Study No. 161

THE IMPACT OF MACRO MANAGEMENT OF AGRICULTURE SCHEME

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PREFACE

The present study entitled as "*The Impact of Macro Management of Agriculture Scheme*" was undertaken at the instance of the Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, Krishi Bhavan, New Delhi as a coordinated study, where the task of coordination has been entrusted with the ADRT Centre, Bangalore. This report has been an individual centre's draft report on the study concerned prepared by our centre, AERC, Visva-Bharati, Santiniketan.

The present study tries to evaluate the impact of interventions made under five distinct sub-schemes subsumed under the Macro management of Agriculture Scheme at the state level, thereby making an attempt to fulfill the specific objectives set for the study as per the initial study design prepared by the coordinating center. In particular, this study tries to evaluate the impact of interventions made under – a) Sustainable Development of Sugarcane Base Cropping System, b) Special Jute Development Programme, c) Balanced and Integrated Use of Fertilizers, d) ICDP – Wheat, and e) ICDP – Coarse Cereals-subsumed under the Macro Management of Agriculture Scheme in West Bengal on the production and productivity of crops. The selection of five distinct sub-schemes out of the six sub-schemes proposed in the initial study design has been done with consultation with the implementing agency at the state level, viz. the Directorate of Agriculture, Government of West Bengal, depending upon the performance and availability of secondary data relating to the sub-schemes concerned.

The study is based on both secondary and primary data. As far as secondary data is concerned, on the one hand, the study has used various published databases at the state and as well as at the national levels from authentic sources like Directorate of Agriculture, Bureau of Applied Economics & Statistics, Agricultural Finance Corporation, Directorate of Finance – all under the Government of West Bengal; and Ministry of Agriculture, Reserve Bank of India, National Accounts Division, Ministry of Statistics and Programme Implementation – under the Government of India. On the other hand, the study has also extensively used various unpublished secondary data relating to the study as obtained from the Directorate of Agriculture, Government of West Bengal- the nodal implementing agency of the Macro management of Agriculture Scheme in West Bengal.

The primary data was collected by conducting detailed field investigation from over five blocks for the five sub-schemes concerned (one block each for five sub-schemes) from three districts of West Bengal as per the initial survey design prepared by the coordinating centre. The selection of blocks/districts has been done in consultation with the officials of the implementing agency at the state level, viz. Directorate of Agriculture, depending upon the performance and availability of data relating to the individual sub-schemes concerned. The sample blocks/districts identified for the study were Block Ausgram-I from Barddhaman District, Blocks Bolpur-Sriniketan and Sainthia from Birbhum District and Blocks Habra-I and Basirhat-I from North 24 Parganas District.

The sample units in the study were the beneficiary farmers, obtaining either physical or financial benefits directly in any form under the sub-schemes concerned. In total, a pool of 250 beneficiary sample households (50 each for the 5 sub-schemes concerned) together constitutes the sample size in this study. The primary data was collected by conducting intensive field survey by way of interviewing each and every beneficiary sample farmers by following a rigorous questionnaire as prepared by the coordinating center.

The scheme of chapters in this study has been designed so as to maintain the logical development of the facts and findings, and to fulfill the particular objectives of the study. In particular- *Chapter 1* introduces us with the very scheme under consideration of the present study, while *Chapter 2* spells out the need for the present study with its particular objectives, along with a brief description of the methodology adopted to carry out the study. *Chapter 3* essentially presents a descriptive profile of the study area, while *Chapter 4* presents a detailed documentation of the results and findings of the study. Lastly, *Chapter 5* briefly summarizes the study with its facts and findings, and suggests policy implications accordingly.

The study team associated with the present study consisted of Mr. Debajit Roy and Mr. Ranjan K Biswas under the active supervision of the undersigned. The field investigation for collecting primary data relating to the study was jointly done by Mr. Debajit Roy and Mr. Ranjan K Biswas. On the part of secondary data, while Mr. Debajit Roy gathered the required secondary data from existing database/literature sources, Mr. Ranjan K Biswas has performed the crucially important task of collecting published and unpublished state/district level secondary data from the concerned State Government offices while maintaining regular contact and coordination with the implementing nodal agency of the concerned scheme, viz. the Directorate of Agriculture, Government of West Bengal. The drafting of the report has been performed by Mr. Debajit Roy with the proactive cooperation of Ranjan K Biswas under the supervision of the undersigned. The secretarial assistance was received from Mr. D. Mondal, Mr. P.

Das, Mr. A. R. Patra, Mr. P. Hazra, while Mr. N Maji and Mr. M A Khaleque assisted in digitalization of the report. Also, Mr. S. Sadhu and Mr. S. Murmu assisted in office maintenance works. I offer my deepest thanks to all of them.

On behalf of this centre, the undersigned takes the opportunity to thank the coordinating center for their painstaking work on coordination of this immensely important study across the individual centers, especially for organizing the entire study design with detailed chapterization and. table formats.

I take this opportunity to thank the officials of the Government of West Bengal for extending their kind help and cooperation to carry out the study. I am especially thankful to the officials of the Directorate of Agriculture, Government of West Bengal and West Bengal Agricultural Finance Corporation, Government of West Bengal, Regional Office, Kolkata who extended whole-hearted support to the study team and spared their precious time to provide us with necessary information to complete the study successfully.

I would also like to express my heartiest thanks to all the sample beneficiary farmers interviewed in this study, who patiently answered all the tedious questions asked while conducting the primary data survey at the cost of their boredom and valuable time.

SD/-

Santiniketan
Date: 01.06.2010

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1.1.1: THE MMA SCHEME

With a view to bring about all round development of agriculture, the Centrally-Sponsored Scheme 'Macro Management of Agriculture (MMA)' was approved by the CCEA on 4-10-2000 and became operational in 2000-01 in all States and UTs by integrating 27 centrally sponsored schemes. It has been a conscious attempt

from the Central Government to move away from the previous pattern of rigid uniformly structured schematic approach, permitting little or no flexibility, which often resulted in large unutilized balances held with the States/UTs. By integrating the existing 27 Centrally Sponsored Scheme under the Macro Management Approach, it was decided that the Central Government will supplement/complement the State Governments' efforts through regionally differentiated Work Plans comprising crop/area/target group specific interventions, formulated in an interactive mode and implemented in spirit of partnership with the States.

As such, the MMA scheme has been conceived as a major step towards achieving decentralization in pursuance of restoring primacy of the States in agricultural development planning, allowing States the flexibility to choose suitable interventions from the various components in addition to their own efforts towards growth of the agriculture sector. Under the scheme, the States enjoy the freedom to develop and pursue activities through work plans prepared by them on the basis of their regional priorities. The States are theoretically free within given parameters to restructure any/all the schemes and their components and include them in their work plan. They are also free to include new interventions in the work plans, provided these are not covered under any other scheme of Central Government or are not part of any on-going State Government schemes. Thus, the states have been given a free hand to finalize their sector-wise allocation as per requirements of their developmental priorities.

1.1.2: OBJECTIVES OF THE MMA SCHEME

The MMA scheme was initially formulated with the broad objective to ensure that central assistance to the States/UTs is spent on focused and specific interventions through decentralization of agricultural development planning. In particular, the objectives of the MMA scheme include:

- Reflection of local needs/crop/regions specific/priorities etc.;
- Providing flexibility and autonomy to the States;
- Optimum utilization of scarce financial resource;
- Maximization of returns; and
- Removal of regional imbalances.

1.1.3: SUB-SCHEMES SUBSUMED UNDER THE MMA SCHEME

The scheme initially consisted of 27 centrally sponsored schemes relating to cooperative, crop production programmes (for rice, wheat, coarse cereals, jute,

sugarcane), watershed development programmes (NWDPRA, River Valley Projects [RVP]/Flood-Prone Rivers [FPR]), horticulture, fertilizers, mechanization and seeds production programmes, (a list of which has been given in Box 1.1.3.1).

Later, with the launch of the National Horticulture Mission in 2005-06, 10 components relating to horticulture were excluded from the MMA scheme. Thus, the MMA scheme comprised the 17 components or sub-schemes, focusing on rice, wheat, coarse cereals, sugarcane, soil health, nutrient and pest management, farm mechanization and watershed development (a list of which has been given in Box 1.1.3.2).

At present, after the launching of the National Food Security Mission (NFSM) and the Rashtriya Krishi Vikas Yojana (RKVY), the MMA scheme has been revised in 2007-08 to make it more relevant to the present agriculture scenario in the States. To avoid thin spread of scarce resources resulting from overlapping and duplication of efforts, the Revised Macro Management of Agriculture (MMA) Scheme excludes 7 erstwhile components, and consists a total of 11 components or sub-schemes (a list of which has been given in Box 1.1.3.3). It has been decided also that once the 'National Project on Balanced Use of Fertilizers' and 'Rainfed Area Development Programme' is launched, the components 'Balanced and Integrated Use of Fertilizers' and 'National Watershed Development Project in Rainfed Areas' respectively would be taken out of the purview of the Revised MMA Scheme.

Box 1.1.3.1
List of Centrally Sponsored Schemes under MMA: 2000-01

1. Assistance to Coop. Weaker Section
2. Assistance to Women Cooperatives
3. Non-overdue Cover Scheme
4. Agri. Credit Stabilization Fund
5. Special Scheme for SC/ST
6. Integrated Cereal Development Programmes in Rice Based Cropping System Areas
7. Integrated Cereal Development Programmes in Wheat Based Cropping System Areas
8. Integrated Cereal Development Programmes in Coarse Cereals Based Cropping System Areas
9. Special Jute Development Programme
10. Sustainable Development of Sugarcane Based Cropping System
11. Balanced & Integrated Use of Fertilizer
12. Promotion of Agricultural Mechanization among Small Farmers
13. Integrated Development of Tropical, Arid & Temperate Zone Fruits
14. Production and Supply of Vegetable Seeds
15. Development of Commercial Floriculture
16. Development of Medicinal and Aromatic Plants
17. Development of Roots and Tuber Crops
18. Development of Cocoa and Cashew
19. Integrated Programme for Development of Spices
20. Development of Mushroom
21. Use of Plastics in Agriculture
22. Bee-Keeping
23. National Watershed Development Project for Rainfed Areas
24. Scheme for Foundation & Certified Seed Production of Vegetable Crops
25. Soil Conservation in Catchments of River Valley Projects & Flood Prone Rivers
26. Reclamation & Development of Alkali Soils
27. State Land Use Board

Source: Ministry of Agriculture, Government of India

Box 1.1.3.2
List of Centrally Sponsored Schemes under MMA: 2005-06

1. Integrated Cereal Development Programmes in Rice Based Cropping System Areas
2. Integrated Cereal Development Programmes in Wheat Based Cropping System Areas
3. Integrated Cereal Development Programmes in Coarse Cereals Based Cropping System Areas
4. Special Jute Development Programme
5. Sustainable Development of Sugarcane Based Cropping System
6. Balanced and Integrated Use of Fertilizer
7. Promotion of Agricultural Mechanization among Small Farmers
8. National Watershed Development Project for Rainfed Areas
9. Scheme for Foundation and Certified Seed Production of Vegetable Crops
10. Soil Conservation in Catchments of River Valley Projects and Flood Prone Rivers
11. Reclamation and Development of Alkali Soils
12. State Land Use Board
13. Assistance to Cooperatives of Weaker Section
14. Assistance to Women Cooperatives
15. Non-overdue Cover Scheme
16. Agriculture Credit Stabilization Fund
17. Special Scheme for SC/ST

Source: Ministry of Agriculture, Government of India

Box 1.1.3.3
List of Centrally Sponsored Schemes under Revised MMA: 2007-08

1. Integrated Cereal Development Programmes in Rice Based Cropping System Areas
2. Integrated Cereal Development Programmes in Wheat Based Cropping System Areas
3. Integrated Cereal Development Programmes in Coarse Cereals Based Cropping System Areas
4. Integrated Development Programme for Pulses and Oilseeds
5. Sustainable Development of Sugarcane Based Cropping System Areas
6. Balanced & Integrated Use of Fertilizer and Pesticides
7. Promotion of Agricultural Mechanization among Farmers
8. National Watershed Development Project for Rainfed Areas
9. Soil Conservation in Catchments of River Valley Projects & Flood Prone Rivers
10. Reclamation & Development of Alkali and Acidic Soils, and
11. State Land Use Board

Source: Ministry of Agriculture, Government of India

1.1.4: STATE OF THE MMA SCHEME IN THE NATION

For the assessment of the state of any Centrally Sponsored Scheme (CSS), it has been customary to consider the budget allocation and expenditure made under the concerned scheme as an effective indicator of its financial progress. As such, it is evident from the table 1.1.4.1 below indicating the budget estimates, revised estimates and expenditure borne under the MMA scheme that the Government of India has been assigning evermore importance to the scheme as revealed by the increasing budget estimates earmarked for the scheme. In fact, the budget estimates more than doubled itself within the 7th year of its commencement from 2000-01 to 2006-07. At the same time, the actual expenditure incurred under the scheme, though registering frequent fluctuations during the period, has also got more than doubled with an annual average growth of about 20 percent per annum.

Table 1.1.4.1
Budget Estimates, Revised Estimates and Expenditure Incurred under MMA

(Rs. Crore)

Year	Budget Estimate	Revised Estimate	Expenditure
2000-01	490.00	381.88	381.88
2001-02	850.00	680.49	678.62
2002-03	738.86	597.00	597.59
2003-04	700.00	648.60	648.49
2004-05	712.92	1189.20	1188.94
2005-06	912.62	819.15	841.86
2006-07	910.00	819.15	841.86

Source: India 2008

With such a huge budget allocation for the MMA scheme, it is obvious to observe that there has also been a remarkable physical achievement under the scheme over the years. In particular, it is estimated that during the 10th Five Year Plan (2002-07) an expenditure of Rs. 4,154 crore has been incurred for achieving treatment of 24.13 lakh hectares of degraded land on watershed basis, 10.39 lakh hectares of land in river valleys and flood prone rivers, 7.36 lakh hectares of alkali soil and distribution of 17.14 lakh farm equipment under the Macro Management of Agriculture scheme.

1.1.5: STATE-WISE ALLOCATION OF FUND UNDER THE MMA SCHEME

A statement showing the state-wise allocation, release and expenditure of funds under the Macro Management of Agriculture scheme [as represented in Table 1.1.5.1] reveals that out of the 910 crore budget allocation earmarked for the year 2006-07, a share of 97.5 percent of budget allocation and 97.2 percent of fund release has been subjected to the States and Union Territories, excluding the directly funded components (viz. ANTWA, DFC & DVC).

The percentage distribution of allocation of resources for the implementation of the MMA scheme among the States & UTs [as has been represented in Table 1.1.5.1 & 1.1.5.2] reveals that Maharashtra (9.84%), Uttar Pradesh (8.34%), Rajasthan (8.33%), Karnataka (6.75%), Madhyapradesh (5.61%) and Tamilnadu (5.17%) are the States with proportionately higher budget allocation as well as fund release. West Bengal, the concerned state in this study, stands only 9th in order of descend with a share of 3.60 percent of total budget allocation and 3.74 percent of total fund release.

In case of the total available fund for the year 2006-07 (viz. unutilized balance + release), it can be observed that an amount more than Rs.100 crore has actually been expended by the States and the Union Territories under Macro management Mode of Work Plans during the year. Out of the total expenditure made by the States and Union Territories, a share of 11.57 percent has been borne out by Maharashtra, followed by Rajasthan (9.52%), Uttar Pradesh (6.91%), Tamilnadu (6.46%) and Karnataka (6.37%) – together accounting for 40.83 percent of the total expenditure. Here, the share of West Bengal, the state under focus of this study, claims a share of 2.75 percent of total expenditure incurred by all the States & UTs, with a rank of 14th in the descending order.

It is to be noted here that in majority of the cases, the States appear to be held with large unutilized balances with them, a characteristic which is often treated as a setback for the effective implementation of centrally sponsored schemes. In particular, out of the total unutilized balance of Rs.34162.41 lakh held as on 01.04.2006, the five leading contributing States are Andhra Pradesh (18.12%) followed by Kerala (11.44%), Gujrat (9.49%), Uttar Pradesh (8.62%) & Rajasthan (8.38%)- together constituting more than 56.05 percent of the unutilized

balances. West Bengal, the concerned state in this study, ranks 20th in order of descend with Rs.1.60 crore unutilized balance during 2006-07.

Table 1.1.5.1
Statement Showing The Allocation, Release And Expenditure under MMA during 2006-07

(Rs. In Lakh)

States	Unspent Balance As On 01.04.2006	Allocation	Releases	Total Funds **Available**	Expend.
A&N Islands	1.68	25.00	25.00	26.68	12.50
Andhra Pradesh	6191.27	4210.00	2541.54	8732.81	5866.23
Arunachal Pradesh	71.34	2200.00	2200.00	2271.34	2146.86
Assam	1705.09	2000.00	1000.00	2705.09	2467.06
Bihar	558.63	2170.00	1564.37	2123.00	2083.55
Chandigarh	0.00	0.00	0.00	0.00	-
Chhattisgarh	1789.84	2300.00	1129.76	2919.60	2797.03
D & N Haveli	0.15	10.00	5.00	5.15	-
Daman & Diu	0.00	0.00	0.00	0.00	3.13
Delhi	75.90	0.00	0.00	75.90	0.00
Goa	83.17	260.00	385.77	468.94	418.97
Gujrat	3240.98	2810.00	2330.84	5571.82	5571.82
Haryana	16.63	2040.00	2700.00	2716.63	2643.52
Himachal Pradesh	162.90	2040.00	2770.59	2933.49	2644.37
Jammu & Kashmir	366.31	4000.00	3351.50	3717.81	2505.96
Jharkhand	374.54	1660.00	830.00	1204.54	920.71
Karnataka	1847.76	5990.00	5214.24	7062.00	6402.65
Kerala	3909.87	3060.00	1350.00	5259.87	3428.38
Lakshadweep	0.00	25.00	12.50	12.50	11.46
Madhya Pradesh	2051.07	4980.00	3963.00	6014.07	3878.78
Maharashtra	1163.70	8730.00	11751.30	12915.00	11626.63
Manipur	154.91	2200.00	2200.00	2354.91	2354.91
Meghalaya	229.63	1800.00	900.00	1129.63	991.96
Mizoram	150.00	2500.00	2300.00	2450.00	2227.00
Nagaland	0.00	2500.00	2221.04	2221.04	2221.04
Orissa	477.82	2550.00	3550.00	4027.82	3704.93
Pondicherry	12.52	0.00	0.00	12.52	7.25
Punjab	2099.05	0.00	426.00	2525.05	1482.04
Rajasthan	2863.28	7390.00	8212.55	11075.83	9572.25
Sikkim	78.11	1900.00	2000.00	2078.11	1823.57
Tamil Nadu	218.27	4590.00	6337.70	6555.97	6491.77
Tripura	1147.30	2000.00	2000.00	3147.30	1853.25
Uttar Pradesh	2945.76	7400.00	5668.14	8613.90	6950.17
Uttaranchal	14.93	2170.00	3144.37	3159.30	2646.17
West Bengal	160.00	3190.00	3190.00	3350.00	2765.21
Total	34162.41	88700.00	85275.21	119437.62	100521.13
Misc. (ANTWA)		800.00			
Direct Funded Component		500.00	1478.56		
DVC		1000.00	1000.00		
Grand Total		91000.00	87753.77		

Source: Ministry of Agriculture, Government of India

Table 1.1.5.2
Percentage Distribution Of Allocation, Release And Expenditure Under MMA during 2006-07

(Rs. In Lakh)

States	% Allocation	% Release	**Expenditure as % of Release**	Expenditure as % of Total Fund
Maharashtra	9.84	13.78	98.94	90.02
Uttar Pradesh	8.34	6.65	122.62	80.69
Rajasthan	8.33	9.63	116.56	86.42
Karnataka	6.75	6.11	122.79	90.66
Madhya Pradesh	5.61	4.65	97.87	64.50
Tamil Nadu	5.17	7.43	102.43	99.02
Andhra Pradesh	4.75	2.98	230.81	67.17
Jammu & Kashmir	4.51	3.93	74.77	67.40
West Bengal	3.60	3.74	86.68	82.54
Kerala	3.45	1.58	253.95	65.18
Gujrat	3.17	2.73	239.05	100.00
Orissa	2.87	4.16	104.36	91.98
Mizoram	2.82	2.70	96.83	90.90
Nagaland	2.82	2.60	100.00	100.00
Chhattisgarh	2.59	1.32	247.58	95.80
Arunachal Pradesh	2.48	2.58	97.58	94.52
Manipur	2.48	2.58	107.04	100.00
Bihar	2.45	1.83	133.19	98.14
Uttaranchal	2.45	3.69	84.16	83.76
Haryana	2.30	3.17	97.91	97.31
Himachal Pradesh	2.30	3.25	95.44	90.14
Assam	2.25	1.17	246.71	91.20
Tripura	2.25	2.35	92.66	58.88
Sikkim	2.14	2.35	91.18	87.75
Meghalaya	2.03	1.06	110.22	87.81
Jharkhand	1.87	0.97	110.93	76.44
Goa	0.29	0.45	108.61	89.34
A&N Islands	0.03	0.03	50.00	46.85
Lakshadweep	0.03	0.01	91.68	91.68
D & N Haveli	0.01	0.01	0.00	0.00
Chandigarh	0.00	0.00	0.00	-
Daman & Diu	0.00	0.00	0.00	-
Delhi	0.00	0.00	0.00	0.00
Pondicherry	0.00	0.00	0.00	57.91
Punjab	0.00	0.50	347.90	58.69
Total	100.00	100.00	-	-

Constructed from Source: Ministry of Agriculture, Government of India

1.2: THE MMA SCHEME IN WEST BENGAL

1.2.1: THE MMA SCHEME IN WEST BENGAL

The Macro Management Mode of scheme is conceived as a major step towards achieving decentralization in pursuance of restoring primacy of the States in agricultural development planning. It should be noted at the outset that under the scheme the State Governments have been assigned with the freedom to develop and pursue activities on the basis of their regional priorities through work plans prepared by them. Thus the States are theoretically free within given parameters to restructure any/all sub-schemes and their components and include them in their work plan. They are also free to include new interventions in the work plans provided these are not covered under any other scheme of Central Government or is not part of any on-going State Government schemes.

Since 2000-2001, the Department of Agriculture, Government of West Bengal, has been implementing various schemes under the Centrally Sponsored Macro Management Mode Work Plan with a view to bring about all round development of agriculture in the State of West Bengal. The concerned Departments of the State Government who are involved in the implementation of annual work plan 2006-07, are (a) Agriculture (Nodal) and (b) Agriculture (Marketing).

1.2.2: SUB-SCHEMES UNDER THE MMA SCHEME IN WEST BENGAL

The schemes subsumed under the Macro Management of Agriculture adopted by West Bengal have been broadly sub-divided into 4 (four) groups/heads for the year 2006-07. These groups are –

a) Soil Health Management Group,
b) Natural Resource Management Group,
c) Agricultural Crops & Others Group, and
d) Innovative Schemes Group.

While the first three groups are implemented directly by the Department of Agriculture (Nodal), the fourth group is implemented by the Department of Agriculture (Marketing). It should be noted that the first group, namely Soil Health Management Group, later got included into the second group (Natural Resource Management Group) afterwards since 2007-08 to facilitate better allocation of resources.

However, out of the 17 identified schemes under the Macro Management of Agriculture Scheme for the year 2006-07, 5 (five) sub-schemes are related with

the Cooperation Department, and are not functioning in West Bengal. Again, out of the remaining 12 schemes, 5(five) schemes have been modified as per the need of the state, while the rest 7 (seven) schemes were in operation maintaining its original form. The excluded schemes are – a) Assistance To Cooperative Weaker Section, b) Assistance To Women Cooperative, c) Non-Overdue Cover Scheme, d) Agricultural Credit Stabilization Fund, and e) Special Scheme For SC/ST.

Box 1.2.2.1
Schemes under MMA during 2006-07 in West Bengal

A. Soil Health Management Group: This group includes the scheme - Balance & Integrated Use of Fertilizers

B. Natural Resource Management Group: This group includes 3(three) different schemes, as follows:

1. NWDPRA;
2. RVP & FPR.
3. State land Use Board

C. Agriculture Crops & Others Group: It includes 10(ten) schemes as under :

I) Integrated Cereal Development Programme – Rice;
II) Special Jute Development Programme;
III) Sugarcane Development Programme;
IV) Integrated Pest Management;
V) Farm Mechanization;
VI) Strengthening of Seed Farms and Production of Quality Seeds;
VII) Integrated Cereal Development Programme - Coarse Cereals
VIII) Dissemination of New Technology through Demonstration for Diversification of Suitable Crops – (ICDP- Wheat);
IX) Concurrent Evaluation by Independent Agency / State Agriculture University
X) Development of Irrigation Facilities

D. Innovative Schemes (New Initiatives): includes 6(six) schemes which are:

I) Agricultural marketing;
II) Culture – Agriculture;
III) Agricultural Extension Programme,
IV) Ensuring Effective Participation of Women in Agriculture;
V) Development of Problem Soils
VI) Soil Survey Establishment linking with Remote Sensing laboratory

Source: Directorate of Agriculture, Government of West Bengal

A detailed list of the schemes adopted in West Bengal under the Macro Management of Agriculture scheme has been presented here for the years 2006-07 & 2007-08 in Box 1.2.2.1, Box 1.2.2.2 and Box 1.2.2.3 respectively.

Box 1.2.2.2
Schemes under MMA during 2007 –08 in West Bengal

A. Natural Resource Management Group: This group includes three different schemes, as follows:

1. Balance & Integrated Use of Fertilizer (Soil Health Management);
2. NWDPRA;
3. RVP & FPR.

B. Agriculture Crops & Others Group: It includes 7(seven) schemes as under :

I) Integrated Cereal Development Programme – Rice;
II) Sugarcane Development Programme;
III) Dissemination of New Technology through Demonstration for Diversification of Suitable Crops – (ICDP- Wheat);
IV) Strengthening of Seed Farms and Production of Quality Seeds;
V) Integrated Pest Management;
VI) Farm Mechanization and
VII) Integrated Cereal Development Programme - Coarse Cereals

C. Innovative Schemes: includes 9(nine) schemes which are:

I) Agricultural marketing;
II) Agricultural Patterns
III) Ensuring Effective Participation of Women in Agriculture;
IV) Agricultural Extension Programme,
V) Transfer of Technology through Electronic Media and Published Literature;
VI) Bio Village Programme in the concept of Sustainable Agriculture;
VII) Training meeting on Rodent Management;
VIII) Development of Problem Soils and
IX) Soil Survey Establishment linking with Remote Sensing laboratory

Source: Directorate of Agriculture, Government of West Bengal

Box 1.2.2.3
Component-wise Breakup of Sub-schemes under MMA during 2006-07 in West Bengal

Soil Health Management Group:

1. Publicity campaign on Organic farming and balanced use of fertilizer etc.
2. Preparation of enriched compost.
    a) Green Manuring DC
3. Correction of soil acidity by application of soil ameliorate by demonstration
4. Demonstration with micro nutrient fertilizers straight.
5. Promotion of Bio-fertilizer use in Pulse crops.
6. Maintenance of Azola & B.G.A. units in 7(seven) Govt. farms
7. Maintenance of Vermi compost production unit at Govt. farm
8. Setting up of vermi compost production unit at farmers field
9. Purchase of instrument, Equipment, Chemicals/ Glass wares
10. Purchase of AAS for analysis of micro nutrients for soil testing labs
11. Preparation of Information Sheets
12. Purchase of AAS for fertilizer testing Labs
13. Purchase of Digertion seeds
14. Purchase of moisture meter
15. Purchase of equipment
16. Setting up of bio fertilizer control labs

Natural Resource Management Group:

1. NWDPRA
2. RVP & FPR
3. State Land Use Board (SLUB)

Agriculture Crops & Others Group :

1. Integrated Cereal Development Programme – Rice :
    a) FFS @ Rs. 17,000/- per FFS
    b) Incentives for Seed Production / Distribution

2. Special Jute Development Programme :
    a) Production Technology Demonstration
    b) Distribution of Certified Jute Seed
    c) Seed Production / Distribution
    d) Excavation / Re-excavation of kachha Retting Tank

3. Sugarcane Development Programme :
    a) Field Demonstrations in Farmers' Fields
    b) State Level Training Programme for Extension Officials
    c) Farmers' Training Meeting
    d) Seed cane Multiplication in Farmers' Fields (1 ha)
    e) Operational expenses

4. Integrated Pest Management :
    a) Organization of FFS in Rice, Oilseeds, Cotton, Vegetables and Sugarcane
    b) Bio-village Programme in the concept of sustainable agriculture in 10 districts of West Bengal

Continued……

5. Farm Mechanization :
    a) Subsidized distribution of Power Tiller
    b) Subsidized distribution of Tractor
    c) Specialized Power Driven Equipment
    d) Thresher and Manual Operated Equipment
    e) Distribution of Sprayer (Manually operated)

6. Strengthening of Seed Farms and Production of Quality Seeds :
    a) Production of Foundation Seeds (for Cereals, Pulses & Oilseeds crops)
    b) Production of Certified Seeds (for Cereals, Pulses & Oilseeds crops) – Subsidy on Cereals
    c) Development of Irrigation Facilities
    d) Mechanization
    e) Minor works

7. ICDP Coarse Cereals :
    a) Distribution of hybrid maize

8. Dissemination of New Technology through Demonstration for Diversification of Suitable Crops – ICDP Wheat
    a) Field Demonstration along with Seed, Fertilizer, etc. with New Technology
    b) Training of Farmers
    c) Operational Expenses

9. Concurrent Evaluation by Independent Agency / State Agriculture University

10. Development of Irrigation Facilities
    a) Demonstration on Sprinkler Irrigation System :
    i) for small, marginal, SC and ST and Women farmers;
    ii) for other farmers up to 2 ha
    b) Demonstration of Drip Irrigation System :
    i) for small, marginal, SC & ST and women farmers;
    ii) for other farmers
    c) Operational Expenses

New Initiatives:

1. Agriculture Marketing (for continuing scheme)
2. Culture – Agriculture :
    a) Organization of Exhibitions (Krishi Mela) in different climate region
    b) Krishi Mela in districts
3. Agriculture Extension Programme :
    a) Organizing District level Workshop by Agricultural Finance Corp. Ltd.
4. Ensuring Effective Participation of Women in Agriculture :
    a) Link Work's Training
    b) Village Level Training
    c) Honorarium to Link Workers
    d) Mahila Gosthi
    e) Operational expenses
5. Development of Problem Soil in West Bengal
6. Soil Survey Establishment linking with Central Sensing Laboratory
    a) Computer with GIS system

…….Concluded.

1.2.3: STATE OF THE MMA SCHEME IN WEST BENGAL

As has been mention earlier, for evaluating the state of any Centrally Sponsored Scheme, it has been customary to consider the allocation and expenditure made under the concerned scheme as an effective indicator of its financial progress. It is for this purpose that we have presented table 1.2.3.1 below stating the allocation and utilization of funds under Macro Management of Agriculture scheme from 2001-02 to the latest available year, viz. 2008-09.

Table 1.2.3.1
Allocation and Utilization of Fund under MMA in West Bengal from 2001-02 to 2008-09

(Rs. Lakh)

Year	Share of Govt.of India	***Share of Govt. of West Bengal***	***Carry Over (If Any)***	***Total Fund Allocated (G.O.I. + State)***	***Total Fund Utilized (G.O.I. + State)***
2001-02	2500.00	283.74333	53.690	2890.43333	2120.32978
2002-03	1427.47	230.34781	645.66032	2303.47813	1925.6195
2003-04	1920.00	251.11889	340.07	2511.18889	2268.83856
2004-05	3152.65	374.52944	218.115	3745.29444	2862.09802
2005-06	2500.00	366.08742	794.78678	3660.8742	3483.09993
2006-07	3190.00	372.22222	160.00	3722.22222	3072.46044
2007-08	3364.21	438.77778	584.79	4387.77778	3316.996
2008-09	3811.30	530.55556	963.70	5305.55556	4427.97692

Source: Directorate of Agriculture, Government of West Bengal

It remains easy to observe from the table 1.2.3.1 that immense importance has been attached with the MMA scheme since its implementation. In fact, during the period 2001-02 to 2008-09, a sum of 234.77 crore has been utilized for the implementation of the schemes under MMA, as against a total fund allocation (Govt. of India + Government of West Bengal) of 285.27 crore. The average annual rate of utilization of funds under the MMA scheme in West Bengal thus stands at a moderate of 82.6 percent points. However, while the annual average rate of growth of the share of the Central Government turns out to be 7.5 percent p.a., that for the State Government stands at 12.4 percent per annum.

Now, a deeper examination of the table 1.2.3.1 by means of considering the proportion of total fund utilized with respect to total allocated fund for the given years reveals that the ratio of fund utilization (in percent) stands out to be 82.6 percent on an average over the years (ranging from 73.4 percent in 2001-02 to 95.1 percent in 2005-06), indicating towards a satisfactory fund utilization record under the MMA scheme in West Bengal. This has special significance to the study, as the attainment of an optimum allocation of scarce financial resource has been one of the specific objectives of the MMA scheme.

Figure 1.2.3.1
Total Fund Allocated & Utilized under MMA in West Bengal during 2001-02 to 2008-09

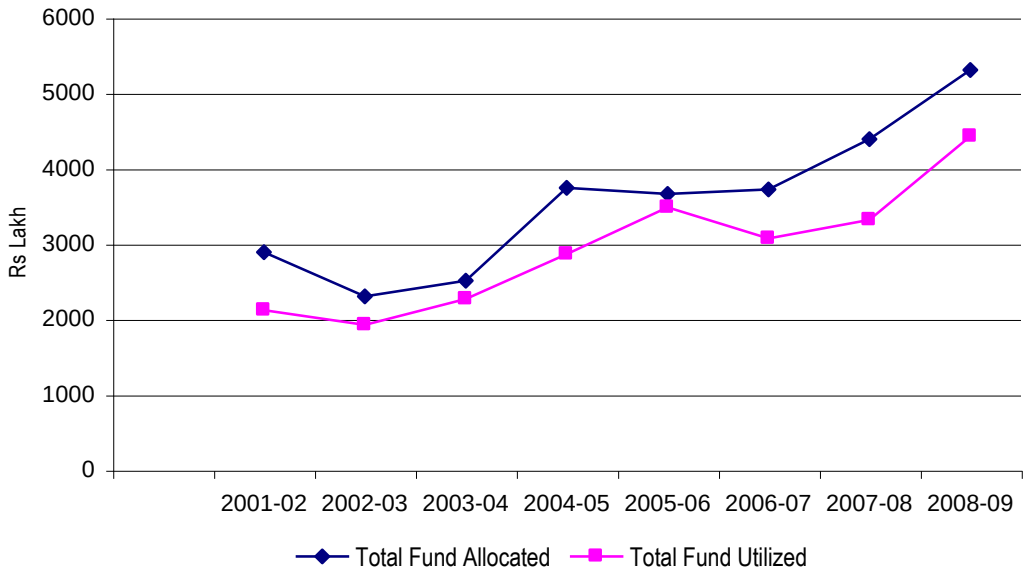
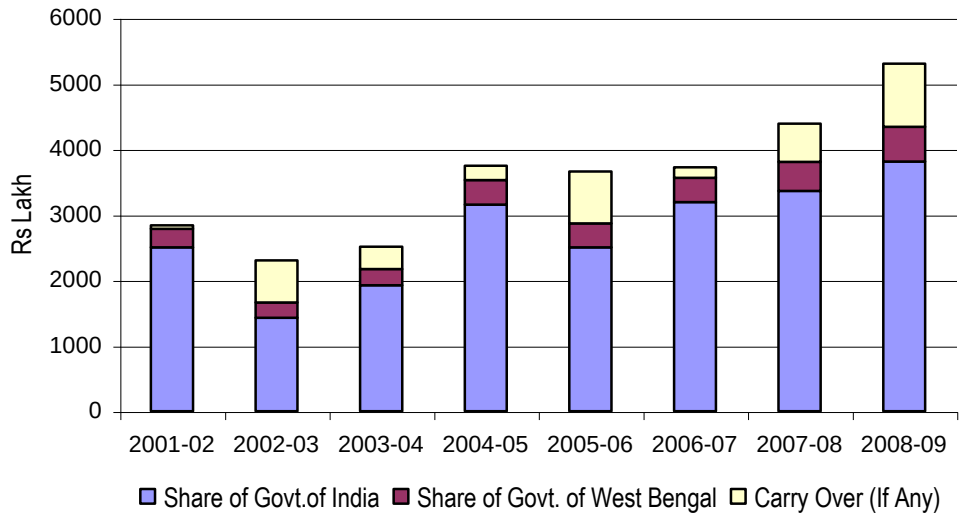


Figure 1.2.3.2
Composition of Total Fund Available under MMA in West Bengal during 2001-02 to 2008-09



All these in turn seem to indicate a positive approach from the Government of West Bengal towards the Macro management of Agriculture scheme, resulting into consistently higher ratio of fund utilization. However, the issue of unutilized balances held with the State needs proper attention from the Government of West Bengal to work upon, as there has been much scope for flexing autonomy in the allocation of resources in agricultural development planning under the MMA scheme.

Table 1.2.3.2
Funding at a Glance under MMA during 2006-07
(Select Schemes under Agricultural Crops & Others Group)

Name of the Scheme	GOI share (Rs. in Lakh)	State share (Rs. in Lakh)	Total (Rs. in Lakh)
ICDP- Rice	225.00	25.00	250.00
Special Jute Development Programme	215.55	23.95	239.50
Sugarcane Development Programme	36.00	4.00	40.00
Integrated Pest Management Programme	45.00	5.00	50.00
Farm Mechanization Programme	382.50	42.50	425.00
Strengthening of Seed Farms & Production of Quality Seeds	225.00	25.00	250.00
Dissemination of New Technology (ICDP- Wheat)	396.00	44.00	440.00
ICDP- Coarse Cereals	36.00	4.00	40.00
Concurrent Evaluation	16.20	1.80	18.00
Total	**1577.25**	**175.25**	**1752.50**

Source: Proposed Work Plan for MMA 2007-08, Directorate of Agriculture, Govt. of W.B.

Table 1.2.3.3
Scheme-wise Financial Outlay & Fund Sanction under MMA in West Bengal during 2007-08
(Select Schemes under Agricultural Crops & Others Group)

Name of Scheme	**Financial Outlay** (Rs. in Lakh)	Fund Sanctioned (Rs. in Lakh)
ICDP- Rice	262.78	262.78
Special Jute Development Programme	-	-
Sugarcane Development Programme	50.00	50.00
Integrated Pest Management Programme	143.67	143.67
Farm Mechanization Programme	858.50	858.50
Strengthening of Seed Farms & Production of Quality Seeds	706.11	706.11
Dissemination of New Technology (ICDP- Wheat)	377.50	377.50
ICDP- Coarse Cereals	112.00	52.00
Concurrent Evaluation	19.35	19.35
TOTAL	**2529.91**	**2469.91**

Source: WBAFC

CHAPTER 2

OBJECTIVES & METHODOLOGY OF THE STUDY

2.1: NEED FOR THE STUDY

The Macro Management of Agriculture Scheme was introduced in November 2000 especially to move away from the previous schematic approach of Centrally Sponsored Schemes permitting very little flexibility, which in turn resulted in large unutilized balances held with the States. The integration of 27 Centrally Sponsored Schemes under Macro Management Approach is supposed to enhance the productivity of the support programmes and accord greater flexibility to the State Governments to develop and pursue activities based on local needs and regional priorities. In pursuance in restoring primacy of the States by achieving decentralization in agricultural development planning, the Macro Management of Agriculture Scheme essentially supplements the State Governments' efforts through regionally differentiated work-plans comprising crop/area/target specific interventions.

Hence, there is always a need to conduct evaluation studies on the scheme, so as to examine the impact of such a decentralized approach at the grass-root level and to verify whether or not the local needs has been served with, i.e. whether the objectives of the schemes have been fulfilled. This is especially true keeping in view of the fact that ever since the implementation of Macro Management of Agriculture Scheme, study on the impact of its Seed Plan and Integrated Nutrient and Pest Management Sub-schemes has not been carried out. Hence the present study tries to examine these aspects.

2.2: OBJECTIVES OF THE STUDY

The particular objectives of the study are-

a) to assess the impact of interventions made under the following sub-schemes subsumed under the Macro Management of Agriculture Scheme on production and productivity of various crops with minimum cost -

   I) ICDP-Wheat
   II) ICDP- Coarse Cereals
   III) Foundation / Certified Seed Production of Vegetable Crops
   IV) Special Jute Development Programme
   V) Sustainable Development of Sugarcane Based Cropping System
   VI) Balanced Integrated Use of Fertilizers

b) to analyze the impact of efforts made by the State in increasing the seed replacement rates (crop wise), in terms of ensuring timely availability of sufficient quantity of good quality seeds, and

c) to analyze the impact of the activities to promote Balanced Integrated Nutrient Management to maintain soil fertility and environment.

However, as the Government of West Bengal has suitably restructured the scheme 'Foundation / Certified Seed Production of Vegetable Crops' modified as 'Strengthening of Seeds Farms and Production of Quality Seeds' of cereal crops, the objectives specified in (a-iii) and (b) has been ruled out from the present study accordingly.

2.3: METHODOLOGY AND DATA SOURCES

To fulfill the specific objectives as spelt out in the earlier sub-section, the study is essentially based on both primary and secondary data. The secondary data has been collected from existing literature, published statistical materials as well as from different nodal offices (e.g. Directorate of Agriculture, Bureau of Applied Economics and Statistics, Directorate of Census Operations, CMIE, etc) at different administrative levels. It should be mentioned here that the study has also extensively used various unpublished secondary data relating to the study as obtained from the Directorate of Agriculture, Government of West Bengal- the nodal implementing agency of the Macro management of Agriculture Scheme in West Bengal.

The primary data for the study has been collected through conducting a multistage stratified sampling survey without replacement from over five blocks for the five distinct sub-schemes concerned (one block each for five sub-schemes) as per the initial survey design prepared by the coordinating centre. The selection of blocks has been done in consultation with the officials of the implementing agency at the state level, viz. Directorate of Agriculture, depending upon the performance and availability of data relating to the individual sub-schemes concerned. The sample blocks/districts identified for the study were Block Ausgram-I from Barddhaman District, Blocks Bolpur-Sriniketan and Sainthia from Birbhum District and Blocks Habra-I and Basirhat-I from North 24 Parganas District.

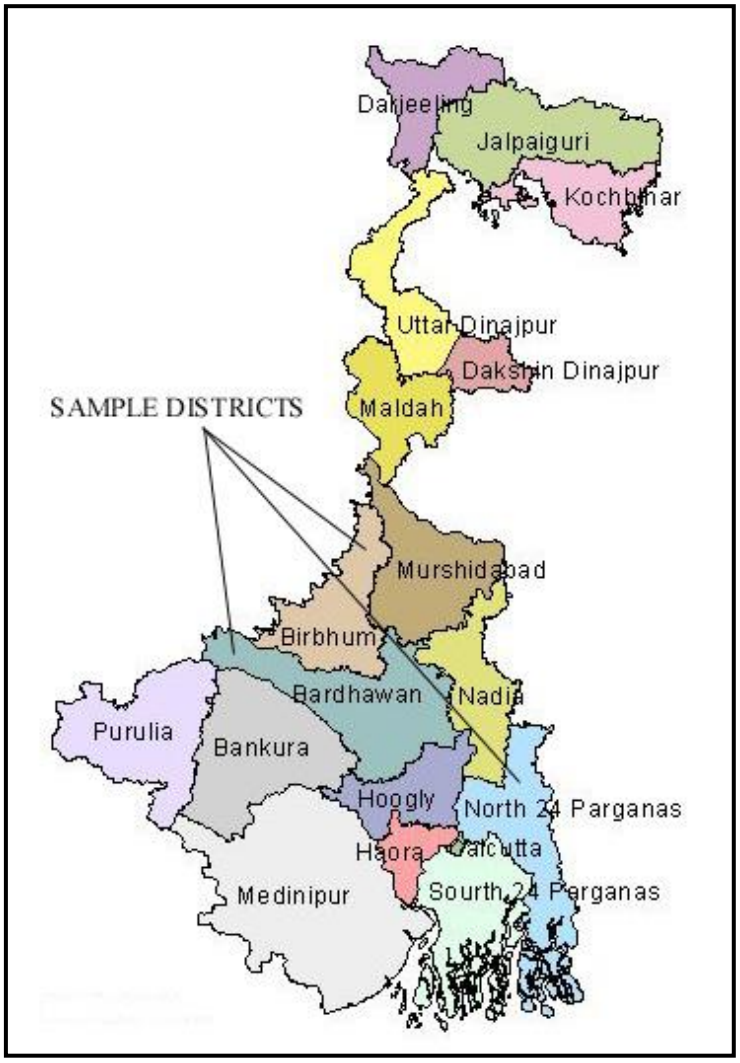
The sample units in the study were the sample beneficiary farmers of the obtaining either physical or financial benefits directly in any form under the sub-schemes concerned. In total a pool of 250 beneficiary sample households (50 each for the 5 sub-schemes concerned) together constitute the sample size in this study. The primary data was collected by conducting intensive field survey by way of interviewing each and every beneficiary sample farmer by following a rigorous questionnaire on various socio-economic activities.

Box 2.4.1
Sampling Design

Sl. No.	Schemes	District	Blocks	Villages	No. of Samples
1	Sustainable Development of Sugarcane Based Cropping System (SUBACS)	Birbhum	Bolpur-Sriniketan	1. Kunchli	9
				2. Sitapur	11
				3. Padmabatipur	10
				4. Birkicha	8
				5. Kankutia	12
Sub-Total					50
3	Balanced Integrated Use of Fertilizers (BIUF)	North 24 Parganas	Habra-I	1. Marakpur	10
				2.Gohalbati	8
				3. Baugachhi	11
				4. Kumra	10
				5. Bamandanga	11
Sub-Total					50
5	Special Jute Development Programme (SJDP)	North 24 Parganas	Basirhat-I	1. Pipha	8
				2. Debhog	7
				3. Gotra	9
				4. Itinda	11
				5. Kodalia	13
Sub-Total					50
2	Dissemination of New Technology through Demonstration for Diversification of Suitable Crops – (ICDP- Wheat)	Barddhaman	Ausgram-I	1. Ausgram	11
				2. Dignagar	7
				3.Kumarganj	9
				4. Dariapur	10
				5.Jadavganj	13
Sub-Total					50
4	ICDP- Coarse Cereals	Birbhum	Sainthia	1. Saraipur	9
				2. Sashidharpur	9
				3. Mahulashul	8
				4. Purba Sundalpur	12
				5. Pimtaria	12
Sub-Total					50
Total No. of Sample Farmers					250

Source: Field Survey

Figure 2.4.1
Map of West Bengal showing Sample



2.4: Scheme of Chapters

The present study has been sub-divided into five broad chapters keeping in view of the logical development of the facts findings, so as to fulfill the particular objectives of the study as spelt out in earlier sections. In particular-

- Chapter 1 introduces us with the very scheme under consideration of this study, viz. Macro Management of Agriculture, with its broad objectives, sub-schemes/components and pattern of assistance to the states. Also, it tries to briefly describe the present state of the MMA scheme at the national as well as at the state level.

- Chapter 2 spells out the need for the study and the particular objectives of the study concerned with a brief description of the methodology adopted to carry out the study. The relevant data sources (both primary and secondary), the scheme of chapters and some technical notes on the study have also been discussed in short in this chapter.
- Chapter 3 essentially presents a descriptive profile of the study area with required facts & figures, as has been necessitated for the logical development of the study.
- Chapter 4 presents a descriptive documentation of the results and findings of the present study as has been obtained through the secondary and primary data surveys conducted for the purpose. In particular, this chapter has been further sub-divided into five sections corresponding to each of the five sub-schemes concerned.
- Chapter 5 presents the objective summary of the study, major findings and goes on to prescribe policy conclusions based on the major findings of the study.

2.5: Analytical Notes

Some of the technical aspects or analytical notes those are crucially important for the study have been briefly described here for better comprehension. These are –

- As the Government of West Bengal has extensively restructured the scheme 'Foundation / Certified Seed Production of Vegetable Crops' modified as 'Strengthening of Seeds Farms and Production of Quality Seeds' primarily of cereal crops, the objectives specified in (a-iii) and (b) do not keep parity with the component activities under the scheme, and has thus been ruled out from the present study accordingly.
- The Government of West Bengal has also frequently restructured the scheme 'Balanced and Integrated Use of Fertilizers' as 'Soil Health Management'. However, as the component activities under the scheme have maintained its original form to a considerable extent, the scheme has thus been incorporated in the study under valid justifications.
- The scheme 'ICDP- Wheat' has also been modified as 'Dissemination of New Technology through Diversification of Suitable Crops'. Nevertheless, as the scheme incorporates component programmes on wheat to a considerable extent, the said names of the scheme has been considered as synonymous in the study, and has thus been incorporated under valid ground.

- The reference year for the study, in general, pertains to the year 2006-07 and 2007-08 for secondary data at the state and the block levels. However, depending upon the availability of data, the period has been extended to 2008-09 as well to cope up with the present state of the sub-scheme schemes. On the other hand, unavailability of secondary data for the said reference years, in particular cases, led to the shifting of the reference year to the year available for secondary data analysis.
- All primary data relating to the particular sub-schemes pertain to the crop year 2007-08, and to crop year 2004-05 as and where necessitated (in case of before & after analysis). Hence, while the period 'before' refers to the crop year 2004-05 (before the farmers became beneficiaries under the sub-schemes), the period 'after' refers to the crop year 2007-08 (after the farmers became beneficiaries under any component activity of the sub-schemes).
- The table formats, for both primary and secondary data, have been reconstructed depending upon the components of the sub-schemes as applicable in case of West Bengal.
- The chapter orientation has also been rearranged in such a fashion to maintain parity between the initial study design and the final table format.

CHAPTER 3

A Profile of The Study Area

3.1: A Profile of the State of West Bengal

3.1.1: A GEOGRAPHIC PROFILE OF WEST BENGAL

The State of West Bengal is one of the Eastern States of India extending from 21°31′ and 27°14′ North latitudes and 86°35′ and 89°53′ East longitudes. The land frontier of the State touches Bangladesh in the east, and is separated from Nepal in the west. Bhutan lies in the north-east, while Sikkim is on the north. On the west there are the states of Bihar, Jharkhand, while in the south lies Orissa, and the Bay of Bengal, washing its southern frontiers.The tropic of cancer passes through the state. The state extends from the snow clad Himalayas in the north to the Bay of Bengal in the South. The Ganges and its numerous tributaries have created fertile regions in the State. West Bengal is rich in natural resources and it has an advantage of six agro-climatic regions, fertile soil of vast bio-diversity and consistent irrigation facilities.

Figure 3.1.1.1
Agro-Climatic Zones of West Bengal

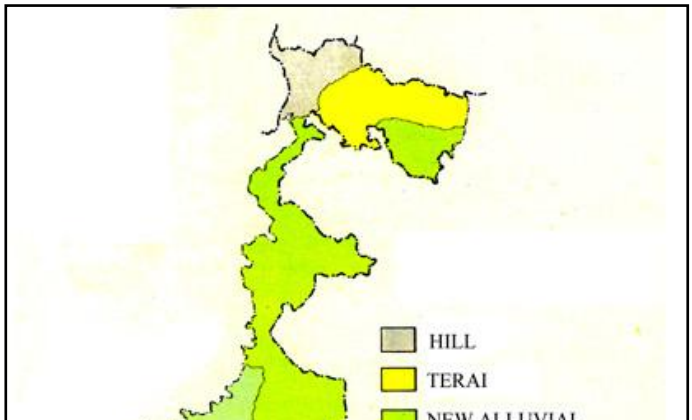
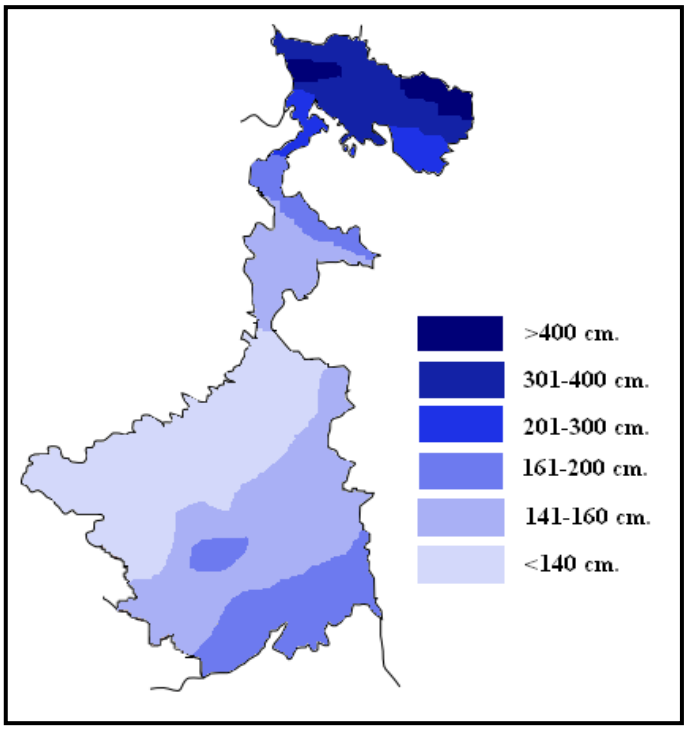


Figure 3.1.1.2
Annual Average Rainfall of West Bengal



West Bengal has been divided into 6 agro-climatic zones on the basis of landform hydrology – soil combinations as well as climate variations. There are – (1) Northern Hill Zone, (2) Terai – Tista Alluvial Zone, (3) Gangetic Alluvial Zone, (4) Vindhya Alluvial Zone, (5) Coastal Saline Zone, and (6) Undulating Red and Laterite Zone.

The Ganges is the main river of West Bengal. While, one of its branch enters Bangladesh as the *Padma*, the other flows through West Bengal as the Bhagirathi and Hooghly River. The other major rivers like Teesta, Torsa, Jaldhaka and Mahananda are in the northern hilly region. Rivers such as the Damodar, Ajay and Kangsabati have flown through the western plateau region, while the

Gangetic Delta and the Sundarbans area have formed a network of numerous rivers and creeks.

West Bengal's climate varies from tropical savannah in the southern portions to humid subtropical in the north. The main seasons are summer, rainy season, a short autumn, and winter. While the summer in the delta region is noted for excessive humidity, the western highlands experience a dry summer like northern India, with the highest day temperature ranging from 38°C to 45°C. At nights, a cool southerly breeze carries moisture from the Bay of Bengal. In early summer thunderstorms known as *Kalbaisakhi*, or Nor'westers, often occur. Monsoons bring rain to the whole state from June to September. West Bengal receives the Bay of Bengal branch of the Indian ocean monsoon that moves in a northwest direction. Winter (December–January) is mild over the plains with average minimum temperatures of 15°C. A cold and dry northern wind blows in the winter, substantially lowering the humidity level. However, the Darjeeling Himalayan Hill region experiences a harsh winter, with occasional snowfall at places.

3.1.2: A DEMOGRAPHIC PROFILE OF WEST BENGAL

As per Census 2001, West Bengal has a population of 8.18 crore, consisting 4.15 crore males and 3.87 crore females. The estimated population of West Bengal as on 1st October 2005 stands at 8.53 crore and it is expected to reach 8.64 crore in 1st October 2006. West Bengal has a population density of 904 inhabitants per square kilometre making it the most densely populated state in India. The state contributes 7.81 percent of India's population.The population of West Bengal has increased from 4.43 crores in 1971 to 8.01 crores in 2001. However, the state's 1990-91 to 2000-01 growth rate of 17.84 percent is lower than the national rate of 21.34 percent. According to 2001 census, rural population of West Bengal was 72.03 percent of the total population whereas the urban population was 27.97 percent of the total population. The rate of growth of urban population has been much more than the rate of growth of rural population, exhibiting a gradual trend of rural to urban migration. The gender ratio of the state has been 934 females per 1000 males. The percentage of male members was 51.72 percent and the percentage of female members was 48.28 percent in 2001. Data of 1995–1999 showed the life expectancy in the state was 63.4 years, higher than the national average of 61.7 years. Hinduism is the principal religion consisting 72 percent of the total population, while Muslims comprise 23 percent; Sikhism, Christianity and other religions make up the rest. Scheduled Castes and Tribes form 28.6 percent and 5.8 percent of the population respectively in rural areas, and 19.9 percent and 1.5 percent respectively in urban areas. There has been significant continual increase in the decadal literacy rates across both rural and urban areas of West Bengal. The present literacy rate is 69.22 percent. The proportion of people living below the poverty line in 1999–2000 was 31.85 percent.

Table 3.1.2.1
A Demographic Profile of West Bengal

Demographic Features		West Bengal
Population	Male	41465985
	Female	38710212
	Total	80176197
Scheduled Castes (%)		23.02
Scheduled Tribes (%)		5.50
Population in age group 0-6 (%)		14.24
Literacy (%)		68.64
Population Density		903
Sex Ratio		934

Source: Census-2001

3.1.3: AN AGRICULTURAL PROFILE OF WEST BENGAL

Agriculture plays such a pivotal role in the State's economy that nearly three out of every four persons is directly or indirectly involved in agriculture. As such agriculture is the primary occupation of the state and the main source of income for the people of West Bengal. About 70 percent of the total population depends on farming for their livelihood. Though the state has only 3 percent of cultivable land, it accounts for 8 percent of the total food grains produced in the nation.

The total food production in the State in 2006-07 was 15820 thousand tonnes. During 2006-07, the production of rice was 14745.9 thousand tonnes, of wheat 799.9 thousand tonnes and of pulses 154.4 thousand tonnes. The production of oilseeds during the same period was 645.4 thousand tonnes and of potato 5052 thousand tonnes. The production of jute was 8411.5 thousand bales in 2006-07.

The net area under cultivation in West Bengal is about 53,54,196 ha with cropping intensity of 177 percent. There are 67.89 lakh operational holdings of different land size classes with an average size of 0.82 ha. The cropping pattern of the state is dominated by food crops, which account for about 87 percent of the area under principal crops in the state. The major crops grown in the state include Rice, Wheat, Jute, Tea, Potato, Sugarcane, Pulses and Oilseeds etc. Among various crops, rice is grown in 58,57,000 ha followed by oilseeds in 6,85,000 ha, potato is grown in 30,800 ha where as pulses is grown in 2,51,000 ha. The state is the highest producer of rice in the nation; also there is remarkable progress in the production of jute and oilseeds. About 60 percent of the raw jute is produced in the state. The state also produces about 28 percent of the total potatoes grown in the country.

Table 3.1.3.1
Share of Different Sectors in NSDP of West Bengal at Constant 1999-00 Prices (Percent)

Sectors	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
Primary Sector	32.85	31.64	32.01	30.22	29.66	28.43	27.01	25.92
Secondary Sector	14.54	14.82	14.62	15.55	16.09	16.63	17.44	18.49

Tertiary Sector	52.61	53.54	53.37	54.23	54.25	54.94	55.55	55.59
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

SOURCE: BUREAU OF APPLIED ECONOMICS & STATISTICS, GOVERNMENT OF WEST BENGAL

The estimate of State Domestic Product is regarded as a significant economic indicator to measure the economic development of a State, while at the same time; it is regarded as an important tool to measure regional disparities as well. The importance of agriculture in the state's economy is reflected by the contribution of primary sector of about 26 per cent to the total NSDP (at constant 1999-2000 prices) in 2006-07 and by its support to employment of nearly 58 per cent of its rural workforce as per census 2001. However, there has been a sharper decline in the share of primary sector in NSDP over the years at constant 1999-2000 prices, as against the gradual increase in the share of the secondary and tertiary sector in NSDP, as reflected in table 3.1.3.1. Within the primary sector, the share of agriculture and allied activities in NSDP has shrunk consistently in the current decade from 26.88 percent in 2001-02 to 21.08 percent in 2006-07 (as per quick estimates) at constant 1999-00 prices. When compared in current prices, the fall in the share of primary sector seems more pronounced over the same period, as has been evident in table 3.1.3.2.

Table 3.1.3.2

Share of Agriculture in Net State Domestic Product in West Bengal

Year	At Current Prices (Base: 1999-00)			At Constant 1999-00 Prices		
	NSDP from Agriculture	NSDP (Total)	%	NSDP from Agriculture	NSDP (Total)	%
2001-02	35658.31	143910.35	24.78	37268.71	138639.00	26.88
2002-03	35769.20	153578.27	23.29	36170.47	143496.07	25.21
2003-04	40095.62	172540.17	23.24	37343.62	151203.97	24.70
2004-05	40397.62	188997.67	21.37	37588.03	161014.61	23.34
2005-06 (P)	43725.86	212453.07	20.58	38232.84	173047.06	22.09
2006-07 (Q)	48777.44	246611.36	19.78	39689.13	188286.91	21.08

Source: Bureau of Applied Economics & Statistics, Government of West Bengal

In case of area under cultivation, West Bengal has faced a gradual shrinkage in the net cropped area over the decades from 54.63 lakh hectares in 1990-91 to 52.96 lakh hectares in 2006-07 (as per provisional estimates) as reflected in table 3.1.3.4. However, this has been more than equally compensated by a sharp rise in the cropping intensity of the state from 159 percent to 182 percent, which in turn has resulted in an increase in the gross copped area from 86.62 lakh hectares to 96.34 lakh hectares over the same period.

Table 3.1.3.3

Area, Yield Rates and Production of Principal Crops in West Bengal

Crops	2005-06			2006-07		
	A	Y	P	A	Y	P
Rice	5783.0	2509	14510.8	5687.0	2593	14745.9
Wheat	366.7	2109	773.5	350.6	2281	799.9
Total Cereals	6241.2	2486	15513.5	6143.8	2575	15820.5
Total Pulses	222.6	784	174.5	219.6	703	154.4
Total Foodgrains	6463.8	2427	15688.0	6363.4	2510	15974.9
Total Oilseeds	643.5	969	623.3	703.4	917	645.4
Potato	354.5	21053	7462.5	407.9	12384	5052.0
Jute*	558.9	14.29	7989.3	594.9	14.14	8411.5

A = Area in '000 hectares, Y = Yield rate in kg/hectare, P = Production in '000 tonnes
** = Production in '000 bales and Yield rate in bales/hectare (1 bale=180 kg)*

Source: Department of Agriculture, Government of West Bengal

At the same time, adoption of HYV cultivation techniques has been in rapid progress in West Bengal since the late 1970s. However, the proportion of HYV cultivation in case of rice and wheat taken together seems to have achieved a plateau in the current decade, as evident in table 3.1.3.5. As wheat (100 percent), Boro Rice (100 percent) and Aus Rice (99.3 percent) has achieved the limit, there has been much scope for improving the adoption ratio particularly by increasing the adoption ratio of HYV for Aman Rice with 87 percent of its area under HYV.

Table 3.1.3.4
Net Cropped Area, Gross Cropped Area & Cropping Intensity in West Bengal

Year	Net Cropped Area (ha.)	Gross Cropped Area (ha.)	Cropping Intensity (%)
1990-91	5463424	8662286	159
1991-92	5476883	8666257	158
1992-93	5494165	8540246	155
1993-94	5459430	8680488	159
1994-95	5463587	8718166	160
1995-96	5461925	8972544	164
1996-97	5463132	9032936	165
1997-98	5465059	9233030	169
1998-99	5440247	9309647	171
1999-00	5471707	9545363	174
2000-01	5417382	9116597	168
2001-02	5521576	9778815	177
1002-03	5354196	9510423	178
2003-04	5427672	9661325	178
2004-05	5374704	9522930	177
2005-06	5294702	9532607	180
2006-07 (P)	5296005	9634535	182

Source: Directorate of Agriculture, Government of West Bengal

Table 3.1.3.5

Area under High-yielding Varieties in West Bengal ('000 ha.)

Year	Aus		Aman		Boro		Total Rice		Wheat		Rice & Wheat	
	HYV	%	HYV	%	HYV	%	HYV	%	HYV	%	HYV	%
2000-01	387.6	98.38	3024.5	83.10	1401.8	100.00	4813.9	88.57	426.0	100.00	5239.9	89.40
2001-02	398.2	98.93	3555.2	84.41	1455.0	100.00	5408.4	89.11	434.0	100.00	5842.4	89.84
2002-03	380.9	98.94	3423.2	84.50	1406.1	100.00	5210.2	89.18	405.3	100.00	5615.5	89.88
2003-04	336.4	99.00	3507.7	85.00	1390.1	100.00	5234.2	89.37	425.7	100.00	5659.9	90.00
2004-05	318.3	99.20	3473.4	85.00	1376.4	100.00	5168.1	89.36	400.1	100.00	5568.2	90.04
2005-06	285.8	99.20	3578.1	87.00	1381.9	100.00	5245.8	90.71	366.7	100.00	5612.5	91.26
2006-07	281.8	99.30	3481.6	87.00	1400.0	100.00	5163.4	90.81	350.6	100.00	5514.0	91.30

Source: Economic Review, 2007-08

Table 3.13.6

Sector-wise Share of NSDP (at Current Prices) and Work-force

(Total NSDP in RS Crores, Work-force in Numbers

Year	Primary sector (%)		Secondary sector (%)		Tertiary sector (%)		Total	
	NSDP	Work-force	NSDP	Work-force	NSDP	Work-force	NSDP	Work-force
1990-91	33.47	53.17	26.03	3.86	40.50	42.97	31501	19994305
1991-92	38.11	52.96	21.57	3.90	40.32	43.13	36432	20581048
1992-93	36.70	52.11	21.85	4.17	41.45	43.72	38768	21293243
1993-94	35.90	51.25	21.31	4.45	42.80	44.30	48398	22038837
1994-95	37.52	50.38	21.15	4.75	41.33	44.88	53888	22819844
1995-96	36.05	49.51	21.04	5.06	42.91	45.43	67136	23638420
1996-97	37.00	48.63	19.66	5.39	43.34	45.98	74423	24496884
1997-98	38.09	47.74	18.70	5.75	43.22	46.51	89595	25397727
1998-99	36.89	46.85	18.33	6.12	44.78	47.03	106175	26343632
1999-00	34.44	45.96	17.90	6.51	47.66	47.53	116898	27337481
2000-01	32.30	45.06	18.44	6.93	49.26	48.02	128974	28382384
2001-02	31.75	44.15	18.10	7.37	50.15	48.48	141358	29481690
2002-03	29.14	43.25	18.00	7.83	52.86	48.92	151632	30639014
2003-04	28.40	42.33	18.69	8.32	52.91	49.35	170782	31858258
2004-05	26.41	41.42	19.16	8.83	54.43	49.75	189490	33143637

Source: Statistical Abstracts (Various Issues), Bureau of Applied Economics and Statistics, Government of West Benga
Census- 1981, 1991, 200

Table 3.1.3.7
Area under Crops as Percentage to Gross Cropped Area in West Bengal

Year	Rice	Wheat	Maize	Ragi	Gram	Tur	Potatoes	Sugarcane	Sesamum	Rapeseed & Mustard	Small Millets	Total Cereals	Total Pulses	Total Food grains
1990-91	67.11	3.11	0.75	0.15	0.30	0.07	2.25	0.14	5.77	4.36	0.12	71.36	3.62	74.99
1991-92	65.93	2.86	0.55	0.15	0.21	0.05	2.64	0.20	6.62	4.76	0.09	69.74	3.11	72.86
1992-93	66.68	3.19	0.63	0.15	0.24	0.05	2.59	0.18	5.78	4.60	0.08	70.80	3.23	74.04
1993-94	67.69	3.54	0.60	0.14	0.22	0.07	2.66	0.12	5.47	4.39	0.10	72.14	3.10	75.24
1994-95	66.21	3.73	0.51	0.14	0.28	0.04	2.66	0.12	5.83	4.33	0.07	70.73	2.61	73.34
1995-96	66.35	3.76	0.50	0.14	0.35	0.04	2.85	0.19	5.75	3.65	0.06	70.91	2.37	73.28
1996-97	64.22	3.89	0.38	0.14	0.32	0.04	3.48	0.28	6.86	3.54	0.08	68.77	2.60	71.37
1997-98	63.90	3.98	0.47	0.14	0.28	0.04	3.08	0.28	6.95	3.54	0.06	68.62	2.40	71.03
1998-99	63.42	3.95	0.41	0.14	0.25	0.03	3.42	0.29	6.57	3.70	0.05	68.05	2.19	70.24
1999-00	64.43	3.82	0.37	0.13	0.28	0.03	3.31	0.24	6.43	3.62	0.05	68.87	2.24	71.11
2000-01	59.62	4.67	0.39	0.14	0.60	0.10	3.29	0.24	6.72	4.78	0.05	64.92	3.01	67.93

2001-02	62.06	4.44	0.34	0.13	0.52	0.04	3.07	0.24	6.67	4.50	0.05	67.06	2.55	69.61
2002-03	61.43	4.26	0.29	0.14	0.50	0.03	3.67	0.21	6.69	4.29	0.04	66.21	2.54	68.76
2003-04	60.62	4.41	0.57	0.14	0.48	0.04	3.19	0.17	6.42	4.68	0.04	65.83	2.61	68.44
2004-05	60.73	4.20	0.68	0.14	0.40	0.02	3.37	0.16	5.98	4.80	0.03	65.82	2.38	68.20
2005-06	60.66	3.85	0.75	0.14	0.42	0.02	3.72	0.16	5.86	4.42	0.04	65.47	2.34	67.81

Source: Statistical Abstracts (Various Issues), Bureau of Applied Economics and Statistics, Government of W

3.2: District Profiles for Sample Districts

3.2.1: A Profile of the District Birbhum

The Birbhum district extends between 23°32′30″and 24°35′40″ North latitudes and between 87°05′25″ and 88°01′40″ East longitudes. The district is bounded by the Santhal Parganas division of Bihar now 'Jharkhand' on the north and west, by the districts of Barddhaman and Murshidabad on east and by Barddhaman on the south. It is the 8th largest district in West Bengal, covering about 4,545 sq. km. area.

Geographically this district is a part of ancient "Radh Bhumi" of Bengal, which indicates barren land and characterized by red and graveled soil. The land soil of Birbhum is mainly composed of sedimentary rock. However, the river basin of 'Ajoy' is plain, consists of soft soil, and thus favourable for cultivation. Topographically the district has been divided into four sub-micro regions viz. Nalhati Plain, Brahmani-Mayurakshi Basin, Suri-Bolpur Plain and Bakreswar Upland. The district is drained by the rivers like Mayurakshi, Ajoy, Brahmani, Dwaraka, Hingla, Kopai and other streams, which constitute the major source of irrigation in this district.

Novermber, December and January are usually the driest months, though even in these months some rain falls. They are actually the part of the cold season, duration of which is mid-November to the end of February. This is followed by hot season from March to May and the south-west monsoon season is June to early October when the heavy rainfall occurs. The district receives a mean annual rainfall varying from 1,100 and 1,600 mm, which come between 61 to 78 rainy days. The rainfall in the district in general decreases from the northwest towards the southwest. About 78 per cent of the annual rainfall comes during the four monsoon months of June to September.

Table 3.2.1.1
A Demographic Profile of the Sample District: Birbhum

Demographic Features		Birbhum
Population	Male	1546633
	Female	1468789
	Total	3015422
Scheduled Castes (%)		29.51
Scheduled Tribes (%)		6.74
Population in age group 0-6 (%)		16.19
Literacy (%)		61.48
Population Density		663
Sex Ratio		950

Source: Census-2001

Birbhum district occupies 13th position in terms of population in the State. It is most rural-based district as it is having 91.0 per cent of the total population in rural areas, whereas the State is having 72.0 per cent of its total rural population. Birbhum has growth rate of population of 18.0 per

cent that makes its rank 10th in the State. So far as density (population per sq.km.) is concerned, Birbhum district occupies 14th position in the State (663). The sex ratio of the district (950) is above the State's sex ratio (934). Literacy rate of the district is 61.5 per cent (lower than the State percentage which is 68.6) thereby making its rank 14th in the state.

Birbhum is primarily an agricultural district with around 75 percent of the people dependent on agriculture. Rice is the major crop of this district and occupies about 70 percent of the grossed cropped area. The other important crops are wheat, potato, mustard, vegetables, sugarcane and pulses. The district has attained surplus production in case of paddy, potato and vegetables.

Table 3.2.1.2
Area, Production & Yield Rates of Principal Crops: District Birbhum

Area in thousand hectares
Production in thousand tonnes

Crops	2004-05			2005-06			2006-07		
	A	P	Y	A	P	Y	A	P	Y
Rice	387.9	1088.0	2805	368.5	1116.3	3029	383.4	1199.4	3128
Wheat	29.1	74.8	2568	30.1	75.7	2511	31.7	83.8	2643
Other Cereals	0.3	0.4	1685	0.3	0.3	1384	0.3	0.5	1490
Total Cereals	417.3	1163.2	2788	398.9	1192.3	2989	415.4	1283.7	3090
Total Pulses	15.7	12.4	788	18.5	14.5	785	20.7	16.0	773
Total Foodgrains	433.0	1175.6	2715	417.4	1206.8	2891	436.1	1299.7	2980
Oilseeds	42.5	33.0	-	36.8	34.3	-	38.2	38.7	-
Jute	0.4	7.0	-	0.2	3.3	-	0.4	6.3	-
Potato	11.2	214.3	-	13.8	283.0	-	16.5	141.2	-

Source: Statistical Handbook, West Bengal, 2007
Economic Review, 2007-08

3.2.2: A PROFILE OF THE DISTRICT NORTH 24 PARGANAS

The district North Twenty four Parganas has a geographic extension from 22°8′ N latitude to 23°16′ N and 88°18′ E to 89°4′ E longitude covering an area of 4,094 sq. Kms. It is bounded on the north and east by the international boundary with Bangladesh. In its south and south-west lies the district South Twenty Four Parganas and Kolkata, river Hugli on the west (adjoining Howrah and Hugli districts) and district Nadia on north-west.

Physiographically the district encompasses both moribund and mature parts of the Ganges delta. The delta forming process by river Hugli or Bhagirathi, which is still active down south, which has made the territory of this district crisscrossed with a complex network of tributaries, distributaries, minor creeks and channels- charged with local run-off and tidal inflow. The district has been divided into three physiographic zones, viz.- Ichhamati-Raimangal Plain, North Bidyadhari Plain, and The flat raised alluvium strip along the Hugli River on the west forming the North Hugli Flat. The district is primarily composed of recent alluvium soils of great thickness deposited during

development of the Gangetic Delta, which is immensely important for agricultural activities in the district.

Table 3.2.2.1
A Demographic Profile of the Sample District: North 24 Parganas

Demographic Features		*North 24 Parganas*
Population	Male	4638756
	Female	4295530
	Total	8934286
Scheduled Castes (%)		20.60
Scheduled Tribes (%)		2.23
Population in age group 0-6 (%)		11.80
Literacy (%)		78.07
Population Density		2182
Sex Ratio		926

Source: Census-2001

Tropical humid climate prevails over this southern part of West Bengal including North Twenty Four Parganas influenced by the tropical monsoon system. The southwest monsoon stream arrives here by the middle of June commencing the actual rainy season, which continues till September. During this period almost 2/3rd of the normal annual rainfall (1565 mm) occurs. The two following months, October and November is the autumn season, while the winter season comprises of December to February. It is followed by a short spring season with gradual increase in temperature till the middle of April. Then the actual summer sets in (April-May) and continues till the outburst of the southwest monsoon rains.

North Twenty Four Parganas is the second most populous district in the state and in India as well. It is the second most urbanized district of the state having more than 54.0 per cent of the total population in the urban areas, whereas 28 per cent of the state's population live in urban areas. The district North Twenty Four Parganas is in alarming condition due to high population growth of 22.7 percent, which is fifth highest in the state. The district has the third highest density of population (2,182 persons per square kilometre) in the state. The sex ratio of the district (926) is well below the state sex ratio (934). Literacy rate of the district is 78.1 per cent thereby making its position 2nd in the state.

Agriculture in North 24 Parganas has witnessed a remarkable increase in food grain production, which currently stands at 7.38 lakh tones. The North 24 Parganas District also contribute significantly towards the West Bengal horticultural produces and is taking shape as a 'Horticulture Hub' of West Bengal. The commercial production of vegetables like tomato, cabbage, cauliflower, pea, brinjal, ladies finger, beans, potato etc. has grown rapidly over the years owing to favourable agro-climatic conditions of the district. The region also offers excellent conditions for commercial production flowers like

rose, tuberose, marigold and gladioli. Fruits like mango, banana, papaya, pine apple, guava, litchi etc. is also grown in the region in commercial scale.

Table 3.2.2.2
Area, Production & Yield Rates of Principal Crops: District North 24 Parganas

Area in thousand hectares
Production in thousand tonnes

Crops	2004-05			2005-06			2006-07		
	A	P	Y	A	P	Y	A	P	Y
Rice	265.2	686.6	2589	277.1	717.4	2589	278.1	726.0	2611
Wheat	5.8	12.5	2149	7.4	16.2	2178	7.0	16.9	2397
Other Cereals	–	–	–	(a)	(b)	2000	–	–	–
Total Cereals	2710	699.1	2580	284.5	733.6	2578	285.1	742.9	2606
Total Pulses	7.5	5.1	604	11.5	8.0	702	13.6	7.8	576
Total Foodgrains	278.5	704.2	2529	296.0	741.6	2506	298.7	750.7	2513
Oilseeds	40.1	35.8	-	44.6	48.7	-	47.0	44.6	-
Jute	50.9	888.5	-	48.2	821.8	-	60.4	1118.8	-
Potato	6.0	126.0	-	5.7	127.3	-	6.6	114.0	-

Source: Statistical Handbook, West Bengal, 2007
Economic Review, 2007-08

3.2.3: A PROFILE OF THE DISTRICT BARDDHAMAN

Barddhaman district extends from 22°56′ to 23°53′ north latitudes and from 86°48′ to 88°25′ east longitudes. The district is bounded on the north by Jharkhand, Birbhum and Murshidabad, on the east by Nadia, on the south by Hugli, Bankura and Puruliya and on the west by Jharkhand. The river Barakar forms the state boundary to the west, the Ajay separates Birbhum and Jharkhand to the north, while the Damodar forms the natural southern boundary with Bankura and Puruliya and Bhagirathi forms the main eastern boundary with a few exceptions. Barddhaman district is the 3rd in West Bengal in respect of its area in the State covering 7,024 sq.kms.

The Barddhaman district is a part of 'proper delta' of the Lower Gangetic Plain. The eastern portion of the district is a wide alluvial plain, highly suitable for cultivation, enclosed by the rivers of Ajay, Bhagirathi and Damodar on the north, east and south. The general slope is from west and north-west to east and south-east. Topographically the district is divided into five sub-micro regions, viz. Ajay-Damodar-Barakar Tract, Kanksa-Ketugram Plain, Barddhaman Plain, Bhagirathi Basin, and Khandaghosh Plain. As its four main rivers on all the four sides surround the district, the river system of Barddhaman is quite rich facilitating a number of irrigation projects to come up. Major Projects like Damodar Valley Corporation for control of flood, irrigation and power serves a great part of the district, as it forms the core of the Damodar Valley region.

As the tropic of cancer has over-passed the district, the climate of this district is typically tropical in nature, characterized by hot and humid climatic conditions with oppressively high relative humidity all the year round, especially from the middle of May to mid- October. The hottest month in Barddhaman is May and the coldest month is January. The average annual

rainfall in the district is 1350.7 mm, with 70 rainy days in a year on an average. The rainfall during the monsoon months (June to September) constitutes 75 per cent of the annual rainfall.

Barddhaman district occupies the 4th position in terms of population in the State. Barddhaman is one of the most urbanized districts having 36.9 per cent of total population in urban areas, well above the 28 per cent of the State's population that live in urban areas. Barddhaman has growth rate (14 per cent) that makes its rank 16th in the State. So far density is concerned, Barddhaman district occupies 7th position in the State. The sex ratio of the district (922) is below the State's sex ratio (934). The position of Barddhaman in respect of the literacy rate is 7th (70.2 per cent).

Table 3.2.3.1
A Demographic Profile of the Sample District: Barddhaman

Demographic Features		*Barddhaman*
Population	Male	3588376
	Female	3307138
	Total	6895514
Scheduled Castes (%)		26.98
Scheduled Tribes (%)		6.41
Population in age group 0-6 (%)		13.10
Literacy (%)		70.18
Population Density		982
Sex Ratio		922

Source: Census-2001

The district Barddhaman is predominantly an agricultural district with 58 percent of the total population belonging to the agricultural population (i.e. cultivators and agricultural labourers). The district is properly known as the granary of West Bengal. Rice is the most important crop of the district, while among commercial crops, jute, mesta, sugarcane, potato, oil seeds etc. are also cultivated in marginally. As such, the principal commodity for trade in the district ha also been rice, which is exported from the district to other districts of the state.

Table 3.2.3.2
Area, Production & Yield Rates of Principal Crops: District Barddhaman

Area in thousand hectares
Production in thousand tonnes

Crops	2004-05			2005-06			2006-07		
	A	P	Y	A	P	Y	A	P	Y
Rice	634.2	1892.9	2985	639.0	1968.5	3081	642.8	1967.0	3060
Wheat	4.9	10.1	2055	2.2	4.8	2199	2.6	5.8	2278
Other Cereals	0.1	0.3	1728	0.3	0.5	1854	0.3	0.8	2555
Total Cereals	639.2	1903.3	2977	641.5	1973.8	3077	645.7	1973.6	3057

Total Pulses	1.5	1.3	858	1.3	1.2	880	3.4	1.4	396
Total Foodgrains	640.7	1904.6	2972	642.8	1975.0	3073	649.1	1975.0	3043
Oilseeds	56.1	40.8	-	42.1	42.1	-	56.4	46.7	-
Jute	12.4	222.7	-	15.4	282.4	-	13.8	229.6	-
Potato	42.4	1132.5	-	43.4	921.2	-	59.4	845.5	-

Source: Statistical Handbook, West Bengal, 2007
Economic Review, 2007-08

CHAPTER 4
RESULTS OF THE STUDY

4.1: SUSTAINABLE DEVELOPMENT OF SUGARCANE BASED CROPPING SYSTEM (SUBACS)

4.1.1: THE SCHEME SUBACS

The scheme 'Sustainable Development of Sugarcane Based Cropping System' (SUBACS) has been in operation ever since the inception of the Macro Management of Agriculture Scheme. The prime objective of the SUBACS scheme is to boost up the production and productivity of sugarcane to meet the domestic demands as well as the export demands of the country. The central attention of the scheme is on the transfer of improved production technology to the farmers through field demonstrations, training of farmers, supply of farm implements, enhancing production of planting materials, efficient use of water, treatment of planting materials etc. The SUBACS scheme is presently under implementation in 22 states including West Bengal.

In West Bengal, The scheme has been implemented aiming at sustainable development of sugarcane-based cropping and encourage production of sugar with improved varieties of high yielding sugarcane varieties. The basic idea is to transfer modern production and post harvest technology among the farming community to meet the requirements of the farmers and to popularize sugarcane cultivation in the farming community. Districts like Purulia, Malda, Birbhum, Paschim Medinipur etc. has been implementing the scheme in varying magnitudes depending upon the availability of funds for its successful implementation. Activities like Filed Demonstrations, Farmers' Training, Seed Cane Multiplier, etc. as components of the scheme have also been carried out in these districts to ensure supply of quality seed cane to farmers and to promote sugarcane cultivation by bringing more area under cultivation. In some pockets, inter cropping with maize, coriander and other short-term crops can also witnessed along with sugarcane to improve the economic return.

This section of the present study hence tries to examine the state and performance of the SUBACS scheme in West Bengal, and attempts to evaluate the impact that has been exerted by the intervention of the scheme on the farming economy by conducting an empirical investigation in the sample block (viz. Bolpur-Sriniketan Block) of a sample district (viz. Birbhum).

4.1.2: THE SCHEME SUBACS IN WEST BENGAL

An analysis of secondary data from official sources on the financial targets & achievement of SUBACS in West Bengal reveals that the scheme SUBACS has experienced a stagnating (and even declining) trend of financial allotment till 2006-07 ever since its inclusion under the MMA scheme. However, it is only during the last two years (2007-08 to 2008-09) that the fund allotment for the SUBACS scheme more than doubled itself to Rs. 61.76 lakh.

Table 4.1.2.1
Financial Targets & Achievements under SUBACS from 2001-02 to 2008-09

(Rs. In Lakh)

Year	Target	***Achievement***	***Achievement in Proportion to Target (%)***
2001-02	32.00	32.00000	100.00
2002-03	33.33	20.67091	62.02
2003-04	20.00	15.88148	79.41
2004-05	20.00	19.54568	97.73
2005-06	29.18	29.18000	100.00
2006-07	30.05	28.73000	95.61
2007-08	50.00	44.79597	89.59
2008-09 (P)	61.76150	49.30929	79.84

(P) – Provisional Estimates
Source: Sugarcane Development Officer, Directorate of Agriculture, Government of West Bengal

However, it should be noted here that the utilization of the allotted fund has been impressive throughout, ranging from more than 60 percent to 100 percent as proportion to the allotted fund. On an average, more than 80 percent of the fund has been utilized under the scheme SUBACS.

Fig.4.1.2.1
Targets & achievements under SUBACS during 2001-02 to 2008-09

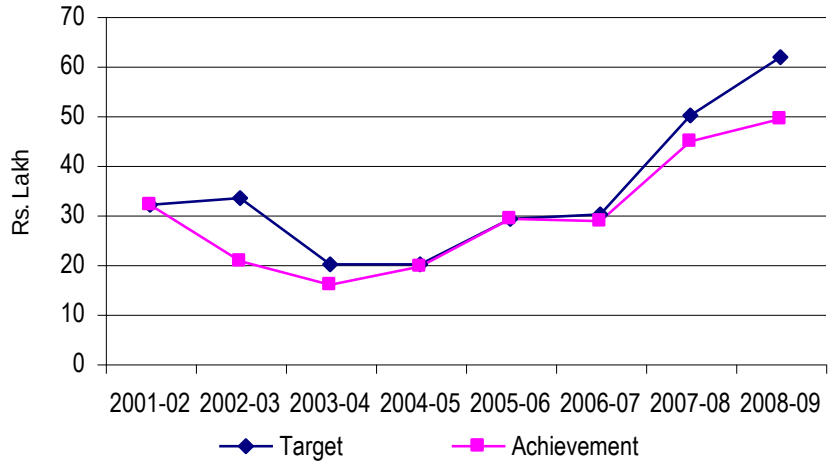


Table 4.1.2.2
Component-wise Break-up of Physical Targets & Achievements under SUBACS: 2001-02 to 2008-09

Year	Field Demonstration in o.5 ha.		State-level 3-day Training of Extension Officials		Farmers' Training (2-day)		Seed Cane Multiplier		Contingency	
	Target	***Achvmt***	Target	***Achvmt***	Target	***Achvmt***	Target	***Achvmt***	Target	***Achvmt***
2001-02	376	376	1	1	100	32	50	42	N.A.	N.A.
2002-03	420	290	1	1	70	32	69	42	N.A.	N.A.
2003-04	250	250	1	1	25	25	25	25	N.A.	N.A.

2004-05	250	250	2	2	25	25	16	16	N.A.	N.A.
2005-06	420	420	3	3	64	64	30	30	N.A.	N.A.
2006-07	420	412	3	1	64	61	30	30	N.A.	N.A.
2007-08	680	640	6	2	100	89	70	64	N.A.	N.A.
2008-09 (P)	1080	937	5	1	100	49	70	32	N.A.	N.A.

(P)- Provisional Estimates
Source: Sugarcane Development Officer, Directorate of Agriculture, Government of West Bengal

A component-wise breakup of the physical targets and achievements under SUBACS in West Bengal reveals that there has been an impressive achievement in conducting field demonstration on farmers' field as a major component of the scheme. However, other important components, especially 2-day farmers' training and seed cane multiplier programmes, have suffered largely in terms of non-utilization of valuable resources.

Table 4.1.2.3

Component-wise Break-up of Physical & Financial Targets & Achievements
under SUBACS during 2008-09 (Provisional)

Components	Physical		Financial	
	Target	Achievement	Target	Achievement
Field Demonstration (0.5 ha. In Farmers' Field @ 500/- per DC	1080	937	54.00	45.62662
Seed Cane Multiplication in Farmers' Filed @ 200/- per ha. Each	70	32	1.40	.63999
2-Day Farmers' Training Meeting @ 5000/- per Training (for 50 farmers)	10	49	5.00	2.44862
3-Day State Level Training for Extension Officials @ 15000/- per Training	5	1	.75	.14999
Contingency	-	-	.61150	.44407
Total	-	-	61.76150	49.30929

Source: Sugarcane Development Officer, Directorate of Agriculture, Government of West Bengal

This apparent neglect of important components like farmers' training programmes appears clear when we consider the available provisional data on component-wise breakup of physical and financial targets and achievements of the scheme in West Bengal during the last financial, i.e. 2008-09. It is to be found here that more than half of the allotted fund for farmers' training and seed cane multiplier programme under the scheme has been left unutilized.

4.1.3: THE SCHEME SUBACS IN THE SAMPLE DISTRICT

Available secondary data on the performance of SUBACS at the district level during the years 2006-07 and 2007-08 reveals that there has been a cent percent achievement for all the components under SUBACS in our sample district, viz. Birbhum. It remains quite impressive to note that apart from field demonstrations on farmers' field, the allotted fund for farmers' training programmes in both the years has been properly utilized.

It has to be noted here that there were no financial provisions or allotments for the component 'State Level Training of Extension Official' for the two financial years under concern. However, the state level training of extension officials has been organized the last financial, viz. 2008-09, though not supported by official data present in this study.

Table No.4.1.3.1

Component-wise Break-up of Physical Targets and Achievement under SUBACS

in Sample District (Birbhum), 2006-07 & 2007-08

Components	2006-07		2007-08	
	Target	Achievement	Target	Achievement
Field Demonstrations in Farmers' Fields (Nos.)	40	40	40	40
State Level Training for Extension Officials (Nos.)	-	-	-	-
Farmers' Training (Nos.)	5	5	5	5
Seed-cane Multiplication in Farmers' Fields (Nos.)	2	2	2	2
Operational expenses (Rs. lakh)	0.20	0.20	0.20	0.20

Source: WBAFC

4.1.4: AN EMPIRICAL STUDY ON THE SCHEME SUBACS

For the purpose of the study, we have carried out an empirical investigation on the scheme SUBACS in the Birbhum district of West Bengal. The selection of the district Birbhum has been made in consultation with the implementing agency, viz. Directorate of Agriculture, Government of West Bengal, based upon the performance and the suitability of the scheme concerned in the particular district. The particular area (Ahmodpur-Labpur belt) of the block Bolpur-Sriniketan selected for carrying out the field survey has been traditionally known for sugarcane cultivation and production of jaggery, as also for production of sugar in the region. It is also one of the prominent areas of sugarcane cultivation in the State with the highest yield rate among the districts, as has been observed by the nearby Government Farms. The sample farmers have been selected from the list of beneficiaries of the scheme available with the Office of the Agriculture Development Office (Sugarcane) of the concerned block by following a simple random sapling method without replacement from over five randomly selected villages. The results of the

empirical investigation have been briefly described below in order to fulfill the broader objectives of the present study.

4.1.4.1: A SOCIO-ECONOMIC PROFILE OF THE SAMPLE BENEFICIARY FARMERS UNDER SUBACS

The sample beneficiary farmers under the present study represent a highly marginalized farming economy, as 70 percent of them are marginal farmers. Again, the sample beneficiary farmers largely consist of Scheduled Tribes, as a good proportion of STs can be found in the villages of the survey region. In fact, the marginal category of beneficiary farmers in this survey primarily consists of the Scheduled Tribes & Castes. It should be noted that a the proportion of General Category of farmers more or less increase with the increase in the size of holding, indicating traditional social dominance of the upper class on landed property. As a consequence, we find the rate of literacy also increasing with the increase in size, reflecting a tendency of increasing literacy rate with the increase in socio-economic power and control over resources. The average family-size also tends to increase in the same manner reflecting a higher level of economic affluence for the larger size-classes.

Table 4.1.4.1.1
Socio-Economic Profile of the Sample Farmers (under SUBACS)

Particulars	Marginal	Small	Semi-medium	Medium	Large	Total
No. of Sample Farmers	35	13	2	-	-	50
Scheduled Castes	9 [25.71]	4 [30.77]	-	-	-	13 [26.00]
Scheduled Tribes	16 [45.71]	6 [46.15]	-	-	-	22 [44.00]
Other Backward Castes	2 [5.71]	-	-	-	-	2 [4.00]
General	8 [22.86]	3 [23.08]	2 [100.00]	-	-	13 [26.00]
Literacy	57.25	64.67	75.00	-	-	59.88
Average Family Size	4.83	5.69	6.00	-	-	5.10

Figures in parenthesis indicate percentages to size-class
Source: Filed Survey

The family composition of the beneficiary farmers, however, appears somewhat inclined towards females with a male-female ratio of 1:1.32, which is reflected more prominently especially for the marginal farmers (consisting mainly of STs) as also for the highest age group.

Table 4.1.4.1.2
Family Composition of Sample Farmers by Sex & Age Group (under SUBACS)

Category of Farmers	Age < 18		Age 18 – 60		Age > 60		Total
	Male	Female	Male	Female	Male	Female	
Marginal	16	21	47	55	11	19	169
Small	9	11	19	23	4	8	74
Semi-medium	1	3	2	3	1	2	12
Medium	-	-	-	-	-	-	-

Large	-	-	-	-	-	-	-
Total	26	35	68	81	16	29	255

Source: Filed Survey

In case of literacy of the beneficiary sample households, we find a higher rate of literacy for the lowest age group followed by the middle age group, indicating towards an increasing influence of the literacy campaign taken up by the Government. However, the female literacy rate in the middle age group appears considerably lower as compared to their counterparts.

Table 4.1.4.1.3

Distribution of Members of Sample Farmers by Educational Status, Sex & Age Group (under SUBACS)

Educational Status	< 18		18 – 60		> 60		Total
	Male	Female	Male	Female	Male	Female	
Illiterate	5	5	15	45	8	25	103
Primary Education Holders	12	17	33	29	4	3	98
Secondary Education Holders	9	13	19	7	4	1	53
Graduate & Above	-	-	1	-	-	-	1
Literate	21	30	53	36	8	4	152
Total	26	35	68	81	16	29	255

Source: Field Survey

Moving on towards the ownership of land by the sample beneficiary farmers, it can be observed that though the marginal farmers contribute 70 percent of the sample beneficiary farmers in this survey, they have the opportunity to command only over 50 percent (including the leased-in lands) of the landed area. Therefore, the concentration of land into the hands of a few larger farmers is clearly visible. Also, the proportion of irrigated area out of the total also comes out to be significantly higher for the largest size-class.

Table 4.1.4.1.4

Details of Land Holding of the Farmers by Size-Class (under SUBACS)

(Area in Hectares)

Category of Farmers	By Ownership Status				By Irrigation Status		Total
	Owned	Leased-in	Leased-out	Others	Irrigated	Un-irrigated	
Marginal	21.84	5.99	0.80	0.31	14.76	12.57	27.33
Small	15.34	4.90	0.27	0.00	10.20	9.77	19.97
Semi-medium	6.85	0.00	0.00	0.00	4.67	2.18	6.85
Medium	-	-	-	-	-	-	-
Large	-	-	-	-	-	-	-
Total	44.03	10.89	1.07	0.31	29.63	24.52	54.15

Source: Field Survey

However, for a majority of the beneficiary sample farmers, the primary occupation has been agriculture (proper) either as agriculturalists (agriculture & horticulture) or as agricultural labourers. Including the allied activities like animal husbandry, 92 percent of the sample beneficiary farmers earn their livelihood primarily through agriculture, as has been found during the survey, while a majority (46 percent) are agricultural labourers.

Table 4.1.4.1.5
Distribution of Primary Occupation of the Sample Farmers by Size-Class (under SUBACS)

Particulars	Marginal	Small	Semi-medium	Medium	Large	Total
Agriculture	9 [18.00]	6 [12.00]	2 [4.00]	-	-	17 [34.00]
Agricultural Labourer	16 [32.00]	7 [14.00]	-	-	-	23 [46.00]
Animal Husbandry	6 [12.00]	-	-	-	-	6 [12.00]
Business	1 [2.00]	-	-	-	-	1 [2.00]
Regular Job	3 [6.00]	-	-	-	-	3 [6.00]
Horticulture	-	-	-	-	-	-

Figures in parenthesis indicate percentages to Sample Size
Source: Filed Survey

4.1.4.2: THE FUNCTIONING OF THE SCHEME SUBACS AND ITS IMPACT

In assessing the impact generated by the intervention of the scheme SUBACS, we can get an outline of the socio-economic the changes in the socio-economic profile by studying aspect like income, expenditure etc. of the farmers having benefited from the scheme, by comparing their status before and after they got benefited. As such, here we find that for all the size classes concerned, there has been quantum positive change in income, expenditure and gross return from field crops of the beneficiary farmers, especially for the small and the marginal farmers. However, it should be noted here that for all the size-classes concerned, the change in expenditure outweighs the changes in income and gross return from field crops.

Table 4.1.4.2.1
Annual Income & Expenditure of the Sample Farmers by Size-Class (under SUBACS)

Category of Farmers	Income (Rs.)		Expenditure (Rs.)		Gross Return* (Rs.)	
	2004-05	2007-08	2004-05	2007-08	2004-05	2007-08
Marginal	27046.31	44041.74	21513.85	35631.74	17684.03	28303.27
Small	41601.68	71008.78	29153.76	52737.15	37417.82	57931.37
Semi-medium	92846.59	134757.61	66208.91	99627.65	82406.17	122282.64
Medium	-	-	-	-	-	-
Large	-	-	-	-	-	-
Total	33462.71	54681.81	25288.03	42638.98	25403.70	39765.75

** From Agriculture*
Source: Filed Survey

Again, the primary survey that we conducted essentially involved an enquiry into the grass-root level functioning of the scheme concerned, viz. SUBACS. This in turn evokes the need for a deeper look at the production behaviour of the sample beneficiary farmers of the scheme, incorporating and analyzing information on input-procurement, input-use, cropping pattern, technical knowledge etc., as also the reach of the concerned scheme to the masses. As such information in this regard is briefly analyzed as under.

Table 4.1.4.2.2

Sugarcane Seed Procurement by the Sample Farmers (under SUBACS)

Category of Farmers	Seed Corporation	Retail Shops	Open Market	Domestic	Other (ADO Office)
Marginal	-	-	4 [8.00]	7 [14.00]	24 [48.00]
Small	-	-	3 [6.00]	3 [6.00]	7 [14.00]
Semi-medium	-	-	-	1 [2.00]	1 [2.00]
Medium	-	-	-	-	-
Large	-	-	-	-	-
Total	-	-	7 [14.00]	11 [22.00]	32 [64.00]

Figures in parenthesis indicate percentages to Sample Size

Source: Filed Survey

As concerned with the procurement of sugarcane seed by the sample beneficiary farmers, the survey finds out that among our sample beneficiaries, a majority has obtained input support under the scheme in the form of cane seeds, while others have opted for domestic seeds or seeds purchased from the open market. This is because of the fact that the pool of sample beneficiary farmers in this study consists of both input beneficiaries as well as technical knowledge beneficiaries. Now, the farmers who received training from camps organized by the Agriculture Development Officers under the scheme (technical knowledge beneficiaries) are not always the recipients of input-support (input beneficiaries) under the scheme, and vise versa. To be more particular, benefit from the scheme in this survey does not essentially indicate an input-support, may rather indicate acquiring technical knowledge on production technologies. However under the present survey, a clear majority (64 percent) of the sample farmers has received input-support in the form of sugarcane seed, while ¾ of them are marginal farmers.

Obviously enough, the farmers who have received input-support under the scheme also received other important inputs like fertilizers, plant protection materials, etc. as also the carrying cost of the sugarcane seed. In fact, the entire support has been borne out of the component activity of the scheme Production Technology Demonstration on Farmers' Fields. Essentially, the farmers' fields here turn into Demonstration Plots, where the key technology adopted is enhancing production and productivity by following soil test based balanced dose of fertilizers with appropriate techniques of plant protection.

Table 4.1.4.2.3
Incentives for Sugarcane Seed Distribution Facilities to the Sample Farmers (under SUBACS)

Category of Farmers	Distribution of Sugarcane Seeds + Carrying Cost	Distribution of Fertilizers, PPC etc.
Marginal	24 [48.00]	24 [48.00]
Small	7 [14.00]	7 [14.00]
Semi-medium	1 [2.00]	1 [2.00]
Medium	-	-
Large	-	-
Total	32 [64.00]	32 [64.00]

Figures in parenthesis indicate percentages to Sample Size
Source: Filed Survey

One of the positive outcomes of all the effort of the Agriculture Officers under the scheme can be observed here in the use fertilizers by the sample beneficiary farmers. Radical changes have been taken place in the application of fertilizers. Plant protection inputs like Thimet –10G has never been used before for sugarcane cultivation by the beneficiary farmers, which is now being used as an essential input. As also, the farmers are also changing their attitude towards a more judicious application of fertilizers based on the requirements of the soils. This has been reflected in the fact that the use of DAP has been radically changed to 10:26:26 (N:P:K), which was supplied for the first time as input-support under the scheme.

Table 4.1.4.2.4
Use of Fertilizers by the Sample Farmers (under SUBACS)

(kg per hectare)

Category of Farmers	2004-05					2007-08				
	Urea	DAP	10:26:26	Thimet 10G	Total	Urea	DAP	10:26:26	Thimet 10G	Total
Marginal	75.25	102.75	-	-	178.00	72.50	-	102.50	5.00	180.00
Small	72.67	106.67	7.67	-	187.01	73.67	7.67	105.25	5.67	192.26
Semi-medium	75.00	100.00	-	-	175.00	75.00	17.50	100.00	-	192.50
Medium	-	-	-	-	-	-	-	-	-	-
Large	-	-	-	-	-	-	-	-	-	-

Source: Filed Survey

The growing awareness on scientific farming technology among the beneficiary farmers can also be observed here, as the survey finds 12 percent of the farmers using soil ameliorates in their farmland. This is encouraging as the concept of using soil ameliorates was never before attempted by the same farmers.

Table 4.1.4.2.5
Use of Soil Ameliorates by the Sample Farmers (under

SUBACS)					
Category of Farmers	Gypsum	Pyrite	Lime	Zinc	Source
Marginal	1 [2.00]	-	2 [4.00]	-	Open Market
Small	-	-	2 [4.00]	-	Open Market
Semi-medium	-	-	1 [2.00]	-	Open Market
Medium	-	-	-	-	-
Large	-	-	-	-	-

Figures in parenthesis indicate percentages to Sample Size
Source: Filed Survey

The impact of the demonstrations under the scheme is also evident on account of growing interest of the farmers in getting their soil tested. The survey finds out that 22 percent of the beneficiary farmers have got their soil tested. However, nine (3) out of the eleven (11) beneficiaries who got their soil tested have got it through the Department of Agriculture, while the other 7 beneficiaries have got it through an NGO. Only one has got his soil tested by self-initiation, which serves to be an encouraging finding in the present context.

In fact, when asked about the reason of not getting their soil tested to the farmers who have not got their soil tested, only a small fraction of them responded in a negative manner stating that they are not interested in such experiments, rather they would like to continue in the traditional way. However, it is important to note that more than half of the sample farmers, though beneficiaries under the scheme, do not know how to get their soil tested but are keen to do so. This confirms us that the general attitude of the farmers is motivated towards scientific cultivation with modern technology, moving away from the traditional format.

Table 4.1.4.2.6
Number of Sample Farmers who got their Soil Tested (under SUBACS)

Category of Farmers	Dept. of Agril.	Self	NGO
Marginal	2 [2.00]	-	5 [4.00]
Small	-	1 [2.00]	2 [2.00]
Semi-medium	1 [2.00]	-	-
Medium	-	-	-
Large	-	-	-

Figures in parenthesis indicate percentages to Sample Size
Source: Filed Survey

Table 4.1.4.2.7
Reasons Given by the Sample Farmers for Not Getting Their Soil Tested (under SUBACS)

Category of Farmers	Not Interested	Not Known	Not Easily Available	Other
Marginal	2 [4.00]	21 [42.00]	5 [10.00]	-
Small	1 [2.00]	6 [12.00]	3 [6.00]	-
Semi-medium	1 [2.00]	-	-	-

Medium	-	-	-	-
Large	-	-	-	-

Figures in parenthesis indicate percentages to Sample Size
Source: Filed Survey

The facts and findings of the survey on farmers' participation in Production Technology Demonstrations also appear encouraging. A good proportion of our sample beneficiary farmers are found to have participated in demonstration on Ring Pit, Ratoon Management, Farmers' Field School etc. Some of the sample beneficiary farmers are even found participating in more than one technology demonstrations, to acquire knowledge on technological aspects of sugarcane cultivation. This in turn reflects the initiative and a boosted up moral from the farmers' side to adopt new technologies and cope with the growing awareness programme as initiated from the side of the implementing authority under the scheme.

Within the organization of the demonstrations, it has been observed that the main organizers of these technology demonstrations are the direct (local) implementing authority, viz. the Agriculture Development Office (Sugarcane) of the concerned block (Bolpur-Sriniketan). However, at the instance of the Directorate of Agriculture, often the State Agriculture Officers also impart training to the beneficiary farmers or organize demonstration camps. When compared against the size-classes, it is found that the 88 percent of our sample beneficiaries have attended at one demonstration/training or the other, where the participation of marginal farmers remains truly significant.

Table 4.1.4.2.8
Participation of the Sample Farmers in Demonstrations (under SUBACS)

Demonstrations	Marginal	Small	Semi-medium	Medium	Large	Total
Large Scale	-	-	-	-	-	-
Ring Pit	6 [12.00]	2 [4.00]	2 [4.00]	-	-	10 [20.00]
Single Eye	-	-	-	-	-	-
Ratoon Management	12 [24.00]	-	-	-	-	12 [24.00]
Farmers' Field School	17 [34.00]	5 [10.00]	-	-	-	22 [44.00]

Figures in parenthesis indicate percentages to Sample Size
Source: Filed Survey

Table 4.1.4.2.9
Organization of the Demonstrations (under SUBACS)

Demonstrations	Marginal	Small	Semi-medium	Medium	Large	Total
Gram Panchayat	-	-	-	-	-	-
Agricultural Development Officer	29 [58.00]	5 [10.00]	-	-	-	34 [68.00]

State Agricultural Officers	6 [12.00]	2 [4.00]	2 [4.00]	-	-	10 [20.00]
I.C.A.R.	-	-	-	-	-	-
Others	-	-	-	-	-	-

Figures in parenthesis indicate percentages to Sample Size
Source: Filed Survey

The costs of attending these demonstration camps/training programmes are seldom sponsored by the organizers, as has been found in the field survey. In fact, it is only during the demonstrations performed by the State Official a separate budget is held on account of transportation of the participating farmers. Otherwise the participating farmers are to bear their own expenses on account of transportation to the venue of demonstration / training / meeting. As such, it has been found that 68 percent of our sample beneficiary farmers have attended the demonstrations bearing costs of transportation out of their pocket. However, in all the demonstrations / trainings / meetings, packaged beverages containing light foods is served to the participating farmers.

Table 4.1.4.2.10
Cost of Attending the Demonstrations (under SUBACS)

Category of Farmers	Organizers	Self-Financed	Others
Marginal	6 [12.00]	29 [58.00]	-
Small	2 [4.00]	5 [10.00]	-
Semi-medium	2 [4.00]	-	-
Medium	-	-	-
Large	-	-	-

Figures in parenthesis indicate percentages to Sample Size
Source: Filed Survey

However, there are a number of suggestions on the demonstrations put forward by the sample beneficiary farmers surveyed, which can be broadly divided into three concrete suggestions. These suggestions are briefly explained as under.

- *First,* there has been a strong suggestion, especially from the marginal and small farmers, on the option of removal of the lower ceiling of 0.50 hectares of land to be considered as demonstration plots. In a highly marginalized economy, such a suggestion should always be considered. It has been observed during the survey that as land plots (suitable for sugarcane cultivation) of 0.50 hectares at a stretch is not available with the farmers; the demonstration plots are organized as a conglomeration of numerous small tracts of few decimals only belonging to a group of farmers. As a result, difficulty arises in the distribution of input-support and other supports to the marginalized plot holders, which has to be

distributed in proportion to their land contribution in the demonstration plot. Hence, the suggestion come that the lower ceiling of 0.50 hectares is to be abolished, at least for an extremely marginalized agriculture like West Bengal.

- Second, the budget on account of input-support needs to be increase for the demonstration plots, as the support amounts only about 13 to 15 percent of the entire process of production. Suggestion are that input-support should also incorporate subsidy sell of power-tillers / hand-tractors, as has the case under the Farm Mechanization Programme.
- Third, there is a suggestion (rather appeal) from the beneficiary farmers on account of organizing technology demonstration more frequently. It is objected that as the demonstrations are conducted all over the block, any particular mouza (or village) gets the opportunity to accommodate a demonstration plot only once in a decade, though depending on a sheer chance factor. As such, the budget provision for conducting demonstrations in more numbers and more frequently needs to be increased at desperately.

Table 4.1.4.2.11

Suggestions Given by the Sample Farmers on Sugarcane Demonstrations (under SUBACS)

Category of Farmers	Lower ceiling on Demo Plots should be removed	Budget should be increased on account of input-support	Demo.s should be more frequently conducted
Marginal	21 [42.00]	11 [22.00]	3 [6.00]
Small	4 [8.00]	3 [6.00]	6 [12.00]
Semi-medium	-	2 [4.00]	-
Medium	-	-	-
Large	-	-	-

Figures in parenthesis indicate percentages to Sample Size

Source: Filed Survey

As a directly visible impact of the SUBACS, the sugarcane cropping pattern of the sample beneficiary farmers has gone through a number of changes in aspects like area under cultivation, production, yield, seed-rate, etc.

- First, there has been a marked increase in the area under sugarcane cultivation for the beneficiary farmers, especially for the marginal farmers. In fact, the area under cultivation of sugarcane increased more than three-folds for the beneficiary marginal farmers, which surely reflects a very positive and encouraging impact of the SUBACS scheme. This remains more encouraging as at the time of conducting this field survey the sample farmers have been found practicing inter-cropping of sugarcane with coriander, maize, etc., which in turn is likely to increase

their gross return from land. Hence, the name of the scheme 'Sustainable Development of Sugarcane-based Cropping System' appears a success to some extent.

- Second, there has been significant improvement in the yield rate of sugarcane under the new technology with balanced use of fertilizers, plant protection material, and cane seed supplied by the implementing agency under the scheme. Though the increase in yield has been quantitatively the maximum for the semi-medium farmers, the marginal farmers on the other hand have witnessed the highest yield rate among all size-classes.
- Third, the combined effect of increase in area under sugarcane cultivation and yield rate of sugarcane has exerted an impact amounting to a quantum increase in production, especially for the marginal farmers. In particular, the production of sugarcane for the marginal farmers more than tripled within a very short time.

Table 4.1.4.2.12
Changes in Sugarcane Cropping Pattern of the Sample Farmers (under SUBACS)
(per hectare)

Category of Farmers	Area (ha)		Production (quit.)		Yield (MT/ha.)		Seed Rate (qt/ha.)		Source of Seed	
	2004-05	2007-08	2004-05	2007-08	2004-05	2007-08	2004-05	2007-08	2004-05	2007-08
Marginal	1.40	4.21	94.25	309.44	67.32	73.50	64.75	62.33	Open Market	ADO Office
Small	1.33	2.87	92.90	207.36	69.85	72.25	64.50	60.67	Open Market	ADO Office
Semi-medium	0.33	0.80	20.96	56.00	63.50	70.00	67.50	62.50	Open Market	ADO Office
Medium	-	-	-	-	-	-	-	-	-	-
Large	-	-	-	-	-	-	-	-	-	-

Source: Filed Survey

There is no doubt about the fact that in this quantum increase in production and productivity, the sugarcane seed (BO-91) supplied to the beneficiary farmers under the scheme has played an important role. It has been found out that though the non-DC farmers have put other high yielding seed like CO-997 into use, the BO-91 seed in terms of yield has outweighed it. It is particularly for this reason that we find BO-91 as the most preferred sugarcane seed (supported by the choice of 80 percent of the sample beneficiary farmers), especially for its high yield and juice-content, which results into higher production of jaggery for domestic consumption as well as commercial production.

Table 4.1.4.2.13

Sample Farmers' Responses towards the Best Varieties of Sugarcane Seed (under SUBACS)			
Category of Farmers	BO-91	CO-997	Reason for the Choice
Marginal	28 [56.00]	7 [14.00]	BO- 91 is Juicy & High Yielding, CO-997 is Irrigation Efficient
Small	11 [22.00]	2 [4.00]	BO- 91 Profitable for Jaggery, CO-997 is Strengthy
Semi-medium	1 [2.00]	1 [2.00]	BO-91 High Yielding & good for Jaggery, CO-997 is Good also
Medium	-	-	-
Large	-	-	-

Figures in parenthesis indicate percentages to Sample Size

Source: Filed Survey

It is thus for sure that the scheme SUBACS has brought about a sea change in the sugarcane cropping pattern, production and productivity of sugarcane, and other important technological aspects of sugarcane cultivation in the region – which invariably brought about significant changes in the socio-economic condition of the sample beneficiary farmers. However, it is extremely disappointing to find that the information regarding such an important on-going scheme has hardly reached the masses. In particular, the survey finds that a majority (68 percent) of the sample beneficiary farmers came to the knowledge of the scheme only through the KPSs (Krishi Sahayaks), followed by the members of local Panchayat. None of the farmers learned about the scheme in Booklets/ Newspapers (if literate) or through TV/Radio/Video or by any electronic media.

Table 4.1.4.2.14
Source of Information to the Sample Farmers about the Scheme (under SUBACS)

Category of Farmers	Booklets	Video Films	Radio	TV	News Paper	KPS	Panchayat Member
Marginal	-	-	-	-	-	23 [26.00]	12 [24.00]
Small	-	-	-	-	-	9 [18.00]	4 [8.00]
Semi-medium	-	-	-	-	-	2 [4.00]	-
Medium	-	-	-	-	-	-	-
Large	-	-	-	-	-	-	-
Total	-	-	-	-	-	34 [68.00]	16 [32.00]

Source: Field Survey

When asked about the reason behind the lack of knowledge about the scheme, a majority of the sample beneficiary farmers insisted that they by themselves lack the initiative to move to the concerned ADO Office to gather information about the scheme or to known about launching of new schemes. The reason that follows this has been that the beneficiary farmers do not posses the communication mediums like TV, Radio, etc. Only a fraction (8 percent) of the beneficiary farmers answered in a negative note that they are not interested about the schemes.

However, the lack of knowledge about the scheme is obviously a serious lacuna of the scheme to work upon, as the scheme deserves much attention from the implementing authority as well as from the masses to sustain it in the glory of success. Hence, component activities like Publicity Campaign (through Audio/Video Electronic Media) can be one good option for both the literates and illiterates.

Table 4.1.4.2.15

Reasons Given by the Sample Farmers for Not Knowing About the Scheme (under SUBACS)

Category of Farmers	Not Interested	Don't Possess Above	Don't Have Library	Lack Initiative to Move to ADO office
Marginal	2 [4.00]	13 [26.00]	-	20 [40.00]
Small	1 [2.00]	7 [14.00]	-	5 [10.00]
Semi-medium	1 [2.00]	-	-	1 [2.00]
Medium	-	-	-	-
Large	-	-	-	-
Total	4 [8.00]	20 [40.00]	-	26 [52.00]

Figures in parenthesis indicate percentages to Sample Size

Source: Filed Survey

4.1.4.3: MAJOR FINDINGS OF THE EMPIRICAL STUDY ON SUBACS

The major findings or the key observations in relation to the broader objective of the present study of this particular empirical investigation on the scheme SUBACS may be described briefly as follows. -

I) For all the size classes concerned, there has been quantum positive change in income, expenditure and gross return from field crops of the beneficiary farmers, especially for the small and the marginal farmers.

II) Radical changes have been taken place in the application of fertilizers, plant protection inputs, etc. The farmers are found to be changing their attitude towards a more judicious application of fertilizers based on the requirements of the soils. The growing consciousness on scientific farming technology among the beneficiary farmers have been reflected in the growing use of soil ameliorates in their farmland.

III) There has been a marked increase in the area under sugarcane cultivation, yield rate and production of sugarcane for the beneficiary farmers, especially for the marginal farmers, under the new technology with balanced use of fertilizers, plant

protection material, and cane seed supplied by the implementing agency under the scheme.

IV) Majority of the sample farmers (especially the marginal farmers) has received input-support in the form of important inputs like fertilizers, plant protection materials, sugarcane seed, etc, as also the carrying cost of the sugarcane seed.

V) A high proportion of sample beneficiary farmers (especially the marginal farmers) are found to have participated in demonstrations to acquire knowledge on technological aspects of sugarcane cultivation, which in turn reflects the initiative from the farmers' side to adopt new technologies and cope with the growing awareness programme as initiated by the implementing authority under the scheme.

VI) The impact of the demonstrations under the scheme has manifested itself through a growing interest of the farmers in getting their soil tested and motivating them towards modern cultivation technology moving away from the traditional format.

VII) As land plots (suitable for sugarcane cultivation) of 0.50 hectares at a stretch is not available with the farmers in a highly marginalized agriculture, the demonstration plots are organized as a conglomeration of numerous small tracts belonging to a group of farmers, which involves difficulties in distribution of input-support and other supports to the marginalized plot holders.

VIII) There are suggestions from the beneficiary farmers that the input-support needs to be increased for the demonstration plots, and to organize technology demonstrations more frequently.

IX) BO-91 turns to be the most preferred sugarcane seed, especially for its high yield and juice-content, which results into higher production of jaggery for domestic consumption as well as commercial production.

X) Information regarding the scheme has hardly reached the masses. The sample beneficiary farmers came to the knowledge of the scheme primarily through the KPS, followed by the members of local Panchayat. None of the farmers learned about the scheme in Booklets/ Newspapers (if literate) or through TV/Radio/Video or by any electronic media.

4.2.1: THE SCHEME BIUF

The Centrally Sponsored Scheme 'Balanced & Integrated Use of Fertilizers' (BIUF) was initially taken up during 1991-92 for promoting Integrated Nutrient Management (INM) envisaging soil test based balanced and judicious application of NPK fertilizers and secondary (Calcium, Sulphur) and micro nutrient fertilizers in conjunction with organic sources of nutrient like Farmyard Manure, Green Manures, Organic Manures (Compost), Phospho-compost, Vermi-compost, etc. and Bio-fertilizers.

The scheme BIUF was continued during subsequent plans envisaging strengthening of analytical facilities for soils, popularizing use of micro nutrients and bio-fertilizers through demonstration and also for setting up of compost units with a view to produce organic manure from city garbage. The scheme BIUF was subsumed under the Macro management of Agriculture scheme in 2000 ensuring that the States/UTs could continue to implement the programme through their work plans.

In West Bengal, the scheme BIUF has been suitably modified and renamed as 'Soil Health Management' (SHM) scheme, using the permissible flexibility of the MMA scheme to satisfy the regional requirements of the States. The basic objective of the SHM Scheme in West Bengal is to enrich soil fertility and maintenance through addition of biomass in soil and judging the fertility status for enhancing the crop production and restoration of soil health. To attain these objectives various component activities have been taken up for management of soil in a comprehensive way. The major activities taken up under the scheme are as follows:

i) Organizing publicity campaign for creating awareness of farmers, construction and demonstration of compost pit for production of enriched bio mass, promotion of bio-fertilizer use in pulse crops, demonstration with Micro Nutrients, maintenance of Azola & BGA units in Govt. Farms and setting up of vermi compost unit in Govt. Farms and farmers fields.

ii) Strengthening Soil Testing Services, establishing fertilizer and bio-fertilizer quality control Lab., and Correction of Soil Acidity by application of soil ameliorates for maintenance and restoration soil health.

The present section of the study here tries to examine the state and performance of the scheme BIUF in West Bengal, and attempts to evaluate the impact that has been generated by the scheme BIUF on the farming economy by conducting an empirical investigation in the sample block (viz. Habra-I Block) of a sample district (viz. North 24 Parganas).

4.2.2: THE SCHEME BIUF IN WEST BENGAL

The scheme BIUF (SHM) has been considered as a crucially important scheme for implementation in West Bengal. It alone claims a share amounting to near about 8 percent of the annual budget outlay of the MMA scheme in West Bengal. However, owing to unavailability of year-wise official data on the

concerned scheme, i.e. BIUF, we should concentrate our focus particularly referring to the years 2006-07 & 2007-08.

Hence, from available official secondary sources, it is evident that the scheme is acquiring even greater importance over the years, as the budget provision for the year 2007-08 for the concerned scheme more than double over the last year (viz. 2006-07) from Rs.250.75 lakh to Rs.691.20 lakh. Along with increasing fund allotment for the BIUF scheme in West Bengal, it remains good to observe that the allotted fund has been utilized maintaining a satisfactory level. In particular, for both the years 2006-07 and 2007-08, more than 93.5 percent of the allocated fund under BIUF has been utilized.

Now, a component-wise break-up of the scheme BIUF during the year 2006-07 sows us that the major chunk of fund (24.25 percent) has been allotted for conducting the Micro Nutrient Demonstrations Camps, where the utilization has also been almost 100 percent. This has been followed by the component 'correction of soil acidity by application of soil ameliorator' with a chunk of 11.96 percent of the allotted fund under the scheme, which shows utilization of almost 100 percent of the allotted fund. Together, these two components account for more than 1/3rd of the allotted fund under BIUF for the year 2006-07. Likewise, it is good to find that under all the components of the scheme BIUF for the year 2006-07, the utilization of funds has been quite satisfactory, except for the component 'Maintenance of Vermi-compost Production Units at Government Farms' with about 55 percent of fund being utilized.

Similarly, a component-wise breakup of the scheme BIUF during the year 2007-08 shows that same two components under BIUF have received the chunk of the allotted fund as the previous year with increase share. In fact, the D/C with Micro Nutrients (34.36 percent) and Correction of Soil Acidity (14.84 percent) together accounts for about half of the entire fund allotted under the scheme during the year 2007-08. The utilization of funds under both the scheme has been satisfactory with more than 95 percent of the allotted fund being utilized. It should also be noted here that the utilization of funds under the components 'Maintenance of Azola and Blue Green Algae in Govt. Farms' and 'Maintenance of Vermi-Compost Production Units at Govt. Farms' again has been a half or even less than half of their respective allotted funds, which needs proper attention.

Now, a comparison of proportion of fund allotted to the individual components over 2006-07 & 2007-08 shows that important components like setting up of bio-fertilizer production units has obtained a much-reduced share (6.20 percent in 2006-07 to 2.17 percent in 2007-08) in the total fund allotment. The same trend holds true to other important components like preparation of enriched compost (7.18 percent in 2006-07 to 5.79 percent in 2007-08); and marginally true for green manuring demonstration camps (2.79 percent to 2.17 percent), 'promotion of bio-fertilizer use in crops' (2.99 percent to 2.31 percent) and 'setting up of vermi-compost unit at farmers' fields (5.98 percent to 5.79 percent).

Table 4.2.2.1
Physical and Financial Targets and Achievements under BIUF (Soil Health Management) during 2006-07

Components	Physical	Financial

	Target	Achievement	Target	Achievement
Publicity Campaign on Organic Farming & Balanced Use of Fertilizers, etc.	250 nos.	236 nos.	7.50000	6.82809
Preparation of Enriched Compost	600 nos.	481 nos.	18.00000	13.79469
Green Manuring DC	7000 bigha	6420.5 bigha	7.00000	5.92498
Correction of Soil Acidity by Application of Soil Ameliorator	1500 MT	1509.125 MT	30.00000	29.99973
D/C with Micronutrients	50000 bigha	56126 bigha	60.80000	60.42562
Promotion of Bio-fertilizer Use in Crops	62,500 bigha	59,772 bigha	7.50000	6.90417
Maintenance of Azola and Blue Green Algae in 7 (seven) Govt. Farms	7 nos.	5 nos.	1.40000	.98499
Maintenance of Vermi-Compost Production Units at Govt. Farms	120 nos.	67 nos.	6.00000	3.33046
Setting-up of Vermi-compost Units at Farmers' Fields	500 nos.	377 nos.	15.00000	10.67603
Purchase of Instruments, Equipments, Chemicals, Glassware, etc.	11 labs	11 labs	20.00000	19.41375
Purchase of AAS for Analysis of Micronutrients for STL	2 labs	2 labs	20.00000	20.00000
Preparation of Information Sheets	10 labs	9 labs	2.00000	1.69681
Purchase of AFS for FCL	2 labs	2 labs	20.00000	20.00000
Purchase of Digestion Sets	3 labs	3 labs	3.00000	3.47212
Purchase of Moisture Meters	1 lab	1 lab	3.00000	2.88600
Purchase of Equipments	10 labs	10 labs	14.00000	12.96219
Setting-up of Bio-fertilizer Production Units	1 no.	1 no.	15.55000	15.55000
Demonstration with Enriched Organic Manures and Herbal Products	-	-	-	-
Total	-	-	250.75000	234.84963

Source: Deputy Director of Agriculture (Manures & Fertilizers), Directorate of Agriculture, Government of West Bengal

Table 4.2.2.2
Physical and Financial Targets and Achievements under BIUF (Soil Health Management) during 2007-08

Components	Physical		Financial	
	Target	Achievement	Target	Achievement
Publicity Campaign on Organic Farming & Balanced Use of Fertilizers, etc.	500 nos.	417 nos.	20.00000	16.52357
Preparation of Enriched Compost	1000 nos.	697 nos.	40.00000	26.82694
Green Manuring DC	10000 bigha	9906 bigha	15.00000	13.92343
Correction of Soil Acidity by Application of Soil Ameliorator	4104 MT	3944 MT	102.60000	98.60000
D/C with Micronutrients	497500 bigha	496730	237.50000	231.90167
Promotion of Bio-fertilizer Use in Crops	100000	103338 bigha	16.00000	14.98051

	bigha			
Maintenance of Azola and Blue Green Algae in 7 (seven) Govt. Farms	0 nos.	-	1.40000	.59590
Maintenance of Vermi-Compost Production Units at Govt. Farms	120 nos.	63 nos.	6.00000	3.02151
Setting-up of Vermi-compost Units at Farmers' Fields	1000 nos.	702 nos.	40.00000	29.71532
Purchase of Instruments, Equipments, Chemicals, Glassware, etc.	-	-	100.00000	100.00000
Purchase of Atomic Absorption Spectrometer Machine	-	-	41.20000	41.20000
Purchase of Digestion Sets	-	-	2.00000	2.00000
Purchase of Equipments	-	-	42.50000	42.50000
Setting-up of Bio-fertilizer Labs	-	-	12.00000	12.00000
Demonstration with Enriched Organic Manures and Herbal Products	1500 bigha	1357 bigha	15.00000	13.11464
Total	-	-	691.20000	646.69349

Source: Deputy Director of Agriculture (Manures & Fertilizers), Directorate of Agriculture, Government of West Bengal

However, if we are to consider the draft expenditure statement of BIUF during the year 2008-09 [table 4.2.2.3], we find that the scheme BIUF has gone through a massive change in its composition. Whereas the number of components has dropped significantly, the allocation of funds under the scheme has also been reduced to less than half of the previous year (2007-08). As per the draft expenditure statement, it is easy find out that the utilization of total fund under BIUF has also been reduced significantly from over 95 percent in 2007-08 to 62 percent in 2008-09.

A component-wise breakup of utilization of fund shows that while components like green manuring demonstration camps, demonstration camps with micro nutrients and promotion of bio fertilizer labs have utilized more than 80 percent of the allotted fund, components like setting up of vermi-compost unit at farmers' fields, maintenance of vermi-compost unit at Government farms and preparation of enriched compost has shown extremely poor utilization of fund. It remains to be noted also that the component 'demonstration camps with micro nutrients' experience the largest shrink in fund as compared to the previous year (32 percent of the previous year's allocation). At the same time, it is to be noted here that though the fund allocation for setting up of vermi-compost units at farmers filed witnessed a three-fold increase, the fact remains that the percentage utilization of fund under the component dropped radically from over 74 percent to 43 percent.

Table 4.2.2.3
Expenditure Statement (Draft) of BIUF (Soil Health Management) during 2008-09

Components	Total Outlay	Fund Utilized	Fund Surrendered
Preparation of Enriched Compost	40.00000	20.60918	19.39082
Green Manuring DC	22.50000	18.34484	4.15526
D/C with Micronutrients	75.00000	66.76889	8.23111
Promotion of Bio-fertilizer Use in Crops	16.00000	13.29268	2.70732

Maintenance of Vermi-Compost Production Units at Govt. Farms	4.80000	2.23258	2.56742
Setting-up of Vermi-compost Units at Farmers' Fields	120.00000	51.34835	68.65165
Total	278.30000	172.59652	105.70348

Source: Deputy Director of Agriculture (Manures & Fertilizers), Government of West Bengal

4.2.3: THE SCHEME BIUF IN THE SAMPLE DISTRICT

Available secondary data on the component-wise breakup of physical targets and achievements of BIUF for our sample district (viz. North 24 Parganas) shows that there has been almost 100 percent achievement in physical terms against the targets set for the district North 24 Parganas during the year 2006-07. It remains extremely satisfactory to find such results, especially considering the fact that the district North 24 Parganas has been the most intensely cultivated district in West Bengal with a cropping intensity of more than 200 percent, and therefore requires proper attention on management of soil health and judicious use of fertilizers.

During the year 2007-08, the performance of the scheme BIUF in our sample district also appears quite satisfactory against the targets set. For both the years, i.e. 2006-07 & 2007-08, there has been a cent percent achievement under the important component activities like promotion of bio-fertilizer use in pulse, demonstration with micro nutrients, green manuring demonstration camps.

Table 4.2.3.1
Physical Targets & Achievements under BIUF in Sample District (North 24 Parganas)

Components		2006-07		2007-08	
		T	A	T	A
1.	Publicity campaign. (no)	20	20	40	40
2.	Preparation of enriched compost.	40	40	68	37
3	Green Manuring DC	450	450	643	643
4	Correction of soil acidity by soil ameliorate through demonstration	-	-	-	-
5	Demonstration with micro nutrient fertilizers	2500	2475	3750	3750
6	Promotion of Bio-fertilizer use in Pulse crops.	4000	4000	6400	6400
7	Maintenance of Azola & B.G.A. units in 7(seven) Govt. farms	-	-	-	-
8	Maintenance of Vermi compost production unit at Govt. farm	6	6	6	4
9	Setting up of vermi compost production unit at farmers field	-	-	90	54
10	DC with Organic manures & herbal products	-	-	75	75

Source: WBAFC

It is to be noted here that there were two additional components in 2007-08 under BIUF in North 24 Parganas – viz. demonstration camps with organic manures and herbal products, and setting up of vermi-compost production units at farmers' fields. While there has been a cent percent achievement during 2007-08 under the component activity demonstration camps with organic manures and herbal products, the achievement against target under the component activity of setting up of vermi-compost production units at farmers' fields in 2007-08 has only managed to reach 60 percent of the target in physical terms.

4.2.4: AN EMPIRICAL STUDY ON THE SCHEME BIUF

To examine the state of the scheme BIUF as implemented at the micro level, an empirical investigation has been conducted in the district North 24 Parganas of West Bengal. The selection of the district North 24 Parganas has been made in consultation with the implementing agency, viz. Directorate of Agriculture, Government of West Bengal, based upon the performance and the suitability of the scheme concerned in the particular district. As has been mentioned elsewhere, the sample district North 24 Parganas records the highest cropping intensity in the State among all other districts, and the district is shaping up as a horticulture hub in southern West Bengal. Hence, there is an acute need for maintaining soil health to facilitate growth in agriculture by means of an attempt to reverse diminishing return from land through balanced and judicious application of fertilizers. However, the sample farmers have been selected by following a simple random sampling method without replacement from over five randomly selected villages from the list of beneficiaries of the scheme available with the Office of the Agriculture Development Officer of the sample block, viz. Habra-I. The results of the empirical investigation conducted in relation to the scheme BIUF in the sample villages of Habra-I of North 24 Parganas have been briefly described below.

4.2.4.1: A SOCIO-ECONOMIC PROFILE OF THE SAMPLE BENEFICIARY FARMERS UNDER BIUF

A brief socio-economic profile of the sample beneficiary farmers reveals that about ¾ of the sample beneficiary farmers falls into the marginal category of farmers out of the 50 sample beneficiary farmers selected for the empirical investigation. According to socio-religious categorization, about 72 percent of the sample farmers belong to the general castes, including the Muslims, while STs (22 percent) and SCs (6 percent) together constitute for the rest 28 percent of the sample beneficiary farmers. The average literacy rate for the sample farmers stands at 69 percent with the average family size of 4.94.

Table 4.2.4.1.1
Socio-Economic Profile of the Sample Farmers (under BIUF)

Particulars	Marginal	Small	Semi-medium	Medium	Large	Total
No.of Sample Farmers	37	12	1	-	-	50
Scheduled Castes	9 [81.81]	2 [18.18]	-	-	-	11 [22.00]
Scheduled Tribes	3 [100.00]	-	-	-	-	3 [6.00]
Other Backward Castes	-	-	-	-	-	-
General	25 [69.44]	10 [27.77]	1[2.77]	-	-	36 [72.00]
Literacy	65.69	81.30	30.00	-	-	68.73
Average Family Size	4.57	5.67	10.00	-	-	4.94

Figures in parenthesis indicate percentages
Source: Filed Survey

A profiling of the family composition of the sample beneficiary farmers traces that the overall ratio of male to female remains inclined towards the male population, as the ratio stands at 1000:885. The ratio of male to female population among the sample beneficiary farmers works to be particularly low for the lowest age group, where the ratio stands at 1000:790.

The state of education among the sample farmers exhibits that the overall rate of literacy of the sample beneficiary farmers stands at 69.63 percent, which is particularly high for the male population belonging to the middle-age group. Within the sexes belonging to particular age groups, it can be found that for all the age groups the female literacy rate consistently lags behind the male literacy rate.

Table 4.2.4.1.2
Family Composition of Sample Farmers by Sex & Age Group (under BIUF)

Category of Farmers	< 18		18 – 60		> 60		Total
	Male	Female	Male	Female	Male	Female	
Marginal	23	21	55	48	9	13	169
Small	19	11	17	12	4	5	68
Semi-medium	1	2	2	3	1	1	10
Medium	-	-	-	-	-	-	-
Large	-	-	-	-	-	-	-
Total	43	34	74	63	14	19	247

Source: Filed Survey

Table 4.2.4.1.3
Distribution of Members of Sample Farmers by Educational Status, Sex & Age Group (under BIUF)

Educational Status	< 18		18 – 60		> 60		Total
	Male	Female	Male	Female	Male	Female	
Illiterate	9	13	12	23	7	11	75
Primary Education Holders	26	15	41	27	4	8	121
Secondary Education Holders	8	6	13	12	1	-	40
Graduate & Above	-	-	8	1	2	-	11
Literate	34	21	62	40	7	8	172
Total	43	34	74	63	14	19	247

Source: Field Survey

In case of distribution of land among the sample beneficiary households with respect to ownership status, the survey traces that though the marginal farmers constitute ¾ of the sample-size, the small and the semi-medium farmers (together constituting the remaining ¼ of the sample-size) account for more than 42 percent of land. In case of availability of irrigation also, it can be found that the proportion of irrigated area with respect to the total area held by the respective classes stands to be the lowest for the marginal category of sample beneficiary farmers.

Table 4.2.4.1.4

Details of Land Holding of the Farmers by Size-Class (under BIUF)

(Area in Hectares)

Category of Farmers	By Ownership				By Irrigation		Total
	Owned	Leased-in	Leased-out	Others	Irrigated	Un-irrigated	
Marginal	32.23	3.33	.00	.11	24.70	10.97	35.67
Small	22.13	.80	.00	.00	16.99	5.94	22.93
Semi-medium	3.23	.00	.00	.00	2.40	0.83	3.23
Medium	-	-	-	-	-	-	-
Large	-	-	-		-	-	-
Total	57.59	4.13	.00	.11	44.09	17.74	61.83

Source: Field Survey

However, the structure of the primary occupation of the sample beneficiary farmers turns out to be rather diversified in nature. Evidently, while 46 percent of the sample beneficiary farmers depend primarily on agriculture, the agricultural labourers constitute 22 percent of the sample size. It is interesting to find that about 14 percent of the sample beneficiary farmers earns their livelihood through horticulture, reflecting that horticulture as an occupation is getting popularized within the farming community in the sample block of the sample district.

Table 4.2.4.1.5
Distribution of Primary Occupation of the Sample Farmers by Size-Class (under BIUF)

Particulars	Marginal	Small	Semi-medium	Medium	Large	Total
Agriculture	16 [32.00]	6 [12.00]	1 [2.00]	-	-	23 [46.00]
Agricultural Labourer	9 [16.00]	2 [4.00]	-	-	-	11 [22.00]
Animal Husbandry	2 [4.00]	-	-	-	-	2 [4.00]
Business	2 [4.00]	1 [2.00]	-	-	-	3 [6.00]
Regular Job	3 [6.00]	1 [2.00]	-	-	-	4 [8.00]
Horticulture	5 [10.00]	2 [2.00]	-	-	-	7 [14.00]

Figures in parenthesis indicate percentages to sample size

Source: Filed Survey

4.2.4.2: THE FUNCTIONING OF THE SCHEME BIUF AND ITS IMPACT

By studying aspect like income, expenditure etc. of the sample beneficiary farmers before and after they received benefits under the scheme BIUF, we can get a rough outline of the socio-economic development of the sample beneficiary farmers brought about by the scheme.

It is here that the survey traces that while the gross return from agriculture for the sample beneficiary households on an average increased by 46 percent in 2007-08 as compared to 2004-05, the gross income and expenditure of the sample households both increased by 41 percent. In particular, the increases in gross return (52 percent), income (49 percent) and expenditure (51 percent) are the most prominent for the marginal farmers, as revealed by the survey on the beneficiary farmers. The positive changes in gross return, income and expenditure of the sample beneficiary farmers, in turn, indicates towards a phenomenon of manifestation of the impact of overall agricultural development on the socio-economic condition of the beneficiary farmers.

Table 4.2.4.2.1
Annual Income & Expenditure of the Sample Farmers by Size-Class (under BIUF)

Category of Farmers	Income (Rs.)		Expenditure (Rs.)		Gross Return* (Rs.)	
	2004-05	2007-08	2004-05	2007-08	2004-05	2007-08
Marginal	26741.37	39957.90	19630.26	29599.69	17678.21	26879.81
Small	93815.49	125218.88	43611.82	55823.91	41656.23	57699.87
Semi-medium	58761.61	78808.99	41902.90	58264.27	49766.79	68529.20
Medium	-	-	-	-	-	-
Large	-	-	-	-	-	-
Total	43479.57	61197.56	25831.29	36466.79	24074.71	35109.61

** From Agriculture*

Source: Filed Survey

One of the major causes behind the general socio-economic development of the farmers has been reflected in the fact that the area under cultivation for these farmers has recorded an increase during the same period, viz. before and after the implementation of the scheme BIUF, which has translated itself into the increase in gross return from agriculture over the years. Here, a few noteworthy points need to be highlighted as follows –

- First, on an average, the area under cultivation in Kharif increased only by 5 percent as against an increase of 35 percent in Boro and 57 percent in Rabi. This clearly indicates towards a quantum jump in the cropping intensity of the sample beneficiary farmers over period.
- Second, while the increase in area for the marginal farmers increased only by 2 percent in Kharif, the increase was as high as 48 percent and 66 percent respectively in Boro and Rabi. This again clearly shows that

the driving size-class behind the increase in cropping intensity has been the marginal category of farmers.

Table 4.2.4.2.2
Changes in Area under Cultivation of the Sample Farmers by Size-Class (under BIUF)
(Hectares)

Category of Farmers	Kharif		Rabi		Boro	
	2004-05	2007-08	2004-05	2007-08	2004-05	2007-08
Marginal	20.17	20.56	7.20	11.92	3.61	5.35
Small	16.07	17.54	2.91	4.15	2.40	2.74
Semi-medium	2.40	2.53	0.40	0.40	0.00	0.00
Medium	-	-	-	-	-	-
Large	-	-	-	-	-	-
Total	38.64	40.63	10.51	16.47	6.01	8.09

Source: Filed Survey

However, the more direct impact of the scheme BIUF on the cultivation practices of the sample beneficiary farmers may be traced out in the application of fertilizers and other land-augmenting inputs like micro-nutrients, manures, etc. In particular, the changes in the pattern of application of chemical fertilizer inputs may indicate whether or not the scheme has impacted the fertilizer-use of the sample beneficiary farmers towards a more balanced and judicious application of fertilizer inputs. In this respect, the findings of this micro-survey may be briefly described as follows. -

- First, there has been a general decline in the rate of application of fertilizer inputs, considering the amount of all fertilizers taken together, to the extent of 4.6 percent in 2007-08 as compared to 2004-05. This has been true for all the size-classes concerned, except for the small farmers with a fractional gain.
- Second, the rate of application (kg/hectare) of urea has declined by 6.45 percent on an average, in case of which the marginal farmers accounted for the largest fall (8.52 percent). As urea has been a major fertilizer input to meet nitrogen requirement in standard cultivation practices, the decline in its rate of application among the sample beneficiary farmers assumes immense significance in the present context.
- Third, the rate of application (kg/hectare) of DAP for the marginal farmers has declined by 5.25 percent for the marginal farmers, while it got increased by 3.37 percent for the small farmers. Here also, a decline in the rate of application of DAP, as being a dominant source of phosphorus, assumes immense significance for the marginal beneficiary farmers in the present context.
- Lastly, the changes in the rate of application of SSP and N:P:K – 10:26:26 remains opposed to each other, as the rate of application of SSP increased at the cost of a decline in the rate of application of 10:26:26.

All the above findings on the changes in fertilizer application of the sample beneficiary farmers indicates towards the fact that the monopoly of chemical fertilizers in supplementing nitrogen and phosphorus has been reversed to some

extent. The decline in vital chemical fertilizers, as has been observed during the survey, has been primarily due to an increase in the rate of application of bio-fertilizers, organic manure, compost, vermi-compost, etc. under the scheme BIUF supplementing for the nutrient requirements. Hence, the impact of the scheme in attaining a balance in fertilizer application among the beneficiary farmers and reviving soil health has been indirectly reflected in the reorganization of chemical fertilizers doses among the sample beneficiary farmers.

Table 4.2.4.2.3

Use of Fertilizers by the Sample Farmers in Major Crops: Paddy-Kharif (under BIUF)

(kg per hectare)

Category of Farmers	2004-05					2007-08				
	Urea	DAP	10:26: 26	SSP	Total	Urea	DAP	10:26: 26	SSP	Total
Marginal	148.65	140.03	72.53	24.98	386.19	135.98	132.68	57.60	35.03	361.29
Small	174.30	158.10	68.78	56.33	457.51	172.20	163.43	76.73	46.73	459.09
Semi-medium	187.50	0.00	168.75	37.50	393.75	180.00	0.00	150.00	37.50	367.50
Medium	-	-	-	-	-	-	-	-	-	-
Large	-	-	-	-	-	-	-	-	-	-
Total	155.58	141.56	73.55	32.75	403.44	145.55	137.40	64.04	37.88	384.87

Source: Filed Survey

However, in case of use of soil ameliorates by the sample beneficiary farmers, the survey finds that only 14 percent of the sample beneficiary farmers receiving benefits under the scheme BIUF have used soil ameliorates for correction of soil acidity/alkalinity. It should be noted here that though distribution of soil ameliorates was a component activity under the BIUF scheme, but the activity was not performed in the sample district, as far as the available data suggests. The sample beneficiary farmers found who have been found to have using soil ameliorates in their land are to purchase ameliorates from the open market out of their pockets.

Table 4.2.4.2.4
Use of Soil Ameliorates by the Sample Farmers (under BIUF)

Category of Farmers	Gypsum	Pyrite	Lime	Zinc	Source
Marginal	2 [4.00]	-	-	3 [6.00]	Open Market
Small	-	-	-	2 [4.00]	Open Market
Semi-medium	-	-	-	-	-
Medium	-	-	-	-	-
Large	-	-	-	-	-

Figures in parenthesis indicate percentages to sample size

Source: Filed Survey

In case of identifying soil acidity/alkalinity (pH balance), it has been found during the survey that about 18 percent of the sample beneficiary farmers has got their soil tested, especially the marginal farmers. However, it needs to be noted that while 6 percent of the sample beneficiary farmers has got their soil tested through

the Department of Agriculture, 8 percent of them has got it through NGOs working on the subject, while 4 percent has tested their soil by themselves. This in turn indicates towards a growing interest of the sample beneficiary farmers towards soil test based judicious application of nutrients.

Table 4.2.4.2.5
Number of Sample Farmers who got their Soil Tested (under BIUF)

Category of Farmers	Dept. of Agril.	Self	NGO
Marginal	3 [6.00]	1 [2.00]	3 [6.00]
Small	-	1 [2.00]	1 [2.00]
Semi-medium	-	-	-
Medium	-	-	-
Large	-	-	-

Figures in parenthesis indicate percentages to sample size

Source: Filed Survey

When asked about the reason for not getting their soil tested, it remains extremely important to find that about ¼ of the sample beneficiary farmers do not know whereabouts regarding soil tests. This has extreme significance as it indicates towards a lack of propagation or mass-campaign in favour of soil tests even within the beneficiaries of the scheme BIUF. Nevertheless, a large section (28 percent) of the sample beneficiary farmers explained their unwillingness for soil tests as they feel that soil tests are not easily available. It should also be noted here that about 16 percent of the sample beneficiary farmers answered that it is a difficult procedure to follow.

Table 4.2.4.2.6
Reasons Given by the Sample Farmers for Not Getting Their Soil Tested (under BIUF)

Category of Farmers	Not Interested	Not Known	Not Easily Available	Difficult Process
Marginal	3 [6.00]	10 [20.00]	10 [20.00]	7 [14.00]
Small	1 [2.00]	7 [14.00]	3 [6.00]	1 [2.00]
Semi-medium	-	-	1 [2.00]	-
Medium	-	-	-	-
Large	-	-	-	-

Figures in parenthesis indicate percentages to sample size

Source: Filed Survey

The participation of the sample beneficiary farmers in the demonstration programmes organized by the immediate implementing authority, i.e. the local ADO office, has been quite satisfactory. About 82 percent of the sample beneficiary households were found to have participated in the demonstrations on Green Manuring, Micro Nutrient Application and Organic Manure & Herbal Products. The rate of participation of our sample beneficiaries in these

demonstrations turns out to be more or less equally distributed over the demonstrations. It is remains to be noted here that about 86.5 percent of the sample beneficiaries belonging to the marginal class have attended one or the other demonstration programmes conducted under the BIUF scheme.

Table 4.2.4.2.7
Participation of the Sample Farmers in Demonstrations (under BIUF)

Demonstrations	Marginal	Small	Semi-medium	Medium	Large	Total
Green Manuring DC	11 [22.00]	3 [6.00]	-	-	-	14 [28.00]
Micro Nutrient DC	9 [18.00]	3 [6.00]	-	-	-	12 [24.00]
Organic Manures DC	12 [24.00]	2 [4.00]	1 [2.00]	-	-	15 [30.00]
-	-	-	-	-	-	-
-	-	-	-	-	-	-

Figures in parenthesis indicate percentages to sample size

Source: Filed Survey

The growing interest of the sample beneficiaries on demonstration programmes is clearly reflected in the fact that about ¼ of the sample beneficiary farmers suggested that the number and frequency of the various demonstrations should increase to cover all aspirant farmers. At the same time, about 20 percent of the sample beneficiary farmers insistent upon organizing demonstrations on vermi-compost production and production of setting up of vermi-compost production units in farmers' fields at subsidized rates. Importantly, more than ½ of the sample beneficiary farmers suggested that the input-support on the demonstration programmes like Green Manuring, Organic Manures, Micro Nutrients, etc. should be increased so as to increase the area coverage and beneficiary coverage under the scheme.

Table 4.2.4.2.8
Suggestions Given by the Sample Farmers on Demonstrations (under BIUF)

Category of Farmers	No. of Demos should increase	Input-support in Demo should increase	Organize Demos on Vermi-compost
Marginal	9 [18.00]	23 [46.00]	5 [10.00]
Small	3 [6.00]	5 [10.00]	4 [8.00]
Semi-medium	-	-	1 [2.00]
Medium	-	-	-
Large	-	-	-

Figures in parenthesis indicate percentages to sample size

Source: Filed Survey

The assistance received by the sample beneficiary farmers under the scheme BIUF has been quite satisfactory with respect to both in scale and variation. Assistances on bio-fertilizers, enriched-compost, micro-nutrients, green-manure, etc have been

received by the sample beneficiary farmers as integral parts of the demonstration programmes conducted under the scheme BIUF. In total, an impressive 90 percent of the sample beneficiary farmers in this micro survey have received such assistance through the immediate implementing authority, viz. the ADO office. It is also to be noted that the farmers expressed satisfaction over the quality of the input materials given in assistance, though not the quantity of the assistance; as the assistance was just enough for the demonstration plot of .33 acres only.

Table 4.2.4.2.9

Assistance and Incentives Received by the Sample Farmers under the Scheme **(under BIUF)**

Category of Farmers	Bio-Fertilizer	Enriched Compost	Micro-Nutrients	Green Manure Seeds	Agri-Gold
Marginal	12 [24.00]	3 [6.00]	9 [18.00]	11 [22.00]	-
Small	2 [4.00]	1 [2.00]	3 [6.00]	3 [6.00]	-
Semi-medium	1 [2.00]	-	-	-	-
Medium	-	-	-	-	-
Large	-	-	-	-	-
Total	15 [30.00]	4 [8.00]	12 [24.00]	14 [28.00]	-

Source: Field Survey

However, the analysis of an impact of the scheme BIUF remains incomplete unless the major indicators of cultivation practices of the farmers are been considered. It is expected that the scheme should have exerted its impact on the major variables like area, production, productivity in the farming operation of the sample beneficiary farmers, thereby indirectly influencing the cost of cultivation and income thereof. As such, the findings of this micro survey conducted upon the sample beneficiaries of BIUF scheme on these aspects have been briefly described below assigning due importance.

- First, as it has been mentioned earlier, the survey reveals that on an average the area under cultivation for the sample beneficiary farmers has been found to have increased by 5 percent regarding cultivation of main crop (viz. paddy) during Kharif reason.
- Second, there has been a positive change in the yield rate of paddy accounting for about 8.5 percent increase in 2007-08 over 2004-05. Within the size-classes, the sample beneficiary farmers belonging to the marginal category recorded the highest increase in yield at around 9.5 percent.
- Third, the combined effect of the increases in area and yield in turn has resulted into an increase in the production of the sample beneficiary farmers, accounting for an increase of around 13.7 percent on an average.
- Fourth, though there has been an all round improvement in area, production and productivity in kharif paddy cultivation for the sample beneficiary farmers, the survey finds that there has been a drastic change in the costs of cultivation also. On an average, the costs of paddy cultivation in kharif increased by 19.2 percent over the same period. Nevertheless, it needs to be

noted here that the increase in costs per hectare of land has been the lowest for the marginal farmers, who are the major constituents of our sample beneficiaries under the scheme.

- Lastly, though there has been a drastic increase in the costs of cultivation per hectare of land for the sample beneficiary farmers, a corresponding increase in the income (gross income/hectare) has more than compensated for the loss arising out of the increase in costs. In fact, on an average, the income of the sample beneficiary farmers increased by about 29.3 percent, while that for the marginal size-class stands about 30.5 percent.

Table 4.2.4.2.10
Changes in Major Variables of the Sample Farmers for Main Crop –Paddy (under BIUF)
(per hectare)

Category of Farmers	Area (ha)		Production (quit.)		Yield (quint./ha.)		Cost (Rs.'000/Ha.)		Income (Rs.'000//Ha.)	
	2004-05	2007-08	2004-05	2007-08	2004-05	2007-08	2004-05	2007-08	2004-05	2007-08
Marginal	20.17	20.56	623.02	706.23	31.22	34.19	7.20	8.45	18.73	24.44
Small	16.07	17.54	611.10	696.19	37.18	39.35	7.97	9.90	22.31	28.13
Semi-medium	2.40	2.53	72.00	82.50	30.00	32.61	5.43	6.69	18.00	23.32
Medium	-	-	-	-	-	-	-	-	-	-
Large	-	-	-	-	-	-	-	-	-	-
Total	38.64	40.63	1306.12	1484.92	32.63	35.39	7.35	8.76	19.58	25.31

Source: Filed Survey

In case of source information about the scheme, the survey finds that the dominant source (for about 56 percent of the beneficiaries) of information about the scheme BIUF has been the KPS attached with the ADO office, followed by the Gram Panchayat and its members. In fact, during the field survey, it appeared that the concerned KPS acts as a facilitator/medium of information about the whereabouts of the launch of new schemes as well as of existing Central and State Government schemes. Nevertheless, it is to be noted here that though there is a provision of publicity campaign for the scheme as integrated component activity under BIUF, only a handful of the sample beneficiaries (20 percent) came to know about the scheme through booklets issued aiming publicity campaign. Rather, alongside with the KPS, the other major source of information about the scheme turns out to be the local Gram Panchayat and its members as 32 percent of our sample beneficiary farmers came to know about the scheme from Panchayat.

Table 4.2.4.2.11
Source of Information to the Sample Farmers about the Scheme (under BIUF)

Category of Farmers	Booklets	Video Films	Radio	TV	News Paper	KPS	Panchayat Member

Marginal	5 [10.00]	-	-	-	-	19 [38.00]	13 [26.00]
Small	4 [8.00]	-	-	-	-	9 [18.00]	3 [6.00]
Semi-medium	1 [2.00]	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-
Large	-	-	-	-	-	-	-
Total	10 [20.00]	-	-	-	-	28 [56.00]	16 [32.00]

Source: Field Survey

When asked about the reason for not knowing about the scheme (before they came to know about it) to the sample beneficiary farmers, the most frequent answer was that they do not approach the local ADO office on a regular basis to update information about existing schemes or schemes to be launched shortly. In fact, as has been said earlier, it appeared during the survey that the sample beneficiary farmers rather trust the KPS and the Panchayat for obtaining information about Central or State Government schemes. Apart from this, only a few sample beneficiary farmers explained either they don't posses TV/Radio (14 percent) or not interested about such schemes (8 percent).

Table 4.2.4.2.12
Reasons Given by the Sample Farmers for Not Knowing About the Scheme (under BIUF)

Category of Farmers	Not Interested	Don't Possess Above	Don't Have Library	Seldom visit the ADO office
Marginal	3 [4.00]	5 [10.00]	-	29 [58.00]
Small	1 [2.00]	2 [4.00]	-	9 [18.00]
Semi-medium	-	-	-	1 [2.00]
Medium	-	-	-	-
Large	-	-	-	-
Total	4 [8.00]	7 [14.00]	-	39 [78.00]

Figures in parenthesis indicate percentages to sample size

Source: Filed Survey

4.2.4.3: MAJOR FINDINGS OF THE EMPIRICAL STUDY ON BIUF

The major findings or the key observations in relation to the broader objective of the present study of this particular empirical investigation on the scheme BIUF may be described briefly as follows. -

I) There have been positive changes in gross return, income and expenditure of the sample beneficiary farmers, which in turn indicate towards a phenomenon of manifestation of the impact of overall agricultural development on the socio-economic condition of the beneficiary farmers. While the gross return from agriculture for the sample beneficiary households on an average increased by 46 percent in 2007-08 as compared to 2004-05, the gross income and expenditure of the sample households both increased by 41 percent, which is most prominent for the marginal farmers.

II) While, on an average, the area under cultivation in kharif increased only by 5 percent, of 35 percent in boro and 57 percent in rabi, indicating towards a quantum jump in the cropping intensity of the sample beneficiary farmers over the period. The phenomena has been especially true for the marginal farmers area under cultivation for marginal farms increased only by 2 percent in kharif, the increase was as high as 48 percent and 66 percent respectively in boro and rabi.

III) The impact of the scheme in attaining a balance in fertilizer application among the beneficiary farmers and reviving soil health has been indirectly reflected in the reorganization of chemical fertilizers doses among the sample beneficiary farmers. The monopoly of chemical fertilizers in supplementing nitrogen and phosphorus has been reversed to some extent, as there has been a general decline in the rate of application of vital chemical fertilizers like urea and DAP. This has been, as observed during the survey, primarily due to an increase in the rate of application of bio-fertilizers, organic manure, compost, vermi-compost, etc. under the scheme BIUF supplementing for the nutrient requirements.

IV) Though distribution of soil ameliorates was a component activity under the BIUF scheme, but the activity was not performed in the sample district, as far as the findings of the survey is concerned. However, those found using soil ameliorates in their land have to purchase ameliorates from the open market at their own costs. Again, though about 18 percent of the sample beneficiary farmers has got their soil tested, only 14 percent of them have actually used soil ameliorates in their farmland.

V) About ¼ of the sample beneficiary farmers do not know the whereabouts regarding soil tests, which indicates towards lack of propagation or mass-campaign in favour of soil tests, even within the beneficiaries of the this scheme on soil health management.

VI) The participation of sample beneficiary farmers in demonstrations organized under the scheme has been found quite high as about 82 percent of the sample beneficiary farmers were found to have participated in the demonstrations on Green Manuring, Micro Nutrient Application and Organic Manure & Herbal Products, etc. The participation of marginal farmers in demonstration has been found to be even higher as about 86.5 percent of the marginal sample beneficiary farmers have attended one or the other demonstration programmes conducted under the scheme.

VII) More than ½ of the sample beneficiary farmers suggested that the input-support on the demonstration programmes like Green Manuring, Organic Manures, Micro Nutrients, etc. should be increased so as to increase the area coverage and beneficiary coverage under the scheme.

VIII) Assistances on bio-fertilizers, enriched-compost, micro-nutrients, green-manure, etc have been received by the sample beneficiary

farmers as integral parts of the demonstration programmes conducted under the scheme BIUF. In total, an impressive 90 percent of the sample beneficiary farmers in this micro survey have received such assistance through the immediate implementing authority, viz. the ADO office.

IX) Regarding cultivation of main crop (viz. paddy- kharif) the area under cultivation, yield rate and production has been found to have increased by 5 percent, 8.5 percent and 13.7 percent respectively on an average in 2007-08 over 2004-05. At the same time, the costs of paddy cultivation in kharif increased by 19.2 percent points, though the corresponding increase of 29.3 percent in income (gross income/hectare) more than compensated for the loss arising out of the increase in costs.

X) The dominant source of information (for about 56 percent of the beneficiaries) about the scheme BIUF has been the KPS attached with the ADO office, followed by the Gram Panchayat and its members. Though there is a provision of publicity campaign under the scheme, only a handful of the sample beneficiaries (20 percent) came to know about the scheme through publicity campaign activities.

4.3: SPECIAL JUTE DEVELOPMENT PROGRAMME (SJDP)

4.3.1: THE SCHEME SJDP

The Centrally Sponsored Scheme on Special Jute Development Programme (SJDP) was launched in 1987-88 for the development of the Jute cultivation in agriculture sector. Initially the programme was launched in eight jute/mesta growing states. While the Jute Programme was first introduced in Assam, Meghalaya, Orrisa, Tripura, U.P & and West Bengal, the Mesta Programme became operational in Andrha Pradesh, Orrisa and Tripura and Sunhemp Programme in UP. Later Ramie was included and introduced in Assam, Meghalaya and Arunachal Pradesh. However, with the introduction of the MMA scheme, the SJDP scheme was subsumed under the MMA scheme in 2001. Again, with the introduction of the Jute Technology Mission (JTM), the scheme SJDP has been phased out of the purview of MMA in West Bengal.

> The prime objective of the scheme SJDP was to increase the productivity and the improvement of the quality of fibre. The basic strategy adopted in SJDP involved - a) distribution of agricultural inputs having positive co-relation with productivity, b) creation of additional retting facility by way of excavation of ratting tanks and motivating the farmers for larger use of fungal culture for up gradation of quality along with conduction of package demonstration and organization of training programme at different levels.

In West Bengal during 2006-07, the scheme SJDP has been implemented in ninety selected blocks of five districts of North Bengal and five districts of South Bengal aiming at increasing productivity, minimizing cost of cultivation and improvement of fiber quality through improved retting methods. Under the scheme, the concerned districts have been implementing the demonstration camps, excavation/re-excavation of retting tanks and organizing jute seed distribution programmes.

4.3.2: THE SCHEME SJDP IN WEST BENGAL

West Bengal happens to be the largest grower of jute in India. About 60 percent of the raw jute in the nation is produced in West Bengal alone. Hence it remains more than necessary to judge its physical and financial performance under the light of the SJDP scheme, oriented towards the increase in productivity of jute in jute growing areas. As it has been mentioned earlier, with the introduction of the Jute Technology Mission (JTM), the SJDP has been phased out of the purview of MMA scheme since the year 2007-08. As such, we are available with official secondary data pertaining to 2006-07 and before (excepting 2003-04 due to non-availability of data).

Hence, as it is evident from the available official secondary sources, the fund allocated under the scheme initially dropped radically (about 1/3rd) in 2002-03 over the previous year 2001-02, but it recovered over time at a slower pace as compared to other schemes subsumed under MMA. However though, the utilization of fund under the scheme SJDP remains to be quite satisfactory over the period (2001-02 to 2006-07) ranging from 75 percent to 93 percent, with more than 86 percent utilization of

fund on an average. It should also be noted here that the fund allocated and utilized under SJDP in 2006-07 more than doubled itself over the previous year 2005-06, though the achievement as proportion to target dropped to 84.55 percent in 2006-07 from 93.42 percent in 2005-06.

Table 4.3.2.1
Financial Targets & Achievements under SJDP from 2001-02 to 2006-07

(Rs. In Lakh)

Year	Target	***Achievement***	***Achievement in Proportion to Target (%)***
2001-02	151.4	114.8098	75.83
2002-03	54.15	47.684	88.06
2003-04	NA	NA	-
2004-05	82.2044390	72.7513820	88.50
2005-06	103.20	96.40461	93.42
2006-07	239.49928	202.5026	84.55

Source: Directorate of Agriculture, Government of West Bengal

Table 4.3.2.2
Component-wise Physical and Financial Target & Achievement under SJDP during 2005-06

Components	Physical		Financial (Rs. Lakh)	
	Target	Achievement	Target	Achievement
Production Technology Demonstration	2000 each	2000 each	10.00	8.69791
Improved Technology Demonstration	25000 each	24893 each	25.75	24.81061
Jute Retting Technology Demonstration	500 each	478 each	10.00	6.55275
Farmers' Training	1000 nos.	890 nos.	10.00	8.89334
Distribution of Certified Jute Seeds on Subsidy	173.014 MT	173.014 MT	28.98	28.98000
Distribution of Manually Operated Sprayer	1000 nos.	1000 nos.	3.20	3.20000
Excavation of Pucca Retting Tank	60 nos.	60 nos.	12.00	12.00000
Operational Expenses	-	-	3.27	3.27000

Total	-	-	103.20	96.40461

Source: Directorate of Agriculture, Government of West Bengal

Now, a component-wise breakup of the available data regarding the physical and financial performance of SJDP in West Bengal in 2005-06 shows that the major chunk of allotted fund has been attributed to the component activities of distribution of certified jute seeds and improved technology demonstration, together accounting for more than half of the allotted fund under the scheme for the year. It remains quite satisfactory to observe that there has been cent percent physical and financial achievement in 2005-06 under the component activities like excavation of pucca retting tank, distribution of manually operated sprayer and distribution of certified jute seeds on subsidy. The financial achievement against the target has also been impressive for the improved technology demonstrations (96 percent) and production technology demonstrations (87 percent), while the physical achievement against targets for the components appear even better at almost 99.57 percent and 100 percent in 2005-06.

Table 4.3.2.3

Component-wise Physical and Financial Target & Achievement under SJDP during 2006-07

Components	Physical		Financial (Rs. Lakh)	
	Target	Achievement	Target	Achievement
Subsidy Sale of Certified Jute Seeds	146.274 MT	79.607 MT	24.50	10.42959
Production Technology Demonstration	5440 nos.	5440 nos.	27.20	24.9351
Improved Technology Demonstration	135322 nos.	135322 nos.	167.79928	151.67741
Excavation/Re-excavation of Kacha Retting Tank	1000 nos.	824 nos.	20.00	15.46
Total	-	-	239.49928	202.5026

Source: Directorate of Agriculture, Government of West Bengal

As compared to the previous year, a component-wise breakup of physical and financial targets and achievements under SJDP in 2006-07 shows that though the budget allocation for the scheme more than doubled over the previous year, the number of component activities has been reduced significantly. To be more particular, it is evident that components like jute retting technology demonstrations, farmers' training programmes, etc have also been dropped out, while the justification of exclusion of such important component activities remains questionable.

However though, on the one hand, it is interesting to observe that the physical targets set under production technology demonstrations and improved technology demonstrations have been fulfilled utilizing less than the target financial outlay for the components. On the other hand, it remains quite disturbing to note that though with lower physical and financial targets set as compared to the previous year, the distribution of certified jute seeds on subsidy has suffered largely, achieving less than half of both financial and physical targets.

Table 4.3.2.4

Component-wise Physical and Financial Target & Achievement under SJDP during 2001-02

Components	Physical		Financial (Rs. Lakh)	
	Target	Achievement	Target	Achievement
Seed in MT @ 8.00 per kg	580 MT	337.83 MT	46.40000	27.02640
Multi-Row Seed Drill (MRS)	900nos.	831 nos.	18.00000	16.62000
Wheel-hoe	1800 nos.	1632 nos.	7.20000	6.24850
District Level Training @ 2000/- each	10 nos.	4 nos.	0.20000	0.08000
Production Demo @ 1500/- each	2000 nos.	2000 nos.	30.00000	25.10534
Retting Technique Demo @ 2000/- each	200 nos.	167 nos.	4.00000	2.45000
Kacha Retting Tank @ 2000/- each	450nos.	343 nos.	9.00000	6.86000
Pucca Retting Tank @ 20000/- each	30 nos.	7 nos.	6.00000	1.40000
Fungal Culture @ 12/- per packet	200000 packets	200000 packets	24.00000	24.00000
Farm Level Training @ 1000/- each	660 nos.	502 nos.	6.60000	5.01960
Total	-	-	151.4	114.8098

Source: Directorate of Agriculture, Government of West Bengal

Table 4.3.2.5

Component-wise Physical and Financial Target & Achievement under SJDP during 2002-03

Components	Physical		Financial (Rs. Lakh)	
	Target	Achievement	Target	Achievement
Seed in MT @ 8.00 per kg	178.30 MT	163.318 MT	14.26400	12.95200
Multi-Row Seed Drill (MRS)	387 nos.	292 nos.	7.74000	5.58600
Wheel-hoe	774 nos.	584 nos.	3.09600	2.10800
District Level Training @ 2000/- each	-	-	-	-
Production Demo @ 1500/- each	-	-	-	-
Retting Technique Demo @ 2000/- each	-	-	-	-
Kacha Retting Tank @ 2000/- each	163 nos.	93 nos.	3.26000	1.86000
Pucca Retting Tank @ 20000/- each	5 nos.	1 no.	1.00000	0.20000
Fungal Culture @ 12/- per packet	200000 packets	199400 packets	24.00000	23.92800

Farm Level Training @ 1000/- each	79 nos.	105 nos.	0.79000	1.05000
Total	-	-	54.15	47.684

Source: Directorate of Agriculture, Government of West Bengal

Table 4.3.2.6

Component-wise Physical and Financial Target & Achievement under SJDP during 2004-05

Components	Target		Achievement	
	Physical	Financial	Physical	Financial
Subsidy Sale of Certified Jute Seed	167.068 MT	15.7847690	160.216 MT	14.9137970
Production Technology Demonstration	3000 nos.	11.8050000	3000 nos.	11.8078750
Improved Technology Demonstration (1 Bigha Seed only)	30795 nos.	13.5008500	30792 nos.	13.1851100
Manually Operated Sprayer (25% subsidy)	2000 nos.	6.4000000	1167 nos	3.4345000
Retting Technology Demonstration	1000 nos.	20.0000000	894 nos.	15.4000200
Farmers' Training	1000 nos.	10.0000000	1000 nos.	9.9999400
Officers' Training at District level	1	.1000000	1	.1000000
Incidental Charge @ 1/- for Improved Technology Demo	-	.4030200	-	.1196900
Contingencies	-	3.3108000	-	2.7904500
Total	-	82.2044390	-	72.7513820

Source: Additional Director of Agriculture (Commercial Crops), Government of West Bengal

4.3.3: THE SCHEME SJDP IN THE SAMPLE DISTRICT

The available data on the physical targets and achievements under SJDP during 2006-07 in our sample district North 24 Parganas shows that there has been a cent percent physical achievement in organizing production technology demonstrations distribution of inputs for demonstration camps. This appears especially encouraging, as the sample district is the fourth largest jute-growing district (after districts Murshidabad, Nadia and Coochbehar) in the state with the highest intensity of cultivation (more than 200 percent). It should also be taken into account while judging the performance of our sample district that the district has been well known for its accommodation of jute processing industries along the river belts.

However, the achievement under the other two components, viz. distribution of certified jute seed and excavation / re-excavation of kachcha retting tanks, have only achieved little over than half of the physical targets set for them. It is quite disturbing to observe that only 8.29 metric tonnes out of the allotted 15 metric tonnes of certified jute seed has actually been distributed among the beneficiary

farmers households. At the same time, only 68 numbers of excavation/re-excavation of kachcha retting tanks has been accomplished against the target of 120 numbers of such activities.

Table 4.3.3.1
Physical Targets & Achievements under SJDP
in Sample District (North 24 Parganas) during 2006-07

Components		2006-07	
		Target	Achievement
1	Production Technology Demonstration	590	590
2	Distribution of Certified Jute Seed (in MT)	15.0	8.29
3	Inputs for DC (in no)	14520	14520
4	Excavation / Re-excavation of kacha Retting Tank	120	68

Source: WBAFC

4.3.4: AN EMPIRICAL STUDY ON THE SCHEME SJDP

To fulfill the objectives of the present study, we have conducted an empirical investigation on the scheme SJDP in the North 24 Parganas district of West Bengal. The selection of the district North 24 Parganas has been made in consultation with the implementing agency, viz. Directorate of Agriculture, Government of West Bengal, based upon the performance and the suitability of the scheme concerned in the particular district. In fact, the district North 24 Parganas has been one of the leading jute producing districts in West Bengal, preceded by Murshidabad, Nadia and Coochbehar districts. As also, the sample block selected for the study (viz. block Bashirhat-I) is one of the major jute growing blocks of the districts. The sample farmers have been selected by following a simple random sampling method without replacement from over five randomly selected villages from the list of beneficiaries of the scheme available with the Office of the Agriculture Development Officer of the concerned block. The results of the empirical investigation have been briefly described below.

4.3.4.1: A SOCIO-ECONOMIC PROFILE OF SAMPLE BENEFICIARY FARMERS UNDER SJDP

Under the present study, the sample beneficiary farmers represent a highly marginalized farming economy, as 88 percent of the sample farmers are marginal farmers, as categorized by their size of holding. The socio-religious class-composition of the sample beneficiary farmers entails that most of the farmers (77 percent) come from the General Category. It should be noted however that the General Category includes a good number of Muslims also, as there is a descent presence of the Muslim Community in the block Bashirhat-I being a district adjacent to the India – Bangladesh border. Interestingly enough, the average rate of literacy among the

sample beneficiary farmers, especially for the marginal category of farmers, stands at more than 76 percent. The average family-size of the sample farmers, on an average, gives a figure of 4.96 persons per family.

Table 4.3.4.1.1
Socio-Economic Profile of the Sample Farmers (under SJDP)

Particulars	Marginal	Small	Semi-medium	Medium	Large	Total
No.of Sample Farmers	44	5	1	-	-	50
Scheduled Castes	7 [15.91]	1 [20.00]	-	-	-	8 [16.00]
Scheduled Tribes	1 [2.27]	-	-	-	-	1 [2.00]
Other Backward Castes	2 [4.55]	-	-	-	-	2 [4.00]
General	34 [77.27]	4 [80.00]	1 [100.00]			39 [78.00]
Literacy	76.19	71.64	100.00	-	-	76.21
Average Family Size	4.93	5.40	4.00	-	-	4.96

Figures in parenthesis indicate percentages to size-class
Source: Filed Survey

The family composition of the beneficiary farmers, however, appears somewhat inclined towards males with a male-female ratio of 1000:908, which is reflected more prominently in case of the lowest age group. Here, the ratio of male to female turns out significantly lower especially for the lowest age group belonging to the marginal farmers, where the ratio stands at 1000:774 only.

Table 4.3.4.1.2
Family Composition of Sample Farmers by Sex & Age Group (under SJDP)

Category of Farmers	< 18		18 – 60		> 60		Total
	Male	Female	Male	Female	Male	Female	
Marginal	31	24	73	62	13	14	217
Small	4	5	5	6	2	5	27
Semi-medium	-	1	1	1	1	-	4
Medium	-	-	-	-	-	-	-
Large	-	-	-	-	-	-	-
Total	35	30	79	69	16	19	248

Source: Filed Survey

. In case of literacy of the sample beneficiary farmers, we find that on an average the rate of literacy stands at 75 percent. However, the rate of literacy for the sample beneficiary farmers steadily diminish as we move to higher age groups, indicating towards an increasing influence of the literacy campaign taken up by the Government. It should be noted that the female literacy rates for all the age groups concerned are found to be much lower than their counterparts in the respective age groups. Nevertheless, the overall educational status of the beneficiary farmers appears quite good with more than 31 percent of them have education more than the primary level.

Table 4.3.4.1.3
Distribution of Members of Sample Farmers by Educational Status, Sex & Age Group (under SJDP)

Educational Status	< 18		18 – 60		> 60		Total
	Male	Female	Male	Female	Male	Female	
Illiterate	4	9	11	20	5	13	62
Primary Education Holders	18	15	38	25	6	6	108
Secondary Education Holders	13	6	24	18	3	-	64
Graduate & Above	-	-	6	6	2	-	14
Literate	31	21	68	49	11	6	186
Total	35	30	79	69	16	19	248

Source: Field Survey

In case of the ownership of land by the sample beneficiary farmers, it can be observed that though the marginal farmers contribute 88 percent of the sample beneficiary farmers in this survey, they have the opportunity to command only over 66 percent (including the leased-in lands) of the landed area. Therefore, the average farm size of the sample beneficiary marginal farmers turns out to be .54 hectares. At the same time, the proportion of irrigated area out of total area can be found here increasing with the increase in size.

Table 4.3.4.1.4
Details of Land Holding of the Farmers by Size-Class (under SJDP)
(Area in Hectares)

Category of Farmers	By Ownership				By Irrigation		Total
	Owned	Leased-in	Leased-out	Others	Irrigated	Un-irrigated	
Marginal	23.27	.74	.27	.10	16.52	7.32	23.84
Small	7.29	.00	.00	.00	5.64	1.65	7.29
Semi-medium	3.12	.00	.00	.00	2.53	0.59	3.12
Medium	-	-	-	-	-	-	-
Large	-	-	-	-	-	-	-
Total	33.68	.74	.27	.10	24.69	9.56	34.25

Source: Field Survey

Moving towards the livelihood of the sample beneficiary farmers, it can be seen that about 58 percent of the farmers has opted for agriculture as their primary occupation, either as agriculturalists or as agricultural labourers. It remains extremely good to find that about 18 percent of the sample beneficiary farmers has chosen horticulture as their primary occupation, which reflects the fact that the district North 24 Parganas is slowly taking shape as a horticulture hub in the southern West Bengal. At the same time, it is also encouraging that more than 18 percent of the sample beneficiary farmers falling under the marginal category has opted for horticulture as their primary occupation. Including the allied activities like animal husbandry, it thus can be found that 84 percent of the sample beneficiary farmers earn their livelihood primarily through agriculture.

Table 4.3.4.1.5
Distribution of Primary Occupation of the Sample Farmers by Size-Class (under SJDP)

Particulars	Marginal	Small	Semi-medium	Medium	Large	Total
Agriculture	18 [36.00]	3 [6.00]	1 [2.00]	-	-	22 [44.00]
Agricultural Labourer	6 [12.00]	1 [2.00]	-	-	-	7 [14.00]
Animal Husbandry	4 [8.00]	-	-	-	-	4 [8.00]
Business	5 [10.00]	-	-	-	-	5 [10.00]
Regular Job	2 [4.00]	-	-	-	-	2 [4.00]
Horticulture	8 [16.00]	1 [2.00]	-	-	-	9 [18.00]

Figures in parenthesis indicate percentages to sample-size
Source: Filed Survey

4.3.4.2: THE FUNCTIONING OF THE SCHEME SJDP AND ITS IMPACT

In an attempt to measure the impact generated by the scheme SJDP on the farming economy, this survey tries to draw an outline of the socio-economic welfare of the sample beneficiary farmers under the scheme by studying aspect like income, expenditure etc. over time, (i.e. by comparing the state of income, expenditure, etc before and after they received benefits under the scheme).

Hence, we find that for all the size classes concerned, there has been quantum positive change in income, expenditure and gross return from field crops of the beneficiary farmers, especially for the small farmers. However, it should be noted here that for all the size-classes concerned, the change in expenditure outweighs the changes in income and gross return from field crops. On an average, though average income of the beneficiary farmers increased by 53 percent, their average expenditure increased by 63 percent; while there has been a 65 percent increase in the gross return from field crops.

Table 4.3.4.2.1
Annual Income & Expenditure of the Sample Farmers by Size-Class (under SJDP)

Category of Farmers	Income (Rs.)		Expenditure (Rs.)		Gross Return* (Rs.)	
	2004-05	2007-08	2004-05	2007-08	2004-05	2007-08
Marginal	15572.73	22795.76	10071.84	15531.12	7025.84	11108.20
Small	32935.20	58245.19	20179.71	40199.94	24364.38	45011.03
Semi-medium	53709.74	85102.66	38300.42	62917.25	40860.00	65828.05
Medium	-	-	-	-	-	-
Large	-	-	-	-	-	-
Total	18071.72	27586.84	11647.20	18945.73	9436.37	15592.88

** From Agriculture*
Source: Filed Survey

However, the empirical investigation that we conducted for the study essentially involved an enquiry into the grass-root level functioning of the scheme concerned, viz. SJDP. This in turn evokes the need for a deeper look at the production behaviour of the sample beneficiary farmers of the scheme,

incorporating and analyzing information on input-procurement, input-use, cropping pattern, technical knowledge etc., as also studying the reach of the concerned scheme to the masses. Hence, the information collection through the field investigation in this regard is briefly analyzed as under.

In the context of procurement of jute seed by the sample beneficiary farmers, the results of the empirical investigations on SJDP reveals that almost ¾ (72 percent) of the sample beneficiary farmers have purchased jute seed from the local ADO office. This has been clearly a result of the component activity of the scheme with respect to subsidy sale of jute seed and distribution of jute seed among the farmers under SJDP. However, those who have not obtained jute seeds from the ADO office under the scheme have been found purchasing seeds from open markets instead (12 percent), while a few farmers were found applying domestic jute seeds in their farmland (16 percent).

Table 4.3.4.2.2
Jute Seed Procurement by the Sample Farmers (under SJDP)

Category of Farmers	Seed Corporation	Retail Shops	Open Market	Domestic	ADO Office
Marginal	-	-	5 [10.00]	7 [14.00]	32 [64.00]
Small	-	-	1 [2.00]	1 [2.00]	3 [6.00]
Semi-medium	-	-	-	-	1 [2.00]
Medium	-	-	-	-	-
Large	-	-	-		-
Total	-	-	6 [12.00]	8 [16.00]	36 [72.00]

Figures in parenthesis indicate percentages to sample-size
Source: Filed Survey

In case use of application of fertilizers by the sample beneficiary farmers in jute cultivation, we find that the fertilizer-use pattern has been changed radically after the intervention of the SJDP scheme through demonstration programmes. In fact, the fertilizers (Urea, SSP, MOP) and weedicides (Thioden) distributed during the demonstration programmes was found by the farmers to be more balanced for the demo plots, the beneficiary farmers appeared adopting the new technology under the influence of the scheme. This in turn reflects a positive attitude of the sample beneficiary farmers towards a balanced and judicious use of fertilizer with proper plant protection techniques like weeding.

Table 4.3.4.2.3
Use of Fertilizers by the Selected Farmers (under SJDP)

(kg per hectare)

Category of Farmers	2004-05					2007-08				
	Urea	DAP	SSP	-	Total	Urea	DAP	SSP	MOP	Total
Marginal	97.73	67.61	75.00	-	240.34	55.68	5.23	179.09	102.73	342.73

Small	135.00	72.50	102.50	-	310.00	66.00	8.00	162.00	97.00	333.00
Semi-medium	100.00	50.00	100.00	-	250.00	75.00	15.00	140.00	75.00	305.00
Medium	-	-	-	-		-	-	-	-	-
Large	-	-	-	-		-	-	-	-	-

Source: Filed Survey

While studying upon the awareness of the farming community about scientific cultivation techniques, it remains highly encouraging to find that the sample beneficiary farmers in our study seem to adopt a balanced and judicious inputs depending upon the precise requirement of their farmland. In fact, the survey finds that 24 percent of the sample beneficiary farmers using soil ameliorates to rectify deficiencies in their valuable land plot, by using ameliorates like zinc. This has been especially encouraging as more than ¼ of the marginal farmers have used soil ameliorates in their plots.

Table 4.3.4.2.4
Use of Soil Ameliorates by the Sample Farmers (under SJDP)

Category of Farmers	Gypsum	Pyrite	Lime	Zinc	Source
Marginal	-	-	-	11 [22.00]	Open Market
Small	-	-	-	1 [2.00]	Open Market
Semi-medium	-	-	-	-	-
Medium	-	-	-	-	-
Large	-	-	-	-	-

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

The growing awareness among the farmers in adopting modern cultivation techniques has also been reflected in the case of growing interests of the farmers in soil tests. In particular, the present survey on the sample beneficiary farmers reveals that a total of 26 percent of the sample beneficiary farmers have got their soil tested. At the same time, it has been found that out of these sample beneficiary farmers who got soil tested, while 8 percent sample beneficiary farmers has got their soil tested through Department of Agriculture under other centrally sponsored schemes, 12 percent and 6 percent of the sample beneficiary farmers have got their soil tested through NGOs and by themselves respectively.

Table 4.3.4.2.5
Number of Sample Farmers who got their Soil Tested (under SJDP)

Category of Farmers	Dept. of Agril.	Self	NGO
Marginal	1 [2.00]	3 [6.00]	5 [10.00]
Small	2 [4.00]	-	1 [2.00]
Semi-medium	1 [2.00]	-	-
Medium	-	-	-

Large	-	-	-

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

However, when asked about the reason for getting their soil tested to the farmers who have not got their farm-soil tested yet, only a few (6 percent) of the sample beneficiary farmers expressed disinterest on the aspect. On the other hand, it is significant to find that about 1/3rd of the sample beneficiary farmers explained that though they are interested to get their soil tested for deficiencies, but they do not know how to avail of the facility. This surely desires much attention from the implementing agency of the CSS schemes (and also for NGOs working on this field) as the phenomenon indicates towards lack of mass-knowledge or mass-campaigns. At the same time, as few farmers also objected that there exists a cumbersome official procedure for obtaining the soil testing facilities, it seems that the existing official procedure for conducting soil-test for the farmers appear difficult for the illiterate (or little-literate) farmers.

Table 4.3.4.2.6
Reasons Given by the Farmers for Not Getting Their Soil Tested (under SJDP)

Category of Farmers	Not Interested	Not Known	Not Easily Available	Difficult Process
Marginal	3 [6.00]	17 [34.00]	12 [24.00]	3 [6.00]
Small	-	-	1 [2.00]	1 [2.00]
Semi-medium	-	-	-	-
Medium	-	-	-	-
Large	-	-	-	-

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

In case of participation of sample beneficiary farmers in various demonstration programmes conducted by the officials under the scheme SJDP, it has been found during the survey that the participation of farmers in these demonstrations remains quite high. This in turn reveals a growing interest of the jute cultivators of the region on acquiring knowledge on various technological aspects of modern jute cultivation practices. In particular, the survey traces participation of 96 percent of the sample beneficiary farmers in one or the other demonstrations conducted under the scheme. While 44 percent of the sample beneficiary farmers were found participated in Production Technology Demonstrations, a good 28 percent of them had participated in Improved Technology Demonstrations.

Table 4.3.4.2.7
Participation of the Farmers in the Demonstrations (under SJDP)

Demonstrations	Marginal	Small	Semi-medium	Medium	Large	Total

Production Technology Demo	22 [44.00]	-	-	-	-	22 [44.00]
Improved Technology Demo	14 [28.00]	-	-	-	-	14 [28.00]
Retting Technique Demo	4 [8.00]	1 [2.00]	-	-	-	5 [10.00]
Kachcha Retting Tank Demo	1 [2.00]	1 [2.00]	-	-	-	2 [4.00]
Pucca Retting Tank Demo	1 [2.00]	2 [4.00]	1 [2.00]	-	-	4 [8.00]

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

The demonstrations on Production Technology, Improved Technology, Retting Technology, etc. are primarily organized by the ADO office. Often experts on the subject of the demonstration / training from State Agriculture Department or from Agriculture Colleges are invited to demonstrate / impart training on the subject held at the farmers' fields. It has been revealed from the survey that while 72 percent of the beneficiary farmers participated in the demonstrations organized by the Agriculture Development Officer, about 22 percent were part of the demonstrations organized by the State Agriculture Officers and others.

Table 4.3.4.2.8
Organization of the Demonstrations (under SJDP)

Demonstrations	Marginal	Small	Semi-medium	Medium	Large	Total
Gram Panchayat	-	-	-	-	-	-
Agricultural Development Officer	36 [72.00]	-	-	-	-	36 [72.00]
State Agricultural Officers	6 [12.00]	4 [8.00]	1 [2.00]	-	-	11 [22.00]
I.C.A.R.	-	-	-	-	-	-
Others	-	-	-	-	-	-

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

On the part of training programmes under the scheme also, we can find a decent level of participation of farmers among the sample beneficiary farmers. In particular, while 40 percent of the sample beneficiary farmers received training on Improved Technology for jute cultivation, another 32 percent of them received training on Production Technology relating to the production of jute. Hence, the survey reveals that as high as 72 percent of our sample beneficiary farmers have received training under the scheme.

Table 4.3.4.2.9
Training Programmes Attended by the Sample Farmers (under SJDP)

Category of Farmers	Improved Technology	Production Technology	-
Marginal	17 [34.00]	16 [32.00]	-
Small	3 [6.00]	-	-
Semi-medium	-	-	-
Medium	-	-	-
Large	-	-	-

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

However, the costs of attending these demonstrations are often borne by the farmers themselves, as it has been expressed by the sample beneficiary farmers during the survey. Though the organizers arrange for light food to be served during the training, the costs of transportation are entirely borne by the farmers themselves. In our sample of beneficiary farmers, while 40 percent of the farmers attended demonstrations / training programme where beverages were provided by the organizers, another 32 percent of the beneficiary farmers attended trainings / demonstrations entirely at their own costs.

Table 4.3.4.2.10
Cost of Attending the Demonstrations (under SJDP)

Category of Farmers	Organizers	Self-Financed	Others
Marginal	17 [34.00]	16 [32.00]	-
Small	3 [6.00]	-	-
Semi-medium	-	-	-
Medium	-	-	-
Large	-	-	-

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

When asked about the difficulties faced by the sample beneficiary farmers in attending the demonstration / training programme organized under the scheme, the most common answer (in 54 percent cases) was that it costs other works to attend the trainings. It should be noted in this regard that the district North 24 Parganas registers more than 200 percent cropping intensity, while at the same time it is the most industrially developed district in West Bengal. Thus, the farmers remain busy throughout the year in some job or the other. Hence, for a majority of these farmers, the demonstrations are attended at the cost of other important jobs scheduled from before. Again, a good proportion of the sample beneficiary farmers also objected about the distance of the venue of the training programmes / demonstrations from their respective villages, as they do not have proper means of transportation to avail. In total, 46 percent of the sample beneficiary farmers held the distance of the venue and absence the of transport facilities to the venue as major difficulties in attending the demonstrations / trainings.

Table 4.3.4.2.11
Difficulties Faced in Attending the Demonstrations (under SJDP)

Category of Farmers	Too Far	Costs Other Works	No Transport
Marginal	16 [32.00]	23 [46.00]	5 [10.00]
Small	2 [4.00]	3 [6.00]	-
Semi-medium	-	1 [2.00]	-
Medium	-	-	-
Large	-	-	-

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

Though only 3 among the 50 sample beneficiary farmers did not participated in the demonstration / trainings organized under the scheme, it remains important to know what exactly was the reason behind their absence in demonstrations / trainings. As such, it is found that while two of them were not interested in demonstrations / trainings, the other one did not knew the whereabouts of the programmes. Hence, these cases do not appear significant enough for valid consideration.

Table 4.3.4.2.12
Reasons Given by the Farmers for Not Attending the Demonstrations (under SJDP)

Category of Farmers	Not Interested	Not Known	Other
Marginal	1 [2.00]	1 [2.00]	-
Small	1 [2.00]	-	-
Semi-medium	-	-	-
Medium	-	-	-
Large	-	-	-

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

However, there are serious valid suggestions to consider from the sample beneficiary farmers on the demonstrations or training programmes. In particular, we can briefly describe these suggestions as below.

First, there is a strong suggestion on the timeliness of the inputs supplied for demonstrations and for the demonstration plots held by the farmers, as suggested by 34 percent of our sample beneficiary farmers. As revealed by the beneficiary farmers, the referred inputs in the form of input-support (like seeds, fertilizers, plant protection materials, herbicides, etc) reach the beneficiary farmers' demonstration plots so late that they have to purchase the inputs from the open market to makeup for the delay, else suspend cultivation running out of required inputs.

Second, as it has been the suggestion from the sample beneficiary farmers (supported by another 32 percent of them), that the amount of inputs supports needs to be increased. As the subsidy sale / distribution of jute seed amounts only a fraction of the entire costs of cultivation, the beneficiary farmers are of the opinion that the input support should be increased, at least in demonstration plots.

Lastly, there has been an appeal from 8 percent of the sample beneficiary farmers that the demonstrations / training programmes should not be held too far from the village. While it costs valuable time in journey, it also involves costs of transportation to be met out of pocket.

Table 4.3.4.2.13 Suggestions Given by the Sample Farmers on Demonstrations (under SJDP)			
Category of Farmers	Input-support should be given on-time	Input-supports should be increased	Should not be held too far from village
Marginal	13 [26.00]	17 [34.00]	4 [8.00]
Small	3 [6.00]	2 [4.00]	-
Semi-medium	1 [2.00]	-	-
Medium	-	-	-
Large	-	-	-

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

Nevertheless, this survey traces that there ahs been a marked increase in the area under jute cultivation of the sample beneficiary farmers. At the same time, there has been an increase in the yield of jute for all the size-classes concerned in this study, especially for the marginal farmers. It appears that the key technology adopted for the demonstration plots in terms of balanced fertilizer dose with proper plant protection technology has resulted in an increase in the yield rate for the beneficiary farmers. In particular, with proper seed treatment, line sowing and weeding of the jute fields under SJDP has been able to demonstrate the advantages of adopting improved cultivation technologies.

The combined effected of an increase in yield and area under cultivation, in turn, has resulted into a boost in the production of jute for the sample beneficiary farmers. Considering all the sample beneficiary farmers at the same time it can be found that while the area under jute has increased by 24.6 percent, the change in the yield rate has been 7.6 percent – thereby resulting into an increase in production by 35.3 percent.

However, it should be noted that the seed-rate has declined considerably for all the size-classes concerned (12.6 percent on an average), which has been especially true for the semi-medium class. It is important to note also that this trajectory of increased production and productivity has been witnessed primarily by the marginal farmers under the demonstration activities of the scheme.

Table 4.3.4.2.14
Changes in Jute Cropping Pattern (under SJDP)
(per hectare)

Category of Farmers	Area (hectare)		Production (quint.)		Yield (quint./ha.)		Seed Rate (kg./ha.)		Source of Seed	
	2004-05	2007-08	2004-05	2007-08	2004-05	2007-08	2004-05	2007-08	2004-05	2007-08
Marginal	2.67	3.33	72.70	100.40	27.23	30.15	9.23	8.18	Open Market	ADO Office
Small	1.33	1.67	36.02	47.23	27.08	28.28	9.45	8.78	Open Market	ADO Office

Semi-medium	0.67	0.82	16.33	21.53	24.38	26.25	9.00	7.50	Open Market	ADO Office
Medium	-	-	-	-	-	-	-	-	-	-
Large	-	-	-	-	-	-	-	-	-	-

Source: Filed Survey

Now, in case of application of jute seed, the present survey finds that there has been a unanimous choice in favour of the high yielding variety of jute seed JRO-524, known as *Nabin*. The reason for such a unanimous choice is that the variety has been specially released for cultivation in sub-tropical agro-climatic conditions, suitable for the Gangetic alluvial zone. As to the farmers, the variety JRO-524 comes as a short-duration jute with higher yield and fibre-content. In fact, more than 86 percent of the sample beneficiary farmers revealed that they prefer JRO-524 because of its short-duration quality, which in effect allows the farmers to prepare land early on time for the next crop to sow. It should be noted here that apart from the sample beneficiary farmers receiving (or purchasing on subsidy) jute seed variety JRO-524 from the ADO office, the farmers who have purchased jute seed from open market (or used domestic seeds) also preferred the variety JRO-524 as the best variety available.

On the part of the source of information to the sample beneficiary farmers about the scheme, this survey finds that the prime source of information about the scheme turns out to be the local KPS, as 80 percent of our sample beneficiary farmers got informed about the scheme from the KPS. In fact, the KPS has been entrusted by the farmers as an authentic source of information to know the whereabouts regarding existing schemes or newly launched schemes by the Central or State Government. The second major source has been the local Panchayat / Panchayat members, as the rest 20 percent of the farmers got informed about the scheme by the local Gram Panchayat Office or the members of the Panchayat.

Table 4.3.4.2.15
Farmers' Responses towards the Best Varieties of Jute (under SJDP)

Category of Farmers	JRO-524	Variety 2	Reason for the Choice
Marginal	44 [86.00]	-	JRO- 524 is a short duration Jute
Small	5 [10.00]	-	JRO- 524 is good in fibre-content
Semi-medium	1 [2.00]	-	JRO- 524 is high yielding
Medium	-	-	-
Large	-	-	-

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

It remains extremely important to find that none of the farmers came to know about the scheme from paper media like booklets, newspapers, etc. or from any electronic media like Radio, TV, Video, etc., which in turn indicates that there has been an information gap with the masses in terms of campaigning for the scheme.

Table 4.3.4.2.16
Source of Information to the Farmer about the Scheme (under SJDP)

Category of Farmers	Booklets	Video Films	Radio	TV	News Paper	KPS	Panchayat
Marginal	-	-	-	-	-	36 [72.00]	8 [16.00]
Small	-	-	-	-	-	4 [4.00]	1 [2.00]
Semi-medium	-	-	-	-	-	-	1 [2.00]
Medium	-	-	-	-		-	-
Large	-	-	-	-	-	-	-
Total	-	-	-	-	-	4 [80.00]	10 [20.00]

Figures in parenthesis indicate percentages to sample-size
Source: Field Survey

When asked about the reason for not knowing the scheme before they got informed by the KPS or by the Panchayat, only a fraction (4 percent) of the sample beneficiary farmers responded negatively stating that they were not interested about the scheme. However, 18 percent of the sample beneficiary farmers explained that the reason for not getting informed about the scheme is that they do not posses mass-communication devices like Radio, TV, etc. as also do not have access to a library or subscribe newspaper. It remains highly interesting to note that a high majority (78 percent) of our sample beneficiary farmers blamed themselves for the lack of knowledge on the scheme as they do not keep in touch with the ADO office on a regular basis.

Table 4.3.4.2.17
Reasons Given by the Farmers for Not Knowing About the Scheme (under SJDP)

Category of Farmers	Not Interested	Don't Possess TV/Radio/etc.	Don't Have Library	Don't access ADO office frequently
Marginal	1 [2.00]	9 [18.00]	-	34 [68.00]
Small	1 [2.00]	-	-	4 [8.00]
Semi-medium	-	-	-	1 [2.00]
Medium	-	-	-	-
Large	-	-	-	-

Figures in parenthesis indicate percentages to sample-size
Source: Filed Survey

4.3.4.3: MAJOR FINDINGS OF THE EMPIRICAL STUDY ON SJDP

Based on this particular empirical investigation on the scheme SJDP, the major findings or the key observations may be described briefly as follows. -

I) There has been quantum positive change in income, expenditure and gross return from field crops of the beneficiary farmers, as revealed by the present empirical survey. On an average, though average income of the beneficiary farmers increased by 53 percent, their average

expenditure increased by 63 percent; while there has been a 65 percent increase in the gross return from field crops.

II) The key technology adopted for the demonstration plots in terms of balanced fertilizer dose with proper plant protection technology has been found to have exerted a positive impact on area, production and productivity of jute, as the area and yield rate under jute were found to have increased by 24.6 percent and 7.6 percent respectively – thereby resulting into an increase in production by 35.3 percent.

III) In case use of fertilizers in jute cultivation by the sample beneficiary farmers, it has been found that the fertilizer-use pattern has been changed radically after the intervention under the SJDP scheme through demonstration programmes, thereby reflecting a positive attitude of the sample beneficiary farmers towards a balanced and judicious use of fertilizer with proper plant protection techniques like weeding.

IV) It has been found that 56 percent of the sample beneficiary farmers have got their soil tested primarily through the local ADO office. However, about ¼ of the sample beneficiary farmers explained that though they are interested to get their soil tested for deficiencies, but they do not know how to avail of the facility in the absence of mass-campaign for the same.

V) Almost 30 percent of the marginal farmers have used soil ameliorates in their plots to rectify soil deficiencies and revive soil health. However, it seems that the existing official procedure for conducting soil-test for the farmers appear difficult for the illiterate (or little-literate) farmers, as few farmers objected of a cumbersome official procedure involved in availing of soil testing facilities.

VI) The empirical investigation reveals that about ¾ of the sample beneficiary farmers have purchased/obtained jute seed from the local ADO office on subsidy under the scheme. Again, the variety of jute seed distributed under the scheme, viz. JRO-524 (Nabin), has been a unanimous choice of the farmers as the best variety of jute seed available owing to its higher yield, greater fibre-content and especially for its short-term duration.

VII) A growing interest of the jute cultivators of the region on acquiring knowledge on various technological aspects of modern jute cultivation practices has bee reflected in the study as 44 percent and 28 percent of the sample beneficiary farmers were found to have participated in Production Technology Demonstrations and Improved Technology Demonstrations respectively, primarily organized by the ADO office under the scheme. At the same time, as high as 72 percent of our sample beneficiary farmers were found to have received training under the scheme.

VIII) The most common difficulty faced by more than half of the sample beneficiary farmers in attending the demonstration/training programme organized under the scheme has been the fact that it costs other works to attend demonstrations/trainings. In the absence of transport facilities,

the distance of demonstration/training venue has also come up as a major difficulty in attending the demonstrations/trainings.

IX) There is a strong suggestion from one-third of the sample beneficiary farmers, especially the input-receiving farmers of the demonstration plots, on the timeliness of the inputs supplied for demonstrations under the scheme. The input-support (like seeds, fertilizers, plant protection materials, herbicides, etc) reach the demo-plots so late that they often go on to purchase inputs from open market to makeup for the delay.

X) The survey finds that the prime source of information about the scheme has been the local KPS, as 80 percent of our sample beneficiary farmers got informed about the scheme from him. At the same time, none of the farmers came to know about the scheme from paper media like booklets, newspapers, etc. or from any electronic media like Radio, TV, Video, etc., which in turn indicates that there has been an information gap with the masses in terms of campaigning for the scheme.

4.4: Integrated Cereal Development Programme – WHEAT (ICDP-W)

4.4.1: THE SCHEME ICDP-W

To supplement the efforts of State Governments for increasing the production and productivity of crops, the Centrally Sponsored Scheme (CSS) Integrated Cereals Development Programme in Wheat Based Cropping Systems Areas (ICDP-Wheat) has been subsumed under the MMA scheme in 2001. Under the scheme, emphasis has being laid on the transfer of improved crop production technologies through organization of field demonstrations, farmers training etc. At the same time, to motivate the farmers to adopt the improved crop production technologies, incentives are being provided in the form of inputs like certified seeds/quality seeds, etc.

The prime objective of ICDP-Wheat is to cope up with the requirement of the wheat and other cereals, while the thrust being given for increasing the productivity per unit of area per unit of time. Again, to bring about an increase in the overall productivity of wheat based cropping system areas of the country, the adoption of cropping system's approach has been emphasized under the scheme ICDP-Wheat.

In order to increase the production and productivity of wheat and other crops in the wheat based cropping system areas, the important components included under the scheme are organization of field demonstrations, training of farmers and farm labourers including women in crop production technologies, encouraging the production of certified HYV seeds, etc.

4.4.2: THE SCHEME ICDP-W IN WEST BENGAL

West Bengal has always been one of the leading producers of cereal crops, especially foodgrains in India. The major crops grown in the state include Rice, Wheat, Jute, Tea, Potato, Sugarcane, Pulses and Oilseeds etc. The state is the highest producer of rice in the nation; also there is remarkable progress in the production of jute, oilseeds and potato. However, the area under wheat cultivation, as always has been the case, lags much below area under cultivation of other cereal crops, especially rice. For instance, during 2006-07, the area under cultivation of wheat was 350.6 th.ha, accounting for only 5.70 percent area under cereal crops as against 89.4 percent under rice cultivation. Needless to say, West Bengal thus has been known as the ‘Rice Bowl’ of the nation practicing a rice-based cropping pattern. Under such circumstances, diversification in the cropping pattern acquires ever more importance in the state. It is here that schemes like ICDP- Wheat comes with tremendous opportunities to move away from such a rice-based cropping patter in pursuance of diversification of crops.

However, under the permissible flexibility/tangibility in the implementation of the MMA scheme, the Government of West Bengal has

modified the scheme ICDP-Wheat to be renamed as 'Dissemination of New Technology through Diversification of Suitable Crops'. Understandably, this has been in pursuance of the fulfilment of regional requirements as has been considered suitable by the State Government. Hence, it appears that the scheme ICDP-Wheat has somewhat got diversified in form and composition, so as to meet the regional requirements and supplement other crop-based schemes adopted in West Bengal.

Table 4.4.2.1
Physical and Financial Targets & Achievements under ICDP- Wheat in West Bengal during 2006-07 (up to Dec'06)

Components		Physical		Financial (Rs. In Lakh)	
		T	A	T	A
	Field Demonstration along with seed, fertilizer etc. with new technology at high yielding varieties for diversification and adoption of wheat and suitable crops	4660 ha.	4000 ha.	233.00	200.00
2.	Training of Farmers	335 nos.	250 nos.	16.75	12.50
3.	Operational Expenses	-	-	3.25	2.80
Total		-	-	253	215.30

Source: WBAFC

This has been clearly reflected from the secondary data available on the scheme Dissemination of New Technology through Diversification of Suitable Crops (ICDP-Wheat), as has been presented here. Evidently enough, while the component activities of the concerned scheme include activities like Filed Demonstration of wheat cultivation with seed-fertilizer treatment during 2006-07, distribution of hybrid rice has also been a component activity under the scheme during 2007-08.

Nevertheless, it should be mentioned here that during 2006-07, the utilization of fund has been quite impressive with a utilization ratio of more than 85 percent of the total sanctioned fund under the scheme till the end of the 3rd quarter. Within the component-wise allocation of fund sanctioned during 2006-07, it can be observed here also that while there has been an achievement of more than 85 percent of the physical target of 'Field Demonstration along with seed, fertilizer etc. with new technology at high yielding varieties for diversification and adoption of wheat and suitable crops', the physical achievement of conducting 'Training of Farmers' stands at a moderate 74 percent.

Table 4.4.2.2
Physical, financial target & fund sanctioned under ICDP-Wheat for the year 2007 –08

Components	Physical Target	Financial Outlay	Fund sanctioned
Field Demonstration along with seed, fertilizer etc with new technology	5250	262.50	262.50
Training of Farmers @ Rs. 5000/- per training for 50 farmers in each	670	33.50	33.50
Operational Expenses	-	6.50	6.50
Hybrid rice @ Rs2500/- / ha	3000	75.00	75.00
Total	-	377.50	377.50

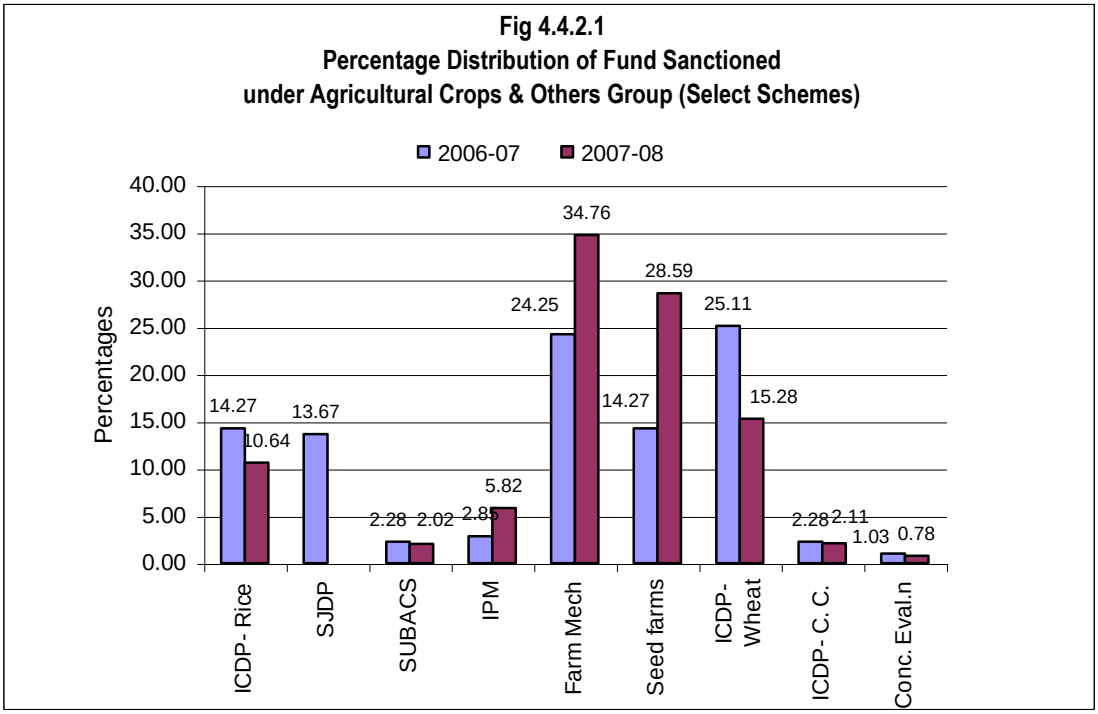
Source: WBAFC

During 2007-08, the scheme ICDP- Wheat seems to have suffered from a delayed sanction of funds for implementation, as the fund sanctioned till the 3rd quarter of the year amounts to Rs. 40 Lakh as against a total financial outlay of Rs. 377.50 Lakh for the scheme during the year. Out of the installment release of fund from the centre only training of farmers has been sanctioned initially. The component activity of Distribution of Hybrid Rice had to be implemented later with the arrival of the second installment of the central release.

However, as the available secondary data on funding of the scheme suggests, the sanction of fund for implementation of the ICDP-Wheat scheme experienced a reduction in 2007-08 as compared to 2006-07. While a sum of Rs. 440 lakh was sanctioned against the scheme during 2006-07, it had got reduced to Rs. 337.50 lakh during 2007-08 for implementation of the scheme in West Bengal. As such the share of ICDP-Wheat among all the ICDP schemes (ICDP- Rice, Wheat, Coarse Cereals) dropped from 60 percent in 2006-07 to 55 percent in 2007-08.

Nevertheless, the scheme ICDP- Wheat has been the largest scheme under the 'Agricultural Crops & Others' group, claiming a share of 25 percent in 2006-07 out of the total fund allocated under the group. Surely, it deserves much attention from the part of the State Government to work upon for the effective implementation of the scheme. However, the general outlook towards the scheme in West Bengal does not appear so, as reflected by the component activities of the scheme and delayed fund release for implementation of the scheme. Rather, it appears that the focus has been shifted towards the Farm Mechanization Programme and Strengthening of Seed Farms in 2007-08. This has been reflected in the fact that during 2007-08, the share of ICDP- Wheat among the scheme under the 'Agricultural crops & Others' group stood at 15 percent as against the Farm Mechanization Programme and Seed Programme with their share of 35 percent and 29 percent respectively.

Fig 4.4.2.1
Percentage Distribution of Fund Sanctioned under Agricultural Crops & Others Group (Select Schemes)



4.4.3: THE SCHEME ICDP-W IN THE SAMPLE DISTRICT

The district Barddhaman has always been an agricultural district with intensive cultivation of rice. In fact, the district is also known as the 'Granary of West Bengal' for its rich tracts of rice. It is under this district that we wish to examine the state of the scheme ICDP-Wheat as a choice for bringing about diversification in the existing cropping pattern.

Table 4.4.3.1
Physical Targets & Achievements under ICDP- Wheat in Sample District (Barddhaman)

Components		2006-07*		2007-08	
		T	A	T	A
	Field Demonstration for diversification of suitable crops (in Ha)	470	470	3975	3975
2.	Training of Farmers (Nos.)	33	33	66	65
3	Operational Expenses (Rs. In Lakh)	0.32	0.32	0.30	0.27

** up to Dec'2007*
Source: WBAFC

As per the secondary data obtained from the West Bengal Agricultural Finance Corporation, the agency assigned with the task of carrying out the

concurrent evaluation of MMA, there has been an impressive physical achievement under the scheme for both the years 2006-07 & 2007-08. In particular, there has been a cent percent achievement of physical and financial targets of all component activities under the scheme in our sample district Barddhaman during 2006-07. During 2007-08 also, the achievement of the scheme has been very close to a cent percent achievement, though the target set for 2007-08 was significantly higher as compared to the previous year. The achievement has been especially appreciable considering the fact that while the number of training camps for farmers got doubled during 2007-08 as compared to 2006-07, the number of field demonstration conducted on diversification of suitable crops during 2007-08 stood at as high as 8.5 times the number of the same during the previous year.

Under such an attempt from the State Government to disseminate new technology so as to promote diversification of crops (suitable for region-specific agro-climatic conditions), the scheme is sure to bring about awareness among the farmers and motivate them towards diversification out of a rice-based and rice-dominated cropping pattern.

4.4.4: AN EMPIRICAL STUDY ON THE SCHEME ICDP-W

The empirical investigation on the scheme ICDP-Wheat (implemented as 'Dissemination of New Technology through Diversification of suitable Crops' in West Bengal) has been conducted in the Barddhaman district of West Bengal. The selection of the district Barddhaman has been made in consultation with the implementing agency, viz. Directorate of Agriculture, Government of West Bengal, based upon the performance and the suitability of the scheme concerned in the particular district. In fact, the district Barddhaman has always been an agricultural district with intensive cultivation of rice, and thus known as the 'Granary of West Bengal' for its rich tracts of rice. It is under this district that we wish to examine the state of the scheme ICDP-Wheat as a choice for bringing about diversification in the existing cropping pattern. The sample block selected for the purpose (viz. block Ausgram-I) shares almost the same characteristics distinctive for the district. The sample beneficiary farmers have been selected by following a simple random sampling method without replacement from over five randomly selected villages from the list of beneficiaries of the scheme available with the Office of the Agriculture Development Officer of the concerned block, located in the town Guskara. The results of the empirical investigation have been briefly described below.

4.4.4.1: A SOCIO-ECONOMIC PROFILE OF SAMPLE BENEFICIARY FARMERS UNDER ICDP-W

A general socio-economic profiling of the sample beneficiary farmers of the present micro-survey on ICDP-Wheat reveals that the pool of sample beneficiary farmers under the survey primarily consists of beneficiaries belonging to the marginal size-class claiming a share of 84 percent of the total

sample-size. At the same time, as per the socio-religious categorization, most of these sample beneficiary farmers come from the Scheduled Castes (42 percent), followed by the Scheduled Tribes (28 percent). The sample beneficiary farmers belonging to the general socio-religious category together form only about ¼ of the sample-size. Though the pool of sample beneficiary farmers has been dominated by the SCs and STs, the state of education in terms of rate of literacy among the sample beneficiaries turn out to be high enough, especially for the marginal beneficiary farmers with an average rate of literacy around 72 percent. Again, the average family size for the marginal farmers has been found to be low with 4.81 person per family as against that for the small and the semi-medium size-class.

Table 4.4.4.1.1
Socio-Economic Profile of the Sample Farmers (under ICDP-W)

Particulars	Marginal	Small	Semi-medium	Medium	Large	Total
No.of Sample Farmers	42	7	1	-	-	50
Scheduled Castes	19 [38.00]	2 [4.00]	-	-	-	21 [42.00]
Scheduled Tribes	13 [26.00]	1 [2.00]	-	-	-	14 [28.00]
Other Backward Castes	3 [6.00]	-	-	-	-	3 [6.00]
General	7 [14.00]	4 [8.00]	1 [2.00]	-	-	12 [24.00]
Literacy	71.97	70.34	66.67	-	-	71.63
Average Family Size	4.81	5.71	6.00	-	-	4.96

Figures in parenthesis indicate percentages
Source: Filed Survey

A glimpse at the family composition of the sample beneficiary farmers reveal that the overall sex ratio stands at 1000:784 taking all the age groups from over all the size-classes together. It should be noted here that the sex ratio is particularly low for the marginal farmers with a ratio of 1000:757, while the ratio appears increasing with the size of farmers. Again, among the age group, the survey finds that while the sex ratio for the lowest age group stands at 1000:780, that for the marginal farmers turns out to be 1000:758 only. However, the members of the sample beneficiary farmers in the working age (viz. 18 to 60 years) accounts for about 58.9 percent of all the family members of the beneficiary farmers taken together.

Table 4.4.4.1.2
Family Composition of Sample Farmers by Sex & Age Group (under ICDP-W)

Category of Farmers	< 18		18 – 60		> 60		Total
	Male	Female	Male	Female	Male	Female	
Marginal	33	25	67	53	15	9	202
Small	7	6	12	10	2	3	40
Semi-medium	1	1	2	2	-	-	6
Medium	-	-	-	-	-	-	-
Large	-	-	-	-	-	-	-
Total	41	32	81	65	17	12	248

Source: Filed Survey

Considering the status of education of the sample beneficiary farmers, the survey reveals that the rate of literacy for all the size-classes and age groups taken together stands at around 72 percent. The overall male literacy rate stands quite high at around 79 percent, while that for their female counterpart works out to be as low as 63 percent. It is interesting to find that around 5 percent of all the members of the sample beneficiary households have attained qualification of graduation or above and around 11 percent of them have got secondary education. The rates of both male and female literacy are found to be the maximum for the lowest age group, followed by the middle age group. However, it should be noted that for all the age groups concerned, the rates of female literacy have been consistently lower than the rates of male literacy.

Table 4.4.4.1.3
Distribution of Members of Sample Farmers by Educational Status, Sex & Age Group (under ICDP-W)

Educational Status	< 18		18 – 60		> 60		Total
	Male	Female	Male	Female	Male	Female	
Illiterate	6	8	13	24	11	8	70
Primary Education Holders	28	21	48	34	5	3	138
Secondary Education Holders	7	3	10	5	1	1	27
Graduate & Above	-	-	10	2	1	-	13
Literate	35	24	68	41	7	4	178
Total	41	32	81	65	17	12	248

Source: Field Survey

In case of ownership of land by the sample beneficiary farmers, it is evident from the findings of this empirical investigation that though the marginal sample beneficiary farmers account for 84 percent of the sample-size, the command over around 63.5 percent of the area covered under the present survey, including leased in lands. Again, with respect to the availability of irrigation for cultivation, it can be found that the marginal farmers account for an even lower proportion (60.5 percent) of the irrigated land under the present survey. These facts in turn indicates towards a concentration of land, especially irrigated land, in the hands of a few larger farmers.

Table 4.4.4.1.4
Details of Land Holding of the Farmers by Size-Class (under ICDP-W)
(Area in Hectares)

Category of Farmers	By Ownership				By Irrigation		Total
	Owned	Leased-in	Leased-out	Others	Irrigated	Un-irrigated	
Marginal	28.70	2.20	.53	.20	24.07	6.50	30.57

Small	12.78	1.33	.00	.00	12.80	1.31	14.11
Semi-medium	3.45	.00	.00	.00	2.86	0.59	3.45
Medium	-	-	-	-	-	-	-
Large	-	-	-	-	-	-	-
Total	44.93	3.54	.53	.20	39.73	8.40	48.13

Source: Field Survey

An investigation in to the occupational structure of the sample beneficiary farmers under the scheme reveals that about 90 percent of the sample beneficiary households earn their livelihood directly through agriculture, either as pure agriculturalists (70 percent) or as agricultural labourers (20 percent). Another 8 percent of the sample beneficiary farmers can be found to depend upon animal husbandry. In total, the primary occupation of 98 percent of the sample beneficiary farmers have been found to concentrate within the agriculture and allied sector.

Table 4.4.4.1.5
Distribution of Primary Occupation of the Sample Farmers by Size-Class (under ICDP-W)

Particulars	Marginal	Small	Semi-medium	Medium	Large	Total
Agriculture	29 [58.00]	5 [10.00]	1 [2.00]	-	-	35 [70.00]
Agricultural Labourer	9 [18.00]	1 [2.00]	-	-	-	10 [20.00]
Animal Husbandry	4 [8.00]	-	-	-	-	4 [8.00]
Business	-	1 [2.00]	-	-	-	1 [2.00]
Regular Job	-	-	-	-	-	-
Horticulture	-	-	-	-	-	-

Source: Filed Survey

4.4.4.2: FUNCTIONING OF THE SCHEME ICDP-W AND ITS IMPACT

In an attempt to measure the impact generated by the scheme ICDP-Wheat on the farming economy, this survey tries to draw an outline of the socio-economic welfare of the sample beneficiary farmers under the scheme by studying aspect like income, expenditure etc. over time, (i.e. by comparing the state of income, expenditure, etc before and after they received benefits under the scheme).

Hence, a detailed account of the annual income, expenditure and gross return from agriculture for the sample beneficiary farmers brings out some important findings, which may be described briefly as under.

- First, on an average, the gross return from agriculture for the sample beneficiary farmers increased by about 52 percent in 2007-08 as against 2004-05, which has been particularly true for the small farmers registering 66 percent increase in gross return from agriculture, followed by the marginal farmers recording 49 percent increase.
- Second, as driven by the increase in gross return from agriculture, the income of the sample beneficiary farmers also experienced a sharp

increase. On an average, the rise in income stands for 53 percent, which remains prominent for the small farmers (59 percent) and for the marginal farmers (53 percent).

- Third, the positive impact of the increases in gross return and income of the sample beneficiary farmers have been found to have got outweighed by an even greater increase in the expenditure of the sample farmers. In fact, on an average, there has been an increase in the expenditure of the sample beneficiary farmers by 59 percent, which remains much higher than the increase in gross return (52 percent) and income (52 percent). This also has been particularly prominent for the smaller farmers (67 percent), followed by the marginal farmers (59 percent).

Table 4.4.4.2.1
Annual Income & Expenditure of the Sample Farmers by Size-Class (under ICDP-W)

Category of Farmers	Income (Rs.)		Expenditure (Rs.)		Gross Return* (Rs.)	
	2004-05	2007-08	2004-05	2007-08	2004-05	2007-08
Marginal	23019.73	35258.52	16312.45	25985.61	17201.11	25706.93
Small	50285.51	80039.01	29514.66	49307.97	36065.76	60024.95
Semi-medium	83185.32	108448.99	59319.45	80177.42	67123.14	89174.38
Medium	-	-	-	-	-	-
Large	-	-	-	-	-	-
Total	28040.25	42991.60	19020.90	30334.58	20840.60	31780.81

** From Agriculture*

Source: Filed Survey

The efforts made under the scheme to promote diversification can be examined here to some extent by considering the changes in area, production and yield of wheat for the sample beneficiary farmers, especially under a rice-dominated cropping pattern. The findings of the survey upon the changes occurred in wheat cultivation practice as an attempt of diversification in such a rice-dominated region has been briefly described here as follows.

- First, though the total area under wheat cultivation for the sample beneficiary farmers account for a small proportion as compared to the gross cropped area of the sample farmers, it remains significant enough to note that the area under wheat cultivation got increased for all the size-classes concerned under the intervention of the ICDP-Wheat scheme. On an average, the increase in area under wheat cultivation increased by 31.5 percent in 2007-08 as compared to that in 2004-05. The increase in the area under wheat has been the most prominent for the small farmers registering 41.3 percent increase, followed by the marginal farmers (29.7 percent) and by the semi-medium farmers (20.6 percent).
- Second, there has also been a general increase in the yield rate of wheat for the sample beneficiary farmers by 5.4 percent on an average. It remains significant to note that the increase in yield has been the

maximum for the marginal farmers registering an increase of 5.8 percent, followed by the small farmers (3.4 percent) and the semi-medium farmers (2.7 percent).

- Third, the increase in area and yield of wheat for the sample beneficiary farmers can be found to have manifested itself through an increase in the production of wheat, registering for about 38.6 percent increase on an average. The small farmers, with the highest increase in area, recorded the highest increase in production also at the rate of 46.2 percent. This has been followed by the marginal farmers (37.2 percent) and the semi-medium farmers (23.9 percent) in their respective order of sequence.

Table 4.4.4.2.2
Changes in Area, Production & Yield of Wheat for the Sample Farmers by Size-Class (under ICDP-W)
(Hectares)

Category of Farmers	Area (ha.)		Production (kg.)		Yield (kg./ha.)	
	Before	After	Before	After	Before	After
Marginal	3.81	4.94	372.12	510.45	97.67	103.33
Small	2.13	3.01	211.15	308.65	99.13	102.54
Semi-medium	1.26	1.52	116.55	144.40	92.50	95.00
Medium	-	-	-	-	-	-
Large	-	-	-	-	-	-
Total	7.20	9.47	703.94	975.91	97.77	103.05

Source: Filed Survey

The reflection of the efforts made under the scheme ICDP-Wheat has also been evident in the fertilizer application pattern by the sample farmers. In particular, there have been several changes in the rate of fertilizer application, which occurred as a direct influence of the scheme through crop production technology demonstrations. To be more precise, there has been a radical change in the fertilizer application pattern of the beneficiary demonstration plot holders under the scheme. The said changes have been briefly described here as follows.

- First, there has been a radical change in the application of MOP for the beneficiary farmers, especially for the beneficiary demonstration plot holders under the scheme. On an average, the application of MOP per unit of land increased by about 85 percent after the active intervention of the scheme as compared to their previous standard practices. This has been especially true for the marginal farmers recording an increase of about 94 percent.
- Second, the rate of application of DAP per unit of land also increased substantially. Considering all the sample beneficiaries together, the average increase in rate of application of DAP stands at 22.2 percent, which remains particularly true for the small and the marginal farmers.
- Third, the rate of application of other fertilizers like N:P:K-10:26:26 has declined considerably at the cost of an increase in the rate of application of DAP and MOP. This has also been prominent for the demo plot holders under the scheme.

- Lastly, the rate of application of Urea increased only marginally for all the size-classes concerned. The phenomenon acquires immense significance under the present consideration, as the key technology adopted in the demonstrations was to increase production and productivity through balanced use of fertilizers and reviving soil health.

  Thus, the changes that took place in the rate of application of fertilizers in the cultivation of wheat by the sample beneficiary farmers appears much influenced by the demonstration programmes conducted under the scheme. The demonstrations with seeds, fertilizers, etc. thus seem to have exerted sufficient impact on the standard fertilizer-use pattern among the sample beneficiary farmers.

Table 4.4.4.2.3
Use of Fertilizers by the Sample Farmers for Wheat (under ICDP-W)

(kg per hectare)

Category of Farmers	2004-05					2006-07				
	Urea	DAP	10:26:26	MOP	Total	Urea	DAP	10:26:26	MOP	Total
Marginal	117.67	92.33	8.67	27.94	246.61	121.78	112.78	3.94	54.17	292.67
Small	122.33	106.17	12.81	39.33	280.64	127.67	131.67	9.33	57.33	324.14
Semi-medium	125.00	112.50	17.50	32.50	287.50	130.00	127.50	0.00	60.00	330.00
Medium	-	-	-	-	-	-	-	-	-	-
Large	-	-	-	-	-	-	-	-	-	-
Total	118.47	94.67	9.43	29.63	252.19	122.77	115.72	4.62	54.73	297.82

Source: Filed Survey

In case of procurement of wheat seed by the sample farmers, it has been found during the survey that the major source of wheat seed for the sample beneficiary farmers under the scheme turns out to be the ADO office, which acts as the local representative of the State Agriculture Department. As much as 48 percent of the sample beneficiary farmers have been found obtaining seeds under the demonstration programmes conducted under the scheme. Apart from the ADO office, the sample beneficiary farmers under the scheme have been found procuring wheat seeds either from the open market (22 percent) or use their own domestic seed (30 percent).

In this context, it needs to be mentioned that there has been an important observation during the survey that the farmers benefited under the wheat seed distribution programmes do not always put it in its intended application. Often, the task of distribution of high yielding wheat seeds is assign with the local Panchayat offices, who do not report back the list of beneficiaries to the concerned ADO offices. Nevertheless, under the demonstration programmes directly monitored by the ADO office, the entire amount usually gets utilized as intended, often falling short of the actual requirement of the farmers.

Table 4.4.4.2.4
Source of Wheat Seed and Seed Rate for the Sample Farmers (under ICDP-W)

Category of Farmers	Seed Corporation	Open Market	Domestic	Agriculture Department	Seed Rate (kg/ha.)

Marginal	-	10 [20.00]	13 [26.00]	19 [38.00]	107.51
Small	-	1 [2.00]	2 [4.00]	4 [8.00]	114.08
Semi-medium	-	-	-	1 [2.00]	115.00
Medium	-	-	-	-	-
Large	-	-	-	-	-
Total	-	11 [22.00]	15 [30.00]	24 [48.00]	108.58

Figures in parenthesis indicate percentages to Sample Size

Source: Filed Survey

As it has been mentioned earlier, it remains evident from the survey that the farmers receiving the seeds under the demonstration programmes has also received fertilizers for application in the demonstration plots. In our sample beneficiary survey, these farmers account for 48 percent of the sample-size, which consists primarily of marginal beneficiary farmers. In fact, the component activity of technology demonstration under the scheme had provisions of distribution of seeds, fertilizers, etc. to the beneficiary demonstration plot holders.

Table 4.4.4.2.5

Assistance & Incentives Provided to the Sample Farmers by Size-Class (under ICDP-W)

Category of Farmers	Seed	Fertilizers	Pesticides, Weedicides
Marginal	19 [38.00]	19 [38.00]	-
Small	4 [8.00]	4 [8.00]	-
Semi-medium	1 [2.00]	1 [2.00]	-
Medium	-	-	-
Large	-	-	-
Total	24 [48.00]	24 [48.00]	-

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

The participation in demonstration programmes among the sample beneficiary farmers has been moderate, as 48 percent of the sample beneficiary farmers were found to have participated in the demonstration programmes. While the participation in production technology demonstrations among our sample beneficiary farmers 32 percent of the sample-size, the participation in improved technology demonstrations turns out to be 16 percent only. However, during the field investigation, it appeared that the allotment demonstration programmes in farmers' fields per block has been too low to match the number of aspirant farmers who wish to hold the demonstration programmes in their land plots and obtain benefits under the scheme.

Table 4.4.4.2.6
Participation of the Sample Farmers in Wheat Demonstrations (under ICDP-W)

Demonstrations	Marginal	Small	Semi-	Medium	Large	Total

			medium			
Production Technology Demo	12 [24.00]	3 [6.00]	1 [2.00]	-	-	16 [32.00]
Improved Technology Demo	7 [14.00]	1 [2.00]	-			8 [16.00]
-	-	-	-	-	-	-
-	-	-	-	-	-	-
Total	19 [38.00]	4 [8.00]	1 [2.00]	-	-	24 [48.00]

Figures in parenthesis indicate percentages to Sample Size

Source: Filed Survey

However, the participation of sample beneficiary farmers in various training programmes conducted under the scheme has been quite high. In fact, about ¾ of the sample beneficiary farmers were found to have participated in any or the other training programme conducted under the scheme. While 46 percent of the sample beneficiary farmers attended the technology training programmes, another 28 percent of the sample beneficiary farmers were found to have participated in the training meetings conducted under the scheme.

Table 4.4.4.2.7
Training Programmes Attended by the Sample Farmers (under ICDP-W)

Category of Farmers	Technology Training	Training Meeting	Total
Marginal	17 [34.00]	11 [22.00]	28 [56.00]
Small	5 [10.00]	3 [6.00]	8 [16.00]
Semi-medium	1 [2.00]	-	1 [2.00]
Medium	-	-	-
Large	-	-	-
Total	23 [46.00]	14 [28.00]	37 [74.00]

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

In case of the organization of the demonstration programmes, it has been found during the survey that for all the demonstration programmes under the scheme, the organizer was the Agriculture Development Officer of the concerned block, viz. Ausgram-I. However, there is information that officers from the State Agriculture Department and institutes like Indian Council for Agricultural Research have imparted training to the farmers earlier under other CSS schemes.

Table 4.4.4.2.8
Organization of the Demonstrations (under ICDP-W)

Demonstrations	Marginal	Small	Semi-medium	Medium	Large	Total
Gram Panchayat	-	-	-	-	-	-
Agricultural Development Officer	19 [38.00]	4 [8.00]	1 [2.00]	-	-	24 [48.00]
State Agricultural Officers	-	-	-	-	-	-
I.C.A.R.	-	-	-	-	-	-

Others	-	-	-	-	-	-

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

When asked about the reason for not attending the demonstration programme to the sample beneficiary farmers who have not participated in the demonstration programmes, the most frequent answer was that they did not know about the whereabouts of the demonstration programmes. It should be noted here the farmers who claimed that they did not knew about the demonstration programmes forms about 44 percent of our sample-size. However, only 8 percent of the sample beneficiary farmers explained that they are not interested in such demonstration programmes.

Table 4.4.4.2.9
Reasons Given by the Farmers for Not Attending the Demonstrations (under ICDP-W)

Category of Farmers	Not Interested	Not Known	Other
Marginal	3 [6.00]	20 [40.00]	-
Small	1 [2.00]	2 [4.00]	-
Semi-medium	-	-	-
Medium	-	-	-
Large	-	-	-

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

When asked about the difficulties faced by the sample beneficiary farmers in attending demonstrations or trainings conducted under the scheme, all the sample beneficiary farmers appeared more or less equally distributed over three major reasons. While 36 percent of the sample beneficiary farmers answered that there is no transport for moving to the venue of meeting / demonstrations that are often held far away from their villages, another 30 percent answered alike by clarifying that the distance of the venue of meeting / demonstration has been a major difficulty in attending the meetings / demonstrations. It should be noted however that about 34 percent of the sample beneficiary farmers responded that the major difficulty in attending the trainings / demonstrations has been the fact that they cost other important works during the daytime.

Table 4.4.4.2.10
Difficulties Faced in Attending the Demonstrations/Trainings (under ICDP-W)

Category of Farmers	Too Far	Costs Other Works	No Transport
Marginal	14 [28.00]	12 [24.00]	16 [32.00]
Small	1 [2.00]	4 [8.00]	2 [4.00]
Semi-medium	-	1 [2.00]	-
Medium	-	-	-

Large	-	-	-
Total	15 [30.00]	17 [34.00]	18 [36.00]

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

However, the sample beneficiary farmers under the scheme came with a lot of suggestions on conducting demonstrations or trainings as faced with difficulties in attending the same. Of them, the most frequent suggestion suggested by about half of the sample beneficiary farmers has been that the demonstrations or trainings or meetings should be conducted nearby their respective villages as they face trouble in attending a distant venue. Apart from this, more than one-thirds of the sample beneficiary farmers suggested that the demonstrations / trainings / meetings should not be organized during the peak season, for example during peak harvest period, as it costs valuable time to be spared for the purpose. They rather suggest that these programmes should preferably be conducted in the lean season when they have very little commitments in their fields. Again, about 18 percent of our sample beneficiary farmers suggested that the farmers should be informed much early about the demonstration / training so that they could reschedule other tasks or arrange for suitable transport.

Regarding the use of soil ameliorates among the sample beneficiary farmers, the survey finds that around 12 percent of the sample beneficiary farmers have used soil ameliorates in their land for the correction of soil acidity / alkalinity. The soil ameliorates used by the sample beneficiary farmers for the said purpose was zinc (applied by 8 percent of sample farmers), lime (4 percent) and gypsum (2 percent). As such, it remains quite encouraging to observe that the farming community is slowly adopting the technology so as to rectify soil problems arising out pH imbalances in soil and micro-nutrient deficiencies.

Table 4.4.4.2.11
Suggestions Given by the Sample Farmers on Demonstrations/Trainings (under ICDP-W)

Category of Farmers	Should be conducted nearby the village	Should not be conducted in peak season	Should be informed much earlier
Marginal	21 [42.00]	13 [26.00]	8 [16.00]
Small	3 [6.00]	4 [8.00]	-
Semi-medium	-	-	1 [2.00]
Medium	-	-	-
Large	-	-	-
Total	24 [48.00]	17 [34.00]	9 [18.00]

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

Table 4.4.4.2.12
Use of Soil Ameliorates by the Sample Farmers (under ICDP-W)

Category of Farmers	Gypsum	Pyrite	Lime	Zinc	Source
Marginal	1 [2.00]	-	1 [2.00]	3 [6.00]	Open Market
Small	-	-	1 [2.00]	1 [2.00]	Open Market
Semi-medium	-	-	-	-	Open Market
Medium	-	-	-	-	-
Large	-	-	-	-	-
Total	1 [2.00]	-	2 [4.00]	4 [8.00]	Open Market

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

In this context, it should be noted here that the survey traces that 16 percent of the sample beneficiary farmers have got their soil tested for detecting the pH balance of their soil, which indirectly shows that the farmers are assigning increasing importance on different aspects of scientific cultivation techniques like soil tests. It is more encouraging to find from the survey that about 6 percent of the sample beneficiary farmers have got their soils tested by self-arrangements.

On the other hand, when asked about the reason for not getting their soil tested for pH balance to the sample beneficiary farmers (who have not got their soils tested yet), a majority (44 percent) of the sample beneficiary farmers responded that they do not know the whereabouts regarding soil tests. This has immense significance in the sense that there is much scope for a mass-campaign for soil tests, even within districts like Barddhaman, which is known as the 'granary of rice' in West Bengal. However, a good proportion of the sample beneficiary farmers (22 percent) responded that soil testing facilities are not easily available, while few others (6 percent) responded that getting ones soil tested for pH balance is a difficult process altogether. Only about 8 percent of the sample beneficiary farmers answered that they are not interested with soil tests.

Table 4.4.4.2.13
Number of Sample Farmers who got their Soil Tested (under ICDP-W)

Category of Farmers	Dept. of Agril.	Self	NGO
Marginal	2 [4.00]	1 [2.00]	2 [4.00]
Small	-	1 [2.00]	1 [2.00]
Semi-medium	-	1 [2.00]	-
Medium	-	-	-
Large	-	-	-
Total	2 [4.00]	3 [6.00]	3 [6.00]

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

Table 4.4.4.2.14
Reasons Given by the Sample Farmers for Not Getting Their Soil Tested (under ICDP-W)

Category of Farmers	Not Interested	Not Known	Not Easily Available	Difficult Process
Marginal	3 [6.00]	21 [42.00]	8 [16.00]	3 [6.00]
Small	1 [2.00]	1 [2.00]	3 [6.00]	-
Semi-medium	-	-	-	-
Medium	-	-	-	-
Large	-	-	-	-
Total	4 [8.00]	22 [44.00]	11 [22.00]	3 [6.00]

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

As regards the choice of the sample beneficiary farmers for wheat seeds, it has been found in the survey that the farmers are more or less divided upon two high yielding seed varieties of wheat, namely Up-262 and PBW-343. While the former (UP-262) has been the choice of about 68 percent of the sample beneficiary farmers, the later (PBW-343) has been the choice of 32 percent of the sample beneficiary farmers. Interestingly, when asked about the reason for their choice to the sample beneficiary farmers, it has been found that both the seed varieties are favoured for their high yields.

It remains significant enough to note that when asked about the source of information about the scheme ICDP-Wheat, the sample beneficiary farmers pointed out two major sources of information on the scheme assigning more or less equal importance. While 52 percent of the sample beneficiary farmers named the KPS as the genuine and prompt source of information on existing agricultural schemes (including ICDP-Wheat), the rest 48 percent of the sample beneficiary farmers held the Panchayat or the members of the same as the source of information on the scheme.

Table 4.4.4.2.15
Sample Farmers' Responses towards the Best Varieties of Wheat (under ICDP-W)

Category of Farmers	UP-262	PBW-343	Reason for the Choice
Marginal	31 [62.00]	11 [22.00]	Up-262 is high yielding PBW-343 is also good
Small	2 [4.00]	5 [10.00]	Up-262 is high yielding PBW-343 is also good
Semi-medium	1 [2.00]	-	Up-262 is high yielding
Medium	-	-	-
Large	-	-	-
Total	34 [68.00]	16 [32.00]	-

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

However, all the other sources like booklets, video films, radio, television, newspapers, etc. have not been very useful as the source of information on the scheme, as none of the sample beneficiary farmers came to know about the scheme through these mediums of mass-communication. This in turn reflects an acute need for reconsidering the present strategy on information on the scheme and schemes alike, as there has been much scope for development in the flow of information to the masses from the Government by effectively using the mass-communication mediums.

Table 4.4.4.2.16
Source of Information to the Sample Farmers about the Scheme (under ICDP-W)

Category of Farmers	Booklets	Video Films	Radio	TV	News Paper	KPS	Panchayat
Marginal	-	-	-	-	-	23 [46.00]	19 [38.00]
Small	-	-	-	-	-	3 [6.00]	4 [8.00]
Semi-medium	-	-	-	-	-	-	1 [2.00]
Medium	-	-	-	-	-	-	-
Large	-	-	-	-	-	-	-
Total	-	-	-	-	-	26 [52.00]	24 [48.00]

Figures in parenthesis indicate percentages to sample-size
Source: Field Survey

When asked about the reason for not knowing about the scheme before, the answers from the sample beneficiary farmers varied over four specific reasons. While a majority (44 percent) of the sample beneficiary farmers answered that they do not visit the ADO office regularly to update information on schemes, another 32 percent clarified that they do not regularly visit the Panchayat office for the same unless there is any work related to the Panchayat. At the same time, another 18 percent of the sample beneficiaries explained that they were not informed about the ICDP-Wheat scheme, as they do not possess the mass-communication electronic mediums like television or radio. Only 3 percent of the sample farmers responded that they were not interested in such schemes.

Table 4.4.4.2.17
Reasons Given by the Farmers for Not Knowing About the Scheme (under ICDP-W)

Category of Farmers	Not Interested	Don't Possess Above	Don't Often Visit Panchayat	Don't Often Visit ADO office
Marginal	2 [4.00]	8 [16.00]	14 [28.00]	18 [36.00]
Small	1 [2.00]	1 [2.00]	2 [4.00]	3 [6.00]
Semi-medium	-	-	-	1 [2.00]
Medium	-	-	-	-
Large	-	-	-	-
Total	3 [6.00]	9 [18.00]	16 [32.00]	22 [44.00]

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

4.4.4.3: MAJOR FINDINGS OF THE EMPIRICAL STUDY ON ICDP-W

Based on this particular empirical investigation on the scheme ICDP-Wheat, the major findings or the key observations may be described briefly as follows. -

I) On an average, the gross return from agriculture for the sample beneficiary farmers increased by about 52 percent in 2007-08 as against 2004-05. As driven by the increase in gross return from agriculture, the income of the sample beneficiary farmers also experienced a sharp increase of 53 percent on an average. The positive impact of the increases in gross return and income has been outweighed by an even greater increase in the expenditure by 59 percent on an average.

II) The area under wheat cultivation got increased for all the size-classes concerned under the intervention of the ICDP-Wheat scheme, primarily through the technology demonstration programmes. On an average, the increase in area under wheat increased by 31.5 percent in 2007-08 as compared to that in 2004-05. There has also been a general increase in the yield rate of wheat by 5.4 percent points on an average, which is the highest for the marginal farmers (5.8 percent). The increase in area and yield of wheat for the sample beneficiary farmers have been found to have manifested itself in an increase in the production of wheat, registering for about 38.6 percent increase on an average.

III) On an average, the application of MOP and DAP per unit of land increased by about 85 percent and 22.2 percent respectively. The rate of application of Urea increased only marginally for all the size-classes concerned. These changes appear to have occurred as a direct influence of the scheme primarily through crop production technology demonstrations with seed-fertilizer support. As the key technology adopted in the demonstrations was to promote diversification of crops through increase production and productivity with balanced use of fertilizers, the findings indicate towards a positive impact of the scheme on fertilizer application pattern also.

IV) The major source of wheat seed for the sample beneficiary farmers under the scheme has been the ADO office, as 48 percent of the sample beneficiary farmers have been found obtaining seeds under the demonstration programmes conducted under the scheme. This is followed by seed purchased from open market (22 percent) and domestic seed (30 percent).

V) About 48 percent of the sample beneficiary farmers, consisting primarily of marginal beneficiary farmers, have received input incentive / support

in the form of seeds, fertilizers, etc. as provisions under component activities of the scheme, like technology demonstrations.

VI) The participation in demonstration programmes among the sample beneficiary farmers has been moderate, as 48 percent of the sample beneficiary farmers were found to have participated in the demonstration programmes. However, the participation of sample beneficiary farmers in various training programmes conducted under the scheme has been quite high at 74 percent. The organizer of these demonstrations / training was the Agriculture Development Officer of the concerned block, viz. Ausgram-I, acting as representative of the State Department of Agriculture.

VII) The major reason behind not attending the demonstrations / training has been the fact that they did not know about the whereabouts of the demonstration programmes, forming about 44 percent of the sample-size. On the other hand, the survey traces that there have been three major difficulties faced by the sample beneficiary farmers in attending demonstrations or trainings – viz. unavailability of transport facilities (36 percent), has to suspend/postpone other works (34 percent), and the distance of the venue of the same (30 percent). At the same time, there have been three major suggestions on conducting demonstrations or trainings – it should be conducted nearby (as suggested by 48 percent of sample-size), it should not be organized during the peak season (34 percent), and it should be informed much earlier (18 percent).

VIII) The survey traces that about 12 percent of the sample beneficiary farmers have used soil ameliorates in their land for the correction of soil acidity / alkalinity, while 16 percent of the sample beneficiary farmers have got their soil tested. These facts appear encouraging as there is an indication that the farmers are assigning greater importance on aspects of scientific cultivation techniques like soil tests and use of soil ameliorates. However, at the same time, 44 percent of the sample beneficiary farmers revealed that they do not know the whereabouts regarding soil tests. This has immense significance in the sense that there is much scope for a mass-campaign for soil tests, even within the most advanced agricultural districts like Barddhaman.

IX) The high yielding seed varieties of wheat, namely UP-262 and PBW-343, have been the choices of 68 percent and 32 percent of the sample beneficiary farmers respectively for their high yields.

X) The major sources of information about the scheme turn out to be the KPS of the concerned block (acting as source of information for 52 percent of sample-size), and the Panchayat or its members (acting as the source of information for the rest 48 percent).

4.5: INTEGRATED CEREAL DEVELOPMENT PROGRAMME – COARSE CEREALS (ICDP-CC)

4.5.1: THE SCHEME ICDP-CC

The Centrally sponsored Scheme (CSS) Integrated Cereals Development Programme in Coarse Cereals Based Cropping Systems Areas (ICDP-Coarse Cereals) has been subsumed under the Macro Management of Agriculture scheme in 2001 to supplement the efforts of State Governments for increasing the production and productivity. Under the scheme, emphasis is being laid on the transfer of improved crop production technologies through organization of field demonstrations and trainings. Along with this, to inspire the farmers to adopt the improved crop production technologies, incentives are being provided through distribution of certified seeds/quality seeds, etc.

The prime objective of the scheme ICDP-Coarse Cereal has been to cope up with the requirement of the coarse cereals and other cereals in the coming years by means of increasing the productivity per unit of area per unit of time including the cropping intensity. To bring about an increase in the overall productivity of coarse cereals and other crops in the coarse cereals based cropping system areas of the country the adoption of cropping system's approach has been emphasized upon.

In order to increase the production and productivity of Coarse Cereals and other crops in coarse cereals based cropping system areas, components like organization of field demonstrations, training of farmers in crop production technologies, encouraging production of certified seeds of HYVs etc. has been adopted under the scheme.

4.5.2: THE SCHEME ICDP-CC IN WEST BENGAL

Though we consider the fact that West Bengal has been one of the leading States in the production of rice (and to some extent, wheat), but there has always been the need to propagate cultivation of other foodgrains, especially cereal crops, like coarse cereal in the face of diversification of traditional cultivation.

However, the performance of the scheme ICDP-Coarse Cereals in West Bengal has not been at par with the other schemes under MMA in terms of lower allocation of fund for the implementation of the scheme. In fact, as the secondary sources from the implementing agency (viz. Department of Agriculture, Govt. of West Bengal) suggest, it appears that the component activities under the concerned scheme has been restricted to some extent in West Bengal.

The apparent restrictions in the implementation of the scheme ICDP-Coarse Cereals appears prominent considering the fact that though there has been a fund allocation of Rs. 40 Lakh in total during 2006-07, no fund was actually been sanctioned for its implementation from the release of the first installment of the central assistance till the 3rd quarter of the year. It is only during the fourth quarter the fund actually got sanctioned for the

implementation of the scheme, after the receipt of the second installment from the centre.

It should also be noted here that the allocated amount for the concerned scheme during 2006-07 has been much lower than the other schemes relating to agricultural crops. To be more particular, while in 2006-07, a sum of Rs.250 Lakh and Rs. 440 Lakh was allocated for the schemes ICDP-Rice and ICDP-Wheat respectively, only Rs. 40 Lakh was allocated for ICDP- Coarse Cereals during the same year– a share of less than 5.5 percent among the ICDP schemes.

Table 4.5.2.1
Physical Target, Financial Outlay and Fund Sanction under ICDP Coarse Cereals during 2006-07

Components	Physical Target	Fund Allocated	Fund Sanctioned
Field Demonstration on Hybrid Varieties of Maize with Fertilizer with New Technology for Diversification (nos.)	3200	38.40	38.40
Operational Expenses	-	1.60	1.60
Total	-	40.00	40

Sources: Proposed Macro Mode Work Plan 2006-07and WBAFC

Nevertheless, during 2007-08 we observe that there has been a fund allocation for ICDP- Coarse Cereal amounting to Rs. 112 Lakh, out of which Rs. 52 Lakh was sanctioned for the implementation of the scheme. The share of ICDP- Coarse Cereals among the ICDP schemes, however, increased to 7.5 percent of the total. This appears to have come at the cost of a reduced share of ICDP-Wheat under reduced total allocation for the year 2007-08 as against 2006-07.

Table 4.5.2.2
Physical Target, Financial Outlay and Fund Sanction under ICDP Coarse Cereals during 2007-08

Components	Physical Target	Fund Allocated	Fund Sanctioned (till 31-12-2007)
Training on TOT (nos.)	1000	50.00	50.00
Distribution of Hybrid seed (qt.)	7500	60.00	Nil
Contingency	-	2.00	2.00
Total	-	112.00	52.00

Source: WBAFC

During the year 2008-09, we again find a comparatively lower allocation for the scheme ICDP- Coarse Cereals, amounting to Rs. 28 Lakh in total (which is about half the allocation during the previous year), borne out of the first installment of the central release of funds amounting to 2516.434 Lakh for the implementation of the MMA schemes in West Bengal during the year.

However though, the lower allotment for the implementation of the scheme ICDP- Coarse Cereals during 2008-09 appears justifiable to some

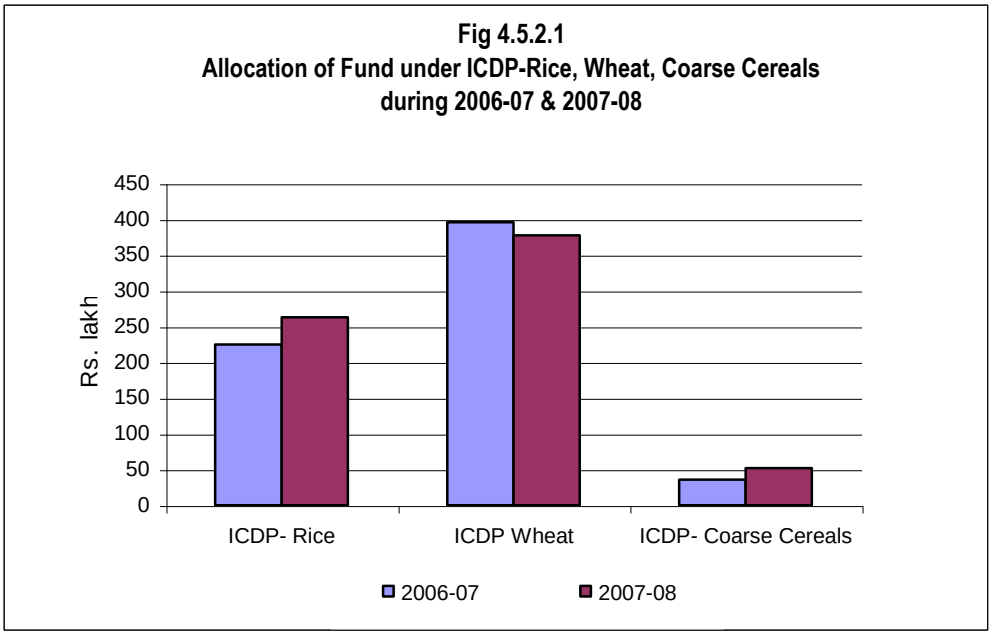
extent considering the fact that the unspent balance of the previous year (2007-08) has also been carried forward to be implemented in 2008-09.

Table 4.5.2.3
Physical Target, Financial Outlay and Fund Sanction under ICDP Coarse Cereals during 2008-09

Components	Physical Target	Fund Allocated	Fund Sanctioned
Training on TOT (nos.)	400	18.00	18.00
Transfer of Technology through Electronic Media	-	7.20	7.20
Contingency	-	2.80	2.80
Total	-	28.00	28.00

Source: GOI Approval No. 6-35/2008 MM, Directorate of Agriculture, Govt. of West Bengal

Fig 4.5.2.1
Allocation of Fund under ICDP-Rice, Wheat, Coarse Cereals during 2006-07 & 2007-08



It should also be noted here that the number of components under the scheme ICDP- Coarse Cereals has been quite low, which again have been changing frequently over the years, apart from training camps for transfer of technology to the farmers. While during 2006-07 Field Demonstration on Hybrid Varieties of Maize with Fertilizer was the major (as well as only) component, Distribution of Hybrid Seed got the focus in 2007-08 and Transfer of Technology through Electronic Media was introduced in 2008-09. All these in turn indicates that the scheme has an area of focus more than it can offer on a consistent basis, especially under limited fund allocation of scarce resources.

4.5.3: THE SCHEME ICDP-CC IN THE SAMPLE DISTRICT

As regarding the implementation of the MMA scheme during 2006-07 in West Bengal in our sample district Birbhum, it can be observed that only Field Demonstration on Hybrid Varieties of Maize with Fertilizer with New Technology for Diversification has been carried out with 100 percent achievement, though against a small target.

Table 4.5.3.1
Physical Targets & Achievements under ICDP- Coarse Cereals in Sample District (Birbhum) during 2006-07 & 2007-08

Components		2006-07		2007-08	
		T	A	T	A
	Distribution of Hybrid Maize (qt.)	50	50	50	50
	Training on TOT (no)	-	-	-	-
3.	Contingency (Rs. In lakh)	.10	.10	0.10	0.08

Source: Directorate of Agriculture, Govt. of West Bengal

During 2007-08, secondary data at the district level suggest that while 50 quintals of hybrid maize has been distributed as per the target, the activity of training programmes on ToT (Transfer of Technology) have not been implemented during the year. However, as per the information obtained from the Office of the Deputy Director of Agriculture, Birbhum the training programmes on ToT out of the unspent balance of 2007-08 were operationalized in the following year 2008-09.

In 2008-09, the component activity of distribution of hybrid maize seed was not implemented in our sample district, as no fund was allotted for the purpose. Rather, as it has been reported by the district officials, training camps on ToT has been carried out to some extent, though the fund for implementing the same actually got disbursed late during the year.

Table 4.5.3.2
Physical & Financial Targets under ICDP- Coarse Cereals in Sample District (Birbhum) during 2008-09

Components		Target		Fund Sanctioned
		Physical	Financial	
	Distribution of Hybrid Maize	-	-	-
	Training on TOT (no)	50	2.50	2.50
3.	Contingency (Rs. In lakh)	-	.10	.10

Source: Office of the Dy. Director of Agril., Suri, Birbhum

All these in turn reveals that the financial stress and delayed release of fund at the State have been translated directly to the district level, at least as has been experienced by our sample district Birbhum. Surely, this needs proper

attention from the implementing agency, as there has been much scope for development of coarse cereals in partly semi-arid districts like our sample district Birbhum.

4.5.4: AN EMPIRICAL STUDY ON THE SCHEME ICDP-CC

As a part of the study, an empirical investigation on the scheme ICDP-Coarse Cereals has been conducted in the Birbhum district of West Bengal. The selection of the district Birbhum has been made in consultation with the implementing agency, viz. Directorate of Agriculture, Government of West Bengal, based upon the suitability of the scheme concerned in the particular district. In fact, the district Birbhum with its scattered semi-arid tracts of lateritic soil offer opportunities for the development of cultivation of coarse cereals in the district. In the absence of proper irrigation facilities in these parts of the district, there remains tremendous scope for the growth in production and productivity of coarse cereals in the district. The sample block selected for the purpose (viz. block Sainthia) shares more or less the same characteristics distinctive for the district. The sample beneficiary farmers have been selected by following a simple random sampling method without replacement from over five randomly selected villages from the list of beneficiaries of the scheme available with the Office of the Agriculture Development Officer of the concerned block, located in the town Ahmodpur.

At the very outset, it needs to be noted that the scheme ICDP-Coarse Cereals has been taken up in West Bengal to cope up with the requirement of the coarse cereals and to bring about an increase in the overall productivity of coarse cereals in the coarse cereals based cropping system areas. Hence, components like organization of field demonstrations, training of farmers in crop production technologies, encouraging production of certified seeds of HYVs etc. has been adopted under the scheme. However, in our sample district Birbhum, the component for 2006-07 was ‘Field Demonstration on Hybrid Varieties of Maize with Fertilizer with New Technology for Diversification’ and the component for 2007-08 was ‘Training on Transfer of Technology’. As such, the present study considers both the years as reference years in case of the empirical investigation on the scheme ICDP-Coarse Cereals. At the same time, though it is reported that the distribution programmes on a number of hybrid seed varieties of coarse cereals (like til, moong, maize, etc.) have been taken up in West Bengal under the scheme in 2006-07, this survey concentrates only upon the maize programme as has been available in the sample district and in the sample block as well.

The results of the empirical investigation have been briefly described as follows.

4.5.4.1: A Socio-Economic Profile of Sample Beneficiary Farmers under ICDP-CC

The socio-economic profiling of the sample beneficiary farmers of the study reveals that the farming economy in the study area has been dominated by the marginal farmers, as 90 percent of the sample beneficiary farmers come from the lowest size-category.

Again, the study area for this particular field investigation on the scheme ICDP-Coarse Cereals falls under a tribal belt, though there is a good presence of other socio-religious classes. In particular, while 42 percent of our sample beneficiary farmers belong to the Scheduled Tribes, another 34 percent of the sample beneficiary farmers come from the General socio-religious category. The SCs (6 percent) and OBCs (8 percent) together constitute only 14 percent of the sample-size.

The rate of literacy for the sample beneficiary farmers turns out to be about 71 percent, which is particularly low at around 67 percent for the marginal sample beneficiary farmers. The average family size for the sample beneficiary farmers stands at 4.98 persons per family on an average.

Table 4.5.4.1.1
Socio-Economic Profile of the Sample Farmers (under ICDP-CC)

Particulars	Marginal	Small	Semi-medium	Medium	Large	Total
No.of Sample Farmers	45	4	1	-	-	50
Scheduled Castes	3 [6.00]	-	-	-	-	3 [6.00]
Scheduled Tribes	21 [42.00]	-	-	-	-	21 [42.00]
Other Backward Castes	4 [8.00]	-	-	-	-	4 [8.00]
General	17 [34.00]	4 [8.00]	1 [2.00]	-	-	22 [44.00]
Literacy	67.42	100.00	100.00	-	-	70.68
Average Family Size	4.98	3.00	11.00	-	-	4.94

Figures in parenthesis indicate percentages to sample-size
Source: Filed Survey

A general profiling of the family composition of the sample beneficiary farmers reveals some important observations, which may be briefly stated as follows.

- First, while the sex ratio for the age groups taken together stands to be 1000:976 on an average, that for the lowest age group turns out to be much lower at 1000:704 as compared to other age groups, which is particularly caused by an even lower sex ratio of the lowest age group among the marginal sample beneficiary farmers. In fact, the sex ratio for the middle age group and the highest age group stands to be 1000: 1049 and 1000:1059 respectively, both inclined in favour of the females.
- Second, the overall sex ratio for the marginal farmers stands at a perfect 1:1, while that for the other size-classes turn out be much lower at

1000:714 and 1000:833 for the small and the semi-medium class respectively.

- Lastly, the overall sex ratio for the working age group (18–60 years) has been inclined towards the females with a ratio of 1000:1049, which is particularly true for the marginal farmers with a male-female ratio of 1000:1068 for the working age group.

Table 4.5.4.1.2
Family Composition of Sample Farmers by Sex & Age Group (under ICDP-CC)

Category of Farmers	< 18		18 – 60		> 60		Total
	Male	Female	Male	Female	Male	Female	
Marginal	23	16	74	79	15	17	224
Small	2	2	4	3	1	-	12
Semi-medium	2	1	3	3	1	1	11
Medium	-	-	-		-		-
Large	-	-	-		-		-
Total	27	19	81	85	17	18	247

Source: Filed Survey

The state of education among the sample beneficiary farmers selected for this particular survey reveals some important observations, which have been briefly described below as follows.

- First, on an average, the survey reveals that the rate of literacy of the sample beneficiary farmers stands at 70.85 percent. While 56 percent of the members of the sample beneficiary farmers turn out to be primary education holders, another 11 percent turns out be secondary education holders, while only 3 percent have qualification of a graduate or above.
- Second, on an average, the rate of literacy of females stands at 63.93 percent, which remains much lower than that of their counterparts, as male literacy stands at 77.60 percent. It needs to be noted here that the literacy rate for the females falls short of that of their counterparts consistently for all the age groups concerned.
- Third, the average rate of literacy has been the highest for the working age group with 76 percent literates, immediately followed by the adolescents' age group (les than 18 years) with 74 percent literates. The average rate of literacy for the highest age group turns out to be much lower at 43 percent only.
- Lastly, while the rate of literacy for the males stands the highest for the lowest age group (81.5 percent) followed by the middle age group (80.3 percent), the literacy rate for the females can be observed to be the highest for the working middle group (71.8 percent) followed by the lowest age group (63.2 percent).

Table 4.5.4.1.3
Distribution of Members of Sample Farmers by Educational Status, Sex & Age Group (under ICDP-CC)

Educational Status	< 18		18 – 60		> 60		Total
	Male	Female	Male	Female	Male	Female	
Illiterate	5	7	16	24	7	13	72
Primary Education Holders	19	9	49	51	6	5	139
Secondary Education Holders	3	3	9	10	3	-	28
Graduate & Above	-	-	7	-	1	-	8
Literate	22	12	65	61	10	5	175
Total	27	19	81	85	17	18	247

Source: Field Survey

Now, a detailed account of the land holding by ownership of the sample beneficiary farmers reveals that though the marginal farmers in this sample survey constitute for about 90 percent of the sample-size, they have a command only over 66.5 percent of the total area under the survey. On the contrary, while the small and semi-medium farmers together form only 10 percent of the sample size, they have a command over 33.6 percent of the area covered under this survey.

On an average, the availability of irrigation for the sample beneficiary farmers stands at 71.9 percent of the total area. While the percentage availability of irrigation turns out to be 74.9 percent for the small farmers, it works out to be 71 percent and 70.5 percent for the marginal and the semi-medium farmers respectively.

Table 4.5.4.1.4
Details of Land Holding of the Farmers by Size-Class (under ICDP-CC)
(Area in Hectares)

Category of Farmers	By Ownership				By Irrigation		Total
	Owned	Leased-in	Leased-out	Others	Irrigated	Un-irrigated	
Marginal	23.38	4.50	.47	.07	19.51	7.97	27.48
Small	8.27	2.67	1.07	.00	7.40	2.47	9.87
Semi-medium	4.00	.00	.00	.00	2.82	1.18	4.00
Medium	-	-	-	-	-	-	-
Large	-	-	-	-	-	-	-
Total	35.64	7.17	1.53	.07	29.73	11.61	41.34

Source: Field Survey

In general, the economic activities of the sample beneficiary farmers, to some extent, carry with it a hint of the particular characteristics of the farming economy in the study region. As such, a detailed account of the distribution of primary occupation of the sample beneficiary farmers under the survey has been considered for the purpose. It remains easy to find that while 72 percent of the sample beneficiary farmers primarily depend upon agriculture and allied activities to earn their livelihood, the remaining 28 percent considers other occupations like business (18 percent) and regular jobs (10 percent) as their prime source of livelihood. Within the agriculture sector, we can find that while agriculture (proper) has been the primary

occupation for 38 percent of the sample beneficiary farmers, the agricultural labourers form 24 percent of the sample size, while another 10 percent are engaged in animal husbandry.

Table 4.5.4.1.5
Distribution of Primary Occupation of the Sample Farmers by Size-Class (under ICDP-CC)

Particulars	Marginal	Small	Semi-medium	Medium	Large	Total
Agriculture	15 [30.00]	3 [6.00]	1 [2.00]	-	-	19 [38.00]
Agricultural Labourer	11 [22.00]	1 [2.00]	-	-	-	12 [24.00]
Animal Husbandry	5 [10.00]	-	-	-		5 [10.00]
Business	9 [18.00]	-	-	-	-	9 [18.00]
Regular Job	5 [10.00]	-	-	-	-	5 [10.00]
Horticulture	-	-	-	-	-	-

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

4.5.4.2: FUNCTIONING OF THE SCHEME ICDP-CC AND ITS IMPACT

As the present survey tries to draw an outline of the socio-economic development of the sample beneficiary farmers over time by studying aspect like income, expenditure etc before and after they received benefits under the scheme, a detailed account of the annual income, expenditure and gross return from agriculture for the sample beneficiary farmers has been calculated for the purpose, which may be described briefly as under.

- First, the study reveals that there has been a quantum jump to the extent of 55.6 percent in the gross return from agriculture in 2007-08 as compared to 2004-05, where the highest increase can be observed for the marginal sample beneficiary farmers (69.6 percent). It should be noted here that the increase has been observed the lowest for the small sample beneficiary farmers to the extent of about 14 percent only.
- Second, though the gross return from agriculture increase at a break-neck rate, the income of the sample beneficiary farmers increased by 37.3 percent in 2007-08 as compared to 2004-05. At the same time, there has been a similar increase on account of annual expenditure borne by the sample beneficiary farmers, which got increased by 36.7 percent in 2007-08 as compared to 2004-05 on an average.
- Third, the increase in income has been the highest for the marginal sample beneficiary farmers (about 40 percent), though the increase in expenditure (21.9 percent) for the particular size-class has been comparatively lower as compared to the increase in expenditure for the other size classes.

The unmatched increase in gross return from agriculture as compared to the increases in income and expenditure, in turn, indicates that the net income from agriculture might have dropped significant over the period concerned. However, the particular phenomenon needs further investigation for

confirmation by incorporating costs of cultivation into consideration, which is beyond the scope of this particular survey.

Table 4.5.4.2.1
Annual Income & Expenditure of the Sample Farmers by Size-Class (under ICDP-CC)

Category of Farmers	Income (Rs.)		Expenditure (Rs.)		Gross Return* (Rs.)	
	2004-05	2007-08	2004-05	2007-08	2004-05	2007-08
Marginal	32924.52	46090.06	22262.32	27125.59	10238.74	17364.78
Small	48351.95	57812.76	23821.95	28699.41	30113.44	34321.77
Semi-medium	105917.97	139941.48	62207.83	85044.22	71280.67	96613.92
Medium	-	-	-	-	-	-
Large	-	-	-	-	-	-
Total	35618.59	48904.90	23186.00	28409.87	13049.55	20306.32

** From Agriculture*

Source: Filed Survey

However, there have been considerable changes in the area under maize cultivation for the sample beneficiary farmers under the scheme. Undoubtedly, the change in area that took place during the period, as observed during the survey, has been the direct impact of the maize seed distribution programmes under the ICDP-Coarse Cereals scheme. In fact, the demonstration of high yielding maize varieties at farmers' field contributed towards the radical increase in the area under coarse cereals in the study region. A number of sample beneficiary farmers, who never tried maize on their field, started cultivating maize under the hybrid maize seed distribution programme supplemented with fertilizers, plant protection materials, nutrients, etc. The changes brought about by the intervention of the scheme are briefly described below, as has been found during the survey.

- First, there has been a quantum positive change in the area under cultivation of maize for the sample beneficiary farmers under the scheme ICDP-Coarse Cereals to the extent of 132.6 percent on an average. The sudden increase in the area under maize cultivation has been particularly true for the marginal and the small sample beneficiary farmers recording increases of 143.7 and 137.4 percent respectively. As it has been mentioned earlier, this all on a sudden increase in the area under ICDP- Coarse Cereals has been primarily owing to the seed distribution programme with fertilizers conducted under the scheme, as has been observed during the survey. The demonstration plots held by the sample beneficiary farmers added to their area under maize cultivation all on a sudden under the scheme.
- Second, there has been a rise in yield rate (kg/hectare) of maize for the sample beneficiary farmers to the extent of 5.7 percent on an average. The increase in yield rate has been particularly prominent for the semi-medium size-class recording an increase of 6.7 percent in 2007-08 as compared to 2004-05.
- Third, the overwhelming increase in the area under maize cultivation of the sample beneficiary farmers taken alongside with the increase in yield rate,

together contributed to an even higher increase in the production of maize for the sample beneficiary farmers. While the total production of maize increased by 157.5 percent in 2007-08 over 2004-05 for the marginal sample beneficiary farmers, that for the small farmers increased by 150.4 percent.

Table 4.5.4.2.2
Changes in Area, Production & Yield of Maize for the Sample Farmers by Size-Class (under ICDP-CC)
(Hectares)

Category of Farmers	Area (ha.)		Production (kg.)		Yield (kg./ha.)	
	2004-05	2007-08	2004-05	2007-08	2004-05	2007-08
Marginal	1.67	4.07	5322.71	13705.03	3187.25	3367.33
Small	1.07	2.54	3322.78	8319.14	3105.40	3275.25
Semi-medium	0.27	0.39	810.00	1248.00	3000.00	3200.00
Medium	-	-	-	-	-	-
Large	-	-	-	-	-	-
Total	3.01	7.00	9455.49	23272.17	3176.96	3356.62

Source: Filed Survey

The key technology adopted for the hybrid maize seed distribution programme was distribution of high yielding varieties of maize with application of fertilizer in balanced dose; maintaining timely irrigation, inter culture, top-dressing, etc. As such, the fertilizers supplied as input-support of the scheme has exerted sufficient impact on the fertilizer use pattern for the sample beneficiary farmers, which has been especially true for the demonstration plot holders of .33 acres each. The major changes that took place in the fertilizer application pattern for the sample beneficiary farmers over the period have been briefly described below.

- First, the rate of application of urea as an essential source of nitrogen declined in 2007-08 as compared to 2004-05 to about 50 percent of the previous rate of application. At the same time the rate of application of DAP as an essential source of phosphate also declined considerably, almost to the same extent as the decline in the rate of application of urea.
- Second, the previous pattern of application of potash by the sample beneficiary farmers has also been reduced to negligible amount (not mention here), whereas the application of fertilizer like Gromass, Gromore, etc. has been adopted.
- Third, there has been a significant rise in the rate of application of the fertilizer IFFCO – N:P:K-10:26:26, which got increased by little less than 4 times the rate of its previous application.

Hence, it is clear that the fertilizer dose for maize cultivation by the sample beneficiary farmers have changed drastically. Understandably, the responsible factor for the external influence that generated the change in fertilizer use pattern of the sample beneficiary farmers may be attributed to the hybrid maize seed distribution programme supplemented with fertilizers. This in effect has generated substantial impact on the dose of particular fertilizers in maize, moving towards a more balanced and judicious application of fertilizers.

Table 4.5.4.2.3

Use of Fertilizers by the Selected Farmers for Maize (under ICDP-CC)

(kg per hectare)

Category of Farmers	2004-05					2006-07				
	Urea	DAP	10:26:26	Potash	Total	Urea	DAP	10:26:26	Gromass	Total
Marginal	134.10	99.15	33.30	23.33	289.88	70.80	50.78	129.15	17.48	268.20
Small	146.25	93.75	54.38	26.25	320.63	95.63	56.25	159.38	20.63	331.88
Semi-medium	150.00	75.00	75.00	37.50	337.50	75.00	75.00	150.00	22.50	322.50
Medium	-	-	-	-	-	-	-	-	-	-
Large	-	-	-	-	-	-	-	-	-	-
Total	135.39	98.24	35.82	23.84	293.29	72.87	51.70	131.99	17.83	274.38

Source: Filed Survey

In case of procurement of seed by the sample beneficiary farmers, it has been found during the field survey that as much as 64 percent of the sample beneficiary farmers have received maize seed from the local ADO office of variety DH-105. Another 28 percent of the sample beneficiary farmers have used their domestic seeds, while only 8 percent of the sample beneficiary farmers purchased maize seeds from the market. However, it should be noted here that the farmers mentioned that hybrid maize seeds are not always available in the local market, and hence they often require to move to the district headquarter to procure the seeds.

Table 4.5.4.2.4
Source of Maize Seed and Seed Rate for the Sample Farmers (under ICDP-CC)

Category of Farmers	Seed Corporation	Open Market	Domestic	Agriculture Department	Seed Rate (kg/ha.)
Marginal	-	4 [8.00]	13 [26.00]	28 [56.00]	26.22
Small	-	-	1 [2.00]	3 [6.00]	24.75
Semi-medium	-	-	-	1 [2.00]	22.50
Medium	-	-	-	-	-
Large	-	-	-	-	-
Total	-	4 [8.00]	14 [28.00]	32 [64.00]	26.03

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

As the seed distribution programme under the scheme ICDP-Coarse Cereals incorporated distribution of hybrid seeds with fertilizer and nutrients, it is understandable the those who have received seeds under the scheme have also received the other inputs, viz. fertilizers, nutrients and ameliorates like IFFCO – N:P:K – 10:26:26- 18 kg.; Macro-Mix-250 gm.; Gomass- 2 kg; and Ciliated Zinc– 150 gm. Packet;- all to be applied for in one bigha (.33 acre) plots.

Table 4.5.4.2.5

Assistance & Incentives Provided to the Sample Farmers by Size-Class (under ICDP-CC)

Category of Farmers	Seed	Fertilizers	Nutrients/Ameliorates
Marginal	28 [56.00]	28 [56.00]	28 [56.00]
Small	3 [6.00]	3 [6.00]	3 [6.00]
Semi-medium	1 [2.00]	1 [2.00]	1 [2.00]
Medium	-	-	-
Large	-	-	-
Total	32 [64.00]	32 [64.00]	32 [64.00]

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

In case of participation of the sample beneficiary farmers in the various trainings conducted under the scheme ICDP- Coarse Cereals, it has been found in the survey that more than one-thirds (68 percent) of all the sample beneficiary farmers have participated in any or the other training programme. In fact, the survey reveals that while 36 percent of our sample beneficiary farmers attended the Transfer of Technology Trainings conducted under the scheme, another 32 percent have participated in the Training Meeting Programmes. It should be noted here that the general attitude of the farmers towards these training programmes has been quite good, as the farmers seemed eager to learn new technologies for such crops like maize, til, moong, etc., which can be sown in between rabi and summer crops.

Table 4.5.4.2.6
Training Programmes Attended by the Sample Farmers (under ICDP-CC)

Category of Farmers	Transfer of Technology	Training Meeting	Organizer
Marginal	17 [34.00]	14 [16.00]	ADO office
Small	1 [2.00]	2 [4.00]	ADO office
Semi-medium	-	-	-
Medium	-	-	-
Large	-	-	-
Total	18 [36.00]	16 [32.00]	-

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

When asked to all the sample beneficiary farmers about the difficulties faced by them in attending the training programmes conducted under the scheme, more than a half (54 percent) of the sample beneficiary farmers held the distance of the venue of trainings as the major bottleneck, as venues of the trainings / meeting are often held in distant from their respective villages. Understandably enough, it remains a tough job to fix the venue of the trainings, as wherever the venue is held, it would appear distant to one or the other sample beneficiary farmers scattered all around the block/Panchayat. This has been followed by the answer, as responded by 32 percent of the sample beneficiary farmers, that participation in training costs other important works. Only 14 percent of the sample beneficiary farmers explained that though they are interested enough about

the trainings, the lack of transport facilities acts as a hurdle in participating in the trainings.

Table 4.5.4.2.7
Difficulties Faced in Attending the Trainings (under ICDP-CC)

Category of Farmers	Too Far	Costs Other Works	No Transport
Marginal	23 [46.00]	15 [30.00]	7 [14.00]
Small	3 [6.00]	1 [2.00]	-
Semi-medium	1 [2.00]	-	-
Medium	-	-	-
Large	-	-	-
Total	27 [54.00]	16 [32.00]	7 [14.00]

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

Table 4.5.4.2.8
Suggestions Given by the Sample Farmers on Trainings (under ICDP-CC)

Category of Farmers	Arrange close to village	Arrange it in the afternoon	Arrange more trainings
Marginal	17 [34.00]	18 [36.00]	10 [20.00]
Small	2 [4.00]	1 [2.00]	1 [2.00]
Semi-medium	1 [2.00]	-	-
Medium	-	-	-
Large	-	-	-
Total	20 [40.00]	19 [38.00]	11 [22.00]

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

Again, when asked for suggestions from the sample beneficiary farmers on the training programmes, it remains significant enough to note that about 22 percent of the sample beneficiary farmers suggested that the training programmes should be arranged more frequently and on diversified topics. However, the rest of the sample beneficiary farmers suggested either about the distance or about the time schedule of the meetings or trainings. In particular, while 40 percent of the sample beneficiary farmers suggested to arrange the training programmes close to their respective villages, another 38 percent of sample beneficiary farmers suggested to arrange the training programme after the daytime, say in the afternoon.

In case of application of soil ameliorates, it remains highly interesting to find that as high as 74 percent of the sample beneficiary farmers have used soil ameliorates in their land plots. However, this has been an illusionary result as most of the sample beneficiary farmers found to have used soil ameliorates have got it through the seed distribution programme under ICDP- Coarse Cereals. If we deduct the respective proportion of such farmers, it comes out

that only 6 percent of the sample beneficiary farmers have used soil ameliorates out of their own interest and own investment. Nevertheless, whatever the proportion of such innovative farmers be, the growing interest on the use of soil ameliorates among the sample beneficiary farmers has been indicative towards adoption of modern technology from within traditional cultivation practices.

Table 4.5.4.2.9
Use of Soil Ameliorates by the Sample Farmers (under ICDP-CC)

Category of Farmers	Gypsum	Pyrite	Lime	Zinc	Source
Marginal	-	-	2 [4.00]	30 [60.00]	ADO office
Small	-	-	-	4 [8.00]	ADO office
Semi-medium	-	-	-	1 [2.00]	ADO office
Medium	-	-	-	-	-
Large	-	-	-	-	-
Total	-	-	2 [4.00]	35 [70.00]	ADO office

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

Table 4.5.4.2.10
Number of Sample Farmers who got their Soil Tested (under ICDP-CC)

Category of Farmers	Dept. of Agril.	Self	NGO
Marginal	1 [2.00]	-	2 [4.00]
Small	1 [2.00]	1 [2.00]	-
Semi-medium	-	-	-
Medium	-	-	-
Large	-	-	-
Total	2 [2.00]	1 [2.00]	2 [4.00]

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

As regards testing of soil for correction of soil acidity / alkalinity, it has been observed during the survey that only 8 percent of the sample beneficiary farmers have got their soil tested. While 2 of the 50 sample farmers have got their soil tests done through the Department of Agriculture, another 2 has got it through NGOs working in this arena. Only 1 out of the 50 sample beneficiary farmers has got it done by self-initiation.

When asked about the reason for not getting their soil tested (to those who have not yet done soil tests), the most frequent answer from the sample beneficiary farmers was that they do not know the whereabouts of the soil tests. In fact, it appeared during the questioning of the farmers that the concept of soil tests has not been clear for the sample farmers. However, about 22 percent of the sample beneficiary farmers responded that the soil testing facilities are not easily available for them, while 10 percent answered alike by explaining that getting soil tests done is a cumbersome procedure which appears difficult

to them. There are also the farmers who readily answered that they are not interested in soil tests, though they form only a fraction (6 percent) of the farming community. All these in turn signifies that there has been a serious lacuna or communication gap regarding the spread of the concept of soil tests within the farming community, which needs proper attention from the concerned departments.

Table 4.5.4.2.11
Reasons Given by the Farmers for Not Getting Their Soil Tested (under ICDP-CC)

Category of Farmers	Not Interested	Not Known	Not Easily Available	Difficult Process
Marginal	2 [4.00]	26 [52.00]	9 [18.00]	5 [10.00]
Small	1 [2.00]	-	1 [2.00]	-
Semi-medium	-	-	1 [2.00]	-
Medium	-	-	-	-
Large	-	-	-	-
Total	3 [6.00]	26 [52.00]	11 [22.00]	5 [10.00]

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

When asked about the choice of the farmers regarding maize seeds available in the market, a majority of the farmers answered that they prefer the hybrid seed variety of Shaktimaan-3, especially for its high yield rate. The second choice of the sample beneficiary farmers was the hybrid variety of Laxmi, which is preferred than the other owing to greater number of cobs.

It should be noted however that none of the sample beneficiary farmers have chosen DH-105 (the seed supplied under the scheme) as the preferred variety of maize, especially owing to lower number of cobs for the variety. At the same time, as has been the observation during the field investigation, the farmers are not happy with the quality of seed supplied under the scheme.

Table 4.5.4.2.12
Farmers' Responses towards the Best Varieties of Maize (under ICDP-CC)

Category of Farmers	Shaktimaan - 3	Laxmi	Reason for the Choice
Marginal	37 [74.00]	8 [16.00]	Shaktiman-3: High yielding hybrid
Small	2 [4.00]	2 [4.00]	Laxmi-3: Greater number of cobs
Semi-medium	-	1 [2.00]	DH-105: lower number of cobs
Medium	-	-	-
Large	-	-	-
Total	39 [78.00]	11 [22.00]	-

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

Regarding the source of information about the scheme ICDP- Coarse Cereals, it has been found that the KPS acts as the major most source of information regarding not only for the scheme ICDP- Coarse Cereals but also for all other Central or State sector schemes. In fact, the KPS of the concerned block has been the source of information for 72 percent of the sample beneficiary farmers, while the remaining 28 percent of the sample beneficiary farmers came to know about the scheme from the Panchayat or its members.

It should also be noted here that neither of the sample beneficiary farmers came to know about the scheme from TV, Radio, Video, etc. nor from Booklets, Newspapers, etc. Though there is enough potential regarding the publicity of the scheme through electronic media, but the potential needs to be tapped in the right direction for an effective mass-campaign for the scheme.

Table 4.5.4.2.13
Source of Information to the Farmer about the Scheme (under ICDP-CC)

Category of Farmers	Booklets	Video Films	Radio	TV	News Paper	KPS	Panchayat
Marginal	-	-	-	-	-	33 [66.00]	12 [24.00]
Small	-	-	-	-	-	3 [6.00]	1 [2.00]
Semi-medium	-	-	-	-	-	-	1 [2.00]
Medium	-	-	-	-	-	-	-
Large	-	-	-	-	-	-	-
Total	-	-	-	-	-	36 [72.00]	14 [28.00]

Figures in parenthesis indicate percentages to sample-size
Source: Field Survey

Finally, when asked about the reason behind not knowing about the scheme before they came to know it from the KPS or Panchayat, most of the sample beneficiary farmers (46 percent) answered that they do not pay visit to the local ADO office on a regular basis. In fact, it appeared that they trust the KPS as the genuine source of information about the existing schemes or newly launched schemes. Again, another 28 percent of the sample beneficiary farmers forwarded a similar explanation that they don't regularly keep in touch with the Panchayat office, and hence did not knew about the scheme. Further, while 22 percent of the sample beneficiary farmers (belonging to the marginal size-class) answered that they do not have the electronic mediums as mentioned above, only a fraction of the sample (4 percent) said that they were not interested in such schemes.

Table 4.5.4.2.14
Reasons Given by the Farmers for Not Knowing About the Scheme (under ICDP-CC)

Category of Farmers	Not Interested	Don't Possess TV/Radio/Etc.	Don't Often Visit Panchayat	Don't Often Visit ADO office
Marginal	2 [4.00]	11 [22.00]	13 [26.00]	19 [38.00]

Small	-	-	1 [2.00]	3 [6.00]
Semi-medium	-	-	-	1 [2.00]
Medium	-	-	-	-
Large	-	-	-	-
Total	2 [4.00]	11 [22.00]	14 [28.00]	23 [46.00]

Figures in parenthesis indicate percentages to sample-size

Source: Filed Survey

4.5.4.3: MAJOR FINDINGS OF THE EMPIRICAL STUDY ON ICDP-CC

Based on this particular empirical investigation on the scheme ICDP-Coarse Cereals, the major findings or the key observations may be described briefly as follows. -

I) There has been a significant increase (55.6 percent) in the gross return from agriculture in 2007-08 as compared to 2004-05, especially for the marginal sample beneficiary farmers (69.6 percent). However, though the gross returns increased sharply, the income of the sample beneficiary farmers increased by 37.3 percent, while expenditure got increased by 36.7 percent on an average. The increase in income has been the highest for the marginal sample beneficiary farmers (about 40 percent), who in turn are the major constituents of the sample-size under the present micro-survey.

II) There has also been a quantum positive change in the area under cultivation of maize for the sample beneficiary farmers under the scheme ICDP-Coarse Cereals to the extent of 132.6 percent, while the rise in yield rate (kg/hectare) of maize increased by 5.7 percent on an average. The overwhelming increase in the area under maize cultivation of the sample beneficiary farmers taken alongside with the increase in yield rate, together contributed to an even higher increase in the production of maize for the sample beneficiary farmers by 157.5 percent, especially for the marginal sample beneficiary farmers.

III) The key technology adopted for the hybrid maize seed distribution programme (viz. distribution of high yielding varieties of maize with application of fertilizer in balanced dose; maintaining timely irrigation, inter culture, top-dressing, etc) has exerted sufficient impact on the fertilizer use pattern for the sample beneficiary farmers, moving towards a more balanced dose and judicious allocation. The rate of application of Urea and DAP as essential sources for nitrogen and phosphorus, declined considerably to about half of its previous rate of application, which has been more than compensated for by a manifold increase in the rate of application of the fertilizer IFFCO – N:P:K-10:26:26.

IV) In case of procurement of seed by the sample beneficiary farmers, the survey finds that as much as 64 percent of the sample beneficiary farmers have received maize seed (variety DH-105) from the local ADO office, while 28 percent used their domestic seeds and 8 percent purchased

maize seeds from the market. However, none of the sample beneficiary farmers have chosen the variety DH-105 (the seed supplied under the scheme) as the preferred variety of maize (owing to lower number of cobs), rather preferred varieties like Shaktimaan-3, Laxmi, etc., especially for higher yield rate.

V) More than two-thirds (68 percent) of all the sample beneficiary farmers have participated in training programmes conducted under the scheme. In particular, while 36 percent of our sample beneficiary farmers attended the Transfer of Technology Trainings, another 32 percent have participated in the Training Meeting Programmes. However, more than a half (54 percent) of the sample beneficiary farmers held the distance of the venue of trainings as the major bottleneck, owing to the fact that the venues of the trainings / meeting are often held at distant places from their respective villages.

VI) Apart from those who have received soil ameliorates under the scheme, only 6 percent of the sample beneficiary farmers can be found to have used soil ameliorates out of their own interest and investment. At the same time, only 8 percent of the sample beneficiary farmers were found to have got their soil tested. In this regard, the most frequent clarification for not getting their soil tested was that they do not know the whereabouts regarding soil tests.

VII) The KPS of the concerned block has been found to act as the prime source of information regarding the scheme ICDP- Coarse Cereals, as also for other Central or State sector schemes. In fact, the KPS of the concerned block has been the source of information for 72 percent of the sample beneficiary farmers, while the remaining 28 percent of the sample beneficiary farmers came to know about the scheme from the Panchayat or its members.

CHAPTER 5
SUMMARY & POLICY IMPLICATIONS

5.1: INTRODUCTION

The Macro Management of Agriculture scheme has been conceived as a major step towards achieving decentralization in pursuance of restoring primacy of the States in agricultural development planning. By integrating the existing 27 Centrally Sponsored Scheme under the Macro Management Approach, it was decided that the Central Government will supplement/complement the State Governments' efforts through regionally differentiated Work Plans comprising crop/area/target group specific interventions, formulated in an interactive mode and implemented in spirit of partnership with the States. As such, the particular objectives of the MMA include - Reflection of local needs/crop/regions specific/priorities etc.; Providing flexibility and autonomy to the States; Optimum utilization of scarce financial resource; Maximization of returns; and Removal of regional imbalances.

The said attempt towards restoring primacy of the states in agricultural development planning by means of providing flexibility and autonomy to the states has been reflected in the fact that the States are theoretically free within given parameters to restructure any/all sub-schemes and their components and include them in their work plan. They are also free to include new interventions in the work plans provided these are not covered under any other scheme of Central Government or is not part of any on-going State Government schemes.

The importance attached to such an attempt towards the decentralization of agricultural development planning and its significance remains established by the fact that the expenditure incurred under the scheme, though registering frequent fluctuations during the period, more than doubled itself within the 7^{th} year of its commencement from 2000-01 to 2006-07 with an annual average growth of about 20 percent per annum. In fact, during the 10^{th} Five Year Plan (2002-07), an expenditure of Rs. 4,154 crore has been incurred as financial commitments towards the scheme. Again, out of the 910 crore budget allocation earmarked for the year 2006-07, a share of 97.5 percent of budget allocation and 97.2 percent of fund release has been subjected to the States and Union Territories.

With such a huge budget allocation for the MMA scheme, it is obvious to observe that there has also been a remarkable physical achievement under the scheme over the years. In particular, it is estimated that during the 10^{th} Five Year Plan (2002-07) the physical achievement under the scheme amounted to the extent of treatment of 24.13 lakh hectares of degraded land on watershed basis, 10.39 lakh hectares of land in river valleys and flood prone rivers, 7.36

lakh hectares of alkali soil and distribution of 17.14 lakh farm equipment under the MMA scheme.

Since its inception in 2000-2001, the Department of Agriculture, Government of West Bengal, has been implementing various schemes under the Macro Management Mode Work Plan with a view to bring about all round development of agriculture in the State of West Bengal. As for the year 2006-07, out of the seventeen schemes identified under the Macro Management of Agriculture Scheme, five sub-schemes are related with the Cooperation Department, and are not functioning in West Bengal. Again, out of the remaining twelve schemes, five schemes have been modified as per the need of the state, while the rest seven schemes were in operation maintaining its original form in West Bengal. These schemes have further been broadly sub-divided into four groups or heads, as – Soil Health Management Group, Natural Resource Management Group, Agricultural Crops & Others Group, and Innovative Schemes Group.

In West Bengal also, immense importance has been attached with the MMA scheme since its implementation. In fact, during the period 2001-02 to 2008-09, a sum of 234.77 crore has been utilized for the implementation of the schemes under MMA, as against a total fund allocation (Govt. of India + Government of West Bengal) of 285.27 crore. The average annual rate of utilization of funds under the MMA scheme in West Bengal thus stands at a moderate of 82.6 percent points. However, while the annual average rate of growth of the share of the Central Government turns out to be 7.5 percent p.a., that for the State Government stands at 12.4 percent per annum.

When compared against the budget allocation, fund release and expenditure under MMA for the year 2006-07 across the States and UTs, the state of West Bengal stands the 9th largest recipient of central budget allocation and fund release, 14th in terms of expenditure, and 20th in terms of unutilized balance. All these in turn seem to indicate a positive approach from the Government of West Bengal towards the all important Macro management of Agriculture scheme.

5.2: OBJECTIVES & METHODOLOGY

The Macro Management of Agriculture Scheme has been considered as the most important vehicle for strategic interventions for technology up-gradation in different crops. Hence, there is always a need to assess the impact of interventions made under the specific sub-schemes under the MMA scheme, so as to examine the impact of such a decentralized approach at the grass-root level and to verify whether or not the local needs has been served with, i.e. whether the objectives of the MMA schemes have been fulfilled.

It remains especially true keeping in view of the fact that ever since the implementation of Macro Management of Agriculture Scheme, study on the impact of its Integrated Nutrient Management Sub-schemes has not been carried out. Hence the present study tries to examine these aspects.

The particular objectives of the study are-

d) to assess the impact of interventions made under the following sub-schemes subsumed under the Macro Management of Agriculture Scheme on production and productivity of various crops with minimum cost -

I) ICDP-Wheat
II) ICDP- Coarse Cereals
III) Foundation / Certified Seed Production of Vegetable Crops
IV) Special Jute Development Programme
V) Sustainable Development of Sugarcane Based Cropping System
VI) Balanced Integrated Use of Fertilizers

e) to analyze the impact of efforts made by the State in increasing the seed replacement rates (crop wise), in terms of ensuring timely availability of sufficient quantity of good quality seeds, and

f) to analyze the impact of the activities to promote Balanced Integrated Nutrient Management to maintain soil fertility and environment.

To fulfill the specific objectives as spelt out earlier, the study is essentially based on both primary and secondary data. The secondary data has been collected from existing literature, published statistical materials as well as from different nodal offices (e.g. Directorate of Agriculture, Bureau of Applied Economics, Directorate of Census Operations, CMIE, etc) at different administrative levels.

The primary data for the study has been collected through conducting a multistage stratified sampling survey without replacement from over five blocks for the five distinct sub-schemes concerned (one block each for five sub-schemes). The selection of blocks has been done in consultation with the officials of the implementing agency at the state level, viz. Directorate of Agriculture, depending upon the performance and availability of data relating to the individual sub-schemes concerned.

The sample blocks/districts identified for the study were Block Ausgram-I from Barddhaman District, Blocks Bolpur-Sriniketan and Sainthia from Birbhum District and Blocks Habra-I and Basirhat-I from North 24 Parganas District. The sample blocks/districts identified for the study were Block Ausgram-I from Barddhaman District, Blocks Bolpur-Sriniketan and Sainthia from Birbhum District and Blocks Habra-I and Basirhat-I from North 24 Parganas District.

The sample units in the study were the sample beneficiary farmers obtaining either physical or financial benefits directly in any form under the sub-schemes concerned. In total, a pool of 250 sample beneficiary farmers together (50 each for the 5 sub-schemes concerned) constitutes the sample size

in this study. The primary data was collected by conducting an intensive field survey by way of interviewing each and every sample beneficiary farmer by following a rigorous questionnaire on various socio-economic activities.

A few important technical aspects relating to the reference year and coverage of schemes for the present study are as follows –

- As the Government of West Bengal has suitably restructured the scheme 'Foundation / Certified Seed Production of Vegetable Crops' modified as 'Strengthening of Seeds Farms and Production of Quality Seeds' of cereal crops, the objectives specified in (a-iii) and (b) has been ruled out from the present study accordingly.
- The Government of West Bengal has also restructured the scheme 'Balanced and Integrated Use of Fertilizers' as 'Soil Health Management'. However, as the component activities under the scheme have maintained its original form to a considerable extent, the scheme has thus been incorporated in the study under valid justifications.
- The scheme 'ICDP- Wheat' has also been modified as 'Dissemination of New Technology through Diversification of Suitable Crops'. Nevertheless, as the scheme incorporates component programmes on wheat to a considerable extent, the said names of the scheme has been considered as synonymous in the study, and has thus been incorporated under valid ground.
- The reference year for the study, in general, pertains to the year 2006-07 and 2007-08 for secondary data at the state and the block levels. However, depending upon the availability of data, the period has been extended to 2008-09 as well to cope up with the present state of the sub-scheme schemes. On the other hand, unavailability of secondary data for the said reference years, in particular cases, led to the shifting of the reference year to the next available year for secondary data analysis.
- All primary data relating to the particular sub-schemes pertain to the crop year 2007-08, and to crop year 2004-05 as and where necessitated (in case of before & after analysis). Hence, while the period 'before' refers to the crop year 2004-05 (before the farmers became beneficiaries under the sub-schemes), the period 'after' refers to the crop year 2007-08 (after the farmers became beneficiaries under any component activity of the sub-schemes).

5.3: THE STUDY AREA

The present study is essentially based on the West Bengal agriculture, which plays such a pivotal role in the State's economy that nearly three out of every four persons is directly or indirectly involved in agriculture. Though the state has only 3 percent of cultivable land, it accounts for 8 percent of the total food grains produced in the nation. The major crops grown in the state include Rice, Wheat, Jute, Tea, Potato, Sugarcane, Pulses and Oilseeds etc. The state is the highest producer of rice in the nation; about 60 percent of the raw jute is produced in the state. Though West Bengal has faced a gradual decline in the net cropped area over the decades, it has got more than equally compensated by a sharp rise in the cropping intensity from 159 percent to 182 percent, as a result of an increase in the gross copped area. The proportion of HYV

cultivation in case of principal crops, especially rice and wheat taken together, seems to have achieved a plateau in the current decade. The importance of agriculture in the State's economy is reflected in the fact that the contribution of primary sector stands at 26 per cent to the total NSDP in 2006-07 (at constant 1999-2000 prices) supporting employment of nearly 58 per cent of its rural workforce as per census 2001.

For the fulfilment of the objectives of the study, a total number of three district of West Bengal, namely Birbhum, Barddhaman and North Twenty Parganas, have been selected as the sample districts, each belonging to distinct agro-climatic zones based on landform hydrology. In particular, while the district Birbhum falls under the Red & Lateritic Zone, district Barddhaman and district North Twenty Parganas belong to the Old (Vindhya) Alluvial Zone and New (Gangetic) Alluvial Zone respectively. Brief agricultural profiles for these district may be present as-

- Birbhum is primarily an agricultural district with around 75 percent of the people dependent on agriculture. Rice is the major crop of this district and occupies about 70percent of the grossed cropped area. The other important crops are wheat, potato, mustard, vegetables, sugarcane and pulses. The district has attained surplus production in case of paddy, potato and vegetables.
- Agriculture in North 24 Parganas has witnessed a remarkable increase in food grain production. The district also contributes significantly towards the West Bengal horticultural produces and is taking shape as a 'Horticulture Hub' of the state. The commercial production of vegetables like tomato, cabbage, cauliflower, pea, brinjal, ladies finger, beans, potato etc. has grown rapidly over the years owing to favourable agro-climatic conditions of the district.
- The district Barddhaman has also been a predominantly agricultural district with 58 percent of the total population belonging to the agricultural population. The district is properly known as the granary of West Bengal. Rice is the most important crop of the district, while among commercial crops, jute, mesta, sugarcane, potato, oil seeds etc. are also cultivated in marginally.

5.4: RESULTS OF THE STUDY

The key observations and the major findings of the empirical investigations relating to the respective sub-schemes can be described here in brief as impact of interventions made under the sub-scheme concerned. A scheme-wise description of the key observation and the major findings has been present here as follows. -

5.4.1: MAJOR FINDINGS ON SUBACS

XI) The impact of interventions under the SUBACS scheme has been found to have manifested itself primarily through a marked increase in the area under

sugarcane cultivation, yield rate and production of sugarcane for the beneficiary farmers, especially for the marginal farmers.

XII) With the increase in production and productivity of the sample beneficiary farms, a quantum positive change occurred in income, expenditure and gross return from field crops of the beneficiary farmers, especially for the small and the marginal farmers.

XIII) With the input-support received under the scheme in the form of important inputs like fertilizers, plant protection materials, sugarcane seed, etc, radical changes have taken place in the application of fertilizers, plant protection inputs, etc. of the sample beneficiary farmers towards a more balanced and judicious application of fertilizers.

XIV) As an impact of the interventions made under the scheme, the participation of the sample beneficiary farmers in the demonstrations programmes or training camps organized by the immediate implementing authority of the scheme (viz. the ADO, Sugarcane of the concerned block) turns out be quite high, which in turn reflects the initiative from the farmers' side to adopt new technologies under modern cultivation practices.

XV) The impact of the demonstrations under the scheme has manifested itself through a gradual change in the cultivation techniques adopted by the sample beneficiary farmers. Moving away from the traditional format, the farmers are found to have been changing their attitude towards modern cultivation techniques with high yielding varieties of high yielding seeds (here, BO-91), balanced fertilizer use with required soil ameliorates based upon soil tests.

XVI) There has been a serious lacuna in case of information regarding the scheme, as none of the sample beneficiary farmers learnt about the scheme though a printed or electronic media. Rather, there has been an important role played by the KPS and the Panchayat as sources of information on the scheme.

5.4.2: MAJOR FINDINGS ON BIUF

XI) The impact of interventions under the scheme BIUF (or 'Soil Health Management' in case of West Bengal) has found to have played a significant role regarding positive changes in the area under cultivation, yield rate and production of main crop (viz. paddy-kharif). While the area under cultivation in kharif increased marginally, the area under cultivation in boro and rabi increased to a considerable extent, resulting into a quantum jump in the cropping intensity of the sample beneficiary farmers over the period. The phenomenon has been especially true for the marginal sample beneficiary farmers.

XII) There have been positive changes in gross return, income and expenditure of the sample beneficiary farmers, which in turn indicate towards a phenomenon of manifestation of the impact of the interventions made under the scheme on the socio-economic condition of the beneficiary farmers, especially marginal farmers. At the same

time, though the costs of paddy cultivation in kharif recorded an increase, the corresponding increase in income (gross income/hectare) more than compensated for the loss arising out of the increase in costs.

XIII) The impact of the interventions made under the scheme in attaining a balance in fertilizer application among the beneficiary farmers and reviving soil health has been indirectly reflected in the reorganization of chemical fertilizers doses among the sample beneficiary farmers. The growing rate of application of chemical fertilizers (e.g. urea, DAP, etc.) in supplementing nitrogen and phosphorus of soil has been reversed to some extent for the sample beneficiary farmers, primarily due to an increase in the rate of application of bio-fertilizers, organic manure, compost, vermi-compost, etc. under the scheme BIUF.

XIV) The participation of sample beneficiary farmers in demonstrations on Green Manuring, Micro Nutrient Application and Organic Manure & Herbal Products, etc. organized by the concerned ADO office under the scheme has been found to be quite high reflecting growing interest of the farmers in adopting modern cultivation practices, with the assistances on bio-fertilizers, enriched-compost, micro-nutrients, green-manure, etc under the scheme BIUF.

XV) Though distribution of soil ameliorates was a component activity under the BIUF scheme, only a few of the sample beneficiary farmers have actually used soil ameliorates in their farmland. In fact, about ¼ of the sample beneficiary farmers do not know the whereabouts regarding soil tests, which indicates towards lack of propagation or mass-campaign in favour of soil tests.

XVI) Though there is a provision of publicity campaign under the scheme, only a handful of the sample beneficiary farmers came to know about the scheme through the activities on publicity campaign. Rather, the dominant sources of information about the scheme BIUF are found to be the KPS and the Gram Panchayat.

5.4.3: MAJOR FINDINGS ON SJDP

XI) The key strategy adopted under the scheme SJDP towards the development of jute cultivation appears to have exerted a significant positive impact on the area, production and productivity of jute for the sample beneficiary farmers. This has particularly come through the production technology demonstration on jute with balanced fertilizer dose and proper plant protection technology conducted on land-plots belonging to the sample beneficiary farmers under the scheme.

XII) The manifestation of the impact of interventions made under the scheme concerned in terms of positive changes in area, yield-rate and

production of jute turn out to have in turn caused a significant rise in income, expenditure and gross return from field crops for the beneficiary farmers.

XIII) The fertilizer-use pattern has changed radically after the intervention of the SJDP scheme mainly through demonstration programmes conducted under the scheme, thereby reflecting a positive attitude of the sample beneficiary farmers towards a more balanced and judicious use of fertilizer with proper plant protection techniques. This has been clearly established considering that one-thirds of the sample beneficiary farmers have used soil ameliorates in their plots, while more than half of the sample beneficiary farmers have got their soil tested to revive pH balance and soil health.

XIV) The component activities under the scheme, especially demonstration programmes, has grown interests among the sample jute cultivators on acquiring knowledge on various technological aspects of modern cultivation practices, which is reflected through a higher rate of participation of beneficiary farmers in demonstration programmes and training camps, organized by the ADO office under the scheme.

XV) The prime source of information about the scheme has been the local KPS, and not any printed or electronic media, which in turn indicates that there has been an information gap with the masses in terms of campaigning for the scheme.

5.4.4: MAJOR FINDINGS ON ICDP-W

XI) Under the intervention of the scheme ICDP-Wheat (modified as 'Dissemination of New Technology through Diversification of Suitable Crops'), the area and yield rate of wheat witnessed significant positive changes for the sample beneficiary farmers, primarily through the technology demonstration programmes- which in turn brought about an increase in the production of wheat in consequence.

XII) With the increase in area and yield rate of wheat, the gross return from agriculture for the sample beneficiary farmers increased to a large extent, resulting into considerable rise in the income of the sample beneficiary farmers, though the positive impact of the increases in gross return and income has been outweighed by an even greater increase in expenditure.

XIII) There has been a positive impact of the scheme on fertilizer application pattern of the beneficiary farmers also, as the key technology adopted in the demonstrations was to promote diversification of crops through increase in production and productivity with balanced use of fertilizers. In particular, the

application of MOP and DAP per unit of land increased considerably, while there has been a marginal increase in the rate of application of urea. These changes appear to have occurred as a direct influence of the scheme primarily through crop production technology demonstrations with seed-fertilizer support.

XIV) The interventions under the scheme appears to have provided the much required impetus for a mass-adoption of modern cultivation techniques, as the participation of the sample beneficiary farms in various training programmes conducted under the scheme has been quite high, though that for the demonstration programmes has been found to be moderate.

XV) There is an indication that the farmers are assigning greater importance on aspects of scientific cultivation techniques like soil tests and use of soil ameliorates, though it is restricted to only to a few farmers. This has immense significance in the sense that there is much scope for a mass-campaign for soil tests, even within the most advanced agricultural districts of West Bengal.

XVI) The major sources of information about the scheme turn out to be the KPS of the concerned block and the Panchayat, whereas the printed or electronic media has not played any significant role in this respect.

5.4.5: MAJOR FINDINGS ON ICDP-CC

VIII) The impact of interventions made under the scheme ICDP-Coarse Cereals appears to have brought about overwhelming increase in the area under cultivation of maize for the sample beneficiary farmers, which in turn, with the increase in yield rate, contributed to an even higher increase in the production of maize. At the same time, the manifestation of the impact of the scheme through increase in production and productivity of maize resulted into significant increase in the gross return from agriculture, income as well as expenditure for the sample beneficiary farmers under the scheme.

IX) The key technology adopted for the hybrid maize seed distribution programme (viz. distribution of high yielding varieties of maize with application of fertilizer in balanced dose; maintaining timely irrigation, inter culture, top-dressing, etc) has exerted significant impact on the fertilizer use pattern for the sample beneficiary farmers towards a more balanced and judicious use of fertilizers.

X) As an impact of the interventions made under the scheme, the participation of the sample beneficiary farmers in training camps organized by the immediate implementing authority turns out be quite high. In particular, more than two-thirds of the sample beneficiary

farmers found to have participated in various training programmes conducted under the scheme, which in turn reflects the initiative from the farmers' side to adopt new technologies under modern cultivation practices.

XVII) The KPS of the concerned block has been found to act as the prime source of information regarding the scheme ICDP- Coarse Cereals, as also for other Central or State sector schemes, whereas the printed or electronic media fails to act as a source of information in this respect.

5.5: POLICY IMPLICATIONS

The major policy recommendations based on the facts and findings as emerged from the study have been briefly described below as follows.-

- Though the increasing budget allocation and fund sanction for the schemes reflects a positive approach from the Government of West Bengal towards the Macro management of Agriculture scheme, the issue of unutilized balances deserves proper attention from the concerned authority to work upon, especially when there has been much scope for flexing autonomy in the allocation of resources in agricultural development planning under the MMA scheme. *[Attention: Department of Agriculture, Government of West Bengal]*
- There are a number of issues regarding the input-support extended under the scheme concerned, which need due attention from the implementing agency at the sharpest. The most important of them is that the inputs supplied for demonstrations and to the demonstration plot holder farmers reach the farmers so late that they have to purchase the inputs from the open market to makeup for the delay, else suspend cultivation running out of required inputs. *[Attention: Inputs Department, Directorate of Agriculture, Government of West Bengal]*
- In a highly marginalized economy like in West Bengal, the lower ceiling on demonstration plots of 0.50 hectares needs to be

reconsidered as land plots suitable for sugarcane cultivation of 0.50 hectares at a stretch is rarely available with the common farmers. Though reorganizing demonstration plots as a conglomeration of numerous small tracts of few decimals only belonging to a group of farmers may evoke a cooperative attitude among the farmers, it may also inversely cause difficulties in the distribution of input-supports among contributory farmers of the demonstration plots, as has been observed in the study. *[Attention: Department of Agriculture, Government of West Bengal]*

- Often the subcomponents under the schemes concerned are entrusted with the local Panchayat offices (e.g. distribution of hybrid wheat seeds), which do not report back the progress of the specific task or its status. The concerned authorities should consider this as a serious flaw in the strategy for implementation of the components of the schemes concerned, as this in turn results into a number of hurdles in the proper implementation of the schemes or to keep track of the progress achieved under the schemes concerned. *[Attention: Ministry of Panchayat, Government of West Bengal; Department of Agriculture, Government of West Bengal]*
- In the process of transformation of the farming economy from its traditional practices to the adoption of modern technologies of farming., the role of soil tests acquire immense significance to facilitate balanced use of fertilizers, nutrient, ameliorates, etc. However, time and again, it has come out that a large section of the farming economy does not know the whereabouts regarding soil tests, even in the agriculturally advanced districts. This surely desires much attention from the concerned authorities as the phenomenon indicates towards an acute need of mass-campaigns in favour of soil test based judicious application of inputs. At the same time, the official procedure for obtaining the soil testing facilities should not be much complicated so as to enable each and every member of the farming community to come to the soil test net. *[Attention: Department of Agriculture, Government of West Bengal]*
- Though the strategy for employing KPSs has been a story of success as being the most prominent source of information regarding the scheme concerned, as also for other agricultural schemes, the fact remains that there exists a serious lacuna of the schemes under MMA regarding publicity campaign programmes. This deserves much attention from the implementing authority as well as from the masses to sustain the advent of the schemes. Here, the effectiveness of the electronic media (TV, Radio, etc.) should be considered with due importance, as they can become good weapons of mass-communication and mass-publicity for the schemes concerned for both the literate and illiterate farmers. *[Attention: Ministry of Agriculture, Government of India; Department of Agriculture Government of West Bengal]*

Obviously, the tasks are many and performing of these tasks enumerated above would require coordinated efforts among different departments of the government.

Nevertheless, considering the broader objectives of the MMA scheme, the aforesaid tasks boil down only to minor corrections in the strategies for implementation of the schemes concerned, so as to sustain the Macro Management Mode in its glory of success.

ANNEXURE TO 3.1.3 (A)

Area under Principle Crops: West Bengal

	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05
	5812.9	5713.3	5694.6	5875.5	5772.7	5953.4	5800.6	5900.3	5904.1	6150.4	5435.3	6069.1	5842.1	5856.6	5783.6
	610.3	540.4	532.5	539.6	518.8	510.5	461.7	423.1	425.0	427.2	394.0	402.5	385.0	339.8	320.8
	896.1	934.4	860.7	1045.0	1043.3	1160.1	1056.4	1206.9	1450.5	1474.3	1401.8	4211.6	4051.0	4126.7	4086.4
	4306.5	4244.5	4301.4	4290.9	4210.6	4282.8	4282.4	4270.3	4028.6	4248.9	3639.5	1455.0	1406.1	1390.1	1376.4
	269.1	248.1	272.1	306.9	325.6	337.8	351.1	367.4	367.5	364.2	426.0	434.0	405.4	425.7	400.1
	10.3	7.4	6.3	6.0	4.7	7.1	5.4	6.1	5.9	5.1	3.5	2.6	2.5	3.1	2.4
	64.6	47.8	53.7	52.3	44.2	45.2	34.5	43.5	38.5	35.1	35.3	33.3	27.7	55.5	64.6
	0.7	0.6	0.6	0.4	0.4	0.4	0.9	0.9	0.9	1.2	1.0	1.2	1.6	-	-
	0.4	0.3	0.3	0.3	0.4	0.2	0.2	0.2	0.2	0.1	0.3	0.4	0.3	-	-
	13.1	12.8	12.5	12.4	12.4	12.9	12.5	12.6	12.9	12.5	12.7	12.8	13.5	-	-
Millets	10.6	7.8	6.8	8.6	6.1	5.5	7.1	5.1	5.0	5.2	4.3	4.6	4.2	-	-
Cereals	-	-	-	-	-	-	-	-	-	-	-	-	-	19.0	17.7
ereals	6181.8	6044.1	6046.1	6262.4	6166.5	6362.5	6212.3	6336.1	6335.0	6573.8	5918.4	6558.0	6197.3	6359.9	6268.4
	25.6	17.8	20.3	18.9	24.3	31.5	29.0	25.5	23.3	26.6	54.7	50.8	47.5	46.5	38.0
har)	5.8	4.3	4.6	6.2	3.8	3.8	3.4	3.6	2.6	3.1	8.9	3.9	3.1	3.4	1.5
	15.5	-	-	-	-	12.2	-	-	-	10.9	11.2	10.9	9.8	11.1	11.7
	73.8	-	-	-	-	44.1	-	-	-	58.8	76.0	71.4	68.7	69.4	62.7
i	44.8	-	-	-	-	27.9	-	-	-	23.1	40.4	34.7	32.8	35.7	35.0
Rabi Pulses	-	170.9	169.1	162.5	113.7	-	123.1	119.2	116.5	-	-	-	-	-	-
Kharif Pulses	-	76.9	82.0	81.4	85.6	-	79.0	73.6	61.3	-	-	-	-	-	-
Pulses	148.5	-	-	-	-	93.2	-	-	-	91.6	83.3	77.4	79.9	85.8	77.5
ulses	314.0	269.9	276.0	269.0	227.4	212.7	234.6	221.9	203.7	214.1	274.5	249.1	241.8	251.9	226.4
oodgrains	6495.8	6314.0	6322.9	6531.4	6393.9	6575.2	6446.9	6558.0	6538.7	6787.9	6192.9	6807.1	6539.1	6611.8	6494.8
ed & Mustard	378.1	412.3	393.2	380.9	377.7	327.5	319.4	327.1	344.4	346.0	436.0	439.6	408.3	452.0	457.5
d	8.5	10.2	9.3	12.3	13.7	15.0	10.6	16.5	10.3	9.8	11.9	11.3	8.9	6.0	5.3
e (Til)	99.3	122.7	91.8	114.8	108.7	115.3	142.5	127.9	100.4	105.4	107.2	108.6	110.9	163.3	148.3
Oilseeds	27.3	28.4	27.6	24.3	30.8	38.8	36.5	36.6	38.0	41.4	43.5	44.7	40.3	63.7	62
ilseeds	513.2	573.6	521.9	532.3	530.9	496.6	509.0	508.1	493.1	502.3	598.6	604.2	568.4	685.0	673.1
	500.2	573.4	493.3	475.2	507.9	515.8	620.1	641.6	612.1	613.9	613.0	651.8	636.1	620.4	569.2
	9.1	13.1	11.1	7.5	6.6	9.3	9.3	9.7	9.9	8.9	10.9	10.6	8.2	9.7	8.6
	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.8	1.2	1.8	0.8	-	-
np	2.0	2.0	2.0	2.3	2.3	2.1	2.2	2.0	1.8	1.5	1.5	1.5	1.4	-	-
ibre	-	-	-	-	-	-	-	-	-	-	-	-	-	2.7	2.5
bres	511.4	588.6	506.5	485.1	516.9	527.3	631.7	653.5	624.2	625.1	626.6	665.7	646.5	632.8	580.3
	101.2	101.9	101.0	102.2	99.9	101.2	102.6	104.0	103.1	103.2	107.5	108.8	109.4	113.4	114.0
ane	12.2	17.0	15.4	10.3	10.6	17.2	24.9	25.8	26.9	22.9	21.6	23.3	19.5	16.9	15.6
o	12.7	13.9	11.7	12.0	12.6	13.3	11.8	10.7	11.8	11.4	10.5	9.7	7.8	13.0	15.1
	194.5	229.0	220.8	230.9	232.3	255.9	314.3	284.0	318.2	315.8	299.7	299.8	349.3	308.4	320.6
llies	48.8	51.5	55.1	53.8	53.6	58.6	58.9	64.0	64.4	63.1	61.5	61.0	61.7	-	-
ger	5.3	6.4	6.9	7.2	8.0	8.1	8.8	9.1	9.4	9.2	9.3	9.3	9.4	-	-
	-	-	-	-	-	-	-	117.25	128.00	130.24	133.70	147.57	152.20	160.90	166.29
bles	-	-	-	-	-	-	-	770.00	800.00	806.40	827.75	874.87	827.75	859.87	868.41

Source: Statistical Handbook, Various Issues, Directorate of Agriculture, Governi
Economic Review, Various Issues, Bureau of Applied Economics & Statistics, Governi

ANNEXURE TO 3.1.3- (B)

Estimates of Area, Yield Rate & Production of Major Crops in West Bengal during 1998-99 to 2007-08

No.	Crop		1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
1.	Aus (Rice)	A	425002	427155	393944	402547	384965	339753	320822	288129	283859	281618
		Y	1743	1938	1736	2091	2069	2117	2036	2102	2027	2009
		P	740680	827970	683950	841832	796652	719205	653044	605662	575294	565825
2.	Aman (Rice)	A	4028620	4248946	3639538	4211562	4051084	4126706	4086404	4112863	4001936	3926544
		Y	1900	1992	1979	2374	2319	2339	2441	2397	2411	2350
		P	7653780	8463310	7202760	9999955	9393991	9653580	9974734	9858092	9649942	9227590
3.	Boro (Rice)	A	1450473	1474338	1401841	1454990	1406078	1390148	1376387	1381957	1401233	1511593
		Y	3393	3031	3240	3034	2986	3086	3093	2928	3226	3259
		P	4921984	4468400	4541328	4414877	4198595	4289455	4257111	4047038	4520656	4926105
4.	Total Rice	A	5094095	6150439	5435323	6069099	5842127	5856607	5383613	5782949	5687028	5719755
		Y	2255	2237	2287	2514	2463	2504	2574	2509	2593	2573
		P	13316444	13759680	12428038	15256664	14389238	14662240	14884889	14510792	14745892	14719520
5.	Wheat	A	367472	364155	426000	434004	405350	425721	400093	366729	350621	352579
		Y	2117	2336	2485	2215	2189	2315	2103	2109	2281	2602
		P	778090	850778	1058610	961533	887437	985686	841473	773514	799876	917284
6.	Barley	A	5938	5077	3471	2622	2459	3077	2421	2403	2848	2058
		Y	995	923	524	1077	952	1346	1672	1248	916	1316
		P	5910	4686	1820	2825	2341	4142	4047	3000	2610	2709
7.	Jowar	A	886	1156	1016	1194	1643	1308	1498	1439	1395	1659
		Y	467	467	513	551	751	487	433	391	434	421
		P	414	540	521	658	1234	637	649	562	606	698
8.	Bajra	A	175	146	313	425	332	258	129	55	79	64
		Y	480	658	818	758	759	694	349	345	393	364
		P	84	96	256	322	252	179	45	19	31	23
9.	Maize	A	38519	35129	35267	33288	27724	55530	64629	71753	85446	77173
		Y	3145	1984	2503	2596	1995	2270	2948	2888	2967	3167
		P	121161	69682	88264	86409	55300	126059	190546	207252	253505	244373
10.	Ragi	A	12895	12489	12651	12730	13517	13577	13065	12621	13135	13062
		Y	1213	1205	1205	1144	1157	1151	1200	1213	1140	1145
		P	15648	15051	15242	14558	15639	15625	15684	15315	14974	14955
11.	Small Millets	A	4977	5207	4346	4610	4156	3791	2999	3283	3254	3137
		Y	656	665	675	678	776	791	887	924	925	956
		P	3264	3465	2933	3125	3223	2997	2661	3035	3010	2999
12.	Total Cereals	A	6334957	6573798	5918387	6557972	6297308	6359869	6268447	6241232	6143806	6169487
		Y	2248	2237	2299	2490	2438	2484	2543	2486	2575	2578
		P	14241015	14703978	13595684	16326094	15354664	15797565	15939994	15513489	15820504	15902561
13.	Gram	A	23286	26618	54685	50832	47538	46492	37987	40038	31212	25112
		Y	815	825	917	851	780	1026	1024	911	768	983
		P	18971	21961	50170	43235	37084	47678	38896	36464	23978	24695
14.	Tur (Arhar)	A	2606	3077	8868	3938	3075	3361	1481	1830	2044	1097
		Y	641	754	669	830	913	1006	710	866	691	810
		P	1672	2320	5930	3268	2806	3382	1052	1584	1412	889

Source: Evaluation Wing, Government of West Bengal

ANNEXURE TO 3.2.1

Estimates of Area (ha.), Yield Rate (kg/ha.) and Production (tonnes) of Principal Crops during 2005-06 to 2007-08
District: Birbhum

Crop	Area			Yield Rate			Production		
	2005-06	2006-07	2007-08	2005-06	2006-07	2007-08	2005-06	2006-07	2007-08
A. Cereals									
Aus Rice	5233	6086	4788	2481	2591	2631	12986	15768	12599
Aman Rice	314476	312799	314944	3016	3070	3044	948410	960320	958708
Boro Rice	48836	64521	74238	3173	3462	3359	154942	223353	249379
Total Rice	368545	383406	393970	3029	3128	3098	1116338	1199441`	1220686
Wheat	30128	31701	32147	2511	2643	2952	75649	83788	94900
Total Maize	162	268	502	1457	1619	1125	236	434	565
Total Other Cereals*	85	73	-	1242	1014	-	106	74	-
Total Cereals	398920	415448	426619	2989	3090	3085	1192329	1283737	1316151
B. Pulses									
Gram	11557	12426	9501	826	792	1166	9549	9843	11083
Tur	21	2	26	797	605	468	17	1	12
Total Mung	32	238	501	406	336	912	13	80	457
Total Maskalai	210	216	116	229	343	302	48	74	35
Masur	4545	5973	5974	620	729	916	2819	4352	5474
Matar	269	212	106	1266	604	717	341	128	76
Khesari	1399	1064	1181	1100	1185	734	1538	1261	867
Kulthi	180	150	165	310	408	402	56	61	66
Soyabean	56	32	41	482	510	541	27	16	22
Other Kharif Pulses	208	321	237	433	436	432	90	140	102
Total Pulses	18477	20634	17848	785	773	1019	14498	15956	18194
Total Foodgrains	417397	436082	444467	2891	2980	3002	1206827	1299693	1334345
C. Oilseeds									
Total Til	1897	3015	3364	896	920	949	1699	2773	3191
Rapeseed & Mustard	34561	34720	32330	934	1019	1161	32282	35393	37542
Linseed	85	239	320	224	254	150	19	61	48
Total Groundnut	145	250	206	1386	1780	1359	201	445	280
Sunflower	75	11	32	1087	1500	940	82	17	30
Safflower	58	48	75	313	503	842	18	24	63
Castor	-	-	-	-	-	-	-	-	-
Niger	-	-	-	-	-	-	-	-	-
Total Oilseeds	36821	38283	36327	932	1011	1133	34301	38713	41154
D. Other Major Crops									
Jute**	179	353	109	18.16	17.76	16.71	3251	6269	1821
Sugarcane	1431	1547	1548	64043	66717	76096	91646	103211	117796
Total Potato	13796	16537	17798	20511	8538	22111	282973	141185	393540
Total Tobacco	-	-	-	-	-	-	-	-	-

* Includes Barley, Ragi, Jowar, Bajra, Millets
** Yield Rate in bales/ha. And Production in bales (1 bale = 180 kg.)

Source: Evaluation Wing, Government of West Bengal

ANNEXURE TO 3.2.2

Estimates of Area (ha.), Yield Rate (kg/ha.) and Production (tonnes) of Principal Crops during 2005-06 to 2007-08
District: North 24 Parganas

Crop	Area	Yield Rate	Production

	2005-06	2006-07	2007-08	2005-06	2006-07	2007-08	2005-06	2006-07	2007-08
A. Cereals									
Aus Rice	18148	17719	20861	2409	2612	2157	43726	46279	44993
Aman Rice	162284	170626	157175	2401	2390	2576	389682	407810	404941
Boro Rice	96675	89707	95528	2937	3031	3085	283954	271884	294718
Total Rice	277107	278052	273564	2589	2611	2722	717362	725973	744652
Wheat	7444	7043	6966	2178	2397	2562	16214	16885	17849
Total Maize	3	-	58	2000	-	3362	6	-	195
Total Other Cereals*									
Total Cereals	284554	285095	280588	2578	2606	2718	733582	742858	762696
B. Pulses									
Gram	819	713	510	990	675	846	811	481	432
Tur	40	35	9	1094	495	1114	44	17	10
Total Mung	297	148	59	306	372	644	91	55	38
Total Maskalai	1730	2190	836	840	747	967	1454	1636	808
Masur	6751	8840	6537	618	490	652	4173	4331	4259
Matar	1109	855	645	796	692	712	882	592	459
Khesari	685	822	556	836	888	966	573	730	537
Kulthi	-	-	-	-	-	-	-	-	-
Soyabean	-	-	-	-	-	-	-	-	-
Other Kharif Pulses	-	-	-	-	-	-	-	-	-
Total Pulses	11431	13603	9152	702	576	715	8028	7842	6543
Total Foodgrains	295985	298698	289740	2506	2513	2655	741610	750700	769239
C. Oilseeds									
Total Til	9343	10542	11818	1020	1166	1007	9526	12297	11901
Rapeseed & Mustard	32263	33100	33208	1081	836	1038	34868	36773	34481
Linseed	15	28	10	416	299	346	6	8	3
Total Groundnut	1384	1673	2214	1601	1749	1743	2216	2926	3859
Sunflower	1580	1691	1456	1284	1018	1249	2029	1721	1819
Safflower	-	-	140	-	-	2732	-	-	382
Castor	-	-	-	-	-	-	-	-	-
Niger	-	-	-	-	-	-	-	-	-
Total Oilseeds	44585	47034	48846	1092	949	1074	48645	44625	52445
D. Other Major Crops									
Jute**	48189	60388	55339	17.05	18.53	17.73	821829	1118763	981028
Sugarcane	503	403	447	76322	67955	110421	38390	27386	49358
Total Potato	5747	6619	10706	22149	17219	21769	127290	113971	233062
Total Tobacco	-	-	-	-	-	-	-	-	-

* Includes Barley, Ragi, Jowar, Bajra, Millets
** Yield Rate in bales/ha. And Production in bales (1 bale = 180 kg.)

Source: Evaluation Wing, Government of West Bengal

ANNEXURE TO 3.2.3

Estimates of Area (ha.), Yield Rate (kg/ha.) and Production (tonnes) of Principal Crops during 2005-06 to 2007-08
District: Barddhaman

Crop	Area			Yield Rate			Production		
	2005-06	2006-07	2007-08	2005-06	2006-07	2007-08	2005-06	2006-07	2007-08
A. Cereals									
Aus Rice	14641	13530	17567	3047	3232	2953	44609	43731	51880
Aman Rice	417180	419514	414468	3273	2864	2719	1365492	1201310	1126762
Boro Rice	207192	209769	203741	2695	3442	3338	558393	721948	679998

Total Rice	639013	642813	635776	3081	3060	2923	1968494	1966989	1858640
Wheat	2204	2560	2216	2199	2278	2717	4846	5832	6022
Total Maize	282	308	336	1855	2555	2685	523	787	902
Total Other Cereals*	-	-	-	-	-	-	-	-	-
Total Cereals	641499	645681	638328	3077	3057	2923	1973863	1973608	1865564
B. Pulses									
Gram	84	350	54	699	630	923	59	221	50
Tur	24	-	22	797	-	468	19	-	10
Total Mung	81	61	62	667	557	661	54	34	41
Total Maskalai	164	97	257	963	784	899	158	76	231
Masur	654	2110	752	939	303	475	614	640	357
Matar	15	161	22	221	614	717	3	99	16
Khesari	213	568	284	919	424	211	196	241	60
Kulthi	37	35	20	500	600	600	19	21	12
Soyabean	18	11	12	722	850	875	13	9	11
Other Kharif Pulses	-	35	33	-	450	470	-	16	16
Total Pulses	1290	3428	1518	880	396	530	1135	1357	804
Total Foodgrains	642789	649109	639846	3073	3043	2917	1974998	1974965	1866368
C. Oilseeds									
Total Til	10859	25459	22814	971	841	732	10549	21420	16710
Rapeseed & Mustard	29182	28933	25630	944	737	850	27536	21334	21795
Linseed	4	2	19	369	202	150	1	-	3
Total Groundnut	1852	2040	2099	2033	1904	2025	3765	3885	4250
Sunflower	135	22	31	1844	1512	1823	249	33	57
Safflower	19	14	11	692	626	556	13	9	6
Castor	-	-	-	-	-	-	-	-	-
Niger	-	-	-	-	-	-	-	-	-
Total Oilseeds	42051	56470	50604	1001	827	846	42113	46681	42821
D. Other Major Crops									
Jute**	15368	13800	11074	18.37	16.64	14.19	282366	229588	157180
Sugarcane	462	2820	817	70587	80612	68727	32611	227325	56150
Total Potato	43351	59443	54359	21249	14224	24520	921168	845521	1332880
Total Tobacco	-	-	-	-	-	-	-	-	-

* Includes Barley, Ragi, Jowar, Bajra, Millets

** Yield Rate in bales/ha. And Production in bales (1 bale = 180 kg.)

Source: Evaluation Wing, Government of West Bengal

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COMMENTS ON DRAFT REPORT

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Dear Sir,

This is in response to your mail sent on April 18, 2010……..
…….as the report strictly comply with our study design and methodology, we do not have major comments from our end on the draft report prepared by your centre. At the same time we request you to send the final copy of the report (both hard and soft copies) at your earliest to prepare the consolidated report.

Once again thank you for your sincere efforts in the completion of the report.

Thanking you

With regards,

SD/-

Keshavamurthy

ACTION TAKEN REPORT

As the Draft Report on 'THE IMPACT OF MACRO MANAGEMENT OF AGRICULTURE SCHEME' has been accepted in the present form by the coordinating centre, viz. Institute for Social and Economic Change, ADRT Centre, Bangalore, the report is being finalized and circulated.

SD /-

Kazi M.B. Rahim

Hony. Director

AERC,
Visva-Bharati