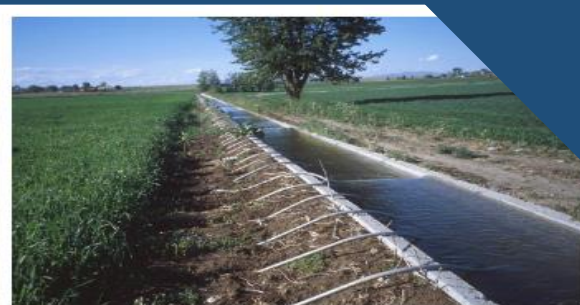


DISTRICT IRRIGATION PLAN



Dhubri, Assam

District Irrigation Plan, 2016-2020

Dhubri, Assam



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Contents

Executive Summary	1
i. Background.....	5
ii. Vision.....	11
iii. Objective.....	11
iv. Strategy/approach	12
v. Programme Components.....	12
vi. Rationale/ Justification Statement	14
vii. Methodology.....	15
Chapter 1: General Information of the District.....	16
1.1 District Profile	16
1.2 Demography	19
1.3 Biomass and livestock.....	20
1.4 Agro-climate, Hydrology and Topography.....	21
1.5 Soil Profile.....	24
1.7 Land Use Pattern	25
Chapter 2: District Water Profile	28
2.1 Area-wise, Crop-wise Irrigation status.....	28
2.2 Production and Productivity of Major Crops	30
2.3 Irrigation Based Classification	44
Chapter 3: District Water Availability.....	46
3.1 Status of Water Availability	46
3.2 Status of Ground Water Availability.....	46
3.3 Status of Command Area	48
3.4 Existing Type of Irrigation.....	56
Chapter 4: Water Requirement/Demand	58
4.1 Domestic Water Demand	58

4.2	Crop Water Requirement	61
4.3	Livestock Water Requirement.....	63
4.4	Industrial water Demand	66
4.5	Water Demand for Power Generation.....	68
4.6	Total Water Demand of the district for various sectors	69
4.7	Water Budget.....	70
Chapter 5: Strategic Action Plan for Irrigation in District under PMKSY.....		72
5.1	Component-wise plan of the district	72
5.2	Block-wise Plan under PMKSY.....	74
5.3	Department-wise plan of the district	94
ANNEXURE.....		96

LIST OF TABLES

Table 1.1: District Profile of Dhubri.....	16
Table 1.2: Block-wise number of males and females in Dhubri.....	19
Table 1.3: Number of large animals in Dhubri	20
Table 1.4: Number of milch cows and draft animals in Dhubri	20
Table 1.5: Number of small animals in Dhubri	21
Table 1.6: Agro-ecological zone and Rainfall in Dhubri district.....	22
Table 1.7: Average Temperature in Dhubri district.....	22
Table 1.8: Potential Evapo-Transpiration and Elevation in Dhubri district	22
Table 1.9: Soil Profile in Dhubri.....	24
Table 1.10: Land use pattern of Dhubri	25
Table 1.11: Block-wise Area under Forest, Wasteland and Other uses.....	27
Table 2.1: Area under major field crops	28
Table 2.2: Area under horticulture crops	29
Table 2.3: Production and Productivity of crops in Golakganj	30
Table 2.4: Production and Productivity of crops in Rupsi.....	31
Table 2.5: Production and Productivity of crops in Gauripur.....	32
Table 2.6: Production and Productivity of crops in Debitola	33
Table 2.7: Production and Productivity of crops in Mankachar	34
Table 2.8: Production and Productivity of crops in Fekamari.....	34
Table 2.9: Production and Productivity of crops in Birsingh Jarua.....	35
Table 2.10: Production and Productivity of crops in South Salmara.....	36
Table 2.11: Production and Productivity of crops in Jamadarhat.....	37
Table 2.12: Production and Productivity of crops in Mahamaya	38
Table 2.13: Production and Productivity of crops in Nayer Alga.....	39
Table 2.14: Production and Productivity of crops in Salkocha	40
Table 2.15: Production and Productivity of crops in Bilasipara.....	41
Table 2.16: Production and Productivity of crops in Hatidhura	42
Table 2.17: Production and Productivity of crops in Agomani	42
Table 2.18: Irrigation based classification	44
Table 3.1: Status of Ground Water Availability in Dhubri.....	47
Table 3.2: Status of Command Area.....	48

Table 3.3: Existing type of Irrigation in Dhubri district	56
Table 4.1: Average Domestic water consumption in an Indian city	58
Table 4.2: Domestic Water Demand.....	59
Table 4.3: Block-wise crop water requirement in Dhubri	61
Table 4.4: Crop water requirement in Dhubri.....	63
Table 4.5: Growth rates for livestock in Assam in 2007-12	64
Table 4.6: Water requirement range and daily water use for livestock	64
Table 4.7: Livestock water demand	65
Table 4.8: Industrial water demand	66
Table 4.9: Total water demand of the district (present).....	69
Table 4.10: Total water demand of the district (projected for 2020).....	69
Table 4.11: Water Budget of Dhubri	70
Table 5.1: Component-wise command area and planned outlay in Dhubri.....	72
Table 5.2:Block-wise command area and planned outlay under PMKSY in Dhubri.....	74
Table 5.3: Command Area and Planned Outlay for Nayer-Alga block.....	76
Table 5.4:Component-wise command area and planned outlay in Debitola block	77
Table 5.5: Command Area and Estimated Cost under PMKSY in Mahamaya block	79
Table 5.6: Component-wise command area and planned outlay in Gauripur block.....	80
Table 5.7: Component-wise command area and planned outlay in Chapar Salkocha block...	81
Table 5.8:Component-wise command area and planned outlay in Agomoni block	82
Table 5.9: Component-wise command area and planned outlay under PMKSY in Golakganj block.....	83
Table 5.10: Component-wise command area and planned outlay under PMKSY in Rupsi block	84
Table 5.11: Component-wise command area and planned outlay under PMKSY in South Salmara block.....	86
Table 5.12: Component-wise command area and planned outlay under PMKSY in Jamadarhat block.....	87
Table 5.13: Component-wise command area and planned outlay under PMKSY in Bilasipara block.....	88
Table 5.14: Component-wise command area and planned outlay under PMKSY in Mankachar block.....	89
Table 5.15: Component-wise command area and planned outlay under PMKSY in Hatidhura block.....	90

Table 5.16: Component-wise command area and planned outlay under PMKSY in Fekamari block.....	92
Table 5.17: Component-wise command area and planned outlay under PMKSY in Birsingh Jarua block	93
Table 5.18: Department wise command area and planned outlay under PMKSY in Dhubri district	94

LIST OF FIGURES

Figure 1.1: Map of Dhubri (Source: www.mapsofindia.com).....	17
Figure 1.2: Block-wise number of males and females in Dhubri	20
Figure 1.3: Mean monthly rainfall of Dhubri district	23
Figure 1.4: Block-wise Land Use Pattern	26
Figure 2.1: Block-wise Irrigation based classification	45
Figure 3.1: Block-wise canal command area in the district.....	56
Figure 4.1: Use of water.....	59
Figure 4.2: Domestic water demand and gap.....	60
Figure 4.3: Present Water demand of the district	69
Figure 4.4: Projected water demand of the district in 2020.....	70
Figure 5.1: Component-wise command area under PMKSY in Dhubri.....	73
Figure 5.2:Component-wise estimated cost under PMKSY in Dhubri.....	73
Figure 5.3: Block-wise command area under PMKSY in Dhubri.....	75
Figure 5.4: Block-wise planned outlay under PMKSY in Dhubri.....	75
Figure 5.5: Share of components in command area in Nayer-Alga block.....	76
Figure 5.6: Share of components in planned outlay in Nayer-Alga block.....	77
Figure 5.7: Component-wise share in command area in Debitola block.....	78
Figure 5.8: Component-wise share in planned outlay in Debitola block.....	78
Figure 5.9: Component-wise share in command area in Mahamaya block.....	79
Figure 5.10: Component-wise share in planned outlay in Mahamaya block.....	79
Figure 5.11: Component-wise share in command area in Gauripur block	80
Figure 5.12: Component-wise share in planned outlay in Gauripur block	80
Figure 5.13: Component-wise share in command area in Chapar Salkocha block	81
Figure 5.14: Component-wise share in planned outlay in Chapar Salkocha block	81
Figure 5.15:Component-wise share in command area in Agomoni block.....	82
Figure 5.16: Component-wise share in planned outlay in Agomoni block	83
Figure 5.17: Component-wise share in command area in Golakganj block	84
Figure 5.18: Component-wise share in planned outlay in Golakganj block.....	84
Figure 5.19: Component-wise share in command area in Rupsi block	85
Figure 5.20: Component-wise share in planned outlay in Rupsi block.....	85

Figure 5.21: Component-wise share in command area under PMKSY in South Salmara block	86
Figure 5.22: Component-wise share in planned outlay under PMKSY in South Salmara block	86
Figure 5.23: Component-wise share in command area under PMKSY in Jamadarhat block..	87
Figure 5.24: Component-wise share in planned outlay under PMKSY in Jamadarhat block .	87
Figure 5.25: Component-wise share in command area under PMKSY in Bilasipara block....	88
Figure 5.26: Component-wise share in planned outlay PMKSY in Bilasipara block	89
Figure 5.27:Component-wise share in command area under PMKSY in Mankachar block...	89
Figure 5.28: Component-wise share in planned outlay under PMKSY in Mankachar block..	90
Figure 5.29: Component-wise share in command area under PMKSY in Hatidhura block....	91
Figure 5.30: Component-wise share in planned outlay under PMKSY in Hatidhura block....	91
Figure 5.31: Component-wise share in command area under PMKSY in Fekamari block.....	92
Figure 5.32: Component-wise share in planned outlay under PMKSY in Fekamari block ...	92
Figure 5.33: Component-wise share in command area under PMKSY in Birsingh Jarua block	93
Figure 5.34: Component-wise share in planned outlay under PMKSY in Birsingh Jarua block	93
Figure 5.35: Department-wise share in command area in Dhubri district.....	94
Figure 5.36: Department-wise share in planned outlay in Dhubri district.....	95

Executive Summary

In an agrarian economy like India, agriculture utilizes the major share of country's exploitable water resources. Though the sector utilizes the maximum share of exploitable water resources, availability of the same at different locations to different extent makes it vital to adopt effective utilization of water through storage, channelizing and judicious use. At some places like Punjab and Haryana, the environmental and socio-economic rationale for this capture by the sector is now being questioned. Accordingly, it is needed to challenge and change the fundamentals of the prevailing view of water resources exploitation. A new and more suitable approach to water resources allocation is necessary if the population is to be adequately fed, without further degradation and destruction of the critical ecosystem services. Water productivity needs to be enhanced considerably, and economic cost-benefit analysis and pricing regimes can play a significant role in such a process. However, these economic measures will not be sufficient on their own. They will need to be buttressed by technological innovation and institutional changes in order to encourage a more equitable distribution of resources and to mitigate potential international conflicts across 'shared' water basins.

Water has unique characteristics that determine both its allocation and use as a resource by agriculture. Agricultural use of water for irrigation is itself contingent on land resources. In a situation of growing water scarcity and rising demands for non-agricultural (household and industrial) use of water, reassessment of sectoral allocations of water are inevitable. In developing countries, irrigated agriculture plays a vital role in contributing towards domestic food security and poverty alleviation. Therefore, achievement of these objectives is dependent on adequate allocations of water to agriculture. Justification of such allocations requires that irrigated agriculture be a cost-effective means of achieving stated political or social objectives, such as food security or poverty alleviation, and that all externalities be taken into account in the pricing mechanism. Improved allocation of irrigation water is required within the agriculture sectors in order to achieve greater efficiency in the use of irrigation water and existing irrigation infrastructure. Reallocation is also required in order to reduce waterlogging and salinization of irrigated land, to decrease the negative environmental impacts and other externalities of irrigation (caused by overextraction of groundwater and depletion and pollution of surface water).

Government of India launched Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) to address the constraints in providing assured irrigation as well as increasing efficiency and productivity of current water use to bring more prosperity to the rural areas. Priorities of Government of

India were reflected in the Hon'ble President's address to the joint Session of the Parliament of 16th Lok Sabha where he indicated that "Each drop of water is precious. Government is committed to giving high priority to water security. It will complete the long pending irrigation projects on priority and launch the 'Pradhan Mantri Krishi Sinchayee Yojana' with the motto of 'Har Khet Ko Pani'. There is a need for seriously considering all options including linking of rivers, where feasible; for ensuring optimal use of our water resources to prevent the recurrence of floods and drought. By harnessing rain water through 'Jal Sanchay' and 'Jal Sinchan', we will nurture water conservation and ground water recharge. Micro irrigation will be popularised to ensure 'Per drop-More crop'".

PMKSY has been approved with an indicative outlay of Rs.50,000 crore over a period of five years from 2015-16 to 2019-20. The programme is an amalgamation of on-going schemes of Ministry of Water Resources, River Development and Ganga Rejuvenation, Ministry of Agriculture & Cooperation and Ministry of Rural Development. The existing schemes AIBP, CADWM, MI, SWMA, Watershed & Convergence with MGNREGA were brought together under the umbrella program of PMKSY. Further the scheme seeks convergence with scheme like Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNRES), Rashtriya Krishi Vikas Yojana (RKVY), Jawaharlal Nehru National Solar Mission and Rural Electrification programmes (JLNNSM&REP), Rural Infrastructure Development Fund (RIDF), Members of Parliament Local Area Development Scheme (MPLAD), Members of Legislative Assembly Local Area Development Fund (MLALAD), Local Body Funds (LBF), Working Plan of State Forest Department (WPSFD) etc. The PMKSY will be implemented in an area development mode only by adopting a decentralized state level planning and projectised execution structure that will allow the state to draw up their own irrigation development plans based on DIPs and SIPs with a horizon of 5-7 years. The program will be supervised and coordinated utilizing the existing mechanism and structure available under Rashtriya Krishi Vikas Yojana (RKVY) program with state agriculture department acting as the State Nodal Agency for implementation of PMKSY. However, the implementing departments for the four components like AIBP, PMKSY (Har Khet Ko Pani), PMKSY (Per drop more crop) and PMKSY (watershed development) will be decided by the respective program ministry/department.

The 05 chapters along with introduction chapter, explains the profile of district, its water requirement for agriculture and allied sector, water availability, assessment of water requirement for various sectors and strategic action plan for augmentation and effective management of available water resources.

District Profile and Demography: Dhubri District - the gateway of western Assam happened to be in the past a meeting place of different racial groups which mingled together and formed a unique Cultural Heritage and Historical Background. Dhubri District is bounded both by inter-state and international border i.e. West Bengal and Bangladesh in the west, Goalpara and Bogaigoan district of Assam and Garo Hills district of Meghalaya in the east, Kokrajhar district in the north, Bangladesh and state of Meghalaya in the south.

As per 2011 census, the total population of the district was 19,49,258 out of which population of female and male are 9,51,410 and 9,97,848. When compared with data as per 2001 census, the decadal growth in population of Dhubri has been 24.44%, i.e. 2.44% growth per annum. GDhubri has a sex ratio of 953 females per thousand males as against state's average of 958 females per 1000 male. It has a literacy rate of 58.34%, significantly lower than the state literacy rate of 72.19%. For male population, the literacy rate in the district is 63.10% while it is comparatively low for females at 53.33%.

Agriculture in Dhubri: Dhubri district is primarily dependent on agriculture and forest products. Main source of income is paddy with surplus production than its requirement. Jute and mustard seed occupy the major share of cash crops. From forest mainly timber and bamboo add to the income though boulder and sand. Fish, milk, meat and egg have small contribution to the economy. Land revenue collection is very small in amount whereas excise duty occupies a lion's share of the Govt. exchequer.

Demand for water sources and the gap: The present water demand of the district has been assessed to be 1751.37 MCM annually. Out of the total water demand 1629.88 mcm (93 percent) is the requirement from crop production. Nearly 107.79 mcm is required for domestic drinking water requirement and another 12.92 mcm (or 1%) is required for livestock water requirement purpose. Industrial water requirement is very low with 0.77079 mcm and there is no water requirement for power generation.

The projected water demand of the district has been assessed to be 1762.05 MCM annually. Out of the total water demand 1629.88 mcm (92 percent) is the requirement from crop production. Nearly 118.33 mcm is required for domestic drinking water requirement and another 13.05 mcm (or 1%) is required for livestock water requirement purpose. Industrial water requirement is very low with 0.7743 mcm and there is no water requirement for power generation.

Component wise proposed plan: The plan is prepared component wise also. Table 5.1 shows component wise plan for 4 years starting from 2016-17 to 2019-20. AIBP component has to be executed by Irrigation Department. Her Khet Ko Pani is to be executed by Irrigation and Agriculture Departments while Per Drop More Crop is to be also executed by Agriculture Department. Watershed component will be taken care of by Soil Conservation department and District Rural Development Agency. However, all the stakeholders need to have coordination among themselves to have the maximum irrigation efficiency and to avoid duplicity. Figure shows the graphical representation of various components of PMKSY. It is observed that the total command area to be brought under PMKSY scheme is 90828 hectares while the estimated fund requirement for the execution of PMKSY activities in the district is Rs.148323 lakhs or Rs.1483.23 crores.

Department wise proposed plan: Department-wise, Irrigation Department has the highest share by some distance with 1351.92 crores or 91% of the planned outlay in Dhubri. Agriculture department has the second highest share with 58.10 crores or 4% of the planned outlay. District Rural Development Agency (DRDA) accounts for 10264 ha (11%) and 64.68 crores (4%) under PMKSY. Soil Conservation Department accounts for 8.52 crores or 1% of the total planned outlay.

Block wise planned outlay: Out of the total plan of 1483.23 crores, the maximum share of 14% is pertaining to Gauripur block followed by Birsingh J aruablock which has a share of 11%. Agomoni block has a share of 10% in the planned outlay for the district. 7 blocks i.e. Mahamaya, Chapar Salkocha, Debitola, Golakganj and Bilasipara blocks have 7% each in the planned outlay. Jamadarhat block has the least planned outlay with Rs.13.01 crores (1%).

i. Background

Preparation of decentralized area specific district planning process visualized in various plans took concrete shape through the years and initiatives like specific guidelines on methodologies and processes for preparation of district plans; framework for preparation of perspective plan, medium term and annual plans by then planning commission in 1969 and the 73rd and 74th constitutional amendments conferring constitutional status to Panchayats at district and sub district level, local self-government in urban areas; constitution of district planning committee to consolidate the plans prepared at Panchayats and municipalities and preparation of a draft development plan for the whole district.

The decentralized planning process was strengthened further through emphasis by planning commission on preparation of district level plans and making it an integral part of the process of preparation of the states 11th five year plan. Planning commission issued guidelines in August 2006 on the preparation of the district plans. The guideline defines the district planning as ‘...the process of preparing an integrated plan for the local government sector in a district taking into account the resources (natural, human and financial) available and covering the sectoral activities and schemes assigned to the district level and below and those implemented through local governments in a state. The document that embodies this statement of resources and their allocation for various purposes is known as the District Plan’.

Government of India through a resolution in National Development Council on 29th May 2007 conceived a special Additional Central Assistance Scheme to address the slow growth of agriculture and allied sectors by incentivizing states to draw up plans for their agriculture sectors more comprehensively. The NDC resolution states "GoI will introduce a new Additional Central Assistance scheme to incentivize states to draw up plans for their agriculture sector more comprehensively, taking agro-climatic conditions, natural resource issues and technology into account, and integrating livestock, poultry and fisheries, etc. This will involve a new scheme for Additional Central Assistance (ACA) to State Plans, administered by the Union Ministry of Agriculture over and above its existing Centrally Sponsored Schemes, to supplement the state-specific strategies including special schemes for beneficiaries of land reforms. The newly created National Rainfed Area Authority will, on request, assist states in planning for Rainfed areas".

The NDC in its resolution advised the states to prepare a comprehensive district agriculture plans (C-DAP) that will fully utilize available resources and will include allied agriculture sectors. Further, GOI issued a manual on preparation of comprehensive district agriculture plans to help the states prepare C-DAP. As per these guidelines, the objective of district planning is ‘to design an integrated and participatory action plan for the development of local area in general and agriculture and allied sectors in particular’. The objectives of Comprehensive District Agriculture Plan (C-DAP) are:

To prepare a Comprehensive District Agriculture Plan (C-DAP) through participatory process involving various organisations and stakeholders.

To enable optimum utilization of scarce natural, physical & financial resources.

To assess and plan for the infrastructure required to support the agriculture development.

To establish linkages with the required institutional support services, like credit, technology transfer, ICT, research etc.

To evolve an action plan for achieving sustainable agricultural growth with food security and cropping system that will improve farmers’ income.

The guidelines wanted the state/district authorities to (i) ensure that the agricultural plans are prepared for the district and then integrated into the agricultural plans of the state based on the agro-climatic conditions, availability of technology, trained manpower and natural resources;(ii) the local needs / crops / feed and fodder / animal husbandry / dairying / fisheries / priorities are reflected in the plan; (iii)the productivity gaps for important crops and livestock and fisheries are reduced; and (iv) the returns to the farmers from these are maximized.

The latest move in the process of strengthening of decentralized planning process was the Government of India guidelines issued in 2015 in the form of a template for the preparation of District Irrigation Plan (DIP) and State Irrigation Plan (SIP) as part of the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) program and made the preparation of DIP and SIP mandatory for the state to receive funds from the program. The present District Irrigation Plan (DIP) report is a product of these long drawn efforts of Government of India to strengthen the decentralized planning process in the country focusing on the vital resource i.e., water.

Water is of vital importance for human & animal life, maintenance of ecological balance and promotion of developmental activities. Considering its vital importance and ever increasing demand for water, making water available to multiple uses, planning and management of water resources and utilization of water economically, optimally and equitably assumes greater importance.

According to the 12th Five Year Plan, the water budget estimates of India by Ministry of Water Resources suggests an availability of 1123 Billion Cubic Meters (BCM) against a current estimated demand of 710 BCM. The Standing Committee of the Ministry of Water Resources estimates that this water demand will rise to 1093 BCM by 2025. Though the existing water availability in the immediate future seems to be adequate, the near constant supply of water resources in the face of increasing demand will strain the water supply-demand balance.

The per capita water availability which stood at 5177 cubic meters in 1951 was reduced to 1820 cubic meters in 2001, while the international prescribed limit is 1800 cubic meters. The projected per capita availability of water is 1341 cubic meters in 2025 and 1140 cubic meters in 2050 suggesting a shortage of water in the medium term¹. Further, the all India water balance estimates does not reflect the variations in water balance across time and space- certain areas having a positive water balance and the others facing acute shortage. The problem is further accentuated by water quality related issues.

With an abundant surface and ground water supply in the first five decades since independence, more than 80 percent of the total available water resources were earmarked for irrigation purposes and the rest for meeting domestic and industrial demands. A recent study² on the demand for water from agriculture, domestic and industrial uses in 2000, 2025 and 2050 seems to suggest that domestic demand (34 BCM in 2000, 66 BCM in 2025 and 101 BCM in 2050) and industrial demand (42 BCM in 2000, 92 BCM in 2025 and 161 BCM in 2050) for water will utilize the total balance water available while agriculture demand for water will be 605 BCM in 2000, 675 BCM in 2025 and 637 BCM in 2050. This change is partly because of the changing sectoral contributions of India's GDP but also because of dynamics of irrigation development in the country where the initial expansion in area under irrigation is propelled by the availability of abundant water resources and availability of good quality land. This is no longer the case in many states where the availability of land and water are serious constraints for further expansion of irrigation. Further, as per the estimates of the then planning commission, out of a total of 141 million hectares of net sown area in the country, 114 million

¹ Ministry of Water Resources (2011), Strategic Plan for Ministry of Water Resources, Government of India, New Delhi.

² Amarasinghe, U.A., Shah T., Turrall, H. and Anand, B.K. 2007. *India's water future to 2025-2050: Business-as-usual scenario and deviations*. Research Report 123, International Water Management Institute, Colombo.

hectares (81%) is Irrigation Potential Created (IPC) and 88 million hectares (62%) is Irrigation Potential Utilized (IPU), leaving almost 20% of irrigated potential unutilized as on March 2012. This leaves 40 percent of the net sown area in the country dependent on rainfall which makes farming a high risk activity.

The competing demands for water resources and the emerging issues and concerns were to be addressed through certain basic principles and commonality in approaches in dealing with planning, development and management of water resources³ under an Integrated Water Resource Management framework. The main objectives of water resource management as delineated in National Water Policy 2012 are:

Planning, development and management of water resources need to be governed by common integrated perspective considering local, regional, State and national context, having an environmentally sound basis, keeping in view the human, social and economic needs.

Principle of equity and social justice must inform use and allocation of water.

Good governance through transparent informed decision making is crucial to the objectives of equity, social justice and sustainability. Meaningful intensive participation, transparency and accountability should guide decision making and regulation of water resources.

Water needs to be managed as a common pool community resource held, by the state, under public trust doctrine to achieve food security, support livelihood, and ensure equitable and sustainable development for all.

Water is essential for sustenance of eco-system, and therefore, minimum ecological needs should be given due consideration.

Safe Water for drinking and sanitation should be considered as pre-emptive needs, followed by high priority allocation for other basic domestic needs (including needs of animals), achieving food security, supporting sustenance agriculture and minimum eco-system needs. Available water, after meeting the above needs, should be allocated in a manner to promote its conservation and efficient use.

³Ministry of Water Resources, National Water Policy, 2012, Government of India, New Delhi.

All the elements of the water cycle, i.e., evapo-transpiration, precipitation, runoff, river, lakes, soil moisture, and ground water, sea, etc., are interdependent and the basic hydrological unit is the river basin, which should be considered as the basic hydrological unit for planning.

Given the limits on enhancing the availability of utilizable water resources and increased variability in supplies due to climate change, meeting the future needs will depend more on demand management, and hence, this needs to be given priority, especially through (a) evolving an agricultural system which economizes on water use and maximizes value from water, and (b) bringing in maximum efficiency in use of water and avoiding wastages.

Water quality and quantity are interlinked and need to be managed in an integrated manner, consistent with broader environmental management approaches inter-alia including the use of economic incentives and penalties to reduce pollution and wastage.

The impact of climate change on water resources availability must be factored into water management related decisions. Water using activities need to be regulated keeping in mind the local geo climatic and hydrological situation.

The National Water Policy 2012 drives the water resource management program planning and management in the country. Government of India launched Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) to address the constraints to providing assured irrigation as well as increasing efficiency and productivity of current water use to bring more prosperity to the rural areas. Priorities of Government of India were reflected in the Hon'ble President's address to the joint Session of the Parliament of 16th Lok Sabha where he indicated that ***“Each drop of water is precious. Government is committed to giving high priority to water security. It will complete the long pending irrigation projects on priority and launch the ‘Pradhan Mantri Krishi Sinchayee Yojana’ with the motto of ‘Har KhetKOPani’. There is a need for seriously considering all options including linking of rivers, where feasible; for ensuring optimal use of our water resources to prevent the recurrence of floods and drought. By harnessing rain water through ‘Jal Sanchay’ and ‘Jal Sinchan’, we will nurture water conservation and ground water recharge. Micro irrigation will be popularized to ensure ‘Per drop-More crop’.*”**

PMKSY has been approved with an indicative outlay of Rs.50,000 crore over a period of five years from 2015-16 to 2019-20. The programme is an amalgamation of on-going schemes of Ministry of Water Resources, River Development and Ganga Rejuvenation, Ministry of Agriculture & Cooperation and Ministry of Rural Development. The existing schemes AIBP, CADWM, MI, SWMA, and Watershed& Convergence with MGNREGA were brought together under the umbrella program of PMKSY. Further the scheme seeks convergence with scheme like Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNRES), Rashtriya Krishi Vikas Yojana (RKVY), Jawaharlal Nehru National Solar Mission and Rural Electrification programmes (JLNNSM&REP), Rural Infrastructure development Fund (RIDF), Member of Parliament Local Area Development Scheme (MPLAD), Member of Legislative Assembly Local Area Development Scheme (MPLALAD), Local body funds (LBF), Working Plan of State Forest Department (WPSFD) etc.

The PMKSY will be implemented in an area development mode by adopting a decentralized state level planning and project based execution structure that will allow the state to draw up their own irrigation development plans based on DIPs and SIPs with a horizon of 5-7 years. The program will be supervised and coordinated utilizing the existing mechanism and structure available under Rashtriya Krishi Vikas Yojana (RKVY) program with state agriculture department acting as the State Nodal Agency for implementation of PMKSY. However, the implementing departments for the four components like AIBP, PMKSY (HarKhetKoPani), PMKSY (Per drop more crop) and PMKSY (watershed development) will be decided by the respective program ministry/department.

The funds under this program would be provided to the states as per the pattern of assistance of Centrally Sponsored Schemes (CSS) decided by the Ministry of Finance and NITI Aayog. During 2015-16 the existing pattern of assistance of ongoing scheme will be continued. An outlay of Rs. 50,000 crore has been approved for 2015-20. The financial assistance provided to the state governments from this centrally sponsored scheme is subject to fulfillment of certain conditions. Firstly, a state will become eligible to access PMKSY fund only if it has prepared the District Irrigation Plans (DIP) and State Irrigation Plan (SIP), excepting for the initial year, and the expenditure in water resource development for agriculture sector in the year under consideration is not less than the baseline expenditure, which is defined as the average of the expenditure in irrigation sector irrespective of the department in the state plan in three years prior to the year under consideration. Secondly, State will be given additional

weightage for levying charges on water and electricity for irrigation purposes, so as to ensure sustainability of the programme. Thirdly, inter state allocation of PMKSY fund will be decided based on (i) share of percentage of unirrigated area in the state vis-à-vis national average including prominence of areas classified under Dessert Development Programme (DDP) and Drought Prone Area Development Programme (DPAP) and (ii) increase in percentage share of expenditure on water resource development for agriculture sector in State Plan expenditure in the previous year over three years prior to it (iv) improvement in irrigation efficiency in the state.

ii. Vision

The overarching vision of Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) will be to ensure access to some means of protective irrigation to all agricultural farms in the country, to produce ‘per drop more crop’, thus bringing much desired rural prosperity.

iii. Objective

The objective of the PMKSY program are to:

- a) Achieve convergence of investments in irrigation at the field level (preparation of district level and, if required, sub district level water use plans).
- b) Enhance the physical access of water on the farm and expand cultivable area under assured irrigation (HarKhetkoPani),
- c) Integration of water source, distribution and its efficient use, to make best use of water through appropriate technologies and practices.
- d) Improve on-farm water use efficiency to reduce wastage and increase availability both in duration and extent,
- e) Enhance the adoption of precision-irrigation and other water saving technologies (More crop per drop).
- f) Enhance recharge of aquifers and introduce sustainable water conservation practices
- g) Ensure the integrated development of Rainfed areas using the watershed approach towards soil and water conservation, regeneration of ground water, arresting runoff, providing livelihood options and other NRM activities.
- h) Promote extension activities relating to water harvesting, water management and crop alignment for farmers and grass root level field functionaries.

- i) Explore the feasibility of reusing treated municipal waste water for peri-urban agriculture, and
- j) Attract greater private investments in irrigation.

iv. Strategy/approach

To achieve these objectives PMKSY adopted strategies that include

- a) Creation of new water sources; repair, restoration and renovation of defunct water sources; construction of water harvesting structures, secondary & micro storage, groundwater development, enhancing potentials of traditional water bodies at village level like Jal Mandir (Gujarat); Khatri, Kuhl (H.P.); Zabo (Nagaland); Eri, Ooranis (T.N.); Dongs (Assam); Katas, Bandhas (Odisha and M.P.) etc.
- b) Developing/augmenting distribution network where irrigation sources (both assured and protective) are available or created;
- c) Promotion of scientific moisture conservation and run off control measures to improve ground water recharge so as to create opportunities for farmer to access recharged water through shallow tube/dug wells;
- d) Promoting efficient water conveyance and field application devices within the farm viz, underground piping system, Drip & Sprinklers, pivots, rain-guns and other application devices etc.;
- e) Encouraging community irrigation through registered user groups/farmer producers' organisations/NGOs; and
- f) Farmer oriented activities like capacity building, training and exposure visits, demonstrations, farm schools, skill development in efficient water and crop management practices (crop alignment) including large scale awareness on more crop per drop of water through mass media campaign, exhibitions, field days, and extension activities through short animation films etc.

v. Programme Components

PMKSY has the following four programme components

- 1 Accelerated Irrigation Benefit Programme (AIBP)** a) To focus on faster completion of ongoing Major and Medium Irrigation including National Projects.

2 PMKSY (Har Khet ko Pani) a) Creation of new water sources through Minor Irrigation (both surface and ground water); b) Repair, restoration and renovation of water bodies; strengthening carrying capacity of traditional water sources, construction rain water harvesting structures (Jal Sanchay); c) Command area development, strengthening and creation of distribution network from source to the farm; d) Ground water development in the areas where it is abundant, so that sink is created to store runoff/ flood water during peak rainy season. e) Improvement in water management and distribution system for water bodies to take advantage of the available source which is not tapped to its fullest capacity (deriving benefits from low hanging fruits). At least 10% of the command area to be covered under micro/precision irrigation. f) Diversion of water from source of different location where it is plenty to nearby water scarce areas, lift irrigation from water bodies/rivers at lower elevation to supplement requirements beyond IWMP and MGNREGS irrespective of irrigation command. g) Creating and rejuvenating traditional water storage systems like Khatri, Kuhl etc. at feasible locations.

3 PMKSY (Per Drop More Crop) a) Programme management, preparation of State/District Irrigation Plan, approval of annual action plan, Monitoring etc. b) Promoting efficient water conveyance and precision water application devices like drips, sprinklers, pivots, rain-guns in the farm (Jal Sinchan); c) Topping up of input cost particularly under civil construction beyond permissible limit (40%), under MGNREGS for activities like lining inlet, outlet, silt traps, distribution system etc. d) Construction of micro irrigation structures to supplement source creation activities including tube wells and dug wells (in areas where ground water is available and not under semi critical /critical /over exploited category of development) which are not supported under AIBP, PMKSY (HarKhet ko Pani), PMKSY (Watershed) and MGNREGS as per block/district irrigation plan. e) Secondary storage structures at tail end of canal system to store water when available in abundance (rainy season) or from perennial sources like streams for use during dry periods through effective on-farm water management; f) Water lifting devices like diesel/ electric/ solar pump sets including water carriage pipes, underground piping system. g) Extension activities for promotion of scientific moisture conservation and agronomic measures including cropping alignment to maximize use of available water including rainfall and minimize irrigation requirement (Jal sarankchan); h) Capacity building, training and awareness campaign including low cost publications, use of pico projectors and low cost films for encouraging potential use water source through technological, agronomic and management practices including community irrigation. i) The extension workers will be empowered to disseminate relevant technologies under PMKSY only after requisite training is

provided to them especially in the area of promotion of scientific moisture conservation and agronomic measures, improved/ innovative distribution system like pipe and box outlet system, etc. Appropriate Domain Experts will act as Master Trainers. j) Information Communication Technology (ICT) interventions through NeGP-A to be made use in the field of water use efficiency, precision irrigation technologies, on farm water management, crop alignment etc. and also to do intensive monitoring of the Scheme.

4 PMKSY (Watershed Development)

a) Effective management of runoff water and improved soil & moisture conservation activities such as ridge area treatment, drainage line treatment, rain water harvesting, in-situ moisture conservation and other allied activities on watershed basis. b) Converging with MGNREGS for creation of water source to full potential in identified backward Rainfed blocks including renovation of traditional water bodies

vi. Rationale/ Justification Statement

In reference to the status and need of irrigation, the water resource management including irrigation related priorities was identified for Dhubri district by the peoples' representatives of district with support from administration and technical experts. For instance the reports of Strategic Research and Extension Plan (SREP) prepared under ATMA program, Comprehensive District Agriculture Plan (C-DAP) prepared as part of Rashtriya Krishi Vikas Yojana (RKVY), Potential Linked Credit Plans (PLP) of NABARD and the Integrated District Development Plan etc. identified number of irrigation related issues for Dhubri district including the (i) protection of crops from abiotic stress factors including flashfloods; (ii) promoting water use efficiency through sprinkler and drip irrigation; (iii) promoting protected polyhouse cultivation to minimize risk factors and enhance quality and productivity; (iv) Improvement of on-farm water delivery and efficiency of existing irrigation systems; (v) promotion of soil conservation of arable & non-arable land through engineering measures; (vi) creation of new water harvesting structures, check dams, ponds, tanks, etc. and (vii) land improvement measures.

vii. Methodology

During the course of preparation of District Irrigation Plan (DIP) the team visited Dhubri district to collect data and have interaction with all the stakeholders. The Methodology adopted to prepare DIP is outlined in brief as under:

Collection of primary and secondary data from multiple sources including Season and Crop Reports, Statistical Handbook, District Census Handbook and other published documents and websites of different departments.

Meetings with state government departments and related institutions were held and meeting through VC was also held with state level authorities.

Discussions and interviews were held with officers of agriculture department, horticulture department, sub division soil conservation office, Agriculture Technology Management Agency (ATMA), Animal Husbandry department, Irrigation department to identify the key issues and key focus areas of the region.

On the basis of detailed discussion and analysis of data, the team arrived at the projections of various components of PMKSY and Department wise plan.

Chapter 1: General Information of the District

1.1 District Profile

Dhubri District - the gateway of western Assam happened to be in the past a meeting place of different racial groups which mingled together and formed a unique Cultural Heritage and Historical Background. The growth of blended culture in this region particularly in case of Language, Art and Religion is due to continuous process of assimilation of various races, caste & creed of local people, invaders & migrated people. Dhubri District is bounded both by inter-state and international border i.e. West Bengal and Bangladesh in the west, Goalpara and Bogaigoan district of Assam and Garo Hills district of Meghalaya in the east, Kokrajhar district in the north, Bangladesh and state of Meghalaya in the south.

Table 1.1: District Profile of Dhubri

Name of the District	District Code	Latitude	Longitude
Dhubri	301	26° 02'N	89° 58'E

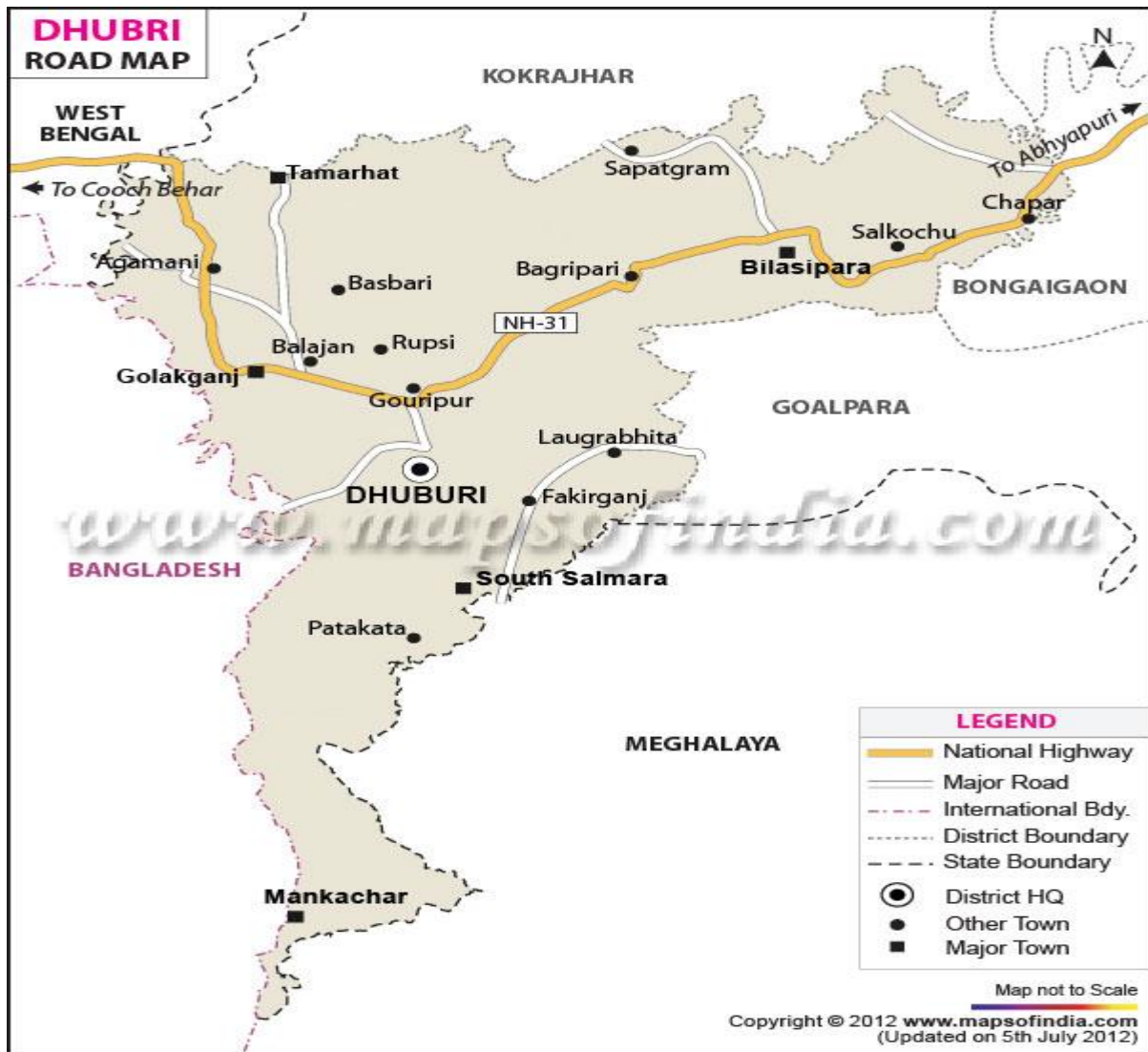


Figure 1.1: Map of Dhubri (Source: www.mapsofindia.com)

Brief History of the district

The word *Dhuburi* comes from a legendary lady named Netai-Dhubuni. The story is connected with Behula-Lakhindar. The word Dhubuni is considered a corruption of 'Dhuburi'. According to Bodo-Kacharis, the word is of Bodo origin and derived from Dubra, a kind of grass. The story of lady Netai-Dhubuni is widely accepted for the naming history of Dhubri and that is where the Gurdwara Sri Tegh Bahadur Sahib stands.

This place is famous for the Sikh Gurdwara Damdama Sahib or Thara Sahib which was constructed in memory of visit of First Sikh Guru Nanak Dev and later it was followed by visit of Ninth guru, Guru Tegh Bahadur. Hence, it has great importance for Sikh community.

Until 1874, Dhubri was mostly a part of Bengal kings. In 1874, the British Government created a new province named Assam Valley Province and incorporated Goalpara district area comprising three civil subdivisions Dhubri, Goalpara and Kokrajhar with the new Assam Province. In 1879, the district headquarters was shifted from Goalpara to Dhubri town. The district of Dhubri is again subdivided in three districts namely Dhubri, Goalpara and Kokrajhar. The town of Dhubri falls under the jurisdiction of the district of Dhubri whose headquarters is at town Dhubri.

The present Dhubri District is one of the three Civil Sub-divisions of erst-while Goalpara district, established in 1876 during British regime. In 1879 the District headquarters was shifted from Goalpara to Dhubri.

In the year 1983 Goalpara district was divided into four separate districts and Dhubri is one of those. Dhubri district has been visited by many historical personalities like - Guru Nanaka, Srimanta Sankardeva, Guru Teg Bahadur, Swami Vivekananda, Mahatma Gandhi, Netaji Subhas Chandra Bose, Gopinath Bordoloi and others.

Dhubri town also was very famous for the Match Factory (WIMCO), though it has shut down due to circumstances but still people who had witnessed the same still remembering the beauty of the factory its staff quarters and their modern art of living. Dhubri is also famous for its Durga Puja and Dashera.

The Dhubri Town was first constituted as a Municipality in 1883. The Dhubri Town is 290 km far from the State Capital at Dispur.

Administrative setup

The Deputy Commissioner of the district is the overall In-Charge of the administration of the entire district. He also acts as the collector in case of Revenue matters as a District Magistrate in case of maintenance of Law and Order and general administration as a District Election Officer in case of conduct of Election as a Principal Census Officer while conducting Census and so on. A number of officers like Additional Deputy Commissioners, Subdivisional Officers, Assistant Commissioners and other assist the Deputy Commissioner in looking after the administration of the district. Dhubri is one of the plains districts of Assam. It falls in the Brahmaputra valley. The river Brahmaputra flows through the heart of Assam and touches almost all the districts. Dhubri was one of the three subdivisions of old Dhubri district. It has three subdivisions namely, Dhubri, Bilasipara and

Mankachar. It has 9 revenue circles, which include 5 Statutory towns and 4 Census towns. Thus the district has 1,091 villages spread over 3 subdivisions and 9 Revenue Circles. It has 15 Community Development Blocks. The total area of the districts is 2176.00 Sq. Kms (Rural: 2144.06 Sq.Km. and Urban: 31.94 Sq.Km). In terms of area the district occupies the 17th rank of the total 27 districts in Assam. It has 168 Gaon Panchayats in all.

1.2 Demography

As per 2011 census, the total population of the district was 19,49,258 out of which population of female and male are 9,51,410 and 9,97,848. When compared with data as per 2001 census, the decadal growth in population of Dhubri has been 24.44%, i.e. 2.44% growth per annum. GDhubri has a sex ratio of 953 females per thousand males as against state's average of 958 females per 1000 male. It has a literacy rate of 58.34%, significantly lower than the state literacy rate of 72.19%. For male population, the literacy rate in the district is 63.10% while it is comparatively low for females at 53.33%.

Table 1.2: Block-wise number of males and females in Dhubri

	Name of the Block	Population		
		Male	Female	Total
1	Hatidhura	27487	26355	53842
2	Golakganj	57033	53549	110582
3	Rupsi	64072	60301	124373
4	Debitola	41186	38213	79399
5	Mahamaya	52333	49920	102253
6	Bilasipara	44811	42751	87562
7	Chapar-salkocha	60372	58428	118800
8	Agamoni	76635	71401	148036
9	Gauripur	110093	103784	213877
10	Birsingjarua	71612	68785	140397
11	Nayeralga	50253	47451	97704
12	Jamadarhat	27880	27249	55129
13	South Salmara	61392	58830	120222

14	Fekamari	86447	83060	169507
15	Mankachar	85396	83772	169168
16	Towns	80846	77561	158407
	TOTAL	997848	951410	1949258

Source: Census 2011

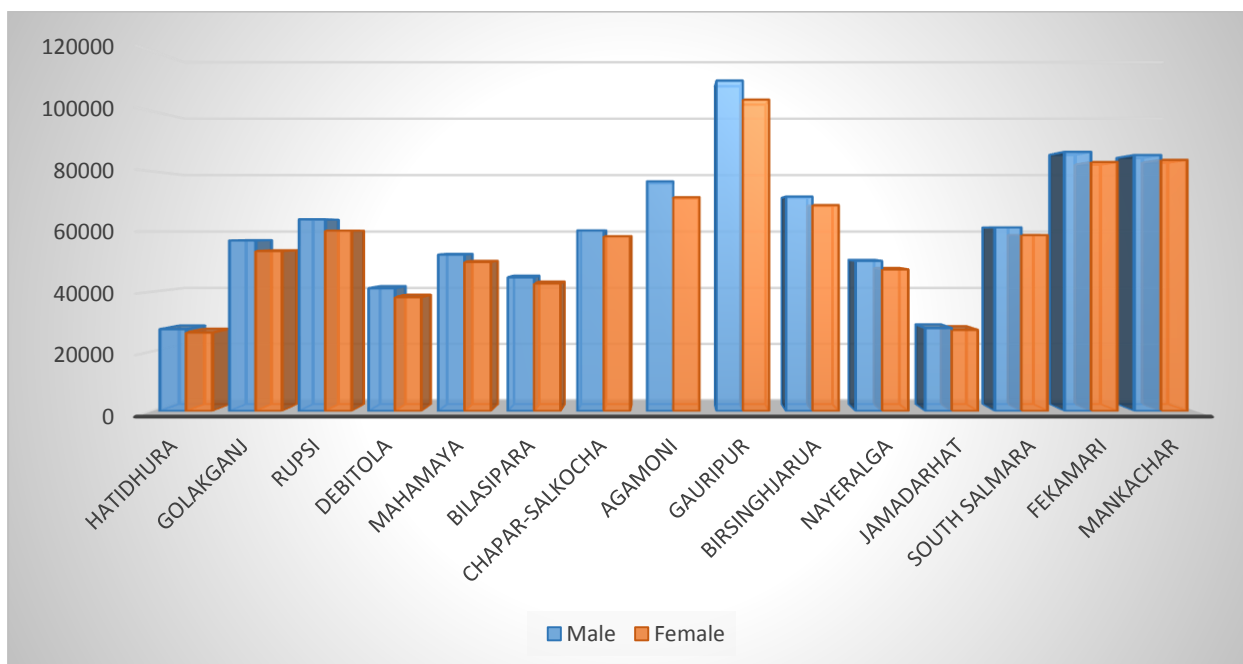


Figure 1.2: Block-wise number of males and females in Dhubri

1.3 Biomass and livestock

Table 1.3: Number of large animals in Dhubri

Large Animal			
Indigenous Cow (Nos.)	Hybrid Cow (Nos.)	In Descriptive Buffalo (Nos.)	Hybrid Buffalo (Nos.)
441351	4332	13525	289

Source: Animal Husbandry Department, Dhubri

Table 1.4: Number of milch cows and draft animals in Dhubri

Milch Cow or Meat Animal	Draft Animal (Buffalo+Bull)
23887	69624

Source: Animal Husbandry Department, Dhubri

Table 1.5: Number of small animals in Dhubri

	Small Animals			
Poultry	Ducks	Pigs	Goats	Sheep
8,98,792	3,26,409	3888	2,50,131	1,07,995

Source: Animal Husbandry Department, Dhubri

Among small animals poultry is the most common livestock in the district with 56.62% of the total livestock population among small animals being poultry. Ducks are the second most common livestock after poultry with 20.56% of small animals being ducks followed thereafter by goats (15.75%) and sheep (6.8%).

1.4 Agro-climate, Hydrology and Topography

Agro-ecology is the study of ecological processes that operate in agricultural production systems. The prefix agro- refers to agriculture. Bringing ecological principles to bear in agro ecosystems can suggest novel management approaches that would not otherwise be considered. Agro-ecology is the application of ecological concepts and methodological design for long-term enhancement and management of soil fertility and agriculture productivity. It provides a strategy to increase diversified agro-ecosystem. So it is benefiting the effect of the incorporation of plant and animal biodiversity, nutrient recycling; biomass creation and growth through the use of natural resource systems based on legumes, trees, and incorporation of livestock. These all make the basis of a sustainable agriculture and aim to improve the food system and societal sustainability. The agro-ecology supports production of both a huge quantity and diversity of good quality of food, thread and medicinal crops, together with family utilization and the market for economic and nutritionally at risk populations. Sustainable agricultural practices have to tackle the conservation of biodiversity, enhanced ecological functions, social tolerance, self-reliance, fairness, improved quality of life and economic productivity of crops and live- stock. Sustainability of agriculture is viewed critically from the point of food and ecological security at the regional scale.

Taking the average, the monthly minimum temperature is observed in January. Similarly the average monthly maximum temperature is observed in May. The average annual rainfall in the district is 2877.9 mm. The rainfall pattern observed is that during November to March (winter) average annual rainfall is low with dry condition while April to October was observed as wet period that received high average annual rainfall. Due to varied distribution of rainfall, the

district suffers from heavy flood during wet period and moisture stress in the dry period. Analysis of rainfall data shows that out of 104 average annual rainy days, there are only 10 rainy days during the period of November to March and the remaining 94 rainy days during the period of April to October. Relative humidity was highest during June & July while it was the lowest during February & March. High relative humidity coupled with high temperature during summer favours the growth of jute & paddy in the district.

Table 1.6: Agro-ecological zone and Rainfall in Dhubri district

	Agro Ecological Zone Type	Normal Annual Rainfall (mm)	Average Monthly Rainfall (mm)	No of Rainy Days	Maximum Rainfall Intensity (mm)		
					Up to 15 min	Beyond 15 but upto 30 min	Beyond 30 but upto 60 min
Dhubri	Lower Brahmaputra Valley Zone	2877.9	179.6	187	165	21	21

Table 1.7: Average Temperature in Dhubri district

Average Weekly Temperature (⁰ C)								
Period								
Summer (Apr-May)			Winter (Oct- Mar)			Rainy (Jun-Sep)		
Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
18.65	34.85	25.7	22.22	27.79	20.43	23.35	35.55	27.9

Table 1.8: Potential Evapo-Transpiration and Elevation in Dhubri district

Potential Evapo-Transpiration (PET)				Elevation		
Period			Cumulative total	Min	Max	Mean
Summer	Winter	Rainy				
3.3	2.28	2.8	29.2			128 ft above MSL

Dhubri district is situated between latitude of 26.22 N and 25.28 N and longitude 89.42 E and 90.12 E. Dhubri falls in the Lower Brahmaputra Valley zone. The topography of the district represents mostly plain lands except a small portion of isolated small hills here and there. The soil type is generally clay loam in the northern part, sandy loam in the middle part, alluvial loam in the southern part. The district has large reservoir of water resources with the river Brahmaputra, Gangadhar, Gadadhar, Tipkai and Jinjiram etc. The agro climatic conditions of the district are conducive for various agricultural activities Farming continues to be the major occupation in the district. As per the 2011 census, there were 1.75 lakh cultivators and 1.07 lakh agricultural labourers in the district, who depended on agriculture for their livelihood. The district received rainfall of 2732 mm, 1515 mm and 1549 mm during 2011, 2012 and 2013 respectively.

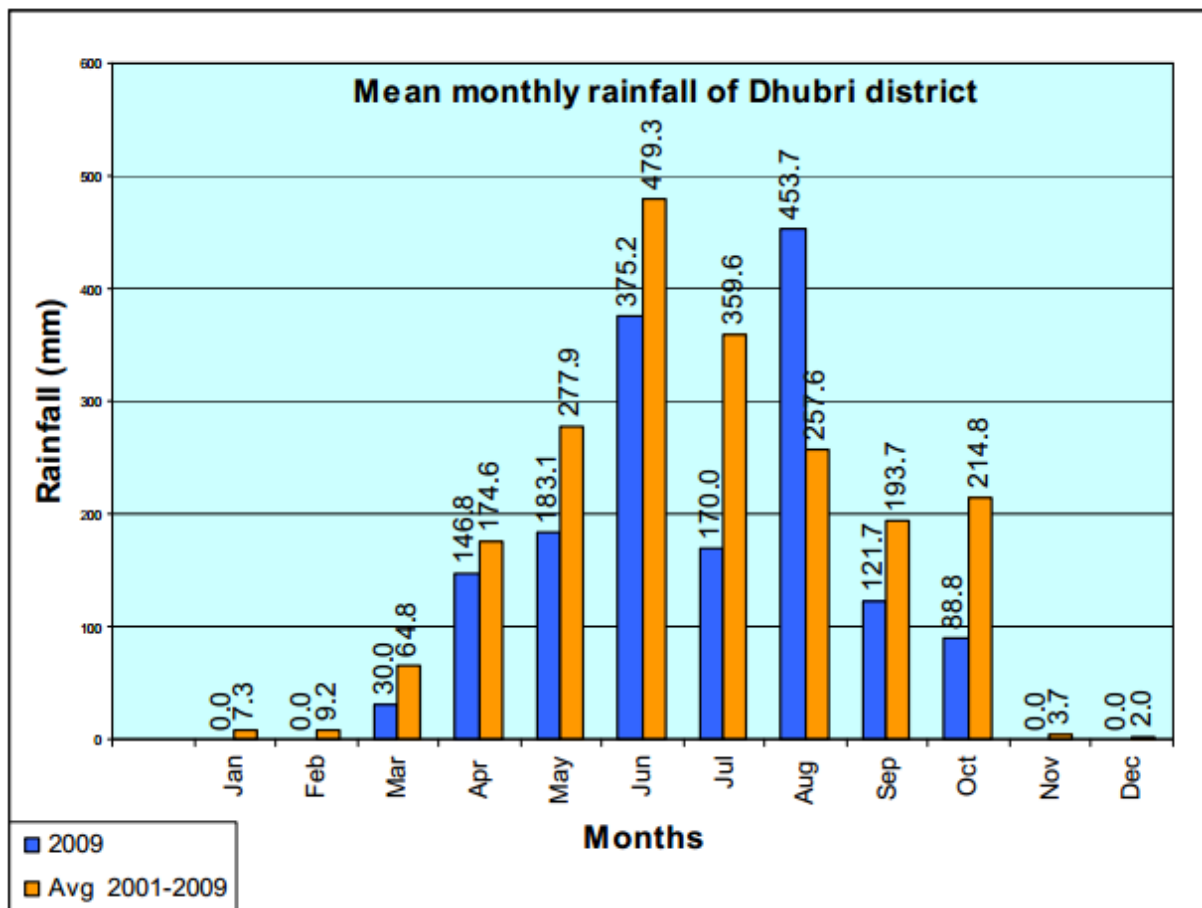


Figure 1.3: Mean monthly rainfall of Dhubri district

1.5 Soil Profile

Table 1.9: Soil Profile in Dhubri

Soil Series	Area (ha)	Land Slope (% slope gradient)	Description of Soil Series
Dhubri	19,861	Very gently sloping (1-3%)	Coarse loamy, mixed, hyperthermic family of Typic Endoaquepts
Golakganj	13,363	Nearly level (0-1%)	Fine, mixed, hyperthermic family of Fluvaquentic Endoaquepts
Salmara	9,006	Moderately sloping (5-10%)	Fine, loamy, mixed, hyperthermic family of Fluventic Dystrudepts

Source: ICAR – National Bureau of Soil Survey & Land Use Planning, Jorhat

Physiographically, the district constitutes the vast alluvial plains of Brahmaputra River system. The monotony of the flat alluvial tract is interrupted by the presence of Archaean inliers in the form of disconnected hillocks referred to as inselbergs and these occur specially in the eastern and southern parts of the district. These hillocks are joined by the offshoots of Shillong plateau and are found on the north bank near Diple beel, Sitdanga beel and east of Bilasipara and on the south bank of the foothill portion of Garo Hills along the district boundary. The level difference between the valley and the peaks of the inselbergs ranges from 25 to 455 m. These hillocks are covered by a thick lateritic mantle and are occupied by evergreen mixed forest. Terraced alluvial deposits occupy 80% of the district with conspicuous occurrence of buried channels, back swamps, etc. Soils in greater part of the district are sandy and silty loam, or clayey loam. It is found to be highly acidic to slightly alkaline in nature and is moderately permeable and characterised by the presence of low organic carbon and low soluble salts. Soils restricted to inselberg areas are more clayey, lateritic and less permeable and are highly acidic in nature. From agriculture point of view, the soils in major part of the area are suitable for all sorts of crops cultivation.

1.7 Land Use Pattern

Table 1.10: Land use pattern of Dhubri

Sl. No.	Name of Block	Total Geographical area (HA)	Area under Agriculture			
			Gross cropped Area	Net sown area	Area sown more than once	Cropping intensity
			(1)	(2)	(1-2)	
1	Golakganj	13783	15134	8889	6275	169
2	Rupshi	13278.21	17035	9182	7853	185.6
3	Gauripur	20296.43	18583.44	12522.5	7802.94	148.4
4	Debitola	5425.74	6289.68	3984.48	2296.36	146
5	Mankachar	10869.97	14940	7834	7106	190
6	Fekamari	15875.21	19694	10577	9117	186
7	Birsingh Jarua	33608	27036	17593	9443	154
8	South Salmara	10628.22	10393.22	6603	3800.2	157
9	Jamadarhat	6586.64	8273.9	5338	2935.9	155
10	Nayeralga	10493.25	9968.58	7030.48	2938.11	141.79
11	Hatidhura	6247	6726	4664	576	144.21
12	Mahamaya	13410	19370	10296	7156	190
13	Bilasipara	11672	16686	9124	7030	190
14	Agomoni	31331	22357	12258	10099	182.39
15	Chapar Salkocha	19282	18025	9217	8818	195.56
TOTAL		222786.7	230511.8	135112.5	93246.51	

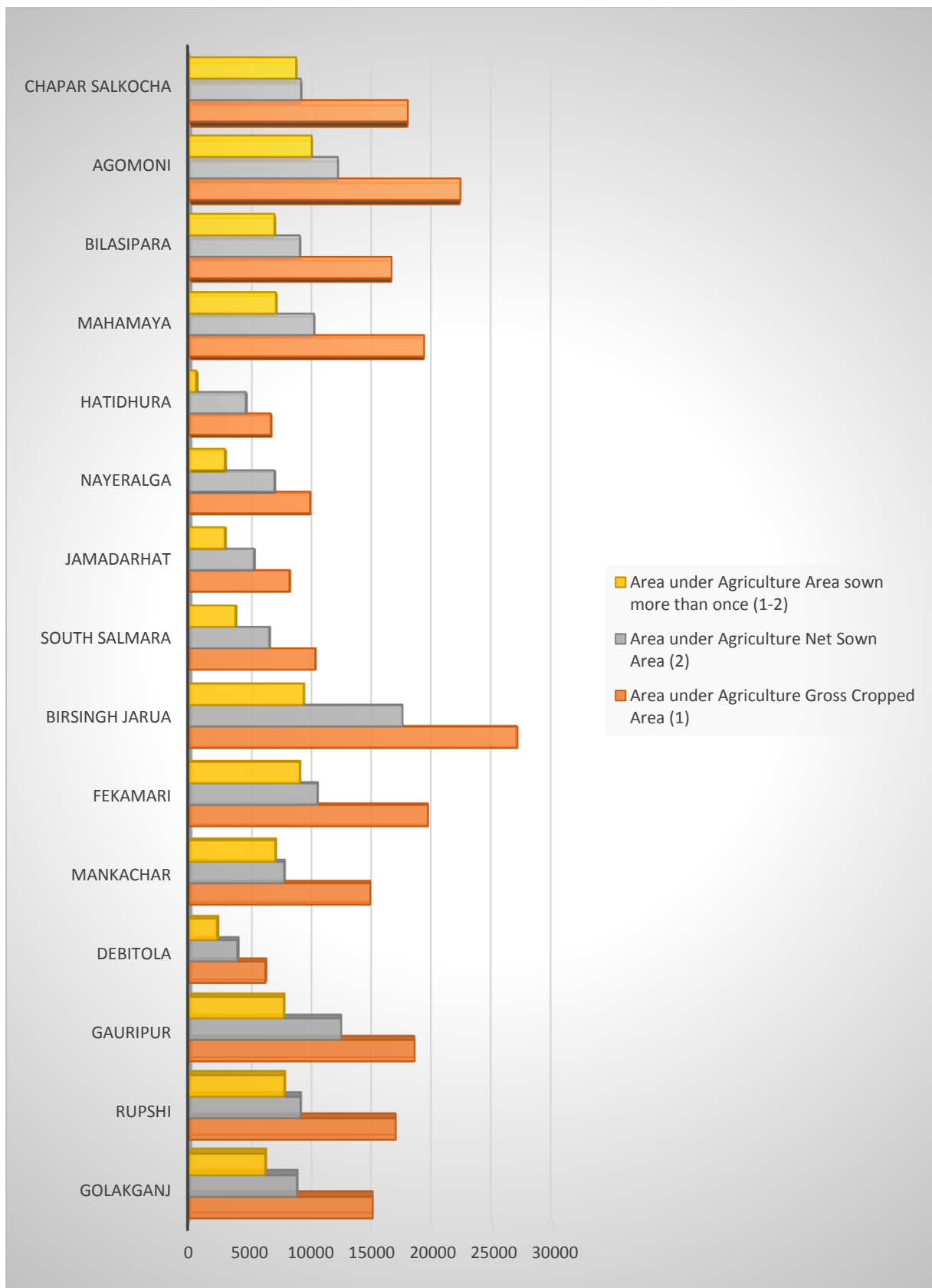


Figure 1.4: Block-wise Land Use Pattern

Table 1.11: Block-wise Area under Forest, Wasteland and Other uses

Sl	Name of the Gram Panchayat	Area under forest	Area under wasteland	Area under other uses
1	Golakganj	0	1684	3260
2	Rupshi	80	1442.21	2574
3	Gauripur	0	2160.29	1554.76
4	Debitola	0	0	1441.26
5	Mankachar	625	178	354
6	Fekamari	0	270	309
7	Birsingh Jarua	0	4925	11090
8	South Salamara	0	2156	2350.22
9	Jamadarhat	0	523	724.17
10	Nayer alga	0	1888.77	1573.99
11	Hatidhuka	0	31	207
12	Mahamaya	71	278	2765
13	Bilasipara	131	239	2178
14	Agomoni	0	175	5752
15	Chapar-Salkocha	1859.5	1479.5	6726
	TOTAL	2766.5	17429.77	42859.4

Source: Agriculture Department, Dhubri

Chapter 2: District Water Profile

2.1 Area-wise, Crop-wise Irrigation status

Dhubri district is primarily dependent on agriculture and forest products. Main source of income is paddy with surplus production than its requirement. Jute and mustard seed occupy the major share of cash crops. From forest mainly timber and bamboo add to the income though boulder and sand. Fish, milk, meat and egg have small contribution to the economy. Land revenue collection is very small in amount whereas excise duty occupies a lion's share of the Govt. exchequer.

Table 2.1: Area under major field crops

Crop	Area('000 ha) (2014-15)
Summer Paddy	62.312
Autumn Paddy	3.321
Rapseed and mustard	24.300
Wheat	1.572
Black Gram	13.81
Nizer	0.589
Seasamum	0.865
Lentil	11.351
Linseed	0.350
Pea	0.435
Groundnut	0.250
Green Gram	0.163

Table 2.2: Area under horticulture crops

Horticulture Crops	Area('000 ha)
Banana	1.625
Guava	0.180
Jackfruit	0.450
Litchi	0.015
Pineapple	0.100
Rabi Vegetable	7.8
Potato	5.850
Khrif vegetable	3.728

2.2 Production and Productivity of Major Crops

Table 2.3: Production and Productivity of crops in Golakganj

Name of the Block: Golakganj Development Block																		
Season	Crop Sown						Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	Fibre	Any other crops	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)	Area (ha.)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs/ha)	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)
A. Kharif	Winter paddy						5078	152340	3000						5078			
					Jute		1204	30100	2500						1204	30100	2500	
B.Rabi		Maize									108.5	5425	5000		108.5	5425	5000	
			Black Gram				410	3075	750						410	3075	750	
			Lentil				90	540	600						90	540	600	
			Pea				250	1625	650						250	1625	650	
				Mustard			550	3850	700		230	2300	1000		780	6150	850	
	Wheat						230	4950	1500		140	2590	1850		370	6450	2425	
Summer	Summer paddy										2115	105750	5000		2115	105750	5000	
Horticulture & Plantation							1171.2	200809.2							1171.2	200809.2		
Total							8983.2				2593.5				1157.67			

Table 2.4: Production and Productivity of crops in Rupsi

Name of the Block: Rupshi Development Block																		
Season	Crop Sown						Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	Fibre	Any other crops	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)	Area (ha.)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs/ha)	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)
A. Kharif	Winer paddy						4824	113863	2360	50,000	94	2632	2800	53000	4918	116495		
					Jute		1154	24711	2141	51000					1154	24711	2141	51000
					Mesta		107	1926	1800	25000					107	1926	1800	25000
		Maize					16	650	4062	15000					16	650	4062	15000
		Small Millet					8	192	2400	15000					8	192	2400	15000
B.Rabi		Maize					57	970	1700	17000	25	1269	5076	20000	82	2239		
			Black Gram				612	10794	1763	13500	40	480	1200	16000	652	11274		
			Lentil				167	1443	864	13500					167	1443	864	13500
			Greengram				67	603	900	13500								
			Pea				106	4280	4038	14000	7	315	4500	17000	113	4595		
				Mustard			780	6240	800	14500	531	6372	1200	16500	1311	12612		
	Wheat						36	678	1884		129	3096	2400		165	3774		
				Nizer			4	16	400					4	16	400		
				Linseed			9	63	700					9	63	700		
				Sesamum			4	20	500					4	20	500		
Summer	Summer paddy										5052	309910	6134	54000	5052	309910	6134	54000

Horticulture & Plantation							1070	100225			685	97422						
Total							9021				6563						13762	

Table 2.5: Production and Productivity of crops in Gauripur

Name of the Block: Gauripur Development Block																		
Season	Crop Sown						Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	Fibre	Any other crops	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)
A. Kharif	Sali paddy						2977		3600									
		maize					59		3200									
			Green Gram				22		900								2500	
					Jute		974		1800									
B.Rabi	Early Alu						83											5000
	Wheat						925		1500				1700					
			Black Gram				716		900									750
			Lentil				132		800									600
			Pea				105		1800				1400					650
				Mustard			2023		1100				1250					850
	Wheat																	2425
Summer	Summer paddy						3432						6300					5000
Horticulture & Plantation							60											

Total							11508											
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Table 2.6: Production and Productivity of crops in Debitola

Name of the Block: Debitola																		
Season	Crop Sown						Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	Fibre	Any other crops	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)
A. Kharif	Winer paddy						50	150 qunitals	3000									
B.Rabi		Maize					25	775	3100									
			Black Gram				140	1680	1200									
			Lentil				45	585	1300									
			Pea				60	900	1500									
				Mustard			3240	38880	1200									
	Wheat						25	60	3000									
Summer	Summer paddy						3600					270000	7500					
Horticulture & Plantation	Potato						190					45600	24000					
	Onion						15	675	4500									
Total							7390											

Table 2.7: Production and Productivity of crops in Mankachar

Name of the Block: Mankachar																			
Season	Crop Sown						Rainfed				Irrigated				Total				
	Cereals	Coarse Cereals	Pulses	Oil Seeds	Fibre	Any other crops	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs/ha)	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)	
A. Kharif	213						213	4473	2100	25000									
						2585	2585	77550	3000	46713									
B.Rabi	4675						4675	126750	3000	30443		21600	4800	36000		48350		36000	
			185				185	1665	900	240661						1665	900	240661	
				783			783	7034	975							7034	975		
Summer	4720						4720	10815	2100	21000		252300	6000	36000		263195		36000	
Horticulture & Plantation	Banana, coconut, ginger, turmeric, cashewnut						2270												
Total							15431												

Table 2.8: Production and Productivity of crops in Fekamari

Name of the Block: Fekamari																		
Season	Crop Sown						Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	Fibre	Any other crops	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs/ha)	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)
A. Kharif	1076						1076	22596	2100	25000						22596	2100	25000

					2705		2705	81150	3000	46000					81150	3000	46000	
B.Rabi	6090						6090	164200	3000	30000		21600	4800	46500		190800		36000
			2092				2092	18828	900	24000						18828	900	24000
				2110			2110	205725	975	26000						205725	975	26000
Summer	6347						6347	8085	2100	21000		357720	6000	46000		365805		36000
Horticulture & Plantation	Coconut, banana						688											
Total							21108											

Table 2.9: Production and Productivity of crops in Birsingh Jarua

Name of the Block: Birsingh Jarua																		
Season	Crop Sown						Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	Fibre	Any other crops	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)	Area (ha.)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)
A. Kharif	Cereals						1709	61524	3600	22500					1709	61524	3600	22500
					Fibre		3384	91368	2700	46500								
B.Rabi	Cereals						789	33138	4200	22500	4183	326274	7800	52500	4972	359412	12000	
		Coarse Cereals					923	22152	2400	15000					923	22152	2400	15000
			Pulses				4477	53724	1200	13500					4477	53724	1200	13500
				Oil Seeds			1902	17118	900	14250	30	450	1500	18750	1932	17568		
Summer																		

Horticulture & Plantation							1368				299							
Total							14552				4512							

Table 2.10: Production and Productivity of crops in South Salmara

Name of the Block: South Salmara																		
Season	Crop Sown						Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	Fibre	Any other crops	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)	Area (ha.)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs/ha)	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)
A. Kharif	Cereals						2235	80460	3600	22500					2235	80460		
		Coarse Cereals					401	9624	2400	15000					401	9624		
					Fibre		1811	48897	2700	46500					1811	48897		
B.Rabi	Cereals						70	2520	3600	22500	2038	158364	7800	52500	2108	161484		
		Coarse Cereals					400	9600	2400	15000					400	9600		
			Pulses				1887	22644	1200	13500					1887	22644		
				Oil Seeds			515	4635	900	14250					515	4635		
Summer																		
Horticulture & Plantation							645.4				378							
Total							7964.4				2416							

Table 2.11: Production and Productivity of crops in Jamadarhat

Name of the Block: Jamadarhat																		
Season	Crop Sown						Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	Fibre	Any other crops	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)	Area (ha.)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs/ha)	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)
A. Kharif	Paddy						1114	40104	3600	22500					1114	40104	3600	22500
					Fibre		988	26676	2700	46500								
B.Rabi	Paddy						297	12474	4200	22500	1159	90402	7800	52500	1159	90402	7800	52500
		*					135	3240	2400	15000					135	3240	2400	15000
			*				887	10644	1200	13500					887	10644	1200	13500
				*			407	3663	900	14250					407	3663	900	14250
Summer																		
Horticulture & Plantation							834				193				1027			
Total							4662				1352							

Table 2.12: Production and Productivity of crops in Mahamaya

Name of the Block: Mahamaya																		
Season	Crop Sown						Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	Fibre	Any other crops	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)	Area (ha.)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs/ha)	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)
A. Kharif	Autumn Paddy						54	1228.5	2275	56443						1228.5	2275	
	maize						40	1248	3120	46215						1248	3120	
					Jute		1015	18585	1831	51744						18585	1831	
B.Rabi	Winter Paddy						120	2904	2420	55418						2904	2420	
				Mustard			440	3520	800	31944						3520	800	
			Black Gram				410	2611.7	637	29066						2611.7	637	
Summer	Summer Paddy										3070	128940	4200	51150		128940	4200	
Horticulture & Plantation							320	22488	23353		429390					22488	23353	
Total							2399				432460							

Table 2.13: Production and Productivity of crops in Nayar Alga

Name of the Block: Nayar Alga																		
Season	Crop Sown						Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	Fibre	Any other crops	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)
A. Kharif	Sahi Paddy						952	52360	5500	52418						52360	5500	52418
			Black/green gram				1635	14715	900	27066						14715	900	27066
					Jute		2521	75630	3000	48455						75630	3000	48455
B.Rabi	Maize						99	4455	4500	31130						4455	4500	31130
	Wheat						85	225	2500	39800						2125	2500	39800
		Millets					12	120	1000	16000						120	1000	16000
			Lentin, pea, green, etc				523	5230	1000	27300						5230	1000	27300
				Mustard, rape seed, ground nut,			1505	16555	1100	28000						16555	1100	28000
Summer	Summer Paddy						5149	231705	4500	25000						231705	4500	25000
	Maize						56	2520	4500	31130						2520	4500	3030
Horticulture & Plantation							953		7							153718	16088	60022
Total							13490											

Table 2.14: Production and Productivity of crops in Salkocha

Name of the Block: Salkocha																		
Season	Crop Sown						Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	Fibre	Any other crops	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)	Area (ha.)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs/ha)	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)
A. Kharif	Sahi Paddy						3554	195470	5500	52418						195470	5500	52418
			Black/green gram				325	2925	900	27066						2925	900	27066
					Jute		667	20010	3000	48455						20010	3000	48455
B.Rabi	Maize						620	27900	4500	31130						27900	4500	31130
	Wheat						315	7875	2500	39800						7875	2500	39800
		Millets					310	3100	1000	16000						3100	1000	16000
			Lentin, pea, green, etc				475	4750	1000	27300						4750	1000	27300
				Mustard, rape seed, ground nut,			1950	21450	1100	27300						21450	1100	27300
Summer	Summer Paddy						9430	14400	4500	25000	901890	9900	52700		911320	24300		
	Maize						155	6975	4500	31130								
Horticulture & Plantation							1110									178576	16088	
Total							18911				901890							

Table 2.15: Production and Productivity of crops in Bilasipara

Name of the Block: Bilasipara																		
Season	Crop Sown						Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	Fibre	Any other crops	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)	Area (ha.)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs/ha)	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)
A. Kharif	Autumn Paddy						156	3548	2275	56443								
	Maize						148	4614	3120	46215	28	959	3430	51512		5573	3275	
					Jute		733	13416	1831	51744								
B.Rabi	Winter paddy						3738	90459	2420	55418	455	12034	2645	55060		102493		
				Mustard			870	7008	800	31914	63	538	846	35120		7546		
			Black gram				335	2133	637	29066								
Summer	Summer Paddy									2058	86436	42020	56150		86436			
			Black Gram				43	268	625	28640								
Horticulture & Plantation							579	83848	47353		65	14430	25800		98278			
Total							6602				2669							

Table 2.16: Production and Productivity of crops in Hatidhura

Name of the Block:		Hatidhura				
Season	Crop Sown					
	Cereals	Coarse Cereals	Pulses	Oil Seeds	Fibre	Any other crops
A. Kharif	3762		120	45	630	260
B.Rabi	660		240	435		450
Summer	1735					
Horticulture & Plantation	356					
Total	6513		360	480	630	710

Table 2.17: Production and Productivity of crops in Agomani

Name of the Block: agomoni Development Block																		
Season	Crop Sown						Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	Fibre	Any other crops	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)	Area (ha.)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs/ha)	Area (ha)	Production (qtn/yr)	Productivity or Yield (Kgs/ha)	Cost of Cultivation (Rs./ha)
A. Kharif	Winter paddy						8773	263190	3000	55418					8773	263190	3000	55418
					Jute		880	20910	2400	51744					880	20910	2400	51744
B.Rabi		Maize									105	5020	5000		105	5425	5000	
			Black Gram				400	2870	750						400	2870	750	
			Lentil				80	510	600						80	510	600	

			Pea				240	1520	650						240	1520	650	
				Mustard			650	4050	700						650	4050	700	
	Wheat						130	2950	1500						130	2950	1500	
Summer	Summer paddy										2015	95740	5000		2015	95740	5000	
Total							11153				2120				13273			

2.3 Irrigation Based Classification

Table 2.18: Irrigation based classification

	Block	Gross Irrigated Area	Net Irrigated Area	Partially Irrigated/ Protective Irrigation	Un-Irrigated or Totally Rainfed
1	Agomani	5470	4875	20	8063
2	Golakganj	3195	2323	105	6461
3	Birsing Jarua	13116	9609	0	7984
4	Gauripur	3937	2500.66	25.84	9996
5	Debitola	130	90.48	-	6894
6	Rupshi	1432	1111.07	106.93	7964
7	Bilasipara	4100	3412	80	5632
8	Chapar Salkocha	2640	1725	40	7452
9	Hatidhura	1647	1128	-	3536
10	Fekamari	5410	4634	56	5887
11	Jamadarhat	4970	4486	26	826
12	Mankachar	3610	2969	45	4820
13	South Salmara	2112	1442	7	2052
14	Nayeralga	5112	3769.48	-	3261
15	Mahamaya	880	615	-	9681
	Total	57761	44689.69	511.77	90509

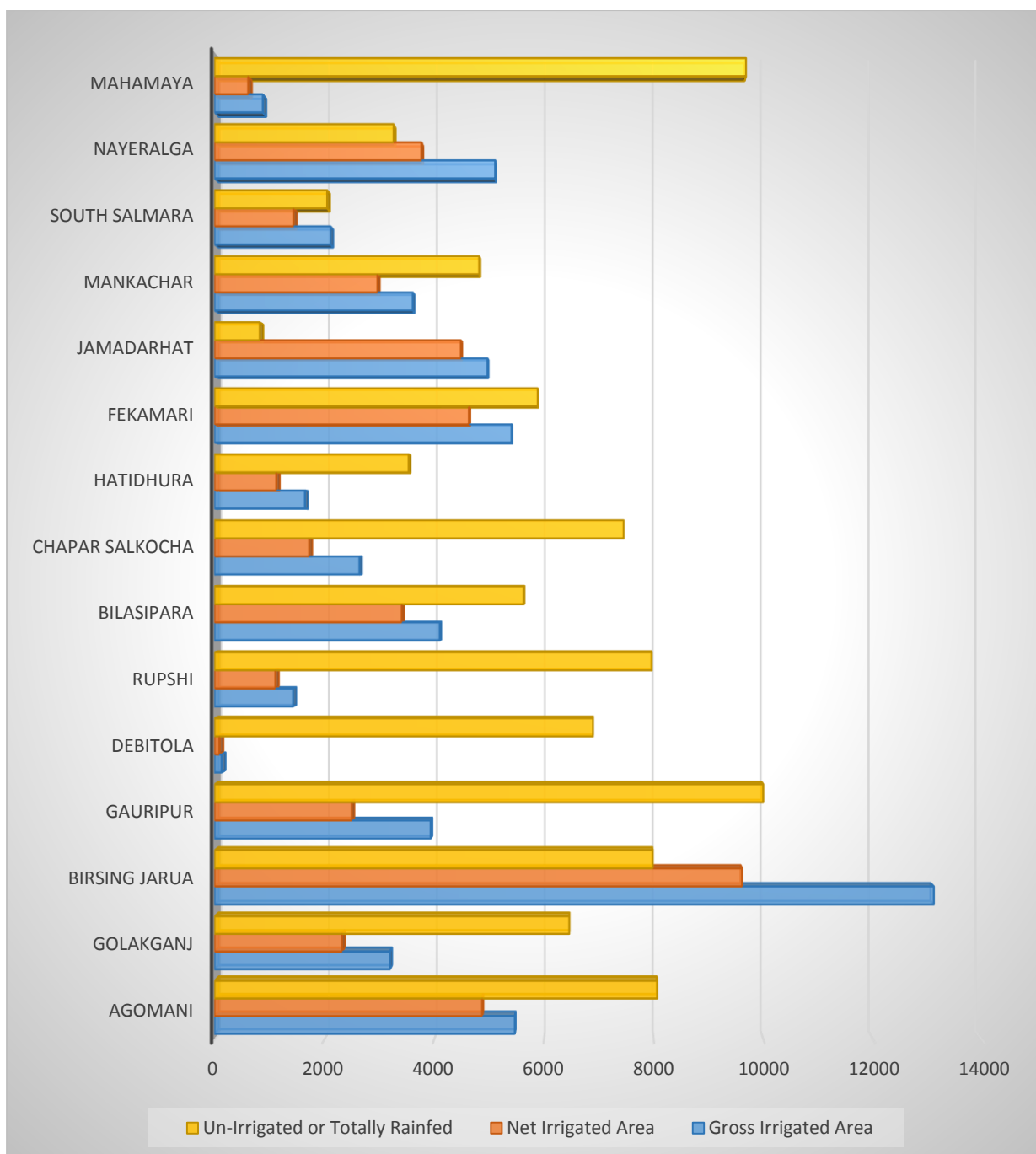


Figure 2.1: Block-wise Irrigation based classification

As discussed earlier, the district is primarily rainfed. A total of 90509 ha of area is under rainfed cultivation. The area under partial irrigation has been reported to be 511.77 ha in Dhubri district.

Chapter 3: District Water Availability

3.1 Status of Water Availability

3.2 Status of Ground Water Availability

Hydrogeology

Ground water conditions in the district can be described under two distinct hydrogeological units, i.e. conditions prevailing in the consolidated formations and the conditions prevailing in the unconsolidated formations. Pre-Cambrian gneiss-schist complex projecting abruptly above the vast stretch of alluvium as isolated hills forms the consolidated formation in the district. These rock formations had been subjected to faulting and fracturing at several places through which water percolates to facilitate weathering. Weathered zone forms as such are restricted to about 10 m thickness and is often lateritic in character. Occurrence of ground water is limited in these formations and is confined to topographic lows and weathered residuum. The movement of ground water is controlled by the presence of fractures and fissures. Extraction of ground water in these zones is possible through large diameter dug wells and bore wells in hydrogeologically suitable areas. Ground water occurs under water table conditions in the weathered zone. The unconsolidated formation is represented by the alluvial deposits of the recent age. This formation is found spreading on either side of the River Brahmaputra and comprises medium to coarse grained sand, gravel, pebbles, cobbles, etc., with intercalation of silt and clay. It is characterised by the presence of hard compact lateritic clay (Chapar formation) followed by coarse sand with pebbles and cobbles. Ground water occurs under water table and semi-confined conditions. The water table contour follows the topography of the area and lies more or less parallel to the Brahmaputra River. The movement of ground water is from north to south in the north bank and south to north in the south bank of Brahmaputra. An artesian belt also exists around Mancachar in the southern part of the district. Detailed hydrogeological surveys aided by exploratory drilling revealed the existence of promising aquifer zones down to the depth of maximum 200 m bgl in the northern bank of the River Brahmaputra and more than 100 m in the southern bank. Aquifer displays various degree of lateral and vertical variation of aquifer indicating various degree of depositional environment both in space and time.

The net ground water availability estimated in the year 2009 is 1635.61 mcm. The existing gross ground water draft 181.12 mcm and the stages of development are 11% only. Future

provision for domestic and Industrial use is 65.35mcm and for Irrigation use is 1432.85 mcm. Assessment unit can be categorized into 4 categories as SAFE, SEMI-CRITICAL, CRITICAL, and OVER-EXPLOITED.

In Dhubri district stage of ground water development is 11%, which shows under the SAFE category. As long-term water level trend does not show any major change so the whole district may be considered as SAFE.

CHART OF GROUND WATER RESOURCE ESTIMATION

Table 3.1: Status of Ground Water Availability in Dhubri

Net Ground Water Availability = 1635.61 mcm
Gross Ground Water Draft = 181.12 mcm
Stage of Ground Water Development = 11%
Future provision for Domestic & Industrial Use = 65.35 mcm
Future Provision for Irrigation Use = 1432.85 mcm

Ground Water Quality

The concentration of major, minor and trace element in the district is generally within the limited range except iron. The iron distribution is abruptly high in and around Tamarhat and Chapar area where it has exceeded the permissible limit of drinking. The ground water is suitable for agricultural and industrial usages.

Status of Ground Water Development

Development of ground water in the district is still in a nascent stage. It is used primarily for drinking and irrigation purpose in the district. As there is no major industry, ground water utilisation for the same is negligible.

Ground Water Management Strategy

Shallow ground water structures are congenial for construction in the district, as water level and aquifer material are laterally persistent throughout the district. Dug wells and dug-cum-bore wells especially near the inselberg zone are very beneficial. Deep tube wells can be constructed preferably below the depth of 50 m tapping aquifer zone with a discharge varying from 100 - 200 m³/hr maintaining a spacing of about 1 km. 4 Considering the vast surface water

as well as ground water resources in the district, it is recommended that conjunctive use of both these resources may be judiciously done.

Ground Water Related Issues and Problems

Frequent floods devastate the district every year during the monsoon months from May to September. Flood accompanied with soil erosion and sand deposition cause maximum damage to standing crops to the agricultural lands. Other than high iron content, most of the chemical constituents are within the permissible limit.

Recommendation

Existing hydrogeological set up and availability of huge ground water resources indicate that there is much scope for the development of ground water with the construction of abstraction structures in a planned and systematic way. Iron treatment plants need to be installed with PHED water supply schemes before using for drinking purpose.

3.3 Status of Command Area

Table 3.2: Status of Command Area

Area in Ha						
Block	Name of the village	Information of canal command			Total Area	
		Total Area	Developed Area	Undeveloped Area	Developed Command	Undeveloped Command
1	2	3	4	5	4+7	5+8
Agomani	Halakura	120	30	90	30	90
Golokganj	Charaikhola	158	20	138	20	138
	Gaikhowa	40	15	25	15	25
	Paglahat	55	20	35	20	35
	Barundanga, Dafarpur	80	20	60	20	60

	Kumarganj, Madhyapetta	413	150	263	150	263
Gauripur	Jaghrapara	130	10	120	10	120
	Madhusoulmari	40	10	30	10	30
Rupshi Development Block	Sahabganj	330	30	300	30	300
	Rupshi	128	20	108	20	108
	Kheras Daobhangi	140	20	120	20	120
	Charaldanga & Chapgarh	256	20	236	20	236
	chapgarh pt-I	80	20	60	20	60
Debitola Development Block	Asharikandi	100	30	70	30	70
	Asharikandi Ph- II	40	10	30	10	30
	Begutali	250	30	220	30	220
	Baladmara	140	20	120	20	120
Mahamaya Development Block	Barkanda	400	30	370	30	370
Bilasipara Development Block	Hakama	158	40	118	40	118
	Gaurang	750	100	650	100	650
	Surjakhata	50	18	32	18	32
Chapar Salkocha Development Block	Saslapara	40	5	35	5	35
	Bhakatgaon	40	20	20	20	20
	Seigram	40	30	10	30	10
Fekamari	Puran Sukchar	38	-	38	-	38
	Sonapara	33	-	33	-	33
	Fulerchar Pt-I	35	-	35	-	35

	Fulerchar Pt-II	37	-	37	-	37
	Bhurakata	36	-	36	-	36
	Sader Gaon	34	-	34	-	34
	Cherargaon	32	-	32	-	32
	Pubergaon	48	25	23	25	23
	Kukurmara	32	-	32	-	32
	Char Kukurmara	35	-	35	-	35
	Boaial	32	-	32	-	32
	Gazarikandi	39	20	19	20	20
	Kukurmara Pt-II	42	-	42	-	42
	Assamkata	33	-	33	-	33
	Moshaldanga	48	30	18	30	18
	Raghupara, Manullapara	36	-	36	-	36
	Sarkarpara, Mondalpara	31	-	31	-	31
	South Roghupara	38	-	38	-	38
	Moynabandha	36	-	36	-	36
	South Moynabandha	38	25	13	25	13
	Dayar Char	49	20	29	20	29
	Kharuabandha Pt-I	45	30	15	30	15

	Purandiara, Chengurchar	50	30	20	30	20
	Puran Diara	39	-	39	-	39
	Ujan jhagrarchar	28	-	28	-	28
	Sonapur	36	-	36	-	36
	Bekardoba	42	30	12	30	12
	Kathalbari	38	-	38	-	38
	Kathalbari Vedamari	38	-	38	-	38
	Kathalbari Jamaldoba	40	-	40	-	40
	Charbari	38	-	38	-	38
	Takimari	32	-	32	-	32
	Uzan Bazar	31	-	31	-	31
	Choto Bazar	38	-	38	-	38
	Khopati Pt-I (Choto Bazar)	38	-	38	-	38
	Manjhuri Gaon	37	-	37	-	37
	Khopati Pt-III	36	-	36	-	36
	Gotabari	34	-	34	-	34
Jamadar Hat	Medertari	32	-	32	-	32
	Medokona Medertari	31	-	31	-	31

	Kumri	28	-	28	-	28
	Chirakuti Chalapara	27	-	27	-	27
	Chalapara	30	-	30	-	30
	Phulpur	31	-	31	-	31
	Moirakuchi Higolchala	28	-	28	-	28
	Ravarchala	29	-	29	-	29
	Bochaimari	33	-	33	-	33
	Satsika	32	-	32	-	32
	Tagangajhar Pt- II	33	-	33	-	33
	Dindinga	10 9	75	34	75	34
Mankachar	Teporpara	14 5	-	145	-	145
	Bomatia	14 4	-	144	-	144
	Dabajani	13 9	-	139	-	139
	Tikshali	13 5	-	135	-	135
	Sadullabari	14 3	-	143	-	143
	Kalapara	13 6	-	136	-	136
	Puthimari	14 9	-	149	-	149

	Jangal	14 6	-	146	-	146
	Kalapani	15 1	-	151	-	151
	Moisghuma	13 3	-	133	-	133
	Tetlabari	14 1	-	141	-	141
	Kudhaldowa	13 8	-	138	-	138
	Bengervita	14 4	-	144	-	144
	Chirakhowa	15 1	-	151	-	151
	Bhirupara	17 0	-	170	-	170
	Bansali	20 0	-	200	-	200
	Jhonjhani, Sotimari	25 0	200	50	200	50
	Chamaibil	15 0	80	70	80	70
	Rangapani,Chan damari	12 0	60	60	60	60
	Kuchnimara, Jordonga	13 0	-	130	-	130
	Kawahagi	17 0	-	170	-	170
	Dhanua Gaon	13 0	90	40	90	40

	Sewraguri	120	-	120	-	
South Salmara	Baladoba Kandar gaon	27	-	27	-	27
	Dhenarkuti	28	-	28	-	28
	Baladoba Puber Gaon	25	-	25	-	25
	Teltari	24	-	24	-	24
	Puber Gaon	29	-	29	-	29
	Chaitar Char	26	-	26	-	26
	Chala Shershow	25	-	25	-	25
	Ambari	22	-	22	-	22
	Bashmura	24	-	24	-	24
	Bhangi Kandi	30	-	30	-	30
	Chinabari Mondal para	29	-	29	-	29
	Bhuapara	28	-	28	-	28
	Madhya Chala	25	-	25	-	25
	Matifata	27	-	27	-	27
	Chinabari Mondal para	28	-	28	-	28
	Karaichala	31	-	31	-	31
	Saulia Ravatari Pt-I	24	-	24	-	24
	Balurghat	28	-	28	-	28
	Kurdar Pahar	31	-	31	-	31

	Barkalia Surjamani	28	-	28	-	28
	Ravatary Pt-II	22	-	22	-	22
	Hazipara Bauskata Pt-II	28	-	28	-	28
	Gasbari Char	29	-	29	-	29
	Khodidila	27	-	27	-	27
	South Salmara Pt-II	28	8	20	8	20
	Tumni, Kawahagi	32	11	21	11	21
	Kawahati	26	-	26	-	26
	Bhaluk Kandi	25	-	25	-	25
	Feshatari	26	-	26	-	26
	Tumni Simlakandi	27	12	15	12	15
	Patakata	26	-	26	-	26
	Boro Chadamari	27	-	27	-	27
	Rajabala	21	-	21	-	21
	Satdubi Pt-II	22	-	22	-	22

Source: Irrigation Department, Dhubri

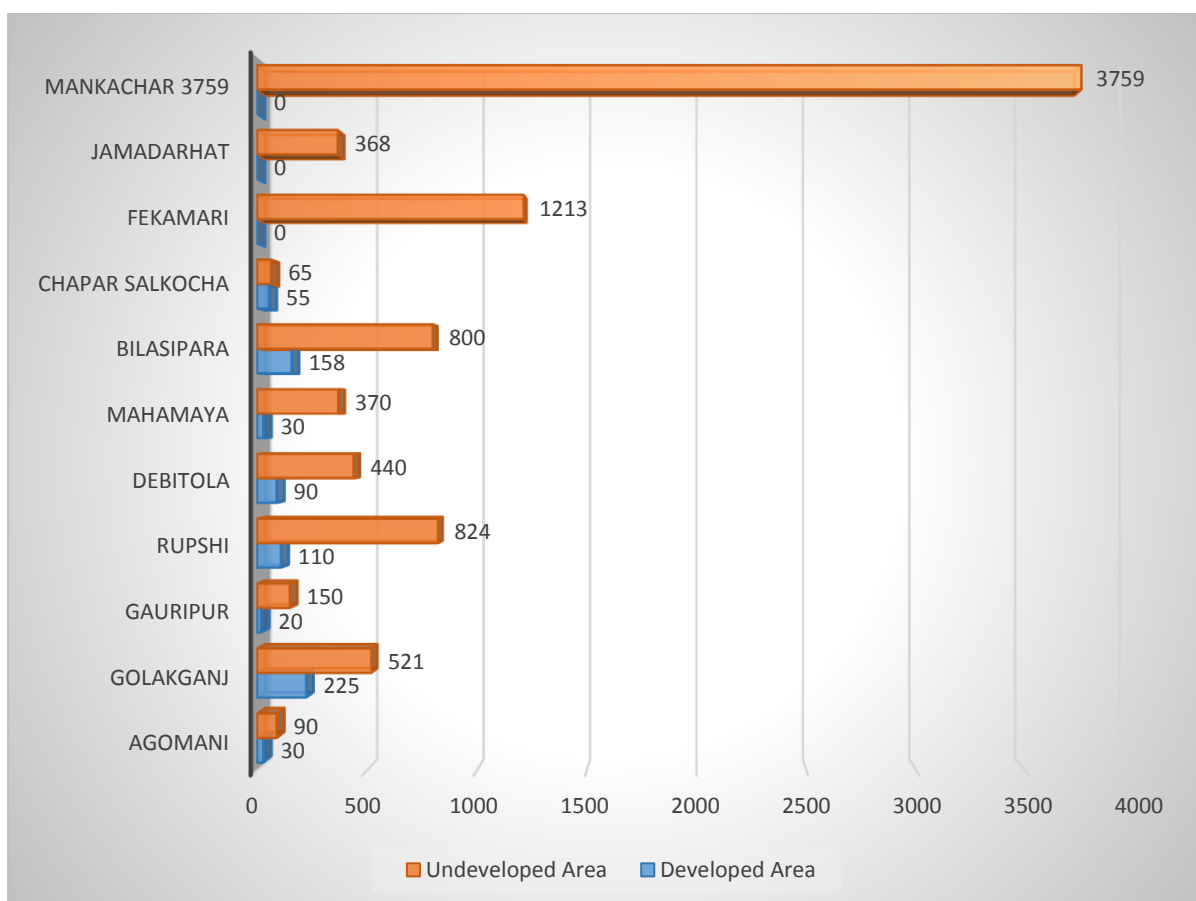


Figure 3.1: Block-wise canal command area in the district

The total canal command area is 9318 hectares in Dhubri district with 718 ha (7.77%) being developed and 8600 ha (92.29) being undeveloped in the district.

3.4 Existing Type of Irrigation

Table 3.3: Existing type of Irrigation in Dhubri district

Name of Tehsil	Surface Irrigation(1)		Ground Water (2)			WH (3)	TEDS	Water Extraction Devices/ Lift			Total	
	Canal Based	T/P/R	Tube Wells	Open Wells	Bore Wells			Elec. Pump (4)	Diesel Pumps (5)	Others (6)	Irr. Sources (1+2+3)	WEU (4+5+6)
Rupshi	716							1260	3183			
Golokganj	648		320					1200	2500	100		
Gauripur	130		40								170	
Debitola	532										532	
Mankachar								1150	3450			
Fekamari								1220	3350			
Birsingh Jarua					3290				554		3290	554

South Salmara					1520				4		15520	4
Jamadarhat			2182					86	200		2182	286
Mahamaya	400							1224	2368			3592
Nayer Alga								723	3565		4288	
Salkocha			120					982	3186		4168	
Bilasipara	1652		60									
Chapar Salkocha			120								120	
TOTAL	4078		2842		4810			7845	22360		30270	4436

Source: Irrigation Department, Dhubri

Chapter 4: Water Requirement/Demand

4.1 Domestic Water Demand

This includes the water requirement in private buildings for drinking, cooking, bathing, gardening, sanitary purposes etc. The amount of domestic water consumption per person shall vary according to the living conditions. The requirement of water depends on a number of factors like climate, culture, working conditions, physiology, level of development, etc.

As per the Bureau of Indian Standards, a minimum water supply of 200 litres per capita per day (lpcd) should be provided for domestic consumption in cities with full flushing systems. It also mentions that the amount of water supply may be reduced to 135 lpcd for the LIG and the economically weaker sections (EWS) of the society and in small towns. The total domestic consumption generally amounts to 55 to 60% of the total water consumption. The break-up of 135 litres/day/person may be approximately taken as shown in table 4.1.

Table 4.1: Average Domestic water consumption in an Indian city

Use	Consumption in litres/day/person
Drinking	5
Cooking	5
Bathing	55
Washing of clothes	20
Washing of utensils	10
Washing and cleaning of houses and residences	10
Flushing of latrines etc.	30
Total	135

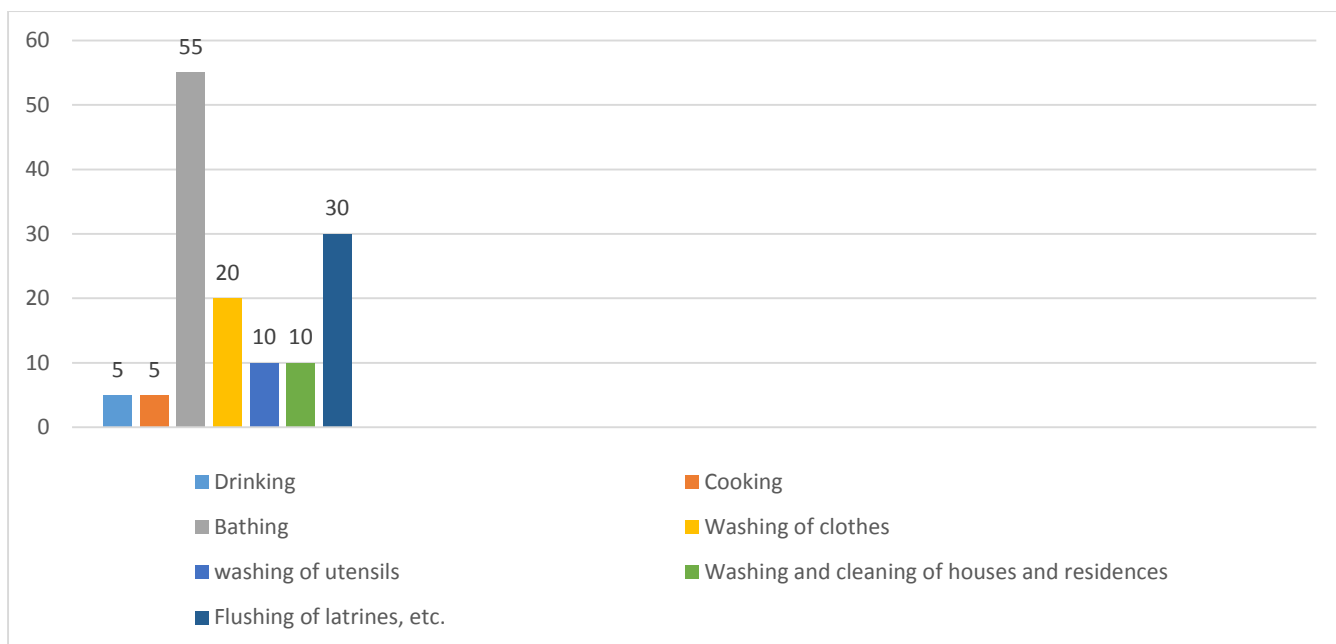


Figure 4.1: Use of water

The decadal growth rate for Dhubri district is 24.44% as per Census, 2011. The projected population in 2020 is worked out assuming the last decadal growth and annual growth rate of 2.444% is used to apply for the period 2011-2020 (9 years). Current population (in 2016) has been calculated by assuming a growth rate of 12.22% ($2.444\% \times 5$ Years) over a period of five years (from 2011-2016). Projected population has been calculated in similar way by assuming a growth rate of 9.776% ($2.444\% \times 4$ Years) over the period of four years (from 2016-2020).

Table 4.2: Domestic Water Demand

Sl. No	Block	Population in 2011	Population in 2016	Present water demand (MCM)	Population in 2020	Gross water demand 2020 (MCM)	Gap (MCM)
1	Hatidhura	53842	60421	2.98	66328	3.27	0.29
2	Golakganj	110582	124095	6.11	136227	6.71	0.60
3	Rupsi	124373	139571	6.88	153216	7.55	0.67
4	Debitola	79399	89102	4.39	97812	4.82	0.43
5	Mahamaya	102253	114748	5.65	125966	6.21	0.55
6	Bilasipara	87562	98262	4.84	107868	5.32	0.47

7	Chapar-Salkocha	118800	133317	6.57	146350	7.21	0.64
8	Agamoni	148036	166126	8.19	182366	8.99	0.80
9	Gauripur	213877	240013	11.83	263476	12.98	1.16
10	Birsingh Jarua	140397	157554	7.76	172956	8.52	0.76
11	Nayer Alga	97704	109643	5.40	120362	5.93	0.53
12	Jamadarhat	55129	61866	3.05	67914	3.35	0.30
13	South salmara	120222	134913	6.65	148102	7.30	0.65
14	Fekamari	169507	190221	9.37	208817	10.29	0.92
15	Mankachar	169168	189840	9.35	208399	10.27	0.91
16	Towns	158407	177764	8.76	195143	9.62	0.86
	TOTAL	1949258	2187457	107.79	2401303	118.32	10.54

Source: Based on computation

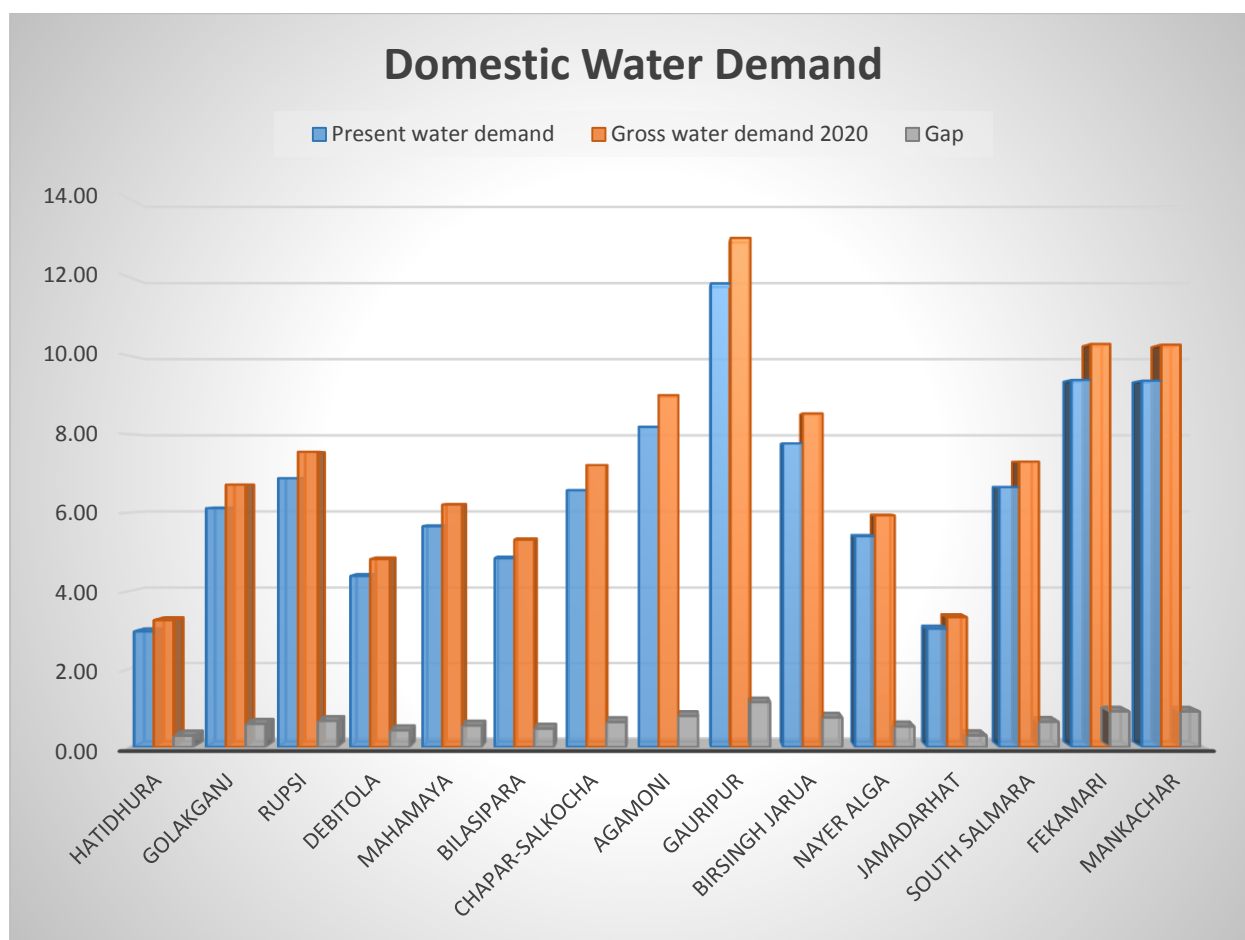


Figure 4.2: Domestic water demand and gap

4.2 Crop Water Requirement

Cereals are cultivated on major part of the gross cropped area in the district. The crops used for calculation of crop water requirement along with their respective assumptions are as under:

Table 4.3: Block-wise crop water requirement in Dhubri

Block	Crops	Area sown (Ha)	Irrigated area (ha)	Crop Water Demand (mm)	Water Potential Required (BCM)	Existing Water Potential (BCM)	Water Potential to be created (BCM)
Agomani Dev. Block	Ahu/Sali paddy/Wheat / Oil seeds	3644.00	20.00	1343	0.04894	0.00027	0.05135
Golokganj Dev. Block	Ahu/Sali paddy/Wheat / Oil seeds	3230.00	105.00	1343	0.04338	0.00141	0.04197
Hatidhura Dev. Block	Ahu/Sali paddy/Wheat / Oil seeds	188.00	0.00	1343	0.03140	0.00000	0.03140
Gauripur Dev. Block Dharmasala	Ahu/Sali paddy/Wheat / Oil seeds	14345.00	25.84	1343	0.19265	0.00035	0.19230
Birsing Jharua Dev. Block	Ahu/Sali paddy/Wheat / Oil seeds	2810.00	0.00	1343	0.03774	0.00000	0.03774
Rupsi Dev. Block	Ahu/Sali paddy/Wheat / Oil seeds	10525.00	106.93	1343	0.14135	0.00143	0.13992
Debitola Dev. Block	Ahu/Sali paddy/Wheat / Oil seeds	5360.00	104.00	1343	0.07198	0.00139	0.07059

Mahamaya Dev. Block	Ahu/Sali paddy/Wheat / Oil seeds	7226.00	40.00	1343	0.09705	0.00054	0.09651
Bilasipara Dev. Block	Ahu/Sali paddy/Wheat / Oil seeds	7678.00	80.00	1343	0.10312	0.00107	0.10205
Nayer Alga Dev. Block	Ahu/Sali paddy/Wheat / Oil seeds	4001.00	0.00	1343	0.05373	0.00000	0.05373
Chapar Salkocha Dev. Block	Ahu/Sali paddy/Wheat / Oil seeds	5551.00	40.00	1343	0.07455	0.00054	0.07401
Fekamari Dev. Block	Ahu/Sali paddy/Wheat / Oil seeds	1315.00	280.00	1343	0.01766	0.00376	0.01390
Jamadar Hat Dev. Block	Ahu/Sali paddy/Wheat / Oil seeds	443.00	0.00	1343	0.00595	0.00000	0.00595
Mankachar Dev. Block	Ahu/Sali paddy/Wheat / Oil seeds	3435.00	945.00	1343	0.04613	0.01269	0.03344
South Salmara Dev. Block	Ahu/Sali paddy/Wheat / Oil seeds	876.00	20.00	1343	0.01176	0.00027	0.01150
Golakganj		3230.00	105.00	1343	0.04338	0.00141	0.04197
Rupshi		10525.0 0	106.93	1343	0.14135	0.00143	0.13992
Debitola Dev. Block		51401.0 0	104.00	1343	0.06903	0.00139	0.06764
Fekamari Dev. Block		1315.00	280.00	1343	0.01766	0.00376	0.01390
Birsingh Jharua		2810.00	0.00	1343	0.03774	0.00000	0.03774

Jamadar Hat Dev. Block		443.00	0.00	1343	0.00595	0.00000	0.00595
Mahamaya Dev. Block		6856.00	40.00	1343	0.09208	0.00054	0.09154
Nayer Alga Dev. Block		3261.00	0.00	1343	0.04380	0.00000	0.04380
Salkocha		5486.00	40.00	1343	0.07368	0.00054	0.07314
Bilasipara Dev. Block		6996.00	80.00	1343	0.09396	0.00107	0.09289

Source: Department of Agriculture

Table 4.4: Crop water requirement in Dhubri

District	Area sown (Ha)	Irrigated area (ha)	Crop Water Demand (MCM)	Water Potential Required (MCM)	Existing Water Potential (MCM)	Water Potential to be created (MCM)
Dhubri	162950	2522.70	1629.89	1596.02	33.86	1562.17

Existing water potential and water potential to be created: The existing water potential is the extent of area already under irrigation irrespective of the source and type of irrigation. Water potential required has been derived from water required by crops cultivated under rainfed conditions. Therefore, the existing water potential represents the water requirement of crops cultivated in irrigated areas. As can be seen the existing water potential is only 3% of the total demand leaving a huge 97% of the crop water demand unmet which needs to be created in the district.

4.3 Livestock Water Requirement

As per the livestock census 2012, livestock population in Assam has grown at a rate of 10.77%. For the purpose of calculation of the growth rates, livestock census of 2012 and 2007 are considered. The growth rates for Assam (2007-2012) is used as growth rates for livestock in the district. These are as follows:

Table 4.5: Growth rates for livestock in Assam in 2007-12

	Growth rate
Poultry	-6.35%
Cattle	2.45%
Sheep	46.43%
Goat	42.81%
Pigs	-18.22%
Ducks	-6.35%

Source: Livestock Census, 2012

The annual growth rates are then used from the data above to arrive at the final figures.

The water consumption for animals is used as per the following:

Table 4.6: Water requirement range and daily water use for livestock

Water Consumptions by Animals/ Birds			
S.No.	Livestock Category	Water Requirement Range	Average water Use L/day
1	Poultry	0.16-0.24	0.20
2	Small Animals	13-20	16.50
3	Large Animals	39-59	49

Source: Adapted from Nutrient Requirements of poultry, sheep, and cattle. (9th edition). Washington D.C.: National Research Council, 1994,

Livestock water demand by 2020 & water potential to be created:

The total livestock water demand in 2016 is 12.92 million cubic meters and the same is being catered to at present by the households. However, by 2020, the livestock water demand may reach 13.05 million cubic meters resulting in an additional water potential requirement of 0.13 million cubic meters.

Table 4.7: Livestock water demand

Block	Total number of livestock	Present water demand (MCM)	Water Demand in 2020 (MCM)	Existing water potential (MCM)	Water potential to be created (MCM)
Golakganj	89307	0.58	0.6	0.58	0.02
Rupshi	159,016	1.00	1.02	1.00	0.02
Gauripur	156668	0.968601	0.984181	0.968601	0.01558
Debitola	88742	0.591305	0.604304	0.591305	0.012998
Mankachar	131656	0.742983	0.735879	0.742983	-0.0071
Fekamari	132,768	0.83	0.83	0.83	0.0025
Birsingh Jarua	125360	0.726475	0.708712	0.726475	-0.01776
Mahamaya	131365	1.029826	1.069979	1.029826	0.040153
Nayar Alga	120841	0.782416	0.813819	0.782416	0.031403
Salkocha	141997	0.413689	0.404041	0.413689	-0.00965
Bilasipara	146172	1.148073	1.179696	1.148073	0.031622
Hatidhura	119252	0.346332	0.347006	0.346332	0.000675
Agomoni	264656	1.519432	1.500558	1.519432	-0.01887
Jamadarhat	204745	1.511927	1.548284	1.511927	0.036357
South Salmara	125420	0.726519	0.708716	0.726519	-0.0178
TOTAL	2,137,965	12.92064	13.05995	12.92064	0.139309

4.4 Industrial water Demand

Table 4.8: Industrial water demand

Block	Name of the Industry	Water Demand (MCM)	Water Demand in 2020 (MCM)	Existing Water Potential (MCM)	Water Potential to be created (MCM)
Agomoni Development Block	Rice mill, Atta chakki, Tailoring, Jute Craft, Steel furniture, D.T.P	0.05069	0.050712	0.05069	0.000009
Bilasipara Development Block	Tailoring, Brick Manufacturing, Jute Craft, Mustard oil mill, Steel furniture, D.T.P, Atta chakki, Rice Mill, Steel Fabrication & furniture, Press offset, Baakery	0.07046	0.07092	0.07046	0.000102
Birsing Jarua Development Block	Jute Craft, Rice mill, Tailoring	0.04081	0.04096	0.04081	0.000065
Chapar-Salkocha Development Block	Rice mill, Tailoring, Atta chaki, Mustard Oil Mill, Jute craft, Brick Manufacturing, Steel Fabrication, Stone Crusher, D.T.P	0.06071	0.06098	0.06071	0.000072
Devitola Development Block	Rice Mill, Jute Craft, Atta chakki, Tailoring, Brick Industry, Steel Furniture,	0.06097	0.06099	0.06097	0.000071

	D.T.P, Terracotta, RCC Products				
Fekamari Development Block	Rice mill, Atta chakki, Tailoring, Dry Fish	0.08091	0.08098	0.08091	0.000135
Gauripur	Rice mill, Atta chakki, Tailoring, Ice Factory, Chow chow manufacturing, Steel Fabrication, D.T.P , Agarbatti manufacturing, Papad making, Concrete Block, Coaltar Industry, Press Offset, Mustard Oil mill, Bakery, Beauty Parlour, Package drinking water	0.08121	0.08135	0.08121	0.000005
Golokganj Development Block	Rice Mill, Atta Chakki, Tailoring, Steel fabrication & furniture, D.T.P, Coaltar industry, Cane & bamboo, Weaving, Jute craft	0.04165	0.04289	0.04165	0.000002
Hatidhura Development Block	Rice mill, chakki, Cane & bamboo, Tailoring, Jute craft	0.03061	0.03089	0.03061	0.000055
Jamadarhat Development Block	Rice mill, Atta chakki, Tailoring, Weaving, Dry fish, Agarbatti Manufacturing, Jute Craft	0.03076	0.03099	0.03076	0.000023
Mahamaya Development Block	Rice mill, Atta chakki, Tailoring, Dry Fish, D.T.P, Steel Furniture,	0.05081	0.05096	0.05081	0.000021

	G.I. bucket & truck manufacturing, Cement factory, Press offset				
Mankachar Development Block	Crusher nut, Rice mill, Atta chakki, Tailoring, Dry Fish, D.T.P, Steel Furniture, G.I. bucket and truck manufacturing, Cement factory, Press offset	0.06029	0.06046	0.06029	0.000089
Nayer Alga Development Block	Rice mill, Tailoring, Steel fabrication and furniture, Chicken supari, Dry fish	0.04021	0.04031	0.04021	0.000012
Rupshi Development Block	Rice mill, Tailoring, Steel furniture, DTP, Jute craft, Flour mill, Brick Manufacturing, Atta Chakki, Cement Factory	0.04039	0.04046	0.04039	0.000017
South Salmara Development Block	Rice mill, Tailoring, Chicken supari, Dry fish, Jute craft	0.03031	0.03045	0.03031	0.000085
TOTAL		0.77079	0.774302	0.77079	0.000763

Source: Department of Agriculture

4.5 Water Demand for Power Generation

Power is not generated in the district and hence, water requirement has been indicated to be zero. The power requirement of district is met through common grid system of the state.

4.6 Total Water Demand of the district for various sectors

Table 4.9: Total water demand of the district (present)

District	Demand from components (MCM)					Total (MCM)
	Domestic	Crop	Livestock	Industrial	Power Generation	
Dhubri	107.79	1629.8861	12.92064	0.77079	0	1751.37

Source: Based on computation

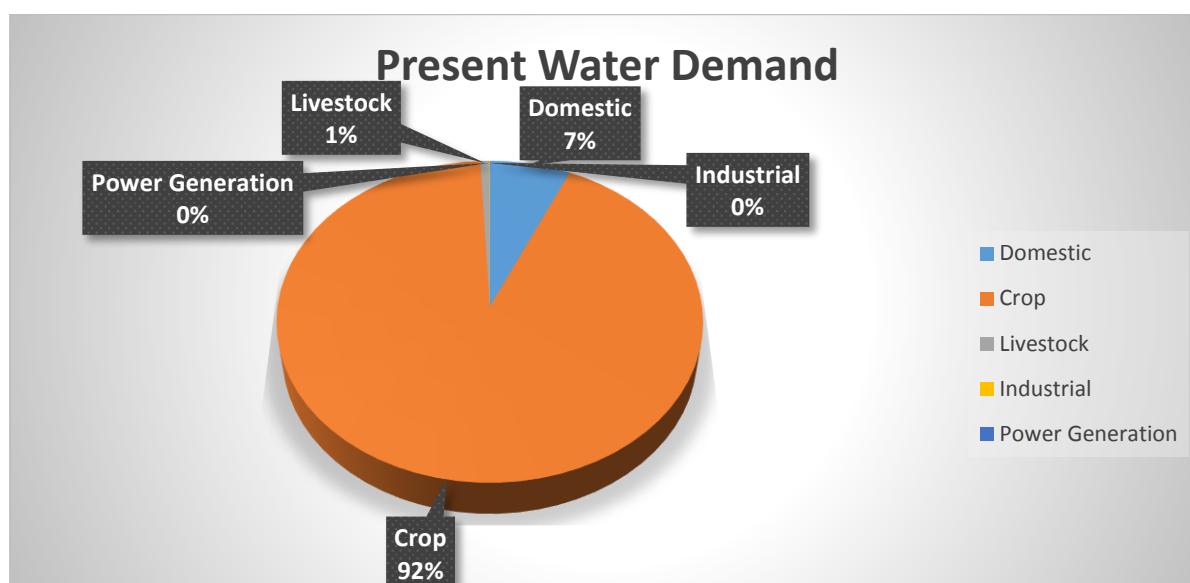


Figure 4.3: Present Water demand of the district

The present water demand of the district has been assessed to be 1751.37 MCM annually. Out of the total water demand 1629.88 mcm (93 percent) is the requirement from crop production. Nearly 107.79 mcm is required for domestic drinking water requirement and another 12.92 mcm (or 1%) is required for livestock water requirement purpose. Industrial water requirement is very low with 0.77079 mcm and there is no water requirement for power generation.

Table 4.10: Total water demand of the district (projected for 2020)

District	Demand from components (MCM)					Total (MCM)
	Domestic	Crop	Livestock	Industrial	Power Generation	
Dhubri	118.33	1629.8861	13.05995	0.774302	0	1762.05

Source: Based on computation

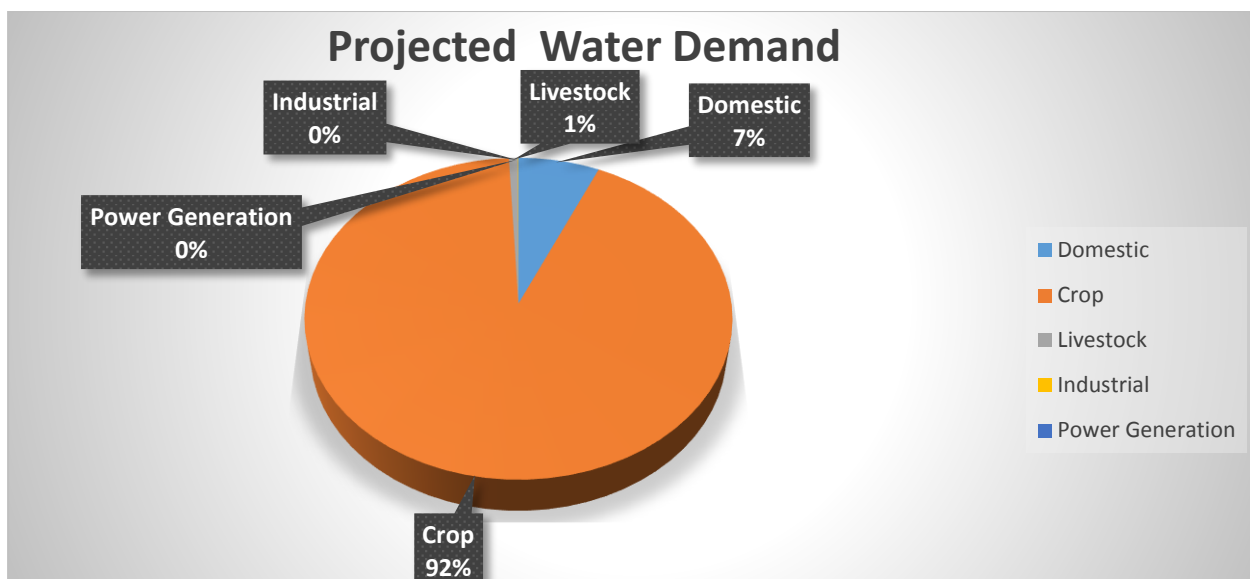


Figure 4.4: Projected water demand of the district in 2020

The projected water demand of the district has been assessed to be 1762.05 MCM annually. Out of the total water demand 1629.88 mcm (92 percent) is the requirement from crop production. Nearly 118.33 mcm is required for domestic drinking water requirement and another 13.05 mcm (or 1%) is required for livestock water requirement purpose. Industrial water requirement is very low with 0.7743 mcm and there is no water requirement for power generation.

4.7 Water Budget

The water budget shows wide gaps between water availability and water demand in the district.

Table 4.11: Water Budget of Dhubri

District	Existing water availability (MCM)			Water Demand (MCM)		Water Gap (MCM)
	Surface Water	Ground Water	Total	Present (2016)	Projected (2020)	
Dhubri				1751.37	1762.05	

Note: Water gap is calculated as water demand minus existing water availability. A negative water gap means that excess water availability exists and a positive water gap means that existing water availability is short of demand.

The water budget analysis suggest that urgent efforts are required to meet the water requirements of the district as the gap is likely to increase in future. Utilizing the surface & ground water potential in the district and activities that promote ground water re-charge and

soil moisture and water conservation etc. are proposed in the Strategic Action plan, 2016-20 that will address the challenge.

Chapter 5: Strategic Action Plan for Irrigation in District under PMKSY

The vision of the scheme PMKSY is to ensure access to some means of protective irrigation to all agricultural farms in the country, to increase water use efficiency by its ‘per drop more crop’ subcomponent, thus bringing much desired rural prosperity. The need of the hour is to have well managed watershed resources which not only enhances the ecological resource base of a rural economy but will also create sustainable livelihood opportunity.

At present, the schemes implemented by all the departments are broadly based and are required to be specific and location/ problem based. On the basis of methodology described above, a strategic plan for four years has been prepared starting from 2016-17 to 2019-20.

5.1 Component-wise plan of the district

The plan is prepared component wise also. Table 5.1 shows component wise plan for 4 years starting from 2016-17 to 2019-20. AIBP component has to be executed by Irrigation Department. Her Khet Ko Pani is to be executed by Irrigation and Agriculture Departments while Per Drop More Crop is to be also executed by Agriculture Department. Watershed component will be taken care of by Soil Conservation department and District Rural Development Agency. However, all the stakeholders need to have coordination among themselves to have the maximum irrigation efficiency and to avoid duplicity. Figure shows the graphical representation of various components of PMKSY. It is observed that the total command area to be brought under PMKSY scheme is 90828 hectares while the estimated fund requirement for the execution of PMKSY activities in the district is Rs.148323 lakhs or Rs.1483.23 crores.

Table 5.1: Component-wise command area and planned outlay in Dhubri

Component wise	Command Area (ha)	Estimated Cost (in Lakhs)
AIBP	6411	16027.5
Har Khet Ko Pani	63638	122991.26
Per Drop More Crop	3415	1984.22
Watershed	17364	7320
Total	90828	148322.98

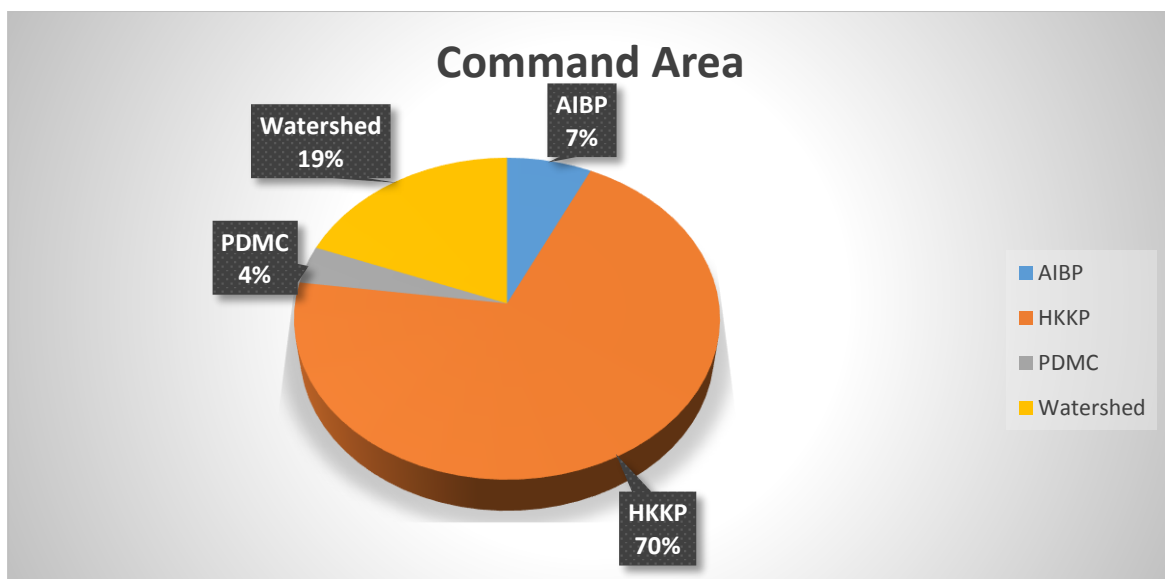


Figure 5.1: Component-wise command area under PMKSY in Dhubri

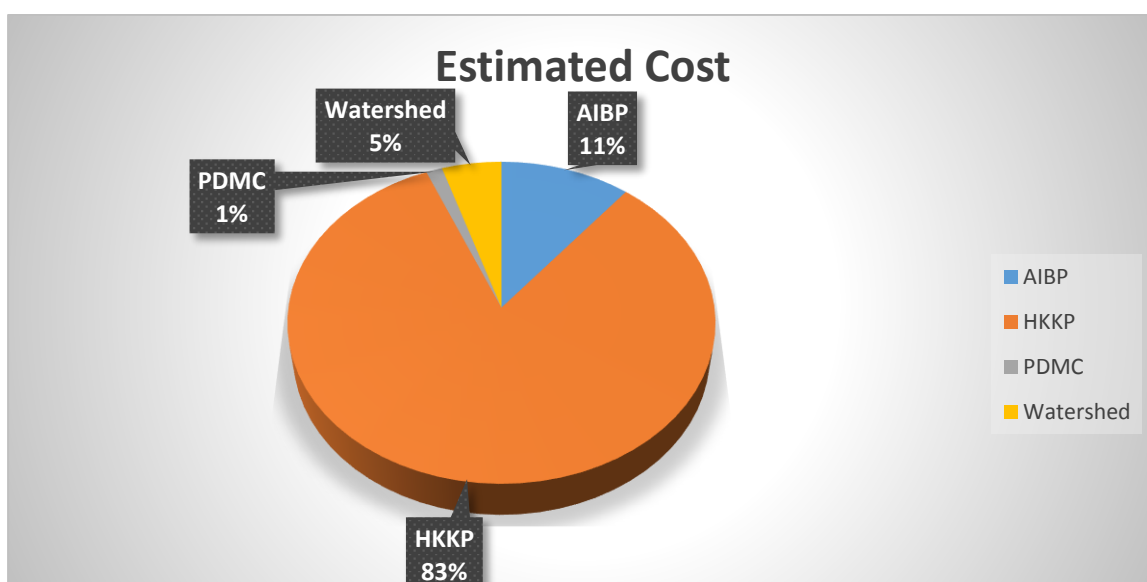


Figure 5.2: Component-wise estimated cost under PMKSY in Dhubri

In terms of percentage the figures show that Har Khet Ko Pani has the largest share in both command area and estimated costs. Har Khet Ko Pani has 70% of share in command area and 83% share in planned outlay under PMKSY in Dhubri district. Watershed activities cover 19% in terms of command area but has a share of only 5% in the planned outlay. Per Drop More Crop has the least share in both command area and estimated cost with 4% (3415 ha) and 1% (19.84 crores) allotted to it respectively.

5.2 Block-wise Plan under PMKSY

Table 5.2: Block-wise command area and planned outlay under PMKSY in Dhubri

	Block	Command Area (in ha)	Estimated Cost (in lakhs)
1	Nayer-Alga	3261	7112.4
2	Debitola	6894	9878.2
3	Mahamaya	9801	10332.9
4	Gouripur	9996	21662.7
5	Chapar Salkocha	7652	10438
6	Agomoni	8062.5	15184.26
7	Golakganj	6461	9820.4
8	Rupsi	7964	13039.1
9	South Salmara	2051.5	2867
10	Jamadarhat	825.5	1301.8
11	Bilasipara	5632	9884.3
12	Mankachar	4820	9201.96
13	Hatidhura	3536.5	6286.68
14	Fekamari	5887	5023.52
15	Birsingh Jarua	7984	16289.76
	TOTAL	90828	148323

Block-wise command area

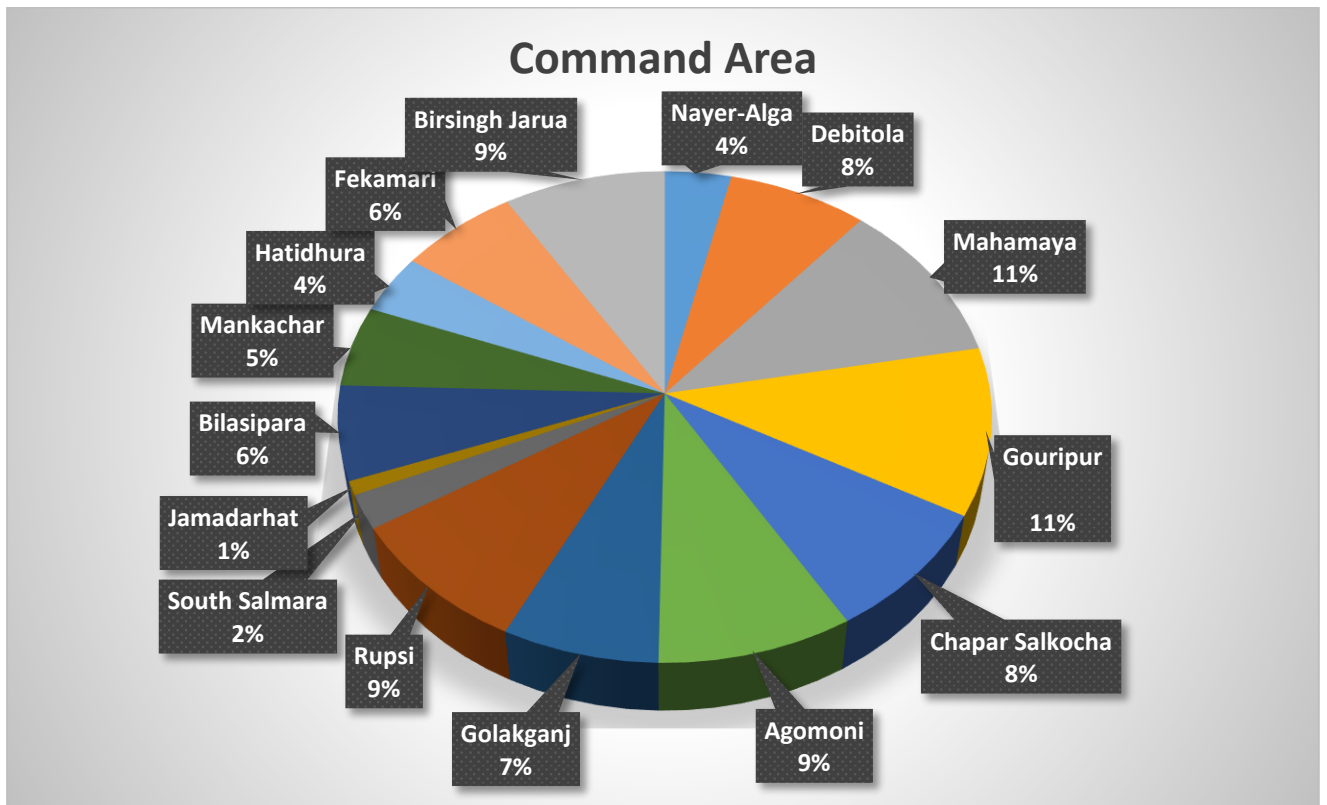


Figure 5.3: Block-wise command area under PMKSY in Dhubri

Block-wise Planned Outlay

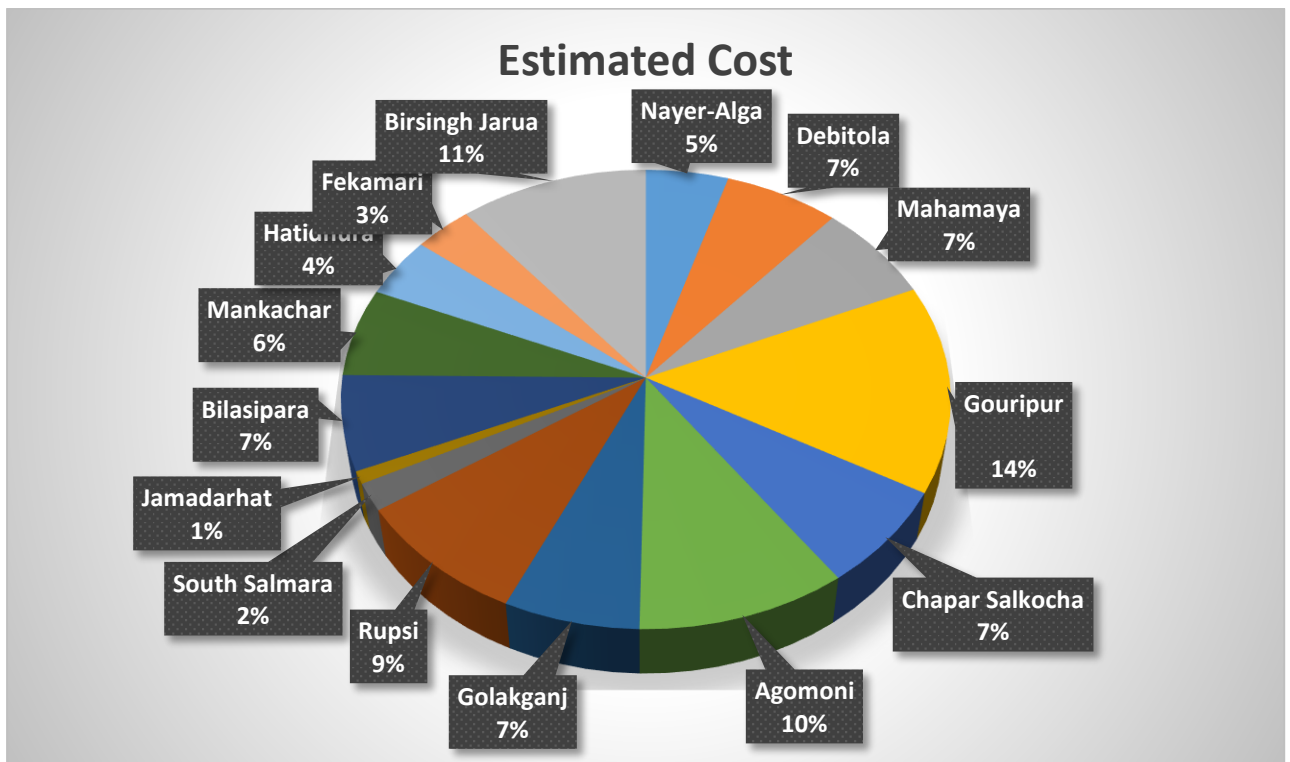


Figure 5.4: Block-wise planned outlay under PMKSY in Dhubri

Out of the total plan of 1483.23 crores, the maximum share of 14% is pertaining to Gauripur block followed by Birsingh J aruablock which has a share of 11%. Agomoni block has a share of 10% in the planned outlay for the district. 7 blocks i.e. Mahamaya, Chapar Salkocha, Debitola, Golakganj and Bilasipara blocks have 7% each in the planned outlay. Jamadarhat block has the least planned outlay with Rs.13.01 crores (1%).

Block-wise, component-wise planned outlay under PMKSY

I. Nayer Alga block

Table 5.3: Command Area and Planned Outlay for Nayer-Alga block

Nayer-Alga	AIBP	HKKP	PDMC	Watershed	Total
Command Area (Ha)	0	2951	20	290	3261
Estimated Cost (rs. Lakhs)	0	6734.4	8	370	7112.4

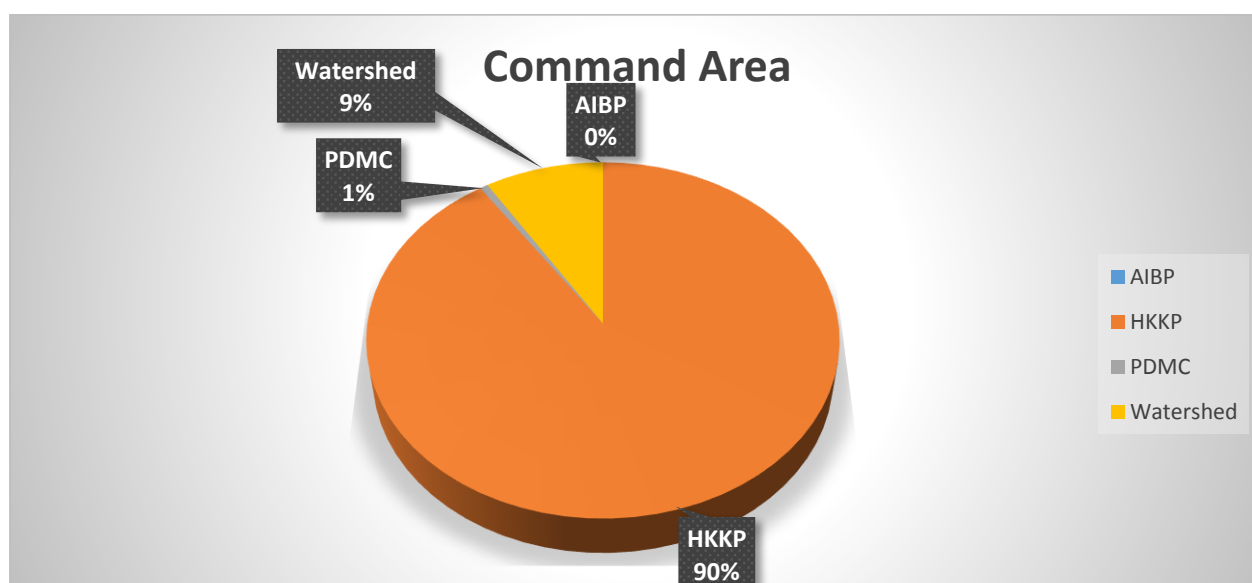


Figure 5.5: Share of components in command area in Nayer-Alga block

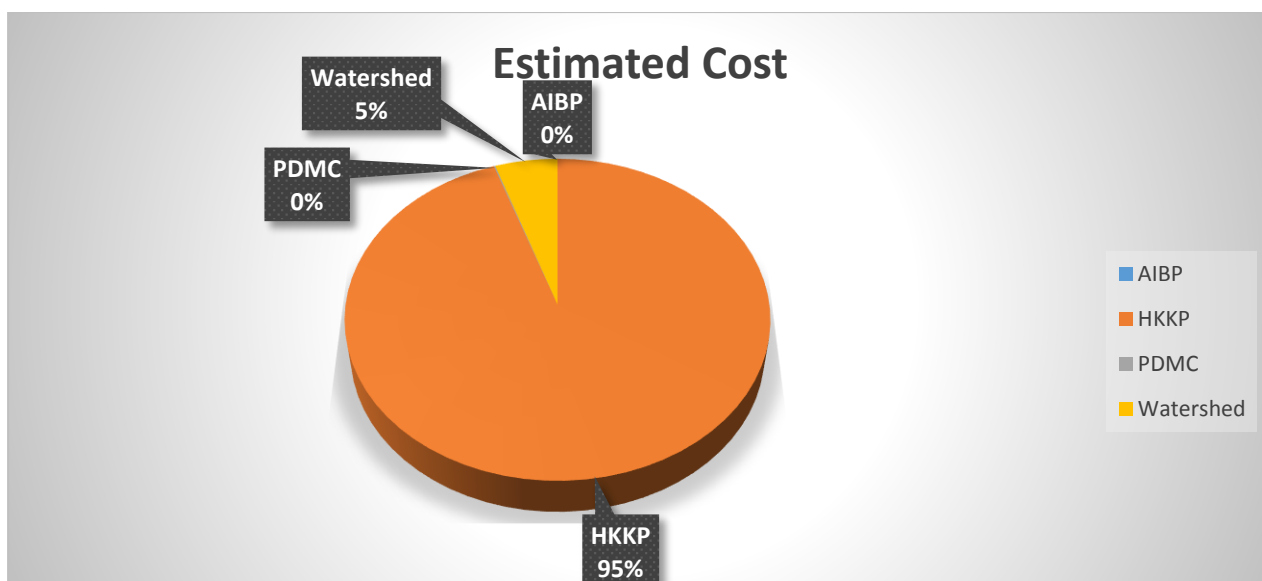


Figure 5.6: Share of components in planned outlay in Nayer-Alga block

In Nayer-Alga block, Har Khet Ko Pani component has the highest share with Rs.100.84 crores (95%), followed by 3.70 crores in Watershed component, 8 lakhs in PDMC and no money in AIBP component. However, in terms of command area, Har Khet Ko Pani has 90% share while Watershed has 9% share of the total command area in the block. Per Drop More Crop has just 20 hectares of command area in the block.

II. Debitola Block

Table 5.4: Component-wise command area and planned outlay in Debitola block

Debitola	AIBP	HKKP	PDMC	Watershed	Total
Command Area	570	3175	0	3149	6894
Estimated Cost	1425	7698.2	0	755	9878.2

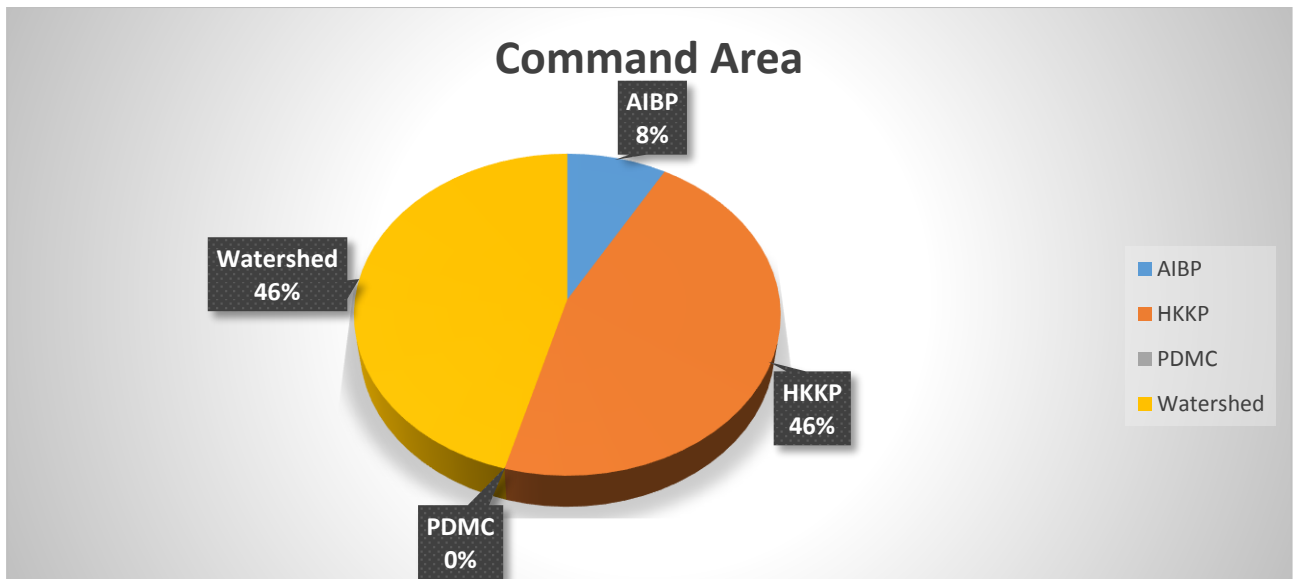


Figure 5.7: Component-wise share in command area in Debitola block

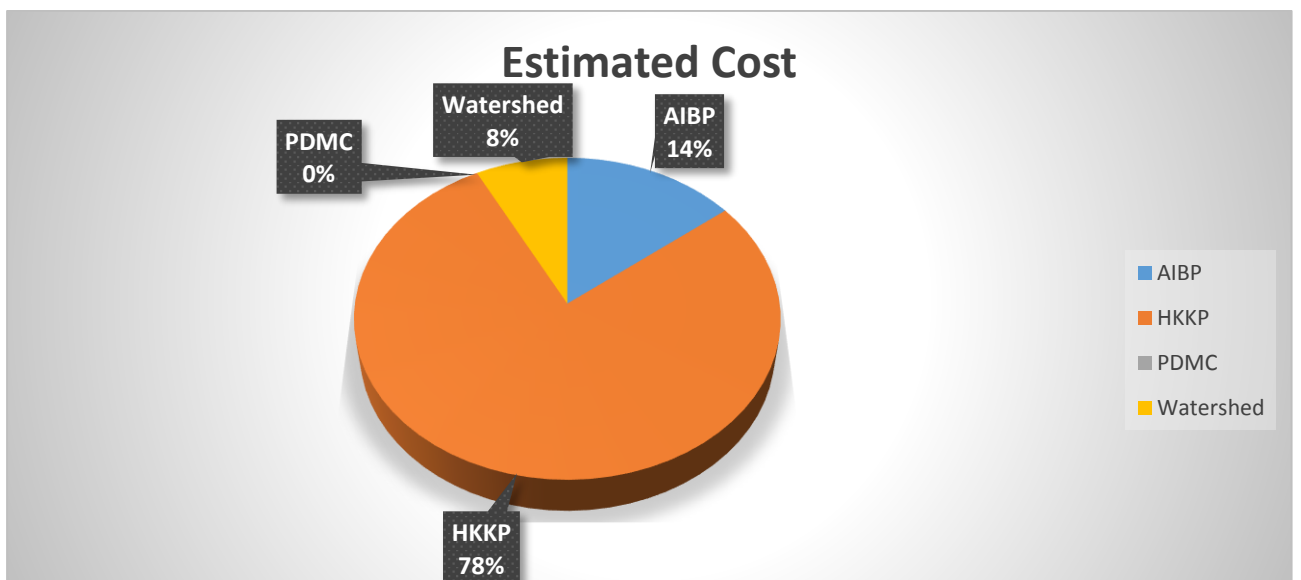


Figure 5.8: Component-wise share in planned outlay in Debitola block

In Debitola block HKKP component has the highest share with 78% followed by AIBP component (14%) and Watershed with 8%. So, the main focus in Debitola block is clearly on increasing the area under the coverage of irrigation. This is understandable given that greater coverage is given first priority here followed by increased efficiency. Moreover drip irrigation is mainly used for horticulture crops

III. Mahamaya Block

Table 5.5: Command Area and Estimated Cost under PMKSY in Mahamaya block

Mahamaya	AIBP	HKKP	PDMC	Watershed	Total
Command Area	300	4040	79	5382	9801
Estimated Cost	750	8528.3	47.6	1007	10332.9

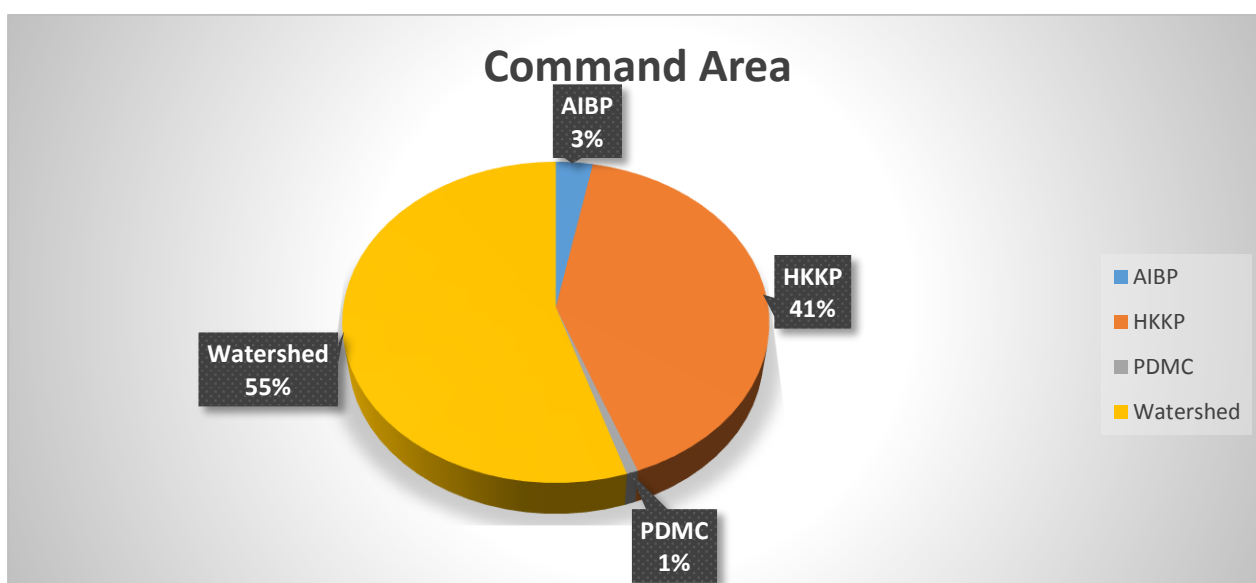


Figure 5.9: Component-wise share in command area in Mahamaya block

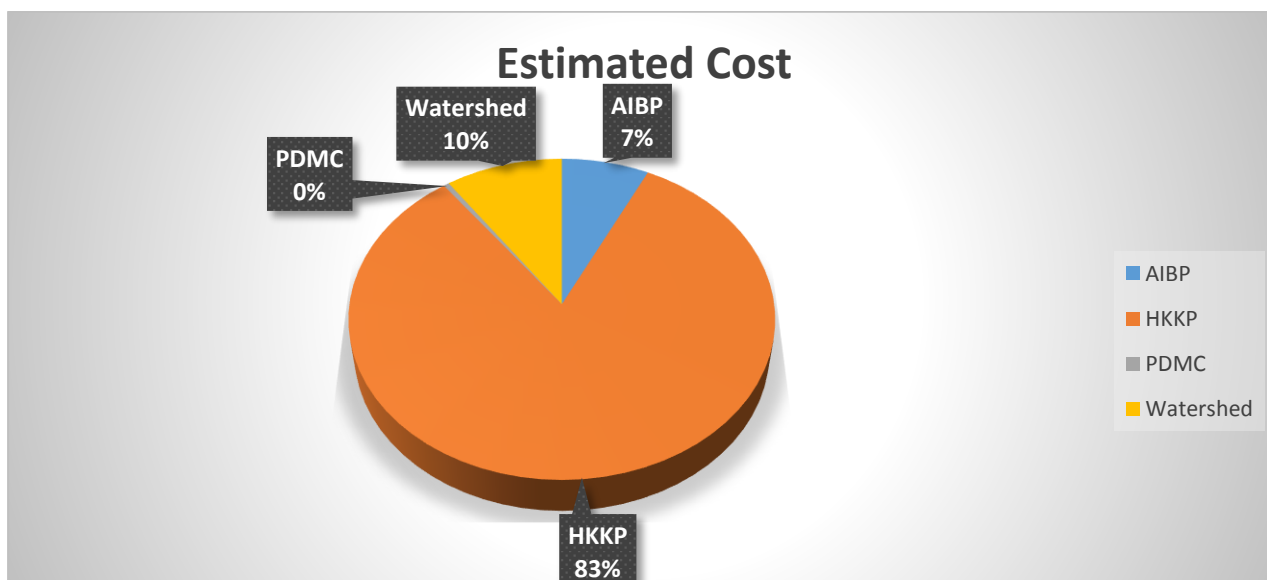


Figure 5.10: Component-wise share in planned outlay in Mahamaya block

In Mahamaya Block, planned outlay in Per Drop More Crop component is 47.6 lakhs allotted to this which makes up not even 1% of the planned outlay for the block. A huge majority of

the outlay is to increase the area under irrigation through HKKP component (83%). Watershed component has 10% of the planned outlay while AIBP accounts for 7% of the planned outlay.

IV. Gauripur Block

Table 5.6: Component-wise command area and planned outlay in Gauripur block

Gauripur	AIBP	HKKP	PDMC	Watershed	Total
Command Area	150	8907	80	859	9996
Estimated Cost	375	20654.7	48	585	21662.7

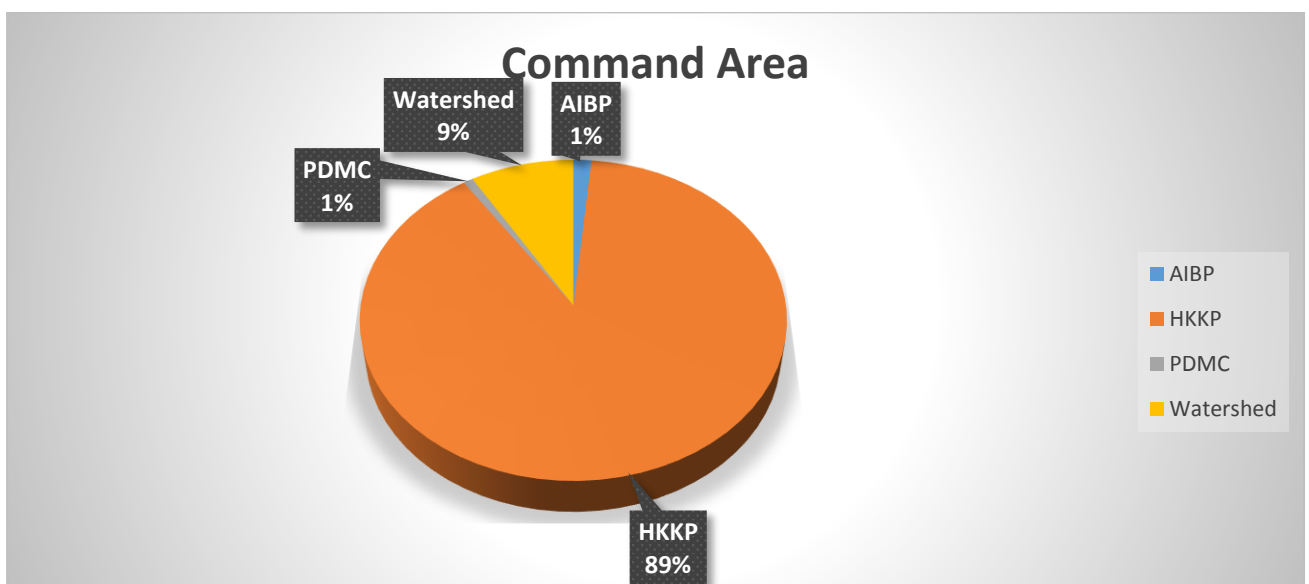


Figure 5.11: Component-wise share in command area in Gauripur block

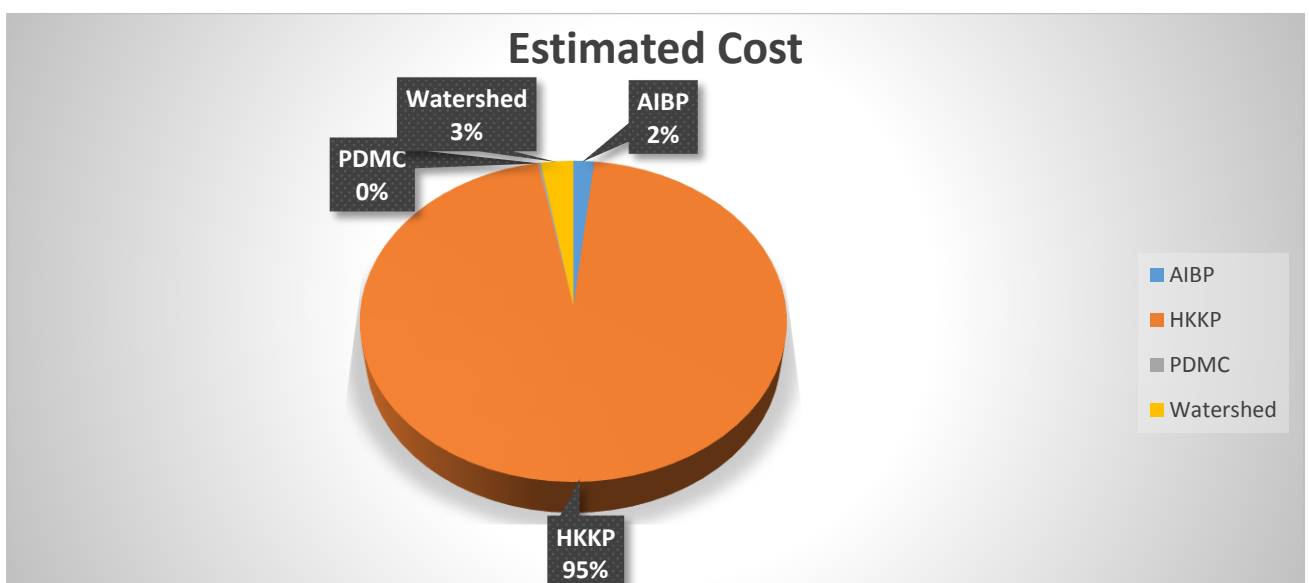


Figure 5.12: Component-wise share in planned outlay in Gauripur block

The maximum planned outlay in PMKSY for Gauripur block is in the HKKP component with a huge 95% or 206.54 crores set aside for it in the planned outlay. AIBP, watershed and PDMC have very meagre outlays in Gauripur block with 3.75 crores, 5.85 crores and 48 lakhs respectively set aside for them in the planned outlay.

V. Chapar Salkocha Block

Table 5.7: Component-wise command area and planned outlay in Chapar Salkocha block

Chapar Salkocha	AIBP	HKKP	PDMC	Watershed	Total
Command Area	0	6170	560	922	7652
Estimated Cost	0	9655	328	455	10438

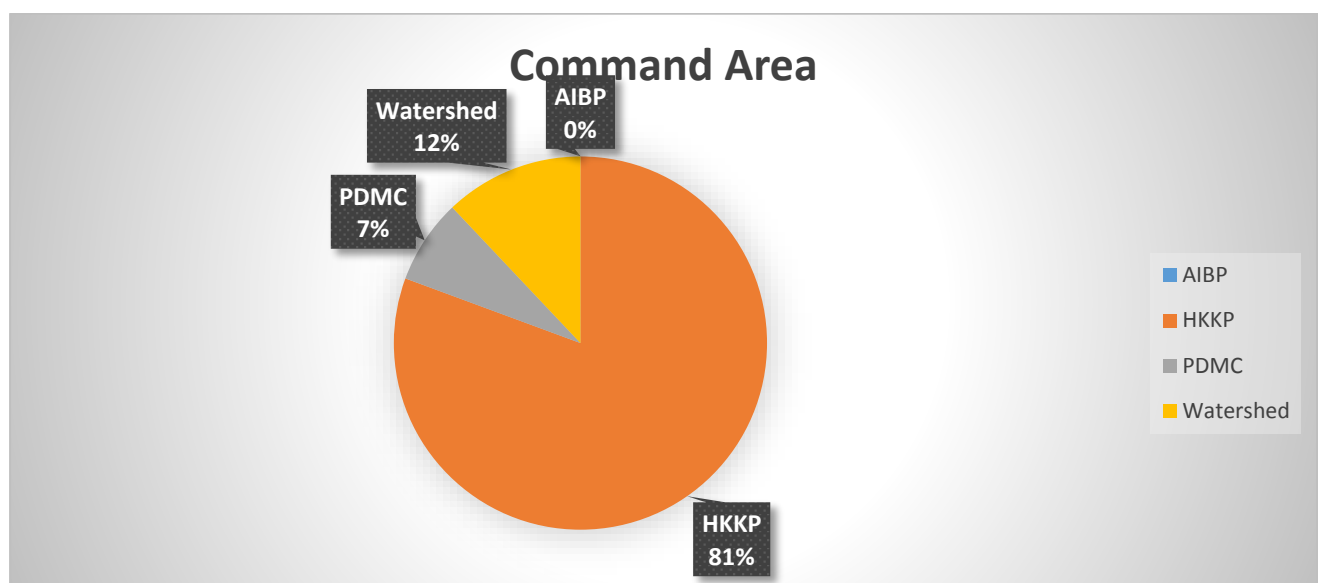


Figure 5.13: Component-wise share in command area in Chapar Salkocha block

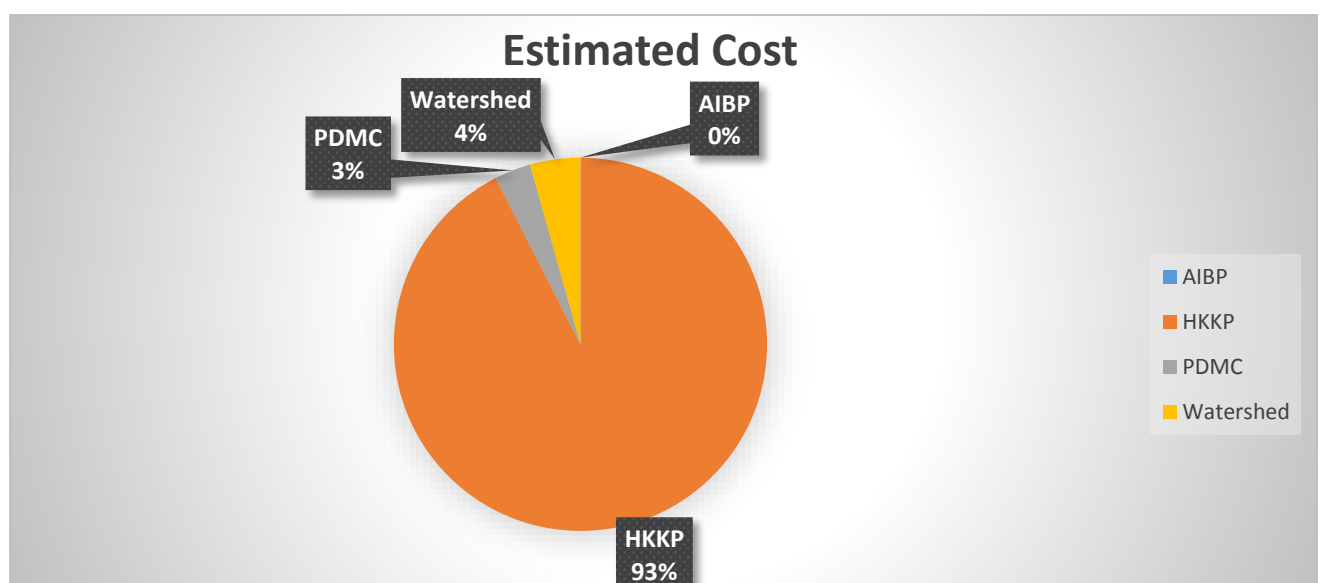


Figure 5.14: Component-wise share in planned outlay in Chapar Salkocha block

In Chapar Salkocha block, the planned outlay on Har Khet Ko Pani and Watershed is 96.55 crores (93%) and 4.55 crores (4%) respectively, followed by 3.28 crores (3%) on Per Drop More Crop.

VI. Agomoni Block

Table 5.8: Component-wise command area and planned outlay in Agomoni block

Agomoni	AIBP	HKKP	PDMC	Watershed	Total
Command Area	0	6920	189	953.5	8062.5
Estimated Cost	0	14609.66	99.6	475	15184.26

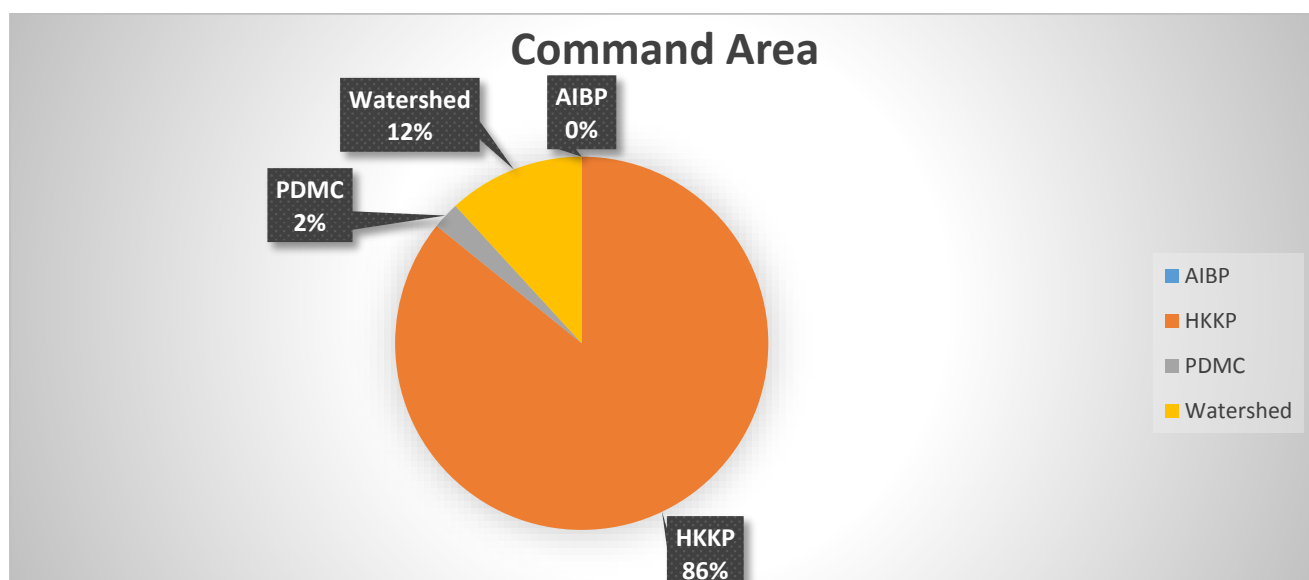


Figure 5.15: Component-wise share in command area in Agomoni block

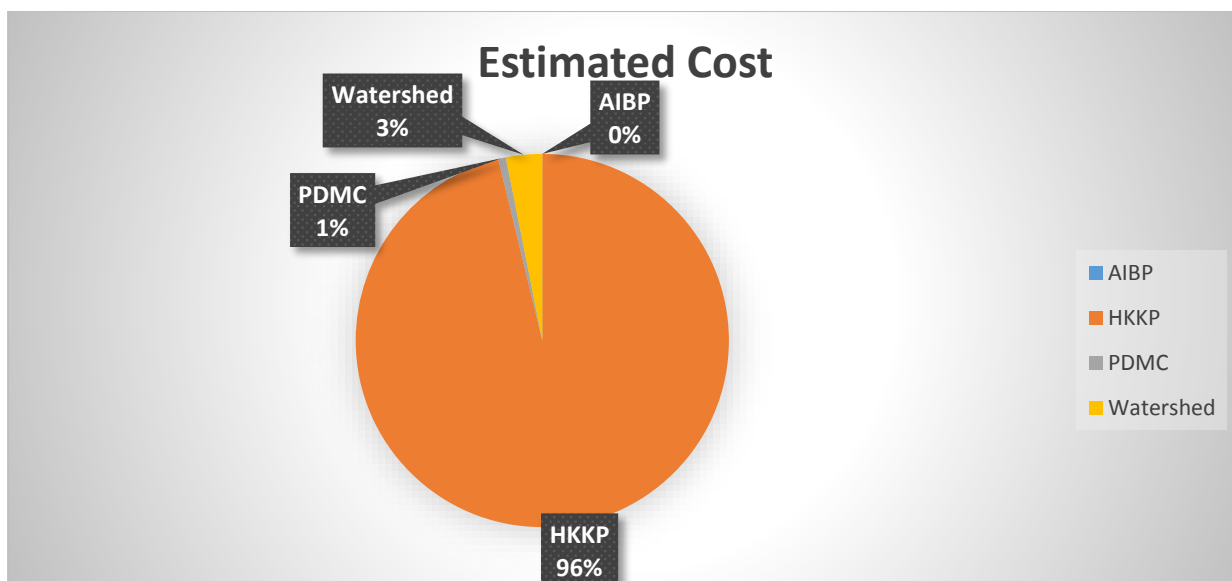


Figure 5.16: Component-wise share in planned outlay in Agomoni block

In Agomoni block Har Khet Ko Pani with 146.09 crores and 96% of the planned outlay for the block is by far the major component planned to be implemented under the PMKSY scheme. This shows the overriding need for increasing area under irrigation in the block. Watershed activities are to be undertaken by Soil Conservation Department and DRDA with 4.75 crores (3%) of the planned outlay. Per Drop More Crop forms a very minor component in the block with only 99.6 laks (1%) being kept aside for it from the planned outlay under PMKSY in the block

VII. Golakganj Block

Table 5.9: Component-wise command area and planned outlay under PMKSY in Golakganj block

Golakganj	AIBP	HKKP	PDMC	Watershed	Total
Command Area	230	5005	301	925	6461
Estimated Cost	575	8637	180.4	428	9820.4

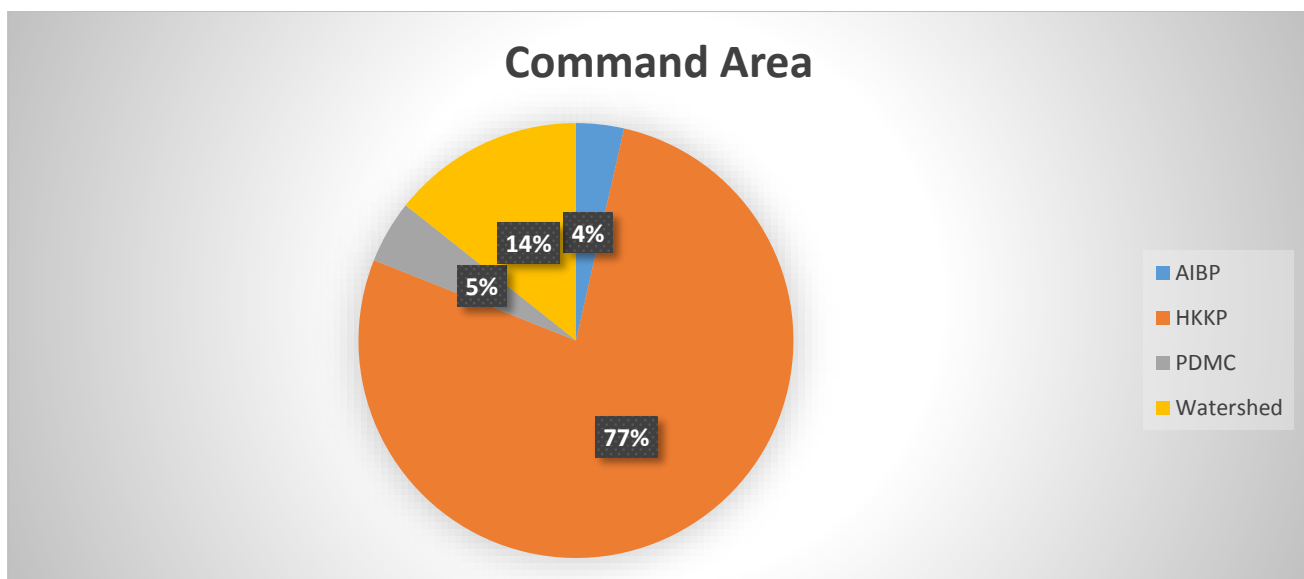


Figure 5.17: Component-wise share in command area in Golakganj block

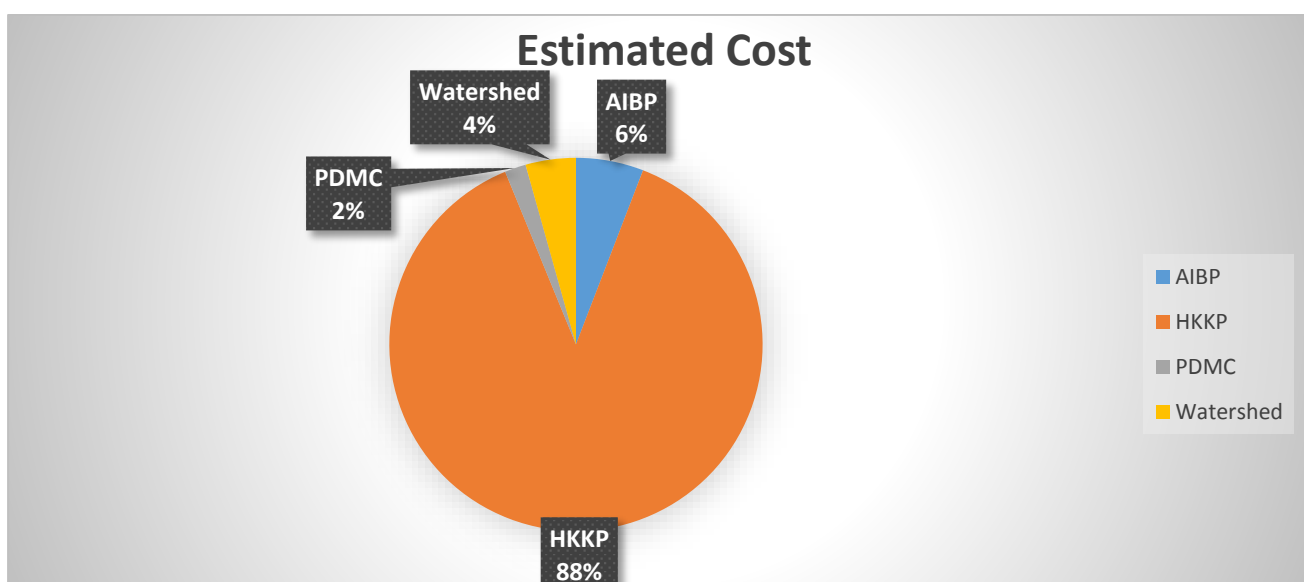


Figure 5.18: Component-wise share in planned outlay in Golakganj block

In Golakganj block, Har Khet Ko Pani component has 88% of the planned outlay with 86.37 crores. AIBP component has 5.75 crores or 6% as planned outlay. Watershed component and Per Drop More Crop component has 4.28 crores and 1.80 crores respectively as planned outlay under PMKSY in Golakganj block.

VIII. Rupsi Block

Table 5.10: Component-wise command area and planned outlay under PMKSY in Rupsi block

Rupsi	AIBP	HKKP	PDMC	Watershed	Total
Command Area	856	5690	566	852	7964
Estimated Cost	2140	10104.5	339.6	455	13039.1

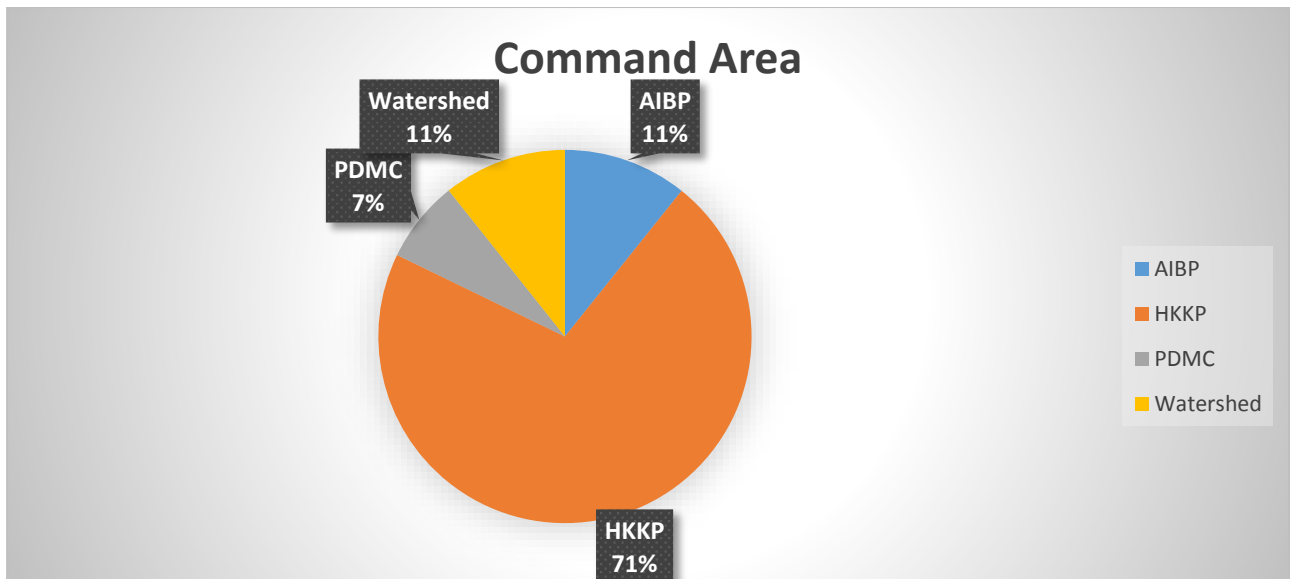


Figure 5.19: Component-wise share in command area in Rupsi block

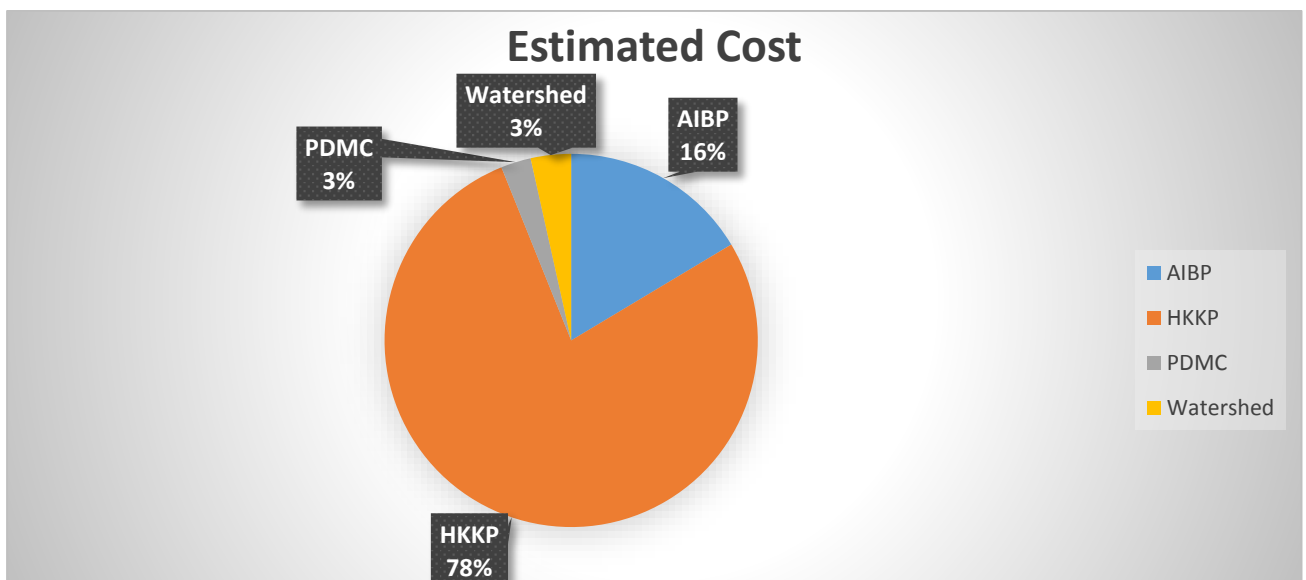


Figure 5.20: Component-wise share in planned outlay in Rupsi block

In Rupsi block, out of the planned outlay of 130.39 crores, 78% or 101.04 crores is planned on Har Khet Ko Pani component. AIBP component takes second place with 21.4 crores (16%) planned for it. Watershed activities have a planned outlay of 4.55 crores (3%) and Per Drop More Crop has the least outlay in the block with only 3.39 crores (3%) kept aside for it.

IX. South Salmara block

Table 5.11: Component-wise command area and planned outlay under PMKSY in South Salmara block

South Salmara	AIBP	HKKP	PDMC	Watershed	Total
Command Area	20	1646	25	360.5	2051.5
Estimated Cost	50	2317	10	490	2867

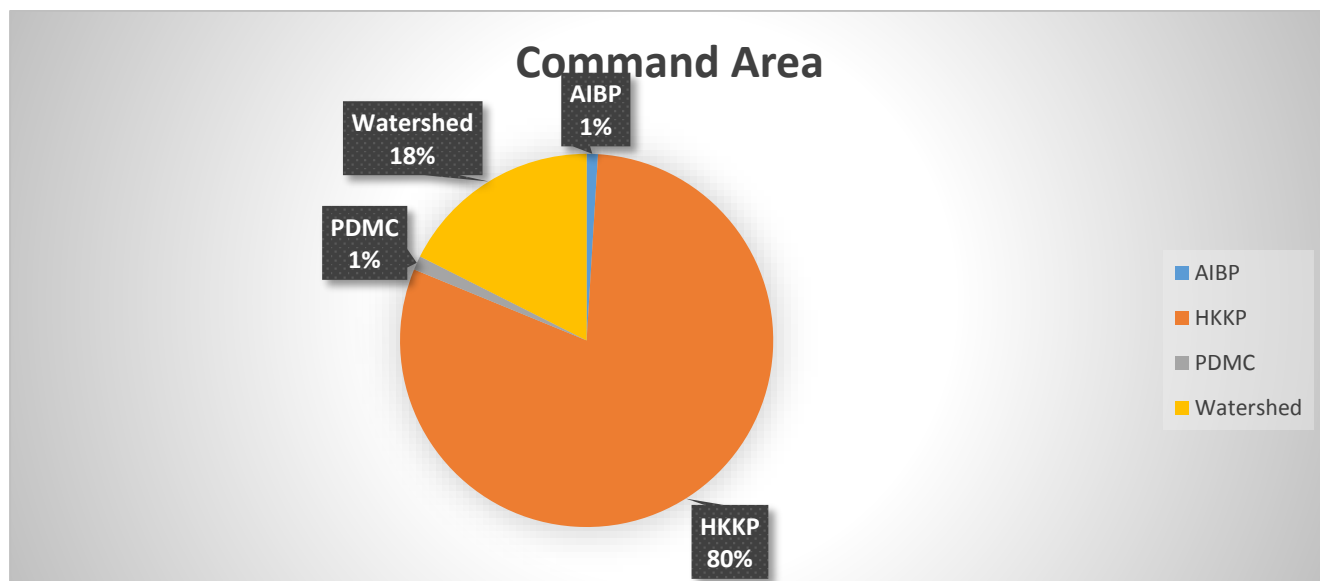


Figure 5.21: Component-wise share in command area under PMKSY in South Salmara block

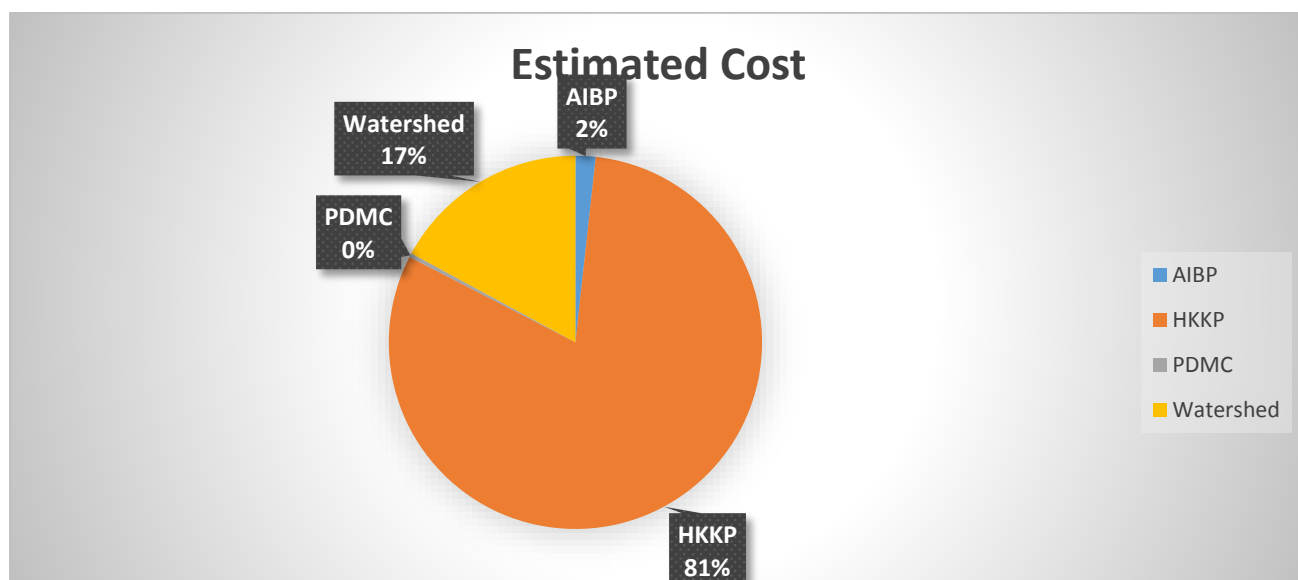


Figure 5.22: Component-wise share in planned outlay under PMKSY in South Salmara block

As seen with other blocks, South Salmara block also has the highest planned outlay in Har Khet Ko Pani with 81% or 23.17 crores as planned outlay. Watershed has 4.9 crores (17%) as

estimated costs in planned outlay under PMKSY scheme in the block. AIBP and Per Drop More Crop has 50 lakhs and 10 lakhs respectively earmarked for them.

X. Jamadarhat block

Table 5.12: Component-wise command area and planned outlay under PMKSY in Jamadarhat block

Jamadarhat	AIBP	HKKP	PDMC	Watershed	Total
Command Area	0	553	10	262.5	825.5
Estimated Cost	0	1142.8	4	155	1301.8

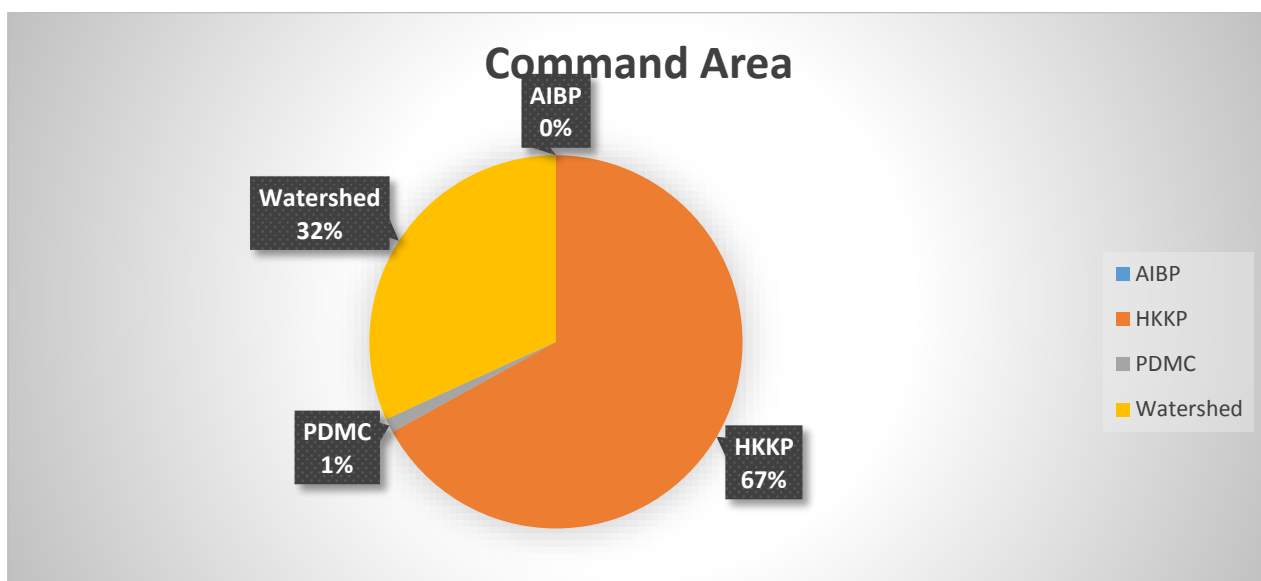


Figure 5.23: Component-wise share in command area under PMKSY in Jamadarhat block

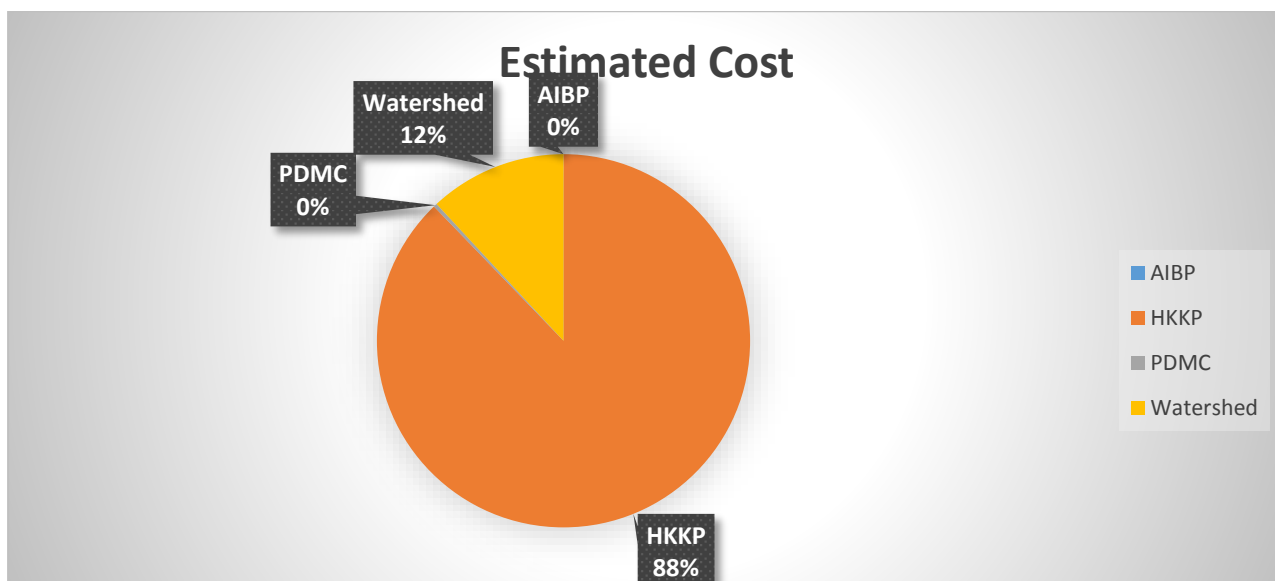


Figure 5.24: Component-wise share in planned outlay under PMKSY in Jamadarhat block

There are two major components planned in the block. These are Har Khet Ko Pani with 88% or 11.42 crores and Watershed with 1.55 crores or 12% in the planned outlay. Per Drop More Crop has less than 1% with a meagre 4 lakhs allotted to it.

XI. Bilasipara block

Table 5.13: Component-wise command area and planned outlay under PMKSY in Bilasipara block

Bilasipara	AIBP	HKKP	PDMC	Watershed	Total
Command Area	570	4270	181	611	5632
Estimated Cost	1425	7940.9	108.4	410	9884.3

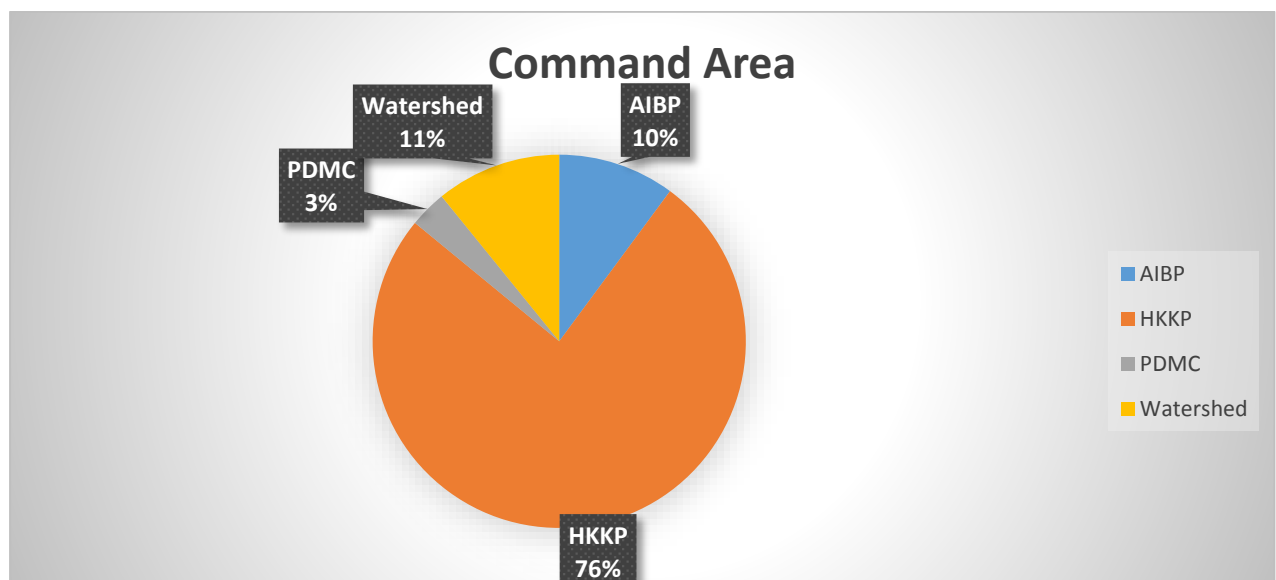


Figure 5.25: Component-wise share in command area under PMKSY in Bilasipara block

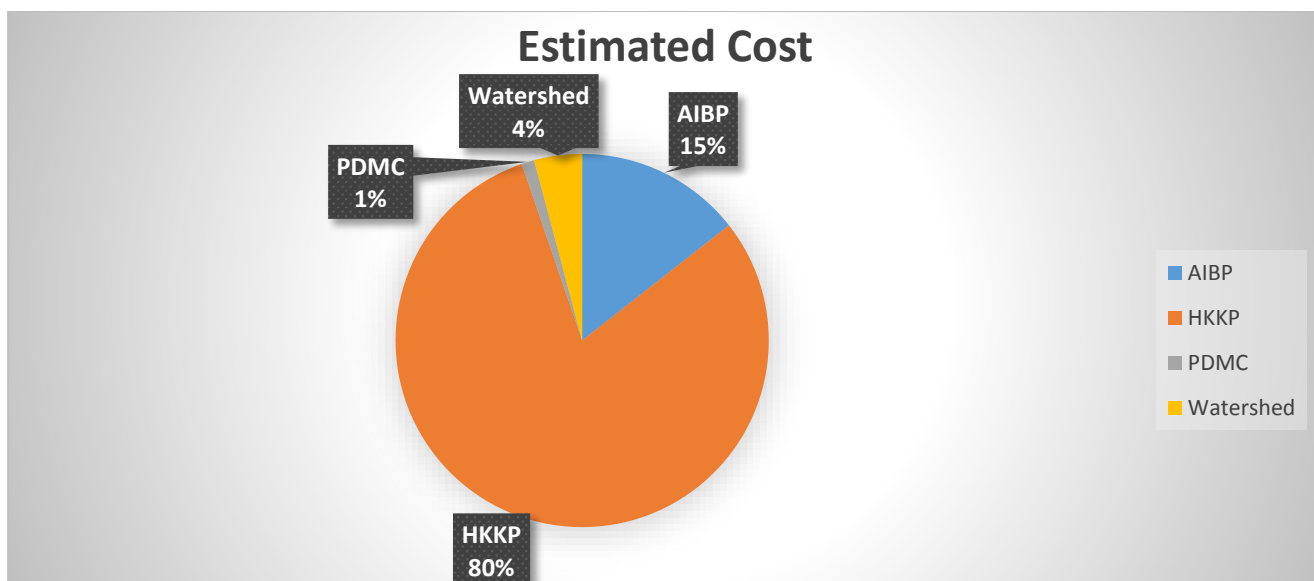


Figure 5.26: Component-wise share in planned outlay PMKSY in Bilasipara block

Har Khet Ko Pani has 76% share in command area and 80% share in planned outlay with 79.40 crores. Watershed component has 11% share in command area but relatively less share of 4% in the planned outlay with 4.1 crores.

XII. Mankachar Block

Table 5.14: Component-wise command area and planned outlay under PMKSY in Mankachar block

Mankachar	AIBP	HKKP	PDMC	Watershed	Total
Command Area	3435	482	51	852	4820
Estimated Cost	8587.5	129.06	30.4	455	9201.96

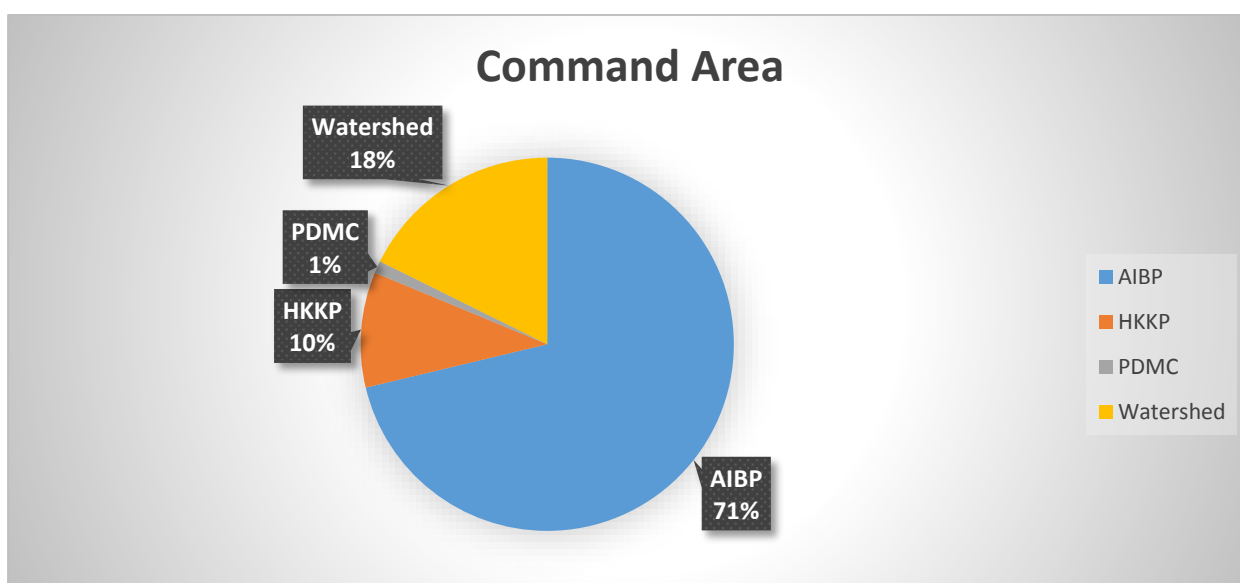


Figure 5.27: Component-wise share in command area under PMKSY in Mankachar block

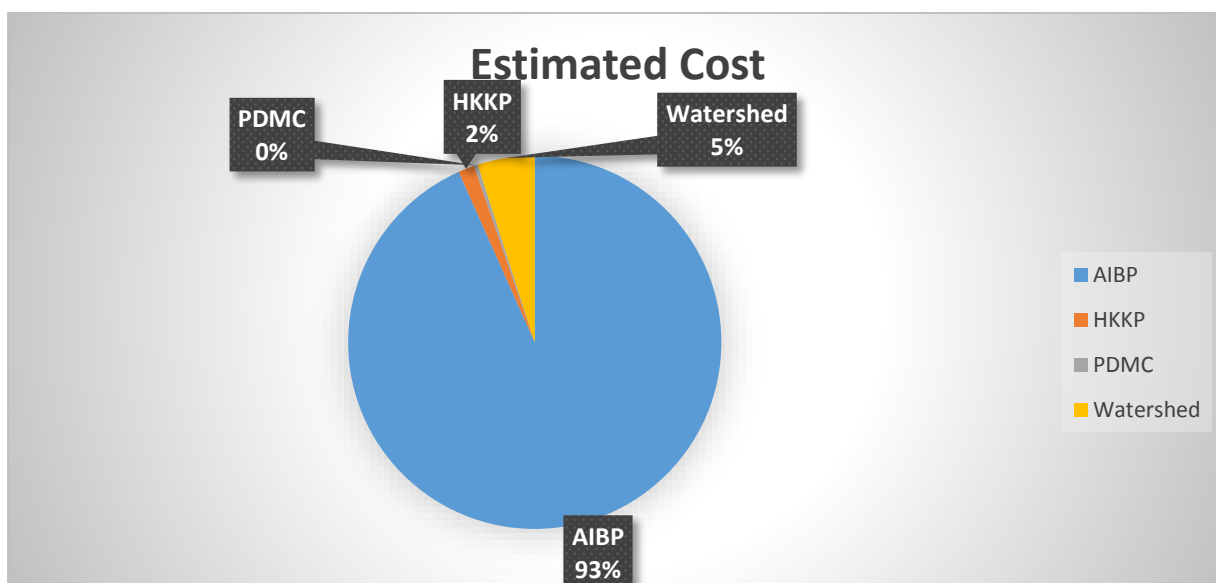


Figure 5.28: Component-wise share in planned outlay under PMKSY in Mankachar block

The maximum share comes under AIBP component with 93% of planned outlay under PMKSY in Mankachar block belonging to it. Watershed component has 5% or 4.55 crores as planned outlay. Har Khet ko Pani component has 1.29 crores or 2% as planned outlay. Per Drop More Crop has a meagre share of less than 1% with 30.4 lakhs as planned outlay.

XIII. Hatidhura block

Table 5.15: Component-wise command area and planned outlay under PMKSY in Hatidhura block

Hatidhura	AIBP	HKKP	PDMC	Watershed	Total
Command Area	0	2979	115	442.5	3536.5
Estimated Cost	0	6025.68	66	195	6286.68

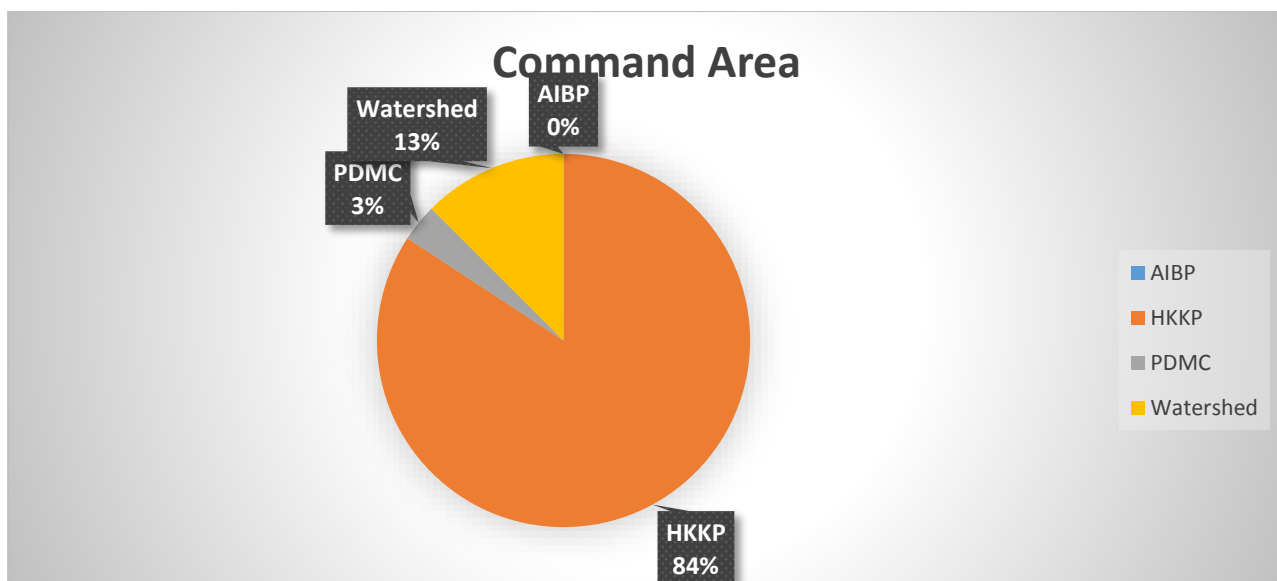


Figure 5.29: Component-wise share in command area under PMKSY in Hatidhura block

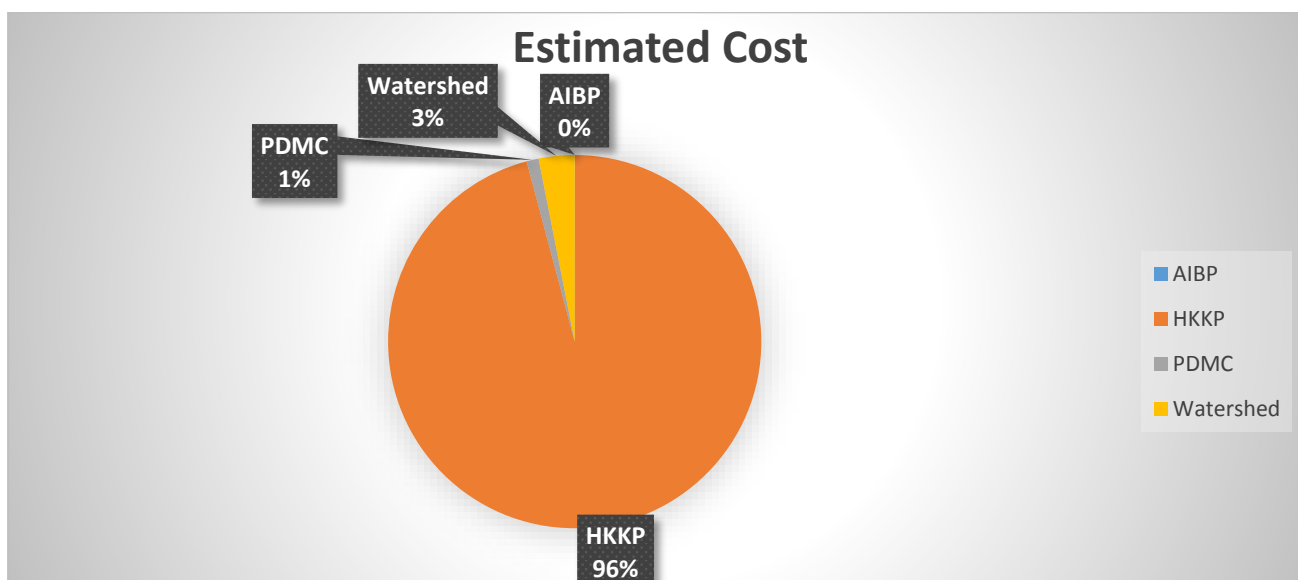


Figure 5.30: Component-wise share in planned outlay under PMKSY in Hatidhura block

In Hatidhura block, Har Khet Ko Pani has 84% of the command area but it accounts for 96% of the planned outlay while Watershed component has 13% of command area in the block but accounts for only 3% of planned outlay. Per Drop More Crop has a planned outlay of only 66 lakhs.

XIV. Fekamari Block

Table 5.16: Component-wise command area and planned outlay under PMKSY in Fekamari block

Fekamari	AIBP	HKKP	PDMC	Watershed	Total
Command Area	280	3825	1143	639	5887
Estimated Cost	700	3166.5	657.02	500	5023.52

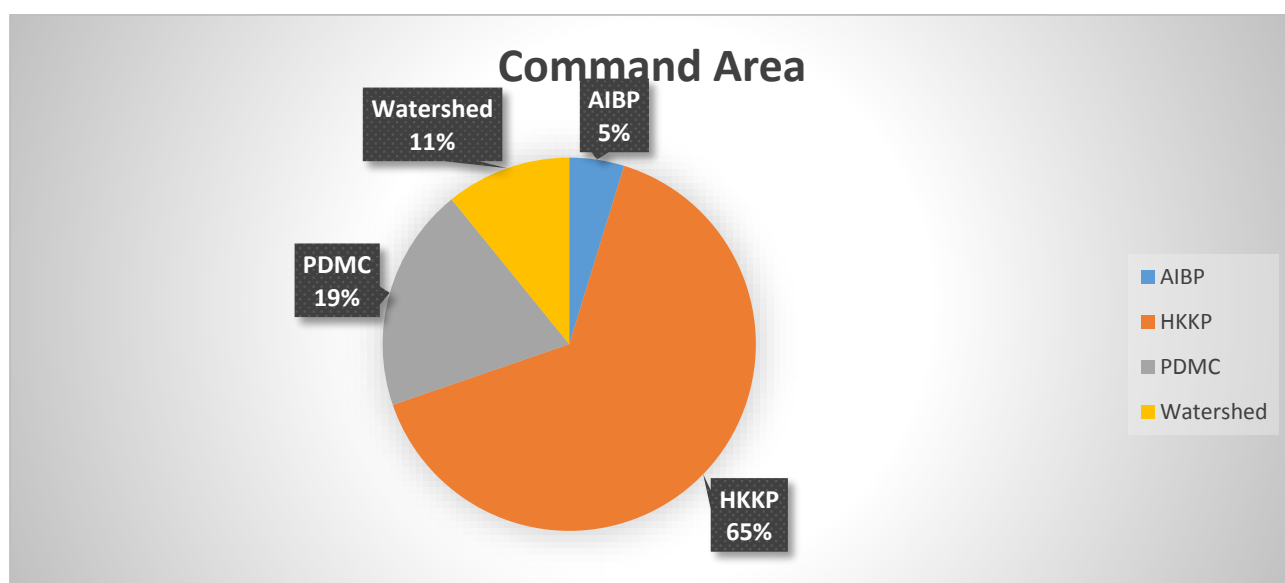


Figure 5.31: Component-wise share in command area under PMKSY in Fekamari block

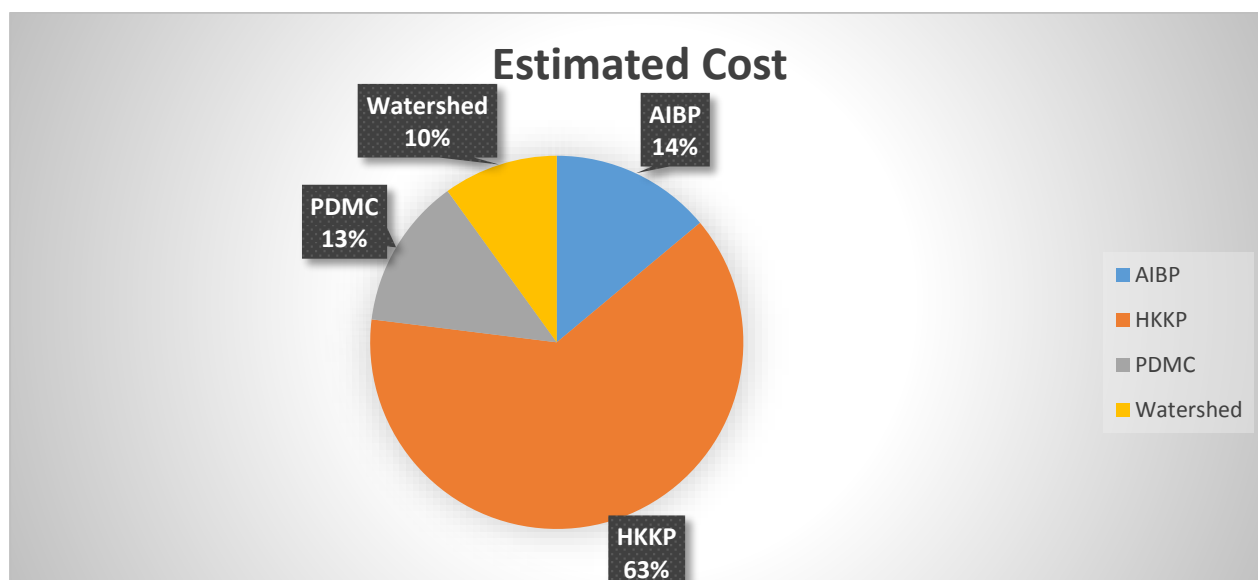


Figure 5.32: Component-wise share in planned outlay under PMKSY in Fekamari block

Har Khet Ko Pani component has share of 65% and 63% in command area and planned outlay respectively. AIBP component has share of 5% and 14% in command area and planned outlay

respectively. Watershed and Per Drop More Crop have the lowest share in the block with 10% and 13% respectively.

XV. Birsingh Jarua block

Table 5.17: Component-wise command area and planned outlay under PMKSY in Birsingh Jarua block

Birsingh Jarua	AIBP	HKKP	PDMC	Watershed	Total
Command Area	0	7025	95	864	7984
Estimated Cost	0	15647.56	57.2	585	16289.76

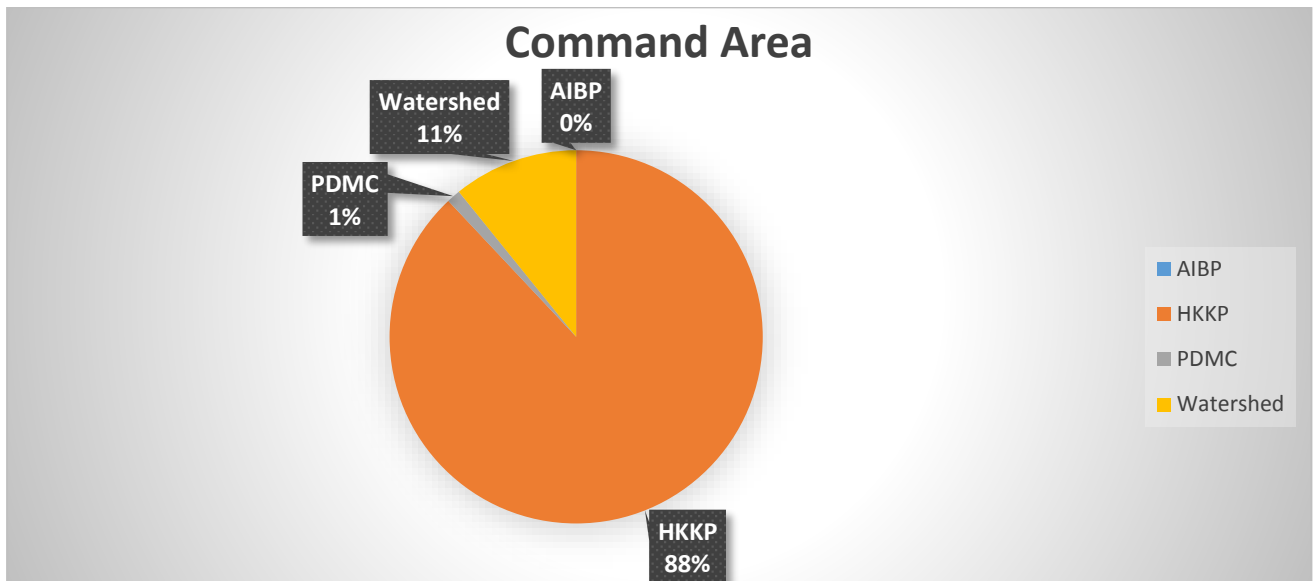


Figure 5.33: Component-wise share in command area under PMKSY in Birsingh Jarua block

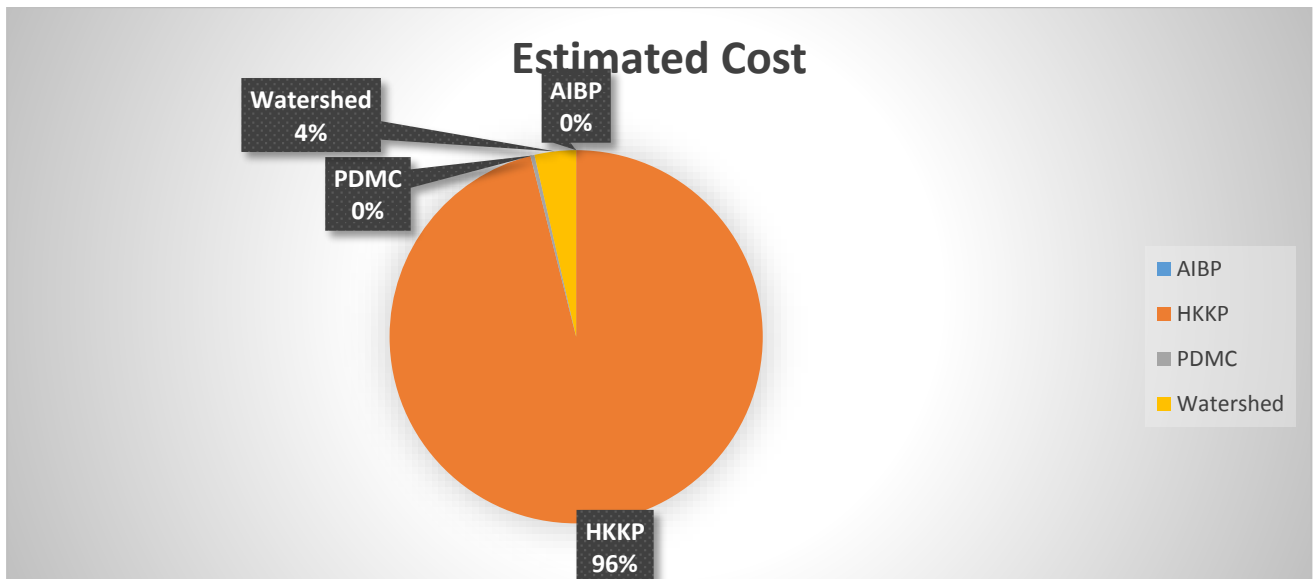


Figure 5.34: Component-wise share in planned outlay under PMKSY in Birsingh Jarua block

In Birsingh Jarua block, three components are planned for under PMKSY. Har Khet Ko Pani has 156.47 crores or a huge 96% of planned outlay under it while Per Drop More Crop has only 57.2 lakhs (<1%). Watershed activities to be undertaken by DRDA in the block has a command area of 864 ha (11%) and 5.85 crores (4%) as planned outlay.

5.3 Department-wise plan of the district

Table 5.18: Department wise command area and planned outlay under PMKSY in Dhubri district

Department wise	Command Area(ha)	Estimated Cost (Rs. lakhs)
Agriculture	19987	5810.48
Irrigation	53477	135192.50
Soil Conservation	7100	852.00
DRDA	10264	6468.00
TOTAL	90828	148322.98

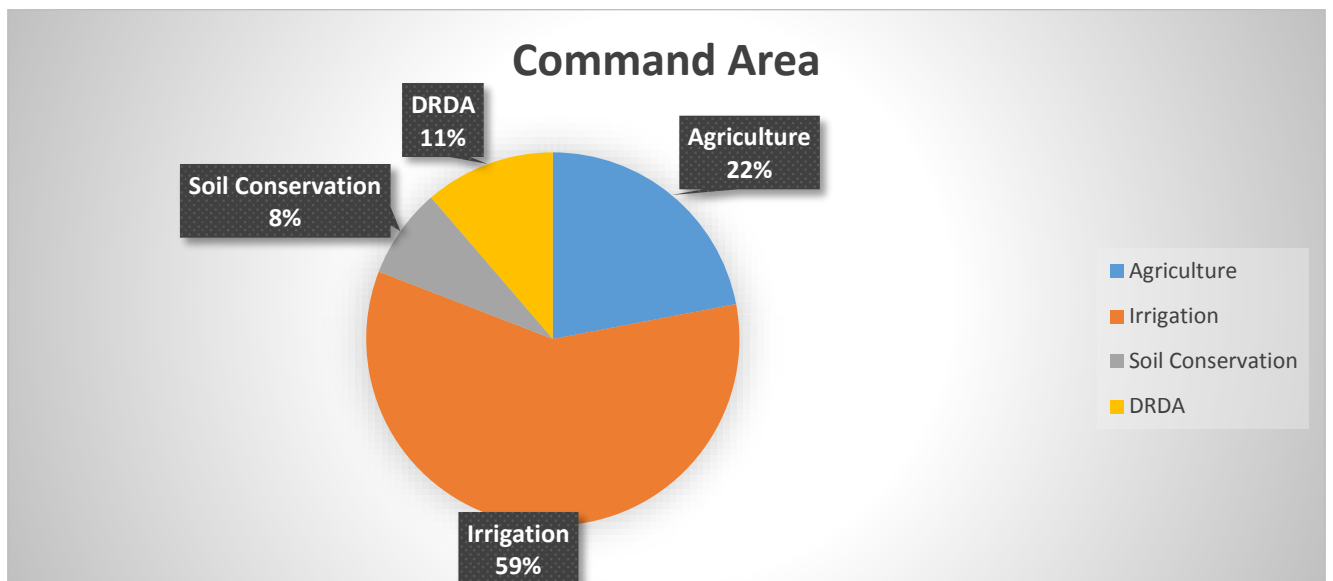


Figure 5.35: Department-wise share in command area in Dhubri district

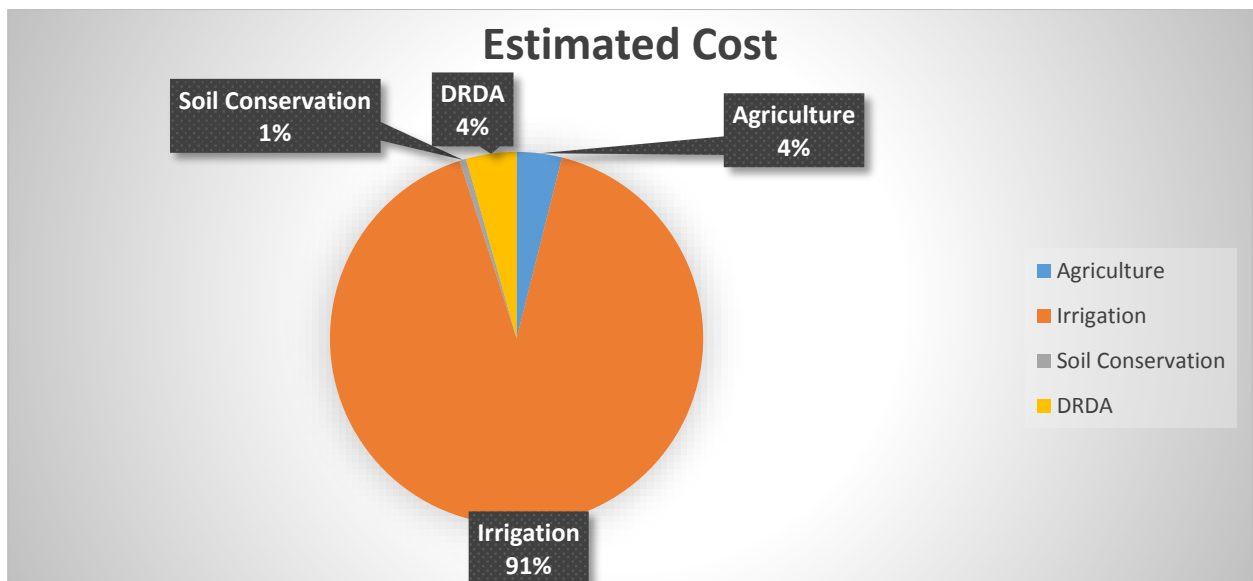


Figure 5.36: Department-wise share in planned outlay in Dhubri district

Department-wise, Irrigation Department has the highest share by some distance with 1351.92 crores or 91% of the planned outlay in Dhubri. Agriculture department has the second highest share with 58.10 crores or 4% of the planned outlay. District Rural Development Agency (DRDA) accounts for 10264 ha (11%) and 64.68 crores (4%) under PMKSY. Soil Conservation Department accounts for 8.52 crores or 1% of the total planned outlay.

ANNEXURE

Irrigation Department

SL. No.	Name of the Block/Sub-Districts	Concerned Ministry/Department	Component	Activity	Total No./Capacity (cum)	Command Area/Irrigation Potential (Ha)	Period of Implementation (5/7 Yrs)	Estimated Cost In (Lakhs)
1	2	3	4	5	6	7	8	9
1	AGOMONI DEV. BLOCK	MoWR	AIBP	Surface Minor Irrigation	-	-	-	-
			Har Khet Ko Pani	Lift Irrigation	4	800.00	5	3200.00
				Ground Water Development	140	4204.00	5	10510.00
				RRR of Water Bodies	1	140.00	5	350.00
				Construction of field channels				
line filed channels	2	60.00	5	150.00				

SL. No.	Name of the Block/Sub-Districts	Concerned Ministry/Department	Component	Activity	Total No./Capacity (cum)	Command Area/Irrigation Potential (Ha)	Period of Implementation (5/7 Yrs)	Estimated Cost In (Lakhs)
1	2	3	4	5	6	7	8	9
1	GOLOKGANJ DEV. BLOCK	MoWR	AIBP	Surface Minor Irrigation	4	230.00	5	575.00
			Har Khet Ko Pani	Lift Irrigation	2	200.00	5	500.00
				Ground Water Development	104	3125.00	5	7812.50
				RRR of Water Bodies				
			Construction of field channels					
				line filed channels				

SL. No.	Name of the Block/Sub-Districts	Concerned Ministry/Department	Component	Activity	Total No./Capacity (cum)	Command Area/Irrigation Potential (Ha)	Period of Implementation (5/7 Yrs)	Estimated Cost In (Lakhs)	
1	2	3	4	5	6	7	8	9	
1	HATIDURA DEV. BLOCK	MoWR	AIBP	Surface Minor Irrigation					
			Har Khet Ko Pani	Lift Irrigation	3	200.00	5	500.00	
				Ground Water Development	90	1738.00	5	4345.00	
				RRR of Water Bodies	3	250.00	5	625.00	
				Construction of field channels					
			line filed channels	2	150.00	5	375.00		

SL. No.	Name of the Block/Sub-Districts	Concerned Ministry/Department	Component	Activity	Total No./Capacity (cum)	Command Area/Irrigation Potential (Ha)	Period of Implementation (5/7 Yrs)	Estimated Cost In (Lakhs)			
1	2	3	4	5	6	7	8	9			
1	GAURIPUR DEV. BLOCK DHARMASALA	MoWR	AIBP	Surface Minor Irrigation	1	150.00	5	375.00			
			Har Khet Ko Pani	Lift Irrigation	68	4075.00	5	10187.50			
				Ground Water Development	133	4000.00	5	10000.00			
				RRR of Water Bodies	2	52.00	5	130.00			
				Construction of Field Channel							
				Lined Field Channels	2	60.00	5	150.00			

SL. No.	Name of the Block/Sub-Districts	Concerned Ministry/ Department	Component	Activity	Total No./ Capacity (cum)	Command Area/ Irrigation Potential (Ha)	Period of Implementation (5/7 Yrs)	Estimated Cost In (Lakhs)		
1	2	3	4	5	6	7	8	9		
1	BIRSING JARUA DEV. BLOCK	MoWR	AIBP	Surface Minor Irrigation	-	-	-	-		
			Har Khet Ko Pani	Lift Irrigation	18	1050.00	5	2625.00		
				Ground Water Development	161	4850.00	5	12125.00		
				RRR of Water Bodies						
				Construction of Field Channel						
				Lined Field Channels	2	270.00	5	675.00		

SL. No.	Name of the Block/Sub-Districts	Concerned Ministry/ Department	Component	Activity	Total No./ Capacity (cum)	Command Area/ Irrigation Potential (Ha)	Period of Implementation (5/7 Yrs)	Estimated Cost In (Lakhs)			
1	2	3	4	5	6	7	8	9			
1	RUPSI DEV. BLOCK	MoWR	AIBP	Surface Minor Irrigation	5	856.00	5	2140.00			
			Har Khet Ko Pani	Lift Irrigation	7	475.00	5	1187.50			
				Ground Water Development	100	3015.00	5	7537.50			
				RRR of Water Bodies	8	240.0	5	600			
				Construction of Field Channel							
				Lined Field Channels	2	150.00	5	375.00			

SL. No.	Name of the Block/Sub-Districts	Concerned Ministry/ Department	Component	Activity	Total No./ Capacity (cum)	Command Area/ Irrigation Potential (Ha)	Period of Implementation (5/7 Yrs)	Estimated Cost In (Lakhs)			
1	2	3	4	5	6	7	8	9			
1	DEBITOLA DEV. BLOCK	MoWR	AIBP	Surface Minor Irrigation	3	570.00	5	1425.00			
			Har Khet Ko Pani	Lift Irrigation	41	2470.00	5	6175.00			
				Ground Water Development	16	480.00	5	1200.00			
				RRR of Water Bodies	2	60.00	5	150.00			
				Construction of Field Channel							
				Lined Field Channels	2	60.00	5	150.00			

SL. No.	Name of the Block/Sub-Districts	Concerned Ministry/Department	Component	Activity	Total No./Capacity (cum)	Command Area/Irrigation Potential (Ha)	Period of Implementation (5/7 Yrs)	Estimated Cost In (Lakhs)
1	2	3	4	5	6	7	8	9
1	MAHAMAYA DEV. BLOCK	MoWR	AIBP	Surface Minor Irrigation	1	300.00	5	750.00
			Har Khet Ko Pani	Lift Irrigation	21	1126.00	5	3115.00
				Ground Water Development	65	1956.00	5	4890.00
				RRR of Water Bodies				
				Construction of Field Channels				
Lined Field Channels	1	120.00	5	300.00				

SL. No.	Name of the Block/Sub-Districts	Concerned Ministry/ Department	Component	Activity	Total No./ Capacity (cum)	Command Area/ Irrigation Potential (Ha)	Period of Implementation (5/7 Yrs)	Estimated Cost In (Lakhs)
1	2	3	4	5	6	7	8	9
1	BILASIPARA DEV. BLOCK	MoWR	AIBP	Surface Minor Irrigation	7	570.00	5	1425.00
			Har Khet Ko Pani	Lift Irrigation	17	1055.00	5	2637.50
				Ground Water Development	58	1730.00	5	4325.00
				RRR of Water Bodies	2	160.00	5	400.00
				Construction of Field Channel				
Lined Field Channel	2	120.00	5	300.00				

SL. No.	Name of the Block/Sub-Districts	Concerned Ministry/ Department	Component	Activity	Total No./ Capacity (cum)	Command Area/ Irrigation Potential (Ha)	Period of Implementation (5/7 Yrs)	Estimated Cost In (Lakhs)
1	2	3	4	5	6	7	8	9
1	NAYERALGA DEV. BLOCK	MoWR	AIBP	Surface Minor Irrigation				
				Har Khet Ko Pani	Lift Irrigation	5	330.00	5
				Ground Water Development	70	2090.00	5	5225.00
				RRR of Water Bodies	5	121.00	5	302.50
				Construction of Field Channels				
	Lined Field Channels	1	120.00	5	300.00			

SL. No.	Name of the Block/Sub-Districts	Concerned Ministry/ Department	Component	Activity	Total No./ Capacity (cum)	Command Area/ Irrigation Potential (Ha)	Period of Implementation (5/7 Yrs)	Estimated Cost In (Lakhs)
1	2	3	4	5	6	7	8	9
1	CHAPAR SALKOCHA DEV. BLOCK	MoWR	AIBP	Surface Minor Irrigation	-	-	-	-
			Har Khet Ko Pani	Lift Irrigation	2	370.00	5	925.00
				Ground Water Development	100	2980.00	5	7450.00
				RRR of Water Bodies	4	220.00	5	550.00
				Construction of Field Channels				
Lined Field Channels	1	60.00	5	150.00				

SL. No.	Name of the Block/Sub-Districts	Concerned Ministry/ Department	Component	Activity	Total No./ Capacity (cum)	Command Area/ Irrigation Potential (Ha)	Period of Implementation (5/7 Yrs)	Estimated Cost In (Lakhs)
1	2	3	4	5	6	7	8	9
1	FEKAMARI DEV. BLOCK	MoWR	AIBP	Surface Minor Irrigation	4	280.00	5	700.00
			Har Khet Ko Pani	Lift Irrigation	41	935.00	5	2337.50
				Ground Water Development				
				RRR of Water Bodies				
				Construction of Field Channels				
Lined Field Channels	2	100.00	5	250.00				

SL. No.	Name of the Block/Sub-Districts	Concerned Ministry/Department	Component	Activity	Total No./Capacity (cum)	Command Area/Irrigation Potential (Ha)	Period of Implementation (5/7 Yrs)	Estimated Cost In (Lakhs)
1	2	3	4	5	6	7	8	9
1	JAMADARHAT DEV. BLOCK	MoWR	AIBP	Surface Minor Irrigation				
				Har Khet Ko Pani	Lift Irrigation	15	443.00	5
				Ground Water Development				
				RRR of Water Bodies				
				Construction of Field Channels				
	Lined Field Channels							

SL. No.	Name of the Block/Sub-Districts	Concerned Ministry/Department	Component	Activity	Total No./Capacity (cum)	Command Area/Irrigation Potential (Ha)	Period of Implementation (5/7 Yrs)	Estimated Cost In (Lakhs)
1	2	3	4	5	6	7	8	9
1	MANKACHAR DEV. BLOCK	MoWR	AIBP	Surface Minor Irrigation	10	3435.00	5	8587.50
			Har Khet Ko Pani	Lift Irrigation				
				Ground Water Development				
				RRR of Water Bodies				
				Construction of Field Channels				
Lined Field Channels								

SL. No.	Name of the Block/Sub-Districts	Concerned Ministry/ Department	Component	Activity	Total No./ Capacity (cum)	Command Area/ Irrigation Potential (Ha)	Period of Implementation (5/7 Yrs)	Estimated Cost In (Lakhs)
1	2	3	4	5	6	7	8	9
1	SOUTH SALMARA DEV. BLOCK	MoWR	AIBP	Surface Minor Irrigation	1	20.00	5	50.00
			Har Khet Ko Pani	Lift Irrigation	37	856.00	5	2140.00
				Ground Water Development				
				RRR of Water Bodies				
				Construction of Field Channels				
Lined Field Channels								

Soil Conservation Department

Abstract for Consolidated Strategic Action Plan for Irrigation under the Component PMKSY (Watershed)
for Dhubri District under Barpeta Soil Conservation Division, Barpeta

Sl. No.	Name of the Block	Concerned Ministry/ Department	Component	Activities	Total No./ Capacity (Cum)	Command Area/ Irrigation Potential (Ha)	Period of Implementation (5 yr)	Estimated Cost (in Rs.)
2	Debitola	DoLR-MoRD	PMKSY	Soil Conservation Activities	211	2500.00	1st/2nd/3rd/4th/5th yr	30000000.00
3	Mahamaya	DoLR-MoRD	PMKSY		212	4600.00	1st/2nd/3rd/4th/5th yr	55200000.00
Total for Dhubri District					423	7100.00		85200000.00

Agriculture Department

Annexure V :Strategic Action Plan for irrigation in District (Block wise)								
Sl.No.	Name of the Block / District	Concerned Ministry / Department	Component	Activity	Total Numbers / Capacity(cum)	Command Area/Irrigation Potential(Ha)	Period of Implementation (5/7 Yrs)	Estiamted Cost Rs.in Lakh
1	Agomani Dev. Block/Dhubri	Agriculture	Har Khet Ko Pani	STW (D)	346	692	5	173.00
2				STW (E)	286	572	5	74.36
3				LLP	161	322	5	48.30
4				Solar Power Pump	26	130	5	104.00
5			Per Drop More Crop	Sprinkler Set	129	129	5	51.60
6				Drip Irrigation Set	120	60	5	48.00
Total=						1905		499.26
Sl.No.	Name of the Block / District	Concerned Ministry / Department	Component	Activity	Total Numbers / Capacity(cum)	Command Area/Irrigation Potential(Ha)	Period of Implementation (5/7 Yrs)	Estiamted Cost Rs.in Lakh
1	Golakganj Dev. Block/Dhubri	Agriculture	Har Khet Ko Pani	STW (D)	380	760	5	140.00
2				STW (E)	300	600	5	78.00
3				LLP	115	230	5	34.50

4				Solar Power Pump	18	90	5	72.00
5			Per Drop More Crop	Sprinkler Set	151	151	5	60.40
6				Drip Irrigation Set	300	150	5	120.00
Total=						1981		504.90
Sl.No.	Name of the Block / District	Concerned Ministry / Department	Component	Activity	Total Numbers / Capacity(cum)	Command Area/Irrigation Potential(Ha)	Period of Implementation (5/7 Yrs)	Estiamted Cost Rs.in Lakh
1	Rupshi Dev. Block/Dhubri	Agriculture	Har Khet Ko Pani	STW (D)	350	700	5	175.00
2				STW (E)	375	750	5	97.50
3				LLP	120	240	5	36.00
4				Solar Power Pump	24	120	5	96.00
5			Per Drop More Crop	Sprinkler Set	283	283	5	113.20
6				Drip Irrigation Set	566	283	5	226.40
Total=						2376		744.10
Sl.No.	Name of the Block / District	Concerned Ministry / Department	Component	Activity	Total Numbers / Capacity(cum)	Command Area/Irrigation Potential(Ha)	Period of Implementation (5/7 Yrs)	Estiamted Cost Rs.in Lakh

1	Gauripur Dev. Block/Dhubri	Agriculture	Har Khet Ko Pani	STW (D)	160	320	5	80.00
2				STW (E)	120	240	5	31.20
3				LLP	40	80	5	12.00
4				Solar Power Pump	16	80	5	64.00
5			Per Drop More Crop	Sprinkler Set	40	40	5	16.00
6				Drip Irrigation Set	80	40	5	32.00
				Total=		800		235.20
Sl.No.	Name of the Block / District	Concerned Ministry / Department	Component	Activity	Total Numbers / Capacity(cum)	Command Area/Irrigation Potential(Ha)	Period of Implementation (5/7 Yrs)	Estiamted Cost Rs.in Lakh
1	Debitola Dev. Block/Dhubri	Agriculture	Har Khet Ko Pani	STW (D)	25	50	5	12.50
2				STW (E)	20	40	5	5.20
3				LLP	5	10	5	1.50
4				Solar Power Pump	1	5	-	4.00
5			Per Drop More Crop	Sprinkler Set	-	-	-	-
6				Drip Irrigation Set	-	-	-	-
				Total=		105		23.20

Sl.No.	Name of the Block / District	Concerned Ministry / Department	Component	Activity	Total Numbers / Capacity(cum)	Command Area/Irrigation Potential(Ha)	Period of Implementation (5/7 Yrs)	Estiamted Cost Rs.in Lakh
1	Mankachar Dev. Block/Dhubri	Agriculture	Har Khet Ko Pani	STW (D)	105	210	5	52.50
2				STW (E)	81	162	5	21.06
3				LLP	25	50	5	7.50
4				Solar Power Pump	12	60	5	48.00
5			Per Drop More Crop	Sprinkler Set	26	26	5	10.40
6				Drip Irrigation Set	50	25	5	20.00
Total=						533		159.46
Sl.No.	Name of the Block / District	Concerned Ministry / Department	Component	Activity	Total Numbers / Capacity(cum)	Command Area/Irrigation Potential(Ha)	Period of Implementation (5/7 Yrs)	Estiamted Cost Rs.in Lakh
1	Fekamari Dev. Block/Dhubri	Agriculture	Har Khet Ko Pani	STW (D)	600	1200	5	300.00
2				STW (E)	450	900	5	117.00
3				LLP	300	600	5	90.00
4				Solar Power Pump	18	90	5	72.00
5			Per Drop More Crop	Sprinkler Set	643	643	5	257.02
6				Drip Irrigation Set	1000	500	5	400.00

					Total=		3933		1236.02
Sl.No.	Name of the Block / District	Concerned Ministry / Department	Component	Activity	Total Numbers / Capacity(cum)	Command Area/Irrigation Potential(Ha)	Period of Implementation (5/7 Yrs)	Estiamted Cost Rs.in Lakh	
1	Birsing Jarua Dev. Block/Dhubri	Agriculture	Har Khet Ko Pani	STW (D)	191	382	5	95.50	
2				STW (E)	141	282	5	36.66	
3				LLP	48	96	5	14.40	
4				Solar Power Pump	19	95	5	76.00	
5			Per Drop More Crop	Sprinkler Set	96	47	5	18.80	
6				Drip Irrigation Set	47	48	5	38.40	
					Total=		950		279.76
Sl.No.	Name of the Block / District	Concerned Ministry / Department	Component	Activity	Total Numbers / Capacity(cum)	Command Area/Irrigation Potential(Ha)	Period of Implementation (5/7 Yrs)	Estiamted Cost Rs.in Lakh	
1	South Salmara Dev. Block/Dhubri	Agriculture	Har Khet Ko Pani	STW (D)	155	310	5	77.50	
2				STW (E)	125	250	5	32.50	
3				LLP	90	180	5	27.00	

4				Solar Power Pump	10	50	5	40.00
5			Per Drop More Crop	Sprinkler Set	25	25	5	10.00
Total=						815		187.00
Sl.No.	Name of the Block / District	Concerned Ministry / Department	Component	Activity	Total Numbers / Capacity(cum)	Command Area/Irrigation Potential(Ha)	Period of Implementation (5/7 Yrs)	Estiamted Cost Rs.in Lakh
1	Jamadarhat Dev. Block/Dhubri	Agriculture	Har Khet Ko Pani	STW (D)	30	60	5	15.00
2				STW (E)	5	10	5	1.30
3				LLP	10	20	5	3.00
4				Solar Power Pump	4	20	5	16.00
5			Per Drop More Crop	Sprinkler Set	10	10	5	4.00
Total=						120		39.30
Sl.No.	Name of the Block / District	Concerned Ministry / Department	Component	Activity	Total Numbers / Capacity(cum)	Command Area/Irrigation Potential(Ha)	Period of Implementation (5/7 Yrs)	Estiamted Cost Rs.in Lakh
1		Agriculture		STW (D)	189	378	5	94.50

2	Mahamaya Dev. Block/Dhubri		Har Khet Ko Pani	STW (E)	130	260	5	33.80
3				LLP	50	100	5	15.00
4				Solar Power Pump	20	100	5	80.00
5			Per Drop More Crop	Sprinkler Set	39	39	5	15.60
6				Drip Irrigation Set	80	40	5	32.00
				Total=		917		270.90
Sl.No.	Name of the Block / District	Concerned Ministry / Department	Component	Activity	Total Numbers / Capacity(cum)	Command Area/Irrigation Potential(Ha)	Period of Implementation (5/7 Yrs)	Estiamted Cost Rs.in Lakh
1	Nayeralga Dev. Block/Dhubri	Agriculture	Har Khet Ko Pani	STW (D)	70	140	5	35.00
2				STW (E)	40	80	5	10.40
3				LLP	15	30	5	4.50
4				Solar Power Pump	8	40	5	32.00
5			Per Drop More Crop	Sprinkler Set	20	20	5	8.00
				Total=		310		89.90

Sl.No.	Name of the Block / District	Concerned Ministry / Department	Component	Activity	Total Numbers / Capacity(cum)	Command Area/Irrigation Potential(Ha)	Period of Implementation (5/7 Yrs)	Estiamted Cost Rs.in Lakh
1	Chapar Salkocha Dev. Block/Dhubri	Agriculture	Har Khet Ko Pani	STW (D)	625	1250	5	312.50
2				STW (E)	425	850	5	110.50
3				LLP	150	300	5	45.00
4				Solar Power Pump	28	140	5	112.00
5			Per Drop More Crop	Sprinkler Set	300	300	5	120.00
6				Drip Irrigation Set	520	260	5	208.00
Total=						3100		908.00
Sl.No.	Name of the Block / District	Concerned Ministry / Department	Component	Activity	Total Numbers / Capacity(cum)	Command Area/Irrigation Potential(Ha)	Period of Implementation (5/7 Yrs)	Estiamted Cost Rs.in Lakh
1	Bilasipara Dev. Block/Dhubri	Agriculture	Har Khet Ko Pani	STW (D)	260	520	5	130.00
2				STW (E)	240	480	5	62.40
3				LLP	60	120	5	18.00
4				Solar Power Pump	17	85	5	68.00
5			Per Drop More Crop	Sprinkler Set	91	91	5	36.40
6				Drip Irrigation Set	180	90	5	72.00

					Total=		1386		386.80
Sl.No.	Name of the Block / District	Concerned Ministry / Department	Component	Activity	Total Numbers / Capacity(cum)	Command Area/Irrigation Potential(Ha)	Period of Implementation (5/7 Yrs)	Estiamted Cost Rs.in Lakh	
1	Hatidhura Dev. Block/Dhubri	Agriculture	Har Khet Ko Pani	STW (D)	165	330	5	82.50	
2				STW (E)	93	186	5	24.18	
3				LLP	20	40	5	6.00	
4				Solar Power Pump	17	85	5	68.00	
5			Per Drop More Crop	Sprinkler Set	65	65	5	26.00	
6				Drip Irrigation Set	100	50	5	40.00	
					Total=		756		246.68

V. CHAPTER V. ACTION PLAN UNDER PMKSY.

D.R.D.A. :: DHUBRI

SL No.	Name of Dev. Block/ Sub-Division/ District.	Concerned Ministry/ Department	Component [PMKSY Watershed]	Activity	Total Capacity /Cum/RM	Number/ Cum/RM	Estimated Cost (Rs. In lakh)	Command Area/ Irrigation Potential (Ha)
1	Agomani Dev. Block/ Sub-Division/ Dhubri District.	MoRD/ DoLR	Water Harvesting Structure (Renovation)	1. Renovation of Community Pond	8 Nos./4 Hect		80.00	120
			Water Harvesting Structure (New)	2. Construction of Farm Pond	3 Nos. / 3 Hect.		45.00	75
			Soil & moisture conservation	3. Construction of Drop spill way	2 Nos. / 1 KM		20.00	51
				1. Construction of earthen cannel	13 Nos. /6.50 Km		65.00	260
				2. Construction of Agril Bundh.	13 Nos. / 10 Km		130.00	260
				3. Construction of Brick cannel	3 Nos. / 1.00 Km		30.00	30
				4. Construction of Drainage channel	6 Nos. /5.00 Km		30.00	150
			Land Development	5. Reclamation of marshy soil	2 Nos. / 1Hect.		10.00	1
				1. Horticulture Plantation	2 Nos. / 1Hect.		10.00	1
			SUB-TOTAL				13 Nos. /6.5 Hect	
							475.00	953.5
2	Bilasipara Dev. Block/ Sub-Division/ Dhubri District.	MoRD/DoLR	Water Harvesting Structure (Renovation)	1. Renovation of Community Pond	6 / 3 Hect		60.00	60
			Water Harvesting Structure (New)	2. Construction of Farm Pond	2 / 2 Hect		30.00	40
			Soil & moisture conservation	3. Construction of Drop spill way	2 / 1 K.M.		20.00	40
				1. Construction of earthen cannel	10 / 5.50 K.M.		50.00	150
				2. Construction of Agril Bundh.	15 / 10.00 K.M.		150.00	225
				3. Construction of Brick cannel	2 / 0.70 K.M.		20.00	10
				4. Construction of Drainage channel	4 / 3.50 K.M.		20.00	80
			Land Development	5. Reclamation of marshy soil	2 / 1 Hect.		10.00	1
				1. Horticulture Plantation	2 / 1 Hect.		10.00	1
			SUB-TOTAL				10 / 5 Hect	
							410.00	611

D. Das
Asstt. Project Officer (Tech),
DRDA :: Dhubri.

[Signature]
PROJECT DIRECTOR,
D.R.D.A. :: DHUBRI

V. CHAPTER V. ACTION PLAN UNDER PMKSY.

D.R.D.A. :: DHUBRI

Sl. No.	Name of Dev. Block/ Sub-Division/ District.	Concerned Ministry/ Department	Component [PMKSY Watershed]	Activity	Total Number/ Capacity /Cum/RM	Estimated Cost (Rs. In lakh)	Command Area/ Irrigation Potential (Ha)	
3	Birsing Jarua Dev. Block/ Dhubri Sub-Division/ Dhubri District.	MoRD/DoLR	Water Harvesting Structure (Renovation)	1. Renovation of Community Pond	10 / 3 Hect	100.00	100	
				2. Construction of Farm Pond	2 / 2 Hect	30.00	40	
			Water Harvesting Structure (New)	3. Construction of Drop spill way	3 / 1 K.M.	30.00	60	
				Soil & moisture conservation	1. Construction of earthen cannel	15 / 5.50 K.M.	75.00	225
					2. Construction of Agril Bundh.	18 / 10.00 K.M.	180.00	270
			3. Construction of Brick cannel		4 / 0.70 K.M.	40.00	20	
			4. Construction of Drainage channel		7 / 3.50 K.M.	35.00	140	
			5. Reclamation of marshy soil		4 / 1 Hect.	20.00	2	
			Land Development	1. Horticulture Plantation	15 / 5 Hect.	75.00	7	
			SUB-TOTAL					
4	Chapor Salkocha Dev. Block/ Dhubri Sub-Division/ Dhubri District.	MoRD/DoLR	Water Harvesting Structure (Renovation)	1. Renovation of Community Pond	8 Nos./4 Hect.	80.00	160	
				2. Construction of Farm Pond	3 Nos./ 3 Hect.	45.00	90	
			Water Harvesting Structure (New)	3. Construction of Drop spill way	2 Nos. / 1 Km.	20.00	50	
				Soil & moisture conservation	1. Construction of earthen cannel	12 Nos. / 6 Km.	60.00	180
					2. Construction of Agril Bundh.	12 Nos. / 9 Km.	120.00	180
			3. Construction of Brick cannel		3 Nos. / 1 Km.	30.00	15	
			4. Construction of Drainage channel		6 Nos./ 5 Km.	30.00	240	
			5. Reclamation of marshy soil		2 Nos. / 1 Hect.	10.00	1	
			Land Development	1. Horticulture Plantation	12 Nos. / 6 Hec.	60.00	6	
			SUB-TOTAL				0	455.00

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V. CHAPTER V. ACTION PLAN UNDER PMKSY.

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Sl. No.	Name of Dev. Block/ Sub-Division/ District.	Concerned Ministry/ Department	Component [PMKSY Watershed]	Activity	Total Number/ Capacity /Cum/RM	Estimated Cost (Rs. In lakh)	Command Area/ Irrigation Potential (Ha)
5	Debitola Dev. Block/ Dhubri Sub-Division/ Dhubri District.	MoRD/DoLR	Water Harvesting Structure (Renovation)	1. Renovation of Community Pond	3 Nos./1.5 Hect.	80.00	45
			Water Harvesting Structure (New)	2. Construction of Farm Pond	3 Nos./ 3 Hect.	45.00	75
				3. Construction of Drop spill way	3 Nos. / 1.5 Km.	20.00	75
			Soil & moisture conservation	1. Construction of earthen cannel	6 Nos. / 3 Km.	60.00	120
				2. Construction of Agril Bundh.	6 Nos. / 6 Km.	120.00	120
				3. Construction of Brick cannel	3 Nos. / 1.5 Km.	30.00	30
				4. Construction of Drainage channel	6 Nos./ 4.5 Km.	30.00	180
				5. Reclamation of marshy soil	2 Nos. / 1 Hect.	10.00	1
Land Development	1. Horticulture Plantation	6 Nos. / 3 Hec.	60.00	3			
SUB-TOTAL						455.00	649
6	Fekamri Dev. Block/ Dhubri Sub-Division/ Dhubri District.	MoRD/DoLR	Water Harvesting Structure (Renovation)	1. Renovation of Community Pond	10 Nos. /5 Hect	100.00	200
			Water Harvesting Structure (New)	2. Construction of Farm Pond			
				3. Construction of Drop spill way			
			Soil & moisture conservation	1. Construction of earthen cannel			
				2. Construction of Agril Bundh.	23 Nos./18.00 Km	230.00	230
				3. Construction of Brick cannel	8 Nos. / 2.5 Km	80.00	200
				4. Construction of Drainage channel			
				5. Reclamation of marshy soil			
Land Development	1. Horticulture Plantation	18 Nos./9 Hect.	90.00	9			
SUB-TOTAL						500.00	639

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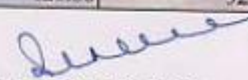
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V. CHAPTER V. ACTION PLAN UNDER PMKSY.

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Sl. No.	Name of Dev. Block/ Sub-Division/ District.	Concerned Ministry/ Department	Component [PMKSY Watershed]	Activity	Total Number/ Capacity /Cum/RM	Estimated Cost (Rs. In lakh)	Command Area/ Irrigation Potential (Ha)
7	Gauripur Dev. Block/ Dhubri Sub-Division/ Dhubri District.	MoRD/DoLR	Water Harvesting Structure (Renovation)	1. Renovation of Community Pond	10 Nos./5 Hect.	100.00	100
			Water Harvesting Structure (New)	2. Construction of Farm Pond	4 Nos. / 3.5 Hect.	60.00	80
				3. Construction of Drop spill way	3 Nos. / 1.50 Km	30.00	60
			Soil & moisture conservation	1. Construction of earthen cannel	15 Nos. / 7 Km.	75.00	225
				2. Construction of Agril Bundh.	15 Nos./ 11 Km.	150.00	225
				3. Construction of Brick cannel	4 Nos. / 1.50 Km.	40.00	20
				4. Construction of Drainage channel	7 Nos. / 5 Km.	35.00	140
				5. Reclamation of marshy soil	4 Nos. / 2 Hect.	20.00	2
			Land Development	1. Horticulture Plantation	15 Nos. / 7 Hect.	75.00	7
						SUB-TOTAL	
8	Golakganj Dev. Block/ Dhubri Sub-Division/ Dhubri District.	MoRD/DoLR	Water Harvesting Structure (Renovation)	1. Renovation of Community Pond	8 Nos. /20.5 Hect	122.00	400
			Water Harvesting Structure (New)	2. Construction of Farm Pond			
				3. Construction of Drop spill way			
			Soil & moisture conservation	1. Construction of earthen cannel	4 Nos. /14 Km.	56.00	325
				2. Construction of Agril Bundh.	1 Nos. /10 Km	250.00	200
				3. Construction of Brick cannel			
				4. Construction of Drainage channel			
				5. Reclamation of marshy soil			
			Land Development	1. Horticulture Plantation			
						SUB-TOTAL	

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V. CHAPTER V. ACTION PLAN UNDER PMKSY.

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Sl. No.	Name of Dev. Block/ Sub-Division/ District.	Concerned Ministry/ Department	Component [PMKSY Watershed]	Activity	Total Number/ Capacity /Cum/RM.	Estimated Cost (Rs. In lakh)	Command Area/ Irrigation Potential (Ha)
9	Hatidhura Dev. Block/ Dhubri Sub-Division/ Dhubri District.	MoRD/DoLR	Water Harvesting Structure (Renovation)	1. Renovation of Community Pond	2 Nos./1 Hect.	20.00	30
			Water Harvesting Structure (New)	2. Construction of Farm Pond	2 Nos. / 2 Hect.	30.00	60
				3. Construction of Drop spill way	2 Nos. / 1 Km	20.00	30
			Soil & moisture conservation	1. Construction of earthen cannel	4 Nos. / 2 Km.	20.00	80
				2. Construction of Agril Bundh.	4 Nos./ 4 Km.	40.00	100
				3. Construction of Brick cannel	2 Nos. / 1 Km.	20.00	20
				4. Construction of Drainage channel	4 Nos. / 3 Km.	20.00	120
				5. Reclamation of marshy soil	1 Nos. / 0.5 Hect.	5.00	0.5
Land Development	1. Horticulture Plantation	4 Nos. / 2 Hect.	20.00	2			
SUB-TOTAL						195.00	442.5
10	Jamadarhat Dev. Block/ Dhubri Sub-Division/ Dhubri District.	MoRD/DoLR	Water Harvesting Structure (Renovation)	1. Renovation of Community Pond	3 Nos./1.5 Hect.	30.00	60
			Water Harvesting Structure (New)	2. Construction of Farm Pond	2 Nos. / 2 Hect.	30.00	60
				3. Construction of Drop spill way			
			Soil & moisture conservation	1. Construction of earthen cannel			
				2. Construction of Agril Bundh.	7 Nos./ 5 Km.	70.00	140
				3. Construction of Brick cannel			
				4. Construction of Drainage channel			
				5. Reclamation of marshy soil			
Land Development	1. Horticulture Plantation	5 Nos. / 2.5 Hect.	25.00	2.5			
SUB-TOTAL						155.00	262.5

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Sl. No.	Name of Dev. Block/ Sub-Division/ District.	Concerned Ministry/ Department	Component [PMKSY Watershed]	Activity	Total Number/ Capacity /Cum/RM	Estimated Cost (Rs. In lakh)	Command Area/ Irrigation Potential (Ha)
11	Mahamaya Dev. Block/ Dhubri Sub-Division/ Dhubri District.	MoRD/DoLR	Water Harvesting Structure (Renovation)	1. Renovation of Community Pond	8 Nos./4 Hect.	80.00	80
				Water Harvesting Structure (New)	2. Construction of Farm Pond	3 Nos. / 3 Hect.	45.00
			Soil & moisture conservation		3. Construction of Drop spill way	2 Nos. / 1 Km	20.00
				1. Construction of earthen cannel	12 Nos. / 6 Km.	60.00	240
				2. Construction of Agril Bundh.	12 Nos. / 9 Km.	120.00	240
				3. Construction of Brick cannel	3 Nos. / 1 Km.	30.00	15
				4. Construction of Drainage channel	6 Nos. /5 Km.	30.00	120
			Land Development	5. Reclamation of marshy soil	2 Nos. / 1 Hect.	10.00	1
1. Horticulture Plantation	12 Nos. / 6 Hect.	60.00		6			
SUB-TOTAL						455.00	782
12	Mankachar Dev. Block/ Dhubri Sub-Division/ Dhubri District.	MoRD/DoLR	Water Harvesting Structure (Renovation)	1. Renovation of Community Pond	10 Nos./5 Hect.	80.00	120
				Water Harvesting Structure (New)	2. Construction of Farm Pond	2 Nos. / 2 Hect.	45.00
			Soil & moisture conservation		3. Construction of Drop spill way	3 Nos. / 1.5 Km	20.00
				1. Construction of earthen cannel	15 Nos. / 7 Km.	60.00	240
				2. Construction of Agril Bundh.	18 Nos. / 13 Km.	120.00	240
				3. Construction of Brick cannel	4 Nos. / 1.5 Km.	30.00	30
				4. Construction of Drainage channel	7 Nos. /6 Km.	30.00	120
			Land Development	5. Reclamation of marshy soil	4 Nos. / 2 Hect.	10.00	1
1. Horticulture Plantation	15 Nos. / 7 Hect.	60.00		6			
SUB-TOTAL						455.00	852

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Sl. No.	Name of Dev. Block/ Sub-Division/ District.	Concerned Ministry/ Department	Component [PMKSY Watershed]	Activity	Total Number/ Capacity /Cum/RM	Estimated Cost (Rs. In lakh)	Command Area/ Irrigation Potential (Ha)
13	Nayeralga Dev. Block/ Dhubri Sub-Division/ Dhubri District.	MoRD/DoLR	Water Harvesting Structure (Renovation)	1. Renovation of Community Pond	4 Nos./2 Hect.	40.00	40
			Water Harvesting Structure (New)	2. Construction of Farm Pond	2 Nos. / 2 Hect.	30.00	40
				3. Construction of Drop spill way	2 Nos. / 1 Km	20.00	40
			Soil & moisture conservation	1. Construction of earthen cannel	9 Nos. / 4.5 Km.	45.00	45
				2. Construction of Agril Bundh.	14 Nos. / 9 Km.	140.00	70
				3. Construction of Brick cannel	2 Nos. / 0.8 Km.	20.00	10
				4. Construction of Drainage channel	4 Nos. / 4 Km.	20.00	40
				5. Reclamation of marshy soil	2 Nos. / 4 Hect.	10.00	1
			Land Development	1. Horticulture Plantation	9 Nos. / 4 Hect.	45.00	4
SUB-TOTAL						370.00	290
14	Rupshi Dev. Block/ Dhubri Sub-Division/ Dhubri District.	MoRD/DoLR	Water Harvesting Structure (Renovation)	1. Renovation of Community Pond	8 Nos./4 Hect.	80.00	120
			Water Harvesting Structure (New)	2. Construction of Farm Pond	3 Nos. / 3 Hect.	45.00	75
				3. Construction of Drop spill way	2 Nos. / 1 Km	20.00	20
			Soil & moisture conservation	1. Construction of earthen cannel	12 Nos. / 6.0 Km.	60.00	240
				2. Construction of Agril Bundh.	12 Nos. / 9 Km.	120.00	240
				3. Construction of Brick cannel	3 Nos. / 1 Km.	30.00	30
				4. Construction of Drainage channel	6 Nos. / 4.5 Km.	30.00	120
				5. Reclamation of marshy soil	2 Nos. / 1 Hect.	10.00	1
			Land Development	1. Horticulture Plantation	12 Nos. / 6.0 Hect.	60.00	6
SUB-TOTAL						455.00	852

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Sl. No.	Name of Dev. Block/ Sub-Division/ District.	Concerned Ministry/ Department	Component [PMKSY Watershed]	Activity	Total Number/ Capacity /Cum/RM	Estimated Cost (Rs. In lakh)	Command Area/ Irrigation Potential (Ha)
15	South Salmara Dev. Block/ Sub-Division/ Dhubri District.	MoRD/DoLR	Water Harvesting Structure (Renovation)	1. Renovation of Community Pond	6 Nos./3 Hect.	60.00	30
			Water Harvesting Structure (New)	2. Construction of Farm Pond	2 Nos. / 2 Hect.	30.00	20
				3. Construction of Drop spill way	2 Nos. / 1 Km	20.00	10
			Soil & moisture conservation	1. Construction of earthen cannel	13 Nos. / 6.5 Km.	65.00	104
				2. Construction of Agril Bundh.	18 Nos. / 18 Km.	180.00	144
				3. Construction of Brick cannel	3 Nos. / 1 Km.	30.00	15
				4. Construction of Drainage channel	6 Nos. /5 Km.	30.00	30
				5. Reclamation of marshy soil	2 Nos. / 1 Hect.	10.00	1
			Land Development	1. Horticulture Plantation	13 Nos. / 6.5 Hect.	65.00	6.5
						SUB-TOTAL	
			GRAND TOTAL		6058.00	9653	

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