilizer

Fertilizer is the basic resource for the development of agriculture in the district and hence there is immense scope for increasing the fertilizer consumption in Patna. Even with the present level of consumption of fertilizer there is much needed to guarantee the balanced use of fertilizers.

S.N.	Item	1998-99	1999-2000	2000-01	2001-02
1	Urea	70.0	70.0	65.0	70.0
2	DAP	10.0	10.0	12.0	10.0
3	SSP	4.0	4.0	5.0	6.0
4	N:P:K (12:36:16)	3.5	3.5	3.5	4.0
	Suphala (20:20:0)	2.0	2.0	2.0	2.0
6	Potash	3.0	3.0	3.0	3.0
7	Ammonium Sulphate	6.0	6.0	6.0	6.0
8	Total	98.5	98.5	96.5	101.0

 Table- 3.2.17
 :Details of fertilizer Consumption in Patna district (In '000MT)

Source: DOA, Patna

The table above shows that Urea still remains the most popular fertilizer with the farmers. Its consumption has however remained by and large constant since 1998-99 to 2001-2002. SSP has gained maximum usability and its consumption has risen by nearly 50 percent in the last four years since 1998-99. The use of Potash, Ammonium Sulphate, NPK, Suphala and SSP is far below the desired level and needs to be taken care of in the district.

3.2.5.1.5: Input Supplying Agencies

The district has a good network of input supplier and their presence in almost all the blocks has helped the farmers a great deal. They also supplement as the informal sources of disseminating information about the use and utilization of agro-chemicals to the farmers. However, their commercial interest some time are at variance with the scientific recommendations resulting in improper use of these agro-chemicals, as is evident in almost all the blocks of the district. Table 3.2.18 shows the block wise number of suppliers of different inputs in Patna district.

Name of Block	Fertilizer sale outlet (No. of outlets)		Seed sellers	Pesticide sellers
	Wholesaler	Retailer		(No. of outlets)
Maner	Nil	6	Nil	Nil
Danapur	5	14	1	Nil
Patna Sadar	5	21	14	7
Sampatchak	Nil	9	Nil	3
Phulwarisharif	2	12	Nil	2
Bihta	Nil	10	1	Nil
Naubatpur	2	8	Nil	3
Bikram	1	9	Nil	Nil
Dulhinbazar	Nil	6	Nil	1
Paliganj	1	12	1	Nil
Masaurahi	6	11	Nil	1
Dhanarua	3	4	1	Nil
Punpun	Nil	5	Nil	1
Fatwah	2	17	2	3
Daniawan	1	6	1	Nil
Khusrupur	Nil	2	Nil	1
Bakhtiarpur	Nil	7	Nil	Nil
Athamalgola	Nil	5	Nil	Nil
Belchi	Nil	Nil	Nil	Nil
Barh	3	10	1	1
Pandarak	Nil	5	Nil	Nil

Table-3.2.18 : Block wise Input and Service facilities in Patna district:

Mokama	1	8	1	Nil
Total	32	185	23	23

Source: DOA, Patna

3.2.5.1.6: Plant Protection Centres

The district has a good departmental network of plant protection centres as detailed in the Table-3.2.19 below.

Table-3.2.19 : Block wise Plant Protection Centres in Patna District

S.No.	Name of Block	Plant Protection Centre	In charge of Plant Protection Centre
1.	Patna Sadar	P.P Centre, Mainpura, Patna	Plant Protection supervisor
2.	Phulwarisharif	P.P Centre, Phulwarisharif	Plant Protection supervisor
3.	Fatuha	P.P Centre,Fatuha	Plant Protection supervisor
4.	Masaurhi	P.P Centre ,Masaruhi	Plant Protection supervisor
5.	Dhanarua	P.P Centre, Dhanarua	Plant Protection supervisor
6.	Punpun	P.P Centre, Punpun	Plant Protection supervisor
7.	Danapur	P.P Centre Danapur	Plant Protection supervisor
8.	Maner	P.P Centre ,Maner	Plant Protection supervisor
9.	Bihta	P.P Centre ,Bihata	Plant Protection supervisor
10.	Bikram	P.P Centre ,Bikram	Plant Protection supervisor
11.	Paliganj	P.P Centre ,Paliganj	Plant Protection supervisor
12.	Naubatpur	P.P Centre ,Naubatpur	Plant Protection supervisor
13.	Barh	P.P Centre ,Barh	Plant Protection supervisor
14.	Bakhtiarpur	P.P Centre ,Bhaktiarpur	Plant Protection supervisor
15.	Pandarak	P.P Centre ,Pandarak	Plant Protection supervisor
16.	Mokameh	P.P Centre ,Mokameh	Plant Protection supervisor
17.	Patna district	P.P Centre .Patna district	Junior Plant Protection Officer

Source: DOA, Patna

3.2.5.2: Horticultural Crops: Patna having the climate conducive for growing a large number of horticultural crops, the actual cultivation of these crops is done at a very small scale as the Table 3.2.20 below shows. The adverse effects of rapid urbanization and growing pressure of the population have resulted in large scale cutting of orchards, in and around Patna. The land thus cleared has either been converted to paddy fields or it has been utilized by the housing sector. Vegetable growing has however been popular among the farmers who were earlier involved in fruit growing due to a ready market in form of urban populace of Patna. The potential for fruit crops depends on various factors such as profitability in relation to other crops, infrastructure, extension support, market availability, appropriate technology, and level of investment. In view of increasing demand for these crops awareness and thrust on scientific plantations, processing facilities and marketing infrastructure needs to be upgraded.

Table-3.2.20:	Area and	production o	f Major	· Fruit and	Vegetable crops	in Patna	District	(2001-02)
								· · · · · · · · · · · · · · · · · · ·

S.No.	Type of fruit /vegetable	Area (Ha.)	Production (MT)
1.	Mango	3545	53145
2.	Guava	904	10840
3.	Litchi	80	450
4.	Lemon	473	3760
5.	Banana	466	6545
6.	Coconut	293	1450
7.	Jamun	300	1880
8.	Рарауа	325	2630
9.	Jackfruit	175	2060
10.	Total fruits	6561	146645
11.	Cauliflower	3410	54560
12.	Cabbage	2070	28980
13.	Onion	2360	47260
14.	Tomato	2180	39225
15.	Chillies	2550	17830
16.	Brinjal	1800	32390
17.	Bhindi	2900	40560
18.	Bottle gourd	345	4095
19.	Other cucurbits	580	6880

20.	Bitter gourd	280	2830
21.	Parval	285	3685
22.	Bodi	295	2035
23.	Others	3500	31485
24.	Total vegetables	22555	311815

Besides the fruit crops, horticulture in Patna also consists of vegetable crops, floriculture, mushroom, sericulture, nurseries for fruit plants and houseplants, apiculture, medicinal and aromatic plants. Out of these vegetable cultivation in Patna is emerging rapidly on commercial lines. Mushroom cultivation is still at a nascent stage due to lack of awareness, marketing facilities and technological gaps. There is one private centre for mushroom spawn production with a capacity of 24000 bottles per bag per year besides a centre of National Horticultural Board in the district.(Table-3.2.21) Apiculture, cultivation of medicinal and aromatic plants needs awareness and scientific input for production on commercial lines. Floriculture is undertaken in 2-3 blocks on a very small scale, main crop is marigold followed by chrysanthemum, tuber rose, and lilies etc. The cut flowers are brought to the district from neighbouring states and also from as far as Karnataka. Government of Bihar has 5 nurseries in the district under horticulture department, however, quality and tested plants for fruit and vegetables are not easily available to the farmers.

S.No.	Name of agency	Address	Nature of Activity
1	Frontline Agro	605, Ashiana Plaza, Buddha Marg, Patna	Spawn Production
	Industries		
2	SSARRDA International	I.C. Pareek, Usha Arcade, East	Spawn Production, Canning
		Boring Canal road, {Patna	
		Ph. 0612-2280159	
		Ph -0612-2290276	
3	Verma Spawn Production	C/O Bharat Decorators,	Spawn Production
	Centre	Sanjay Gandhi Nagar,	
		Rdno1 Hanuman Nagar, Patna	
4	Veerangana Suneeti Smriti	India Machinery House, Exhibition Road,	Mushroom Production
	Sansthan	Patna.	
		Ph0612-2273622	
5	Magadh Agro Farming	Chitragupta Nagar, Patna-20.	Value Added Products of Mushroom
		Ph0612-2345101	
6	Bharat Gunjan Mushroom	Manav Sansadhan Vikas Sansthan,	Spawn production and Training
	farm	R.K.Nagar,	Centre.
		Laloo Path, New By-pass Road, Patna-20	Project Report Preparation.
		Ph0612-2355279	

3.2.5.3: Fisheries: The district has 250 Km, of reverine stretch, 8006 fishermen families but pisciculture is yet to develop on modern scientific and commercial lines. This sector has immense potential as an investment activity in Patna. The total fish catch in the district from rivers is 1250 MT per annum. Apart from 1416.42 ha. of pond area as mentioned earlier there is about 300 ha. of water area where fish farming can be done profitably and easily. Another 150 ha. area where it can be undertaken with some development (NABARD Potential Linked Credit Plan 2002-03 to 2006-07). There are 7 active primary fishermen cooperative societies in Shivnagar, Pandarak, Ghoswari, Daniyawan, Patna City, Maner, and Ranipur besides, one modern fish seed hatchery of 15 crore fish spawn production capacity at Bhusaula Danapur in the district. There is no fish feed plant in the district and fish farmers use bran and oil cakes for feed purposes. The major source of finger lings in the district is from rivers and as such quality seeds still holds the key to the success of fisheries in Patna. Table 3.2.22 shows block wise details of pisciculture in the district.

S.No.	Name of Block	No. of Ponds	Total area under the	No. of Fishermen
			ponds ha.	Families
1.	Maner	37	81.86	338
2.	Danapur	71	37.15	1146
3.	Patna Sadar	75	61.2	2270

4.	Sampatchak	Nil	Nil	Nil
5.	Phulwarisharif	198	108.2	282
6.	Bihta	73	36.58	305
7.	Noubatpur	65	242.86	170
8.	Bikram	63	30.8	186
9.	Dulhinbazar*	Nil	Nil	Nil
10.	Paliganj	60	36.8	282
11.	Masaurahi	79	36.8	226
12.	Dhanarua	66	20.2	141
13.	Punpun	25	34.4	118
14.	Fatwah	107	25.66	565
15.	Daniawan*	Nil	Nil	Nil
16.	Khusrupur*	Nil	Nil	Nil
17.	Bakhtiarpur	121	311.27	281
18.	Athamalgola*	Nil	Nil	Nil
19.	Belchi*	Nil	Nil	Nil
20.	Barh	65	77.1	1243
21.	Pandarak	38	268.44	227
22.	Ghoswari*	Nil	Nil	Nil
23.	Mokama	7	7.1	226
24.	Total Patna District	1150	1416.42	8006

Source: NABARD- PLP-2002-03

*1.Dulhinbazar Block has been carved out from Paliganj and Bikram Blocks.

2.Sampatchak block has been carved out from Phulwarisharif.

3. Daniawan and Khusrupur blocks have been carved out from Fatuha.

4. Athmalgola and Belchi blocks have been carved out from Barh block.

5. Ghoswari Block has been carved out from Mokameh.

Culture and capture fisheries in traditional ways are practiced in the Patna district. Capture fisheries is practiced in the rivers

while culture fisheries is practiced in ponds etc. The major varieties of fish that are cultured in Patna are Rohu, Katla, Mrigal, Grass Carp, Common Carp, and Silver Carp while in captured fisheries main fish caught in the rivers are Rohu, Katla, Mrigal, Bovai, Tengra, Bachwa, Soura among others. The gap between demand (10500Tonnes/Year) and supply (6000 m Tonnes/Year) is significant in the district which needs appropriate intervention.

3.2.5.4: Animal Resources

3.2.5.4.1: Dairy: As per latest available information (Live stock Census-1992) the district has indigenous cows (112455), cross bred cows (8878), buffalo (200287) of which Murrah buffalo are 20150. This activity not only contributes to production and nutrition but also helps in employment generation and income substitution to the farmers. World famous Sonepur Cattle Fair (32Km.) is a major source of good quality milch animals to the district besides the animals from Haryana and Punjab are also available to the farmers round the year. Table No- 3.2.23 and 3.2.24 show the status and other details about existing dairy animals in Patna district.

Table- 3.2.23 :Status of Milch Animals in Patna District:

Sl.No.	Type of milch Animal	Population
1	Indigenous Cow	112455
2	Cross Bred Cow	8878
3	Buffalo	200287
4	of which G.M.B.	20150

Table-3.2.24 : Other Details about Milch Animals:

Particulars	Buffaloes	Cross bred Cows
a. No. of milch animals as per latest livestock census	200287	8878
b. Addition of milch animals at 2.5% growth rate per year up to Assessment yr. (March 2002)	50071	2220

c. Total no. of milch animals (a+b)	250358	11090
d.(i) No. of breedable heifers added as milch animals [40% calving of items (C). 50:50 sex ratio. 20% calf mortality and 50% culling]	20028	887
(ii) No. of breedable heifers added as milch animals from indigenous cows [30% calving of indigenous milch cows population 50:50 sex ratio, 20% calf mortality and 50% culling]	Nil	6447
(iii)Total breedable heifers added [i+ii]	20028	7634
e. Total milch animals item[c+d(iii)]	270386	18724

3.2.5.5: Poultry : The district has one Central Poultry Farm of 6000 birds that extend & training facility to prospective entrepreneurs. 97 and 71 persons have been trained during 2000-01 & April 2001 to July 2006, respectively. About 227 poultry farms are in private sector including broilers, layers and hatcheries in the district. In spite of these efforts109000 dozen eggs/week is brought to the district. On an average per capita consumption of egg is 17 and that of chicken meat is 160 gm. per annum against the ICMR recommendation of 180 eggs and 10.8 kg of meat per year. A large gap in production potential is yet to be tapped to meet the local egg demand for the district.

3.2.5.6: Sheep, Goat and Piggery: Rearing of Sheep, Goat and Pigs has been a good economic activity allied to agriculture, which helps generate additional income to rural poor. Mostly these activities are undertaken in villages by below poverty line people, particularly the schedule caste and schedule tribe. Although the SC and ST constitute 15.6 % of district population but pork is mostly brought to the district from outside to meet its growing demand. Recently sheep, goat, piggery have emerged as a separate economic activity, undertaken by other segments of the societies as well. The rearing of these includes stall-fed farming, crossbreeding and grading up for milk, mutton, wool and their processing. The major bottleneck for change to stall-feeding is the shrinking pastures in the district, which are around 125.94 ha. The landless and marginal farmers rearing on small scale are unaware of stall-fed sheep, goat and pig. The acclimatised goat breed for the district is Black Bengal for meat and Jamunapari for milk. Acclimatised pig for pork is Yorkshire. There is no organised commercial sheep /goat / pig rearing farm in the district. **3.3: Demographic Information:** Patna has the highest literacy rate (53.04 %) as well as awareness level in the state. It has highly educated and skilled manpower available for industrial development. The Male: Female ratio in the district is 1.15: 1.00, whereas in age group between 0-6 years it is 1.05: 1.00. Table-3.2.25 gives the details of population from different blocks of the district. The total SC and ST population in the district was 15.63 percent as per Census Report –1991(i.e. SC- 560094 and ST-5370).

Name of Bloc Population			Child pop Group(0-	Child population in age Group(0-6)			Literates		
	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females
Maner	208014 (26912)	113374 (14270)	94640 (12642)	42517 (5039)	17527 (2622)	24990 (2417)	79968 (13983)	52391 (8691)	27577 (5292)
Danapur	320153 (211331)	171414 (112897)	148739 (98434)	52206 (30797)	27371 (16332)	24835 (14465)	170525 (129599)	104543 (77302)	65982 (52297)
Patna Sadar	1509332 (1442932)	820906 (784871)	688426 (658061)	197476 (240491)	103555 (96362)	93921 (87367)	1054217 (1030554)	618825 (4811112)	435492 (428442)
Sampatchak	68652	35851	32801	13390	6903	6487	33564	21596	11968
Phulwarisharif	190260 (53166)	100341 (28089)	89919 (25077)	32977 (8153)	17137 (4225)	15840 (3928)	103113 (33583)	63565 (19575)	39548 (14008)
Bihta	207342	109242	98100	38788	20118	18670	102311	66700	35611
Naubatpur	170462	89601	80861	31758	16471	15287	79203	51811	27392

 Table-3.2.25
 : Block wise Population details of Patna District (2001 Census Unpublished Figures)

Bikram	139031	72273	66758	25316	13191	12125	66000	42903	23097
Dulhinbazar	103397	53843	49554	19426	10121	9305	45709	30058	15651
Paliganj	206177	107744	98433	38173	19442	18731	94430	61691	32739
Masaurhi	204910	106863	98047	38623	20200	18423	90496	59242	31254
	(46943)	(24793)	(22150)	(7853)	(4083)	(3770)	(26335)	(16067)	(10268)
Dhanarua	174642	91252	83390	33345	17032	16313	74036	49819	24217
Punpun	117138	61598	55540	21663	11153	10510	51685	33896	17789
Fatwah	154059	82072	71987	29738	15737	14001	63859	42865	20994
	(38362)	(20598)	(17764)	(6462)	(3414)	(3048)	(20265)	(12445)	(7820)
Daniawan	59896	31768	28128	12639	5988	6651	26835	16905	9930
Khusrupur	80436	42612	37824	16078	8435	7643	30393	20191	10202
-	(12185)	(6446)	(5739)	(2128)	(1101)	(1027)	(6546)	(3992)	(2554)
Bhakhtiarpur	172205	92399	79806	34196	17757	16439	68636	45762	22874
	(32288)	(17238)	(15055)	(5847)	(3019)	(2828)	(17005)	(10704)	(6301)
Athmalgola	65914	35249	30665	13588	7056	6532	28449	18648	9801
Belchi	48467	25406	23061	9182	4687	4495	18018	12188	5830
Barh	162378	86707	75671	30004	15445	14559	74839	47825	27014
	(48405)	(26097)	(22308)	(7375)	(3860)	(3515)0	(28710)	(17155)	(11555)
Pandarakh	123450	64870	58580	24411	12489	11922	44980	30623	14357
Ghoswari	56312	30286	26026	11331	5894	5637	17008	12581	4427
Mokama	167224	89278	77946	29017	14944	14073	79550	50240	29310
	(56400)	(29805)	(26595)	(8958)	(4615)	(4343)	(31771)	(19252)	(12519)
Patna District	4709851	2514949	2194902	795842	408453	387389	2497924	1554868	943056
	(1968924)	(1065099)	(903825)	(266341)	(159633)	(126708)	(1338351)	(787295)	(551056)

N.B. Figure in the parenthesis denote the urban population

3.3: Land and Soil

3.3.1: Land Use Pattern: The Total geographical Area of Patna district is 317236 ha., Net Sown Area is 201103.63 ha., Gross Cropped Area is 256694.99 ha. and Net Irrigated Area is 67637.24 ha. Out of the total geographical area, Tal is 30209.06 ha, Diara, 16344.98 ha. and Jalla area is 3508.5 ha. Diara land is the area on the embankment of river Ganga and in rainy season (July to October) this area remains submerged with flood waters, the alluvium deposits of the floodwaters makes it very fertile for Rabi crops and vegetables, before the onslaught of next floods floods. Tal lands are another huge chunk of low lands in Patna district, which remains submerged during the Rainy season, but this area yields a bumper Rabi crop. Some summer crops are also cultivated in Tal areas on a very limited scale, with the help of shallow tube wells. Jalla is another type of low land submerged with water during rainy season but this area is famous for vegetable cultivation during Rabi and summer season. Table 3.3.1 shows the soil types in Patna district with corresponding major crops grown.

Table- 3.3.1: Soil Types of Patna and Major Crops Grown

S.No.	Type of Soil	Crops grown
	Kewal (Heavy clay)	Paddy+ All Rabi crops.
	Domat (Loam)	Paddy+ All Vegetables
	Balsundri (Very Light soil)	Rabi crops
	Rehara (Alkaline)	Negligible area not fit for cultivation.

Fig.- 3.6 Shows the type of lands in the district and Fig.-3.7 and 3.9 show the soil pH and zinc availability in Patna soils. Although marginal farmers are maximum in numbers, but the district has a good percentage of small and medium farmers with 24.50 percent and 22.90 percent area, respectively. Table 3.3.2 gives details of area under different types of holding with percentage in the district. Table 3.3.3 below shows the source wise irrigation with area in the district .

 Table-3.3.2
 : Details About the Types of holding pattern in Patna district

S. No.	Type of Holding	No. of Holdings	Total Area (ha.)	Percent of Total Agril. Area
1.	Marginal (less than 1 ha.)	288297	101099	42.90
2.	Small (1-2 ha.)	44799	57875	24.50
3.	Medium (2-4 ha.)	20200	53978	22.90
4.	Large (4-10 ha.)	3882	20820	08.80

5.	Very large (more than 10 ha.)	118	1907	00.90
6.	Total	357296	235678	100.00

Source-NABARD-PLP for Patna District.

3.3.2: Rainfed and Irrigated Area:

Table- 3.3.3	: Source	wise	Area	Irrigated in Patna District(in ha.).

S.No.	Source	Area
1	Tube well	75819
2	Canal	43175
3	Tank	6235
4	River lift Irrigation	2984
5	Dug well	2784
6	Others	8932
7	Net Irrigated Area	139929

3.4: Ongoing Development, Extension and Research:

Patna district being the state capital is rich in developmental departments for research and Extension. It has got Central Government institutions like ICAR –Research Complex for Eastern Region, Central Potato Research Station, Rice Research Station, Coconut Board, Central Plant Protection office, and institutes of Rajendra Agricultural University, Pusa, such as Agricultural research institute, Bihar Veterinary College, and S.G.Institute of dairy technology. The other research units important to the farmers of the district are water and Land Management Institute, Bihar State Cooperative Milk Federation, Fisheries Training Institute, DNS Regional Cooperative Training Institute. All the major developmental institutions of the Government of Bihar have their headquarters in Patna.

3.4.1: Government Sponsored Programmes and Other Important Programmes in Patna District.

The major credit linked Govt. sponsored programmes undergoing in the district for poverty alleviation and employment generation are the Swarna Jayanti Gram Swarojgar Yojana (SGSY), the Prime Minister Rojgar Yojana (PMRY). Other credit linked programmes are Gramin Awas Yojana (GAY) Gramin Yojana (GY) and the Scheduled Caste Action Plan(SCAP).

3.4.1.1: Swarna Jayanti Gram Swarojgar Yojana (SGSY)-

Introduced in April 1999 by restructuring and clubbing the earlier poverty alleviation programmes like IRDP, TRYSEM, DWCRA, and GKY. SGSY is a credit –cum subsidy programme for permanent eradication of poverty with emphasis on developing BPL families on "Self Help Group" pattern. It basically aims at capacity building of BPL families to enable them for "Self Help".

3.4.1.2: Prime Minister Rojgar Yojana (PMRY)-

PMRY was introduced in 1993 for providing gainful employment to the educated unemployed youth of urban areas by setting up their own enterprise in the NFS with the assistance of bank loan and subsidy component. However, during 1994-95 the operational limit of the scheme was extended to thr rural areas too and at present, even the Farm Sector activities/ enterprises are eligible for sanction under the scheme.

3.4.1.3: Other Important Programmes-

Other important Govt. programmes linked with credit component are Gramin Awas Yojana, Garima Yojana, and the Scheduled Caste Action Plan. However, no credit flow has taken place under these schemes in the recent past.

A detailed break-up of the District Rural Development Agency, Patna has been given in the Table-3.4.1.

	Kurur Development Ageney): uthu:								
S.	Name of	Balance on	Amount re	ceived from	Income	Total	Total	Balance as	
No.	Scheme	1/4/2000	the govt.		from other	amount	expenditure	on	
			State	Central	sources	received		31/3/2001	
			Share	Share					
1.	Upgraded	Nil	7560.00	Nil	Nil	7560.00	Nil	7560.00	
	PMRY								
2.	Construction of	Nil	30240.00	Nil	Nil	30240.00	Nil	30240.00	
	New Houses								
	underPMRY								
3.	Indira Awas	2071.579	1958.00	20845.00	432.898	25307.477	24600.00	707.477	
	yojana								
4.	IAYcredit-cum-	1.00	Nil	Nil	19.411	20.411	Nil	20.411	
	grant								
5.	IAY upgradation	3495.00	Nil	Nil	100.631	3595.631	3490.00	105.631	
6.	Sunishchit	7136.116	5799.00	35513.00	Nil	48448.116	314856.50	16961.616	
	rojgar yojana								
7.	DRDA	1577.036	1641.30	2638.00	2277.276	8113.612	6672.745	1460.867	
	administrative								
8.	JGSY	26111.00	13802.00	70714.00	Nil	110627.00	76107.00	34520.00	
	consolidated								
9.	SGSY	111899.659	11933.00	Nil	5348.235	12918.894	29544.447	99636.447	
10.	Indira Awas	66928.00	Nil	Nil	1740.764	68668.761	66928.00	1740.761	
	under basic								
	minimum								
	Service								

Table-3.4.1 :Details of various schemes, total allocation, amount received and spent during 2000-2001 by the District Rural Development Agency, Patna.

3.5: Banking facilities in Patna district

There are at present 29 scheduled commercial banks working in Patna district, and the lead bank of the district is Punjab National Bank, which has maximum branches located in rural areas. The State Bank of India has the largest presence in the district with 69 branches spread all over the district but mostly in urban areas. The total number of branches of banks in Patna is 316, with 144 urban, 131 semi urban and 141 rural branches. Table 3.5.1 gives the branch wise and location wise details of the different bank branches in Patna district.

Table -3.5.1 : Bank Wise Number of Branches in Patna Dsitrict.

S.No.	Name of Bank	Urban branch	Semi-urban	Rural branch	Total number of
		1.4	branch	51	branches
1.	Punjab national bank	14	3	51	68
2.	State Bank of India	38	13	18	69
3.	Central bank of India	19	1	6	26
4.	Bank of India	7	2	9	18
5.	Allahabad Bank	10	1	11	22
6.	Canara Bank	7	3	3	13
7.	United Bank	6	2	Nil	8
8.	UCO Bank	4	Nil	1	5
9.	Dena Bank	1	1	Nil	2
10.	Bank of Baroda	4	1	1	6
11.	Indian Bank	4	1	Nil	5
12.	Syndicate Bank	1	Nil	1	2
13.	Union Bank	5	Nil	1	6
14.	State Bank of Bik. & Jai	3	Nil	Nil	3
15.	Andhra bank	1	Nil	Nil	1
16.	Vijaya bank	2	Nil	Nil	2
17.	Bank of Madura	1	Nil	Nil	11
18.	Oriental Bank of Commerce	1	Nil	Nil	2
19.	Corporation Bank	2	Nil	Nil	1
20.	State Bank of Patiala	1	Nil	Nil	1
21.	Indian Overseas Bank	1	Nil	Nil	1
22.	Bank of Maharashtra	1	Nil	Nil	1

23.	Punjab & Sindh bank	1	Nil	Nil	1
24.	Federal Bank	1	Nil	Nil	1
25.	South Indian bank	1	Nil	Nil	1
26.	Jammu& Kashmir bank	1	Nil	Nil	1
27.	Patliputra Gramin bank	1	3	17	21
28.	Land Development bank	1	Nil	6	7
29.	Patliputra Central Coop.	5	Nil	16	21
	Bank				
30.	Total	144	31	141	316

3.6: Marketing in Patna District:

3.6.1: Marketing and Storage Facilities:

The marketing of agricultural produce is the most important post harvest aspect of the agricultural production system. Thus a good marketing system not only protects the interests of the producers but also of the consumer, which is a prerequisite for any planned development of the agricultural economy. The agricultural marketing in the district can be classified into three broad categories namely: Village level markets, Sub-division or Block level markets, District/ State Capital level market and Regulated markets. Marufganj Wholesale Mandi caters the needs of not only the local retailers but also the traders of nearby districts and adjoining states like Jharkhand, West Bengal and Uttar Pradesh. Patna being the state capital has wholesale markets for almost all the major agricultural commodities along with well-developed market infrastructure at the village/ block/ local levels as well.

So far as regulated markets are concerned there are six regulated markets in the district the details are presented in table 3.6.1. A perusal of the table reveals that these Krishi Utpadan Bazar Samitis not only provide the facilities for marketing but also have storage facilities in their campus, which can be provided, to the users on payment basis. Bihar State Agricultural Marketing Board also runs a few cold storages; the details are presented in Table 3.6.2. The district also has two State owned Ware houses located in Patna City and Musallahpur (Table-3.6.3).

Table – 3.6.1	:Agricultural marketing Facilities in Patna district	

S.No.	Item	Existing Facility	Storage Capacity
1.	Krishi Utpadan Bazar Samiti, Patna City	Market yard & godown	5000MT
2.	Krishi Utpadan Bazar Samiti, Musallahpur	Market yard & godown	1000MT
3.	Krishi Utpadan Bazar Samiti, Danapur	Market yard & godown	NA
		under construction	
4.	Krishi Utpadan Bazar Samiti, Bihta	Market yard & godown	1000MT
5.	Krishi Utpadan Bazar Samiti, Fatuha	Market yard & godown	1000MT
6.	Krishi Utpadan Bazar Samiti, Barh	Market yard & godown	2000MT
7.	Krishi Utpadan Bazar Samiti, Mokameh	Market yard & godown	1500MT
8.	Krishi Utpadan Bazar Samiti, Masaurahi	NA	NA
9.	Total	6 market yards and	11500MT
		Godowns	

Table-3.6.2 :Cold Storages under Bihar State Agricultural marketing Board in Patna

S.No.	Item	Existing Capacity
1	Cold Storage –Patna City	8000MT
2	Cold Storage- Musallahpur	8000MT

Table-3.6.3 :Warehousing facilities in Patna

S.No.	Item
1	State Ware house, Patna City
2	State Warehouse, Musallahpur

3.6.2: Constraints in Marketing:

Marketing of agricultural produce faces several problems, which prevent farmers from getting remunerative prices. Primarily the production is in the hands of a large number of small cultivators, who lack sound capital base and proper storage facilities and are unorganised. They are faced by occasional gluts and depression in prices. Secondly, in case of perishable commodities like vegetables, fruits and spices, lack of preservation and sound transportation and processing facilities, they are at the mercy of the traders. Though the Tal area is famous for quality pulse production, it has failed to live up to its expectations due to severe law and order problems in form of extortion threats to the processors by the local vested interests. Farmers in general are forced to sell their produce at unfavourable places and time resulting in improper price, terms and payment schedule. In the present scenario fostering Farmers Organization is the only hope for strengthening the bargaining capacity of the small and marginal farmers, which the governmental agencies have failed so far.

3.7: Non Farm Sector

3.7.1: Industries

The potential of Industrial Development of any region depends on the interplay of factors such as natural resources, available infrastructure, entrepreneurship skills, market demand, Govt. policies etc. non-farm sector activities can be broadly grouped into the following:

- 1. Rural Artisans/ Craftsmen
- 2. Tiny Industries, cottage and Village Industries.
- 3. Ancillary Units.
- 4.Handlooms.
- 5. Powerlooms
- 6. Agro Industries
- 7. SSI

3.7.2: Agro based industries:

Patna district has the potential for setting up industries like Rice Mills, Chura Mills, Dal mills, Flour Mills, Oil Mills, Bran-oil mills, Ginger powder making units, garlic and Onion powder/ paste making units, jam/Jelly/ Sauce/ Ketchup units, Corn-flake mills, Potato chips unit, Vodka making/ Distillation from potato, card board making from rice husk, Honey processing units.

3.7.3: Demand based industries:

Tiles units ,Asbestos sheet unit ,plastic-sheet (for roof topping) units, Bricks kilns ,Iron grill making, Agriculture tools and equipment manufacturing, Tractor trolley making ,Thresher making ,Medicines-particularly herbal medicines ,distilling and manufacturing units.

3.7.4: District Industries Centre:

The district industries centre is expected to plan, promote and support industrial activities in the district. But at present its activities are confined only for implementation of PMRY and registration of industrial units.

3.7.5: Training Facilities:

a. **Small Industries Services Institute** (**SISI**) of the Govt of India is providing training for entrepreneurship development and also supporting project formulation.

b. Women Development Corporation is there to promote and support women entrepreneurship.

c. NGOs: Some of the important NGOs operating in the district for entrepreneurship development as well as for promotion of SHGs to take –up micro NFS activities.

d. **NABARD** is supporting NGOs for conduct of Rural Entrepreneurship Development Programme (REDPs) in the district and also for formulation of SHGs and helping them in starting income generating activities, which includes NFS activities too.

e. **Institute for Entrepreneurship Development (IED)**, Patna is a premier institute located in Patna which functions as a nodal agency to cultivate, demonstrate, guide and monitor entrepreneurship development activities directed towards various groups. The Institute has well-developed infrastructure facilities at its disposal and has earned a good name for itself in the field.

f. **D.N.S Regional Institute of Cooperative Management**, Patna is another state level institute located at Patna, under Ministry of Agriculture & Cooperation, Govt. of India. It is centrally located with good lodging facilities and training infrastructure.

3.7.6:Marketing of Produce:

There is no dirth of market. There is a ready market for most of the industrial produce identified for the district in Patna itself. Besides, goods can easily be marketed to other district of the state and may be exported to other state and other countries. However the most important factor for marketing of these SSI and tiny industries is the 'Quality' of the products. In the present competitive market quality products and constant value addition is the buzzword for success.

3.8: Non-Governmental Organizations

There are a large number of NGOs' working in different sectors in Patna district. The names of a few prominent ones working in the field of agriculture have been listed below. (Table-3.8.1).

S.No.	Name of NGO	Address	
1.	Adarsh Yuva Swayam Sahayata	Sahar Rampur, Naubatpur, Patna	
	Samooh		
2.	Adivasi Harijan Mahila Samagra	Lav Kush Vihar, Mahesh Nagar, P.O., Keshari Nagar, Patna	
	Vikas Parishad		
3.	Ahwan	Prem Vihar, Indra Puri, Road No1, Patna –24.	
4.	Ambedkar Vikas Parishad	Guru Tola, Mokama, Patna	
5.	Anamika Janabhimukh Sansthan	Chhattapura, Sheonar, Mokama, Patna	
6.	Bhartiya Sulabh Seva Sansar	Near Ram Janki Temple, Raghunath Tola, Anisabad, Patna	
7.	Bihar Alpsankhyak, Anusoochit	Bihar Veterinary College Campus, Quarter No5, Patna-14	
	Jati Samaj Kalyan Samiti		
8.	Bihar Dalit Vikas Samiti	Masaurahi, Patna	
9.	Bihar Dalit Vikas Samiti	Rukunpura, Patna	
10.	Bihar Kutir Udyog Lok Seva	Sheikhpura, Patna	
	Sangh		
11.	Drishti	VillYusufpur, Fatuha, Patna	
12.	Drishti.com	M-3/17, S.K.Puri, Patna-1	
13.	Federation of NGO's	26, Ashiana Harniwas, 3 rd Floor, Dak Bungalow Road, Patna	
14.	Gram Swaraj Samiti	Aunta, Mokama, Patna	
15.	Gramin Pragati	Paijana, Ghoswari, Mokama, Patna	
16.	Gramin Sansadhan Vikas	Ram Sahai Lane, Mahendru, Patna-6	
	Sansthan		
17.	Gramin Vikas Samiti	Bankipur Gorakh, Fatuha, Patna -803201	
18.	Gramodyoga Vikas Jyoti	Govindpur, Lakshman Tola, Phulwarisharif,	
		Patna-801505.	
19.	Janhit Kala Sansthan	G-3, Ashoka Place, Exhibition Road, Patna	
20.	Kisan Khetihar Samaj	VillTetari, P.OMohanpur, Punpun, Patna	
21.	Kisan Vikas Samiti	Lav Kush Tower, Exhibition road, Patna-1	
22.	Organization for Development of	15-Adarsh Colony, Kidvaipuri, Patna	
	Urban and Rural		
23.	Organization for Research and	Ashiana Road, Mauryan Iron & Steel Works Campus. Near Prakash	
	Development	Deep Enclave, Patna	
24.	Research and Development	C-8, Road No. –5, R-Block, Patna	

Table-3.8.1: Name of Non-Governmental Organizations Working in Agricultural Sector in Patna District.

	Society			
25.	Sakhi	Aparna Bank Colony-Phase-I, Ramjaipal Road, New Bailey Road,		
		P.O. Danapur Cantt, Patna		
26.	Saubhagya Samajic Sansthan	Patna		
27.	Shanti Niketan Vidya Mandir	Maya Bhawan, Mahavir Nagar, West Dasratha, Patna		
28.	Shosit Mahila Seva Mandal	Maurya Iron Steel Campus, Ashiyana Road, Patna -14		
29.	Sita Mahila Evam Bal Vikas	Patna		
	Kendra			
30.	Srishti Foundation	C-18, Sri Krishna Puri, Basawan Park Path, Patna		
31.	Veerangana Suniti Smriti	India Machinery House, Exhibition Road, Patna		
	Sansthan			
32.	Vidyasagar Samajik Surksha	A/22, RD Tower, New Punai Chak, Patna		
	Evam Shodh Sansthan			

Source-Various Sources

3.9: Information on Credit:

Finance is the basic need for any economic activity. Due to poor socio economic conditions of the small and marginal farmers, agricultural credit assumes importance for rural development. Various credit institutions functioning in the district, their targets and achievements have been given in Table 3.9.1. The block wise areas for financing under different priority sector schemes worked out by the Lead bank of the district (Punjab National Bank) have been given in Table 3.9.2.

Name of Bank	Target	Achievement Priority Sector			Non priority sector		
	Priority Sector	Agric. & allied	SSI & NFS	Others	Total	Target	Achievement
PNB	410300	172237	36686	125608	334531	261000	211422
SBI	454346	29610	21116	58230	108956	488995	147707
BOI	134582	8941	2442	12499	23882	102128	48164
CBI	126473	4071	26216	1268	31555	198380	38555
ALLAH	94034	5173	2015	39386	46574	121023	45585
CANARA	102436	22571	3208	12410	38189	81538	24180
BOB	32244	7856	1100	36435	45391	45513	13906
UNION	19380	781	6200	5165	12146	31096	12347
UNITED	27161	2923	3448	8700	15071	67899	11517
UKO	25645	16100	18900	22100	57100	49920	Nil
SYNDICATE	16080	166	300	21948	22414	13338	24834
ANDHRA	5537	110	597	3049	3756	9022	20001
INDIAN	14203	2974	Nil	3330	6304	24453	Nil
DENA	13536	Nil	Nil	1127	1127	14768	6044
IOB	9810	Nil	Nil	Nil	Nil	11111	Nil
FEDERAL	5940	Nil	967	3974	4941	9022	10036
OBC	8395	Nil	Nil	1654	1654	9022	43023
ICICI	7051	Nil	Nil	Nil	Nil	9022	Nil
BOM	5211	Nil	Nil	1405	1405	9022	14853
CORPOR.	18715	Nil	Nil	667	667	17303	Nil
VIJAYA	9854	1520	300	8480	10300	12025	7610
SBP	3719	Nil	238	3517	3755	9022	3078
SBBJ	14169	Nil	Nil	6766	6766	35347	Nil
P&SINDH	10581	Nil	Nil	665	665	18044	5000
S. INDIAN	3368	Nil	Nil	Nil	Nil	4186	Nil
J&K	5670	Nil	Nil	1210	1210	1820	5870
PKGB	99746	13594	24299	2121	40014	43862	Nil
PCCB	52289	Nil	Nil	Nil	Nil	Nil	Nil
LDB	33581	Nil	Nil	Nil	Nil	Nil	Nil
BMCB	3801	Nil	Nil	Nil	Nil	2397	Nil
TOTAL	1763816	288627	148032	381714	818373	1704729	693732

Source-District Credit Plan-2002-2003

Table-3.9.2 : Approved Priority Areas Under SGSY for Financing by Commercial banks under District Credit Plan.(2002-03)
S.No	Name of the	Approved Priority Areas Under SGSY for Financing by Commercial banks under
•	Block	District Credit Plan.
1	Maner	Dairy, Transportation. Poultry, Fishery, Tractor and Implements, Pump set and Boring
2	Danapur	Dairy, Transportation. Poultry, Fishery, Tractor and Implements, Pump set and Boring
3	Patna Sadar	Dairy, Transportation. Poultry, Tractor and Implements,
4	Sampatchak	Dairy, Transportation, Horticulture, Tractor and Implements, Pump set and Boring
5	Phulwarisharif	Dairy, Transportation. Poultry, Fishery, Tractor and Implements, Pump set and Boring
6	Bihta	Dairy, Transportation, Tractor and Implements, Pump set and Boring, Brass Utensils
		making.
7	Naubatpur	Dairy, Transportation, Fishery, Tractor and Implements, Pump set and Boring
8	Bikram	Dairy, Transportation. Poultry, Fishery, Tractor and Implements,
9	Dulhinbazar	Dairy, Transportation. Poultry, Tractor and Implements, Pump set and Boring
10	Paliganj	Dairy, Knitting and Weaving, Transportation. Poultry, Tractor and Implements,
		Pump set and Boring
11	Masaurahi	Dairy, Transportation. Poultry, Tractor and Implements, Pump set and Boring
12	Dhanarua	Dairy, Transportation, Tractor and Implements, Pump set and Boring, Food
		Processing
13	Punpun	Dairy, Transportation. Poultry, Fishery, Tractor and Implements, Pump set and
		Boring,
14	Fatwah	Dairy, Transportation. Poultry, Fishery, Tractor and Implements, Pump set and
		Boring
15	Daniawan	Dairy, Transportation. Poultry, Fishery, Tractor and Implements, Pump set and
		Boring
16	Khusrupur	Dairy, Transportation Piggery, Tractor and Implements, Pump set and Boring
17	Bakhtiarpur	Dairy, Transportation, Line Hotel, Tractor and Implements, Pump set and Boring
18	Athamalgola;	Dairy, Transportation. Poultry, Fishery, Tractor and Implements, Pump set and
		Boring
19	Belchi	Dairy, Transportation, Tractor and Implements, Pump set and Boring
20	Barh	Dairy, Transportation, Line Hotel, Tractor and Implements, Pump set and Boring
21	Pandarakh	Dairy, Transportation, Tractor and Implements, Pump set and Boring, Food
		processing
22	Ghoswari	Dairy, Transportation, Fishery, Tractor and Implements, Pump set and Boring
23	Mokama	Dairy, Transportation, Poultry, Fishery, Tractor and Implements, Pump set and
		Boring, Ready made Garments
L	1	1

Source-District Credit Plan-2002-2003

In spite of all the odds Patna district have been may special feature relevant for its agricultural development. It has ready market for almost all farm and non-farm sector goods, It is well connected with all major business centre of country and state through rail, road and metropolitans by air, climate is conducive for agriculture /horticulture crops all necessary farm as well as non-farm inputs are available of competitive price ,highly educated and skilled workforce available for industry development in primary secondary and tertiary sectors and districts is comparatively better than other district of state in infrastructure

facilities. Agriculture is predominant economic activity in the district followed by dairy, poultry, fishery besides other allied agricultural activities and services in non-farm sector. Industrial activities are in a very poor shape either due to shifting of the entrepreneurs from the district or due to lack of governmental support.





Fig-3.1: Agro-ecological Zones of Bihar



Fig-3.2- Patna District and Its Neighbouring Districts in Bihar



Fig-3.4- Administrative Map of Patna District









Fig-3.8-Mean Annual rainfall in Patna District



Fig-3.9-Zinc Status of Patna Soils



S.	Nome of	Coographical	Cultivable	Cultivated	Culturable	Current	Fallow	Pastures	Land Put to	Non-Agri. Uses		Land Under	Barren and
NO	Block	Area	Area	Area	Waste	2-5 Yrs	Upto 1Yr	Nil	Land	Permanent	Seasonal	Misc. Plantation	e Land
1	Patna Sadar	13610.00	4448.1	2385.50	2062.48	118.11	1944.37	NIL	5788.53	1181.88	NIL	197.57	NIL
	Phulwari-												
2	sharif	18164.57	13570.05	8283.44	5286.6	23.35	5263.26	NIL	1856.00	1490.85	14.13	10.33	NIL
3	Fatuha	24926.38	20770.81	20763.62	7.19	NIL	7.19	NIL	4079.85	29.96	45.74	NIL	NIL
4	Masaurahi	19990.94	17336.43	17168.28	168.15	NIL	168.15	NIL	1782.12	448.37	424.00	NIL	NIL
5	Punpun	12685.04	11106.37	8039.75	3066.62	31.71	3034.91	NIL	1161.44	200.21	101.65	NIL	NIL
6	Dhanura	18003.94	14313.71	12491.59	1822.12	NIL	1822.12	NIL	3690.22	NIL	NIL	NIL	NIL
7	Barh	19621.26	15589.81	13649.37	1940.44	NIL	1940.44	NIL	2442.59	599.94	168.53	NIL	NIL
	Bakhtiar-					NIL							
8	pur	8776.09	10370	8568.46	1791.54		1791.54	NIL	1964.19	1409.33	286.76	NIL	NIL
9	Pandarak	22574.80	14625.15	11107.08	3518.07	1354.72	2163.35	NIL	3782.05	1586.06	2081.51	148.93	NIL
1	Mokameh												
0		32574.02	22120.69	17102.63	5018.06	NIL	5018.06	NIL	3549.11	75.11	NIL	NIL	NIL
1	Danapur	22765 86	4676 74	4242.06	434 68	67.47	367.21	NII	2628 79	2455 47	883.07	NII	NII
1	Maner	22700.00	4070.74	4242.00	-0-1.00	53.98			2020.70	2400.41	000.07		
2		18905.12	11506.62	10980	526.62		472.64	NIL	6166.18	645.82	549.37	37.12	NIL
1	Bihta					NIL							
3		19186.80	13143.89	11967.04	1176.85		806.52	34.33	3617.56	121.09	66.05	22.79	370.33
1	Naubat-	16715 75	14603 84	14524.03	79.81	NIL	79.81	NII	2069.83	5 77	36.29	NII	NII
1	Bikram	10/10.70	14000.04	14024.00	70.01	NII	70.01		2000.00	0.11	00.20		
5	2	25263.78	20714.79	20458.88	255.91		255.91	NIL	3487.62	27.34	786.11	23.09	NIL
1	Paliganj												
6		23471.65	20021.4	19371.9	649.51	101.86	547.64	91.61	2292.37	81.82	414.24	59.9	NIL
1 7	Patna Distt.	317236.00	228918.4	201103.63	27804.65	1751.20	25683.12	125.94	50358.45	11859.02	5857.45	499.73	370.33

Table-3.2.3 : Block wise Land Use Classification for Patna District (in ha .)(2001-2002)

N.B.-

S.No.	Name of Block	Paddy				Wheat			Maize		
		Area	Production	Yield	Area	Production	Yield	Area	Production	Yield	
		(Ha.)	(M.T.)	(Kg/Ha.)	(Ha.)	(M.T.)	(Kg/Ha.)	(Ha.)	(M.T.)	(Kg/Ha.)	
1.	Patna Sadar	965	4439	4600	1495	6342	4242	Nil	Nil	Nil	
2.	Phulwarisharif	9131	31921	3496	8900	17996	2022	100	552	5525	
3.	Fatuha	9960	30468	3059	9175	27534	3001	505	1447	2865	
4.	Masaurhi	7285	24958	3426	7225	17679	2447	75	149	1985	
5.	Dhanarua	6420	6424	4141	6800	16150	2375	Nil	Nil	Nil	
6.	Punpun	3320	6939	2090	5485	11864	2163	Nil	Nil	Nil	
7.	Danapur	250	805	3222	3475	10268	2955	Nil	Nil	Nil	
8.	Maner	2610	7994	3063	3395	8361	2463	1050	3386	3225	
9.	Bihta	4810	13251	2755	8100	21051	2599	Nil	Nil	Nil	
10.	Bikram	13680	65938	4820	10470	36446	3481	Nil	Nil	Nil	
11.	Paliganj	12960	55221	4284	9005	30400	3376	Nil	Nil	Nil	
12.	Naubatpur	9672	36115	3734	8990	19715	2193	Nil	Nil	Nil	
13.	Barh	401	980	2444	4425	10128	2289	1030	1452	1410	
14.	Bakhtiarpur	605	2021	3341	2955	8661	2931	1645	3783	2300	
15.	Pandarak	145	574	3962	2480	7308	2947	1220	1966	1612	
16.	Mokameh	279	848	3041	3935	10904	2771	Nil	Nil	Nil	
17.	Patna district	84793	288896	3407	96310	314882	3269	5625	12735	2264	

Table-3.2.12: Area, Production and Productivity of Major Cereals in Patna (2001-02)

Source: District Agriculture Office, Patna

N.B.-

TABLE-3.2.4: Season -Wise Cropped Area in Patna District (2001-02)

S. No.	Name of the block	Kharif				R	Rabi Summer			Total Cultivated	Area Sown More
		Bhadai (June-Sept)		Aghani (June to Dec)						Area	Than once
		Irrigated	Un Irrigated	Irrigated	Un- Irrigated	Irrigated	Un- Irrigated	Irrigated	Un- Irrigated	-	
1	Patna Sadar	Nil	117.38	1767.85	189.13	602.07	338.55	46.38	Nil	3061.31	699.50
2	Phulwari Sharif	Nil	345.71	6738.81	Nil	102.95	1574.46	152.92	Nil	9836.85	1553.43
3	Fathua	Nil	57.91	5560.66	Nil	4978.20	15758.83	38.80	42.64	26437.04	5673.44
4	Masaurhi	298.27	40.26	11690.80	Nil	9078.16	6129.88	389.94	39.21	27666.52	10498.27
5	Punpun	7.33	54.92	4225.34	Nil	1705.29	2929.91	119.77	24.51	9067.07	1027.35
6	Dhanarua	51.50	278.65	8981.20	Nil	2806.93	1150.24	316.29	44.42	13629.23	5074.67
7	Barh	3.07	1585.76	3878.03	Nil	4335.91	6736.11	167.24	Nil	16706.12	3056.77
8	Bakhtiarpur	2.75	1812.40	3758.58	Nil	4802.59	314.02	1048.01	154.90	11893.24	3312.07
9	Pandarak	10.55	1560.65	2174.93	Nil	4191.54	3169.39	70.37	2.30	11179.73	72.67
10	Mokama	Nil	5083.37	901.74	Nil	2834.51	8258.01	122.69	30.57	17230.88	128.51
11	Danapur	Nil	255.59	2580.57	Nil	4026.67	79.48	186.66	22.51	7151.48	2913.38
12	Maner	Nil	1324.65	4972.75	426.90	3304.84	3811.07	942.22	Nil	14782.43	3802.46
13	Bihta	255.26	129.22	9085.31	Nil	2730.05	860.32	134.79	68.25	13263.2	1298.14
14	Noubatpur	90.00	391.61	10337.91	Nil	3940.92	5439.25	131.78	33.66	20365.13	584.06
15	Bikram	279.74	79.62	9799.79	Nil	8497.05	4357.38	225.01	5.55	23244.24	2758.38
16	Paliganj	56.98	1113.01	14645.0	Nil	6466.39	8624.67	255.35	19.05	31180.45	11808.67
	Total	1055.45	14230.00	101099.27	616.03	65326.07	69531.57	4348.22	487.57	256694.99	54288.77

N.B.-

S.	Name of Block	Masoor (Lentil)		ntil)	Arhar (Pigeon pea)			Gram (Chick pea)			Khesari (lathyrus)		
No		Area (Ha.	Producti on (M.T.)	Yield Kg/Ha.)	Area (Ha.)	Production (M.T.)	Yield (Kg/Ha.)	Area (Ha.)	Production (M.T.)	Yield (Kg/Ha.)	Area (Ha.)	Production (M.T.)	Yield (Kg/Ha.)
1.	Patna Sadar	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
2.	Phulwarisharif	2400	3916	1632	Nil	Nil	Nil	Nil	Nil	Nil	900	985	1095
3.	Fatuha	4070	6247	1535	Nil	Nil	Nil	1380	2336	1693	885	1385	1565
4.	Masaurhi	4025	3904	970	Nil	Nil	Nil	1150	1555	1353	780	842	1080
5.	Dhanarua	3920	4900	1250	Nil	Nil	Nil	1175	1805	1537	890	930	1045
6.	Punpun	4110	6670	1623	Nil	Nil	Nil	1105	1745	1580	Nil	Nil	Nil
7.	Danapur	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
8.	Maner	910	1574	1730	405	328	810	Nil	Nil	Nil	Nil	Nil	Nil
9.	Bihta	2800	3262	1165	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
10.	Bikram	5680	5538	975	Nil	Nil	Nil	1290	1747	1353	590	551	935
11.	Paliganj	3505	9400	2682	Nil	Nil	Nil	950	1525	1606	525	1148	2187
12.	Naubatpur	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	360	375	1043
13.	Barh	6845	4792	700	260	337	1295	1410	1390	986	1030	1339	1300
14.	Bakhtiarpur	Nil	Nil	Nil	395	570	1445	Nil	Nil	Nil	Nil	Nil	Nil
15.	Pandarak	2700	769	285	300	549	1830	800	280	350	Nil	Nil	Nil
16.	Mokameh	9660	1932	200	205	136	665	3040	760	250	2050	1644	802
17.	Patna district	50625	48188	952	1565	1920	1227	12300	13143	1068	8010	9199	1148

Table-3.2.13 : Area, Production and Productivity of major Pulses in Patna district (Year 2001-02)

Source: District Agriculture Office, Patna

N.B.-

Chapter-4

ANALYSIS OF ONGOING EXTENSION AND DEVELOPMENT ACTIVITIES IN PATNA DISTRICT

GOVERNMENT ORGANIZATIONS

Department of Agriculture, Horticulture, Animal Husbandry, Dairy and Fisheries are the development departments having technical set-up, which is catering to the farming enterprises and the farming community of the district. Besides the above a State Agricultural University (Rajendra Agricultural University, Bihar) through its three institutions namely Agricultural Research Institute, Patna, S.G.Institute of Dairy Technology, Patna, Bihar Veterinary College, Patna along with a Krishi Vigyan Kendra at Barh and a number of NGO's are also lending a helping hand to the farming community through dissemination of improved and superior technology and solution to their problems therein. The district being the state capital has several central government institutions located in its boundaries relevant to the farming community. The important ones are ICAR Research Complex for Eastern Region, Directorate of Water Management research, Directorate of Rice Research-Regional office, Central Potato Research Station, to name a few.

4.1: AGRICULTURE

The department of Agriculture in the Patna district has about 300 technical personnel upto VLW level and are engaged in different extension activities like quality test of agricultural input and other agricultural development work. The technical persons are engaged at district, sub-divisions, and block level for transfer of technology under different ongoing schemes. The district is receiving appropriate help form the state level organizations established in the capital town such as Agricultural Research Institute, Mithapur, Central Plant Protection Office, Punai Chak (Patna) and the Rajendra Agricultural University, Bihar who are also responsible for the transfer of technology to the farmers.

4.1.1: On Going Activities of Department of Agriculture:

Two centrally sponsored schemes namely, Macro-mode Management Programme and Accelerated Maize Development Programme have been recently introduced to the activities of the department apart from routine work.

4.1.1.1.Agricultural Extension Strengthening and Development Planning under Macro-mode.

Following are main components of Macro-mode for strengthening of agricultural extension and developmental planning:

A. Male discussion group

- B.Female discussion group
- C.Two day's farmers training

Under the programme selection and training of Panchayat-wise' Kisan Mitra' is conducted at grass root level for increasing quantity and quality of the production. These Kisan Mitra will be ready for delivering the latest agro-technology in the field by training in groups. Block wise details of Macro mode programme for strengthening agricultural extension and other development programmes has been given in Table-4.I. It shows the Targeted Strengthening of Agricultural Extension under Macro mode

S.N.	Block	Male discu	ussion group	Female dis	scussion group	Two day training	rs farmer's
		Physical	Financial	Physical	Financial	Physical	Financial
1.	Patna Sadar	1	0.02	1	0.02	1	0.05
2.	Phulwarisharif	1	0.02	1	0.02	1	0.05
3.	Sampatchak	1	0.02	1	0.02	Nil	Nil
4.	Fatuha	1	0.02	1	0.02	1	0.05
5.	Khusrupur	1	0.02	1	0.02	Nil	Nil
6.	Daniawan	1	0.02	1	0.02	1	0.05
7.	Masaurhi	1	0.02	1	0.02	1	0.05
8.	Dhanarua	1	0.02	1	0.02	1	0.05
9.	Punpun	1	0.02	1	0.02	1	0.05
10.	Danapur	1	0.02	1	0.02	1	0.05
11.	Maner	1	0.02	1	0.02	1	0.05
12.	Bihta	1	0.02	1	0.02	1	0.05
13.	Bikram	1	0.02	1	0.02	1	0.05
14.	Dulhinbazar	1	0.02	1	0.02	Nil	Nil
15.	Paliganj	1	0.02	1	0.02	1	0.05
16.	Naubatpur	1	0.02	1	0.02	1	0.05
17.	Barh	1	0.02	1	0.02	1	0.05
18.	Athmalgola	1	0.02	1	0.02	1	0.05
19.	Belchi	1	0.02	1	0.02	Nil	Nil
20.	Bakhtiarpur	1	0.02	1	0.02	Nil	Nil
21.	Pandarak	1	0.02	1	0.02	1	0.05
22.	Mokameh	1	0.02	1	0.02	1	0.05
23.	Ghoswari	1	0.02	1	0.02	Nil	Nil
24.	Total	23	0.46	23	0.46	16	0.80

Table- 4.1 : Block wise ongoing Macro mode-Extension Programmes in Patna District (Year2000-03)(in Lakh Rs.)

4.1.1.2. Accelerated Maize Development Programme(AMDP):

Following are the main components of the AMDP, the details of which are presented in Table-4.2.

a. Technical Demonstration, b. Cultivators training, c. Integrated pest management

Table-4.2 : Targeted Block-wise	proposals under AMDP Programme	for Patna District(Year 2002-03)
J	· · · · · · · · · · · · · · · · · · ·	

S.No.	Block	Block		Farmers	Training	Integrate	d Pest	Agril. Implements	
		Demons	tration				nent		
		Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial
1.	Patna Sadar	2		3	0.15	2	0.12	12	0.18
2.	Phulwarisharif	3	0.15	3	0.15	3	0.18	12	0.18
3.	Sampatchak	1	0.05	2	0.15	1	0.06	3	0.12
4.	Fatuha	2	0.10	2	0.10	2	0.12	12	0.18
5.	Khusrupur	2	0.10	2	0.10	1	0.06	8	0.12
6.	Daniawan	1	0.05	2	0.10	1	0.06	8	0.12
7.	Masaurhi	4	0.20	4	0.20	3	0.18	18	0.27
8.	Dhanarua	4	0.20	5	0.25	3	0.18	18	0.27
9.	Punpun	3	0.15	3	0.25	2	0.12	12	0.18
10.	Danapur	3	0.15	4	0.20	3	0.18	12	0.18
11.	Maner	4	0.20	4	0.20	3	0.18	18	0.27
12.	Bihta	5	0.25	6	0.30	4	0.24	22	0.33
13.	Bikram	3	0.15	4	0.20	3	0.18	12	0.18
14.	Dulhinbazar	2	0.10	3	0.15	2	0.12	12	0.18
15.	Paliganj	5	0.25	6	0.30	4	0.24	22	0.33
16.	Naubatpur	4	0.20	4	0.20	3	0.18	18	0.27
17.	Barh	3	0.15	3	0.15	2	0.12	18	0.27
18.	Athmalgola	2	0.10	2	0.10	2	0.12	8	0.12
19.	Belchi	1	0.05	2	0.10	1	0.06	8	0.12
20.	Bakhtiarpur	3	0.15	4	0.20	3	0.18	12	0.18
21.	Pandarak	3	0.15	3	0.15	3	0.18	12	0.18
22.	Mokameh	3	0.15	3	0.15	2	0.12	12	0.18
23.	Ghoswari	2	0.10	2	0.10	1	0.06	8	0.12
24.	Total	65	3.28	76	3.80	54	3.24	302	4.53

Other than the aforesaid on going scheme there are two schemes going on in the district for ground water exploitation. These schemes are known as Million Shallow Tube well (MSTP) programme and On-Farm Water Management Programme (OFWAM). The financial structure of the programme is in ratio of 20:30:50 viz. 20% cultivator's contribution, 30% subsidy component, and 50% loan amount for sinking of shallow tube well on their own land and for pumping sets installation.

4.1.1.3: Role and Responsibilities of the Department of Agriculture.

4.1.1.3.1: District Agriculture Officer.

a. To look after the entire development activities in the district.

b. To allocate and prepare block wise programme for crop production.

c. To arrange the location specific, critical inputs and stocking the same at the district H/Q.

d. Project planning, evaluation and monitoring of Agriculture and Horticultural development activities of the district.

e. Issuing licenses and ensuring distribution of quality seed, fertilizer and pesticides sold in the district.

f. Organizing training programmes for capacity building of the farmers and subordinate functionaries.

g. Liaison with other line departments.

4.1.1.3.2: Sub-Divisional Agriculture Officer.

a. To look after the agriculture development activities in the sub-division.

b. To co-ordination supply of quality seeds, pesticides and fertilizer at various sale points in the sub-division.

- c. To prepare sub-division wise production programmes.
- d. To organize farmer training programmes in his area.

4.1.1.3.3: Junior Plant Protection Officer.

- a. To look after plant protection activities in the district.
- b. To ensure sale of quality insecticides and pesticides.
- c. Active role in the centrally sponsored IPM programme.

4.1.1.3.4: Assistant Soil Chemist.

- a. Arrange for soil survey in the district.
- b. Successful management of fertilizer use in the district as per soil test results.
- c. Analysis of the soil samples collected form the fields.

4.1.1.3.5: Block Agriculture Officer.

- a. To look after all agriculture and horticulture activities in the block.
- b. To ensure timely supply of quality agricultural inputs.
- c. To organize training programmes, field days/campaign for farmers.

4.1.1.4: District Horticulture Officer.

- a. To ensure timely supply of quality agricultural inputs.
- b. To arrange for farmers training to develop horticulture, floriculture and vegetable cultivation.
- c. Extension activities related to horticultural crops in the district.

4.2: Department of Animal Husbandry

Animal Husbandry being a major component of agricultural activities, contributes a lot in augmenting the farmers economy. Nowadays farmers are developing ' the milk production' as a parallel business to crop production. Thus cattle and buffalo rearing in capital (as well as in state) is mushrooming everyday and that spells the success of 'Patna Dairy Project', extrapolating their milk & milk products in almost every

household. The field of 'meat production' is mainly dominated by poultry, with goatary and piggery as other major contributors.

4.2.1: Major activities of A.H. in Patna district includes:

4.2.1.1: Disease control (prevention & cure)- Sub divisional Animal Husbandry Officers at Sub-divisional level, Block Animal Husbandry Officers at Block level, and Touring Veterinary Officers in field dispensaries support District Animal Husbandry Officer in the district. Altogether 16 BAHOs, 32 TVOs and their technical staff carry out the treatment, castration and vaccination of livestock in their respective areas under the supervision of five SAHOs, monitored by DAHO at district level.

4.2.1.2: Artificial Insemination-Special Deputy Director (Frozen Semen), with assistance from Project Officer and 2 Artificial Insemination officers, are responsible for the production of frozen semen; which is further being distributed through out Patna district by 4 Assistant Directors, 8 Animal Husbandry Officers and 16 Livestock Assistants headed by Special Deputy Director (Animal Development).

4.2.1.3: Research and vaccine production-Institute of Animal Health and Production is under Director (I.A.H.P.) followed by different departments headed by Research Officers and Junior Research Officers.
4.2.1.4: Animal breeding-A unit named exotic Animal Breeding Farm is running with organizational setup

comprising of Project Officer-1, Manager-1, Farm Vet. Officer-1 and Livestock Officer-1.At present the unit is involved in cattle and buffalo cross-breeding.

4.2.1.5: Poultry production-Patna have a central poultry farm for broiler and layer production with a setup comprising of General Manager-1, Manager-1, Assistant Manager-1 and 4 Assistant Poultry Marketing Officers.

4.2.1.6: Fodder development-One Fodder Development Officer with the assistance of 8 Livestock Assistants provides technical know-how to foster fodder production in Patna district.

4.2.1.7: Farmers' training programmes-Training for Cattle Breeding and Management, goat rearing, poultry production and fodder production are scheduled for the persons recommended by different BAHOs and TVOs from their respective areas. In addition, Bihar Veterinary College, Patna provides an extra opportunity to this district by means of its ongoing research activities and veterinary practices.

4.3: Department of Dairy Development:

The District Dairy Development Officer of Patna works for the development of rural dairy in Patna district. The development work is focused on technology dissemination and ensuring production of quality milk and milk products by different agencies. For this purpose a Quality Control Lab is under construction at Patna.

4.3.1: Activities of District Dairy Development Office, Patna

4.3.1.1.-"Gavya Goshthi" (Dairy Farmers' Meet) –The dairy farmers are organized to meet once a month for solving their problems.

4.3.1.2.-Clean milk production- Demonstrations are conducted in villages for clean milk production.

4.3.1.3.-Survey of villages for milk potential and for organizing co-op. milk societies.

4.3.1.4.-Milk yield competition- Every year milk yield competition is conducted in milk cooperative societies to encourage ideal dairy farming.

4.3.1.5.-Mini Dairies- As per the target fixed by state government Mini Dairies are established in villages for progressive farmers. Per mini dairy shed five milch cattle are provided through bank loan and departmental subsidy followed by some input in the form of cattle feed, medicines, insurance premium etc.

4.3.1.6: Special component scheme – Under this scheme SC/ST members of villages are provided one milch animal each to encourage Dairying and thereby improve their livelihood.

The activities, organizational setup, of the Dairy Development Department in Patna have been presented in table-4.3, and 4.4 respectively. Tables 4.5 to 4.11 give other important details of Department of Dairy Development.

Table-4.3: Activities of District Dairy Development Office, Patna

S. No	Name of the Schemes	2001-02	2002-03 (Till Oct')
1.	"Gavya Goshthi" Dairy farmers meet	54	18
2.	Clean Milk Production	43	20
3.	Survey of villages	32	25
4.	Milk Yield Competition	30	30 (yet to be conducted)
5.	Mini Dairies	3	4 (yet to be established)
6.	Special Component Scheme	45	16 (yet to be established)
7.	Artificial Insemination by Patna Dairy Project	9158	1323(up to July 2002)
8.	Milk procurement by Patna Dairy Project	26877	25688 (Kg per day)
		(Kg per day)	
9.	No. of Milk cooperative societies	329	333
10.	No. of functional Milk cooperative	290	303

Table-4.4: Organizational Setup of Dairy Development Department in Patna District

S.No.	Name of the post	Number of
		persons
1	District Dairy Development Officer	1
2	Dairy Technical Officer	1
3	Senior Input Supervisor	2
4	Field Assistant	1
5	Livestock Assistant	4

Table-4.5: Linkages with other organizations to Dairy Deptt. Name of the Level of linkage Type of linkage Purpose organization Village level Patna Dairy Project Backward To enhance quality & quantity of milk, better remunerative price of milk to producer **Dairy Research Office** Another unit of Dairy Forward **Research & Extension** Department Table-4.6: List of client groups (farmers/others) of District Dairy Dev. Deptt. Category Nos. 4(2001-02),3(2002-03) Mini Dairy Farmers 45(2001-02), 16(2002-03) Special component farmers(SC/ST)

Table-4.7: List of farmers' organization attached to District Dairy Dev. Office

S.No.	Name of the Organization	Locality	Area of Operation	Activities
1.	Milk Producers co-op Societies- MPCS (303 functional)	Spread over district in villages	Milk production at village level	Procurement of milk produced by members of MPCS

Table-4.8: List of Dairy Processing units

S.No.	Name of the unit	Location	Area of Operation	Capacity	Activity
1.	Patna Dairy Project	Phulwarisharif, Patna	Entire district	150TLPD & 3TLPD of Ice-cream	Procurement and processing of milk & production of

					milk products
2.	Raj Dairy	Bahadurpur, Patna	-Do-	10TLPD	- Do -

Table-4.9: List of Milk Marketing Agencies

S.No.	Name of the agency	Location	Area of operation	Commodity handled	Capacity
1.	Patna Dairy Project	Phulwarisharif, Patna	Vicinity of Patna	Processed milk, Ice-cream, Butter, Paneer, Mishti dahi, Lassi, Peda, Flavored milk, Ghee, Rasogulla,Gulabjamun, Kalakand.	150 TLPD, 3 TLPD
2.	Raj Dairy	Bahadurpur, Patna	-Do-	Processed milk, Ice-cream, Ghee, Butter, Paneer, Lassi, Flavored milk,	10 TLPD,
3.	Hulasi Dairy	Sakdi, Bhojpur Dtt.	-Do-	Processed milk	-
4.	Ganga Dairy	Begusarai	-Do-	Processed milk	-

Table-4.10: List of Dairy Training Institutions in Patna District

S.No.	Name of the institution	Location	Area of Training	Type of trainees
1.	COMFED- Farmer Training center	Patna	Clean milk production, Artificial Insemination, Testing of milk, Dairy Husbandry, etc.	Dairy farmers/members of milk co-op societies

Table-4.11: Input Support Offered by Department of Dairy Development, Patna

1	a				
	S.No.	Name of the input	Source-Public/Private	Quantity	Constraints in
				handled	supplying input
	1.	Technical know how about rearing milch animal	Dairy dept. (Govt of Bihar)		
	2	Medicine, cattle feed, etc.	Dairy dept. (Govt of Bihar)		

4.4: Department of Fisheries:

Patna district is endowed with large perennial, non-perennial water bodies and it can play a vital role in development of fisheries if the present fresh water resources are managed judiciously and wisely. There are approximately 973 government ponds and tanks in Patna covering 1204.22-hectare area along with parts of Ganga, Sone, and Punpun rivers. On the other hand a large number of private tanks (approx. 500) are also there in Patna district. Fish production in Patna from these rivers and tanks is presently of the tune of 1400 MT per annum, which caters to about 8000 fishermen families of the district.

Generally speaking, culture and capture fisheries in traditional ways are practiced in the Patna district. Capture fisheries is practiced in the rivers while culture fisheries is practiced in ponds etc. the major varieties of fish which are cultured in Patna are Rohu, Katla, Mrigal, Grass Carp, Common Carp, and Silver Carp while in captured fisheries main fishes caught in the rivers are Rohu, Katla, Mrigal, Bovai, Tengra, Bachwa, Soura among others. Out of the 23 blocks of Patna district block-level fishermen cooperative societies are working in some of the blocks (9). There are four fish feed farms in the district and they are located at Bhusaula-Danapur, Phulwarisharif, Agamkuan, and Paliganj. There is also a Fish Research Centre located at Mithapur, Patna. This centre has all the modern training facilities and is headed by an officer of the rank of Deputy Director of Fisheries department.

The main activities of the Fisheries department are as follows:

- 1. Imparting short-term settlement of water bodies to the fishery societies and individuals.
- 2. Long term settlement (up to 10 years) for water bodies above 4acres to the fishery societies and individuals.
- 3. Training the fishermen in modern fisheries technology.
- 4. Fish seed production and supply.
- 5. Providing assistance to the fishermen on 'Composite Fish Culture" through a World Bank aided scheme.
- 6. Renovation of privately owned fishponds and tanks and construction of new tanks with help of World Bank.
- 7. Helping the entrepreneurs in setting up hatcheries in the district.
- 8. Providing assistance for the housing facilities to the fishermen families under National Fishermen Welfare Scheme.
- 9. Providing necessary advice and support to fishermen on their rights.

The different line department working in Patna district are as obvious quite rich in man power, infrastructural resources, technical capacity etc. but due to gaps in operating resources makes them less than optimally useful for the overall agricultural development in the district. What they need is clear direction and motivation along with operating expenses to give a boost to R-E-F linkages along with quality leadership to usher in a new era in the overall development of this sector.

ANALYSIS OF ONGOING EXTENSION AND DEVELOPMENT ACTIVITIES IN THE DISTRICT

GOVERNMENT ORGANIZATIONS

Agriculture Department:

Department of Agriculture, Animal Husbandry, dairy and Fisheries are the development departments having technical set-up, which is catering to the farming enterprises and the farming community of the district. Besides the above a State Agricultural University (Rajendra Agricultural University, Bihar) through its three institutions namely Agricultural Research Institute, Patna, S.G.Institute of Dairy Technology, Patna ,Bihar Veterinary College, Patna along with a Krishi Vigyan Kendra at Barh and a number of NGO's are also lending a helping hand to the farming community through dissemination of improved and superior technology and solution to their problems therein.

The Department of Agriculture in Patna has a strength of about 300 technical personnel from District Agriculture Officer to Village Level Worker, who are engaged in different types of extension activities, quality test of agricultural inputs, and other agricultural developmental works. The technical personnel are involved at district, sub-division, block and village level in transfer of technology to the target groups i. e. farmers. The district is receiving appropriate support from the state level organizatios established in the capital Patna such as Agricultural Research Institute, Patna, Krishi Vigyan Kendra, Barh, Central Plant Protection Office,Punaichak,Patna and several ICAR research establishments like ICAR Research Station for Eastern Region, Central Potato Research Station,Patna, Directorate of Rice Research(Regional Station),Patna and several such institutions located within the district. the deartment also gets adequate support from the Directorate of Extension Education,R.A.U.,Pusa, which is always ready to help the department in its extension activities.

On Going Activities of The Department of Agriculture:

The recent on going schemes in the department are essentially sponsored under "Macro mode Management Programme" and "Accelerated Maize Development Programme".

Accelerated Maize Development Programme:

Following are the main components of the programme-

1. Technical demonstration

2. Farmers training

3.Integrated Pest Management

4.Farm Mechanization

Blockwise targets of this programme are given in the Table .

Agricultural Extension Strengthening and Development Planning under Macromode:

Following are the main components of the programme-

1. Formation of Male discussion groups.

2.Formation of female discussion groups.

3. Two days farmers training.

Under the AESDPM Kisan Mitra are to be selected at grass root level for increasing the effectiveness and quality of production technology. These Kisan Mitra will be trained in latest agricultural techniques so that they can train the farmer groups. Blockwise details of the AESDPM are given in table .

Chapter-5

Identification, Description and Analysis of Existing Farming System Under **Each AES**

5.1: Agro-Ecological Situation-

Based on the variations in precipitation, soil type, irrigation facilities, topography and land use pattern the Patna district has been classified under five different Agro-ecological situations (AES). These AES are named as under:

AES-I: -Tal areas, representing water logging problem and heavy textured soils.

AES-II: -Diara areas, representing southern banks along Ganga river, having sandy loam soils.

AES-III: - Jalla areas, a much peculiar one in the district, representing water stagnation problem attached with the city of Patna and having old alluvial soils.

AES-IV:-Irrigated plains, having old alluvium and clay soils well irrigated by Sone Command canals with most fertile land tract of the district.

AES-V: -Rainfed plains, having old alluvium soil, fertile land and where agricultural operations are totally dependent on rainwater.

Table 5.1.1: AES and village selected for participatory data collection.

S.No.	Name of ACZ	Name of AES	Name of Block	Name of Representative Village
1.	ACZ-III B	1.Tal, (Water logging, heavy textured soil)	Ghoswari	Ghoswari
2.		2.Diara, (Along southern bank of Ganga)	Danapur	Habaspur
3.		3.Jalla, (Peculiar situation, water stagnation problem)	Patna Sadar	Sonama
4.		4. Irrigated plain (Well irrigated and fertile)	Naubatpur	Chiraura
5.		5.Rainfed plain (Unirrigated fertile land)	Phulwarisharif	Mahuli

Table-5.1.2 : Important Information for Different Teams During Field Visits(Held during 3^{RD} June to 15^{TH} June 2002).

	AES-I (Tal)	AES-II (Diara)	AES-III (Jalla)	AES-IV (Irrigated	AES-V (Rainfed Plains)
	、 ,		、 <i>`</i>	Plains)	· · ·
Village	Ghoswari	Habaspur	Sonama	Chiraura	Mahuli
Distance from Patna	105KM	40 KM	28KM	35KM	22 KM
Block	Ghoswari	Danapur	Patna Sadar	Naubatpur	Phulwarisharif
Concerned BDO and his phone	Sri Anil Kumar 06132-32695(O) 06132-32429(R)	Md.Waris Khan, 424295(O) 591560(R)	Ms. Meena Kumari 657484(O)	Sri Devendra Kumar	Sri Shashi Bhusan Kumar 251190(O)
Team leader & his contact no.	Sri Ram Anugrah Pd. Singh 06132-32320(O)	Sri A.N.Mishra	a Sri Arvind Sri Chakreshwar Kumar, Kr.Sharma 666246 (R) 666246(R) 06135-77324(O)		Sri Birendra Sharma, 258068(R) 251190(O)
Contact Person/farmer & his Phone number .if any		Sri Ram Niwas Rai (Mukhia) Sri Bhola Rai, Sri Hira Lal Singh	Sri Randhir Kumar Sri Satish Prasad, (Mukhia) 617135	Sri Bhagirath Singh,S/o Late Sri Ram Dahin Singh	Sri Navin Bhusan Singh, Sri Anil Kr.Singh
Contact Place	Panchayat Bhawan, Ghoswari	Primary School, Habaspur	Community Hall, Sonama	Library Building, Chiraura	Primary-cum- Middle School, Mahuli
Team Sri R.A.P. Singh Dr.V.K.Sinha Sri K. Chaubey Sri K.M.Katariar Dr.U. Singh		Sri A.N.Mishra Dr.M. Kumar Sri V.N.Sharma Sri M. Kumar Sri Uma Kant	Sri A. Kumar, Sri S. M. Prasad Sri P.K.Gupta Dr. K.K.Sinha Sri U. Prakash	Sri C. Kr.Sharma Sri B.Kumar Dr. S.K.Thakur Sri Sudhir Prasad	Sri Birendra Sharma, Sri Prem Lal Singh Dr. K.K.Krishna Dr. J. Prasad Sri O.P.Gupta
Active InformantsDharma Raj Pd. Yadav Jaipal Mahto Sumitra Devi Lakshmi Narain Rajendra SaoRam Niwas (Mukhia) Bhola Rai, Hira Lal Sir Dharmarath Science Chandeswan Rajendra SaoRam Niwas (Mukhia) Bhola Rai, Hira Lal Sir Dharmarath Chandeswan Raja ram P Hikayat ran		Ram Niwas Rai (Mukhia) Bhola Rai, Hira Lal Singh Dharmarath Rai Sri Nivas Rai Chandeswar Mahto Raja ram Pandey Hikayat ram	Randhir Kumar Satish Prasad Rajendra Singh Shyamsher Singh Bhagwan Das Yugeshwar Singh Rambabu Singh Karo Singh Suresh Singh	Bhagirath Singh Indra Bihari Singh Surendra Singh Faujdar Paswan Gurcharan Ram Radhey Raman Singh	Anil Kr.Singh R.P. Singh M.P.Singh K.K.Singh S.R.Sao G.C.Singh R.J.ingh S.B.Singh Jugul Singh

		Chedi Rai Bidur Shah	Nagina Singh Sipahi Singh		Navin Bhusan Singh,
Facilitators	Dr. Brajesh Shahi, Mrs. Veena Shahi, Sri N.R. Hayagreeva, Dr.K.M.Singh	Dr. Brajesh Shahi, Mrs. Veena Shahi Sri N.R. Hayagreeva, Dr.K.M.Singh	Dr. Brajesh Shahi Mrs. Veena Shahi Sri N.R. Hayagreeva, Dr.K.M.Singh	Dr. Brajesh Shahi, Mrs. Veena Shahi Sri N.R. Hayagreeva, Dr K M Singh	Dr. Brajesh Shahi , Mrs. Veena Shahi Sri N.R. Hayagreeva, Dr.K.M.Singh

Map showing the AES in Patna district.

5.2: Land Holding Pattern in the Representative Village:

The basic infrastructure and data on operational land holdings of the representative villages of the classified five (5) AES was collected by using PRA tools and cross checked with the secondary data collected from the different line departments of the district. The details of land holding pattern in the representative villages have been presented in Table-5.2.1.

Table 5.2.1:Details of Land Holding Pattern in the Representative Village:

Size of				Num	ber and are	ea in eac	h AES			
operational	AES	5-I	AES-II		AES-III		AES-IV		AES-V	
holding	Number	Area	Number	Area	Number	Area	Number	Area	Number	Area
Large	01	06.00	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
(>4 ha.)										
Medium	27	79.00	Nil	Nil	15	60	07	37.00	Nil	Nil
(>2-4 ha.)										
Small	38	63.00	17	25.00	25	50	25	74.25	07	12.00
(>1-2 ha.)										
Marginal	172	96.00	169	32.20	150	10	115	100.00	131	110.00
(< 1 ha.)										
Landless	345	Nil	134	Nil	110	Nil	312	Nil	1146	Nil

5.3: Income group with ranking (Wealth Ranking).

Based on resources, activities generating income and service rendered to different sectors; the inhabitants of the representative village have been classified under the following groups.

- (i) Families having income > 2 lakh.
- (ii) Families having income between 1 to 2 lakh.
- (iii) Families having income between 0.5 to 1.0 lakh.
- (iv) Families having income between 0.25 to 0.50 lakh.
- (v) Families having between 0.25 lakh.

The wealth ranking of the representative villages is given in the Table 5.3.1-

Table No:-5.3.1: Wealth ranking of the families in the different A.E.S.(No. of Families)

S .No.	Wealth groups	AESI	AES II	AES III	AESIV	AES V	Total
1	I	30	12	35	07	07	91
	(above 2 lakh)						(4.80)
2	II	48	85	52	25	36	246
	(1-2 lakh)						(13.02)
3	III	96	39	55	75	70	335
	(0.5-1 lakh)						(17.74)
4	IV	258	50	75	40	47	470
	(0.25-05 lakh)						(24.89)
5	V	151	134	81	174	206	740
	(below 0.25 lakh)						(39.52)
Total		583	320	298	321	366	1888
							(100.00)

It is evident from the Table 5.3.1 that out of the total families in the 5 representative AES villages 4.8% inhabitants are above two-lakh income. Similarly 13.02% families lie between 1 to 2 lakh, 17.74 % families are between 0.5 to 1.0 lakh 24.89 % are between 25 to 0.50 lakh and rest 39.52 % families are in the income group of below 0.25 lakh.

5.4 Demographic Pattern of Villages Under Different AES.

Out of the five representative village selected under different AES, the average population per village was 3020 and the male to female ratio was 910 females per 1000 male .The se population is 26.6% of the total population while OBC and General was 73.4% of the total population. The agricultural workers were 29.7%, the non-agricultural workers were 12.5 percent. The average literacy rate of the representative village is was 28 percent. The detailed demographic trend of the five AES is educated in Table –5.4.1.

Table-5.4.1: Demographic Details from Representative AES villages

S.	Population	AES I	AES II	AES III	AES IV	AES V
No.						
1	Male	2172	2153	1068	1233	1280
2	Female	1776	1901	900	1240	1376
3	Total	3948	4054	1968	2473	2656
4	Agriculture Workers	1069	1243	412	312	1146
5	Non Agriculture	470	619	385	140	150
	Workers					
6	S/C	925	133	510	586	1593
7	S/T	-	-	-	-	-
8	OBC/General	3023	3921	1458	1887	1063
9	Literacy	26.67	19.7	18.9	44.3	30%

It is quite obvious from the above table that out of the total population the agriculture workers are 27.7% and non-agriculture workers are 11.7% in the representative village of related five AES.

5.5: Land and Soils:

5.5.1: Land utilization:

The total geographical area of the villages selected for collection of primary information was 1459 ha. Out of which the total cultivable area of the villages was 91.30% where as cultivated area was 90.18%, cultivable waste land was 1.95 %, current fallows were 0.38%, forest 0.34 %, pastures were nil, land put to non-agricultural uses 5.65%, land under misc. tree crops were 0.70%, and barren and uncultivable land was 6.22 %.

Table – 5.5.1: Land utilization Pattern in AES Villages (ha.)

S.No.	Particulars	AES I	AES II	AES III	AES IV	AES V	Total
1	Geographical area	837.00	75.00	120.00	300.00	127.00	1459.00 (100.00)
2	Cultivable area	824.00	57.20	108.00	221.00	122.00	1332.20 (91.30)
3	Cultivated area	819.00	57.20	108.00	211.50	120.00	1315.70 (90.18)
4	Cultivable waste land	04.00	12.50	Nil	10.00	02.00	28.50 (1.95)
5	Current fallows	Nil	Nil	5.50	Nil	Nil	5.50 (0.38)
6	Forest	Nil	Nil	Nil	5.00	Nil	5.00 (0.34)
7	Pastures	Nil	Nil	Nil		Nil	Nil
8	Land put to non-agricultural uses	10.00	05.00	12.00	50.50	05.00	82.50 (5.65)
9	Land under misc. tree crops	01.00	0.25	Nil	09.00	Nil	10.25 (0.70)
10	Barren and uncultivable land	03.00	8.75	Nil	06.00	73.00	90.75 (6.22)

5.5.2: Soils

The soils of the selected AES-villages are light to heavy in texture and the agro-ecological situations have been identified as under-

1. Diara land- Light alluvium (Loam- Sandy Loam)

2. Tal land- Heavy alluvium (Clay soils)

3. Alluvial plains both irrigated and rainfed plains- (Light alluvium, loam)

The soils of the aforesaid AES are moderately well drained to somewhat poorly drained, moderately acidic to slightly alkaline in nature. The information on different types of soils of the selected villages is given in Table 5.5.2.

Table-5.5.2: Information on Types of Soils in Selected Villages.(in ha.)

S.No.	Particulars	AES I	AES II	AES III	AES IV	AES V
1	Light Alluvium	-	57.2	-	211.50	127.00
2	Heavy Alluvium (Clay)	824.00	-	108.00	-	-

5.6.1: Irrigation

So far as the irrigation facilities under different AES was concerned, AES I,II and III fall under Tal, Diara and Jalla areas while AES IV and V fall under Irrigated and Rainfed areas respectively. The percentage of irrigated area of AES I, II, and III

are7.28%, 80.2% and 91.6% respectively, while AES IV comes under Sone Command area yielding 92.2% irrigated and 7.8% rainfed area. Similarly, under AES V, 15.7% of the cultivated area is irrigated and 84.3% area is rainfed. The details of area under irrigation in the selected villages have been given in Table 5.6.1.

S.No.	Source of Irrigation	AES I	AES II	AES III	AES IV	AES V
_						
1	Canal	Nil	Nil	Nil	150.5	Nil
2	State Tube well	Nil	Nil	Nil	Nil	Nil
3	Private Tube well	60.0	45.9	99.0	39.5	20.0
4	ERP sets	Nil	Nil	Nil	Nil	Nil
5	Seasonal river	Nil	Nil	Nil	Nil	Nil
6	Others	Nil	Nil	Nil	5.0	Nil
7	Total	60.0	45.9	99.0	195.0	20.0

Table 5.6.2 provide the details of families associated with different enterprises in the representative villages.

SI.No.	Enterprises	No of families associated with different enterprises village of AES.					
		1		III	IV	V	
1.	Agriculture	238	186	150	147	160	
	Irrigated		90	150	147	-	
	Unirrigated	238	96	-	-	-	
2.	Horticulture	83	25	40	04	5	
	Orchard	3	-	-	04	-	
	Vegetable	83	25	40	-	5	
	Flower	-	-	-	-	-	
3.	Animal Husbandry	245	142	140	193	141	
	Cow	55	125	75	30	25	
	Buffalo	/3	/1	40	130	64	
	Goat	64	12	25	100	61	
	Pig	64	-	-		52	
	Poultry	19	-	-	04	-	
4.	Fisherv	-	-	-	-	43	
5.	Agriculture Labourers	178	134	108	108	121	
	Non-farm enterprises	192	80	110	53	85	
	Regular Service	19	12	40	11	20	
	Daily wage earner	167	61	50	33	30	
	Business	6	7	15	-	5	

Table-5.6.2	2: No. Of families as	ssociated with different enterprises.
SI No	Enternrises	No of families associated with different

Table-5.6.3 to 5.6.6 gives existing farming system in the representative villages according to holding size .

Table –5.6.3 : Existing Farming System with Small Holding Families in Representative Villages of Each A	LES of
Patna District	

S.No.	Enterprises	Contribution	Contribution of different enterprise towards annual income of the					
		families in re	presentative vil	lage of each A	ES			
		I	II	III	IV	V		
1.	Agriculture	Р	Р	S	Р	Р		
	Irrigated	+	+	+	+	_		
	Unirrigated	++	+	+	_	+		
2.	Horticulture	Т	Т	Р	_	_		
	Orchard	_	+	_	_	_		
	Vegetable	+	++	+	_	_		
	Flower	_	_	_	_	_		
3.	Animal Husbandry	S	S	Т	S	S		
	Cow	+	++	++	++	+		
	Buffalo	+	+	+	+++	++		
	Goat	_	_	_	_	_		
	Pig	_	_	_	_	_		
	Poultry	_	_	_	+	_		
4.	Fishery	_	_	_	_	_		
5.	Agricultural Labourers	_	_	_	_	_		
6.	Non-farm activities	_	Q	Q	Т	Q		

Regular service	Q	_	_	++	Т
Non-farm enterprise		+	+	+	-

P – Primary, S—Secondary, T-Tertiary, Q- Quaternary and + shows the relative importance in increasing order.

S.No.	Enterprises	Contribution families in re	Contribution of different enterprise towards annual income of the families in representative village of each AES				
		I	II *	III*	IV	V*	
1.	Agriculture	Р	Р	Р	Р	Р	
	Irrigated	-	+	+	+	-	
	Unirrigated	+	++	+	-	+	
2.	Horticulture	-	S	Т	Т	-	
	Orchard		-	-	+		
	Vegetable		+	+	-		
	Flower		-	-	-		
3.	Animal Husbandry	S	Q	-	-	Т	
	Cow	++	+	-	+	++	
	Buffalo	+	-	-	-	+	
	Goat	-	-	-	-	-	
	Pig	-	-	-	-	-	
	Poultry	-	+	-	-	-	
4.	Fishery	-	-	-	-	-	
5.	Agricultural Labourers	-	-	-	-	-	
6.	Non-farm activities	Т	T	S	S	S	
	Regular service	+	+	+	+	-	
	Non-farm enterprise	++	++	++	++	+	

Table –5.6.4 : Existing Farming System with Medium Holding Families in Representative Villages of Each AES of Patna District

P – Primary, S—Secondary, T-Tertiary, Q- Quaternary and + shows the relative importance in increasing order. * only small and marginal farmers were present in those villages.

Table –5.6.5 : Existing Farming System with Large	Holding Families in Representative Villages of	Each AES of
Patna District		

S.No.	Enterprises	Contribution	Contribution of different enterprise towards annual income of the				
		families in re	presentative vil	lage of each Al	ES		
		I *	II *	III*	IV*	V*	
1.	Agriculture	P	Р	Р	Р	Р	
	Irrigated	-	+	+	+	+	
	Unirrigated	+	+	+	-	++	
2.	Horticulture	-	Q	S	-	Т	
	Orchard	-	+	+	-	+	
	Vegetable	-	-	-	-	-	
	Flower	-	-	-	-	-	
3.	Animal Husbandry	-	Т	-	-	-	
	Cow	-	++	-	-	-	
	Buffalo	-	+	-	-	-	
	Goat	-	-	-	-	-	
	Pig	-	-	-	-	-	
	Poultry	-	-	-	-	-	
4.	Fishery	-	-	-	-	-	
5.	Agricultural Labourers	-	-	-	-	-	
6.	Non-farm activities	S	S	Т	S	S	
	Regular service	+	-	+	+	+	
	Non-farm enterprise	++	+	++	++	++	

P –Primary, S—Secondary, T-Tertiary, Q- Quaternary and + shows the relative importance in increasing order. * Only small and marginal farmers were present in those villages.

Table -5.6.6 : Existing Farming System with Landless Families in Representative Villages of Each AES of Patna
District

S.No.	Enterprises	Contribution families in re	Contribution of different enterprise towards annual income of the families in representative village of each AES					
		I	II	III	IV	V		
1.	Agriculture	-	-	-	-	-		
	Irrigated	-	-	-	-	-		
	Unirrigated	-	-	-	-	-		
2.	Horticulture	-	-	-	-	-		
	Orchard	-	-	-	-	-		
	Vegetable	-	-	-	-	-		

	Flower	-	-	-	-	-
3.	Animal Husbandry	Р	Т	S	Р	Р
	Cow	_	+++	+++	++	+
	Buffalo	++	++	++++	+++	++++
	Goat	_	+	++	+	++
	Pig	+	_	+	_	+++
	Poultry	_	_	_	_	_
4.	Fishery	_	_	_	_	_
5.	Agricultural Labourers	Т	Р	Р	Т	Т
6.	Non-farm activities	S	S	Т	S	S
	Regular service	-	-	-	-	_
	Non-farm enterprise	+	+	+	_	_

P – Primary, S—Secondary, T-Tertiary, Q- Quaternary and + shows the relative importance in increasing order.

5.6. Agriculture

The major crops covering more than 90 % of the Gross Cropped Area of the paddy, wheat, maize, pulses, potato and oilseeds. The area and productivity trend of such important crops are given in Table-5.6.7.

Table-5.6.7: Major Commodities in Diffe	erent AES of Patna District
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Enterprise			Commodity		
	AES-I	AES-II	AES-III	AES-IV	AES-V
Crops	Lentil, Lathyrus Gram Wheat Pea Maize	Wheat Maize Lentil Arhar Pea Mustard	Lentil Gram Wheat Lathyrus	Paddy Wheat Lentil Lathyrus Maize Pea Gram Mustard	Paddy Wheat Lentil Maize Sunflower Lathyrus Gram Mustard
				Summer Moong Sugarcane	Summer moong
Horticulture	Ladies finger Onion Potato	Pointed gourd Coriander Cucurbits Ladyfinger Nenua Bottle gourd Brinjal Onion Flower Bitter gourd Tomato	Onion Spinach Potato Radish Cabbage Nenua Cauliflower Brinjal Tomato Ladyfinger	Banana Mango Potato Ladyfinger Onion Radish Spices Cabbage Brinjal Cauliflower Coriander Flowers- marigold	Jasmine jackfruit Mango Guava Brinjal Cabbage Potato Ladyfinger Onion Cucurbits
Animal Husbandry	Buffalo Cow Goat Pig Poultry-broiler	Cows-crossbred Buffalo Goat Sachharum spp. Sorghum Lucern Oats	Cows Buffalo Goat Poultry-broiler	Buffalo Cow Goat Poultry-Broiler Pig Chinese Cabbage Berseem Sorghum	Cow Buffalo Goat Pig Poultry-broiler Sorghum Oats
Fishery		Reverine	Ponds but no commercial production	Ponds but no commercial use for fisheries.	Commercial production

5.7:Production and Productivity of Important Commodities under Different enterprises for Five Selected Representative Villages

The enterprise wise and AES wise trends in area, production and productivity have been presented in the Tables below from -5.7.1 to 5.7.20.

Table –5.7.1 : Trend in Area Production and Productivity of Paddy in Different AES

Table				li va i					119 01 1	aaayn		0.0			
Yr.	Area	a in Ha	i. In A	ES in I	Ha.	Prod	uctio	n in Al	ES in M1	Г	Pro	ductiv	/ity in	Qtls./	Ha.
	I							III	IV	V				IV	V
1970	Nil	Nil	40	170	120	Nil	Nil	80	408	300	Nil	Nil	20	24	25
1975	Nil	Nil	45	175	120	Nil	Nil	90	504	300	Nil	Nil	20	29	25

1980	Nil	Nil	45	175	120	Nil	Nil	90	560	300	Nil	Nil	20	32	30
1985	Nil	Nil	45	178	120	Nil	Nil	115	569	300	Nil	Nil	26	32	25
1990	Nil	Nil	20	182	120	Nil	Nil	70	728	240	Nil	Nil	35	40	20
1995	Nil	Nil	20	185	120	Nil	Nil	70	740	240	Nil	Nil	35	40	20
2000	Nil	Nil	20	185	120	Nil	Nil	70	740	240	Nil	Nil	35	40	20

Table -5.7.2 : Trend in Area Production and Productivity of Wheat in Different AES

Yr.	Area	in Ha. I	n AE	S in I	Ha.	Prod	uction i	n AE	ES in MT		Pro	ductiv	/ity in	QtIs./H	a.
	-	=	≡	IV	۷		I II		IV	۷	_	=	≡	IV	V
1970	65	37.5	4	25	03	156	60	8	48	04	24	16	20	19.2	13
1975	82	37.5	4	35	03	26. 24	60	8	84	04	32	16	20	24.0	13
1980	Nil	50.0	4	45	25	Nil	120	8	129.6	63	Nil	24	20	28.8	25
1985	Nil	50.0	4	60	25	Nil	160	8	192.0	63	Nil	32	20	32.0	25
1990	100	32.5	3	80	20	320	104	9	256.0	50	32	32	30	32.0	25
1995	- Nil	32.5	2	60	20	Nil	104	6	192.0	50	Nil	32	30	32.0	25
2000	100	32.5	2	50	15	320	94.5	6	168.0	38	32	29	30	33.6	25

Table -5.7.3: Trend in Area Production and Productivity of Maize in Different AES

Yr.	Area	in Ha. I	n AES	S in H	a.	Prod	uctio	n in A	ES in M	IT	Pro	ductivit	y in Q	tls./Ha.	
	1	II	III	IV	۷	I	=	≡	IV	۷	-	=		IV	V
1970	120	25	20	05	Nil	384	32	60	9.6	Nil	32	12.8	30	19.2	Nil
1975	Nil	25	20	05	Nil		32	60	9.6	Nil	Nil	12.8	30	19.2	Nil
1980	140	25	20	05	Nil	448	40	60	9.6	Nil	32	16	30	19.2	Nil
1985	Nil	37.5	20	05	Nil		80	70	12.0	Nil	Nil	21.3	35	24.0	Nil
1990	175	37.5	10	05	Nil	560	80	45	12.0	Nil	32	21.3	45	24.0	Nil
1995	Nil	37.5	10	02	Nil		90	45	4.8	Nil	Nil	24	45	24.0	Nil
2000	200	37.5	10	02	Nil	640	95	45	4.8	Nil	32	25.3	45	24.0	Nil

Table - 5.7.4: Trend in Area Production and Productivity of Lentil in Different AES

Yr.	Area	in Ha. I	n AE	S in H	a.	Produc	tion in	AES i	n MT		Prod	uctivit	y in Qt	ls./Ha.	
	I	Ш	=	IV	۷	Ι	=	Ш	IV	V	-	=	Ш	IV	V
1970	655	7.5	20	25	12	524	120	24	48	12	08	16	12	19.2	10
1975	Nil	7.5	20	35	12	Nil	120	24	67.2	12	Nil	16	12	19.2	10
1980	Nil	7.5	18	25	15	Nil	120	20	48.0	15	Nil	16	10	19.2	10
1985	615	Nil	Nil	35	20	799.5	Nil	Nil	67.2	20	13	Nil	Nil	19.2	10
1990	Nil	Nil	Nil	40	25	Nil	Nil	Nil	76.8	25	Nil	Nil	Nil	19.2	10
1995	Nil	Nil	Nil	40	30	Nil	Nil	Nil	64.0	36	Nil	Nil	Nil	16.0	12
2000	575	2.5	Nil	40	35	2013	32	Nil	64.0	42	3.5	12.	Nil	16.0	12
												8			

Table – 5.7.5: Trend in Area Production and Productivity of Arhar in Different AES

Yr.	Area	in Ha.	In AE	ES in H	a.	Pro	duction	in AE	ES in N	IT	Prod	uctivity	in Qtl	s./Ha.	
	1	Ш	Ξ	IV	۷	I	II	III	IV	V	I	II	III	IV	V
1970	Nil	2.5	Nil	5.0	Nil	Nil	0.8	Nil	1.7	Nil	Nil	3.2	Nil	3.5	Nil
									5						
1975	Nil	2.5	Nil	8.0	Nil	Nil	0.8	Nil	3.2	Nil	Nil	3.2	Nil	4.0	Nil
1980	Nil	3.7	Nil	10.	Nil	Nil	1.8	Nil	5.0	Nil	Nil	4.8	Nil	5.0	Nil
		5		0											
1985	Nil	4.0	Nil	8.0	Nil	Nil	1.92	Nil	4.0	Nil	Nil	4.8	Nil	5.0	Nil
1990	Nil	5.0	Nil	5.0	Nil	Nil	6.4	Nil	7.0	Nil	Nil	12.8	Nil	14.0	Nil
1995	Nil	5.0	Nil	5.0	Nil	Nil	8.0	Nil	7.5	Nil	Nil	16.0	Nil	15.0	Nil
2000	Nil	7.2	Nil	5.0	Nil	Nil	11.5	Nil	8.0	Nil	Nil	16.0	Nil	16.0	Nil

Table – 5.7.6: Trend in Area Production and Productivity of Potato in Different AES

Yr.	Are	a in Ha.	In AE	ES in	Ha.	Pro	ductio	n in AE	SinN	IT	Pro	ductivi	ty in Qt	ls./Ha.	
	Ι	Π	III	Ι	۷		=	=	IV	۷	-	=	III	IV	V
				V											
1970	Nil	Nil	25	5	Nil	Nil	Nil	375	64	Nil	Nil	Nil	150	128	Nil
1975	Nil	Nil	35	5	Nil	Nil	Nil	560	64	Nil	Nil	Nil	160	128	Nil
1980	Nil	Nil	40	5	Nil	Nil	Nil	640	64	Nil	Nil	Nil	160	128	Nil
1985	Nil	3.75	45	4	Nil	Nil	60	720	64	Nil	Nil	160	160	160	Nil
1990	Nil	3.75	45	4	Nil	Nil	84	990	64	Nil	Nil	224	220	160	Nil
1995	Nil	7.50	55	5	Nil	Nil	168	1125	80	Nil	Nil	224	225	160	Nil
2000	Nil	10.0	60	5	Nil	Nil	256	1500	80	Nil	Nil	256	250	160	Nil

Table –5.7.7: Trend in Area Production and Productivity of Onion in Different AES

a,				
	Yr.	Area in Ha. In AES in	Production in AES in MT	Productivity in Qtls./Ha.
		Ha.		-

	I	II	III	IV	۷	I	11	III	IV	V	I	II	III	IV	V
1970	Nil	Nil	25	Nil	Nil	Nil	Nil	500	Nil	Nil	Nil	Nil	200	Nil	Nil
1975	Nil	Nil	35	Nil	Nil	Nil	Nil	770	Nil	Nil	Nil	Nil	220	Nil	Nil
1980	Nil	Nil	40	Nil	Nil	Nil	Nil	940	Nil	Nil	Nil	Nil	235	Nil	Nil
1985	Nil	Nil	45	Nil	Nil	Nil	Nil	1102	Nil	Nil	Nil	Nil	245	Nil	Nil
1990	Nil	5	45	Nil	5	Nil	100	1237.5	Nil	30	Nil	200	275	Nil	60
1995	Nil	10	45	Nil	10	Nil	225	1237.5	Nil	60	Nil	225	275	Nil	60
2000	Nil	15	60	Nil	15	Nil	375	1920	Nil	90	Nil	250	320	Nil	60

Table –5.7.8: Trend in Area Production and Productivity of Lathyrus in Different AES

Yr.	Area	in Al	ES in	Ha.		Produ	ction i	n AE	S in M1	Г	Pro	ductiv	/ity in (Qtls./	Ha.
	1	=	≡	IV	V	I	Ш		IV	V	I	11	III	IV	V
1970	125	Nil	Nil	100	105	150	Nil	Nil	120	126	32	Nil	Nil	12	12
1975	Nil	Nil	Nil	100	105	Nil	Nil	Nil	120	126	Nil	Nil	Nil	12	12
1980	100	Nil	Nil	100	80	120	Nil	Nil	120	96	16	Nil	Nil	12	12
1985	Nil	Nil	Nil	90	75	Nil	Nil	Nil	108	30	Nil	Nil	Nil	12	12
1990	82	Nil	Nil	80	55	65.6	Nil	Nil	96	44	16	Nil	Nil	08	08
1995	Nil	Nil	Nil	70	45	Nil	Nil	Nil	84	36	Nil	Nil	Nil	08	08
2000	60	Nil	Nil	50	20	48	Nil	Nil	60	32	16	Nil	Nil	08	08

Table – 5.7.9: Trend in Area Production and Productivity of Gram in Different AES

Yr.	Area	in Ha	. In A	ES in I	Ha.	Prod	uctio	n in A	ES in	MT	Pro	ductiv	vity in	Qtls./	Ha.
	I	=	≡	IV	۷	-	=	=	IV	V		=	Ξ	IV	V
1970	245	Nil	20	Nil	Nil	390	Nil	30	Nil	Nil	16	Nil	15	Nil	Nil
1975	Nil	Nil	20	Nil	Nil	Nil	Nil	30	Nil	Nil	Nil	Nil	15	Nil	Nil
1980	200	Nil	20	Nil	Nil	320	Nil	30	Nil	Nil	16	Nil	15	Nil	Nil
1985	Nil	Nil	20	10	Nil	Nil	Nil	30	16	Nil	Nil	Nil	15	16	Nil
1990	80	Nil	10	05	15	40	Nil	15	08	16	05	Nil	15	16	11
1995	Nil	Nil	10	05	15	Nil	Nil	15	08	16	Nil	Nil	15	16	10.6
2000	40	Nil	10	2.5	15	14	Nil	15	04	18	05	Nil	15	16	12

Table -5.7.10: Trend in Area Production and Productivity of Mustard in Different AES

Yr.	Area	in Ha. I	n AES	in Ha	I .	Proc	ductio	on in J	AES in	MT	Pro	ductiv	/ity in	Qtls./	Ha.
	-			IV	V	-	=	≡	IV	۷	-	=	=	IV	V
1970	Nil	10	Nil	05	Nil	Nil	7	Nil	3.5	Nil	Nil	7	Nil	7	Nil
1975	Nil	10	Nil	05	Nil	Nil	7	Nil	3.5	Nil	Nil	7	Nil	7	Nil
1980	Nil	12	Nil	05	Nil	Nil	10	Nil	4	Nil	Nil	8	Nil	8	Nil
1985	Nil	12	Nil	05	Nil	Nil	12	Nil	5	Nil	Nil	10	Nil	10	Nil
1990	Nil	11	Nil	05	Nil	Nil	12	Nil	6	Nil	Nil	11	Nil	12	Nil
1995	Nil	11.5	Nil	05	Nil	Nil	14	Nil	7	Nil	Nil	12	Nil	14	Nil
2000	Nil	10	Nil	05	Nil	Nil	14	Nil	7.5	Nil	Nil	14	Nil	15	Nil

Table -5.7.11: Trend in Area and Productivity of Mango in Different AES

Yr.	Area	a in Ha	. In A	ES in	Ha.	Prod	uctivit	y in Qt	ls./Ha.	
	I	=	Ш	IV	۷	Ι	II	III	IV	٧
1970	Nil	Nil	Nil	5	10	Nil	Nil	Nil	200	300
1975	Nil	Nil	Nil	4	8	Nil	Nil	Nil	200	300
1980	Nil	Nil	Nil	4	4	Nil	Nil	Nil	275	350
1985	Nil	2	Nil	3	2	Nil	225	Nil	275	325
1990	Nil	3	Nil	3	1	Nil	250	Nil	300	325
1995	Nil	3.5	Nil	2	1	Nil	300	Nil	325	350
2000	Nil	5.0	Nil	1	1	Nil	350	Nil	350	350

Table -5.7.12: Trend in Area of Bamboo in Different AES

Yr.	Area	a In AE	S in I	Ha.	
	_	=	≡	IV	V
1970	Nil	3.5	Nil	10.2	3.9
1975	Nil	4	Nil	8.3	4.1
1980	Nil	4.2	Nil	7.1	4.1
1985	Nil	5.3	Nil	6.4	3.6
1990	Nil	6.7	Nil	5.9	3.0
1995	Nil	8.7	Nil	4.4	3.9
2000	Nil	9.6	Nil	3.6	4.7

Table - 5.7.13 : Trend in Area Production and Productivity of Vegetables in Different AES

Yr.	Area	a i In AE	S in H	la.		Pro	ductivi	ty in Qt	ls./Ha	a.
	I	II	=	IV	۷	I	II	III	IV	V
1970	Nil	Nil	40	Nil	Nil	Nil	Nil	200	Nil	Nil
1975	Nil	7.5	48	Nil	Nil	Nil	32	200	Nil	Nil

1980	Nil	7.5	50	Nil	Nil	Nil	32	220	Nil	Nil
1985	Nil	10.0	52	Nil	Nil	Nil	32	240	Nil	Nil
1990	Nil	23.75	52	Nil	Nil	Nil	192	360	Nil	Nil
1995	Nil	21.25	33	Nil	Nil	Nil	253	300	Nil	Nil
2000	Nil	20.0	26	Nil	Nil	Nil	253	400	Nil	Nil

Table –5.7.14: Trend in Number, Production and Productivity of Goat milk in Different AES

Yr.	No.	of Go	oats			Produc lactatic	tion of N n	lilk in	Qtls.	/	Produ	ctivity I	kg./an	imal	
	Ι	=	≡	IV	۷	1	II		IV	۷	I	Ш	=	IV	V
1970	28	Nil	Nil	Nil	Nil	7.0	Nil	Nil	Nil	Nil	0.25	Nil	Nil	Nil	Nil
1975	32	20	Nil	Nil	Nil	8.32	10.00	Nil	Nil	Nil	0.26	0.50	Nil	Nil	Nil
1980	35	21	Nil	Nil	Nil	12.25	12.60	Nil	Nil	Nil	0.35	0.60	Nil	Nil	Nil
1985	36	25	Nil	Nil	Nil	18.00	18.75	Nil	Nil	Nil	0.50	0.75	Nil	Nil	Nil
1990	40	25	Nil	Nil	Nil	32.00	18.75	Nil	Nil	Nil	0.80	0.75	Nil	Nil	Nil
1995	42	28	Nil	Nil	Nil	42.00	28.00	Nil	Nil	Nil	1.00	1.00	Nil	Nil	Nil
2000	50	31	Nil	Nil	Nil	55.00	38.75	Nil	Nil	Nil	1.10	1.25	Nil	Nil	Nil

Table –5.7.15: Trend in Number, Production and Productivity of Goat Meat in Different AES

Yr.	No. c	of Goa	ats			Produ	ction of	f Meat i	n QtIs./	year	Produ	ctivity l	kg./anim	nal	
	1	II	III	IV	V	-	II	III	IV	V	-	=	=	IV	V
1970	60	50	22	92	112	2.40	3.00	1.10	7.8	11.2	4.00	6.00	5.00	7.0	10.0
1975	55	55	25	95	100	2.47	3.30	1.37	7.4	10.0	4.50	6.00	5.50	7.4	10.0
1980	49	48	32	99	100	2.45	2.40	1.92	7.8	10.0	5.00	5.00	6.00	7.8	10.0
1985	40	40	35	105	105	2.20	3.00	2.45	8.6	10.5	5.50	7.50	7.00	8.2	10.0
1990	60	30	45	111	120	3.60	2.40	3.37	10.2	14.4	6.00	8.00	7.50	8.5	12.0
1995	80	35	52	129	135	5.20	2.80	4.16	11.4	16.2	6.50	8.10	8.00	8.5	12.0
2000	139	35	55	140	150	9.73	2.90	4.67	12.7	18.0	7.00	8.20	8.50	8.5	12.0

Table –5.7.16: Trend in Number, Production and Productivity of Pigs in Different AES

Yr.	No. c	of Pig	S			Produ	ction	of Po	ork in	Qtls./	Pro	ductiv	vity kę	g./ani	mal
						year									
	I			IV	V	I			IV	V				IV	V
1970	100	Nil	Nil	Nil	200	15	Nil	Nil	Nil	60.0	15	Nil	Nil	Nil	30
1975	120	Nil	Nil	Nil	200	21.6	Nil	Nil	Nil	60.0	18	Nil	Nil	Nil	30
1980	135	Nil	Nil	Nil	200	27.0	Nil	Nil	Nil	60.0	20	Nil	Nil	Nil	30
1985	145	Nil	Nil	Nil	205	31.9	Nil	Nil	Nil	61.5	22	Nil	Nil	Nil	30
1990	150	Nil	Nil	Nil	190	37.5	Nil	Nil	Nil	57.0	25	Nil	Nil	Nil	30
1995	175	Nil	Nil	Nil	200	61.2	Nil	Nil	Nil	60.0	35	Nil	Nil	Nil	30
2000	200	Nil	Nil	Nil	200	70.0	Nil	Nil	Nil	60.0	35	Nil	Nil	Nil	30

Table – 5.7.17 : Trend in Area Production and Productivity of Desi cows in Different AES

Yr.	No.	of De	si Co	ws		Produ lactati	ction of on	f Milk i	n Qtls./	year/	Produ	ctivity I	kg./anim	nal /Lacta	ation
	I	Ш	Ξ	IV	۷	Ι	1	=	IV	V	Ι	=	III	IV	V
1970	48		32	55	12	600	-	384	550	129	1000	-	1200	1000	1080
1975	54	68	42	61	12	650 816 523 610 129					1000	1200	1245	1000	1080
1980	61	Nil	45	69	15	732	Nil	567	724	162	1100	-	1260	1050	1080
1985	70	57	54	75	15	840	684	570	806	152	1200	1200	1240	1075	1080
1990	75	48	60	81	17	900	576	741	911	104	1200	1200	1235	1125	1200
1995	80	45	65	98	21	960	540	800	1127	252	1200	1200	1230	1150	1200
2000	88	54	70	106	25	1100	648	875	1272	300	1200	1200	1250	1200	1200

Table –5.7.18: Trend in Number, Production and Productivity of Buffaloes in Different AES

Yr.	No.	of Bu	Iffaloe	es		Prod lacta	uction tion	of Milk i	n Qtls./ ye	ear/	Produc	tivity k	g./anima	/Lactati	on
	I	=	=	IV	V	-	=	=	IV	V	1		III	IV	V
1970	Nil		75	115	105	Nil		1050	1581.2	1470	1000		1400	1375	1350
1975	Nil	42	72	127	90	Nil	630	1008	1746.2	1210	1100	1500	1400	1375	1350
1980	32	45	66	138	90	352	675	924	1806	1210	1100	1500	1400	1400	1350
1985	40	45	57	141	65	480	675	855	2044.4	1350	1200	1500	1500	1450	1350
1990	43	45	51	153	50	644	675	739.5	2218.5	750	1500	1500	1450	1450	1500
1995	50	40	45	165	42	750	600	652.5	2475	630	1500	1500	1450	1500	1500
2000	56	47	40	185	32	840	705	600	2775	480	1500	1500	1500	1500	1500

Table -5.7.19: Trend in Number, Production and Productivity of Cross-bred Cows in Different AES

Table	Table Strift. Trend in Hamber, Freddollon and Freddollwrty of Oross-bred Cows in Different AED											
Yr.	No. of Cows	Production of Milk in Qtls./ year/lactation	Productivity kg./animal /lactation									

	I	II	III	IV	V	I	II	III	IV	V	I	II		IV	V
1970	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil						
1975	Nil	Nil	4	Nil	Nil	Nil	Nil	60	Nil	Nil	Nil	Nil	1500	Nil	Nil
1980	12	6	14	Nil	Nil	180	90	238	Nil	Nil	1500	1500	1700	Nil	Nil
1985	18	55	20	1	Nil	324	990	360	12	Nil	1800	1800	1800	1200	Nil
1990	20	86	22	2	Nil	400	1806	440	28	Nil	2000	2100	2000	1400	Nil
1995	24	95	35	3	Nil	432	1995	735	45	Nil	1800	2100	2100	1500	Nil
2000	30	110	50	6	Nil	540	2310	1050	108	Nil	1800	2100	2100	1800	Nil

Table –5.7.20: Trend in Number, Production and Productivity of Broiler in Different AES

Yr.	No. of birds					Production of chicken in Qtls.					Productivity kg./ bird				
	I	Π	Ξ	IV	V	Ι	=		IV	۷	Ι	=	III	IV	V
1970	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
1975	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
1980	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
1985	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
1990	20	Nil	Nil	Nil	Nil	0.30	Nil	Nil	Nil	Nil	1.5	Nil	Nil	Nil	Nil
1995	50	Nil	Nil	Nil	Nil	0.80	Nil	Nil	Nil	Nil	1.6	Nil	Nil	Nil	Nil
2000	86	Nil	Nil	19200	Nil	1.65	Nil	Nil	2592	Nil	1.91	Nil	Nil	1.35	Nil

Table-5.7.21 gives the details of livestock population in the different AES villages selected for the preparation of SREP. Table-5.7.21 : Livestock population (No) in different AES village in Patna district.

SL.No	Type of Livestock	Í		Number	of animals	
		I	II	III	IV	V
1.	Buffalo					
	Local	56	47	40	185	32
	Graded	-	-	-	-	-
2.	Cows					
	Local	88	54	70	106	25
	Graded	30	110	50	6	-
3.	Goats	189	66	55	140	150
	Sub-total of cattle	363	277	215	437	207
4.	Poultry –Broiler	-	-	-	19000	-
5.	Poultry-Backyard	86	-	-	200	-
6.	Pigs	200	-	-	-	200

5.8: Gap in Adoption:

5.8.1: Wheat

The partial gap in wheat yield is mainly due to the critical gap in adoption of improved technology in seed treatment and plant protection components, which has been observed in AES III, IV and V. The partial gap in adoption of recommended varieties, seed rate, use of manure and fertilizers and to some extent irrigation has been observed in almost all the AES. It is important to mention here that farmers use high seed rate than the recommended rate. Wheat in AES I is being taken on a small scale as an insurance against possible failure of pulses during Rabi season. Tal being a traditional pulse growing area, farmers are shifting towards wheat due to recurring failure of major pulses like gram and lentil due to diseases, pest problems along with absence of appropriate research input in controlling the disease and pests has resulted in very low yields to the growers. The findings have been presented in Table-5.8.1 below.

Table -5.8.1 : Gap in Adoption of Improved Technology in representative villages of different	AES in Patna District
Crop: Wheat	

S.No.	Recommended F/P/N practice	Gap in in AES	adoptio villages	Remarks			
		AES-I	AES- II	AES- III	AES- IV	AES-V	
1	Sowing time/method	F	F	F	F	F	Moisture regime
2	Varieties	Р	Р	Р	Р	Р	Non availability
3	Seed rate(kg/ha)	Р	Р	Р	Р	Р	Traditional
4	Seed treatment	F	F	F	F	F	
5	Organic manure	F	F	F	F	F	
6	Fertilizer (kg/ha) Basal (N+P+K) Top dressing (N)	Ρ	Р	Р	Р	Р	
7	Method of fertilizer use	Р	Р	Р	Р	Р	
8	Micro nutrients	F	F	F	F	F	
9	Pest management	F	F	F	F	F	
10	Disease management	F	F	F	F	F	
11	Weed control	F	F	F	F	F	

12	Irrigation	F	F	F	F	F	
13	Land management	Р	Р	Р	Р	Р	
14	Method of sowing	Р	Р	Р	Р	Р	
15	Water management	F	F	F	F	F	
16	Yield	Р	Р	Р	Р	Р	

5.8.2:Paddy: Critical gap has been observed in case of seed treatment, application of organic manure, application of micro-nutrients (specially zinc), pest and disease management in paddy cultivation in all the AES. The partial gap has been observed in time of seedling transplanting, use of improved variety, and dose of fertilizer use. Seedling mainly dependent on rain. Use of variety depends on supply of good seed and balanced fertilizer use depends on soil testing and economic condition of the farmers. Table 5.8.2 shows the gaps in adoption of recommended technology in paddy crop in different AES.

Table -5.8.2 : Gap in Adoption of Improved Technology in representative villages of different	AES in Patna District.
Crop: Paddy	

S.No.	Recommended F/P/N practice	Gap ir techno	n adoptio ology in	on of imp AES villa	oroved ages		Remarks
		AES I	AES II	AES III	AES IV	AES V	
1	Sowing time/method	Ρ	-	Р	Р	Ρ	Late arrival of monsoon/ irrigation water in canal
2	Varieties	Р	-	Р	Р	Р	Non-availability of quality seeds
3	Seed rate (kg/ha)	Р	-	Р	Р		Lack of knowledge
4	Seed treatment	F	-	F	Р	F	
5	Organic manure	F	-	F	F	F	
6	Fertilizer (kg/ha) Basal (N+P+K) Top dressing (N)	P	-	P	Р	P	
7	Method of fertilizer use	Р	-	Р	Р	Р	
8	Micro nutrients	F	-	Р	F	Р	
9	Pest management	Р	-	Р	Р	Р	
10	Disease management	Р	-	Р	Р	Р	
11	Weed control	Ν	-	Ν	Ν	Ν	
12	Irrigation	Р	-	Р	Р	Р	
13	Method of harvesting	Ν	-	Ν	N	Ν	
14	Water management	Р	-	Р	Р	Р	
15	Yield	Р	-	P	P	Р	CG

5.8.3:Maize:

5.8.3.1: Rabi maize: Rabi maize is cultivated mainly in AES-II and AESIV. While Kharif maize is cultivated in AESII. There is negligible yield gap in case of Rabi maize, however it can further be improved by filling the critical gap in case of seed treatment, fertilizer-cum-micro-nutrient application and pest management practices.

5.8.3.2: Kharif maize: In Kharif maize the critical gap has been observed in seed treatment, micronutrient and pest management. Except sowing time, seed rate and method of fertilizer application the gap in rest of the operations are partial.(Table-5.8.3.1).

Table -5.8.3.1:	Gap in Adoption o	f Improved	Technology	in representative	villages of different	AES in Patna
District. Crop:	Rabi Maize					

S.No.	Recommended F/P/N practice	Gap ir techno	adoptio	on of imp AES villa	roved ages		Remarks
	-	AES	AES	AES	AES	AES	
		1	П	III	IV	V	
1	Sowing time/method	Р	Ν	Р	Р	Р	
2	Varieties	Р	Р	Ν	Р	Р	
3	Seed rate (kg/ha)	Р	Р	Ν	Р	Ν	
4	Seed treatment	-	-	-	-	-	
5	Organic manure	F	F	F	F	F	
6	Fertilizer (kg/ha)	Р	Р	Р	Р	Р	
	Basal (N+P+K)						
	Top dressing (N)						
7	Method of fertilizer use	Р	Р	Р	Р	Р	
8	Micro nutrients	-	-	-	-	-	
9	Pest management	Р	Р	F	Р	Р	
10	Disease management	Р	Р	F	Р	Р	
11	Weed control	Ν	Р	N	Р	Р	
12	Irrigation	Р	Р	Р	Р	Р	
13	Method of harvesting	Ν	Ν	N	Ν	Ν	
14	Yield	Р	Р	Р	Р	Р	CG

Table -5.8.3.2: Gap in Adoption of Improved Technology in representative villages of different AES in Patna District. Crop: Kharif Maize

S.No.	Recommended F/P/N practice	Gap ir techno	n adoptio blogy in	on of imp AES villa	Remarks		
		AES	AES	AES	AES	AES	
					IV	V	
1	Sowing time/method	Р	Р	Р	Р	Р	
2	Varieties	F	F	F	F	F	CG
3	Seed rate (kg/ha)	F	Р	Р	F	Р	
4	Seed treatment	F	F	F	F	F	
5	Organic manure	F	Р	F	F	F	
6	Fertilizer (kg/ha)	Р	Р	Р	Р	Р	
	Basal (N+P+K)						
	Top dressing (N)						
7	Method of fertilizer use	F	F	F	F	F	CG
8	Micro nutrients	-	-	-	-	-	
9	Pest management	Р	Р	Р	Р	Р	
10	Disease management	Р	Р	Р	Р	Р	
11	Weed control	Ν	Ν	Ν	Ν	Ν	
12	Irrigation	Ν	Ν	Ν	Ν	Ν	
13	Method of harvesting	Ν	Ν	Ν	Ν	Ν	
14	Yield	F	Р	Р	F	F	

5.8.4: Pulse Crops

5.8.4.1: Moong: Moong is cultivated during summer within a short period of 60-70 days. It is grown after Rabi and before Kharif in AES IV and AES V. it is also cultivated in AES-I, II,and III to fulfil the crop rotation of Toria-Moong-Kharif crop, or Kharif crop-Fallow. In all the AES traditional Kharif. Summer moong is taken. The farmers are not adopting high yielding varieties because local moong is known for its better taste and is also cultivated as a mixed crop for fodder. There is ample of scope for improving the yield by adopting improved technology in moong cultivation.

5.8.4:2 Lentil:

Table -5.8.4.1:	: Gap in Adoption	of Improved	Technology in	representative	villages of dif	ferent Al	ES in Patna
District. Crop:	: Lentil						

S.No.	Recommended F/P/N	Gap in adoption of improved technology in AFS villages					Remarks
	practice	AES-I	AES-	AES-	AES- IV	AES-V	
1	Sowing time/method	F	F	F	F	F	Moisture regime
2	Varieties	Р	Р	Р	Р	Р	Non availability
3	Seed rate(kg/ha)	Р	Р	Р	Р	Р	Traditional
4	Seed treatment	F	F	F	F	F	CG
5	Organic manure	F	F	F	F	F	
6	Fertilizer (kg/ha) Basal (N+P+K) Top dressing (N)	Р	Р	Ρ	Ρ	Ρ	
7	Method of fertilizer use	Р	Р	Р	Р	Р	
8	Micro nutrients	F	F	F	F	F	
9	Pest management	F	F	F	F	F	CG
10	Disease management	F	F	F	F	F	CG
11	Weed control	F	F	F	F	F	CG
12	Irrigation	F	F	F	F	F	
13	Land management	Р	Р	Р	Р	Р	
14	Method of sowing	Р	Р	Р	Р	Р	
15	Water management	F	F	F	F	F	
16	Yield	Ρ	Р	Р	Р	Р	

5.8.4:3: Gram

Table-5.8.4:2 : Gap in Adoption of Improved Technology in representative villages of different AES in Patna District. Crop: Gram

S.No.	Recommended F/P/N practice	Gap in in AES	adoptio villages	Remarks			
		AES-I	AES- II	AES- III	AES- IV	AES-V	
1	Sowing time/method	F	F	F	F	F	Moisture regime
2	Varieties	Р	Р	Р	Р	Р	Non availability
3	Seed rate(kg/ha)	Р	Р	Р	Р	Р	Traditional
4	Seed treatment	F	F	F	F	F	CG

5	Organic manure	F	F	F	F	F	
6	Fertilizer (kg/ha)	Р	Р	Р	Р	Р	
	Basal (N+P+K)						
	Top dressing (N)						
7	Method of fertilizer use	Р	Р	Р	Ρ	Р	
8	Micro nutrients	F	F	F	F	F	
9	Pest management	F	F	F	F	F	CG
10	Disease management	F	F	F	F	F	CG
11	Weed control	F	F	F	F	F	CG
12	Irrigation	F	F	F	F	F	
13	Land management	Р	Р	Р	Р	Р	
14	Method of sowing	Р	Р	Р	Р	Р	
15	Water management	F	F	F	F	F	
16	Yield	Р	Р	Р	Р	Р	

5.8.4.4: Lathyrus: Lathyrus is grown in almost all the AES of Patna district for its fodder potential as well as for human consumption, both as green and dal purpose. Despite a ban by the Government on the crop, the farmers prefer the crop mainly because it is resistant to many diseases and pests and thrives on residual/ scanty moisture. ATMA would strive for creating awareness among the farmers and refer to RAU, Pusa for suggesting alternative crops for the agricultural and dairy farming systems. (Table-5.8.4.3).

Table -5.8.4.3: Gap in Adoption OF Improved technology in r	epresentative villages of differer	nt AES in Patna District.
Crop: Lathyrus		

S.No.	Recommended F/P/N practice	Gap ir	n adoptio ology in	Remarks			
		AES	AES II	AES III	AES IV	AES V	
1	Sowing time/method	Т	Т	Т	Т	Т	
2	Varieties	Т	Т	Т	Т	Т	
3	Seed rate (kg/ha)	Т	Т	Т	Т	Т	
4	Seed treatment	Т	Т	Т	Т	Т	
5	Organic manure	Т	Т	Т	Т	Т	
6	Fertilizer (kg/ha) Basal (N+P+K) Top dressing (N)	Т	Т	Т	Т	Т	
7	Method of fertilizer use	Т	Т	Т	Т	Т	
8	Micro nutrients	Т	Т	Т	Т	Т	
9	Pest management	Т	Т	Т	Т	Т	
10	Disease management	Т	Т	Т	Т	Т	
11	Weed control	Т	Т	Т	Т	Т	
12	Irrigation	Т	Т	Т	Т	Т	
13	Method of harvesting	Т	Т	Т	Т	Т	
14	Marketing	Т	Т	Т	Т	Т	
15	Yield	Т	Т	Т	Т	Т	

Table -5.8.4:4: Gap in Adoption of Improved Technology in representative villages of different AES in Patna District. Crop: Pea

S.No.	Recommended F/P/N	Gap in	adoptio	Remarks			
	practice	in AES	in AES villages				
		AES-I	AES-	AES- III	AES- IV	AES-V	
1	Sowing time/method	F	F	F	F	F	Moisture regime
2	Varieties	Р	Р	Р	Р	Р	Non availability
3	Seed rate(kg/ha)	Р	Р	Р	Р	Р	Traditional
4	Seed treatment	F	F	F	F	F	CG
5	Organic manure	F	F	F	F	F	
6	Fertilizer (kg/ha)	Р	Р	Р	Р	Р	
	Basal (N+P+K)						
	Top dressing (N)						
7	Method of fertilizer use	Р	Р	Р	Р	Р	
8	Micro nutrients	F	F	F	F	F	
9	Pest management	F	F	F	F	F	CG
10	Disease management	F	F	F	F	F	CG
11	Weed control	F	F	F	F	F	CG
12	Irrigation	F	F	F	F	F	
13	Land management	Р	Р	Р	Р	Р	
14	Method of sowing	Р	Р	Р	Р	Р	
15	Water management	F	F	F	F	F	
16	Yield	Р	Р	Р	Р	Р	
5.8.5: Oilseed Crops

S.No.	Recommended F/P/N practice	Gap ir techno	n adoptio ology in	on of imp AES villa		Remarks	
		AES I	AES II	AES III	AES IV	AES V	
1	Sowing time/method	Р	Р	Р	Р	Р	
2	Varieties	Р	Р	Р	Р	Р	
3	Seed rate (kg/ha)	Р	Р	Р	Р	Р	
4	Seed treatment	F	F	F	F	F	CG
5	Organic manure	F	F	F	F	F	
6	Fertilizer (kg/ha) Basal (N+P+K) Top dressing (N)	F	Р	F	F	Р	
7	Method of fertilizer use	Р	Р	Р	Р	Р	
8	Micro nutrients	N	N	N	N	N	
9	Pest management	Р	Р	Р	Р	Р	
10	Disease management	Р	Р	Р	Р	Р	
11	Weed control	Ν	Ν	Ν	Ν	Ν	
12	Irrigation	Р	Р	Р	Р	Р	
13	Method of harvesting	Ν	Ν	Ν	Ν	Ν	
14	Marketing	Т	Т	Т	Т	Т	
15	Yield	Р	Р	Р	Р	Р	

 Table - 5.8.5.1: Gap in Adoption of Improved Technology in representative villages of different AES in Patna

 District. Crop: Mustard-Toria

5.8.6: Sugar Cane: Since time immemorial Bihar farmers have proficiency in growing sugarcane. Due to apathy of Government and closure of sugar mills farmers have been forced to diversify. Because of proximity to Patna city consumers, the sugar cane area has been limited to juice purpose and gur making. Sugar cane has also great social importance during the Chatha and other important festivals. With government intervention the crop can be revived again and this would greatly benefit the framers of the district.

Table –5.8.6.1: Gap in Adoption of Improved	Technology in representative	villages of different	AES in Patna
District. Crop: Sugarcane			

S.No.	Recommended F/P/N practice	Gap ir techno	n adoptie ology in	on of imp AES vill		Remarks	
		AES	AES	AES	AES	AES	
		1	II	III	IV	V	
1	Sowing time/method	-	-	-	Т	Т	
2	Varieties	-	-	-	Т	Т	
3	Seed rate (kg/ha)	-	-	-	Т	Т	
4	Seed treatment	-	-	-	Т	Т	
5	Organic manure	-	-	-	Т	Т	
6	Fertilizer (kg/ha)	-	-	-	Т	Т	
	Basal (N+P+K)						
	Top dressing (N)						
7	Method of fertilizer use	-	-	-	Т	Т	
8	Micro nutrients	-	-	-	Т	Т	
9	Pest management	-	-	-	Т	Т	
10	Disease management	-	-	-	Т	Т	
11	Weed control	-	-	-	Т	Т	
12	Irrigation	-	-	-	Т	Т	
13	Method of harvesting	-	-	-	Т	Т	
14	Water management	-	-	-	Т	Т	
15	Yield	-	-	-	Т	Т	

5.8.7: Vegetable Crops

Table-5.8.7.1: Gap in adoption of improved technology for different vegetables in AES I (TAL)

SI. No.	Item	Gap in adopt in different v	ed technology	Remarks		
		Ladies finger	Onion	Potato		
1.	Sowing time/method	Р	Р	F		
2.	Varieties	Р	Р	Р		
3.	Seed rate(kg/ ha)	F	F	F		
4.	Seed treatment	Р	Р	Р		
5.	Spacing	Р	Р	Р		
6.	Organic manure	Р	Р	Р	CG	
7.	Fertilizer (kg/ha)					
	- Basal (N+P+K)	F	F	F		
	- Top dress (N)	F	F	F		

8.	Micro-nutrients	Р	Р	Р	
9.	Pest management	Р	Р	Р	CG
10.	Disease management	Р	Р	Р	CG
11.	Weed control	N	Р	Р	
12.	Irrigation	N	Р	Р	
13.	Method of harvesting	Р	Р	Р	
14.	Marketing*	Р	Р	Р	

*Traditional, E : Excess, + : Mixed farming with sugarcane and maize.

Table-5.8.7.2: Gap in adoption of improved technology for different vegetable in AES II (Diara)

SI.	Item	Gap in adoption of improved technology in different vegetable										
No.		Pointed Gourd	Bitter gourd	Nenua	Ladies finger	Tomato	Brinjal	Onion	Potato	Coriander		
1.	Sowing	Р	Р	Р	Р	Р	Р	Р	Р	Р		
	time/method											
2.	Varieties	Р	Р	Р	Р	Р	Р	Р	Р	F		
3.	Seed rate	Р	Р	Р	Р	Р	Р	Р	Р	Р		
	(kg/ ha)											
4.	Seed treatment	F	F	F	F	F	F	F	F	F	CG	
5.	Spacing	Р	Р	Р	Р	Р	Р	Р	Р	Р		
6.	Organic manure	F	F	Р	Р	F	F	Р	F	F	CG	
7.	Fertilizer (kg/ha)											
	- Basal	Р	Р	Р	Р	Р	Р	Р	Р	Р		
	(N+P+K)											
	 Top dress 	F	F	F	F	F	F	F	F	F		
	(N)											
8.	Micro-nutrients	F	F	F	F	F	F	F	F	F	CG	
9.	Pest	Р	Р	Р	Р	Р	P	Р	Р	Р	CG	
	management											
10.	Disease	Р	Р	Р	Р	Р	Р	Р	Р	Р	CG	
	management											
11.	Weed control	Р	Р	Ν	Р	Ν	Ν	Ν	Ν	N		
12.	Irrigation	Р	Р	Р	Ν	Р	Ν	Р	Р	Р		
13.	Method of	Р	Р	Р	Р	Р	Р	Р	Р	Р		
	harvesting											
14.	Marketing*	Р	Р	Р	Р	Р	Р	Р	F	Р	CG	
									(CG)			
15.	Yield	Р	Р	Р	Р	Р	Р	Р	Р	Р		

*Traditional, E : Excess, + : Mixed farming with sugarcane and maize. **Table-5.8.7.3 : Gap in adoption of improved technology for different vegetable in AES III (JALLA)**

SI.	Item	Gap in adoption of improved technology in different vegetable R										
No.		Pointed	Bitter	Nenua	Ladies	Tomato	Brinjal	Onion	Potato	Coriander		
		Gourd	gourd		finger							
1.	Sowing	P	Р	P	Р	Р	Р	Р	Р	Р		
	time/method											
2.	Varieties	Р	Р	Р	Р	Р	Ν	Ν	Р	F		
3.	Seed rate	Р	Р	Р	Р	Р	Р	Р	Р	Р		
	(kg/ ha)											
4.	Seed treatment	F	F	F	F	F	F	F	Р	Р	CG	
5.	Spacing	Р	Р	Р	Р	Р	Р	Р	Р	Р		
6.	Organic manure	F	F	F	Р	F	F	Р	F	Р		
7.	Fertilizer (kg/ha)											
	- Basal	Р	Р	Р	Р	Р	Р	Р	Р	Р		
	(N+P+K)											
	 Top dress 	F	F	F	F	F	F	F	F	F		
	(N)											
8.	Micro-nutrients	F	F	F	F	F	F	F	F	F		
9.	Pest	Р	Р	Р	Р	Р	Р	Р	Р	Р	CG	
	management											
10.	Disease	Р	Р	Р	Р	Р	Р	Р	Р	Р	CG	
	management											
11.	Weed control	Р	Р	Р	Р	Р	Ν	Ν	Ν	N		
12.	Irrigation	Р	Р	Р	Р	Ν	Ν	Р	Р	N		
13.	Method of	Р	Р	Р	Р	Р	Р	Р	Р	Р		
	harvesting											
14.	Marketing*	Р	Р	Р	Р	Р	Р	F(C	F	Р	CG	
	Ŭ			1				G)	(CG)			
15.	Yield	Р	Р	Р	Р	Р	Р	P	P	Р		

*Traditional, E : Excess, + : Mixed farming with sugarcane and maize. Table-5.8.7.4 : Gap in adoption of improved technology for different vegetable in AES IV (Irrigated uplands)

SI.	Item	Gap i	n ador	tion of	improv	ed techr	noloav ir	n diffe	rent v	egetab	e			Remarks
No.		Point	ed Bi	tter	Nenua	Ladies	Tomato	Brinj	al Or	nion P	otato	Corian	Cauli	
		Gou	rd go	ourd		finger		-				der	flowe	r
1.	Sowing time/method	P	P		Р	P	Р	Р	P		Ρ	Р	Р	
2.	Varieties	Р	P		Р	Р	Р	Р	P		Р	Р	Ρ	
3.	Seed rate (kg/ ha)	P	P		Ρ	P	Р	Р	P		Р	Р	Ρ	
4.	Seed treatment	F	F		F	F	F	F	F		F	F	F	CG
5.	Spacing	Р	P		P	Р	Р	Р	P		Р	Р	Р	
6.	Organic	F	F		F	F	F	F	P		F	F	Р	CG
	manure													
7.	Fertilizer													
	(kg/ha)	_			-	_	-	_			-		_	
	- Basal	Р			Р	Р	Р	Р			Р	Р	Р	
	- Top dress	F	F		F	F	F	F	F		F	F	F	
	(N)		1.		1	1	•		'			•		
8.	Micro-nutrients	F	F		F	F	F	F	F		F	F	F	CG
9.	Pest	Р	P		P	Р	Р	Р	P		Р	Р	Р	
	management													
10.	Disease	Р	P		Р	Р	Р	Ρ	P		Р	Р	Ρ	
	management						_	_			_	_		
11.	Weed control	N	P		N	Р	Р	P	<u>N</u>		P	Р	<u>N</u>	
12.	Irrigation	N	N		N	Р	Р	Р	- P		N	N	N	CG
13.	Method of	Р			Р	Р	Р	Р			Ρ	Р	Ρ	
14	Marketing*	P	P		P	P	P	P	F(CG)	F(CG)	P	Р	CG
15	Yield	P	P		P	P	P	P		00)	P	P	P	00
*Trac	litional, E :	Exces	s, + :	Mixed	farming	with sug	arcane a	ind ma	aize.		-			
Table	e - 5.8.7.5: Gap ir	n adop	otion of	improv	ved tecl	hnology	for diffe	rent v	egetal	bles in	AES \	V (Rain	fed up	lands)
SI.	Item		Gap in	n adopt	ion of ir	nproved	l techno	logy ir	n diffe	rent ve	getab	le		Remarks
No.			Point	Bitter	Nonu	Ladi	es Tom	ato B	rinjal	Onion	Potat	o Coria	nder	
			Gour	goura	Nenu	a nnge	=1							
			d											
1.	Sowing		Р	Р	Р	Р	Р		Р	Р	Ρ	Р		
	time/method			_						_	_			
2.	Varieties		<u>P</u>	Р	Р	<u> P</u>	<u> </u>		N	Р	Р			
3.	Seed rate		Р	Р	P	P	Р		Р	Р	Р			
4	Seed treatmer	nt	F	F	F	F	F		F	F	F	F		CG
5.	Spacing	it.	P	P	P	P	P		P	P	P	P		00
6.	Organic manu	re	F	F	F	F	F		F	P	P	F		CG
7.	Fertilizer (kg/h	a)												
	- Basal		Р	Р	Ρ	Р	Р		Р	Р	Р	Р		
	(N+P+K)		_	_		_	_		_	_	_			
	- I op dress	; (N)	F		F F	F	F		F		F	F –		
8.	Micro-nutrients	S												CG
9.	Pest managen	iient	<u>г</u>			<u>۲</u>				Г D	P	۲ م		├ ────┤
10.	management		г			F			۲'	Г				
11	Weed control		N	N	N	N	P		N	Р	N	P		
12.	Irrigation		P	P	N	P	P		P	P	P	P		
13.	Method of		Р	Р	P	N	P		N	Р	P	P		
	harvesting													
14.	Marketing*		Ρ	Р	Р	Р	Р		P	F(CG) F(C	G) P		
15.	Yield		Р	Р	Р	P	P		P	Р	F	P		

T- Traditional, E : Excess, + : Mixed farming with sugarcane and maize.

5.8.8: Fodder Crops:

Table-5.8.8 : Gap in adoption of improved technology in representative villages of different AES in Patna district Crop: Fodder Crops

S.	ltem	Gap in adop	Gap in adoption of improved technology									
No.		Sachharum	Sorghum			Chinese cabbage	Berseem	Oats				
	AES		11	IV	v	IV	IV	11	v			
1	Land preparation	Т	Ν	Ν	Ν	Р	N	Ν	Ν			
2	Spacing	Т	Ν	Ν	Ν	Р	Ν	Ν	Ν			

3	Planting									
	-time	Т	Р	Ν	Ν	Р	N	Ν	Ν	CG
	-material	Т	Р	Р	Р	Р	Р	Р	Р	
	- method	Т	Р	Р	Ρ	Р	Р	Р	Р	
4	Organic manure	Т	Р	Р	Р	Р	Р	Р	Р	CG
	-quantity	Р	Р	Р	Р	Р	Р	Р	Р	
	-method	Р	Р	Р	Р	Р	Р	Р	Р	
	-time	Р	Р	Р	Ρ	Р	Р	Р	Р	
5	Fertilizer (kg/ha)									
	-Basal (N+P+K)	Т	Р	Р	Ρ	Р	Р	Р	Р	
	-Top dressing (N)	Т	Р	Р	Ρ	Р	Р	Р	Р	
6	Method of fertilizer use	Т	Р	Р	Ρ	Р	Р	Р	Ρ	
7	Micro-nutrient use	Т	F	F	F	F	F	F	F	CG
8	Pest management	Т	F	F	F	F	F	F	F	
9	Disease management	Т	F	F	F	F	F	F	F	
10	Weed control	Т	Ν	Ν	Ν	N	N	Ν	Ν	
11	Irrigation	Т	Р	Р	Ρ	Р	Р	Р	Ρ	
12	Special practices (pruning)	Т	Р	Р	Ρ	Р	Р	Р	Ρ	
13	No. of cuttings	Т	Ν	N	N	N	N	N	N	
14	Yield	Т	Р	Р	Ρ	Р	Р	Р	Ρ	

5.8.9: Fruit Crops

Table-5.8.9.1: Gap in adoption of improved technology in representative villages of different AES in Patna district **Crop: Fruit Crops**

S.	Item	Gap in adoption of improved technology									
No		Guava	Bana	ina		Papaya	Mango				
	AES	V	II	IV	V	V	I	IV	V		
1	Sowing time/ method	Р	Р	Р	Ρ	Р	Р	Р	Р		
2	Varieties	Р	Р	Р	Р	Р	Р	Ρ	Р		
3	Seed rate (Kg/ha)	Р	Р	Р	Р	Р	Р	Ρ	Р		
4	Seed treatment	F	F	F	F	F	F	F	F		
5	Spacing	Р	Р	Р	Р	Р	Р	Ρ	Р		
6	Organic manure	F	F	F	F	F	F	F	F	CG	
7	Fertilizer (kg/ha)									CG	
	-Basal (N+P+K)	Р	F	F	F	Р	F	Р	Р		
	-Top dressing (N)	F	F	F	F	F	F	F	F		
8	Method of fertilizer use	Р	F	F	F	Р	F	Р	Р		
9	Micro-nutrient use	F	F	F	F	F	F	F	F		
10	Pest management	P (CG)	Р	Р	Ρ	Р	P (CG)	P (CG)	P(CG)	CG	
11	Disease management	Р	Р	Р	Ρ	Р	Р	Р	Р	CG	
12	Weed control	Р	Р	Р	Р	Р	Ν	Ρ	Р		
13	Irrigation	Р	Р	Ν	Ρ	Р	Р	Ν	Р	CG	
14	Method of harvesting	Р	Р	Р	Р	Р	Р	Ρ	Р		
15	Farm level processing	Р	Р	Р	Р	Р	Р	Ρ	Р	CG	
16	Special practices	F	F	F	F	F	F	F	F	CG	
17	Marketing	Р	Р	Р	Р	Р	Р	Р	Р		
18	Yield	Р	Р	Р	Р	Р	Р	Р	Р	CG	

5.8.10: Flowers Table –5.8.10: Gap in Adoption of Package of Practices in representative villages of different AES in Patna District. Crop: Floriculture-Marigold

S.No.	Recommended F/P/N practice	Gap in techn	n adopti ology in	on of im AES vil	Remarks		
		AES I	AES II	AES III	AES IV	AES V	
1	Sowing time/method	Р	Р	Р	-	-	CG
2	Varieties	Ν	Ν	Ν	-	-	
3	Seed rate (kg/ha)	Ν	Ν	Ν	-	-	
4	Seed treatment	-	-	-	-	-	
5	Spacing	Ν	Ν	Ν	-	-	
6	Organic manure	F	F	F	-	-	CG
7	Fertilizer (kg/ha) Basal (N+P+K) Top dressing (N)	Р	Р	P	-	-	CG
8	Method of fertilizer use	Р	Р	Р	-	-	
9	Micro nutrients	Ν	Ν	Ν	-	-	
10	Pest management	Р	Р	Р	-	-	CG

11	Disease management	Р	Р	Р	-	-	
12	Weed control	N	N	N	-	-	
13	Irrigation	Ν	Ν	N	-	-	
14	Method of harvesting	Ν	Ν	Ν	-	-	
15	Processing at farm	-	-	-	-	-	CG
	level						
16	Marketing	Т	Т	Т	-	-	CG
17	Yield	Р	Р	Р	-	-	

5.8.11: Animal Husbandry Table-5.8.11.1- : Gap in adoption in Animal Husbandry-Buffalo

S.	Item of Package	Recommendation	Gap in a	doption	of improve	ed technolo	ogy in	Remarks
NO			represe	ntative v	llage of ea	Ch AES	450.14	
			AES-1	AES-II	AES-III	AES-IV	AES-V	
1	Breed upgradation		_	_		_	_	
	Artificial		Р	F	N	P	Р	CG
	Prood	Murrah Cradad	D		N	D		<u> </u>
	Location		Г					0
	Noturol	A.I.Centre Murroh Crodod	Г		Г D		Г	
	insemination	Multan, Gladed		F	Г			
	Location	Bull Centre	P	P	P	P	P	
2	Feed	Buil Contro	•	-	1	•		
2	Management							
	(per animal)							
	Green fodder	35-40	Р	F	Р	N	F	CG
	(Kg/dav)				•			
	Dry fodder	8-10	Р	Р	Р	N	Р	
	(Kg/day)							
	Concentrates	2.5-3.0 kg	Р	F	Р	Р	Р	
	(g/day)	(1 kg of						
		concentrate for						
		every 2.5 lit. of milk						
		produced)						
	Minerals (mix)	40 gm/day	F	F	Р	Р	Р	CG
	Vitamins (mix)	10 ml/day	Р	F	Р	Р	F	CG
3	Inter Calving		Р	Р	Р	Р	Р	
	Period (Months)	14-16 months						
4	Health care		Р	F	Р	-	Р	CG
	(Per annum)		_				_	
	HS/BQ	Twice	Р	F	Р	Р	Р	CG
	(No. of							
	vaccinations)		_	_			_	
	FMD		Р	F	Р	Р	Р	CG
	Rinder Pest	On need	Р		F	F		
	Mastitis test	On need	Р	P	F			
	Thilariasai	On need	P	P		F		
5	Deworming	Quarterly once	۲ ۲	۲	Г	1 P	۲ ۲	
5	General							
	Management	0	D		- -	NI	-	
	(Times (dev)	Unce	P	P	1	IN	1	
	(Times/ day)	0000	D	D	т	N	т	
	(Times/day)	Unce						
	Housing	Pucca	D	D	т	т	T	
	(Pucca/kutcha)	i ucca	1-	1-	1		'	
<u> </u>	Drinking water	50 lit	P	N	P	N	P	
<u> </u>	Yallowing		P	N	N	N	N	
6	Average Yield		1		IN I	11	IN	
	Milk/ /Day /	10-15 lit	Р	Р	Р	Р	Р	
	Buffalo/Cow		'	'	•	'	'	
L			1	1		1		

Table-5.8.11.2 : Gap in adoption in Animal Husbandry-Cows(Cross bred and Desi)

S.	Item of Package	Recommendation	Gap in a	adoption	of improve	ed technol	ogy in	Remarks
No			represe	ntative v	Ilage of ea	ch AES		
			AES-1	AES-II	AES-III	AES-IV	AES-V	
1	Breed upgradation		_	_			_	
	Artificial		Р	Р	Р	Р	Р	
	insemination		<u> </u>	_	6	_		00
	Breed	Jersey, C.B.,R.S	Р	Р	P	Р	P	CG
	Location	A.I.Centre	P	P	P	Р	F	
	Natural	Jersey, C.B.,R.S	Р	Р	Р	Р	Р	
		Dull Contro	D	D	D	D	D	
2	Location	buil Centre	Р	Р	P	P	P	<u> </u>
2	Managamant							CG
	(per animal)							
	Green fodder	30-35 ka	P	F	P	P	P	
	(Kg/dav)	00-00 Ng	1		1	1	1	
	Dry fodder	6 kg/day	Р	Р	Р	N	Р	
	(Kg/dav)	o ng/day	•		•			
-	Concentrates	2.0 –2.5 kg for per	Р	F	Р	Р	Р	
	(q/day)	kg of milk produced	-	-	-		-	
	Minerals (mix)	40 gm/day	Р	F	Р	Р	F	CG
	Vitamins (mix)	10 ml/day	Р	F	F	Р	F	CG
3	Inter Calving	-	Р	Р	Р	Р	Р	
	Period (Months)	12-14 months						
4	Health care							
	(Per annum)							
	HS/BQ	Twice	Р	Р	Р	Р	Р	
	(No. of							
	vaccinations)	- ·	_	_			_	
	FMD		Р	Р	P	Р	P	
	Rinder Pest	On need	P	Р	P		P	00
	Mastitis test	On need		Р	F			
	I hilariasai	On need		Р				CG
-	Deworming	Quarterly once	Р	Р	Р	Р	Р	
э	General							
	Washing	0000	т	D	D	N		
	(Times/ day)	Once	1	Г	Г	IN	Г	
	(Times/ day)	Once	т	F	P	N	P	
	(Times/day)			'	•			
	Housing	Pucca	Т	Р	Р	т	Р	
	(Pucca/kutcha)		-	·			1.	
	Drinking water	40-50 lit.	Р	Р	Р	N	Р	
6	Average Yield							
<u> </u>	Milk/ /Day /	8-10 lit./day	Р	Р	Р	Р	Р	
	Buffalo/Cow							

Table-5.8.11.3 : Gap in adoption in Animal Husbandry-Goat

S. No	Item of Package	Recommendation	Gap in a	adoption	of improve	ed technolo Ich AES	ogy in	Remarks
			AES-1	AES-II	AES-III	AES-IV	AES-V	
1	Breed upgradation							
	Artificial							
	insemination							
	Breed	Improved	F	F	F	Р	F	CG
	Location	A.I.Centre	F	F	F	Р	F	CG
	Natural	Improved	Р	Р	Р	Р	Р	
	insemination							
	Location	Bull Centre	Р	Р	Р	Р	Р	
2	Feed							
	Management							
	(per animal)		_	_	-		-	
	Green fodder	2-3 kg	Р	Р	I	N	F	CG
	(Kg/day)	1.0	<u> </u>	NI	D	NI	<u> </u>	
	Dry todder	1-2	Р	N	Р	N	Р	
	(Kg/uay)	200.250	D	D	D	D	D	
	(a/day)	200-250	F	F	Р	F	Р	
	(g/uay) Minerals (mix)	10 gm/day	F	F	F	D	F	<u> </u>
	Vitamine (mix)	5 ml/day	F	F	F	P	P	00
3	Inter Calving	5 mi/day	P	P	P	P	P	
0	Period (Months)	6-7 months	'			1	'	
4	Health care							
	(Per annum)							
	HS/BQ	Twice	F	F	F	F	F	CG
	(No. of							
	vaccinations)							
	FMD	Twice	F	F	F	F	F	
	ENT	Once	F	F	F	F	F	
	Deworming	Quarterly once	Р	Р	Р	F	Р	
5	General							
	Management							
	Washing	Nil	Т	Р	Р	Р	Р	
	(Times/ day)							
	Cleaning	Once	Т	Р	Р	Р	Р	
	(Times/day)				-			
	Housing	Pucca	Г	P	ľ	Ī	Р	
	(Pucca/kutcha)		-			- -		
	Drinking water	5 lit.		N	۲ -			
6	Average Yield	15-20 kg.	11					1

Table 5.8.11.4- : Gap in adoption in Animal Husbandry-Backyard Poultry

S. No	Item of Package	Recommendation	Gap in a represe	adoption ntative v	ogy in	Remarks		
			AES-1	AES-II	AES-III	AES-IV	AES-V	
1	Breed upgradation							
	Breed	Graded, Improved	Р	-	-	-	Р	CG
2	Feed			-	-	-		
	Management							
	(per bird)							
	Concentrates	100-120 gm/day	N	-	-	-	Ν	
	(g/day)							
	Minerals (mix)	1 gm /bird/ /day	Ν	-	-	-	Ν	
	Vitamins (mix)	0.1 ml/bird/day	Р	-	-	-	Р	
3	Health care			-	-	-		
	(Per annum)							
	Marek's disease	Once in life time	F	-	-	-	F	CG
	RD(No. of	Twice	F	-	-	-	F	CG
	vaccination)							
	Fowl pox	Once	F	-	-	-	F	CG
	Deworming	Quarterly once	F	-	-	-	F	CG
4	General			-	-	-		
	Management							
	Cleaning	Once	F	-	-	-	F	
	(Times/day)							
	Housing	Pucca	Т	-	-	-	Т	
	(Pucca/kutcha)							
	Drinking water	Adequate	Р	-	-	-	Р	
5	Average Yield-egg	200-250 eggs/year	Р	-	-	-	Р	
	Chicken meat	10-12 kg/ year	Р	-	-	-	Р	
	Broiler meat	1.5-2.0 kg/ bird	Р	-	-	-	Ρ	

Table-5.8.11.5 : Gap in adoption in Animal Husbandry-Pig

S.	Item of Package	Recommendation	Gap in a	adoption	of impro	ved tech	nology in	Rem	Remarks	
No			represe	ntative v	illage of	each AE	S			
1	Breed upgradation		AE5-1	AES-II	AES-III	AES	-IV AES-V			
	Artificial									
	insemination									
	Breed	Improved	F	-	-	F	F	CG		
	Location	A.I.Centre	F	-	-	F	F	CG		
	Natural	Improved	Р	-	-	P	Р			
	Location	Bull Centre	F	-	-	F	F			
2	Feed Management									
	(per animal)									
	Green fodder (Kg/day)	2-3 kg	Р	-	-	Р	Р			
	Dry fodder (Kg/day)	1-2	Р	-	-	Р	Р			
	Concentrates	200-250	F	-	-	F	F	CG		
	(g/uay) Minerals (mix)	10 cm/day	F	-	_	F	F	CG		
	Vitamins (mix)	5 ml/dav	F	-	-	F	F	CG		
3	Inter Calving		P	-	-	P	P			
	Period (Months)	6-7 months								
4	Health care (Per annum)			-	-					
	HS/BQ	Twice	F	-	-	F	F	CG		
	(No. of vaccinations)									
	FMD	Twice	F	-	-	F	F	CG		
	ENT	Once	F	-	-	F	F	CG		
	Deworming	Quarterly once	F	-	-	F	F	CG		
5	General Management			-	-					
	Washing	Nil	Р	-	-	Р	Р			
	(Times/ day)	0.000	-							
	(Times/day)	Once	1	-	-	1	1			
	Housing	Pucca	Т	-	-	Т	Т			
	Drinking water	5 lit	P	-	_	P	P			
6	Average Yield	35-40 kg	P	-	-	P	P			
Tabl	e- 5.8.11.6: Fisherv	gap analysis in differ	ent AES o	of Patna o	district			1		
S.No	b. Item of package	Recommendatio	on <u>n</u>			Gap in	adoption of i	mprov	ed techr	noloav in
						differe	nt AĖS	•		0,
						Ι	II ≈ III	IV	V	Remarks
1	CULTURE									≈ -
		If only IMC is take	on Catla F	Robu Mri	ler					fishery
	a. maian oarp	40:30:30	Sil Oalla, I		Jai	-	Р	Р	Р	nanery
	b. Exotic Carp	If IMC with EC				-	F -	F	F	CG
	C Prawn	Catla, Rohu, Mrig	jal			-	F -	F	F	
	d. Cat fish	Silver carp Grass	carp=2			-	F -	F	F	
2.	Pond Preparation	5:35:25:5:5:5								CG
	a. Organic Manur	e 10.000kg				-	Т -	Т	F	CG
	b. In-organic Manure	200 Kg/ha				-	т -	Т	F	CG
	c. Bio-fertilizer	40,000Kg/ha				-	т -	Т	F	CG
	d. Lime	200 kg/ha				-	F -	F	F	
	e. Water depth	1.5 mt.				-	P -	Р	Ν	
3.	Weed Control	Manual /mechani	cal 2-4-d a	application	<u>ו</u>	-	P -	Р	F	CG
4.	Stocking Zone					-	-			CG
	a. Spawn	10,000-20,000				-	P -	Р	Р	
	b. Fry	10,000				-	P -	Р	Ν	
L	c. Fingerling	5,000				-	F -	P	F	
5.	Feeding Schedule	9				-	-			

5.

	a. Rice bran	Rice bran and ground nut oil cake mixture in the ratio of 1:1 submerged weed to be added if grass carp is stocked	-	Р	-	Ρ	F	
	b. Oil cake		-	Р	-	Р	F	
	c. Green Leaf		-	Р	-	Р	Ν	
6.	Disease	Application of CIFAX and lime	-	Р	-	Р	Р	CG
7.	Sample Netting	Quarterly to assess growth	-	Р	-	Р	Р	
8.	Aeration	During morning hours churning by mechanical /mechanical means	-	F	-	F	F	
9.	Harvesting Method	Cycle	-	Р	-	Р	Ν	
10.	Culture Method	Composite pisciculture	-	Р	-	Р	Ρ	CG
11.	Average Yield	2-3 t/ha	-	Р	-	Т	Р	CG

5.9: IPM and INM Practices in the Representative Villages

Table -	5.9.1 : Recommended IPM	practices and Gap in A	doption in Different	AES in Patna District
Crop:	Wheat	-	-	

S.No.	Recommended IPM practice	Gap in a	ap in adoption in AES							
		AES-I	AES-II	AES-III	AES-IV	AES-V				
1	Cultural measures									
	Summer ploughing	N	N	Ν	N	N				
	Crop sanitation	Р	Р	Р	Р	Р				
	Trimming of bunds & cleaning	F	F	F	F	F				
	Crop rotation	Р	Р	Р	Р	Р				
2	Varietal									
	Resistant / tolerant	Р	Р	Р	Р	Р				
	Varieties against key pests	F	F	F	F	F				
3	Mechanical									
	Use of light pheromone traps	F	F	F	F	F				
	Use of bamboo percher	F	F	F	F	F				
4	Physical									
	Sun drying of seeds & seed treatment	Р	Р	Р	Р	Р				
	Weed & fertilizer management	Р	Р	Р	Р	Р				
5	Biological									
	Use of bio-agents	F	F	F	F	F				
	Use of bio-pesticides	F	F	F	F	F				
6	Chemical									
	Eco-friendly chemicals	F	F	F	F	F				

Table -5.9.2: Recommended IPM practices and Gap in Adoption in Different AES in Patna District. Crop: Paddy

S.No.	Recommended IPM practice	Gap in a	Gap in adoption in AES							
		AES-I	AES-II	AES-III	AES-IV	AES-V				
1	Cultural measures									
	Summer ploughing	F	Р	Р	Р	Р				
	Crop sanitation	F	F	F	F	F				
	Trimming of bunds & cleaning	F	F	F	F	F				
	Crop rotation	P	Р	Р	Р	Р				
2	Varietal									
	Resistant / tolerant	F	F	F	Р	Р				
	Varieties against key pests	F	F	F	F	F				
3	Mechanical									
	Use of light pheromone traps	F	F	F	F	F				
	Use of bamboo percher	F	F	F	F	F				
4	Physical									
	Sun drying of seeds & seed	Р	Р	Р	Р	Р				
	treatment									
	Weed & fertilizer management	Р	Р	Р	Р	Р				
5	Biological									
	Use of bio-agents	F	F	F	F	F				
	Use of bio-pesticides	F	F	F	F	F				
6	Chemical									
	Eco-friendly chemicals	F	F	F	F	F				

Table -5.9.3: Recommended IPM practices and Gap in Adoption in Different AES in Patna District. Crop: Maize

S.No.	Recommended IPM practice	Gap in adoption in AES						
		AES-I	AES-II	AES-III	AES-IV	AES-V		

1	Cultural measures					
	Summer ploughing	F	F	F	F	F
	Crop sanitation	F	F	F	F	F
	Trimming of bunds & cleaning	F	F	F	F	F
	Crop rotation	Р	Р	Р	Р	Р
2	Varietal					
	Resistant / tolerant	Р	Р	Р	Р	Р
	Varieties against key pests	F	F	F	F	F
3	Mechanical					
	Use of light pheromone traps	F	F	F	F	F
	Use of bamboo percher	F	F	F	F	F
4	Physical					
	Sun drying of seeds & seed	Р	Р	Р	Р	Р
	treatment					
	Weed & fertilizer management	Р	Р	Р	Р	Р
5	Biological					
	Use of bio-agents	F	F	F	F	F
	Use of bio-pesticides	F	F	F	F	F
6	Chemical					
	Eco-friendly chemicals	F	F	F	F	F

Table -5.9.4 : Recommended IPM practices and Gap in Adoption in Different AES in Patna District. Crop: Oil seeds(Mustard)

S.No.	Recommended IPM practice	Gap in a	doption in	AES		
		AES-I	AES-II	AES-III	AES-IV	AES-V
1	Cultural measures					
	Summer ploughing	Р	Р	Р	Р	Р
	Crop sanitation	Р	Р	Р	Р	Р
	Trimming of bunds & cleaning	F	F	F	F	F
	Crop rotation	Р	Р	Р	Р	Р
2	Varietal					
	Resistant / tolerant	P	Р	Р	Р	Р
	Varieties against key pests	Р	Р	Р	Р	Р
3	Mechanical					
	Use of light pheromone traps	F	F	F	F	F
	Use of bamboo percher	F	F	F	F	F
4	Physical					
	Sun drying of seeds & seed	Р	Р	Р	Р	Р
	treatment					
	Weed & fertilizer management	F	F	F	F	F
5	Biological					
	Use of bio-agents	Р	Р	Р	Р	Р
	Use of bio-pesticides	F	F	F	F	F
6	Chemical					
	Eco-friendly chemicals	F	F	F	F	F

 Table -5.9.5: Recommended IPM practices and Gap in Adoption in Different AES in Patna District.

 Crop: Gram

S.No.	Recommended IPM practice	Gap in a	doption in A	ES		
		AES-I	AES-II	AES-III	AES-IV	AES-V
1	Cultural measures					
	Summer ploughing	Ν	N	N	N	N
	Crop sanitation	Р	Р	Р	Р	Р
	Trimming of bunds & cleaning	F	F	F	F	F
	Crop rotation	Р	Р	Р	Р	Р
2	Varietal					
	Resistant / tolerant	F	F	F	F	F
	Varieties against key pests	F	F	F	F	F
3	Mechanical					
	Use of light pheromone traps	F	F	F	F	F
	Use of bamboo percher	F	F	F	F	F
4	Physical					
	Sun drying of seeds & seed treatment	Р	Р	Р	Ρ	Ρ
	Weed & fertilizer management	Р	Р	Р	Р	Р
5	Biological					
	Use of bio-agents	F	F	F	F	F
	Use of bio-pesticides	F	F	F	F	F
6	Chemical					
	Eco-friendly chemicals	F	F	F	F	F

Table -5.9.6	6: Recommended IPM	I practices and Gap in	n Adoption in Differe	nt AES in Patna District.
Crop: Lent	til		-	

S.No.	Recommended IPM practice	Gap in a	adoption in <i>I</i>	AES		
		AES-I	AES-II	AES-III	AES-IV	AES-V
1	Cultural measures					
	Summer ploughing	Р	Р	Р	Р	Р
	Crop sanitation	Р	Р	Р	Р	Р
	Trimming of bunds & cleaning	F	F	F	F	F
	Crop rotation	Р	Р	Р	Р	Р
2	Varietal					
	Resistant / tolerant	Р	Р	Р	Р	Р
	Varieties against key pests	F	F	F	F	F
3	Mechanical					
	Use of light pheromone traps	F	F	F	F	F
	Use of bamboo percher	F	F	F	F	F
4	Physical					
	Sun drying of seeds & seed	Р	Р	Р	Р	Р
	treatment					
	Weed & fertilizer management	Р	Р	Р	Р	P
5	Biological					
	Use of bio-agents	F	F	F	F	F
	Use of bio-pesticides	F	F	F	F	F
6	Chemical					
	Eco-friendly chemicals	F	F	F	F	F

 Table -5.9.7: Recommended IPM practices and Gap in Adoption in Different AES in Patna District.

 Crop:
 Pea

S.No.	Recommended IPM practice	Gap in a	adoption in	AES		
		AES-I	AES-II	AES-III	AES-IV	AES-V
1	Cultural measures					
	Summer ploughing	Р	Р	Р	Р	Р
	Crop sanitation	Р	Р	Р	Р	Р
	Trimming of bunds & cleaning	F	F	F	F	F
	Crop rotation	Р	Р	Р	Р	Р
2	Varietal					
	Resistant / tolerant	Р	Р	Р	Р	Р
	Varieties against key pests	F	F	F	F	F
3	Mechanical					
	Use of light pheromone traps	F	F	F	F	F
	Use of bamboo percher	F	F	F	F	F
4	Physical					
	Sun drying of seeds & seed	Р	Р	Р	Р	Р
	treatment					
	Weed & fertilizer management	Р	Р	Р	Р	Р
5	Biological					
	Use of bio-agents	F	F	F	F	F
	Use of bio-pesticides	F	F	F	F	F
6	Chemical					
	Eco-friendly chemicals	F	F	F	F	F

Table -5.9.8: Recommended IPM practices and Gap in Adoption in Different AES in Patna Dist	rict.
Crop: Potato	

S.No.	Recommended IPM practice	Gap in adoption in AES					
		AES-I	AES-II	AES-III	AES-IV	AES-V	
1	Cultural measures						
	Summer ploughing	Р	Р	Р	Р	Р	
	Crop sanitation	Р	Р	Р	Р	Р	
	Trimming of bunds & cleaning	F	F	F	F	F	
	Crop rotation	Р	Р	Р	Р	Р	
2	Varietal						
	Resistant / tolerant	Р	Р	Р	Р	Р	
	Varieties against key pests	F	F	F	F	F	
3	Mechanical						
	Use of light pheromone traps	F	F	F	F	F	
	Use of bamboo percher	F	F	F	F	F	
4	Physical						
	Sun drying of seeds & seed treatment	Р	Р	Р	Р	Ρ	

	Weed & fertilizer management	Р	Р	Р	Р	Р
5	Biological					
	Use of bio-agents	F	F	F	F	F
	Use of bio-pesticides	F	F	F	F	F
6	Chemical					
	Eco-friendly chemicals	F	F	F	F	F

Table –5.9.9: Recommended IPM practices and Gap in Adoption in Different AES in Patna District. Crop: Cabbage

S.No.	Recommended IPM practice	Gap in adoption in AES					
		AES-I	AES-II	AES-III	AES-IV	AES-V	
1	Cultural measures						
	Summer ploughing	Р	Р	Р	Р	Р	
	Crop sanitation	Р	Р	Р	Р	Р	
	Trimming of bunds & cleaning	F	F	F	F	F	
	Crop rotation	Р	Р	Р	Р	Р	
2	Varietal						
	Resistant / tolerant	Р	Р	Р	Р	Р	
	Varieties against key pests	F	F	F	F	F	
3	Mechanical						
	Use of light pheromone traps	F	F	F	F	F	
	Use of bamboo percher	F	F	F	F	F	
4	Physical						
	Sun drying of seeds & seed	Р	Р	Р	Р	Р	
	treatment						
	Weed & fertilizer management	Р	Р	Р	Р	Р	
5	Biological						
	Use of bio-agents	F	F	F	F	F	
	Use of bio-pesticides	F	F	F	F	F	
6	Chemical						
	Eco-friendly chemicals	F	F	F	F	F	

 Table -5.9.10: Recommended IPM practices and Gap in Adoption in Different AES in Patna District.

 Crop:
 Brinjal

S.No.	Recommended IPM practice	Gap in a	adoption in	AES		
	· · · · · · · · · · · · · · · · · · ·	AES-I	AES-II	AES-III	AES-IV	AES-V
1	Cultural measures					
	Summer ploughing	Р	Р	Р	Р	Р
	Crop sanitation	Р	Р	Р	Р	Р
	Trimming of bunds & cleaning	F	F	F	F	F
	Crop rotation	Р	Р	Р	Р	Р
2	Varietal					
	Resistant / tolerant	Р	Р	Р	Р	Р
	Varieties against key pests	F	F	F	F	F
3	Mechanical					
	Use of light pheromone traps	F	F	F	F	F
	Use of bamboo percher	F	F	F	F	F
4	Physical					
	Sun drying of seeds & seed treatment	Р	Р	Р	Р	Р
	Weed & fertilizer management	Р	Р	Р	Р	Р
5	Biological					
	Use of bio-agents	F	F	F	F	F
	Use of bio-pesticides	F	F	F	F	F
6	Chemical					
	Eco-friendly chemicals	F	F	F	F	F

Table - 5.9.11: Recommended IPM practices and Gap in Adoption in Different AES in Patna District. Crop: Cauliflower

S.No.	Recommended IPM practice	Gap in adoption in AES					
		AES-I	AES-II	AES-III	AES-IV	AES-V	
1	Cultural measures						
	Summer ploughing	Р	Р	P	Р	Р	
	Crop sanitation	Р	Р	Р	Р	Р	
	Trimming of bunds & cleaning	F	F	F	F	F	
	Crop rotation	Р	Р	Р	Р	Р	
2	Varietal						
	Resistant / tolerant	Р	Р	Р	Р	Р	
	Varieties against key pests	F	F	F	F	F	
3	Mechanical						

	Use of light pheromone traps	F	F	F	F	F
	Use of bamboo percher	F	F	F	F	F
4	Physical					
	Sun drying of seeds & seed treatment	Р	Р	Р	Ρ	Ρ
	Weed & fertilizer management	Р	Р	Р	Р	Р
5	Biological					
	Use of bio-agents	F	F	F	F	F
	Use of bio-pesticides	F	F	F	F	F
6	Chemical					
	Eco-friendly chemicals	F	F	F	F	F

Table-5.9.12: Major Crop Pests in Selected Villages

Crop	Name of Pest/ Disease	AES-I	AES-II	AES-III	AES-IV	AES-V
Lentil	Cutworm (IP)	Р	Р	Р	Р	Р
	Lentil rust (D)	F	F	F	F	F
Pea	Cutworm (IP)	Р	Р	Р	Р	Р
	Powdery Mildew (D)	Р	Р	Р	Р	Р
Wheat	Stem Borer (IP)	Р	Р	Р	Р	Р
	Hairy caterpillar (IP)	Р	Р	Р	Р	Р
	Loose smut (D)	Р	Р	Р	Р	Р
	Bunt (D)	Р	Р	Р	Р	Р
Paddy	Case worm (IP)	Р	Р	Р	Р	Р
	Stem borer (IP)	Р	Р	Р	Р	Р
	Gandhi bug (IP)	Р	Р	Р	Р	Р
	Sheath blight (D)	N	Ν	Р	Р	Р
	Leaf blight (D)	N	Ν	Р	Р	Р
Cabbage	Cabbage moth (IP)	Р	Р	Р	Р	Р
	Thrips (IP)	Р	Р	Р	Р	Р
	Foot rot (D)	Р	Р	Р	Р	Р
Brinjal	Fruit borer (IP)	Р	Р	Р	Р	Р
	Shoot borer (IP)	Р	Р	Р	Р	Р
	Wilting (D)	Р	Р	Р	Р	Р
Maize	Hairy caterpillar (IP)	Р	Р	Р	Р	Р
	Stump borer (IP)	Р	Р	Р	Р	Р
	Leaf blight (D)	Р	Р	Р	Р	Р
Oilseeds	Mustard aphids (IP)	F	F	F	F	F
	Downy mildew (D)	Р	Р	Р	Р	Р
Potato	Jassids (IP)	Р	Р	Р	Р	Р
	Aphids (IP)	Р	Р	Р	Р	Р
	Early blight (D)	Р	Р	Р	Р	Р
	Late blight (D)	Р	Р	Р	Р	Р
Gram	Cutworm (IP)	F	Р	Р	Р	Р
	Pod borer (IP)	F	P	P	P	P
Cauliflower	Leaf hopper (IP)	P	P	P	Р	P
	Moth (IP)	P	P	P	P	P
	Wilting (D)	P	Р	Р	Р	Р

IP- Insect-pest, D-Diseases

5.10: Reasons of Gap in Adoption of Technology:

The reasons of gap in adoption of technologies in important commodities were assessed as responded by the farmers of different agro-ecological situations during participatory field data collection by AES teams. The commodities with more than 10% of the cultivated area of the representative villages have been taken for study to find out the gaps in adoption and reasons thereof. The gaps are broadly classified into three types namely Extension gap, Adoption gap and Research gaps. The strategy to address each type of gaps is spelt out in the relevant chapters. **Table- 5.10.1: Types and Reasons of Gap in Adoption of Improved Technology**

S.No.	Type of Gap	Reasons of Gap	Code No.
	Extension gap	a. Lack of awareness	1
		b. Lack of knowledge	2
		c. Lack of skill	3
		d. Lack of motivation	4
		e. Lack of conviction	5
		f. Lack of awareness about legislation	6
	Adoption gap	a. Fear of risk	7
		b. Lack of resources	8
		c. Lack of input availability	9
		d. Lack of market and infrastructure	10
	Research gap	a. Lack of specific recommendation for AES	11
		 b. Recommendation is cumbersome, not profitable & incompatible with market & infrastructure 	12

c. Recommendation is inappropriate 13

The existing farming situation under which the commodities are grown and reasons of gap in cross cutting technologies are indicated in the following Table-5.10.2. **Table-5.10.2: Reasons of Gap in Cross Cutting Technologies**

S.No.	Enterprise	Commodity	Cross cutting	Reasons of gap
			technological gap	(code)
1.	Agriculture	Wheat	Variety	1,2,9,11
2.		Paddy	Variety/ sowing time	1,2,9,11
3.		Rabi-Maize	INM, IPM	2,4,7,9,11
4.		Kharif- Maize	Variety, INM	1,2,4,7,9,11
5.		Gram	Variety, IPM, Seed	1,2,4,7,9,11
			Treatment	
6.		Lentil	Variety, IPM	1,2,4,7,9,11
7.		Pea	Variety, IPM	1,2,4,7,9,11
8.		Mustard -toria	INM, Seed Treatment	1,2,4,7,9,11
9.		Lathyrus	Legal restriction	6
10.		Sugar cane	Lack of industry support	10
11.		Fodder crops	Planting, INM,IPM	5,9,11,13
12.	Horticulture (Fruits)	Guava, Mango, Banana, Papaya	INM, IPM, Special practices, Yield	2,3,5,9,10,11
13.	Horticulture (Vegetables)	Pointed gourd, Bitter gourd Nenua, Ladies finger, Tomato Brinjal, Potato, Onion Coriander.	Variety, INM, IPM, Marketing, Processing	2,3,5,8,9,10,11,12
14.	Horticulture (Floriculture)	Marigold	Variety, INM, IPM, Processing	1,2,7,9,10
15.	Animal husbandry	Buffalo, Cow- (cross bred and Desi)	AI, Breed, Feed, Mineral, Vitamin, Health care	1,2,3,5,8,9,10
16.		Backyard poultry	Breed, Disease	1,2,5,7,9
17.		Goat	Breed, Feed, Mineral, Health care	1,2,3,5,8,9,10
18.		Pig	Breed, AI, Feed, Health care	1,2,3,5,8,9,10
19.	Fishery	Composite Fish culture Reverine Fish culture Prawn culture	Feed, Pond, Ratio, Yield	1,2,7,8,9



SWOT ANALYSIS

The information collected through primary and secondary sources was subjected to SWOT Analysis by the District Core Team, Scientists, from (RAU) ARI, Patna, SGIDT, Patna under the facilitation of Project Director and MANAGE, State Consultant. The out come of the SWOT analysis has been tabulated under specific heads like Management of:

- Natural Resources 1-
- 11-Social Economy
- 111-Infrastructure IV-
- Farming Systems V-
- Agricultural Production System Horticultural production System VI-
- VII-Animal Husbandry
- VIII-Fisheries
- Plantations IX-

Table-6.1: Management of Natural Resources

Particulars	Relevance to AES					
(NRM, INM, and IPM)	AES-I	AES-II	AES-III	AES-IV	AES-V	
	Tal	Diara	Jalla	Irrigated	Rainfed	
Strengths						
1.Rich Bio-diversity	Y	Y	Y	-	-	
2. Rich fertile soils available with option to grow variety	-	Y	Y	Y	Y	
of crops and plants						
3. Climate and soil highly suitable for growing quality	-	Y	-	Y	Y	
fruits(mango, gauava, banana etc.)						
4.Easy availability of ground water	Y	Y	Y	Y	Y	
5.Adequate rainfall	Y	Y	Y	Y	Y	
Weaknesses						
1.Degradation of soil fertility due to continuous	Y	-	-	Y	Y	
cropping without adequate soil health management						
practices.						
2.Obstruction of natural drainage system	Y	-	Y	-	Y	
3.Incidence of flash floods	-	Y	Y	-	-	
4. Infestation of weeds especially-Phalaris minor and	Y	Y	Y	Y	Y	
Parthinium spp.						
5.Non-functional old canal system.	-	-	-	Y	-	
6.Spurious and adulterated marketing of agricultural	Y	Y	Y	Y	Y	
inputs.						
7.Water logging	Y	Y	Y	-	-	
Opportunities						
1. Unexplored bio-diversity with respect to vegetables	Y	Y	Y	-	-	
and pulses.						
Threats						
1. Injudicious use of agricultural chemicals, polluting	-	-	Y	Y	-	
ground aquifers.						

Table-6.2: Management of Socio-Economy.

Particulars	Relevance to AES					
	AES-I	AES-II	AES-III	AES-IV	AES-V	
	Tal	Diara	Jalla	Irrigated	Rainfed	
Strengths						
1.Cheap and skilled labour force locally available.	Y	Y	Y	Y	Y	
2.NGO network available for almost all the areas of	Y	Y	Y	Y	Y	
farmer's interest.						
3.Large number of women SHG's	Y	Y	Y	Y	Y	
Weaknesses						
1.Large number of small and marginal land holdings.	Y	Y	Y	Y	Y	
2.Land consolidation not yet initiated seriously in the	Y	Y	Y	Y	Y	
district.						
Large number of absentee landowners.	Y	Y	Y	Y	Y	
4.Low literacy in rural areas.	Y	Y	Y	Y	Y	
5.Exploitation by rural moneylenders.	Y	Y	Y	Y	Y	
6.Alcoholism most common in rural areas.	Y	Y	Y	Y	Y	
7.High migration rate of local labour force.	Y	Y	Y	-	-	
8.Deep imprint of class conflicts on rural psyche	-	-	-	Y	Y	
against development.						

9. Significant part of south central Patna under Naxal Threats.	-	-	-	Y	Y
10.Non-participation of women and children of higher castes in cultivation related work.	Y	Y	Y	Y	Y
Opportunities					
1.Large skilled caste groups available for					
i. Animal husbandry,	Y	Y	Y	Y	Y
ii. Vegetable cultivation	Y	Y	Y	Y	Y
iii. Pisciculture	Y	Y	Y	Y	Y
iv. Floriculture	Y	Y	Y	Y	Y
2.Knowledgeable farming community and willingness	Y	Y	Y	Y	Y
to go for diversification for better and sustainable					
income.					
3.Immense scope for opening Agri-Clinics in light of	Y	Y	Y	Y	Y
unemployment agricultural and allied graduates and					
demand for their services in rural areas.					
4.Skilled and educated work force available.	Y	Y	Y	Y	Y
5.Patna being the state capital has large pool of	Y	Y	Y	Y	Y
technical manpower.					
Threats				-	
1.Non availability of labour force at peak agricultural	Y	Y	Y	Y	Y
season.					
2.A general unwillingness among agricultural workers	Y	Y	Y	Y	Y
due to social stigma and community pressure for					
working in higher caste-men's fields.					
3.Immense biotic pressure, urbanization, unplanned	-	-	Y	Y	Y
infrastructure, development interfering with natural					
resource management.					
4. Absentee farmers.	Ý	Ý	Ý	Y	Ý
5.Large-scale migration of rural work force.	Y	Y	Y	Y	Y

Table- 6.3 : Management of Infrastructure

Particulars	Relevance to AES					
	AES-I	AES-II	AES-III	AES-IV	AES-V	
	Tal	Diara	Jalla	Irrigated	Rainfed	
Strengths						
1.Well connected to most parts of the country by Rail/ Road/Air/ Waterways	Y	-	Y	Y	Y	
2.Strong R and D network present for Human	Y	Y	Y	Y	Y	
Resource Development.						
3.All season connectivity to district headquarters.	-	-	Y	Y	Y	
Weaknesses						
1. Poor maintenance of rural road network.	Y	Y	Y	Y	Y	
2. Absence of assured power supply in rural areas.	Y	Y	Y	Y	Y	
3.Inadequate network of State Agril. Marketing Board	Y	Y	Y	Y	Y	
to show presence among farmers.						
Non- operational cold storages.	Y	-	Y	Y	Y	
5. Poor agro-processing facilities.	Y	Y	Y	Y	Y	
6.Poor storage facilities.	Y	Y	Y	Y	Y	
7. Unorganized market structure for some commodities.	Y	Y	Y	Y	Y	
Opportunities						
1. Great scope for developing marketing infrastructure	Y	Y	Y	Y	Y	
2. Agro-processing can be promoted in a big way.	Y	Y	Y	Y	Y	
3.Demand for setting up cold chains and storage	Y	Y	Y	Y	Y	
facilities.						
Threats						
 Poor law and order is the biggest threat. 	Y	Y	Y	Y	Y	
2. People are generally unaware about sustainability of	Y	Y	Y	Y	Y	
infrastructure and its maintenance						

Table- 6.4: Management of Farming System

Particulars	Relevance to AES					
	AES-I Tal	AES-II Diara	AES-III Jalla	AES-IV Irrigated	AES-V Rainfed	
Strengths						
1. Successful introduction of apiary, pisciculture,	-	Y	-	Y	Y	
floriculture and mushroom cultivation.						

2.Breed upgradation facility available for animals, poultry, etc.	Y	Y	Y	Y	Y
3.Revitalizing fish production system.	Y	Y	Y	Y	Y
Weaknesses		•			
1.Considerable yield gap due to technological gap in	Y	Y	-	Υ	Y
management.					
2.Monocropping and monoculture.	Y	Y	Y	-	-
3.Poor post-harvest technology.	Y	Y	Y	Y	Y
4. Predominantly Rice-Wheat cropping system with	-	-	-	Y	Y
poor off-take after harvest leading to low-price					
recovery.					
Opportunities					
1. District technically sound with a galaxy of Research	Y	Y	Y	Y	Y
and Training institutions.					
Vast network of NGO's involved in these avenues.	Y	Y	Y	Y	Y
Threats					
1. Injudicious use of family labour.	Y	Y	Y	Y	Y
2.Recurrence of natural vagaries.	Y	Y	Y	-	-
3.Lack of interest in agriculture among resource rich	Y	Y	Y	Y	Y
farmers due to social problems.					
4. Highly fragmented land holding due to absence of	Y	Y	Y	Y	Y
land consolidation.					

Table-6.5: Management of Agricultural Crops

Particulars	Relevance to AES					
	AES-I	AES-II	AES-III	AES-IV	AES-V	
	Tal	Diara	Jalla	Irrigated	Rainfed	
Strengths			•			
1.All basic factors needed for successful cultivation of	-	-	-	Y	Y	
major cereals like rice, wheat, and maize available in						
the district.						
2.Expertise of farming communities and willingness to	-	-	-	Y	Y	
tryout new innovations in rice cultivation.						
3. Predominantly rice eating population.	Y	Y	Y	Y	Y	
4. Availability of traditional pulse and vegetable	Y	Y	Y	-	-	
varieties.						
5. Availability of aquatic flora and fauna in soil to	Y	Y	Y	Y	Y	
augment natural decomposition of plant residue.						
6.New silt deposition every year in crop areas.	Y	Y	Y	-	-	
Weaknesses						
1.Closure of sugar mills resulting in non-remunerative	-	-	-	Y	Y	
prices for sugarcane.						
2.No alternative marketing system available for	-	-	-	Y	Y	
sugarcane.						
3. Critical technological gap in seed treatment,	Y	Y	Y	Y	Y	
application of balanced fertilizers including micro						
nutrients, and pest and disease management.						
4.Non-availability of quality seeds of recommended	Y	Y	Y	Y	Y	
varieties.						
5.Partial gap in adoption of modern cultural practices	Y	Y	Y	Y	Y	
in crop production.						
6.Non-use of bio-fertilizers and green manuring	-	Y	-	Y	Y	
practices.						
7.Lack of organized marketing institutions.	Y	Y	Y	Y	Y	
8.Distress sale of paddy, wheat and pulses.	Y	Y	Y	Y	Y	
Invasion of spurious inputs in open markets.	Y	Y	Y	Y	Y	
10.Non-popularisation of agricultural implements and	Y	Y	Y	Y	Y	
farm machinery.						
11.Lack of modern processing facilities for agricultural	Y	Y	Y	Y	Y	
products.						
12.Application of imbalanced chemical fertilizers	Y	Y	Y	Y	Y	
without understanding the soil fertility status						
13.Non-adoption of INM technology including	Y	Y	Y	Y	Y	
micronutrients.						
14.Non-adoption of IPM technology particularly bio-	Y	Y	Υ	Y	Y	
pesticides, bio-agents and eco-friendly pesticides.						
15. Excess/indiscriminate use of pesticides in	Y	-	Y	-	Y	
vegetables.						
Opportunities						

1.Immense scope for growing very fine rice varieties of	-	-	-	Y	Y
rice, for its milling, packaging and value addition.					
2. Proximity to RAU and its research network has	Y	Y	Y	Y	Y
scope for undertaking on-farm research trails.					
3.Scope for preventing distress sale of paddy by	-	-	-	Y	Y
opening more purchase outlets of FCI & PACS at block					
level to procure paddy.					
4. Scope for revival of old but otherwise operational	-	-	-	Y	Y
sugar mills to give boost to sugarcane production.					
5. Promoting small entrepreneurship ventures for	Y	Y	Y	Y	Y
setting processing, packaging and marketing for					
sugarcane, paddy, oilseeds and other crops.					
6.Scope for introduction and intensification of quality	-	Y	-	Y	Y
protein maize (QPM) and sweet corn ensuring better					
nutrition and price to the growers.					
7.Immense scope for establishing maize based	Y	Y	Y	Y	Y
industries for cattle/ poultry feed.					
8.Low cost technology for high soil moisture areas	-	Y	-	Y	Y
available at nearby ARI. Patna and ICAR RCER for					
rice wheat production under zero tillage seeding.					
9.Large number of rice cultivars for all farming	-	Y	-	Y	Y
situations of Patna available at ARI,Patna.					
10.IPM regional centre located at Patna.	Y	Y	Y	Y	Y
Threats					
1.Low remunerative prices of paddy, wheat depresses	-	Y	-	-	Y
acreage.					
2. Deterioration of soil health due to indiscriminate use	-	-	-	Y	Y
of chemical fertilizer with minimum use of organic or					
bio-fertilizers.					
3.Lack of storage and processing facilities at local	Y	Y	-	Y	Y
level force farmers to deliberately go for low harvest.					
4. Theft and destruction of crops every year by thieves	Y	Y	Y	Y	Y
and unsocial elements adversely affecting crop					
cultivation.					
5. Few weeds pose health hazard (Parthinium spp.).	Y	Y	Y	Y	Y

6.6: Management of Horticultural Production System Table- 6.6.1 : Management of Horticultural Production System (Fruits)

Particulars	Relevance to AES					
	AES-I	AES-II	AES-III	AES-IV	AES-V	
	Tal	Diara	Jalla	Irrigated	Rainfed	
Strengths	•	•	•		1	
 Agro climate and fertile soils ideally suited for 	-	Y	-	Y	Y	
mango(Digha Maldah variety), banana,guava, jack						
fruit, citrus, papaya, coconut crops.						
2. Availability of promising traditional races of	-	Y	-	Y	Y	
mango(Dudiya Maldah,Bambaiya,Sepia, Sukul),						
papaya, guava, jackfruit, Jamun etc.						
Weaknesses	-	•	•			
 Lack of processing, packaging, preservation and 	-	Y	-	Y	Y	
export infrastructure.						
2.Inadequate extension support services.	-	Y	-	Y	Y	
3. Shortage of reliable nurseries to supply good quality	-	Y	-	Y	Y	
planting material.						
Full potential of orchards not exploited by following	-	Y	-	Y	Y	
agri-horti-agrostology-apiculture.						
5.Non-adoption of INM and IPM measures.	-	Y	-	Y	Y	
Lack of scientific inputs and farm management	-	Y	-	Y	Y	
practices.						
Opportunities						
1. Immense scope for value addition and export of fruit	-	Y	-	Y	Y	
crops.						
Scope for integrating agri-horti-apiary for	-	Y	-	Y	Y	
augmenting farm income.						
3. Great export potential for Digha Maldah variety of	-	-	-	Y	Y	
mango if the shelf life is enhanced and adequate						
promotion is done in export markets.						
4. Straw berry cultivation has emerged as a promising	-	-	-	Y	-	
enterprise.						
5.Large fruit nurseries for mango cultivars available at	-	Y	-	Y	Y	
ARI, Patna.						

6.Scope for promoting multi-purpose trees for fuel, fodder, timber and fruits	-	Y	-	Y	Y
Threats					
1.Access to better and leading markets for better	-	Y	-	Y	Y
prices not possible in absence of cooling chambers					
and refrigerated transportation facilities.					

Table- 6.6.2 : Management of Horticultural Production System (Vegetables and Flowers)

Particulars	Relevance to AES					
	AES-I Tal	AES-II Diara	AES-III Jalla	AES-IV Irrigated	AES-V Rainfed	
Strengths	1		1		1	
1.Expertise of traditional vegetable growers available.	-	Y	Y	-	-	
2.Soil ,climate, ground water conducive to grow	-	Y	Y	Y	Y	
vegetables, spices and flowers.						
3.Ready market for all vegetables and flowers	-	Y	Υ	Y	Y	
produced with potential for export to neighbouring						
states and countries.						
4. Quality seed material for vegetables, spices,	-	Y	Y	Y	Y	
floriculture available in lose proximity of the						
neighbouring district, Vaishali.						
5. Success stories available for vegetables, mushroom	-	-	-	Y	Y	
and floriculture.		N	X	X	X	
6. I rue potato seeds available with CPRS along with	-	Y	Y	Y	Y	
technology.		V	X	X	X	
7. Short duration, low gestation of the enterprise.	-	Y	Y	Y	Y	
8. Mushroom spawn available locally in Patha.	-	ř	ř	Ŷ	ř	
Weaknesses	1	V	V	V	V	
flowers and mushroom.	-	Ŷ	Ŷ	Ŷ	Ŷ	
2.No processing facility available for value addition.	-	Y	Y	Y	Y	
3.Low cold storing capacity with erratic power supply.	-	Y	Y	Y	Y	
Excessive use of chemicals and pesticides.	-	Y	Y	-	-	
5.Unorganized growers	-	Y	Y	Y	Y	
6.High involvement of middle men.	-	Y	Y	Y	Y	
Opportunities		1	1			
1.Great scope for production of non-traditional	-	-	Y	Y	-	
vegetables with ready market.						
2.Scope for intensification of floriculture.	-	Y	Y	Y	Y	
3. High demand and remuneration for vegetable seed	-	Y	Y	-	-	
production.					Ň	
4. Sufficient paddy straw and innovative farmers	-	Y	-	Y	Y	
available for mushroom production.		V	X	X	X	
5. Scope for marketing by producers / Village youth	-	Y	Y	Y	Y	
Infough FIG /CIG for remunerative prices.				V	V	
FIG and CIG.	-	-	-	ř	ř	
7.With highly dense urban population and limited	-	Y	-	-	Y	
scope for open gardens, demand for house plants and						
decorative plants very high.						
Threats		1		-	-	
1.Lack of planned marketing strategies combined with	-	Y	Υ	Y	Y	
higher productivity in vegetables and floriculture may						
adversely affect the entrepreneurs.						
2.Indiscriminate use of pesticides in vegetable crops.	-	Y	Y Y	-	-	

Table- 6.6.3 : Management of Horticultural Production System (Medicinal and Aromatic Plants)

Particulars	Relevance to AES						
	AES-I	AES-II	AES-III	AES-IV	AES-V		
	Tal	Diara	Jalla	Irrigated	Rainfed		
Strengths							
1.Rural Patna replete with medicinal and aromatic	-	Y	-	Y	Y		
plants like Sarpagandha, Stawar, Gilore, Trikone,							
Bramhi, Gulmar, Bhringaraj.							
2.An aromatic plant Muskadana is being cultivated in	Y	-	-	-	-		
about 200 ha. With processing facilities.							
3.Baidyanath Ayurved Bhawan has its processing	-	-	-	-	Y		
plant located in the district.							

Weaknesses					
1.Low level of awareness on profitability and techno-	-	Y	-	Y	Y
managerial skills with farmers.					
2.Non-availability of assured and quality seed	-	Y	-	Y	Y
material.					
Opportunities					
1.Presence of pharmaceutical, cosmetic and	-	Y	-	Y	Y
confectionary industry in Patna to use their essential					
oils and chemicals.					
2.Agro-climatic suitable for wide range of cultivation of	-	Y	-	Y	Y
such plants.					
3. Highly remunerative prices and great demand for	-	-	-	-	Y
Khus, Ashwagandha, Sarpagandha, Safed Musali,					
exists.					
4. Avenues for sale and procurement in bulk through	-	Y	-	Y	Y
internet.					
5. Promotional schemes by Central and State	-	-	-	-	Y
Governments for setting up of distillation plants.					
Threats	-			-	-
1. High oil content make them venerable to destruction	-	Y	-	Y	Y
by vested interest.					

Table- 6.7 : Management of Animal Husbandry Production System.

Particulars	Relevance to AES					
	AES-I	AES-II	AES-III	AES-IV	AES-V	
	Tal	Diara	Jalla	Irrigated	Rainfed	
Strengths						
1. Presence of a viable milk cooperative societies in	Y	Y	Y	Y	Y	
the district facilities facilitating breed up gradation						
through A.I., purchase of milk etc.						
2. Traditional expertise in cattle rearing.	Y	Y	Y	Y	Y	
3.Bank of well trained male and female paravets	Y	Y	Y	Y	Y	
available.						
4. Every house hold possesses milch animals in	Y	Y	Y	Y	Y	
varying numbers.						
5.Goat rearing a popular enterprise for assured	Y	Y	Y	Y	Y	
income among landless and marginal farmers.						
6.Poultry enterprise for income generation is a way of	-	-	-	Y	Y	
life.						
7. Pig rearing by poor sections of society as a bread	Y	Y	Y	Y	Y	
earner.						
8.Wheat and paddy straw available in abundance.	-	Y	-	Y	Y	
Weaknesses	-					
1.Non-cultivation of fodder crops (legumes) due to	Y	Y	Y	-	-	
non-conviction about their profitability.						
2. Seeds fro fodder crop not available.	Y	Y	Y	Y	Y	
3.Defunct infrastructure of goat A.I. centres.	Y	Y	Y	Y	Y	
4.Lack of awareness on scientific management	Y	Y	Y	Y	Y	
processes in dairy, poultry and small ruminants.						
5.Lack of popularization of improved breeds of pig	Y	Y	Y	Y	Y	
suitable for local conditions						
6.Stall-feeding is only option for commercial cattle	Y	Y	Y	Y	Y	
rearing.						
7.Non-practice of resource conservation technology.	Y	Y	Y	Y	Y	
Opportunities		•		•		
1. Stall feeding has attracted higher sections of society	Y	-	-	Y	Y	
towards non-traditional cattle rearing on commercial						
basis.						
2.A variety of fodder can be taken	Y	-	-	Y	Y	
3. Scope for low cost cattle feed supplement with local	Y	-	-	Y	Y	
resources available.						
4. Scope for commercial poultry farming by	Y	Y	Y	Y	Y	
unemployed youth/ landless communities exits with						
assured market demand.						
5. Processing and value addition of surplus milk can	Y	Y	Y	Y	Y	
augment income.						
6.Divyayan Red poultry breed developed by	Y	Y	Y	Y	Y	
KVK,Ranchi available for backyard poultry.						
Threats						
1. High population pressure on land leads to less	-	Y	Y	Y	Y	
fodder production.						

2. Unscientific and unplanned A.I. poorly trained Para	Y	Y	Y	Y	Y
Vets leads to non-sustainable pregnancy and					
diseases.					

Table-6.8 : Management of Fisheries

Particulars			Relevance to	to AES			
	AES-I	AES-II	AES-III	AES-IV	AES-V		
	Tal	Diara	Jalla	Irrigated	Rainfed		
Strengths							
1. About 250 Km. of reverine stretch and 1150 ponds	Y	Y	Y	Y	Y		
spread over 1416 ha.							
2. About 8006 fishermen families, seven active primary	Y	Y	Y	Y	Y		
fishermen cooperative societies							
3.Government fish hatchery with 15 crore-fingerling	Y	Y	Y	Y	Y		
capacities located in Patna.							
4. Fishermen families have knowledge, skill, gear and	Y	Y	Y	Y	Y		
crafts along with fishing boats.							
5.Large demand-supply gap of fish consumption to the	Y	Y	Y	Y	Y		
tune of 40 percent.							
Weaknesses							
1.Inadequate availability of promising seed material	-	-	Y	Y	Y		
(quality and in time)							
2.Government leasing policy on ponds not conducive	-	Y	Y	Y	Y		
for growers to run them profitably.							
3.Lack of social cohesiveness among fish farmers.	-	Y	Y	Y	Y		
4.Lack of transport and cold chain facility.	-	Y	Y	Y	Y		
5.Hygienic fish processing not common.	-	Y	Y	Y	Y		
6.Recurring appearance of alterative disease	-	Y	Y	Y	Y		
syndrome.							
7.No organized marketing of fish in the market.	Y	Y	Y	Y	Y		
Opportunities							
1.Farmer's innovations and success stories have	-	-	-	Y	Y		
immense scope for replication in neighbouring areas.							
2.Reputed R&D departments available.	-	Y	-	Y	Y		
3.Immense scope for fish seed (Fingerling) production	-	-	-	Y	Y		
to cater the need of South Patna.							
4. Scope for entrepreneurship development for fish-	-	Y	-	Y	Y		
feed production.							
5.Great scope for proven reverine fishery.	-	Y	-	Y	-		
Threats	1			1	1		
1. Fish being brought from other states competes with	-	Y	-	Y	Y		
local fish for price in the market							

Table- 6.9: Management of Plantation / Multi-purpose Trees

Particulars	Relevance	Relevance to AES						
	AES-I	AES-II	AES-III	AES-IV	AES-V			
	Tal	Diara	Jalla	Irrigated	Rainfed			
Strengths								
No forest area in the district.	Y	Y	Y	Y	Y			
Absentee farmers interested in plantation / multi-	-	Y	Y	Y	Y			
purpose trees.								
Technology for plantation / multi-purpose tree	Y	Y	Y	Y	Y			
available.								
Weaknesses								
Farmers unaware of technology.	Y	Y	Y	Y	Y			
Planting material not easily available to the farmers.	Y	Y	Y	Y	Y			
Opportunities								
Variety of material and technology available with the	Y	Y	Y	Y	Y			
S.A.U.								
Threats								
Fencing of big area difficult and uneconomical.	Y	Y	Y	Y	Y			
Fear of grazing by stray animals.	Y	Y	Y	Y	Y			

<u>Chapter-7</u>

Identification of Critical Issues, Problems and Opportunities

The critical issues problems and opportunities have been identified on the basis of primary and secondary data and SWOT analysis exercise with a view to evolving need-based strategy for organizing extension and research activities. For the sake of convenience in planning, the above information have been categorised under five groups namely:

- I.- Management of Natural resources
- II.- Socio Economic Improvement
- III.- Management of Agricultural Production System
- IV.- Management of Horticultural Production System
- V.- Management of Animal Production System
- VI.- Management of Fisheries
- VII.- Management of Plantations.

Table-7: Critical, Issues, Problems and Opportunities in each AES of Patna District

Issue	ssues problems and Opportunities		Re	leva	nce t	o AE	S
			I	II	III	IV	V
7.1	Management of Natural Resources	E/R					
1.	Degradation of soil fertility		Υ	Υ	-	Υ	Υ
	Application of imbalanced fertilizer.		Υ	Υ	Y	Y	Υ
	Non-application of organic manure in the soil.		Υ	Υ	Υ	Υ	Υ
	Unawareness to micronutrient application.		Υ	Υ	Υ	Υ	Υ
	Repeated tillage leading to loss of soil organic matter.		Y	Υ	Y	Y	Υ
	Intensive cropping.		-	Υ	-	-	Υ
	Non-inclusion of legumes in crop rotation.		-	Υ	-	-	Υ
	Seeds of green manuring crops unavailable.		Υ	Υ	Y	Y	Υ
	Only spurious chemical nutrients available.		Υ	Υ	Y	Y	Υ
2.	Non-judicious use of agro-chemicals.	E/R					
	Unaware about INM and IPM practices.		Υ	Υ	Y	Y	Υ
	Excessive use of pesticides in vegetable crops.		-	-	Y	-	-
	Availability of spurious agro-chemicals.		Υ	Y	Y	Y	Υ
	Large dependence of farmers on input dealers for crop		Υ	Y	Y	Y	Υ
	protection.						
3.	Water logging	R/E					
	Prolonged period of water stagnation affecting subsequent		Υ	Y	Y	-	-
	crops.						
	Suitable / promising crop varieties /cultivars not available.		Y	Υ	Y	-	-
	Development of proper package and practices for such areas.		Y	Υ	-	-	-
	Mono cropping prevalent in such areas.		Y	Υ	Y	Y	Υ
	Poor road infrastructure due heavy soils.		Y	Υ	Y	Y	Υ
4.	Bio-diversity	R	Υ	Υ	Y	Y	Υ
	No scientific selection and improvement about seed and		-	Y	Y	-	-
	germplasm conservation done for vegetable cultivation.						
	Lack of efforts for improvement / selection of prevalent pulse		Υ	-	-	Υ	-
	varieties of Tal region.						
	Opportunities						
1.	Soil fertility and sustainability	R/E/P					
	Awareness and promotion of soil testing and AES / crop wise		Υ	Υ	Υ	Υ	Υ
	recommendation of fertilizers.						
	Promoting Zero-tillage in rice-wheat.		-	Υ	-	Y	Υ
	Strict regulation and checking the supply of spurious agro-		Y	Y	Y	Y	Υ
	chemical.						
	Inclusion of micronutrients.		-	Υ	-	-	Υ
2.	Judicious use of agro-chemicals.	E/P					
	IPM practices awareness needed		Υ	Y	Υ	Y	Υ

	Harmful effects of excessive pesticide use to be brought to the		Y	Y	Y	Y	Y
	knowledge of farmers along with its economics.						
	Large network of governmental agencies for keeping an eye on		Y	Y	Y	Y	Y
	adulteration in agro-chemicals.	D/F					
3.	water Logging	K/E	V	V	V	V	V
	Research enorts needed for improvement of local varieties of		Ŷ	Ŷ	Y	Y	Ŷ
	Vegetables and pulses.		V	V	V		
4	Agronomic manipulations testing needed on local conditions.		Ť	ĭ V	ĭ V	- V	- V
4.	Plantation on field bunds by loguminous troos		-	T V	T V	I V	I V
	Multi-purpose trees on awareness for fodder and fuel		I V	I V	I V	I V	
72	Socio Economic Issues and Problems		I	I	1	I	I
1.2	Socio-economic improvement	P/F/R					
	Immediate attention on land consolidation and its proper	176/10	Y	Y	Y	Y	Y
	documentation.			•			
	Strengthening farmers for access to credit, market, and		Υ	Y	Y	Y	Y
	bargaining power to escape from the grips of moneylenders and middlemen.						
	Increasing entrepreneurship and adopting measures to curb		Υ	Υ	Υ	Y	Υ
	migration of rural labour.						
	Social capital building through capacity building measures like		Y	Y	Y	Y	Y
	group dynamics and exposure visits.						
	Enabling farmers through Farmer Organizations for problem		Y	Y	Y	Y	Y
	Solving skills.	E/P					
	Availability of large trained technical manpower to set up own	L/1	Y	Y	Y	Y	Y
	Agri-clinics having potential demand				· ·		'
73	Agricultural Production System	F/R					
7.0	Considerable vield gaps in different crops due to	E /IX					
	Non-availability of quality seed material		Y	Y	Y	Y	Y
	Non-practice of INM and IPM		Ý	Ý	Ŷ	Ŷ	Ŷ
	Skill gap in general cultural practices.		-	-	-	Ŷ	Ŷ
	Non-adoption of soil test based fertilizer application.		Y	Y	Y	Ŷ	Ŷ
	Non-availability of situation specific pulses and vegetable		Ý	Ý	Ý	-	-
	varieties.		-	-	-		
2.	Low profitability from agricultural enterprises.						
	Due to rise in cost of production as a result of costlier inputs.		Υ	Y	Y	Y	Υ
	Distress sale of produce due to unorganised and farmers non-		Υ	Y	Y	Υ	Υ
	responsive marketing infrastructure.						
	Labour scarcity at produce due to unorganised markets.		Υ	Υ	Υ	Υ	Υ
	Non-adoption of risk minimizing and low cost technologies.		Υ	Υ	-	Υ	Υ
	Non-availability of situation specific pulse and vegetable		Υ	Y	Y	Υ	Υ
	varieties.						
	Lack of post harvest, storage and processing facilities.		Y	Y	Y	Y	Y
	General apathy on the part of Government towards procurement		Y	Y	Y	Υ	Y
	and extending support price leading to unstable prices.				\	\	
	Limited knowledge of crop insurance and other governmental		Y	Y	Y	Y	Y
	schemes.						
	Opportunities			V		V	V
	Crop diversification possibilities to remunerative medicinal and		-	ľ	- V	Γ V	Υ Υ
	crop diversification possibilities to remunerative medicinal and		-	-	T	r	ĭ
7 /	Aromatic plants along with honculture.						$\left - \right $
1	Significant vield gan in fruit and vegetable crops due to	F					
	Knowledge and skill gap in scientific production	<u> </u>	-	V	-	V	V
	Non-availability of quality seed material		-	Y	Y	Y	
	Non-adoption of INM and IPM practices		Y	Y	Y	Y	Y
	Poor acceptance of F1 hybrids in vegetables		-	Y	Y	-	-
2	Distress sale of fruits and vegetables reducing profitability	P/E			· ·		
	due to						

	Unorganised growers.	-	Υ	Y	Υ	Y
	Ineffective cooling and storage facilities.	-	Υ	Y	Υ	Υ
	Lack of value addition.	-	Υ	Y	Y	Υ
	Lack of post-harvest and handling techniques,	-	Υ	Y	Y	Y
	Nexus between middle men harming farmers interest.	-	Y	Y	Y	Y
	Opportunity		-		-	-
	Scope for value addition and export.	-	Y	Y	Y	Y
	Scope for utilizing interspaces of orchards for apiary and horti-	-	Ý	Y	Y	Y
	pasture		· ·			•
	Export potential for local mango (var -Digha Maldah) through-					
	a Research efforts for increasing shelf life	-	-	-	Y	Y
	b. Exploring export markets	_	-	-	V	v
	Innovations tried out in pon-conventional fruit crops like		V	_	-	V
	strawberry needs replication	-	1	-	-	•
	Sildwberry needs replication.		v			V
	revalence of ARI, Failed and other nursery growers in and	-	T	-	-	T
	arounu Paina for planting material.		V	V	V	V
	Immense scope of using trained people as para-norts.	-	Y	Y	Y	Y
	Conducive agro-climate and demand for multipurpose trees to	-	Y	Y	Y	Y
	supplement fodder, timber and fuel wood.					
	Scope for exotic vegetables in urban markets.	-	Y	Y	-	Y
	Scope for intensification of floriculture ,spices and floriculture	-	Y	-	Y	Y
	through traditionally skilled farmers.			.		
	Scope for supplying planting materials to urban customers for	-	Y	Y	-	-
	terrace gardens					
	Ready market and demand for mushroom throughout the year.	-	Y	Y	Y	-
	Conducive agro-climate, non-remunerative traditional crops and	-	Y	Y	-	Y
	monetary support from the Government for medicinal and					
	aromatic plants may bring capital investment to this sector.					
7.5	Animal Production System					
	Slow rate of croce broading and Al programme due to E/D/					
	Slow rate of cross breeding and Ai programme due to E/K/	P				
	Inactive extension and support services	Р Ү	Y	Y	Y	Y
	Slow rate of cross breeding and Ar programme due to Erkn Inactive extension and support services Malnutrition of indigenous cows and buffaloes.	P Y Y	Y Y	Y Y	Y Y	Y Y
	Slow rate of cross breeding and Ar programme due to Erkh Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Erkh	P Y Y Y	Y Y Y	Y Y Y	Y Y Y	Y Y Y
	Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision.	P Y Y Y Y	Y Y Y Y	Y Y Y Y	Y Y Y Y	Y Y Y Y
	Slow rate of cross breeding and Ar programme due to Erkin Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Inadequate	P Y Y Y Y Y Y	Y Y Y Y Y	Y Y Y Y Y	Y Y Y Y Y	Y Y Y Y Y
·	Slow rate of cross breeding and Ar programme due to Erkin Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Lack of proper health care to animals.	P Y Y Y Y Y Y Y	Y Y Y Y Y Y	Y Y Y Y Y Y	Y Y Y Y Y Y	Y Y Y Y Y
·	Slow rate of cross breeding and Ar programme due to Erkin Inactive extension and support services Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Lack of proper health care to animals. Unawareness of government schemes.	P Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y	Y Y Y Y Y Y	Y Y Y Y Y Y	Y Y Y Y Y Y
· · · · · · · · · · · · · · · · · · ·	Slow rate of cross breeding and Ar programme due to Erkn Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Lack of proper health care to animals. Unawareness of government schemes. Low productivity of dairy animals due to Inade to	P Y Y Y Y Y Y Y	Y Y Y Y Y Y	Y Y Y Y Y Y Y	Y Y Y Y Y Y Y	Y Y Y Y Y Y
· ·	Slow rate of cross breeding and Ar programme due to Erkn Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Lack of proper health care to animals. Unawareness of government schemes. Low productivity of dairy animals due to Want of green fodder.	P Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y	Y Y Y Y Y Y	Y Y Y Y Y Y	Y Y Y Y Y Y
	Slow rate of cross breeding and Ar programme due to Erkin Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Lack of proper health care to animals. Unawareness of government schemes. Low productivity of dairy animals due to Want of green fodder. Poor sanitation and housing Ended and housing	P Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y - Y	Y Y Y Y Y Y - Y	Y Y Y Y Y Y - Y	Y Y Y Y Y Y Y
	Slow rate of cross breeding and Ar programme due to Erkin Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Lack of proper health care to animals. Unawareness of government schemes. Low productivity of dairy animals due to Want of green fodder. Poor sanitation and housing Improper health measure	P Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y - Y	Y Y Y Y Y Y - Y	Y Y Y Y Y Y - Y Y	Y Y Y Y Y Y Y - Y
	Stow rate of cross breeding and Ar programme due to Erkin Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Lack of proper health care to animals. Unawareness of government schemes. Low productivity of dairy animals due to Want of green fodder. Poor sanitation and housing Improper health measure. Luborganised marketing in rural areas Improvement set areas	P Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y - Y Y Y	Y Y Y Y Y Y - Y Y Y	Y Y Y Y Y Y - Y Y Y	Y Y Y Y Y Y Y - Y
	Stow rate of cross breeding and Ar programme due to Erkin Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Lack of proper health care to animals. Unawareness of government schemes. Low productivity of dairy animals due to Want of green fodder. Poor sanitation and housing Improper health measure. Unorganised marketing in rural areas. Non-availability of medicines	P Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y - Y
	Stow rate of cross breeding and Ar programme due to Erkin Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Lack of proper health care to animals. Unawareness of government schemes. Low productivity of dairy animals due to Want of green fodder. Poor sanitation and housing Improper health measure. Unorganised marketing in rural areas. Non-availability of medicines.	P Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
	Slow rate of cross breeding and Ar programme due to Erkin Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Lack of proper health care to animals. Unawareness of government schemes. Low productivity of dairy animals due to Want of green fodder. Poor sanitation and housing Improper health measure. Unorganised marketing in rural areas. Non-availability of medicines. Serious scientific knowledge gap and skill gap Limited knowledge about ingurance.	P Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y - Y	Y Y Y Y Y Y - Y Y Y - Y Y	Y Y Y Y Y Y Y Y - Y Y
	Slow rate of cross breeding and Ar programme due to Erkn Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Lack of proper health care to animals. Unawareness of government schemes. Low productivity of dairy animals due to Want of green fodder. Poor sanitation and housing Improper health measure. Unorganised marketing in rural areas. Non-availability of medicines. Serious scientific knowledge gap and skill gap Limited knowledge about insurance.	P Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y - Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y - Y Y Y Y Y
	Slow rate of cross breeding and Ar programme due to Erkin Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Lack of proper health care to animals. Unawareness of government schemes. Low productivity of dairy animals due to Want of green fodder. Poor sanitation and housing Improper health measure. Unorganised marketing in rural areas. Non-availability of medicines. Serious scientific knowledge gap and skill gap Limited knowledge about insurance. Low productivity of poultry birds due to Carious to for the surant for the suran	P Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y - Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y - Y Y Y Y
	Slow rate of cross breeding and Ar programme due to Erkin Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Lack of proper health care to animals. Unawareness of government schemes. Low productivity of dairy animals due to Want of green fodder. Poor sanitation and housing Improper health measure. Unorganised marketing in rural areas. Non-availability of medicines. Serious scientific knowledge gap and skill gap Limited knowledge about insurance. Low productivity of poultry birds due to Serious techno-management practices.	P Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y - Y Y - - Y	Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y - Y Y Y Y
	Slow rate of cross breeding and Ar programme due to Erkin Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Lack of proper health care to animals. Unawareness of government schemes. Low productivity of dairy animals due to Want of green fodder. Poor sanitation and housing Improper health measure. Unorganised marketing in rural areas. Non-availability of medicines. Serious scientific knowledge gap and skill gap Limited knowledge about insurance. Low productivity of poultry birds due to Serious techno-management practices.	P Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y - Y Y - - - -	Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y
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	Stow rate of cross breeding and Al programme due to Erkin Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Lack of proper health care to animals. Unawareness of government schemes. Low productivity of dairy animals due to Want of green fodder. Poor sanitation and housing Improper health measure. Unorganised marketing in rural areas. Non-availability of medicines. Serious scientific knowledge gap and skill gap Limited knowledge about insurance. Low productivity of poultry birds due to Serious techno-management practices. Non-availability of poultry feed at reasonable price. Knowledge gap for backyard poultry of promising breeds Limited financial back up and insurance. Limited financial back up and insurance.	P Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y - Y - Y - - - - -	Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
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	Stow rate of cross breeding and A programme due to Erkin Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Lack of proper health care to animals. Unawareness of government schemes. Low productivity of dairy animals due to Want of green fodder. Poor sanitation and housing Improper health measure. Unorganised marketing in rural areas. Non-availability of medicines. Serious scientific knowledge gap and skill gap Limited knowledge about insurance. Low productivity of poultry birds due to Serious techno-management practices. Non-availability of poultry feed at reasonable price. Knowledge gap for backyard poultry of promising breeds Limited financial back up and insurance. Unorganised market forcing distress selling. Opportunity E/R Scope for green fodder cultivation and multi purpose trees. Market demand for dairy.	P Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y - Y Y - Y - Y - - Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y - Y Y - Y - Y - Y - Y - Y - Y - Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
	Stow rate of cross breeding and A programme due to Erkin Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Lack of proper health care to animals. Unawareness of government schemes. Low productivity of dairy animals due to Want of green fodder. Poor sanitation and housing Improper health measure. Unorganised marketing in rural areas. Non-availability of medicines. Serious scientific knowledge gap and skill gap Limited knowledge about insurance. Low productivity of poultry birds due to Serious techno-management practices. Non-availability of poultry feed at reasonable price. Knowledge gap for backyard poultry of promising breeds Limited financial back up and insurance. Unorganised market forcing distress selling. Opportunity E/R Scope for green fodder cultivation and multi purpose trees. Market demand for dairy. Stall feeding can attract new entrepreneurs towards goatary, dairy , piggery and poultry if incentive is provided by the	P Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y - Y Y - Y - Y -	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y - Y Y - - Y - - Y - - Y - - Y -	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
	Stow rate of cross breeding and A programme due to Erkin Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Lack of proper health care to animals. Unawareness of government schemes. Low productivity of dairy animals due to Want of green fodder. Poor sanitation and housing Improper health measure. Unorganised marketing in rural areas. Non-availability of medicines. Serious scientific knowledge gap and skill gap Limited knowledge about insurance. Low productivity of poultry birds due to Serious techno-management practices. Non-availability of poultry feed at reasonable price. Knowledge gap for backyard poultry of promising breeds Limited financial back up and insurance. Unorganised market forcing distress selling. Opportunity E/R Scope for green fodder cultivation and multi purpose trees. Market demand for dairy. Stall feeding can attract new entrepreneurs towards goatary, dairy , piggery and poultry if incentive is provided by the government. More analtery of analtery.	P Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y - Y Y Y - Y Y - - Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
	Stow rate of cross breeding and A programme due to Erkin Inactive extension and support services Malnutrition of indigenous cows and buffaloes. Constraints in supply of liquid nitrogen and frozen semen. Inadequate mobility and supervision. Inadequate livestock assistants for door service. Lack of proper health care to animals. Unawareness of government schemes. Unawareness of government schemes. Low productivity of dairy animals due to Want of green fodder. Poor sanitation and housing Improper health measure. Unorganised marketing in rural areas. Non-availability of medicines. Serious scientific knowledge gap and skill gap Limited knowledge about insurance. Low productivity of poultry birds due to Serious techno-management practices. Non-availability of poultry feed at reasonable price. Knowledge gap for backyard poultry of promising breeds Limited financial back up and insurance. Unorganised market forcing distress selling. Opportunity E/R Scope for green fodder cultivation and multi purpose trees. Market demand for dairy. Stall feeding can attract new entrepreneurs towards goatary, dairy , piggery and poultry if incentive is provided by the government. Scope for low cost cattle feed production from locally available	P Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y - Y Y - Y - Y - Y - Y - Y - Y - Y - - Y - - Y -	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y

	Scope for commercial poultry production.		-	-	Υ	Y	Y
	Fishery						
7.6	Management of Fish Production System	E					
	Low productivity of fish due to						
	Cumbersome leasing policy of the government.		-	-	Υ	Y	Υ
	Lack of community water bodies.		-	-	Υ	Y	Υ
	Serious technological gap in cultivation practices.		-	-	Υ	Y	Υ
	Inadequate availability of good quality seed and fingerlings.		-	-	Υ	Y	Υ
	Inadequate credit support.		-	-	Υ	Y	Υ
7.7	Plantation	R					
	Drying of Seesum trees.		Υ	Υ	Υ	Y	Υ
	Screening of multipurpose trees/fodder species for promotion of commercial dairy.		Y	Y	Y	Y	Y

<u>Chapter-8</u>

PROPOSED EXTENSION STRATEGIES

Based upon the analysis of issues problems and opportunities, relevant and feasible strategic have been worked out for carrying out extension activities in the district. The strategic have been under five major groups as indicated below.

i. Diversification and intensification of existing farming systems.

ii. Improvement in productivity and income of existing enterprises and commodities within EFS.

iii. Natural resource management for ensuring sustainability in production and productivity.

iv. Human Resource development.

v. Community organization.

vi. Sustainability of the project.

vii. Media support and use of IT.

viii. Promotion of NGO's and Private organizations.

ix. Dovetailing on-going schemes.

x. Empowerment of Farmwomen and building SRM

8.1: Diversification and Identification of Existing farming system

The major production system under farming system of the district is agriculture production system, horticulture production system, livestock production system, fish production system and plantation. Using the Relative Spread Index (RSI) and Relative Yield Index (RYI) crop suitability of the crops for the district been assessed using RSI and RYI.

RSI= <u>Crop area expressed as % of total cultivated area in the district</u> x100 Crop area expressed as % of total cultivated area in the state

RYI= <u>Mean yield of the crop in the district</u> x 100 Mean yield of the crop in the state High spread-90-200%

Low spread-30-90% High yield-60-200% Low yield-30-60% Using the two indices the crop can be grouped as follows:

		RSI	
		High	Low
RYI	High	HS-HY	LS-HY
	Low	HS-LY	LS-LY

Low spread and low yield crops are undesirable which need diversification. High spread and low yield crops are either to be substituted or their yield level can be increased by technological and input intervention .Low spread and high yield crops should be encouraged and horizontal expansion of such crops need to encouraged. The high spread and high yield crops are to be encouraged and value addition, agro processing and marketing of such crops need to be improved for more profit and sustainable issues are to be addressed. The less remunerative enterprise need diversification and existing farming systems require further intensification to increase the production level.

8.2: Improvement in Productivity and Income of Existing Enterprises and Commodities within existing farming system.

Most of the enterprises and commodities of the district have comparatively lower yield rate than the state & national average. There exists a yield between the potential farm yield and actual yield as the following Table-8.1 shows.

Table-8.1: Area, Production, Productivity, Potential per unit area, Total Production Potential and Percent of Exploitation of Total Production Potential of Crops in Patna District

Сгор	Area (000ha.)	Production (000Tons)	Productivity (q/ha.)	Potential (q/ha)	Total Production	Exploitation of Total Production (%)
Cereals						
1. Wheat	96.31	314.84	32.69	42.50	409.32	76.90
2. Kharif Maize	6.88	27.34	39.75	50.00	34.39	79.5

3. Rabi Maize	8.00	26.11	32.64	40.00	32.00	81.60
4. Summer	3.00	9.79	32.64	40.00	12.00	81.60
5. Rice (Kharif)	84.793	288.89	34.07	45.00	38.57	75.71
Oilseeds						
1.Rapeseed/	7.10	7.10	10.00	14.00	9.94	71.40
Mustard						
2.Sunflower	0.20	2.00	10.00	14.00	2.80	71.40
Pulses						
1. Arhar	1.57	1.92	12.27	25.00	39.14	49.00
2.Chikpea	12.30	13.14	10.68	25.00	30.75	42.70
3.Lentil	50.00	45.00	9.00	20.00	100.00	45.00
4.Pea	2.25	2.25	10.00	15.00	3.75	60.00
5.Moong	0.50	0.85	8.00	12.00	0.96	88.50
(Summer)						
6.Others Pulses	9.68	11.48	11.86			

Strategies are suggested to reduce the yield gap II for improvement in productivity and income of existing enterprises.

The farmers are inclined to have more production and profit with minimum risk. Therefore various extension strategic to overcome the technological gaps and reduce anticipated risk are suggested. The constraint in achieving the Potential and Experiment Station yield is due to the Biological Constraints(Variety, weeds, pests, problem of soils, water, soil fertility etc) and Socio-Economic Constraints(cost and returns, credit availability, tradition and attitudes, knowledge, input availability, institutions etc.)

Improvement in sustainable crop production. The various problem relevant to Natural Resources Management (NRM) have been identified and strategic suggested to reverse the process of Natural Resources degradation.

8.3: Natural Resource Management for Ensuring Sustainability in Production and Productivity.

During the field study it was observed that unabated soil erosion and degradation of natural resource base poses a serious problem for sustainable crop production, particularly in Diara areas of the district. Various problems relating to soil and water management, IPM and INM have been identified and strategies suggested to conserve the natural resources and their regeneration.

Table-8.3.1: Proposed Extension Strategy

Strategy/Intensification	Relevance to AES				
	AES-	AES-	AES-	AES-	AES-
	I- Tal	II-	III-	IV-	V-
		Diara	Jalla	Irriga ted	Rainf ed
A. Agricultural Production System					
1.Introduction and intensification of sweet corn and	Y	Y	-	Υ	Y
Quality Protein Maize.					
2.Additional income from commercial mushroom	Y	Y	Y	Y	Y
cultivation.					
3. Area expansion under forage cultivation to strengthen.	Y	Y	-	Υ	Y
4. Diversification and intensification of spices enterprises.	Y	Y	-	Υ	Y
5. Diversification and intensification of medicinal and	Y	Y	-	Υ	Y
aromatic plants.					

Table-8.3.2: Proposed Extension Strategy

Strategy/Intensification	Relevance to AES				
	AES-	AES-	AES-	AES-	AES-
	1	II	III	IV	V
Horticultural Production System					
1.Popularizing commercial floriculture.	Y	Y	-	Y	Y
2.Introduction and intensification of exotic and non-	-	Y	Y	Y	Y
traditional vegetable cultivation					
3.Introduction and intensification of Agri-horti farming	-	Y	-	Y	Y
system, apiary and multi-tier cropping.					
4. Expansion of area under off-season vegetables.	-	Y	Y	Y	Y
5.Introduction and intensification of strawberry	-	Y	-	Y	Y
cultivation.					
6.Intensification of area under local fruit races	Y	Y	Y	Υ	Y
particularly Digha Maldah variety of mango.					

Table-8.3.3: Proposed Extension Strategy

Strategy/Intensification	Relevance to AES				
	AES-	AES-	AES-	AES-	AES-
	1	II	III	IV	V
Livestock Production System					
1.Breed upgradation in dairy animals	Y	Υ	Y	Y	Υ
2.Expansion of commercial goat rearing and breed	-	Y	-	Y	Y
upgradation.					
3.Intensification of backyard poultry.	-	Υ	Y	-	Υ
4.Intensification of commercial poultry.	Υ	-	-	Y	Y
5. Commercial through introduction to improved breeds.	-	Y	-	Y	Y
6.Introduction and intensification of commercial poultry	-	-	-	Y	Y
(layers)					

Table-8.3.4: Proposed Extension Strategy

Strategy/Intensification	Relevance to AES				
	AES-	AES-	AES-	AES-	AES-
	1	11	III	IV	V
Fish Production System					
1. Introduction and intensification of fresh water prawn	Y	-	-	Y	Y
culture.					
2. Introduction and intensification of composite fish	Y	-	-	Y	Y
culture.					

Table-8.3.5: Proposed Extension Strategy

Strategy/Intensification	Relevance to AES				
Plantation	AES- AES- AES- AES- A				AES-
	1	II	III	IV	V
1. Intensification of alternate land use with agro-forestry	-	Y	-	Υ	Y
commercial silvi-pasture and farm forestry.					
2. Introduction and intensification of multipurpose trees	Y	Y	-	Y	Y

Table-8.4.1: Improvement in Productivity and Income of Existing Farming Systems

Strategy/Intensification	Relevance to AES				
	AES-	AES-	AES-	AES-	AES-
	1	II	III	IV	V
A. Agricultural Production System					
1. Overcoming technological gaps in agricultural crops	Y	Y	Y	Y	Y
like rice, wheat, maize, pulses and oilseeds.					
2.Decentralized production of seeds of preferred	Y	Y	-	Y	Y
varieties under the concept of seed village scheme.					
3. Value addition and agro-processing in rice, maize,	Y	Y	-	Y	Y
wheat and pulses.					
4. Ensuring production and delivery of quality production	Y	Y	Y	Y	Y
inputs.					
Popularization of useful machinery for cost	Y	Y	Y	Y	Y
minimization, zero tillage etc.					
6.Optimization of seedling and planting time in light of	Y	Y	-	Y	Y
soil moisture.					
7.Forward linkage with Govt. and private agencies for	Υ	Y	Υ	Y	Y
remunerative prices of farm produce.					
8.Revival of old sugar mills.	-	-	-	Υ	Y

Table-8.4.2: Improvement in Productivity and Income of Existing Farming Systems

Strategy/Intensification	Relevance to AES				
A. Horticultural Production System	AES-	AES-	AES-	AES-	AES-
	1	11	III	IV	V
1.Overcoming technical gaps in major fruit crops like	Y	Y	Y	Y	Y
mango, guava, citrus and banana.					
2.Overcoming technological gaps in major vegetable	-	Y	Y	-	-
crops.					
3.Decentralized seed and propagating material	-	Y	Y	-	-
production of major vegetables.					
4.Intensification of production of true potato seeds.	-	Y	Y	Y	Υ

5. Promotion of FIGs' for commercial cultivation of planting material and production for floriculture/ foliage	Y	Y	Y	Y	Y	
and house plants						
Popularizing micro-irrigation and Govt. schemes.	Y	Y	Y	Y	Y	
7.Streamlining, refreshing and capacity building of Para-	Y	Y	Y	Y	Y	
vets, malis with help from Rau, Pusa.						

Table-8.4.3: Improvement in Productivity and Income of Existing Farming Systems

Strategy/Intensification	Relevance to AES				
A.Animal Production System	AES-	AES-	AES-	AES-	AES-
	1	II	III	IV	V
1.Improved feeding, housing and health are for dairy	Y	Y	Y	Y	Y
animals.					
2.Vaccination scheduling and treatment of ecto parasites	Y	Y	Y	Y	Y
for poultry, pigs, goat and cattle.					
3.Fodder cultivation round the year for improved	Υ	Y	Y	Y	Y
nutritional availability					
4. Round the year fodder cultivation for improved nutrition	Y	Y	Y	Y	Y
availability to dairy animals					
5. Processing & preservation of surplus milk for value	Y	Y	Y	Y	Y
addition					
6. Promotion of entrepreneurship for p[producing goat	-	Y	-	Y	Y
manure under ATMA brand					
Renovation of bio gas plants and its replication	Y	Y	Y	Y	Y
8. Promotion of vermi composting from farm byproducts	Υ	Y	Y	Y	Y
9.Making inventory of service providers & paravets for	Y	Y	Y	Y	Y
stream limning refreshing and capacity building					
10.Popularisation of solar energy for farm activity	Y	Y	Y	Y	Y
11.	Υ	Y	Y	Y	Y
Ensuring of clean milk production					
12. Promotion of production and use of mineral blocks	Y	Y	Y	Y	Y
and vitamins in dairy ration					

Table-8.4.4: Improvement in Productivity and Income of Existing Farming Systems

Strategy/Intensification	Relevance to AES				
Pisciculture system		AES-	AES-	AES-	AES-
-		11	III	IV	V
1.Commercial fish production on scientific lines		-	-	Y	Y
2.Decentralized production of fingerlings		-	-	Y	Y
3.Entrepreneurship development for fish net (improved)		Y	-	Y	Y
production					
Promotion of fish feed production units	Y	Y	-	Y	Y

Table-8.2.5: Improvement in Productivity and Income of Existing Farming Systems

Strategy/Intensification		Relevance to AES				
Plantation crops		AES-	AES-	AES-	AES-	
·		II	III	IV	V	
1.Decentralized production of saplings for forestry and		Y	-	Y	Y	
silvi-pasture						
2.Decentralized production of quality fodder seeds		-	-	Y	Y	
including legumes under horti-pasture						

Table-8.3: Natural Resource management for Sustainability of Production and Productivity

Strategy/Intensification		Relevance to AES			
	AES-	AES-	AES-	AES-	AES-
	1	II	III	IV	V
1.Mangement of soil health through cultural practices	Y	Y	Y	Y	Y
and suitable crop rotations.					
2.INM an IPM	Y	Y	Y	Y	Y
3.Inclusion of organics in nutrient management.	Y	Y	Y	Y	Y
4. Promotion of green Manuring through seed production.	Y	Y	Y	Y	Y
5. Micro nutrient mangement for optimum yield and soil	Y	Y	Y	Y	Y
health along with organics.					
6. Checking obnoxious weeds like <i>Phalaris minor</i> and	Y	Y	Y	Y	Y
Parthinium.					
7. Regulating marketing of spurious and adulterated agril.	Y	Y	Y	Y	Y
Inputs.					

8.Managing existing and potential water areas for	Y	-	Y	Y	Y
pisciculture					
9.Intensification of zero tillage to reduce exposure	Y	Y	Y	Y	Y
oxidation of soil organic matter.					
10. Promotion of soil test based intensive cultivation for	Y	Y	Y	Y	Y
balanced nutrition.					
11. In mono cropped areas like Tal the sustainability can	Y	Y	-	Y	Y
be brought through remunerative pulses.					
12. Canning and processing of vegetables in Jalla areas		Y	Y	Y	Y
may be key to sustainability of its production.					
13.Better nutrient management is key to sustainability of	Y	Y	Y	Y	Y
irrigated areas of Patna.					
14. Diversification to agricultural, allied	Y	-	-	Y	Y
And women enterprises (Home Science) is key to					
sustainability of Rainfed areas.					
15. Animal production system is key to Diara area's		Y	-	-	-
sustainability to curb recurrent floods and erosion.					

8.4: Human Resources Development.

Through a systematic skill gap analysis compulsory training and skill upgradation of all extension functionaries will be ensured by conducting " DACUM' methodology. Using resources of all training institutes viz. BAMETI, MANAGE and other centres of excellence a bank of trainer would be developed for ATMA, Patna from among the BTT and District Core Team. Human resources development is vital component for the success of any projects for effective implementation of the projects as well as for its sustainability all the stakeholders including extension functions of agricultural and allied department, NGOs private extension workers, inputs handling agencies are required to be trained various aspects relating to their roles & responsibilities. Training would be centered on Group Dynamics, record keeping, accountancy, financial management of savings and credit, identification of group business activities, and on imparting technical skill to under take value added ventures for the promotion of farmers integration with Agri-business. Table 8.4 gives the strategies to institutionalize the HRD component.

Table-8.4: Human Resource Development

Strategy / Intensification (Relevant to All AES)

1. Increasing techno-managerial capacity of farming community on Farming System approach.
2. Acquaintance to gap in technical, managerial and organizational aspects.
3. Training on importance of follow-up action and feedback.
4. Organizing training to extension personnel on participatory research, extension techniques,
behavioral science and inter personal skills etc.
5. Training to extension personnel in training needs assessment (TNA).
6.Regular interface between GB, FAC, NGOs' with BTT FIGs, CIGs' and Research Scientists.
7. Training on IT and Cyber extension.
8.Skill upgradation training for grass root level workers.
9. Specialized training course for NGOs', farmers, farmwomen and Para-technicians.
10. Exposure visits of public and private extension workers including FIGs'.
11.Organizing need based training programme for extension functionaries of line departments,
NGOs', service providers and Para-technicians.

8.5: Promotion of Community Organizations.

Group approach is the corner stone of the restructured extension mechanism. A major component of extension services will be the mobilization of the community into farmers group-FIG's, FO's and SHG's. Farmers' Organization will be linked with Panchayat through existing statutory institutional arrangements. FO's will be supported directly through public funds and will be involved in the planning; implementation, monitoring and feedback of programme. FO's at the village level would be federated at higher levels. Representative of FO's would be members of decision making bodies such as ATMA's Block-level Farmers' Advisory Committee (FAC), Commodity Associations (CO's) . the ultimate aim is for FO's to internalize extension services for its members and provide backward (inputs, credit, technology) and forward linkages (post-harvest facilities, markets, value addition) in a vertically integrated arrangement. Under the new dispensation there would be paradigm shift from top down blanket dissemination of technological packages, towards providing producers with the knowledge and understanding to solve their own location specific problems. FIGs' will first generate a demand for information, technology and management techniques, the extensionist would then respond to group demand rather than disseminating routine messages. A summary statement of strategies under each group for specific agro-ecological situation is given in Table-8.5 below.

Table-8.5: Promotion of Community Organizations

Strategy / Intensification (Relevant to All AES)

1.Organization of farmer Groups for new commodities to be produced through diversification of farming system.

2.Organization of commodity oriented groups for milk, egg, vegetables, fruits, mushroom, honey, etc. for better access to information, technology, inputs and markets.

Organization of woman SHGs' for NRM and sustainable livelihood options.
Organization of user groups for Afforestation and avenue plantations.
Empowerment of existing SHGs' and WIGs' in the district through partnership with NGOs'.
6.Seed village concept through FIGs' in all cereals, pulses, fodder crops, nursery of various
horticultural crops.
Promotion of FIGs' for fingerling production and value addition in dairy products.
8. Promotion of CIGs' for export oriented marketing of fruits and exotic vegetables.

8.6: Sustainability of the Project.

Generally, provision of extension service given by the government, state agriculture university ,non governmental organization and private companies under one umbrella to avoid multiplicity and contradictory messages reaching the farmers. Most of the projects do not sustain after the project when the funds are withdrawn. Cost sharing by the farmers and building a Revolving fund by ATMA will be ensured for project sustainability after the fund flow is withdrawn. At least there are some willing farmers who can pay for cost of inputs and services for building up such a revolving funds. The AES wise strategies for making the project and extension system sustainable have been presented in Table-8.6 below.

Table-8.6.1: Sustainability of Project and Extension System

S.No.	Strategy / Intensification (Relevant to All AES)						
Sustainat	stainability of Project						
1	Realistic cost recovery for agro-services offered by ATMA.						
2	Cost sharing by farmers on sustainable issues like soil and water conservation and NRM.						
3	Building up revolving fund by collecting cost for supply of inputs like bio-fertilizer, planting						
	material, AI, and soil testing.						
3	Opening Agri-clinics and providing consultancy on payment.						
Sustainat	pility of Extension System						
1.Linkage	es of extension services provided by Govt,/ RAU/ NGOs' and Private companies to						
improve o	quality of message and avoid multiplicity.						
1	Identification of different extension agencies their activities and area of operation.						
2	Development of common understanding regarding approach methodology and delivery of						
	content.						
3	Providing technical support wherever necessary						
4	Arranging interface of these organization with farmers Advisory Committees (FAC)						
5	Developing final modalities and monitoring mechanism by management committee and						
	governing board of ATMA.						
6	Arrangement of refresher courses for these agencies to display latest technology.						
2.Establis	shing of strong linkage between research extension farmers and services providing						
agencies.							
1	Finding out different operators in the field of research and support services and their						
•	ongoing activities.						
2	Finding out the demand of the farmers from above agencies and existing gap if any.						
3	Developing and establishing mutually agreed linkage mechanism.						
4	Development and operationalising monitoring and evaluation mechanism.						
5	Creating friendly atmosphere among research and extension workers and farming						
2 To invo	Continuinty.						
extension	3. To involve farming community to decision making and delivering mechanism in agriculture						
1	Studying the present process and level of the involvement of the farming community						
2	Studying the status and activities of different farmers organization working in agriculture						
-	extension.						
3	Identity needs and mechanism of farmers representing at various level through farmers						
	organization based on activities and commodities.						
4	Developing and operating a mechanism for adequate representation of women.						
	Development and operationalising monitoring mechanism.						
4.Handlin	g over the extension system of the farming community in the long run so as to						
operate a	n extension system.						
1	Find out and study the farmers organizations engaged in extension services.						
2	Identifying farmers organization ready to take over the responsibility of extension						
	Arranging exposure visits ,training ,technical and managerial support.						
3	Developing Memorandum Of Understanding (MOU) for sharing responsibility between						
	tarmers organization and public extension system.						
4	Developing a monitoring and evaluation mechanism.						
5.Encoura	aging farmers to share the cost of critical extension services and inputs to reduce the						
burden o	n public extension.						
1	Identifying the present system of sharing the cost of services provided by various						
	organizations.						

2	Developing a mutually agreed mechanism of cost sharing for extension services and							
	critical inputs Separately for commercial and non-commercial purposes.							
6.To revie	6.To review and redesign ongoing research and development programmes in tune with the							
farming c	farming community.							
1	Establishing the need of farming community in terms of research extension and							
	development.							
2	Studying the ongoing research and development programmes							
3	Dovetailing ongoing development programmes with needs of farmers.							
4	Modify the component of ongoing programmes wherever necessary.							
7. Docum	entation of the process so as to replicate in future.							
1	Finding out the activities and Areas of Excellence to be documented for wider replication.							
2	Identifying the success stories in different areas and analyzing them.							
3	Documentation the process so as to replicate the same.							
4	Providing technical support wherever necessary.							
8. Creatio	on of a bank of resource persons for HRD and Capacity building							
1	Making inventory of available resource persons /experts especially retired from different							
	fields both locally and from outside the district.							
2	Orientation of the resource persons about NATP project objectives.							
2	Inviting them to register with ATMA, Patna for future assignments.							
3	Modalities for honorarium to be worked jointly with BAMETI and MANAGE.							

Table-8.6.2: Sustainability of Support Services

S.No.	Strategy / Intensification (Relevant to All AES)					
Sustainat	Sustainability of Support Services					
1	Increase mobility of research and extension functionaries towards effective					
	implementation of the project					
2	Assessing the need and finalizing norms and modalities for mobility support to different					
	level of functionaries and motivating them for higher responsibility.					
3	Improve performance of research and extension functionaries by provision of operational					
	facilities at different levels.					
4	Identification of area and type of required support at various levels.					
5	Providing support within the budget and within world Bank procurement and					
	reimbursement procedures.					

8.7: Media Support and Use of Information technology

Under the NATP all the Block level Farm Information and Advisory Centres in Patna district would be electronically linked to district, state and national institutions. Central Govt. would support states in the use of electronic linkages and computerization so that marketing, research, extension and farming communities are linked to each other, and into local, national and global networks. The objective is to link all blocks of the district with national and international networks in a phased manner.

This would include ATMA newsletter, success stories in film and electronic form, technical messages in electronic form and on electronic media, electronic access to all stake holder, through NICNET, and proposed video conferencing facilities being established at DM's Conference Hall, electronic mail access to ICAR institutes and researches from Rajendra Agricultural University, Bihar along with state and national administrative offices, and electronic access to ARIS system databases and, eventually, to the World Wide Web.

Strategy wise activities with budget provisions have been dealt in detail in chapter 11.7.

8.8: Promotion of NGOs' and Private Organizations'

Strength of NGOs' in mobilizing communities into farmer organization FOs'/ FIGs/Market Associations can be effectively utilized. As such NGOs' complement the public extension effort in several centrally sponsored programmes. Also extension services are contracted out and out-sourced to NGOs' at the block level. In such case the NGOs' substitute for public extension. ATMA funds will be utilized to support NGOs'. A systematic training, capacity building and technical back stopping mechanism, would be supported through ATMA funds to provide extension services.

There is a great demand particularly for medicinal and aromatic, fruit, and flower plants in the district. To meet this enhanced demand a Resource Centre-cum- Gene Bank is being proposed to be set up in collaboration with NGO partners, namely Sristi Foundation, Patna. This NGO has a very good track record in promoting these enterprises. Strategy wise activities with budget provisions have been dealt in detail in chapter 11.8.

8.9: Empowerment of Farmwomen and Ensuring SRM

Farmwomen contribute significantly to agriculture production, livestock production and household food security in the district. Their skills can be improved to reduce drudgery and to improve the quality of work through need based training. Women farmers could be involved in the decision making process in NRM. Entrepreneurship development can also be introduced among them. They can be involved in special production activities including post-production activities to avoid physical strain, labour, time and to improve the quality of work and value. Formation of women groups in the concept of SHG or FIG is also considered essential for farmwomen. Strategy wise activities with budget provisions have been dealt in detail in chapter 11.9.

8.10: Dovetailing Ongoing Schemes Through ATMA

As per the Policy Framework for Agricultural Extension funds from the Central Government together with state share for all Technology Transfer and extension activities would be pooled at ATMA level and released for various activities according to the Strategic Research and extension Plan prepared for the district. Annually huge funds are released to the states under more than 100 centrally sponsored schemes (crop, horticulture, inputs, soil & water management) for the purpose of Transfer of Technology, ATMA would be conduit of these funds. Strategy wise activities with budget provisions have been dealt in detail in chapter 11.10.

ĺ	Strategy /Intervention	Department	Dovetailing of Ongoing Schemes
	1.Empowering ATMA to seek additional funds from different ongoing Govt. schemes.	a. District Rural Development Agency (DRDA)	 Watershed Management Scheme. Swarna Jayanti Gram Swarojgar Yojana (SGSY)- Prime Minister Rojgar Yojana (PMRY) Gramin Awas Yojana Garima Yojana Scheduled Caste Action Plan Million Shallow Tube well Programme
		 b. Cooperative Department c. NABARD d. Industries Department e. Fisheries Department q. COMFED 	
	2.Involving Block Technical team(BTT) in planning and implementation of all ongoing schemes.	 a. Identification of components of different schemes to different blocks. b. Request by ATMA for placement of funds with BTT for implementation of schemes. 	
	3. Increasing the efficiency of extension workers by providing mobility support.	a. Providing loan for purchase of two-wheelers by Govt. on priority basis to BTT members.b. Provision for convergence allowance to field functionaries by ATMA.	
Integration of Govt., Public, Private and		NGO's sector programs while makir	g them farmer driven.
	4.All development programmes to be reviewed for provision of extension support while preparing Annual/Seasonal action plans.	ATMA and other line departments	ATMA Management Committee and ATMA Governing Board to ensure.
	5.Orientation of all non-government organization, private and public sector units to NATP concept and approach.	ATMA and other line departments	ATMA Management Committee and ATMA Governing Board to ensure.

Table- Dovetailing Ongoing Schemes Through ATMA

Chapter-9

Research Strategies

The stereotyped concept of the channels of communication between research, extension and farmers is that the extension worker communicate research findings to the farmers and transmit latter problem to the research who then incorporates these problems in to their work programme. This make the research worker effectively insulated form direct contact with farmers. Even if research projects are highly relevant and a package of advice is objectively appropriate they can still be rejected by unfocussed groups leaving research and extension personnel disillusioned .The participation of farmers in research and extension programme, which includes formulation of policies and requirement planning as well as implementation is therefore of great importance.

Technology can be generated by research and by innovative farmers and others. Once a technology has been identified as being promising by focused group, it needs testing to make sure that it is suitable for the situation in which it is likely to be used, If it passes this test it, then becomes proven technology which can be advocated with confidence through extension work. The elements in the transfer of technology would be as follows.

SI.No.	I.No. Production System					
			Rele	vance t	o AES	
	Agriculture Production System	AES-	AES-	AES	AES-IV	AES
			II	-111		-V
1	INM in rice wheat based cropping system	-	Y	-	Y	Y
2	Screening the gene bank of pulses grown in	Y	-	-	Y	Y
	Tal and Patna district.					
3	Introduction of pest resistance to gene pool	Y	-	-	-	-
	of tal pulses					
4	Development of situation specific tal pulses	Y	-	-	-	-
	of required duration					
5	IPM in vegetable based cropping systems	-	Y	Y	Y	Y
6	Inclusion of low water requiring crop/crop	-	-	Y	-	Y
	rotation for rainfed areas					
7	Micro-nutrients scheduling for irrigated Rice-	-	Y	Y	Y	Y
	Wheat system					
8	Soil organic matter studies with green	Y	Y	Y	Y	Y
	manuring to keep healthy balance of organic					
carbon in soil						
9 Studies to revitalize old orchard on		Y	Y	Y	Y	Y
	commercial lines.					
10	Studies to increase keeping quality of local	Y	Y	Y	Y	Y
	mango race (Digha maldah) and other					
	surplus vegetable crops.					
11	Studies on drying up Seshum plants.	Y	Y	Y	Y	Y
12	Successful introduction of medicinal &	-	Y	-	Y	Y
	aromatic plants, mushroom and Floriculture.					
13 Screenings of oilseed like mustard-toria &		Y	Y	-	Y	Y
	castor, which has potential in the district.					
14	14 Validation of indigenous technical		Y	Y	Y	Y
	knowledge.					
15	15 To study the feasibility of Agri-horticulture &		Y	Y	Y	Y
	horti-pasture system in old & news orchard.					

Table-9.1: Research Strategies for Agricultural production System
SI.	SI. Animal Production System		Relevance to AES						
No.		AES-1	AES-	AES-	AES-IV	AES-V			
			II						
1.	Studies and delineation of F.M.D prone area in the district.	Y	Y	Y	Y	Y			
2	Studies on Dangnala disease of cattle.	Y	Y	Y	Y	Y			
3	Studies on Crossbred cow infertility.	Y	Y	Y	Y	Y			
4	Study of suitability of different fodder	Y	Y	Y	Y	Y			
	crops on agri-situation basis.								
5	Studies on demand and supply of	Y	Y	Y	Y	Y			
	animal products for marketing status								
	improvement.								
6	Economic study of each animal	Y	Y	Y	Y	Y			
	enterprise under different situation of								
	the district.								
7	Studies on nutritious animal and poultry	Y	Y	Y	Y	Y			
	feed production from locally available								
	material as health supplement.								
8	Studies on development of alternatives	Y	Y	Y	Y	Y			
	against high use of Oxytocin.								

Table 9.2 : Research Strategies for Animal Husbandry Production System.

Table-9.3: Research Strategies for Fish Production System.

SI.	Fish Production System	Relevance to AES				
No.		AES-	AES-II	AES-	AES-IV	AES-V
		I		III		
1	Studies on development of riverine fish culture technique.	Y	Y	-	-	-
2	Studies on exotic carp suffering from diseases.	Y	-	Y	Y	Y
3	Studies on low cost fish feed production technique from locally available resources.	Y	Y	Y	Y	Y

Table-9.4: Research Strategies for Plantations

SI.	Plantation Production System	Relevance to AES						
No.		AES-I	AES- II	AES- III	AES-IV	AES- V		
1	Study for checking the wilting type of death of Seshum trees.	Y	Y	Y	Y	Y		
2	Screening of multipurpose trees for fodder & fuel purpose	Y	Y	Y	Y	Y		
3	Screening of tree species for afforestation and biomass production.	Y	Y	Y	Y	Y		

Proposed Marketing Strategies and Activity Schedule.

Marketing Support and Value Addition will be the prime focus for ATMA, Patna as the

farmers are at a disadvantage on knowledge about prices, volumes, quantities, alternative marketing channels and other features governing market transactions. Government can improve the communications flow and the quality of information to farmers through training workshops and publications and by this improve transparency and facilitate transactions. Government can also sponsor market matching exercise, that is, sponsor meetings and workshops involving farmers and Agri-business enterprises to improve mutual understanding of constraints and requirements, and promote concrete business deals.

Farmers have increasingly begun to perceive marketing rather than production as the major constraints to enhancing farm income. With major thrust of extension agencies on production technique, marketing extension so far has not received the attention it deserves. This assumes greater significance in the light of the new international trading regime under the WTO and the export opportunities being opened up. Public extension functionaries are presently ill-equipped to deal with marketing extension .The multi-agency extension service will need to address these issues through strengthening capacity of the public agency.

Supporting private sector in marketing extension and making extensive use of media and IT in information and technology dissemination. Marketing extension so far peripheral issues in the extension scenario will need to be brought center-stage. Future trading in agricultural commodities would be explored through ATMA, as there is a great potential due to huge surpluses available with the farmers and traders. Indeed production will now need to be significantly dictated by market requirement.

Strate	egy/Intensification and Activities	Remarks
AMa	rketing Support And Value Addition	(Budgetary
		Provisions
1.	Revival of old and closed sugar mills with farmers management	Nil
2.	Promoting private entrepreneurship to establish sugarcane based industries (organic	2.0
	gur making.)-HRD component	
3.	Promoting private entrepreneurship for maize based industries for cattle and poultry	4.0
	feed and other value added products Research and HRD component	
4.	Promotion of Kisan Ki Mandi. – Tech. Know-how, Publicity, Contingency and	5.0
	Dovetailing with District Administration for cost sharing & facilitationFive centres	
5.	Promotion of Commodity Cooperative Marketing Capacity building	2.0
6.	Promotion of Rural godowns and cold chambers Dovetailing with Govt. departments.	Nil
7.	Strengthening of FCI network, PACS and State Agril. Marketing Board outlets	Nil
	Dovetailing with Govt.	
8.	Networking with COMFED (Sudha brand) outlets for marketing mushroom, honey etc.	Nil
9.	Popularizing very fine rice varieties along with milling, processing and marketing. HRD,	5.0
	Exposure visit and forward linkage.	
10.	Intensification of organic vegetables production. HRD, Exposure visit and forward	3.0
	linkage.	
11.	Frequent market surveys for consumer preference to tailor demand-linked	7.5
10	production.(Market study & participatory technology development)	
12.	Strengthening market information through IT and FIAC. (Internet connectivity& hiring IT	7.5
40	facilitators)	N 1*1
13.	Develop and establish market information network from block, district, state, national to	NII
45	International levels. (Inrough FIAC)	N1:1
15.	Studying the present market information network prevailing in the district along with the	INII
16	yaps.	NU
10.	Establishing the need for improvement through mountation betwork is possessive.	INII
	Γ moning out the commodutes, market where information network is necessary (milough	

Table-10 : Proposed Strategies for Marketing Support And Value Addition

17.	Developing an information technology network at various levels.	2.0
18.	Developing an operational mechanism (For establishing net work of FIAC with ATMA).	Nil
19.	Technical and managerial support to FIAC and BTTs	Nil
20.	Studying the present status of dissemination of market information by different	Nil
	organizations through various media.	
21.	Exploring possibility of news media-FM radio station (Hiring air time)	3.0
22.	Integrating of various media sources through developing mechanism to be	Nil
	operationalized and monitored (Net working).	
23.	Exploiting possibility of news media like print internet, etc.	1.0
24.	Identifying and studying of the existing farmers organizations.	Nil
25.	Identification of success stories.	Nil
26.	Identifying the farmers /farming community along with communities with a possibility of	Nil
	promoting market oriented organization, at various level.	
27.	Arranging exposure visits training etc.	5.0
28.	Providing techno-managerial support.	3.0
29.	Developing and operationalising a monitoring mechanism (Convergence allowance)	2.0
30.	Identifying and studying activities of various organizations engaged in marketing	Nil
	operation along with commodities handled.	
31.	Finding out the need for marketing the commodities by farmers/farming community.	Nil
32.	Providing technical and managerial support.	3.0
33.	Exploring options for contract farming in medicinal and aromatic plants and vegetables	3.0
34.	Creation of Export promotion zone for fine scented basmati rice (Through linkage).	Nil
35.	Promotion of Commodity Interest Groups in major commodities.	5.0
	1. Formation of CIG through awareness and training	
	Survey /study/consultancy to establish viable processing units.	
36.	Assessment of export oriented marketable commodity by engaging marketing	10.0
	consultants /agencies for forecasting the production and local consumption statistics	
	for Patna district.	
	TOTAL	73.0

Activity Schedule and Investment Plan

Under each extension strategy as proposed for different AES in Chapter 8 the proposed Activity Schedule along with unit size, unit cost, Number of units and Total such activities (Group Demonstrations, Field Days and Exposure visits) have been spelt out in the following Tables.

Details of extension activities to be carried out for addressing each extension strategies

11.1: Diversification and Intensification of Existing Farming System:

Strategic Issues and	Progra	amme cost	t	Activity	Remarks if		
Activity Intervention	_			Schedu	Agency	any	
	Unit	Unit Unit No Total		ling			
	size	cost	of	cost			
		(Rs)	Units	(Rs)			
11.1.1: Agriculture production system							•
1. Introduction and intensification of S	weet Co	orn and Qu	ality Pro	tein Maize			-
I. Awareness campaign	20	1000	16	16,000	2003-05	BTT	From on going Schemes
ii.Identification of area, promotion of SHG	20	2000	16	32000	2003-05	BTT	
iii Exposure Visit		5000	16	80000	2003-05	BTT	
iv. Backward and forward linkage		0000	10	00000	2000 00		
v. Field day and documentation		2000	16	32000	2003-05	BTT	
2. Additional income from commercial	mushro	om cultiva	ation			1 - · ·	
i. Awareness campaign for adoption of commercial mushroom cultivation.	20	1000	25	25000	2003-05	BTT	
ii. Identification and analysis of success stories on commercial mushroom cultivation					2003-05	ARI/ BTT	
iv. Training to farmers on mushroom cultivation technology (from preparation of beds to harvesting and marketing)	20	2000	25	50000	2003-05	ARI/ BTT	
v. Facilitating supply of critical inputs like spawns							
v. Exposure visit to success sites.		5000	2	10000	2003-05	BTT	
vi. Organizing field day near successful demonstration sites.	-	2000	25	50000	2003-05	BTT	
vii. Linkage with marketing outlets of PDP.							
Total				8,00,00 0			
3. Area expansion under forage cultiva	ation dai	ry enterpr	ises				-
i. Identification of areas where forage cultivation can be taken successfully					2003-05	BTT	
ii. Promoting SHG/FIG	20					BTT	
iii. Awareness campaign	20	1000	25	25000	2003-05	BTT	
iv. Training to SHG/FIG in techno- managerial aspect	20	2000	25	50000	2003-05	BTT	
v. Facilitating supply Critical Inputs like forage seeds / Slips.		5000	16	80000	2003-05	ARI BTT	On going scheme
vi. Demonstration on farmers field	0.5 ha.	1000	25	25000			
vi. Exposure visit for FIG to successful sites		5000	16	80000	2003-05	BTT	
viii. Field Day		2000	16	32000	2003-05	BTT	
4. Diversification and intensification o	f spices						
i. Awareness campaign for growing spices	20	2000	16	32000	2003-05	BTT	
ii. Identification of area where spices							
iv. Training of farmers/group of farmers		2000	16	32000	2003-05	BTT	
iv. Arrangement for supply of critical inputs like improved seeds.		1500	16	24000	2003-05	BTT	Revolving fund basis

v. Demonstration	0.5	1000	25	25000	2003-05					
	ha.			400000	0000.05	DTT				
VI. Exposure Visit to Cochin		50000	2	100000	2003-05	BII				
vii. Post narvest management for better										
viji, Linkage (Backward and Forward)										
5. Diversification and intensification of medicinal and aromatic plants.										
i. Identification of specific areas for					2003-05	BTT				
medicinal and aromatic plant cultivation										
iv.Training to FIGs'	20	2000	16	32000	2003-05	BTT	_			
iii. Facilitating supply of key inputs,		1000	16	16000	2003-05	BTT				
vi Exposure visit to successful sites		50000	2	100000	2003-05	BTT	-			
and CIMAP. Lucknow		00000	2	100000	2000 00					
v. Linkage with inputs supply and										
marketing agencies.										
vi. Revolving funds for strengthing		100000		100000						
FIG/SHGs'				40.40.000		<u> </u>				
I otal				10,48,000		<u> </u>				
1 Reputatizing commercial Elericultur	•									
i Awareness campaign for commercial	20	1000	16	16000	2003-05	BTT				
horticulture cultivation	20	1000	10	10000	2000 00					
ii. Identification of specific areas for										
commercial cultivation of flower crops										
iii. Facilitate supply of improved planting	20	400	4	6000	2003-05	BTT	Revolving			
materials of foliage plants and flowers							funds			
particularly marigold, lily gladioli, tube										
rose and other inputs		2500	4	10000	2002.05	DTT				
better floriculture management		2500	4	10000	2003-05	ыі				
v. Facilitating regularized market supply							On aoina			
of produce							SGŠY			
							scheme			
							benefite			
2. Introduction and intensification of	exotic ar	nd non trac	litional	vegetable cu	Iltivation					
2. Introduction and intensification of i. Awareness campaign for commercial	exotic ar	nd non trac 1000	litional	vegetable cu 16000	altivation 2003-05	BTT				
2. Introduction and intensification of i. Awareness campaign for commercial vegetable cultivation	exotic ar 20	nd non trac 1000	litional 16	16000	Iltivation 2003-05	BTT				
 2. Introduction and intensification of i. Awareness campaign for commercial vegetable cultivation ii. Identification of specific areas for commercial cultivation of vegetable 	exotic ar 20	nd non trac 1000	litional 16	vegetable cu 16000	ultivation 2003-05	BTT				
 2. Introduction and intensification of i. Awareness campaign for commercial vegetable cultivation ii. Identification of specific areas for commercial cultivation of vegetable crops 	exotic ar 20	nd non trac 1000	litional 16	vegetable cu 16000	altivation 2003-05	BTT				
2. Introduction and intensification of i. Awareness campaign for commercial vegetable cultivation ii. Identification of specific areas for commercial cultivation of vegetable crops iii. Training to FIG for improved	exotic ar 20	1000 2000	litional 16 16	vegetable cu 16000 32000	Jltivation 2003-05 2003-05	BTT				
 2. Introduction and intensification of i. Awareness campaign for commercial vegetable cultivation ii. Identification of specific areas for commercial cultivation of vegetable crops iii. Training to FIG for improved cultivation of vegetable. 	20	2000	litional 16 16 16	vegetable cu 16000 32000	Jltivation 2003-05 2003-05	BTT				
 2. Introduction and intensification of Awareness campaign for commercial vegetable cultivation Identification of specific areas for commercial cultivation of vegetable crops Training to FIG for improved cultivation of vegetable. Facilitate supply of improved planting 	20 20 20	2000	litional 16 16 16 16	vegetable cu 16000 32000 16000	Jltivation 2003-05 2003-05 2003-05	BTT BTT BTT	Revolving			
2. Introduction and intensification of i. Awareness campaign for commercial vegetable cultivation ii. Identification of specific areas for commercial cultivation of vegetable crops iii. Training to FIG for improved cultivation of vegetable. iv. Facilitate supply of improved planting materials of vegetable seeds and other inputto	20 20 20	2000	litional 16 16 16	vegetable cu 16000 32000 16000	Jltivation 2003-05 2003-05 2003-05	BTT BTT BTT	Revolving funds			
2. Introduction and intensification of i. Awareness campaign for commercial vegetable cultivation ii. Identification of specific areas for commercial cultivation of vegetable crops iii. Training to FIG for improved cultivation of vegetable. iv. Facilitate supply of improved planting materials of vegetable seeds and other inputs v. Exposure visit to success site for	20 20 20	2000	litional 16 16 16	vegetable cu 16000 32000 16000	Jltivation 2003-05 2003-05 2003-05	BTT BTT BTT	Revolving funds			
 2. Introduction and intensification of i. Awareness campaign for commercial vegetable cultivation ii. Identification of specific areas for commercial cultivation of vegetable crops iii. Training to FIG for improved cultivation of vegetable. iv. Facilitate supply of improved planting materials of vegetable seeds and other inputs v. Exposure visit to success site for better crop management 	20 20 20	2000 1000 2000 50000	litional 16 16 16 2	vegetable cu 16000 32000 16000 100000	Jltivation 2003-05 2003-05 2003-05 2003-05	BTT BTT BTT BTT	Revolving funds			
 2. Introduction and intensification of Awareness campaign for commercial vegetable cultivation Identification of specific areas for commercial cultivation of vegetable crops Training to FIG for improved cultivation of vegetable. Facilitate supply of improved planting materials of vegetable seeds and other inputs Exposure visit to success site for better crop management Facilitating regularized market 	20 20 20	2000 1000 2000 50000	litional 16 16 16 2	vegetable cu 16000 32000 16000 100000	Jltivation 2003-05 2003-05 2003-05 2003-05	BTT BTT BTT BTT	Revolving funds			
 2. Introduction and intensification of i. Awareness campaign for commercial vegetable cultivation ii. Identification of specific areas for commercial cultivation of vegetable crops iii. Training to FIG for improved cultivation of vegetable. iv. Facilitate supply of improved planting materials of vegetable seeds and other inputs v. Exposure visit to success site for better crop management vi. Facilitating regularized market supply of produce 	20 20 20	2000 1000 2000 50000	litional 16 16 16 2	vegetable cu 16000 32000 16000 100000	Jltivation 2003-05 2003-05 2003-05 2003-05	BTT BTT BTT BTT	Revolving funds On going SGSY			
 2. Introduction and intensification of i. Awareness campaign for commercial vegetable cultivation ii. Identification of specific areas for commercial cultivation of vegetable crops iii. Training to FIG for improved cultivation of vegetable. iv. Facilitate supply of improved planting materials of vegetable seeds and other inputs v. Exposure visit to success site for better crop management vi. Facilitating regularized market supply of produce 	20 20 20	2000 1000 2000 50000	litional 16 16 2	vegetable cu 16000 32000 16000 100000	Iltivation 2003-05 2003-05 2003-05 2003-05	BTT BTT BTT BTT	Revolving funds On going SGSY scheme			
 2. Introduction and intensification of i. Awareness campaign for commercial vegetable cultivation ii. Identification of specific areas for commercial cultivation of vegetable crops iii. Training to FIG for improved cultivation of vegetable. iv. Facilitate supply of improved planting materials of vegetable seeds and other inputs v. Exposure visit to success site for better crop management vi. Facilitating regularized market supply of produce vii. Organize field day 	20 20 20	2000 2000 2000	litional 16 16 2 16	vegetable cu 16000 32000 16000 100000 32000	Jltivation 2003-05 2003-05 2003-05 2003-05 2003-05	BTT BTT BTT BTT	Revolving funds On going SGSY scheme			
2. Introduction and intensification of i. Awareness campaign for commercial vegetable cultivation ii. Identification of specific areas for commercial cultivation of vegetable crops iii. Training to FIG for improved cultivation of vegetable. iv. Facilitate supply of improved planting materials of vegetable seeds and other inputs v. Exposure visit to success site for better crop management vi. Facilitating regularized market supply of produce vii. Organize field day viii. Linkage with marketing agencies	20 20	2000 2000 2000 2000	litional 16 16 2 16	vegetable cu 16000 32000 16000 100000 32000 32000	Iltivation 2003-05 2003-05 2003-05 2003-05 2003-05	BTT BTT BTT BTT	Revolving funds On going SGSY scheme			
 2. Introduction and intensification of Awareness campaign for commercial vegetable cultivation Identification of specific areas for commercial cultivation of vegetable crops Training to FIG for improved cultivation of vegetable. Facilitate supply of improved planting materials of vegetable seeds and other inputs Exposure visit to success site for better crop management Facilitating regularized market supply of produce vii. Organize field day viii. Linkage with marketing agencies Antroduction and Intensification of A 	20 20 20 gri-Horti	2000 2000 2000 2000 50000 2000 -Farming §	litional 16 16 2 16 3 ystem	vegetable cu 16000 32000 16000 100000 32000 32000 , Apiary and	Iltivation 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 Multi-tier C	BTT BTT BTT BTT Sropping	Revolving funds On going SGSY scheme			
 2. Introduction and intensification of Awareness campaign for commercial vegetable cultivation Identification of specific areas for commercial cultivation of vegetable crops Training to FIG for improved cultivation of vegetable. Facilitate supply of improved planting materials of vegetable seeds and other inputs Exposure visit to success site for better crop management Facilitating regularized market supply of produce vii. Organize field day viii. Linkage with marketing agencies Awareness campaign for introduction and oppage of area under Agril horti 	20 20 20 20 gri-Horti 20	d non trac 1000 2000 1000 50000 2000 -Farming S 1000	litional 16 16 16 2 16 3 9	vegetable cu 16000 32000 16000 100000 32000 32000 , Apiary and 9000	Iltivation 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05	BTT BTT BTT BTT BTT BTT	Revolving funds On going SGSY scheme			
 2. Introduction and intensification of Awareness campaign for commercial vegetable cultivation Identification of specific areas for commercial cultivation of vegetable crops Training to FIG for improved cultivation of vegetable. Facilitate supply of improved planting materials of vegetable seeds and other inputs Exposure visit to success site for better crop management Facilitating regularized market supply of produce Vii. Organize field day Viii. Linkage with marketing agencies Awareness campaign for introduction and expansion of area under Agril-horti 	20 20 20 20 gri-Horti 20	d non trac 1000 2000 1000 50000 2000 -Farming \$ 1000	litional 16 16 16 2 16 5ystem 9	vegetable cu 16000 32000 16000 100000 32000 32000 , Apiary and 9000	Iltivation 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05	BTT BTT BTT BTT BTT Topping BTT/ NGO	Revolving funds On going SGSY scheme			
 2. Introduction and intensification of Awareness campaign for commercial vegetable cultivation Identification of specific areas for commercial cultivation of vegetable crops Training to FIG for improved cultivation of vegetable. Facilitate supply of improved planting materials of vegetable seeds and other inputs Exposure visit to success site for better crop management Facilitating regularized market supply of produce Vii. Organize field day Viii. Linkage with marketing agencies Awareness campaign for introduction and expansion of area under Agril-horti farming such as intercropping and 	20 20 20 gri-Horti 20	d non trac 1000 2000 1000 50000 2000 -Farming \$ 1000	litional 16 16 16 2 16 3 9	vegetable cu 16000 32000 16000 100000 32000 32000 , Apiary and 9000	Iltivation 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05	BTT BTT BTT BTT BTT Fropping BTT/ NGO	Revolving funds On going SGSY scheme			
 2. Introduction and intensification of Awareness campaign for commercial vegetable cultivation Identification of specific areas for commercial cultivation of vegetable crops Training to FIG for improved cultivation of vegetable. Facilitate supply of improved planting materials of vegetable seeds and other inputs Exposure visit to success site for better crop management Facilitating regularized market supply of produce vii. Organize field day viii. Linkage with marketing agencies Awareness campaign for introduction and expansion of area under Agril-horti farming such as intercropping and additional crop under shade. 	20 20 20 gri-Horti 20 20	2000 2000 2000 2000 50000 2000 -Farming \$ 1000	litional 16 16 2 16 3 9	vegetable cu 16000 32000 16000 100000 32000 32000 , Apiary and 9000	Iltivation 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05	BTT BTT BTT BTT BTT D BTT/ NGO BTT/	Revolving funds On going SGSY scheme			
 2. Introduction and intensification of Awareness campaign for commercial vegetable cultivation Identification of specific areas for commercial cultivation of vegetable crops Training to FIG for improved cultivation of vegetable. Facilitate supply of improved planting materials of vegetable seeds and other inputs Exposure visit to success site for better crop management Facilitating regularized market supply of produce vii. Organize field day viii. Linkage with marketing agencies Awareness campaign for introduction and expansion of area under Agril-horti farming such as intercropping and additional crop under shade. 	20 20 20 gri-Horti 20 20	d non trac 1000 2000 1000 50000 2000 -Farming S 1000	litional 16 16 16 2 16 3 9	vegetable cu 16000 32000 16000 100000 32000 32000 , Apiary and 9000	Iltivation 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05	BTT BTT BTT BTT BTT Sropping BTT/ NGO BTT/ NGO	Revolving funds On going SGSY scheme			
 2. Introduction and intensification of Awareness campaign for commercial vegetable cultivation ii. Identification of specific areas for commercial cultivation of vegetable crops iii. Training to FIG for improved cultivation of vegetable. iv. Facilitate supply of improved planting materials of vegetable seeds and other inputs v. Exposure visit to success site for better crop management vi. Facilitating regularized market supply of produce vii. Organize field day viii. Linkage with marketing agencies 3. Introduction and Intensification of A i. Awareness campaign for introduction and expansion of area under Agril-horti farming such as intercropping and additional crop under shade. ii. Promotion of FIG 	exotic ar 20 20 20 gri-Horti 20 20 20 20 20 20	d non trac 1000 2000 1000 50000 2000 -Farming \$ 1000 2000 -Farming \$ 2000 2000	litional 16 16 16 2 16 3 9 9	vegetable cu 16000 32000 16000 100000 32000 32000 , Apiary and 9000	Iltivation 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05	BTT BTT BTT BTT BTT Topping BTT/ NGO BTT/ NGO BTT/	Revolving funds On going SGSY scheme			
2. Introduction and intensification of i. Awareness campaign for commercial vegetable cultivation ii. Identification of specific areas for commercial cultivation of vegetable crops iii. Training to FIG for improved cultivation of vegetable. iv. Facilitate supply of improved planting materials of vegetable seeds and other inputs v. Exposure visit to success site for better crop management vi. Facilitating regularized market supply of produce vii. Organize field day viii. Linkage with marketing agencies 3. Introduction and Intensification of A i. Awareness campaign for introduction and expansion of area under Agril-horti farming such as intercropping and additional crop under shade. ii. Promotion of FIG	exotic ar 20 20 20 gri-Horti 20 20 20	d non trac 1000 2000 1000 50000 2000 -Farming \$ 1000 2000	litional 16 16 16 2 3 ystem 9 9	vegetable cu 16000 32000 16000 16000 32000 16000 32000 100000 32000 , Apiary and 9000 18000	Iltivation 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05	BTT BTT BTT BTT BTT BTT/ NGO BTT/ NGO BTT/ NGO	Revolving funds On going SGSY scheme			
 2. Introduction and intensification of Awareness campaign for commercial vegetable cultivation Identification of specific areas for commercial cultivation of vegetable crops Training to FIG for improved cultivation of vegetable. Facilitate supply of improved planting materials of vegetable seeds and other inputs Facilitating regularized market supply of produce Vii. Organize field day Viii. Linkage with marketing agencies 3. Introduction and Intensification of A i. Awareness campaign for introduction and expansion of area under Agril-horti farming such as intercropping and additional crop under shade. Iii. Community demonstration iv. Field day 	exotic ar 20 20 20 20 gri-Horti 20 20 20	d non trac 1000 2000 1000 50000 2000 -Farming \$ 1000 2000 -2000 -2000 -2000 -2000 -2000 2000 2000 2000	litional 16 16 16 2 16 3 9 9 9 9	vegetable cu 16000 32000 16000 16000 32000 100000 32000 4 32000 9000 18000 18000	Iltivation 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05	BTT BTT BTT BTT BTT BTT/ NGO BTT/ NGO BTT/ NGO BTT/ NGO	Revolving funds On going SGSY scheme			
 2. Introduction and intensification of Awareness campaign for commercial vegetable cultivation Identification of specific areas for commercial cultivation of vegetable crops Training to FIG for improved cultivation of vegetable. Facilitate supply of improved planting materials of vegetable seeds and other inputs Exposure visit to success site for better crop management Facilitating regularized market supply of produce Vii. Organize field day Viii. Linkage with marketing agencies Awareness campaign for introduction and expansion of area under Agril-horti farming such as intercropping and additional crop under shade. Promotion of FIG Iii. Community demonstration 	exotic ar 20 20 20 gri-Horti 20 20 20	d non trac 1000 2000 1000 50000 2000 -Farming S 1000 2000 2000 2000 2000 2000 2000 2000 2000 2000	litional 16 16 16 2 16 3 9 9 9 9 9	vegetable cu 16000 32000 16000 100000 32000 32000 32000 9000 18000 18000	Iltivation 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05	BTT BTT BTT BTT BTT BTT NGO BTT/ NGO BTT/ NGO	Revolving funds On going SGSY scheme			
 2. Introduction and intensification of Awareness campaign for commercial vegetable cultivation Identification of specific areas for commercial cultivation of vegetable crops Training to FIG for improved cultivation of vegetable. Facilitate supply of improved planting materials of vegetable seeds and other inputs Exposure visit to success site for better crop management Facilitating regularized market supply of produce vii. Organize field day viii. Linkage with marketing agencies Awareness campaign for introduction and expansion of area under Agril-horti farming such as intercropping and additional crop under shade. Promotion of FIG Iii. Community demonstration iv. Field day v. Backward and forward linkage 4. Expansion of area under off season 	exotic ar 20 20 20 gri-Horti 20 20 20 20	d non trac 1000 2000 1000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000	litional 16 16 16 2 16 3 9 9 9 9 9	vegetable cu 16000 32000 16000 100000 32000 32000 32000 9000 18000 18000	Iltivation 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05	BTT BTT BTT BTT BTT BTT/ NGO BTT/ NGO BTT/ NGO BTT/ NGO	Revolving funds On going SGSY scheme			
 2. Introduction and intensification of Awareness campaign for commercial vegetable cultivation ii. Identification of specific areas for commercial cultivation of vegetable crops iii. Training to FIG for improved cultivation of vegetable. iv. Facilitate supply of improved planting materials of vegetable seeds and other inputs v. Exposure visit to success site for better crop management vi. Facilitating regularized market supply of produce vii. Organize field day viii. Linkage with marketing agencies Awareness campaign for introduction and expansion of area under Agril-horti farming such as intercropping and additional crop under shade. ii. Promotion of FIG lii. Community demonstration iv. Field day v. Backward and forward linkage Area expansion. campaign (group) 	exotic ar 20 20 20 gri-Horti 20 20 20 20 vegetab	d non trac 1000 2000 1000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000	litional 16 16 16 2 16 3 ystem 9 9 9 9	vegetable cu 16000 32000 16000 100000 32000 32000 0 100000 18000 18000 18000	Iltivation 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05	BTT BTT BTT BTT BTT BTT/ NGO BTT/ NGO BTT/ NGO BTT/ NGO	Revolving funds On going SGSY scheme			
 2. Introduction and intensification of Awareness campaign for commercial vegetable cultivation Identification of specific areas for commercial cultivation of vegetable crops Training to FIG for improved cultivation of vegetable. Facilitate supply of improved planting materials of vegetable seeds and other inputs Exposure visit to success site for better crop management Facilitating regularized market supply of produce vii. Organize field day viii. Linkage with marketing agencies Awareness campaign for introduction and expansion of area under Agril-horti farming such as intercropping and additional crop under shade. Promotion of FIG Iii. Community demonstration iv. Field day v. Backward and forward linkage 4. Expansion of area under off season Area expansion, campaign (group discussion) formed under macro mode 	20 20 20 20 gri-Horti 20 20 20 20 vegetab	d non trac 1000 2000 1000 50000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000	litional 16 16 16 2 3 3 5 9 9 9 9	vegetable cu 16000 32000 16000 100000 32000 32000 0 100000 18000 18000 18000	Iltivation 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05 2003-05	BTT BTT BTT BTT BTT Sropping BTT/ NGO BTT/ NGO BTT/ NGO BTT/ NGO	Revolving funds On going SGSY scheme			

ii. Promotion of FIG	20				2003-05	BTT/	
						NGO	
iii. Training to off-season vegetable	20	5000	16	80000	2003-05	BTT	
groups in specific area for particular							
situations and follow-up.							
iv. Facilitating supply to critical inputs		1000	16	16000	2003-05	BTT	On
such as off-season vegetable seeds							revolving
and other inputs.							fund basis
5. Introduction and intensification of S	trawberr	y cultivatio	on.				
i. Identification of specific site and					2003-05	BTT	
cultivation for strawberry farming							
ii. Awareness campaign		1000	16	16000	2003-05	BTT	
iii. Training to enthusiastic farmers.		2000	16	32000	2003-05	BTT	
iv. Supply of critical inputs, planting		5000	16	80000	2003-05	BTT	
material(straw berry new suckers), etc.							
v. Exposure visit to nearby successful		5000	16	80000	2003-05	BTT	
sites.							
6. Intensification of area under local fr	uit races	particular	ly Digha	Maldah ma	ngo and R	ejuvenal	tion of Old
Orchards		-			•	•	
i. Identification of specific beneficiaries		1000	16	16000	2003-	BTT	
for the particular mango cultivation and					05		
awareness.							
ii. Promotion of FIG						BTT	
iii. Training to interested mango		50000	2	100000	2003-	BTT	
growers at CISH-Lucknow/ UPDASP-					05		
Saharanpur							
iv. Organizing mango days at		30000	2	60000	2003-	BTT	
successful sites and felicitations to					05		
successful farmers.							
Total				7,53,000			

1	1.	1.	3:	Live	stock	production	system
			υ.		31000	production	System

Strategic Issues and Activity	ategic Issues and Activity Programme cost						Remarks if		
Intervention	Unit	Unit	No.	Total	Schedu	Agency	any		
	size	cost	of	cost	ling		-		
		(Rs)	Units	(Rs)					
Live stock Production System									
Breed upgradation in dairy animals	05	22500	4.4	245000	2002.05		I		
Refresher training of paravets for	25	22500	14	315000	2003-05	AHD			
from each AES for 3 days duration									
Develop literature on general animal	1000	100		66000	2003-05	AHD			
health management in local language.	copies								
Revival of frozen semen bank				200000					
(revolving fund on cost recovery									
terms). Semen to be procured from									
BAIF and COMFED	20	50000	2	100000	2002.05				
Slliguri	20	50000	2	100000	2003-05	АПО			
Organization of camps for infertility		5000	23	115000	2003-05	AHD			
treatment									
Input supply on cost recovery basis									
Commercial Goat Rearing									
Awareness campaign		1000	10	10000	2003-05	AHD	AES		
Training on improved doet rearing for	20	12000	4	48000	2003-05		10,0.		
3 davs at BVC. Patna.	20	12000	-	40000	2003-03				
Revolving fund for arranging improved		20000	3	60000	2003-05	BTT			
breed/ stock and other inputs to FIGs.			-						
Exposure visit to CIG, Mathura	20	50000	1	50000	2003-05	BTT			
Intensification of backyard poultry	<u> </u>		-						
Awareness campaign for backyard	1	1000	3	3000	2003-05	BTT	AES		
poultry									
Training of 2 days duration at BVC	30	10000	3	30000	2003-05	BTT	10, 0.		
Patna	50	10000	5	30000	2003-03	DII			
Exposure visit to CARI,	30	50000	3	150000	2003-05	BTT			
Izzatnagar and field day									
Revolving fund for FIGs	10	2000	15	30000	2003-05	BTT			
Intensification of commercial poultry		1000				DTT			
Awareness campaign	1	1000	3	3000	2003-05	BII	AES		
Training on commercial poultry At	30	10000	3	30000	2003-05	BTT	10,0.		
BVC.	00	10000	U	00000	2000 00	DII			
Patna of 3 days duration									
Exposure visit and field days at	30	50000	3	150000	2003-05	BTT			
successful sites. (CARI,Izzatnagar)									
Revolving fund for FIGs	10	20000	3	60000	2003-05	BTT			
Backward and forward linkage		manage of a)reede						
Awaronoss campaign		mproved E	sreeas	2000	2002.05	DTT			
Awareness campaign	'	1000	5	3000	2003-03				
Training on commercial piggery at	30	10000	3	30000	2003-05	BTT	,		
BVC,	-								
Patna of 3 days duration									
Exposure visit and field days at	30	50000	3	150000	2003-05	BTT			
successful sites(IVRI,Izzatnagar).	10	20000	22	460000	2002.05				
Revolving lund for FIGS	10	20000	23	460000	2003-05	ын			
Introduction and Intensification Com	mercial I	aver poul	rv		<u> </u>				
Awareness campaign	1	1000	3	3000	2003-05	BTT	AES IV		
			-				and V.		
Training on commercial layer poultry	30	10000	3	30000	2003-05	BTT			
At BVC,Patna of 3 days duration									
Vaccination camp on cost recovery		5000	2	10000	2003-05	BTT			
Dasis Exposure visit and field dave at	30	50000	3	150000	2002.05	BTT			
Successful sites IVRI Izzatnanar	30	50000	5	10000	2003-03				
Revolving fund for FIGs	10	20000	23	460000	2003-05	BTT			
Backward and forward linkage	-		1			ł			
11.1.4: Fish Production System		4	·	•	•	·	·		
Introduction and Intensification of Fr	esh Wate	er Prawn C	ulture						

11.2: Improvement in productivity and income of existing farming system.								
11.2.1: Agriculture Production System								
1. Overcome Technological Gaps in Ag	ricultura	I Crops lik	e Rice, V	Vheat, Maiz	ze, Pulses	and Oilse	eds	
i. Educating farmers on technological		3000	25	75000				
gaps through extension functionaries								
iii. Organizing training programme on		5000	25	125000	2002.05	DTT		
technological gaps.		3000	25	123000	2003-03			
iii. Organize demonstration on seed		2000	25	50000	2003-05	BTT		
treatment, fertilizer and pest								
management								
iv. Demonstration on use of bio fertilizer		1000	25	25000	2003-05	BTT		
and micronutrient								
v. Linkage of farmers with credit inputs								
and marketing		2000	20	40000	2002.05	DTT		
vi. Farmers neid days for replication of		2000	20	40000	2003-05	ыі		
vii Workshop on Agro-processing and		20000	2	40000	2003-05	BTT		
Value –addition techniques		20000	-	10000	2000 00	511		
2. Decentralized Production of Seeds of	Preferr	ed Varietie	s Under	the Conce	pt of Seed	Village		
i. Identification of success stories where			16		2003-05			
quality seed is produced and sold by								
farmers.								
ii. Identification and selection of villages			16		2003-05		On going	
and villagers for seed production .		45000	40	0.40000	0000.05	DTT	scheme	
III. Exposure visits of farmers to		15000	16	240000	2003-05	BII		
iv Training of farmers on seed		25000	1	100000	2003-05	BTT		
certification production and regular		20000	4	100000	2003-03			
follow-up								
v. Procurement of foundation /certified				100000	2003-05	ATMA	Revolving	
seeds of preferred varieties from							fund.	
reliable sources.								
vi. Facilitating linkage with credit inputs								
supply and certification.								
VII. Forward linkage for procurement of								
A Value addition and agro-processing in	Dico N	laiza Wha	at Bulso	<u> </u>				
i Identification of FIG and CIG	I KICE, N		ai, ruise	3.				
ii. Exposure Visit to agro-processing		2500	16	40000	2003-05	BTT		
center particularly Rice Maize. Wheat		2000		10000	2000 00	5.1		
and pulses produces								
iii. Demonstration and training on agro-		1000	16	16000	2003-05	BTT		
processing value addition								
iv. Facilitate linkage with supply of						ATMA		
processing machinery credit and								
marketing.						DTT		
quality seed production in specific areas						ы		
vi. Facilitating supply of guality						АТМА		
foundation /certified system						,BTT		
4. Ensuring production and delivery gu	ality inp	ut				,		
			r		1			
Identification of FIGs and CIGs for		2000	16	32000	2003-05	BTT		
quality seed production in specific areas								
Excilitating supply of quality foundation		2000	16	22000	2002 05	DTT		
/certified seed		2000	10	32000	2003-05	ыі		
Linkage with registered input suppliers						BTT,	Through	
viz. Fertilizer, seed micro-nutrients etc.						AIMA	on going	
							scheme.	
5.Popularization of useful machineries f	or cost	minimizati	on (Zero	tillage)				
Organizing awareness campaign on		2000	25	50000	2003-	BTT		
useful farm equipment .					05			
Facilitate training and demonstration at		5000	25	125000	2003-	BTT		
farming site.					05			

Identification of agro-services, contract with farmers, agriclinic dealing equipment		2000	25	50000	2003- 05					
Linkage with on going schemes for subsidized sale of farm machines and other agril-equipment.						BTT, ATMA	On going scheme.			
Total				10,90,000						
6.Optimization of seeding and planting time in the light of soil moisture										
Awareness campaign on zero tillage machineries		2000	16	32000	2003- 05	BTT				
Demonstration on farmers for zero tillage machine.		2000	16	32000	2003- 05	BTT				
Training to farmers on tilling and tilth management in the light of moisture management		5000	16	80000	2003- 05	BTT				
Exposure visit to successful farming places where zero tillage machines have been used .		2500	16	20000	2003- 05	BTT	On going schems			
Identification of agencies dealing with zero tillage machines.		1000	16	16000	2003- 05	BTT				
Facilitating infrastructural facilities to district Agriculture Office to extensify popularize the scheme		2000	16	32000	2003- 05					
7.Forward linkage with government an	d private	agencies	for remu	inerative pric	e for har	vest	•			
Carry out diagnostic study about issue relating to market		2000	16	32000	2003- 05	BTT				
Dove tailing of ongoing scheme on post harvest technology and market availabilities						ATMA ,BTT				
Identify for market opportunities for each commodity		2000	16	32000	2003- 05	BTT				
Total				14,16,000						
11.2.2: Horticulture Production system					1					
1. Overcoming technical gap in major i	ruit crop	s like mar		a, Banana an		DTT	1			
know-how, package of practices and technological gaps.		4000	10	04000	05	ЫП				
ii. Organizing location based training on technological gaps.		5000	16	80000	2003- 05	BTT				
material, after-care, IPM, INM, etc. and care and management of old orchards.		15000	4	60000	2003- 05	BII				
iv. Exposure visit to CISH Lucknow		50000	2	100000	2003- 05	BTT				
v. Establish linkage (credit, supply of inputs and marketing channels).										
2. Over coming technological gap in n	najor veg	etable cro	ps.	0000	0000	DTT				
education of farmers through mass media /extension functionaries on technological gaps.		2000	4	8000	2003- 05	ыт				
ii.Organizing special training on hybrid vegetable cultivation		2000	4	8000	2003- 05	BTT				
iii. Demonstration on INM, IPM and other package of practices.		2000	4	8000	2003- 05	BTT				
iv. Exposure visit to IIVR Varanasi		50000	2	100000	200 3- 05	BTT				
3. Decentralized Production of Seed &	Planting	Material c	ot Major \	egetables						

i. Awareness campaign	10	000	4	4000	2003-	BTT	
ii. Identification and promotion of FIGs' for decentralized vegetable seed					2003- 05	BTT	
production	15	000	1	60000	2003	PTT	
sites in other district/state.			+	80000	05	ЫП	
Iv Training for seed production and certification.	50	· 000	4	20000	2003- 05	BTT	
v.Arrangement of foundation /certified seed of location specific varieties from reliable sources on payment for the interested FIGs'.	10	00 ·	4	4000	2003- 05	BTT	Revolving basis and explore NHB schemes.
Total				8,18,000			
4. Intensification of True Potato Seed Pro	oduction (TF	PS).					
 Awareness campaign and identification of areas where farmers are ready to grow TPS. 	20	00	16	32000	2003- 05	BTT	
ii. Training to interested growers at CPRI, Patna particularly for nursery preparations	20	00	16	32000	2003- 05	BTT	
iii. Exposure visit to success sites of Nalanda district.	15	000	2	30000	2003- 05	BTT	
iv. Demonstration on farmers site	20	00	16	32000	2003- 05	BTT	
v. Linkage with research and extension institutions.							
5. Promotion of FIGs for Planting Mater	ial in Comn	nercial Fl	oricultu	Ire			L
i. Awareness and Identification of FIGs in specific areas to promote them for commercial cultivations of floriculture .	20	00 2	25	50000	2003- 05	BTT	Through on going scheme like SGSY.
ii. Special training to FIGs' for production of planting materials.	50	00 2	25	125000	2003- 05	BTT	
iii. Facilitate supply of critical inputs such as planting material.	20	000	25	50000	2003- 05	BTT	Through on going scheme.
iv. Exposure visits to BTT members on –Group Dynamics, IPNM, Water Budgeting, Vermi-composting, Fodder crops and Plant Tissue culture at MANAGE and other institutions at Hyderabad.	50	000 2	2	100000	2003- 05	ATMA	
v. Exposure visit to successful sites for FIGs'.	50	000	2	100000	2003- 05	ATMA	
6. Popularizing Micro Irrigation and Go	vernment S	chemes-	OFWA	M)			
 Awareness campaign and identification of successful sites where the sprinkler or drip irrigation system already in use. 	20	00 2	25	50000	2003- 05	BTT	
ii. Identification and follow-up with potential farmers and commercial banks.						BTT ATMA	
iii. Exposure visit to successful sites to Ranchi (Madan Lal Badhia Farm, near BIT Meshra) and KVK-Divyayan, Ranchi.	50	000	2	100000	2003- 05	ATMA	
iv. Linkage with credit and other input supplying agencies.						BTT ATMA	Through on going schemes.
v. Identification of agril services center dealing with micro irrigation machines			(h.a 17			ATMA	
7. Stream-lining and Capacity Building	of Para Hor	ticulture	/Malis d	developed by	γ RAU Ρι	Isa	

i. Identification of Para Hort's / Mali's developed from RAU.					BTT ATMA	
ii. Facilitating the para-horts / malis for registration with ATMA Patna.				2003- 05	BTT	
iii. Linking of selected and identified para-horts /Malis with fruit and flower growers.				2003- 05	BTT	
iv. Revolving funds for strengthening Selected and identified Para-horts /Malis to open commercial flower center.	5000	20	100000	2003- 05	BTT	
TOTAL			13,17,000			

11.2.3: livestock production system										
Strategic Issue and Activity	Progra	amme cost	1		Activi		Remarks			
intervention	Unit Size	Unit cost (Rs)	No of units	Total cost	ty sche dulin a	Agency	if any			
Livestock production System.					J					
1Improved feeding housing & health	care for	dairy anin	nals							
Demonstration on local cattle feed	30	45000	5	22500	2003-	Dairy	One/ AES			
mixture					05	deptt.				
Health care camp of dairy animals.	30	4500	5	22500	2003-	A.H	One /			
	20	50000	5	250000	05	Deptt	AES.			
farming optropropours for 3 days in	30	50000	5	250000	2003-	Dairy	block			
Harvana / kernal					05	Depii	DIOCK			
Supply of cattle by PDP-linkage						BTT				
Supply of minerals blocks						BTT				
2Vaccinations schedule treatment ec	toparasi	tes for cat	tle ,poulti	y goat ,pig ,g	goat					
(i) Printed materials for vaccinations	-	1.00	10000	10000	2003-	BTT	A.H.D			
schedule .					05					
(ii)Supply of input						BTT				
(iii)Training of paravets	30	28500	5	142500	2003-	BTT	BVC,			
(iv) Dovolving funds to perovets for		2000	20	60000	05	ртт	Patna			
Training of 5 EIG members at RAU		2000	30	80000	2003-	ыі				
Patna for 6 days					00					
3Fodder cultivations round the year f	or impro	ved nutrit	ional avai	ilabilitv to da	irv anim	als				
Demonstration of options for various	10	20000	5	100000	2003-	BTT/				
fodder crops in the farming systems at					05	ARI				
RAU ,Mithapur Patna .										
Exposure visit & field day at IGFRI	1 FIG	50000	3	150000	2003-	BTT				
,Jhansi	of 20				05					
Revolving funds for fodder bank at		60000	5	300000	2003-	BTT				
Veterinary Campus	0000	5000	4	00000	05	DTT				
Developing AES wise forage calendar	2000	5000	4	20000	2003-	BII				
4 -Processing & preservation of milk	products	s for value		s	05					
(i)Assessment of problems related to	product					BTT				
spoilage of surplus milk (Convergence										
allowance assessment)										
(ii)Exposure visit at Haryana/ Punjab/	20	50000	5	250000	2003-	BTT				
NDDB ,Anand					05					
(iii) I raining on value addition of milk &	20	8000	5	40000	2003-	BII				
(2 days at BVC/PDP/SCIDT)					05					
(iv)Revolving funds (for manual cream	20	25000	5	125000	2003-	FIG/				
separator, hand churn, khoa making	20	20000	Ŭ	120000	05	BTT				
utensils etc.)										
5Promotion of entrepreneurship for p	oroducin	g goat ma	nure und	er ATMA brai	nd	•	-			
(i)Awareness campaign in this aspects	20	1000	5	1000	2003-	BTT				
					05					
(II) Identification of goat rearing						BII/				
entrepreneurs and group formation	<u> </u>					NGU				

(iii)Introduction of cross breed with the help of bank credit, forage and seed materials					2003- 05	BTT	On going Activity
(iv)Arrangement of improved breeds to interested entrepreneurs as revolving funds	20	10000	3	30000	2003- 05	BTT	
(v)Regular Deworming to prevent diarrhea							On going y
(vi)Follow up							
6Vermicomposting from farm by proc	lucts		20		2003-	BTT	4 days in
(a) Awareness bampaign			20		05	DII	one month programm e
(b) Demonstration cum training at Patna	20	4000	3	12000	2003- 05	BTT	
(c)Revolving funds		10000	5	50000	2003- 05	BTT	
(d) Developing innovative farmers as entrepreneur for vermiculture inputs		20000	1	20000		ATMA	
7Making inventory of Services provid	ers & Pa	ra-vets ,sti	eamlinin	g/ refreshing	y /capaci	ty buildir	ng
(i) Contracting EDP cell of RAU Pusa & NGOs, A.H Deptt & PDP					2003- 05	BTT	
(ii)Organizing training needs assessment workshop	30	4000	1	4000	2003- 05	BTT	
(iii)Registering viable paravets under ATMA					2003- 05	BTT	
(3 days duration RAU Pusa)	30	18000	5	90000	2003- 05	BTT	
(vi)Revolving funds to provide paravets kit		5000	10	50000	2003- 05	BTT	
8Popularizing solar energy for farm a	ctivity						
(i) Awareness campaign	20	1000	20	20000	2003- 05	BTT	
(ii)Exposure visit & field day with training (Krishi expo at New Delhi etc.	20	50000	2	100000	2003- 05	BTT	
(iii)Backward & forward linkage follow					2003- 05	BTT	
9.Demonstration of clean milk product	ion						•
(i)Awareness campaign about	20	1000	20	20000	2003-	BTT	
bacteriological quality of milk (ii)Exposure visit & field day at NDRI,	20	50000	5	250000	05 2003-	BTT	
(iii)Demonstration of clean milk	50	1500	333	499500	05 2003-	BTT	
production in MPCS (Two dairy personal & one hired vehicles for each demo)					05		
(iv)Promoting group milking of milch animals at MPCS, providing one S.S can ,strainer milk pot etc. as revolving		1800	333	599400	2003- 05	BTT	
(v) Printed material for clean milk		2.00	40000	80000	2003-	BTT	
production		2500	23	57500	05 2003-	BTT	
(vi)Setting up milk testing lab at every blocks for testing FAT & SNF on revolving funds basis and service					05		
10 -Promotion of production and use a	f minoro	le blocke P	vitamin	in dainy ratio) ne		1
(i)Awareness campaign about	1	1000	30	30000	2003-	BTT	
deficiency of minerals & vitamin in milch animals				20000	2006		
(ii)Exposure visit at vet. college Patna for one day or PDP for secretaries of MPCS	20	2.00	5	10000	2003- 2006	BTT	
(III)Promotion of minerals blocks and vitamins						PDP	On going
TOTAL				34,06,900			activity .

Strategic Issue and Activity	Programme cost				Activity	Agency	Remarks
intervention	Unit	Unit	No of	Total	schedul	• •	if any
	Size	cost	units	cost	ing		-
		(Rs)					
Livestock production System							
11.2.4: Fish Production System							
1.Commercial fish production on scier	ntific lines	S		1			
i. Awareness campaign	1	1000	6	6000	2003-05	BTT	
ii. Training at various institution of	30	12000	5	60000	2003-05	BTT	
repute within Bihar College of Fisheries,							
Dholi							
iii. Distribution of printed materials to	1000	100		66000	2003-05	BTT	
promote commercial fish production on	copies						
Scientific line	4/00	50000	4	50000	0000.05	DTT	
IV. Exposure visit to FIG group leader	1(30	50000	1	50000	2003-05	BII	
	farmers)						
v. village chaupais for experience							
2 Decentralized Production of Finger I	ingo						
2. Decentralized Production of Pinger	ings	1000	2	2000	2002.05	DTT	
i. Awareness campaign	20	12000	5	60000	2003-05	DTT	
II. Training at various institution of	30	12000	5	60000	2003-05	ыі	
Dholi							
iii Distribution of printed materials to	1000	100		66000	2002.05	PTT	
nomote commercial fish production on	conies	100		00000	2003-05	ыт	
scientific line	copies						
iv Exposure visit to FIG group leader	1/30	50000	1	50000	2003-05	BTT	
along with BTT to Fisheries College	farmers)	30000		30000	2003-03	DII	
Dholi	iannei 3)						
v Backward and Forward linkages							
3 Entrepreneurship Development for Ir	nproved	Fishnet Pr	oduction				
i Awareness campaign	1	1000	3	3000	2003-05	BTT	
ii Training and Exposure visit at various	30	50000	1	50000	2003-05	BTT	
institution of repute at Barrakpore	00	00000	•	00000	2000 00	DII	
iii Backward and Forward linkages							
4.Promotion of Fish Feed Production I	Jnit			L			
i. Identification of Fish feed production							
units within and outside the district.							
ii. Entrepreneurship development	20	20000	4	80000	2003-05	BTT	
iii. Awareness campaign	1	1000	3	3000	2003-05	BTT	
iv. Training and Exposure visit at	30	50000	1	50000	2003-05	BTT	
various institution of repute within/							
outside Bihar							
v. Backward and Forward linkages.						1	
11.2.5 : Management of Plantation Cro	ps			I.			
1. Decentralized production of sapling	s for fore	stry and s	ilvi-pastı	ire			
Awareness campaign	1	1000	5	5000	2003-05	BTT	
Interrogation with department of foresty					2003-05	BTT	
Promotion of FIG with NGOs support	1	2000	5	10000	2003-05	BTT	
Backward and forward linkage					2003-05	BTT	
Revolving fund to FIG for development	1	1000	5	5000	2003-05	BTT	
nursery							
Follow up							
2.Decentralized production of quality f	odder se	eds includ	ing legu	nes under	horti-past	ure	
Awareness campaign	1	1000	5	5000	2003-05	BTT	
Interrogation with department of foresty					2003-05	BTT	
Promotion of FIG with NGOs support	1	2000	5	10000	2003-05	BTT	
Backward and forward linkage					2003-05	BTT	
Revolving fund to FIG for development	1	1000	5	5000	2003-05	BTT	
nursery							
Follow up							
TOTAL				67,35,9			
				00			

11.3: Natural Resource Management for Sustainability in Production and Productivity

Management of soil health through cultural practices and suitable crop rotation

Awareness campaign for			25	500	12500	BTT,ARI	On going
maintaining soil health by use of bulky organic manures.							scheme
Organizing refresher training for adopting suitable crop rotation to location specific areas		5000	25	125000	2003-05	BTT	
Demonstration on farmers field on crop rotation Paddy-Wheat, Paddy-Pulses, Maize- Potato/Maize-Pulses		1000	25	25000	2003-05	BTT	
Field day/ Exposure visit to site of other farmers.		2500	25	62500	2003-05	BTT	
Based on texture and structure of soil suitable cultural practice.					2003-05	BTT	
Follow up measure for expansion of the technology such as soil testing soil management balanced use of chemical fertilizer. Soil testing kit to be provided to at least 16 blocks of Patna.					2003-05	BTT	Cost of the kit has being given in the other chapter.
Integrated Nutrients Management				•			•
To organize awareness campaign for INM technologies		1000	25	25000	2003-05	BTT	
Identification and selection of feasible waste land where green manure seeds Bio fertilizer can be produced through SHGs/Mahila Mandal etc.		2000	25	50000	2003-05	BTT	
Organizing training for cultivators on production on and use of bio fertilizer vermi fertilizers compost and balance use of chemical fertilizer on soil tests.		5000	25	125000	2003-05	BTT	
Organizing field day at the site of successful		2500	25	62500	2003-05	BTT	
Integrated Pest management							
Organize awareness campaign on IPM technology		1000	25	25000	2003-05	BTT	
Identification of critical areas where pest infestation always occur		2000	25	50000	2003-05	BTT	
Organizing demonstration on crop							
Organizing farmer's field day to make the farmers IPM experts		2500	25	62500	2003-05	BTT	
Organizing training to farmers.		2500	25	62500	2003-05	BTT	
Facilitate supply of bio pesticides in set net pheromone traps etc. on subsidized payment.		4000	25	100000	2003-05	BTT	
Inclusion of organics in nutrients	manage	ement				•	
Awareness campaign for use of organic in nutrient management		1000	25	25000	2003-05	BTT	
Organize farming for farmers for production and inclusion of organics in nutrients management		5000	25	125000	2003-05	BTT	
To organize field day on		1000	25	25000	2003-05	BTT	
To organize plantation of leaf manure crops on waste land or an common lands.							
Promotion of green manuring three	ough se	ed produ	ction	•		•	
Identification of areas and villages cultivation of for green manuring crops		1000	25	25000	2003-05	BTT	
Multiplication of the green manure seed varieties through co- operation of the farmers						BTT	

Facilitate supply of critical inputs						BTT,ATMA	
like and through seed supplying							
agency.							
Organizing demonstration and		1000	25	25000	2003-05	BTT	
field days.		4000	05	05000	0000.05	DTT	
Exposure visit to successful site.		1000	25	25000	2003-05	BII	
Farmers training on improved		5000	25	125000	2003-05	вп	
Micro nutrients managements for	ontimun	n fiold & c	soil heal	th along with	organics		
Awareness campaign about micro-	optimu	2000	25	50000	2003-05	BTT	
nutrients management		2000	20	00000	2000 00	5.1	
Identify the specific areas where		1000	25	25000	2003-05	BTT	
the soil deficiencies in micro-							
nutrients such as zinc in particular							
Training to progressive farmers for		5000	25	125000	2003-05	BTT	
proper management of							
micronutrients.			~ -				
Demonstration on specific crops		2000	25	50000	2003-05	вп	
often occurs							
Conduct field days at the site of		2500	25	62500	2003-05	BTT	
successful demonstration		2000	20	02000	2003-03	ын	
Checking obnoxious weeds like P	halaris r	ninor and	Parthin	ium	1	1	1
To identify the areas first where		1000	25	25000	2003-05	BTT	
these obnoxious weeds are visible							
To educate the farmers for		4000	25	100000	2003-05	BTT	
Judicious use of weedicides		5000		405353	0000		
Organizing training for better		5000	25	125000	2003-05	BTT	
knowledge of pre and post							
cultivators including mechanical							
eradication							
Regulating marketing of superiors	s & adult	erated ar	aicultura	al inputs		L	L
Organizing extensive survey of the		1000	25	25000	2003-05	BTT	
input supplier.							
Organizing orientation		5000	25	125000	2003-05	BTT	
programmed for selected and							
specific input supplier viz. license							
noider to regulate the adulteration							
and unlicensed dealers							
Arrangement for taking sample of		2000	25	50000	2003-05	BTT	
agriculture inputs for testing it to		2000	20	00000	2000 00	DII	
quality control laboratory							
Managing existing and potential a	reas for	piscicult	ure	•			
Awareness campaign about							
pisciculture				405222	0000	D . T . T	
Facilitating utilization of		5000	25	125000	2003-05	ВГ	
abandoned water areas by							
Encouraging traditional fisherman		2000	25	50000			The on
by providing them finderlinds		2000		00000			going
unsubsidized.							scheme
Intensification of zero tillage to re	duce ex	posure ox	idation	of soil orgar	nic matter	•	•
Awareness campaign about		1000	25	25000	2003-05	BTT	
benefits of zero-tillage machine							
Demonstration successful site of		2000	25	50000	2002-	BTT	
Zero tilling and production of crops		2500	2E	62500	2004	PTT	
successful cultivators		2000	20	02000	2002- 2004	ווט	
Exposure visit to Aaril Engineering		1000	25	25000	2002-	BTT	
department/ Zero tillage machine				20000	2004		
supplier in Patna.							
Promotion of soil test based inten	sive cul	tivation fo	or baland	ced nutrition			
Awareness campaign for benefit of		2000	25	50000	2003-05	BTT	On going
Soil testing		2000	25	50000	2002.05	DTT	scheme
Arrangement for collection of soil		2000	25	50000	2003-05	вп	On going
sample unough the line Deptt.			1				SUITEITIE

Facilitate with a soil testing ket at least to 16 block of the district.			16	400000	2003-05	BTT	
Arrangement for making available the soil testing support as early as possible on receipt of to ken money from the cultivators						BTT	
In mono cropped area like tal the	sustain	ability car		ht through	remunerat	ive nulses	
Intensification of area under remunerative lentil crops.						BTT	
Facilitating market supply of the production the remunerative price.						BTT	
Demonstration on farmers field for improved and disease resistant variety		1000	25	25000	2003-05	BTT	
Encourage IPM technology to these areas against pests and disease.						BTT	On going scheme
Judicious and timely use of pesticides to be arranged.							
Arrangement for pulses processing for remunerative price of the commodity.		1000	5x5	25000		BTT	
Canning and processing of veget	able in 2	Zalla area	may be l	key to sustai	inability of	its productio	n
Identification and selection of specific vegetable for canning and processing.		2000	25	50000	2003-05	BTT	
Linkage with input credit and marketing						BTT	
Encouraging use of organics for quality vegetable production, canning and processing						BTT	
Organizing training camp for specific vegetable for canning and Processing.		5000	25	125000	2003-05	BTT	
TOTAL				29,75,500			

11.4 Human Resource Development

In project implementation the role of human resources is well established and well developed human resources are undoubtedly a boon for success of a project. In ATMA the innovative concepts are to be conceptualized through a varied type of official and non-official groups viz., Governing Board (GB), ATMA Management Committee(AMC), Block Technology Team (BTT), Farmers Advisory Committee (FAC), Farmers Interest Groups (FIG), Self Help Groups (SHG), and Farmers Organizations. Keeping it in view it is necessary that the constituents of these groups are well trained with homogeneous concepts to achieve the desired goals viz., sustainability, intensification and diversification of various farming systems. Therefore training and workshops / seminars will be conducted under following heads.

2003 Technology Management

b. Extension Management

c. Information Technology

d. Workshops / Seminars

11.4.1: Activity and Investment Plan on Technology Management:

Training Course	Progra	mme Cost			Activity	Agency	Remarks
	Unit size	Unit cost (Rs.)	No. of units	Total cost (Rs.)	Scheduli ng		
One day training on INM and fertilizer use on soil test basis.	1 (20)	2000	6	12000	2003-05	KVK	
One day training on <i>in situ</i> Water Harvesting Techniques.	1 (20)	2000	3	6000	2003-05	KVK	
One day training on commercial cultivation of vegetable, preservation and packaging of vegetables.	1 (20)	2000	3	6000	2003-05	KVK	
One day training on nursery raising of fruit plants, vegetables and flowers.	1 (20)	2000	3	6000	2003-05	KVK	
One day training on scope and potential of green house /poly house technology.	1 (20)	2000	3	6000	2003-05	KVK	
One day training on economic use and	1 (20)	2000	3	6000	2003-05	KVK	

maintenance of power tillers.						
One day training on production technology	1 (20)	2000	3	6000	2003-05	KVK
of off-season and exotic vegetables.						
One day training on cultivation,	1 (20)	2000	3	6000	2003-05	KVK
preservation, packaging and marketing of						
rare / exotic vegetables.						
One day training on control of obnoxious	1 (20)	2000	6	12000	2003-05	KVK
weeds and management of pasture lands /						
arable lands						
One day training on commercial floriculture	1 (20)	2000	6	12000	2003-05	KVK/
and its marketing.						ZRS
One day training on training and pruning	1 (20)	2000	3	6000	2003-05	ARI/
practices in horticultural crops.						ZRS
One day training on successful mushroom	1 (20)	2000	3	6000	2003-05	KVK
cultivation.						
One day training to vet. Pharmacists of AH	1 (20)	2000	3	6000	2003-05	DOAH
department on cattle management and						
artificial insemination.						
One day training to field officers of	1 (20)	2,000	3	6000	2003-05	KVK
fisheries department regarding fish farming						
technology.						
Study visits / exposure visits to field officers	1 (20)	200000	1	200000	2003-05	ATMA
of Animal Husbandry/ fishery/ and other						/BTT
concerned departments/Scientists to study						
project activities in other ATMA districts.						
(5 days visit outside the state)						
Study visits / exposure visits to field officers	1 (20)	100000	1	100000	2003-05	ATMA/
of Animal Husbandry/ fishery/ and other						BTT
concerned departments/Scientists to study						
project activities in other ATMA districts.						
(5 days visit within the state)						
One day training to NGO executives on	1 (20)	5000/-	6	30000	2003-05	KVK
advanced agriculture, horticulture, animal						
husbandry, fishery, and other income						
generating avocations.						
TOTAL				4,32,00		
				0		

11.4.2: Activity and Investment Plan on Extension Management:

Item		Program	me Cost		Activity	Agency
	Unit	Unit cost	No.	Total cost	Scheduling	
	size	(Rs.)	of	(Rs.)		
			units			
Orientation of GB about project	1(15)	2,50,000	1	2,50,000	2003-05	MANAGE
management (3 days)						
Study visit of ATMA Chairman, Project	1 (4)	12,50000	2	25,00,000	2003-05	ATMA /GOI
Director / Dy.P.D. and State Consultant in						
Participatory Extension Management						
abroad.						
Orientation of AMC about project	1(15)	2,50,000	1	2,50,000	2003-05	MANAGE
implementation and project management						
Project management and Participatory	1(2)	12,00000	2	24,00,000	2003-05	GOI/ ATMA
extension abroad for ATMA and line						
department officers.	4(05)	4 00 000		0.50.000	0000.05	DANAETI
Iraining for BIT members about NATP,	1(35)	1,26,000	2	2,52,000	2003-05	BAMETI
preparation of Block Action Plan and						
Account Keeping (6 days).	4(05)	50.000	-		0000.05	
Orientation of BTT members about Team	1(25)	50,000	4	2,00,000	2003-05	BAMEITat
Building modules, formation of FIG, SHG,						district level
TTK and success stories (2 days).	4(00)	00.000	00		0000.05	
Orientation of FAC members regarding	1(30)	60,000	23		2003-05	
ATMA-NATP project management.	4(05)	0500	440	0.75.000	0000.05	DTT
Interaction of FIG, SHG, NGO with BTT	1(25)	2500	110	2,75,000	2003-05	вп
and line department officers / scientists.	4(05)	0.500		-	0000.05	DTT
Sensitization of Block and Gram Panchayat	1(35)	2,500			2003-05	BH
members (Pradnan and Up-Pradnan,						
Mukniya etc.) about NATP-ATMA project	4(05)	4.00.000	-	0.50.000	0000.05	
Orientation course of BTT members about	1(35)	1,26,000	2	2,52,000	2003-05	BAMEII
farmers training methodology, monitoring of						

the project and extension management						
Training of AMC and other officers of line	1(5)	1.00.000	2	2.00.000	2003-05	MANAGE/
departments about Participatory extension	.(0)	.,,	_	_,00,000		IIM.
management (3 days).						Lucknow
Exposure visit of AMC and other line	1(15)	3,50,000	4	14,00,000	2003-05	DOE/GOI/M
department officers to other ATMA districts						ANAGE
outside state.						
Training of AMC and other officers of line	1(30)	60,000	3	1,80,000	2003-05	BAMETI
departments about Monitoring and						
Evaluation of NATP (3 days).						
Exposure visit of BTT and FAC members to	1(30)	1,50,000	3	4,50,000	2003-05	ATMA/BTT
other ATMA districts within and outside						
state for project management and formation						
Orientation of AMC and other officers of	1(15)	2 50 000	2	5 00 000	2002.05	
line departments about Strategic and	1(13)	2,50,000	2	5,00,000	2003-05	
Participatory Planning (3 days)						/ IIW,
Orientation of stakeholder like input	1(50)	25.000	10	2 50 000	2003-05	BAMETI
distributing agencies regarding role of	1(00)	20,000	10	2,00,000	2000 00	D/ WIL II
inputs in the agricultural development (2						
days).						
Orientation of quality control enforcing	1(15)	25,000	5	1,25,000	2003-05	BAMETI
agencies regarding their roles and	. ,					
responsibilities for making available quality						
inputs to the farmers (2 days).						
Orientation of FAC members about NATP	1(30)	7,500	23		2003-05	BAMETI
(1day)						
Exposure visit of NGOs, FIGs, and other	1(30)	1,50,000	2	3,00,000	2003-05	BTT/ATMA
stakeholders to other AIMA's within and						
outside state to acquire latest technology						
and extension participatory management						
Exposure visit of FACs and BTTs to other	1(30)	1 00 000	5	5 00 000	2003-05	ΔΤΜΔ
success story sites /ATMA.	1(00)	1,00,000	Ŭ	0,00,000	2000 00	7 (1 1 1 1 7)
Organization of Training programme for	1(30)	20.000	6	1.20.000	2003-05	BAMETI
BTT members on extension methodology	.(,	,	-	.,,		
and communication techniques (2 days).						
Training Need Assessment					2003-05	
Farming system approach						
Exposure visits for NGOs, Successful					2003-05	
farmers, Non-official members of GB						
Orientation and training to AGB,	1(50)	1			2003-05	
AMCmembers and O/C of FAC (2 days)				_		
Interaction of AGB and AMC members with					2003-05	
FAC members.					0000.05	
Training of O/C FAC and its members for					2003-05	
Training of NCOo' on community	1(25)				2002.05	
	1(23)				2003-05	MANAGE
(7 days)						
Organizing training for private extension					2003-05	
workers(NGOs', FIGs' SHGs' etc.)						
Exposure visits for public and private					2003-05	
extension workers to appropriate areas and						
organizations outside district / state.						
TOTAL				1,27,05,00		
		1		0		

11.4.3: Activity and Investment Plan on Information Technology:

Item	Programme Cost				Activity	Agency
	Unit size	Unit cost (Rs.)	No. of units	Total cost (Rs.)	Scheduling	
Training on use of media, IT and use of internet to AMC members (6 days).	1(20)	1,20,000	3	3,60,000	2003-05	ATMA/ BAMETI
Training on use of media, IT and use of internet to officers of line departments (4 days).	1(30)	1,50,000	5	6,00,000	2003-05	ATMA/ BAMETI

Training on use of media, IT and use of internet to BTT members and officers of line departments (4 days).	1(15)	1,00,000	23	23,00,000	2003-05	ATMA/ BAMETI
Training on use of media, IT and use of internet to AGB members and scientists of KVK, ARI, SGIDT, BVC and officers of line departments (3 days).	1(20)	1,25,000	12	16,00,000	2003-05	ATMA/ BAMETI
Training on use of media, IT and use of internet to District Core Team members and officers of line departments (6 days).	1(12)	2,50,000	1	2,50,000	2003-05	ATMA/ BAMETI
TOTAL				51,10,000		

11.4.4: Activity and Investment Plan on Workshop /Seminars:

Item	Programme Cost				Activity	Agency
	Unit size	Unit cost (Rs.)	No. of units	Total cost (Rs.)	Scheduling	
Project launching workshop (AMC, AGB, DCT, FAC, BTT, NGO, FIG, SHG etc.) (1 day)	1 (500)	1,00,000	1	1,00,000	2003-05	ATMA/BTT
Organization of two interaction workshops of scientists, district heads of line departments and NGOs/ BTTs (one day)	1 (150)	75,000	3	225,000	2003-05	ATMA/BTT
Organization of two interaction workshops of scientists, district heads of line departments and NGOs/ BTTs (one day)	1 (200)	2,00,000	4	8,00,000	2003-05	ATMA/BTT
Annual workshop on Review of Project Acivities (line departments/AMC/BTT and NGOs')- (one day)	1 (250)	2,50,000	2	5,00,000	2003-05	ATMA/BTT
Training need assessment through DACUM methodology	50	50000	1	50000	2003-05	ATMA
Entrepreneurial skill and agri-business management	50	50000	2	100000	2003-05	ATMA
Market led extension and market led production strategies					2003-05	
Management of Common Property Resources (CPR)					2003-05	
Training need assessment for extension personnel, NGOs, Private service providers, farmers and para professionals					2003-05	
Organizing need based trainings for above officers.	25	50,000	2	1,00,000	2003-05	
Exposure visit of public and private extension workers and FIGs.	25	50,000	10	5,00,000	2003-05	
Skill upgradation training for grass root level workers.	25	50,000	10	5,00,000	2003-05	
Orientation training of AGB/FAC/DCT and BTT.	25	20,000	10	2,00,000	2003-05	
Training on IT and Cyber extension.	25	40,00,000	3	1,20,000	2003-05	
Organizing Training to Extension Personn Science and Inter Personnel Skills	el in Par	ticipatory Res	earch and	d Extension	Techniques, I	Behavioural
Training at RAU, Pusa for grass root workers.	25	15000	16	240000	BAMETI	
Training at MANAGE, Hyderabad, for senior officers	20	140000	8	1120000	ATMA/ MANAGE	
TOTAL				45,55,000		

11.5 Community Organization

Strategy / Interventions	Activities	Unit	Unit cost	Total cost
Organizing the communities by the N	GO with support and guidan	ce from the Gove	rnment departme	nts
a. Identification of NGOs on different as	50 NGOs'			
community organizations				

b. Organizing communities on major en through rapport building and PRA exerc	terprises / commodities ise.		Rs. 5,000/- per block for organizing at least one- community and commodity/ activity based	250000
			organizations.	
Building the capacity of the organize	d communities.	1		
	As mentioned in project			
Ensuring calf quatainshility of the ar	sustainability component.			
a Brovision of fixed capital to each EIG			Pc 5000/ por	
	, SHG, WIG, CIG ,FO and		KS. 5000/- per	
h Provision of revolving fund			unit	
Encouraging women for joint particit	nation and for forming their s	senarate organizat	tion	
a Identification of Women Interest Grou	ins for different activities	46 units		
b Capacity building of WIGs'		25	5000	125 000
c. Encouraging male groups for bringing	a more women in the	20	0000	120,000
mainstream of development through W	IGs.			
Strengthening and enlisting support	of the existing Community C	Progenizations (CO).	1
a. Identification of existing community of	rganizations whose:	T ,		
i. Activities are in consonance with NAT	P-ATMA objectives.			
ii. Which can be harnessed for achievir	ng NATP-ATMA objectives.			
b. Assessment of strength and weaknes	ss and take measures for			
strengthening Community Organization	S:			
i. Training		46 nos. for 3 days	Rs.1000/- per	46,000
		aayo	anne	
ii. Financial support in form of		46 COs'	25000/- per CO	11,50,000
fixed capital and operational expenses				
Promoting COs' from Gram	a. Awareness generation			
Panchayat level to district level	b. Supporting federation of			
	the organizations			
TOTAL				18,21,000

11.6 Sustainability of the Project

Strategy / Interventions	Activities	Unit	Unit cost	Total cost
Membership fee				
a. Member ship fee per FAC member@	Rs. 200/- per member per			
year and Rs. 50/- per member as month	ly fee.			
b. Membership fee for FIGs and Fos' @	Rs. 100/- per member as one			
time entry fee and Rs. 10-25/- per month	n as monthly fee.			
Natural Recourses Management				
Cost sharing by farmers on sustainability	issues like soil and water		1000	10000
conservation and NRM				
Motivating the farmers to pay 25-50 % o	f the cost for the community			
work and 50% in individual work.				
Pursuing the user groups for community	work and building a revolving			
fund				
Soil testing				
a. Identification and training of Agricultur	al graduates for setting up			
agri-clinics.				
b. Registration fee for each Agri-clinics	Rs. 500/- and monthly fee of			
Rs.100/- chargeable.				
c. Arranging for the training of these agri	entrepreneurs through			
MANAGE / RAU, Pusa.				
d. Providing soil-testing kits to the traine	d Agri-entrepreneurs.			Included
				elsewhere
Artificial Insemination at the door ste	р			
a. 5 youth with science background to be	e trained from each block in			Included
AI.				elsewhere
B. Al kit to made available to them.				
c. Charge Rs. 50/- per Al				

d. Provision for specialized consultancy.			
Mobility support to line department and BTT.	•	•	
a. Making provision for two motorcycles at ATMA office for field trips	2 units	50000/-	100000/-
by the staff.			
b. Provision for mobility and minor repairs to University Scientists / line	30	10000/-	300000/-
department staff /BTT for convergence with ATMA activities.			
c. Provision for TA and DA as per Govt. of Bihar rules for participation.	30 institutions	20000/-	600000/-
Misc. contingencies			
a. Provision for contingency to meet stationery, internet connectivity	30 institutions	1500/-	45000/-
charges on limited basis.			
Establishment of Agri-clinics at various levels viz. Jansevak /FIAC/DAO/	KVK/ARI on fixed	days.	
a. Provision for most essential furniture at these Agri-clinics.	50	2000/-	100000/-
b. Provision for essential diagnostic equipments and chemical and	50	5000/-	250000/-
regents on cost recovery basis. (2 per block, 1 each at DAO/KVK and			
ARI and ATMA)			
c. Supply of printed material on technical packages and Govt.	50	10000/-	500000/-
Schemes.			
Promoting non-land based enterprises (NLBE) for employment and	lincome		
a. Identification of groups and enterprises.			
 Imparting skill training at RAU, Pusa. For 2 days. 	2	15000/-	30000/-
c. Forward and backward linkages.			
Promoting agro-entrepreneurship (Agro Service Centres)			
a. Identification of entrepreneurs and registering them with ATMA for a			
fee of Rs. 100/-per annum.			
b. Assessment of potential for setting up service centre/ custom hire			
services.			
c. Training to entrepreneurs on techno-managerial and financial	2	20000/-	40000/-
aspects through Agri-clinics and KVK.			
d. Establishing linkages with FIGs.			
e. Encouraging Agro-service centres for contract farming and			
marketing.			
f. Follow-up			
TOTAL			19,75,000

11.7 : Media Support and Use of Information technology

Media Support and Use of Information technology

Strategy / Interventions and Activities	Unit	Unit cost	Total cost
Establishing a reliable and effective information and communication			
systems.			
Establishment of FIAC in each block.			Included
			separately
Providing telephone and internet linkage block to the district and			-do-
beyond.			
Improving the technical literature support services.	200	500	100000
Disseminating through local print and electronic media.		50000	50000
Capacity building of functionaries and farmers for effective use of			Included
information technology system.			separately
Developing and operating an effective market information system.			
Use of Electronic Media:	-		-
Production of video films	50	10000	5,00,000
Production of video spot /advt./ jingle			
Use of AIR /local Radio Station and commercial broadcasting stations.	50	5000	2,50,000
Production of audio sponsored programmes for broadcast on AIR.	-	-	-
Production of audio spots/ jingles with folk songs and music.	-	-	-
Use of private TV channels.	-	-	-
Use of cable TV network for title slide/ announcements/ slogans.	-	-	-
Use of AIR.	-	-	-
Use of cinema slides at district/ block/ sub-divisional level.	-	-	-
Providing teleconferencing facility.	-	-	-
Providing toll-free telephone connectivity at ATMA headquarter/ FIAC	25	4,000	1,00,000
level.			
Preparation of CD/Cassettes for loading on web sites.	2	2,50,000	5,00,000
Use of interactive conferencing facility through satellite.	-	-	1,00,000
Use of Print Media:			
Use of local/ vernacular newspapers.			
Printing of leaflets/ posters/ bulletins/ colour photo post cards and	-	-	2,00,000
handbills.			

Use of Advertisement on cover pages.	-	-	1,00,000
Use of bus back panels.	-	-	50,000
Newspaper advertisements on different aspects of agril. And allied			50,000
aspects.			
Use of Other Media Tools		•	•
Organization of Kisan Mela, Exhibitions, Exchange visit programmes	1	5,00,000	5,00,000
and street plays.			
Organizing Workshops/Orientation Programmes on Media Support.	6	50,000	3,00,000
Linkage of Agricultural Programmes through Gyan Darshan and	-	-	-
Satellite Educational TV channel of IGNOU.			
Establishment of Information Shop			
a. Setting up of Agri-help Line at ATMA office with sub-centres at Sristi	2	2,00,000	4,00,000
Foundation, Patna (local NGO partner). Phone lines, Internet			
connectivity and Resource Persons would be made available on a			
weekday for three hours.			
b. Info-shop will be established in all the 23 blocks by FAC/BTT.			Included
			elsewhere
c. Literature on latest agricultural technology and district level planning	23	-	-do-
will be made available to info-shop through FAC/BTT.			
d. Info-shops established under ATMA will replicate the technical	-	-	-
messages and make it available to its user.			
e. Private entrepreneurs will be encouraged to open Info-shops in rural	-	-	-
areas and in Kisan ki Mandi.			
t. A I MA will charge 5 % user fee/ registration fee from these info-	-	-	-
snops, which may be revised over time.			
Computer Training			la alcala al
a. One computer with internet and Power back-up facility would be	-		Included
Installed in all 23 FIAC in the blocks.			eisewriere
b. Computer training for a certain ree would be imparted to			alsowboro
Literature and Information			eisewiieie
De Provision for library with literature and journals ato to Agri help lines	25		Included
a. Fromsion for library with interature and journals etc. to Agn help lines	25		elsewbere
a Printing and sale of information brouchers on standard proven and			Included
advanced technology on differential cost sharing basis			elsewhere
b. Cost for information accessed from ARIS net and other sources is			CISCWITCIC
to be paid by the users on real time basis			
To make available quality planting material and inputs			
a To encourage establishment of a Tissue culture lab at ARI. Patna	1	1000000/-	100000/-
for production of quality planting material.		1000000,	1000000,
Establishing inter departmental coordination committee at block			
level through KPS concept			
a. The BTT to function as ' Kisan Pramrashdatri Samiti', which would	23		
provide all technical advisory, input to the farmers and get the feed	-		
back from them.			
b. BAO/ BAHO at block level to head the FIAC assisted by other	23		
technical department staff.			
Strengthening the information/ database at block level through		1	
NICNET connectivity.			
a. Provision for NICNET connectivity to FIAC.	23	1000/-	23000/-
b. Training to BTT/FAC members on computer uses.	23		Included
			elsewhere
c. Provision of telephone, fax and power back up through Gen-set to	23	_	Included
FIAC.			elsewhere.
TOTAL			42,23,000

11.8: Promotion of NGOs' and Private Organizations'

		Total Cost
-	-	-
-	-	-
-	-	-
5	1,00,000	5,00,000
5	1,00,000	5,00,000
	- - 5 5	 5 1,00,000 5 1,00,000

Setting up of a Resource Centre-cum-Gene Bank in partnership with Sristi Foundation, Patna.	One	10,00,000	10,000,00
TOTAL			20.00.000

11.9: Empowerment of Farmwomen and Ensuring SRM

		1
Unit	Unit cost	Total cost
20	10,000	2,00,000
5	10,000	50,000
10	2000	20,000
10	2000	20,000
10	3000	30,000
20	2000	40,000
10	10,000	1,00,000
5	10,000	50,000
20	1000	20,000
20	3000	60,000
10	5,000	50,000
10	5000	50,000
science) is ke	y to sustainabili	ty of rainfed
-	-	-
25	1000	25000
25	2000	50000
25	5000	125000
		89,00,00
	Unit 20 5 10 10 10 20 10 20 10 20 10 20 10 5 20 10 5 20 210 22 25 25 25	Unit Unit cost 20 10,000 5 10,000 10 2000 10 2000 10 3000 20 2000 10 3000 20 2000 10 10,000 5 10,000 20 1000 20 3000 10 5,000 10 5,000 10 5000 25 1000 25 5000 25 5000

11.10: Dovetailing of Ongoing Schemes with ATMA, Patna Strategy / Interventions and Activities

2003. District Rural Development Agency (DRDA)

Empowering ATMA to seek additional funds from different ongoing Govt. schemes.

2003. Watershed Management Scheme.

2003. Swarna Jayanti Gram Swarojgar Yojana (SGSY)-

2003. Prime Minister Rojgar Yojana (PMRY)

- 2003. Gramin Awas Yojana
- 2003. Garima Yojana
- 2003. Scheduled Caste Action Plan

-Million Shallow Tube well Programme

2003. ICDP

2003. NPRI

b. Cooperative Department

- c. NABARD
- d. Industries Department
- e. Fisheries Department
- f.. COMFED

Involving Block Technical Team (BTT) in planning and implementation of all ongoing schemes

2003. Identification of components of different schemes to different blocks.

b. Request by ATMA for placement of funds with BTT for implementation of schemes

Increasing the efficiency of extension workers by providing mobility support

2003. Providing loan for purchase of two-wheelers by Govt. on priority basis to BTT members.

b. Provision for convergence allowance to field functionaries by ATMA.

11.11: Activity Schedule and Investment Proposal for Research Activities:

Strategic Issue and	Programme cost				Activity	Executi
Activity intervention	Size	cost (Rs)	Units	cost	scheduling	Agency
11.11.1:Agriculture Production System						

A . Refining technological package as per agro-ecological situation for each commodity						
Recommendation of technological package for different AES for important commodities		500	40	20000	2003-05	ZRS
1 Fine timing existing technologies with specific	needs fo	r hetter ac		of package	by economic arou	Ins
Organising workshop for different commodities /AES involving FIG/CIG,ZRS/KVK, Extension workers	30 perso ns	3000	20	60000	2003-05	ZRS
2 Situation specific addition of proven new tech	nology					
Identification of specific problem In issues	30	3000	5	15000	2003-05	Enternri
based (Agril sc. ,Animal sc, Fisheries workshop persons		0000	0	10000	2000 00	ses group /ZRS/K VK/BTT
Field verification of innovative technology for specific problems in that situation	30	6000	5	30000	2003-05	ZRS/ KVK
Preparation of appropriate package & recommendaion to address the specific problems		500	5	2500	2003-05	BTT/ ZRS
Adoptive research on INMS IPM						BTT/ ZRS
3Tailoring I.T.K options to technological packa	ges of fa	rmers choi	ce		•	
Documentation validation refinement of I.T.K to address specific problems.		5000	5	25000	2003-05	ZRS/ BTT
B On farm participatory research of refined	technolo	gy for diffe	erent con	nmodity	-	-
1On farm participatory research of refined technology for different commodity problem not possible to address on stations.: Field verification of refined technological package for different commodity specific in the situation.		7000	20	140000	2003-05	
Other on-farmers trails not possible on station		10000	5	50000	2003-05	ZRS/
2On farm testing of technological options		4000	10	40000	2003-05	ZRS/
3Participatory plant breeding : Set PRA based breading objectives to different commodities (Pulse vegetable Animals) for development	5	3000	5	15000	2003-05	ZRS
4Evaluation of farmers technology : PRA based farmers technology testing and approved for recommendation	5	3000	10	30000	2003-05	ZRS/ KVK
5Participatory Varietal selection.: PRA based suitable seed strains selections and development for further works.	8	10000	5	50000	2003-05	ZRS
6Cropping intensity based micro-nutrients scheduling : On farmers research for different crop rotations		8000	10	80000	2003-05	ZRS/ RAU
7Improving soil health : On farm research for improving soil organic		6000	10	60000	2003-05	ZRS/ RAU
8Sisam (D.sisam) tree curing recommendation: Studying the causes of widespread drying of sisam tree		10000	1	10000	2003-05	ZRS
9Screening of MPTS : Screening of MPTS for fuel, fodder withstanding water table (wasteland)		10000	3	30000	2003-05	ZRS/ RAU
10Adoptive research on inter cropping system in orchards: Demonstration and exposure visit.		10000	5	50000	2003-05	ZRS/ RAU
C Utilization of Resources of ARI more efficiently						
Revelopment of nursery to augment available	ability to			Idl 60000	2002.05	700
& aromatic plants		00000			2003-05	250
Revolving funds nursery for selected vegetable		60000	1	60000	2003-05	ZRS/ KVK
Revolving fund for 'Tal' pulse seeds production scheme		60000	1	60000	2003-05	ZRS/ KVK

Revolving funds mushroom spawn production		30000	1	30000	2003-05	KVK
Revolving funds soil testing units for		75000	1	75000	2003-05	785
nutritional recommendation		75000	1	73000	2003-05	2113
2 Introduction of most remunerative farmin	a eveton) for differ	ont situa	tions		
Introduction of aromatic and medicinal plants	20			35000	2003-05	785
Introduction of floriculture	20	7000	5	35000	2003-05	785
Economic assessment of different enterprises	20	2000	20	40000	2003-05	785
/commodity		2000	20	40000	2003-03	2110
D Particinatory research on improving livest	tock not	ential and	ІТК			
1 -Increasing animal vield attributes						
Preparation and popularizing low cost cattle		5000	5	25000	2003-05	ZRS/
feed from locally available resources for cattle		0000	Ŭ	20000	2000 00	KVK
and poultry						
Documentation and validation of ITK for		3000	5	15000	2003-05	ZRS/
animals health & breading			-			KVK
Participatory breed improvement	20	2000	20	40000	2003-05	ZRS/
						BTT
Workout convenient fodder cultivations		5000	5	25000	2003-05	BTT/
						KVK
Training needs analysis of entrepreneurs		5000	6	30000	2003-05	ZRS/
						KVK
e. Fish yield improvement						
Developing technology for reversine fishery		40000	1	40000	2003-05	SAU
yield improvement & sustainability						
Fish feed preparation from locally available		20000	1	20000	2003-05	SAU
materials.						
F. Rural women studies				•	-	
PRA based studies for farm, uneducated &		20000	3	60000	2003-05	KVK
educated rural women for knowing their						
interest priorities & potentials						
G. Past harvest management & value additions						
Screening and suitable varieties of tomato		40000	4	160000	2003-05	SAU
potato for agro-processing						
Preservation technique development for		20000	3	60000	2003-05	SAU
green chickpea.						
Development of "Area excellence team with		20000	10	200000	2003-05	SAU
farmers trader consumer, industry						
representatives scientists						
IOIAL	1		1	1	1	1

<u>Proposed Organization & Management of Extension System of Patna</u> District Under NATP.

The language has to be taken care of in light of Bilaspur SREP for roles of different stake holders

The organizational setup of ATMA (NATP) comprises of Deputy Commissioner as Chairman, Deputy Development Commissioner as Vice-Chairman and Project Director as Chief Executive – cum-Treasurer of ATMA. ATMA has a governing Board comprising of official and non-official as key stakeholder .It has ATMA Managing Committee (AMC) consisting of district heads of line department and organization /institutions.

Constitution of ATMA Management Committee (AMC)

A district level ATMA Management Committee comprising of heads of following Department /organizations/Institutions was constituted.

Agricultural Technology Management Agency (ATMA) Governing Board:

A Governing Board of the Society has been constituted as mentioned below:

1.	District Magistrate, Patna	Chairman
2.	Dy.Dev.Commissioner, Patna	Vice-Chairman
3.	Joint Director (Agriculture)	Member
4.	R.D., Agricultural Research Institute, Patna	-do-
5.	Lead Bank Officer of the District	-do-
6.	General Manager	
	District Industries Centre (DIC),,Patna	-do-
7.	Director (Marketing), Bihar State	
	Agriculture Marketing Board	-do-
8.	One farmer representative	-do-
9.	One livestock producer	-do-
10.	One horticultural farmer	-do-
11.	One representative from Fisheries	-do-
12.	One representative of	
13.	Women Farmer Interest Group (FIG)	-do-
14.	One representative of SC/ST farmer	-do-
15.	One representative of NGO	-do-
16.	One representative of	
17.	Input Supplying Associations	-do-
18.	Project Director, ATMA	Member Secretary-cum
		Treasurer (Ex-Officio)

Key function of the ATMA Governing Board:

1.Meet at least once in a quarter to discuss and deliberate upon the activities of the Society. The quorum of at least 1/3rd of the total strength is essential for the meeting of the Governing Board under this regulation. The Member Secretary may convene the fresh meeting immediately in case the requirement of quorum is not met at any meeting. Any change in the Society (ATMA) byelaws should be approved by 2/3rd of the members of the Society and shall be submitted for approval of Technology Dissemination Management Committee (TDMC), Government of India, and New Delhi;

2.Function not withstanding that any person entitled to be a member by reason of his office is not represented on the Governing Board for time being. The proceedings and action of the Governing Board / Executive Committee shall not be invalidated by the above reasons, or from the existence of any vacancy or any defects in the appointment of its members;

3.Review and approve strategic and annual work plans that are prepared and submitted to the Governing Board by the participating units;

4. Receive and Review annual progress reports submitted by the participating units;

5. Provide feedback and direction to these participating units as needed about the various research and extension activities being carried out within the district;

6.Receive and allocate project funds to carry out priority research, extension and related activities within the district;

7.Foster the organization and development of Farmers Interest Groups (FIGs) and Farmers Organizations (FOs) within the district;

8. Facilitate greater involvement of private sector firms and organizations in providing inputs, technical support, agro-processing and marketing services to farmers;

9.Encourage agriculture lending institutions to increase the availability of capital to resource poor and marginal farmers, especially Scheduled Caste, Scheduled Tribe and Women Farmers;

10.Encourage each line department, Krishi Vigyan Kendras and Zonal Research Stations to establish Farmer Advisory Committees to provide feedback and input into their respective research and extension programmes;

11.Enter into contracts and agreements as appropriate to promote and support agricultural development activities within the district;

12. Identify other sources of financial support that would help ensure the financial sustainability of the ATMA and its participating units;

13.Establish revolving funds / accounts for each participating units and encourage each units to make available technical services, such as artificial insemination, soil testing etc. on a cost recovery basis moving towards full cost recovery in a phased manner;

14. Arrange for the audit of ATMA's financial account; and

15. Adopt and amend the rules and by-laws of the ATMA.

Powers of the Governing Board :

1. Save as herein expressly provided, as having to be passed by the Society in a general meeting, all the duties, powers, functions and rights whatsoever or consequential and incidental to carry out the objectives of the Society shall only be exercised or performed by the Governing Board either by itself or through the Management Committee subject to such limitation (s) as the Government of India and the State Government may from time to time impose in respect of the expenditure of their grants.

2.In particular and without prejudice to the generality of foregoing provisions, the Governing Board may: -

a.Make, amend or repeal any regulation relating to the administration and management of the affairs of the Society subject to the observance of the provisions contained in the Societies Act under which the Society 'ATMA' is registered.

b.To consider the Annual Budget and its subsequent alterations placed before it by the Member Secretary from time to time and to pass it with such modification as the Governing Body may think fit.

c.To accept donations and endowment or give grants upon such terms as it thinks fit.

d.To appoint committees, boards and sub-committees etc. for such purpose and such terms as it may deem fit and to remove any of them.

e.If the Governing Board requires to constitute a sub-committee on agro-processing and marketing it may constitute these sub-committees, which shall look after the issues relating to the value additions and marketing of the farm produce. The Chairman of the Committee shall be Member of the Society nominated by the Governing Board. The Sub-Committee shall exercise all functions including inviting persons inside or outside the Society depending on the need of the committee. The key functions of this sub-committee may be to review the position of the value addition and marketing of agricultural produce and plan out for future and to put a summary of the report to the Governing Body of the Society.

f.To do generally all such acts and things as may be necessary or incidental for carrying out the objectives of the society or any of them provided that nothing herein contained shall authorize the Governing Board to do any act or to pass any bye-laws which may be repugnant to the provisions hereof or to the powers hereby conferred on the Governing Board and other authorities, or which may be inconsistent with the objective of the society.

Functions of the ATMA Management Committee:

a.Carry out periodic Participatory Rural Appraisals (PRAs) to identify the problems and constraints faced by farmers of different socioeconomic groups within the districts.

b.Prepare an integrated, Strategic Research and Extension Plan (SREP) for the district that would specify short and medium-term adaptive research as well technology validation and refinement and extension priorities for the district; these priorities should reflect the important constraints identified during the PRA.

c.Prepare annual work plans and budget proposals that would be submitted to the ATMA Governing Board for review, possible modification and approval.

d.Coordinate the execution of these annual work plans through participating line departments, ZRSs, KVKs, NGOs, FIGs/FOs and allied institutions, including private sector firms.

e.Maintain appropriate project accounts and carry out satisfactory audit thereof for submission to Technology Dissemination Unit (TDU).

f.Establish coordinating mechanisms at the block level, such as Farmer Advisory Centres (FACs), that would integrate extension and technology transfer activities at the block and village levels.

g.Provide annual performance reports to the Governing Board outlining the various research, extension, and related activities that were actually carried out, including targets achieved; and

h.Provide secretariat assistance to the Governing Board and initiate action on policy direction, investment decisions and other guidance received from the Board.

Composition of AMC :

1.	Project Director of ATMA	- Chairman
2.	District Agriculture Officer, (DAO), Patna	- Member

3.	District Horticulture Officer, (DHO), Patna	- Member
4.	District DairyDevelopment Officer,(DDDO),Patna	-Member
5.	District Animal Husbandry Officer (DAHO), Patna	- Member
6.	District Fisheries Officer(DFO),Patna	- Member
8.	T.O., K.V.K., Agwanpur, Barh	- Member
9.	Regional Director, Agricultural Research Institute,	
	Dhelwan, Lohiyanagar, Patna	- Member
10.	One representative of NGO / In charge of	
	farmer's organization	- Member
11-1	2. Two representatives of farmer organization	
	(On one year rotation basis)	- Member
13.	Associate Dean-cum-Principal, Bihar Veterinary	-Member
	College, Patna-14	
14.	Associate Dean-cum-Director, Sanjay Gandhi	
	Institute of Dairy Technology, Jagdeo path,	
	Patna-14	-Member
15.	Director, Directorate of Rice Development,	
	Pataliputra Colony, Patna	-Member
16.	Head, Central Potato Research Station,	
	Phulwarisharif, Patna	-Member
17.	Director, Water And Land Management Institute,	
	(WALMI) Phulwarisharif, Patna	-Member
18.	Director, Water Technology Centre for Eastern	
	Region, Phulwari Sharif, Patna	-Member
19.	Director, Indian Council of Agricultural	
	Research, Eastern Region Head Quarter,	
	Phulwarisharif, Patna	-Member
20.	Divisional Forest Officer, Patna	-Member

Role of ATMA Management Committee:

1.-To develop SREP after PRA studies.

2.-Gide Block Technology Team (BTT) to develop Block Action Plan based on SREP

3.-To guide BTT members ,farmers Advisory Committee (FAC) in the implementation of Block Action Plan (BAPs).

4.-To provide technical advice to ATMA .

5.-To maintain state level department /organization /institutions liaisons.

6.-To reorient the ingoing developmental activities of various department in consonance with the SREP .

7.-To explore value addition ,processing and marketing avenues for the commodities produced in the district.

8.-To advise input and services support systems for strengthening line department

To create opportunities for greater involvement of private sector in agriculture .

Block Level Setup:

Block Technical Team (BTT) comprising of officers drawn from line department functioning at block level .will develop implement and monitor all field activities in association with Farmers Advisory Committee (FAC) through farmers groups /SHGs /FIGs Following officers will from the BTT.

Farmer Advisory Committee (FAC):

It has been decided to constitute the FAC with following conditions-

1. Three farmers from each enterprise from different villages

2.Success story farmers from different blocks / villages

3. Actual practicing farmers should be selected and not the absentee farmers

Block Technology Team (BTT)

BTT has been constituted in all the Blocks of Patna district and the notification of the same is awaited. (In the blocks where any particular line department is un-represented due to non-availability of officers; in such blocks the officers posted in the nearby blocks have been asked to look after the BTT work).

It was decided to form the BTT/TOFA with following officials at block level as members:

1.Block Agriculture Officer

2.Block Animal Husbandry Officer/Touring Veterinary Officer

3.Block Fisheries Officer

4. Block Dairy Development Officer

5. Block Plant Protection Supervisor/ Block plant Protection Officer

6. Block Horticulture officer

7.Block Forestry officer

8.KVK/ARI representative

9. Block Lady Extension Supervisor

10.Block- level Anganwadi Supervisor

It was also decided to include the following as special invitee to the BTT/TOFA

1.NGO representative

2.One representative from Co-operative department

3.One representative from Irrigation/minor irrigation department

4. One representative from Agricultural Marketing Board

5. One representative from Local Lead Bank branch

Meeting of BTT and FAC

BTT and FAC have been asked to hold the meeting twice a month. As it is not possible for the Project Director to monitor the meeting of every BTT and FAC in all the 23 blocks of Patna it has been decided in principal to appoint Area officers drawn from different line departments to oversee the functioning of both BTT and FAC.

Farm Information and Advisory Centres (FIAC)

It has been decided in principle to establish the FIAC within the respective block premises and the civil work would be done by a government agency to be decided by the ATMA Governing Board after the approval and finances made available by the TDMC, Govt. of India. Role of BTT

BTT will be responsible for

1. -Preparation of Block Action Plan in consultant with FAC.

2. -Execution of Block Action Plan in collaboration with FAC through farmer's interest group (FIGs)

3. -Maintenance of proper accounts for the funds received from ATMA.

4. -It will consist of members drawn from various farming communities /group s with at least 30% members from women folk .The FAC will consist of following Technical guidance to FIGs and farmers.

5. -Maintance of liaison with inputs /services /marketing /processing sectors for effective linkage between them and the farming community.

6. -Co-ordination with KVKs and ZRS for conducting on farm research and field studies.

7. -Identification of replication of success stories and indigenous technical knowledge.

8. -Updating the agricultural profile regular intervals.

9. -Involvement of Non-Government Organization (NGOs) identified by the ATMA for the organization of FIGs

10. -Organizing training camp, field days exposure visits and conducting demonstration.

11. -Development of support system for involvement of private sector entrepreneurs.

12. -Appropriate guidance to the base level extension.

Composition of FAC

It will consist of members drawn from various farming communities /group with at least 30 % members from women folk .The FAC will consist of the following members.

a. One cereal / pulse / millet grower

- b. One Cattle rearing farmer
- c. One Fish growing farmer
- d. One Horticulture / Olericulture / Floriculture farmer
- e. One farmer engaged in Bee-keeping /mushroom /goatery / poultry
- f. One input / seed / agro-chemicals / fertilizer supplier
- g. One representative of Local NGO
- h. One representative from SC/ST farmers

i. One women farmer

The term of Chairman of FAC would be for one year and will be rotated amongst the members and the Officer -in -Charge /Convenor of BTT would be the members Secretary –cum-Treasurer of the FAC.

Role of FAC

1. - FAC will work in close association with BTT for the execution of Block Action Plan and will give attention to the problems of larger sections of farming community rather than individual farmers.

2. - FAC will locate, compile and report the success stories, innovative practices and ITKs for validation refinement and replication

3. -FAC will raise the demands of farming community to the district level officers KVKs and ZRS.4. -FAC will update their knowledge to enable them to act as resources personnel to the farming community

5.- FAC will interact regularly with base level extension workers.

OPERATIONAL MODALITIES

Agriculture Technology Management Agency (ATMA). Patna shall function under the overall guidance of the Governing Board (GB) represented by sixteen members including District Magistrate as the Chairman. The ATMA management Committee (AMC) represented by different line departments under the chairmanship of the Project Director will manage the day-to-day activities of ATMA. Operational modalities about planning and implementation of action plan and pattern of fund flow are briefly outlined below.

13.1: Preparation of annual action plan

Basing on the SREP of the dist. A detailed annual work plan is to be prepared for each block as a unit. The farm information and advisory center (FIAC) team would prepare block action plan (BAP) that would detail extension activities to be carried out. The BAP of each block will be prepared by taking the following steps.

I. Identification of major ecological situation in each block & number of villages covered under each AES. ii. Using data collected from representative villages of each AES. The annual action for each AES is to be prepared.

iii. Prioritizing the extension & researchable issue. The BAP will be prepared based on the strategies and activity schedule required to be implemented in each AES.

iv. Care should be taken to dovetail the ongoing schemes of line departments and central Government agencies to NATP without duplicating the activities.

13.2 : Technical approval of BAP

The BAP so prepared by the FIAC team is to be approved by the farmer advisory Committee (FIAC) before it's approval by G.B.ATMA .the Scientist of KVK.PRTS and senior officer of line department in the district may also participate I in the meeting at block level for approval of action plan so that their involvement also takes place.

13.3: Administrative approval of action plan

The ATMA management Committee (AMC) would ensure that these plan are technically and administratively feasible, and consistent with the SREP, before being forward to the ATMA GB for approval. Then the GB of ATMA will approve the consolidated plan.

The line department of the district and research units would also prepare seasonal or annual work plan to (i) Maintain diagnostic and support service,

(ii) Organize in service training and technical support activities for FIAC and field level extension staff,

(iii) Cary out research programmes, and

(iv) Periodically up to date the district SREP. The approved work plan and investment plan is to be submitted to the TDMC for approval and release of funds by the ministry of Agriculture to ATMA.

13.4: Funds flow mechanism

ATMA will have operational flexibility in use of project funding. However ,the overall investment funds for infrastructure development ,human resources development ,extension and participatory research component and operational cost will be released directly by Technology Dissemination unit of the ministry of the Agriculture .Govt of India . Technology Dissemination Management committee at the national level will release the funds to ATMA in respect of the participating units against specific seasonal / annual action plan after formal approval.

On receipts of funds by ATMA, it will be released directly to the district heads of the participating organization against their action plan. But funds for the programme component at block level, the required funds will be released to Convenor of BTT, who in turn would release the same to the member of the BTT for execution of the programme in consultation with the FIAC members. Detailed information about release of funds to the BTT for programme component would be informed to the concerned DTT members to enable him/her for effective monitoring and supervision of field activities.

The financial report from the BTT and DTT would flow to ATMA for consolidation and onward transmission to UDU .On receipt of financial report from BTT and DTT, ATMA would submit an audit quarterly statement of expenditure (SOE) to Govt .of India for reimbursement of claims. For smooth Management of the accounting procedure BTT shall maintain the following records/register.

- (i) Cash book
- (ii) Advance Register

- (iii) Guard file
- (iv) Stock book
- (v) T.A Register etc.
- (vi)

13.5 : Modalities for implementation of various activities .

Infrastructure Development:

This includes construction /renovation of the existing structure and procurement of equipment and vehicle after following guides lines issued by World Bank /Govt .of India

The renovation related work would be carried out separately by respective participating organization after formal approval of the Chairman ATMA. The allocated budget for the purpose must be spent as per the prescribed World Bank norms.

Construction of FIAC building at Block level would be carried out by ATMA in accordance with the World Bank terms and condition. But formal approval of the Chairman is necessary.

While purchasing the vehicle of ATMA, limit of budget and G.O.I. guidance and clearance are to be taken into consideration .Due attention should be given to purchase field vehicle rather than a car.

The equipment may broadly be divided into two categories namely IT & non-IT equipments. IT equipment like computers are proposed to be procedure by MANAGE through international bidding. The non IT equipment including furniture and other assets for the participating organization and FIAC would also be purchased centrally by ATMA through open tender to maintain uniformity in respect quality and cost. The participating organization should submit their requirement to ATMA well an advance.

All the above-indicated actions indicated under infrastructure development needs prior approval of G.B., ATMA.

13.6 : Human Resources Development.

Bihar Agricultural Management and Extension Training Institute (BAMETI),Pusa has been identified as SAMETI under NATP to impart extension management related training to the field functionaries of participating organization. BAMETI may organize off-campus and on-campus courses for the officials basing on the requirement of the need and situation for farmers and grassroots level workers. ARI, Patna, SGIDT, Patna, BVC, Patna have been identified to meet the training needs as the Training Centre for Agriculture, Animal Husbandry and Dairy training. Various types of training courses under the requirement of NATP have been suggested in SREP on the basis of Training Need Assessment (TNA), the details of which are as follows.

13.6.1 : Exposure visit of farmers within the district.

Basing on the distance of the area, 20 farmers at a time may be taken to a successful site maximum for a period of two days. For this purpose maximum of Rs.5,000/- may be spent. Similarly for the purpose of outside district exposure visit of the farmers, a sum of RS. 15,000/- would be spent. For out side state Rs. 50,000/- would be earmarked. Guidelines of DOE,MOA,GOI annexed would be followed as per practicability.

13.6.2 : Awareness Campaign

Awareness Campaign for activities like soil testing, Implements use, use of bio-fertilizer, organic farming etc. may be conducted for duration of 4 hours only. Preferably in the afternoon .In each campaign 50 farmers would participate & estimated cost per campaign may be pegged at RS.1,000/-

13.6.3 : Farmers Training

Two types of farmers training have been suggested in SREP i.e.Institutioanl training and villages level or block level institutional Training is for 3 days & one week where as field level training is for the one day duration and per head expenditure is Rs.200/- & Rs .100/-per day per participant, respectively.

13.6.4: Institutional Training for Extension Functionaries of Line Department, ZRS, KVK Scientists, NGO ,Governing Board and Management Committee Members of ATMA & FAC Members.

No. of participants per training is 25 and Rs.500/- as institutional charges per head per day, basing on the training needs would be required exclusive of journey charges. On the request of ATMA ,Patna BAMETI or other Institutes of repute in Bihar like Institute of Entrepreneurial Development, DNS Regional Cooperative Management Institute, Patna, and outside Bihar viz. CIMAP, Lucknow, IIVR, Varanasi ,CIFA, Bhubneshwar, NDDB, Anand could also organize various types of training courses for the aforesaid category of personnel on the basis of the request of ATMA, Patna.

13.7: Extension Activities

The extension programme are to be managed by FIAC, expenditure will be incurred as per seasonal /annual action plan.

13.7.1 : Demonstration

Demonstration for cereals, pulses, oilseeds, vegetable and specific cash crops like cotton ginger and turmeric have been suggested in SREP .The area of demonstration is 0.1 ha in case of vegetable and cash craps where as it is 0.2 ha in cereals, pulses and oilseeds .In each demonstration. The cost of critical inputs that are not generally applied by the farmers may be borne out of programme component subject to a limit of Rs.1, 000/- only. While conducting the demonstration the steps required in pre-planning. Planning & follow – up stage should be meticulously taken up. The result of demonstration should be documented & presented to FAC/AMC.

13.7.2: Field Day: Field day is one of the most important activity to be organized on completion of demonstration. Fifty participants and Rs.2, 000/- may be spent in each field day. This field day would also serve as awareness campaign for 50 framers invited from new FIGs'.

13.7.3: Participatory Research:

The participatory research component of this programme would be implemented by concerned RRTTS/KVK. It may be mentioned here that planning and execution of participatory research shall be done in an integrated manner on farming system basis.

13.7.4: Community organization:

The job may be assigned to some identified & competent NGOs with good track record in different block. FIGs (farmers interest group) and WIGs (women interest group) are expected to be formed by the NGOs in collaboration with FAC and BTT. There should be close coordination between FIAC and NGOs at grassroots level. Project director ATMA as well as AMC members would coordinate this assignment.

13.7.5: Preparation of A.V.Aids:

Simple visual aids like charts, posters on some of thrust crops of the block and important practice are required to be prepared by FIAC and grassroots level extension workers of line department. But printing of leaflets, preparations of video films are to be done centrally by ATMA and the expenditure may be incurred from ATMA budget.

13.7.6: Documentation

The result of demonstration and success stories will be documented in Bi-monthly News Letters, Souvenirs, Annual Reports and Video films for use as training material. The cost structure proposed for different items would be as follows:

S.No.	Item	Frequency	Cost (Rs.)	Total cost for
				year Rs.)
1	Extension leaflets	Bi-monthly	12,000/-	72,000/-
	(On different subjects/ topics)		(Per 1000 copies)	
2	Charts, Posters, Hoardings	Yearly	1,00,000/-	1,00,000/-
3	ATMA News Letters	Bi-monthly	12,000/-	72,000/-
			(Per 1000 copies)	
4	Souvenirs	Quarterly	25,000/-	1,00,000/-
			(Per 1000 copies)	
5	Annual reports	Yearly	50,000/-	50,000/-
6	Video films	Half-Yearly	3,00,000/-	6,00,000/-
	(Made with Beta- cam) for wider			
	Door Darshan telecast			
7	Total			Rs. 9,94,000/-

Table 13.1: Details of Proposed expenditure on Various Documentation Items.

13.7.7: Case studies and Success Stories:

Various case studies and success stories would be documented and developed by ATMA, Patna for wider publicity and circulation among the various stake holders of the extension system and horizontal learning/ experience sharing among different ATMA's'.

SUCCESS STORIES

During the field visits for collection of primary information and subsequent field tours for promoting ATMA concept and farmer groups efforts were made to document **areas of excellence** and **successful experiences** of the farmers through their own endeavours related to agricultural development on different farming systems and enterprises in the district, which can be replicated under similar agro-ecological / economical situations. Some of these are enumerated below:

A. Popularising Floriculture in an extremist affected area:

Name of Success Story- Sri Shyam Nandan Thakur Village-Majhanpura, Block-Dhanarua, District-Patna

Sri Thakur belongs to the weaker section of society and the area from which he comes is an extremist affected area. With no support from any Governmental agency Sri Thakur on his own initiative and encouragement from a local NGO, namely Action Group for Citizens Rights started cultivation of Marigold in his village. In this endeavour he gained support from three of his fellow villagers who pooled their land and started this new venture in10 bighas of land. The initial working capital of Rs. 10,000/- was collected from their own savings. They started in 1998 and within no time they started earning a net profit of Rs. 50-60,000/- per annum per bigha of land from the sale of garlands in Patna flower market. They distribute the earning as per the share of land and money contribute to this venture and time devoted in their enterprise. He brings seeds of marigold from Kolkata for planting during summer season and uses local seeds and planting material for other seasons. Sri Shyam Nandan Thakur has been instrumental in bringing a sea change in lives of poor farm women who now earn as much as Rs.15-16, 000/- per annum from garland making and plucking the marigold flowers from their fields. Sri Thakur now intends to send his flowers to distant places like Kolkata and New Delhi because he feels that the Patna flower market for marigold has reached a saturation point, he

now wants to diversify to medicinal and aromatic plants cultivation if proper technology and planting material is made available to him.

B. Farmers Mobilization for a Social Cause:

Name of the Success Story-Sri Ajay Kumar, Chairman, Manjhauli Vitarani, (Water Distribution Society), Vill. & P.O.-Nagwan, Block- Naubatpur, District-Patna

Sri Ajay Kumar, a postgraduate from Patna University has been organizing the farmers of his region for social and agricultural causes since early nineties. When he started farming he found that farmers located at the tail end of the Sone Canal system were not getting adequate water from the canal and this caused great resentment among the farmers. Sri Ajay Kumar organized a meeting of the State Agril Production Commissioner, the Chairman of Sone Command Area Development Authority, the Irrigation Commissioner, and the State Director of Marketing and in this meeting it was decided to allow the villagers to do the needful so that the farmers at the tail end of canal could also get water to irrigate their crops. Sri Kumar organized the disgruntled farmers and formed a two-tired organization namely a Village Level Committee (VLC) and a Central Level Committee (CLC) with members drawn from the affected villages and farms. To start their activities of cleaning the canal of weeds and filling the holes in the bunds they needed funds, this he tackled by a two pronged approach- he asked the members to collect donations @ of Rs. 10/- per farm, this way he collected Rs. 1 lakh for the cause. Those farmers who could not pay cash he requested them to contribute two bundles of paddy straw which when sold fetched another Rs. 50,000/- to the CLC. He entrusted the job of overseeing the de-silting work to the respective VLC's who were being affected by that stretch of canal. Constant monitoring of this work ensured that the job was done with a fair amount of transparency and missionary zeal. Sri Kumar has been successful in organizing the farmers towards the cause of agricultural development and his organizing skills are evident when he was successful in marketing the paddy from his area to the Food Corporation of India to the tune of Rs. 3 crores last year after lobbying with the Central and State Governments for

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the cause of farmers. Sri Ajay Kumar attributes his success to the support of his fellow farmers and also to the Participatory Irrigation Management Scheme (PIMS) being implemented in the Sone Command Area. He has also started to organize the farmers to take up seed production and marketing through Self Help Groups (SHG's) / Farmers Interest Groups (FIG's).

C. A Dedicate Medicinal Plant Grower:

Name of Success Story-Sri Arjun Prasad,

Secretary-Gramodaya Vikas Jyoti, Vill.-Govindpur, Lakshman Tola, Block- Phulwarisharif, District-Patna.

Sri Arjun Prasad, an electrician by profession runs an NGO in a backward village of Patna. He has great interest in medicinal and aromatic plant. This led him to approach Central Institute of Medicinal and Aromatic Plants (CIMAP), Lucknow, for receiving training on cultivation and processing aspect of aromatic and medicinal plants. After this he came in contact of ATMA, Patna and seeing his knowledge and devotion towards the cause, he was advised to form an FIG on medicinal plant. Sri Prasad desired to start a nursery of medicinal plants from where he could supply planting material to those fellow farmers. Efforts are on to link their FIG with DRDA under SGSY so that they can start the production and supply of planting material to the enterprising farmers at the earliest.

D. Farmers Mobilization for Irrigation Water Management:

Name of the Success Story-Sri Girindra Narain Sharma,

Chairman, Maner Vitarani, (Water Distribution Society), Vill. -Dihri, P.O.-Taranagar, Block- Bihta, District-Patna Has been instrumental in organising and mobilizing the farmers for social and agricultural causes. His efforts have brought the Governmental procurement agencies to set up centres for buying paddy and wheat. To check the situation from turning chaotic he, along with core group of farmers allotted one day each to the each village, so that they could sell their produce without any hassles. He has been involved with the Participatory Irrigation Management Scheme (PIMS) to amicably settle the water distribution issues along with organizing farmers to de-silt the canal through VLC in 25 villages. Sri Sharma has come in contact of ATMA and has been involved in spreading the ATMA concept among farmers.

E. Private Initiatives of A Dairy Entrepreneur:

Name of Success Story- Sri Ranjan Kumar

Vill.-& P.O. –Lakhanchand, Block- Mokama, District-Patna.

Sri Ranjan Kumar belongs to a rich farming family. His father was a senior police officer and he has received education from Jawaharlal Nehru University, New Delhi and has a management degree from University, United Kingdom along with a Diploma course on Dairying from UK. He now practices law after successfully demonstrating that, though coming from an affluent back ground and having received quality education he could successfully run a dairy farm on modern line and run it profitably too. He started after getting a bank loan, with 6 cows in 1986 on a family plot of land in the out skirts of Patna town, which was other, wise useless. He contacted the prospective buyers (mostly bulk milk user like sweet shops) and got a commitment from them to purchase all the milk he could supply. He often had to carry the milk on his Jeep to sell when some regular buyers could not lift it. He gradually expanded to a well-run dairy of 45 cows and grows his own fodder on the farm. His USP has been supplying milk to bulk purchaser and using modern management practices in running the dairy. His dairy farm now has 25 lactating cows with an average milk production of 200 litres per day.

F.-Popularising Cooperative Spirit in Diara Areas through Dairy:

Name of the Success Story-Sri Hira Lal Singh,

Former Secretary, Habaspur Milk Producers Cooperative Society, Vill. -Habaspur, P.S.-. Shahpur, P.O. –Ganghara, Block- Danapur, District-Patna

Shri Hiralal Singh of village Habaspur in Diara region, P.O. Gangaraha in Danapur block is a legend of co-operative dairying. He started Cooperative Dairy Society in 1976 under Bihar State Dairy Corporation with a procurement of 400.00 LPD, which increased to 500 LPD in 1982 under COMFED and at present procuring 600.00 LPD. He remained Chairman of that society for several years. He possesses 20 cows and 2 buffaloes a total of 6 hectares of land. Later his son Shri Vijay Kumar Singh became chairman of Vaishal-Patliputra Milk co-op. Union Ltd. in 1999.

Though he has not generated comprehensive income for himself from this act he spread the concept of co-op dairying in the obscure Diara region providing market for fluid milk. By this generous act he and his family are icon of reverence in that area.

G.- Mushroom Cultivation and Marketing Through Collective Effort

Name of the Success Story-Sri Manoj Kumar,

Vill.& P.O. -Chilbilli,

P.S.-. Phulwarisharif,

Block- Phulwarisharif,

District-Patna

Sri Manoj Kumar a PDS shop owner was trained by the Department of Industry, Govt. of Bihar at its Training Institute, near Gandhi Maidan, in Patna. Sri Kumar started commercial cultivation of Oyster mushroom in small quantity in year 2001 by investing Rs. 4000/ for the spawn and other facilities necessary for mushroom cultivation. But his production potential was limited to producing 3-4 kg of mushroom per day only. This led him to contact other farmers of his village who had received training on Mushroom. He was successful in forming an FIG with 7(seven) farmer as members and they started marketing

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the mushrooms together. This enabled them to supply to bulk consumers through a local agent Sri Upendra Verma of Rajendra Nagar, Patna. The average income of Sri Manoj Kumar from mushroom production is Rs.3000/- per month. The group meets frequently and decides on the variety to produce based on seasonality, as they do not have facilities to control temperature at their disposal. The problems faced by the group are of availability of quality mushroom spawn and its marketing as there is less awareness about nutritional aspect of mushroom among the consumers.

H.- Farmers Organization and Milk Marketing Through Cooperatives:

Name of the Success Story-Patna Dairy Project,

P.S.-. Phulwarisharif,

Block- Phulwarisharif,

District-Patna

Patna was one of the milk sheds identified under Operation Flood-1 for its implementation. In order to implement the programme and also to organize milk procurement activities of two plants namely Feeder Balancing Diary (FBD), and Feed Plant (CFP), Bihar State Dairy Corporation was formed in the year 1972. The corporation was supposed to develop the Dairy Cooperatives both at village level and milk shed level on 'Anand Pattern' and it was expected that the milk shed level cooperatives would take over entire infrastructure created in due course. Though the progress of Corporation was good initially it could not achieve its goals for which it was established. Subsequently, the NDDB was requested to take over the management of infrastructure with effect from 1st October 1981 under the banner of Patna Dairy Project (PDP). NDDB immediately after taking over positioned an integrated Spear Head Team to restructure the milk procurement activities and also for streamlining the working of the FBD and CFP. Under the management of NDDB the project had not only made excellent progress but had been able to establish the fact that the co-operative could function equally well in Bihar too and what is essential is the proper atmosphere and guidance. Along with the organization of milk procurement activities and management of both the plants on commercial lines, the NDDB took special care to develop the Vaishal Patliputra Dugdh Utpadak Sahkari Sangh Ltd. (VPDUSS), the milk

shed level cooperative for taking over the project once the NDDB withdraws its management. NDDB handed over the Patna Dairy Project (PDP) to Vaishal Pataliputra Dugdh Utpadak Sahkari Sangh Ltd (VPDUSS) with effect from 1st July 1988.

Presently, there are 913 DCS in the areas of PDP covering the districts of Patna, Vaishali, Nalanda and fringe areas of Saran with a total membership of 57695. The daily average procurement has reached 88500 litres during 2001-02 and it is hoped that the project shall collect above one lakh liters of milk per day in commencing year.

There are 159 Women Cooperative Societies exclusively managed by women and run by rural women folk. While the union has a fairly good number of functional societies, emphasis is being given to consolidate the functioning of DCS by increasing the member's participation.

PDP in addition to providing a ready and stable market for rurally produced milk at doorstep has also been providing inputs required for increasing milk production viz. Al with frozen semen, veterinary first aid, vaccination, supply of balanced feed, supply of fodder seeds, treatment of paddy straw/ wheat bhusa with urea, supply of urea molasses block etc. on no profit no loss basis. The response from the milk producers for all these inputs has been exceedingly encouraging and PDP is in the process of extending these facilities to more and more areas.

PDP was first to start milk marketing in sachets in Bihar during 1981 and its product profile includes- fluid milk of various grades, milk powder, butter, ghee, gulab Jamun, peda, ice cream, paneer, Surabhi, rasogulla, diet ice cream and plain/mishti dahi along with this it also manufactures and supplies cattle feed to its members.

Major achievement of PDP through social mobilization:

a. Many women DCS members have taken up Artificial Insemination as a vocation, which was earlier, a taboo for them in the rural areas.

b. The gap between lean season and flush season has come down to 10%, which is lowest in India, as compared to the earlier scenario when it was as high as 60 percent.

c. PDP is the only dairy in Eastern India with ISO 9001:2000 and HACCP (IS-15000) certification.

d. Has developed an army of Para-vets, who are serving the rural milk producers in a big way.

e. Has contributed in uplifting the economic status of rural people through sustained and regular income through milk production.

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f. Product promotion by establishing linkages with a private entrepreneur (Sudha butter – Shakun bread)

I. Success Story of a Medicinal Plant Grower

Name-Sri Jagdish Singh

Village-Suintha

Block-Phulwarisharif

District-Patna

This enterprising farmer from Suintha village in Phulwarisharif block started the cultivation of Mentha and Mushrooms in the year 2000. for Mentha he traveled to village-Ghasi ka Purwa in Allahabad(UP) to get the required planting material. He started alone but later formed a group of 12 like minded farmers and is now successfully selling his Mentha oil to various traders located at Pratapgarh, Haidergrah and Barabanki in UP. He gets information about the prices and demand for the oil through phone and then decides where to sell his oil. While discussing about the economics of the crop he said that the cost of planting comes around Rs.25, 000/- per ha. And the yield of oil from the first cutting is around 80 kg/ha. Which gives a return of Rs. 300/- per kg, which adds up to Rs. 24,000/- per cutting. In total he takes three cutting from the crop and thus getting a gross return of Rs.72, 000/- per ha. in a year. His experience shows that the second cutting is the most promising of the three and is done about two months after the first one. The first cut is done 75 days after planting and the third two months after the second

J.- Popularizing Cultivation of Medicinal and Aromatic Plants Through NGO:

Name of the Success Story-SRISTI Foundation

C-18, Sri Krishna Puri, Basawan Park Path (Opp.- Lalita Hotel), Block- Patna Sadar, District-Patna.

Sristi Foundation a local NGO, which was established in 1997, has been working in the field of medicinal and aromatic plants, creation of employment opportunities through rural entrepreneurship, developing a pool of resource persons for transfer of technology, and development of fisheries, etc. Sristi Foundation has also been giving training and technical advice to farmers and entrepreneurs so as to enable them to encounter the changed scenario of post-WTO world. Sristi supplies technology along with planting material to the farmers under its various programmes along with much needed marketing support in form of market information and helps them in identifying the potential buyers with the help of Internet and other information sources. This NGO has been managing a Regional Institute of Fisheries Technology and Agro-Extension Management through a pool of experts and advisors. It maintains linkages with ATMA, Patna, NABARD; Bihar Association for Cultivation of Science, Regional Biotech Consortium, Centre for Innovations and Technology Transfer, Medicinal and Aromatic plants Growers Association of Bihar. This NGO has been doing a yeomen service for the development of rural enterprises through supply of seeds and planting

material of exotic vegetables and medicinal and aromatic plants, extraction technology for aromatic plants along with much needed market related information about the post harvest disposal of the produce. Sristi Foundation is the first NGO to develop low cost technology for Spirulina algae culture in Bihar/ Northern India. It has also introduced fresh water prawn culture technology in the state. Sristi is networking the scientific NGO's to catalyse the rural development process. There are 252 scientists, entrepreneurs, technocrats and economists associated with Sristi Foundation and they have 68 franchise and associate offices in Bihar and India, while four associates are located in foreign countries under its village globalisation programme. It has also established a herbal garden-cum –gene bank of medicinal plants at Patna. NIRD, Hyderabad has selected Sristi, the only NGO from Bihar for their directory named 'Rural Development Organization of India'. Sristi is presently providing training and technology in more than 100 areas in agriculture and rural sectors

Some Other Successful Farmers of Patna District.

	Name and address	Area
1	Mr.Shaym Sharan,	Pig farming at Vill- Ghansoorpur, Bakhtiarpur,
	Sharan Niwas,	Patna, (6 KM before, Bakhtiarpur),
	Road No-6C, Gardnibagh, Patna	Near Fauji Hotel
2	Mr. Kumar Rakesh Sinha	Growing Mushroom (Oyster)
	M/s Ashish Mushrooms	
	South of MIG-147	
	Adarsh Vikramshila	
	Hanuman Nagar, Kankarbagh,	
2	Palina Mr. Shrikont Singh	Herbel gorden owner
3	Mr. Shrikant Singh	Herbal garden owner
	Madbay Mill factory	
	Po- Patna city Patna	
4	Mr. Siva Ram Singh	Horticulture /fruits Nursery Owner
	Sivaram Bag Paudhshla	
	Vill:- Balahpur	
	Po:- Mor, Mokama, dist- Patna	
5	Prof.C.N Sharma	Medicinal plants & sweet corn grower and dealer
	Kamla Niwas Road No:-1	
	Khas Mahal, Chiraiyan Tarnd,	
	Patna	
6	Mr. R.S Shekhar	Green house fabricator
	Address:- 7-HF/3-11,HIG Colony	
	,Bhoothath Road	
	Kankarbagn, Patha –20,	
7	Dr Nutan SPISTI Foundation	Medicinal plants Aromatic plants & exotic
'	C-18. S.K Puri Patna	vegetable grower-cum-Nurserv owner
8	Mr. Vijay Singh	Honey bee keeping
	At &P O:- Berhna ,Block	
	Barh, Patna.	
9	50- farmers	The farmers of the Sheonar village have planted
	Vill: - Sheonar	Papaya on more than 50 Acres
	Block-Mokama	
	Distt: - Patna	