DISTRICT IRRIGATION PLAN

TINSUKIA, ASSAM

NABCONS NABARD CONSULTANCY SERVICES

District Irrigation Plan, 2016-2020

Tinsukia, Assam

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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 judicial 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 over extraction 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 five 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 Demography:

As per 2011 census, the population of the district is 13,27,929 which is 4.25% of the state's population. With a population density of 350 person per square kilometer, Tinsukia is relatively less densed compared to the population density of the state (398 person per square kilometer). The number of males and females in the district are 6,80,231 and 6,47,698 respectively forming a sex ratio of 952 female per 1000 male. Compared to the population recorded in 2001 census, there was an increase of 15.47 percent in the population in 2011. The literacy rate of the district is 69.66% which is little less than the average literacy rate of the state which stood at 72.19%. There are 2,68,598 households in the district.

Agriculture in Tinsukia:

Agriculture occupies a prominent place in the economy of the district and is a major source of occupation for people. Rice, the major cereal crop, covers 69,561 hectares. Other cerelas like maize, wheat, small millets are having negligible area. Rapeseed and mustard are the important oilseed crops; sesamum and linseed are also grown to a limited extent. Black gram, green gram and pea are the main pulse crops of the district. Among fibre crops, jute is grown in only some limited pockets. The district has net and gross cropped areas of 1,00,930.7 hectares and 1,23,009.8 hectares respectively, the net cropped area being just 24 percent of the total geographical area. About 22,079.17 hectares out of the gross cropped areas is put under multiple cropping with an average cropping intensity 122 percent as against 152.43 percent for the state.

District Water Profile:

The district is drained by mighty River Brahmaputra flowing NE-SW direction and its tributaries Dibru and Burhi-Dihing flowing from Naga-Patkai hill range in the south. All the rivers are ephemeral in nature and carry huge quantities of water and sediment during rainy season and cause submergence of low lying areas.

The annual dynamic ground water resources are estimated to be 159036 ha m, while the net annual ground water draft is 16697 ha m. The stage of ground water development is only 12% percent and the district is still under "safe" category. The demand of ground water for domestic

and industrial use projected till 2025 is estimated to be about 4257 ham and 125230 ham water is still available for future irrigation development.

Demand for water and the gap:

Total surface and ground water available in the district is 500 MCM. Total present water requirement for the district is 440.65 MCM while the total future water requirement for the district is 449.39 MCM. The water budget clearly shows the water gap between the water availability and requirement**.** The negative gap indicates that there is sufficient water resources for irrigation, domestic and the industrial uses without creating any deficit in our water potential.

PMKSY Financial Proposal:

Total plan of Tinsukia district for four years works out to be Rs. 111226.46 lakh. Maximum share of Rs. 83210.34 lakh (75%) is for Agriculture department followed by Irrigation department with Rs. 23102 lakh (21%) and Soil Conservation department with Rs. 4914.12 lakh (4%). The total plan of four years is equally divided in to 4 years i.e. 2016-17, 2017-18, 2018-19 and 2019-20.

Expected Outcome:

The gross irrigated area in the district is 5261 hectare which is around 3% of 170224.5 hectare of the gross cropped area. Agriculture, irrigation and Soil Conservation departments of the district have proposed to bring additional 91345 hectares of land under irrigated cultivation system.

Introduction

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 prepare a draft development plan for the whole district.

The decentralized planning process was further strengthened 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. The Planning commission issued guidelines in August 2006 for preparation of the district plans. The guidelines define 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 (ACAS) 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 utilisation 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 required 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) local needs / crops / feed and fodder / animal husbandry / dairying / fisheries / priorities are reflected in the plan; (iii) 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 states to receive funds from the program. The present 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, in the face of population growth, urbanization & industrialization and considerations of climatic change, making water, an increasingly a scarce resource, available to multiple uses, planning and management of this vital resources, 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, with the near constant supply of water resources in the face of increasing demand on account of population growth, urbanisation and industrialization will strain the water supply-demand balance.

The per capita water availability which stood at 5,177 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 shortage of water in the medium term[1]. 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 the abundant surface and ground water supply in the first five decades since independence, more than 80 percent of the total available water resources were allocated for irrigation purposes and the rest meeting the domestic and industrial demands. In a recent study[2] 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

[1]Ministry of Water Resources (2011), Strategic Plan for Ministry of Water Resources, GoI, New Delhi
[2]Amarasinghe, U.A., Shah T., Turral, 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.

(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 and also partly 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 of the states where the availability of land and water are serious constraints for further expansion of irrigation. Further, as per the erstwhile planning commission up to March 2012 out of 141 million hectares of net sown area in the country 114 (or 81%) million hectares is Irrigation Potential Created (IPC) and 88 (or 62%) million hectares is Irrigation Potential Utilised (IPU) leaving almost 20% of irrigated potential unutilized. This leaves 40 percent of the net sown area in the country dependent on rainfall which makes farming a high risk and less productive.

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 resources[3] under an Integrated Water Resource Management framework. The main objectives of water resource management as delineated in National Water Policy 2012 are:

a) 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.
b) Principle of equity and social justice must inform use and allocation of water.
c) 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.
d) 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.
e) Water is essential for sustenance of eco-system, and therefore, minimum ecological needs should be given due consideration.

[3]Ministry of Water Resources, National Water Policy, 2012, GoI, New Delhi.

f) 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.

g) 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.

h) 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.

i) 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.

j) 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.

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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 was 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 fulfilment 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, States will be given additional weightage for levying charges on water and electricity for irrigation purposes, so as to ensure sustainability of the programme. Thirdly, interstate allocation of PMKSY fund will be decided based on

- Share of percentage of unirrigated area in the state vis-à-vis national average including prominence of areas classified under Desert Development Programme (DDP) and Drought Prone Area Development Programme (DPAP)
- 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 and
- Improvement in irrigation efficiency in the state.

Vision

The overreaching 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.

Objective

The objectives of the PMKSY 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 (Har Khet ko Pani),
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.

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 farmers 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' organizations/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.

Programme Components

PMKSY has following four components:

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

2. PMKSY (Har Khet ko Pani): This component focuses on-

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 (Har Khet ko Pani), PMKSY (Watershed) and MGNREGS as per Taluka/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 pumpsets including water carriage pipes, underground piping system.
g) Extension activities for promotion of scientific moisture conservation and agronomic measures including cropping alignment to maximise use of available water including rainfall and minimise 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 Talukas including renovation of traditional water bodies

Rationale/ Justification

In reference to the status and need of irrigation, the water resource management including irrigation related priorities was identified for Tinsukia 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 Tinsukia district including (i) creating irrigation potential through water harvesting structure, Nalla and Check Bundh, Percolation and Recharge tanks (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) increase the forest cover in the district and (vii) land improvement measures.

Methodology

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

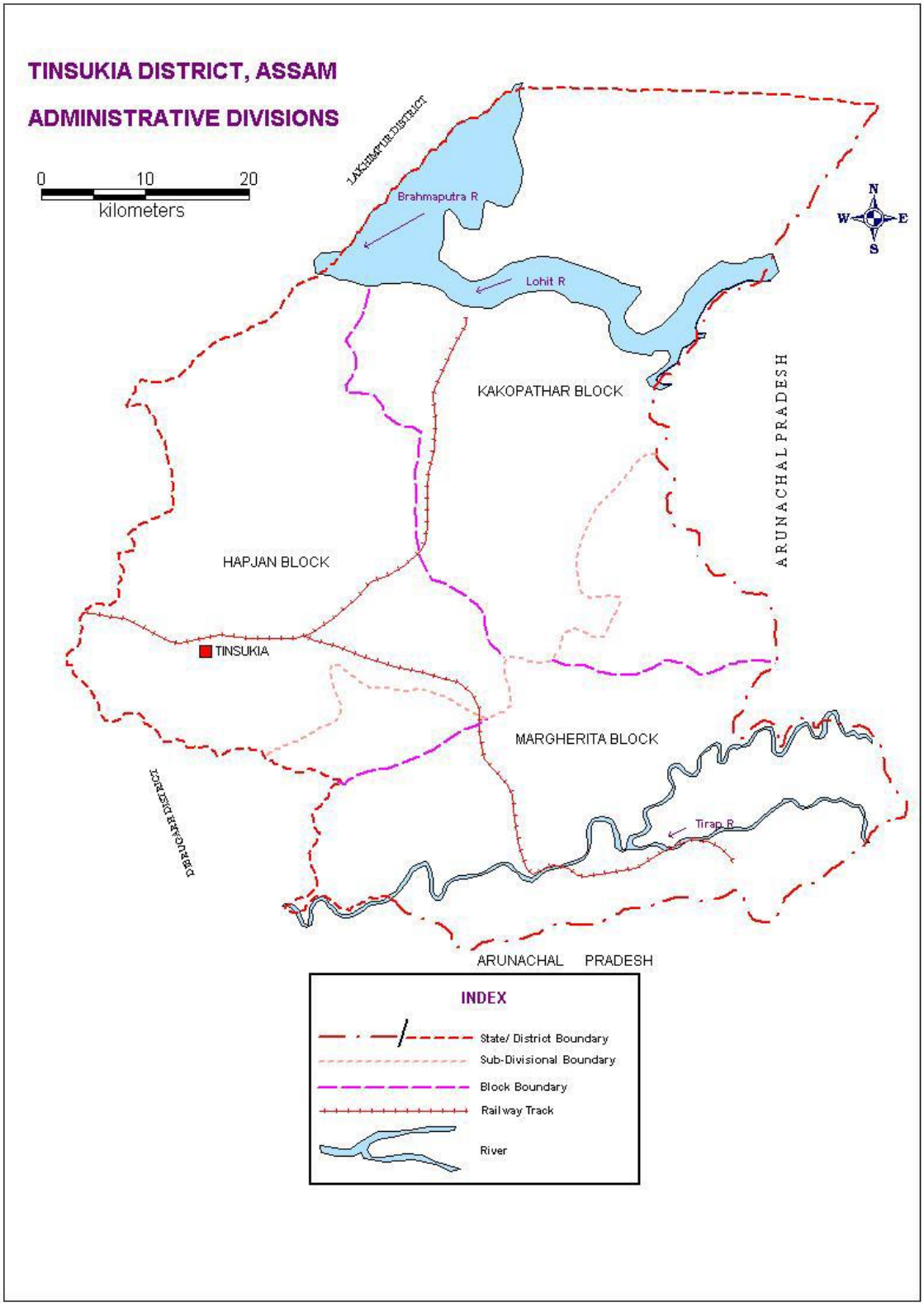
a) Collection of primary and secondary data from field from various sources including published documents and websites.
b) Various meetings were held to obtain ground level realities and data from key personnel/stakeholders through structured, unstructured interviews, focused group discussions etc.
c) Meetings with various State Government departments and related institutions were held
d) Meeting was also held with State Level authorities.
e) GIS maps of the areas/clusters were studied to understand the land morphology, topography of the district.
f) Focused group discussions and interaction with agriculture officers, horticulture officers, soil conservation officers, extension officers, rural development department, animal husbandry department, irrigation officers both at Talukas and district level for identifying the key issues and focus areas of the region.
g) Discussion with NABARD officer of the district was also held during the visit.

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 for four years from 2016-17 to 2019-20 as detailed in the plan.

Chapter 1 : General Information of the District

1.1 District Profile

Tinsukia district of Assam is located in the easternmost part of the State lies between $27^{o}23'$ and $27^{o}48'$ North Latitudes and $95^{o}22'$ and $95^{o}38'$ East Longitudes. It covers an area of 3,790 sq. Km of Brahmaputra Basin. For administrative convenience, the district has been divided into 3 sub-divisions, 7 blocks and 88 Gram Panchayats. The district is drained by mighty River Brahmaputra flowing NE-SW direction and its tributaries Dibru and Burhi-Dihing flowing from Naga-Patkai hill range in the south. All the rivers are ephemeral in nature and carry huge quantities of water and sediment during rainy season and cause submergence of low lying areas.



Map 1-1: Tinsukia district map

Table 1-1: District Profile

Name of the District	District Code	Latitude	Longitude
Tinsukia	AS23	27º23’ to 27º48’ North	95º22’ to 95º38’ East

Source: Census of India 2011, Tinsukia

Brief history of the district

Tinsukia was declared as the 23rd district of Assam on 1st October 1989 when it was split from Dibrugarh with three sub divisions Tinsukia, Margherita (M), and Sadiya.The ancient name of Tinsukia was Bangmara which was orginally known as Changmai Pathar. It was the capital of Muttack Kingdom.The ancient name of Tinsukia was Bengmara.

In 1823, the British first discovered tea plants in Sadiya and the first tea plantation was started in Chabua near Tinsukia. (The name Chabua comes from "Chah-Buwa"/tea plantation).In 1882, the Dibru-Sadiya Railway was opened to traffic by the Assam Railway & Trading Company, centred on Tinsukia, and a turning point in the economic development of north-east India.

In ancient days, there was no place in the name of Tinsukia, it was a part of Somarpith division of upper Assam or old Kamrupa kingdom as mentioned in Kalikapuran and Joginitrant. The Somarpith Division of Kamrupa was the abode of Chutia, Barahi, Ahom, Kachari, Matak, Moran etc. and this division was ruled by different kings of different races probably from 12th century. In 13th century the Tai prince Chukapha after crossing Patkai Mountain had first met Moran Barahi in this division. Once a time, Kunti of king Bhismak generation of Sadiya ruled Kuntirajya which was a part of Somar and it was near present Tinsukia town. Because of the fact that the place Kuntigohali or Khamti Gohali, which is about 7 kms from Tinsukia has acknowledged about existence of Kuntirajya near to Tinsukia. The last ruler of different races of king of this area of Somar division was from Matak/Chutia.

Tinsukia district was originally a part of Lakhimpur district and thereafter it was a part of Dibrugarh district. Tinsukia was finally formed a separate district in 1989. The district is formed comprising the area of Tinsukia and Sadiya subdivisions of the erstwhile Dibrugarh district. It has another new sub-division named Margherita.

Administrative Set-up of Tinsukia

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, Extra-Assistant Commissioners and other assist the Deputy Commissioner in looking after the administration of the district.

For the administrative purposes, the entire district is divided into three sub-divisions viz., Tinsukia, Margherita and Sadiya. Again each sub-division is divided into revenue circles and under revenue circles there are Mouzas comprising revenue villages. There are total 4 revenue circles and 1168 villages. The names of Revenue Circles are Sadiya, Doom Dooma, Tinsukia, Margherita. It has 86 Gaon Panchayats and 7 Community Development Blocks. There are 13 towns which includes 5 Statutory Towns and 8 Census Towns. Tinsukia district covers an area of 3790 Sq.Km (Rural: 3728.504 Sq.Km. and Urban: 61.496 Sq.Km.)

1.2 District Demography

As per 2011 census, the population of the district is 13,27,929 which is 4.25% of the state's population. With a population density of 350 person per square kilometer, Tinsukia is relatively less densed compared to the population density of the state (398 person per square kilometer). The number of males and females in the district are 6,80,231 and 6,47,698 respectively forming a sex ratio of 952 female per 1000 male. Compared to the population recorded in 2001 census, there was an increase of 15.47 percent in the population in 2011. The literacy rate of the district is 69.66% which is little less than the average literacy rate of the state which stood at 72.19%. There are 2,68,598 households in the district.

Table 1-2: Demography of Tinsukia

Name of the Block	Population			SC		ST		Total	
	M*	F	CH	NHH	NM	NHH	NM	NHH	NM
Sadiya	52572	49862	14353	585	2974	4396	25167	19317	102434
Saikhowa	56591	54366	16582	770	4452	2775	14174	21069	110957
Hapjan	106483	104654	31379	431	2251	718	3203	41777	211137
Kakapathar	109036	105671	32615	511	2613	2510	12972	41728	214707
Guijan	63472	60641	16062	1488	7343	1198	6257	25856	124113
Itakhuli	63086	61177	16763	370	1869	453	2083	25455	124263
Margherita	130515	123210	35631	1639	7618	3393	16565	53021	253725
Urban centres	98476	88117	18441	1830	8568	434	1645	40375	186593
Total	**680231**	**647698**	**181826**	**7624**	**37688**	**15877**	**82066**	**268598**	**1327929**

Source: Census of India 2011, Tinsukia

*M- Male, F- Female, CH- Children 0-14 years, NHH- No. of households, NM- No. of members

Margherita block has the highest population of 2,53,725 while Sadiya block has the lowest population of 1,02,434. In urban population, total population is 1,86,593 with 40,375 number of households. The following figure shows the number of male, female and children population in the blocks of Tinsukia district.

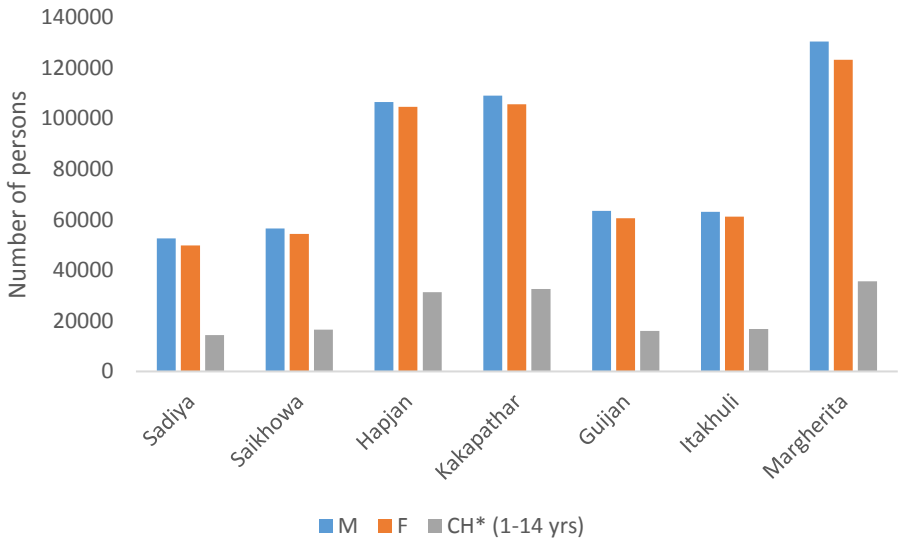


Figure 1-1: Number of Male, Female and Children in blocks of Tinsukia district

Total number of SC households in the district is 7,624 with the total population of 37,688. Out of this, Margherita block has the highest number of SC population of 7,618 while Itakhuli block has the lowest SC population of 1,869. Total number of ST households in the district is 15,877 with the total population of 82,066. Out of this, Sadiya block has the highest number of ST population of 25,167 while Hapjan block has the lowest ST population of 3,203.

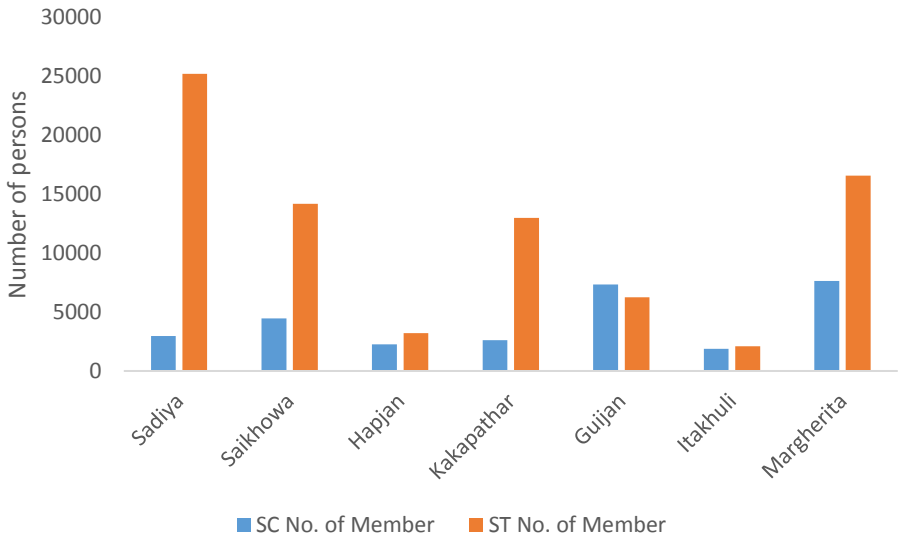


Figure 1-2: Number of SC and ST members in blocks of Tinsukia district

1.3 Biomass and Livestock

Next to Agriculture and Horticulture, Livestock rearing is an important enterprise of the district. Cows, buffaloes, draft animals, goats pigs, poultry are main commodities of livestock enterprise. Cross breed cows, improved breed buffaloes and upgraded pigs in small numbers

are also reared in almost all the blocks of the district. Mostly the local breeds are common. The population of the Large and Small are given in Table no. 1-3 and 1-4. During the last 30 years, milk production has increased more than three times, egg production three and half times, chicken and chevrons more than three times, pork more than three times and beef nearly two times.

Table 1-3: Population of Small Animals in Tinsukia

Blocks	Small Animals				
	Poultry (Nos.)	Ducks (Nos.)	Pigs (Nos.)	Goats (Nos.)	Sheeps (Nos.)
Sadiya	80764	33704	11776	23576	-
Saikhowa	37152	15504	5420	10849	-
Hapjan	66724	32019	11187	22399	150
Kakapathar	78743	32862	11481	22988	-
Guijan	41901	13315	2650	9315	-
Itakhuli	41996	17526	6124	12260	-
Margherita	92473	38593	13443	26995	24
Total	**439753**	**183523**	**62081**	**128382**	**174**

Table 1-4: Population of Large Animals in Tinsukia

Blocks	Large Animals			
	Indigenous Cow (Nos.)	Hybrid Cow (Nos.)	In descriptive Buffalo (Nos.)	Hybrid Buffalo (Nos.)
Sadiya	75658	2796	4510	-
Saikhowa	34804	1286	2117	-
Hapjan	71875	2656	3334	-
Kakapathar	73769	2726	2422	-
Guijan	29887	2112	1865	-
Itakhuli	39347	1454	1825	-
Margherita	86628	3201	3519	-
Total	**411968**	**16231**	**19592**	**-**

1.4 Agro-Ecology, Climate, Hydrology and Topography

The district experiences sub-tropical humid climate where winter temperature goes up to 37^{O}C. Humidity is also more than 90 percent during rainy season. The district is endowed with high rainfall during all the months in a year. The South West monsoon sets in the month of June and lasts up to September. Out of 2323 mm normal annual rainfall, about 65 percent rain is received from monsoon. The mean daily maximum temperature during winter is about 24°C and minimum is 17.5°C. The mean daily maximum temperature during summer is 31°C and the minimum is 24° C.

Based on climatic variations and soil type, the state of Assam is broadly divided into six Agro-Climatic Zones. Each zone covers more than one district and Tinsukia district along with four

other districts fall under Upper Brahmaputra Valley Zone (UBVZ). Dependiing upon the criteria of altitude, soil type, rainfall pattern, irrigation facilities available, topography etc., the district has been divided into five Agro-Ecological Situations (AES). However, for the preparation of the situation specific DIP, the AESs covering forest area, tea gardens and hilly areas are not considered. The spread of AES is as given below.

Table 1-5: AES, Rainfall and Topography of Tinsukia district

Agro-Ecological Zone Type	Type of Terrain	Blocks covered	Normal Annual Rainfall (mm)	Average Monthly Rainfall (mm)	No. of Rainy days (No.)
AES I	Humid Alluvial Flood Prone	Saikhowa, Guijan, Sadiya	2323	193.58	140-150
AES II	Humid Alluvial Flood Free	Kakapathar, Saikhowa, Hapjan, Itakholi, Guijan, Sadiya			
AES III	Sub-Humid Alluvial Flood Free	Kakapathar, Saikhowa, Hapjan, Itakholi, Guijan, Margherita			

Table 1-6: Climate of Tinsukia district

Average Weekly Temperature (°C)								
Period								
Summer (April-May)			Winter (Oct.-Mar.)			Rainy (June-Sept.)		
Min	Max	Mean.	Min	Max	Mean.	Min	Max	Mean.
24	31	27.5	11	24	17.5	21	29	25

1.5 Soil Profile

Physiographically the area is characterised by Brahmaputra plains and hills in the southern part, with gentle slope towards north-west. The distinguishable geomorphic units are as follows.

a) Flood plain
b) Younger and older alluvium plain
c) Structural hill

The soil in the area may be grouped into three broad categories depending upon the origin and occurrence. These are given below.

a) Newer alluvial Soil: Flood plain areas of River Brahmaputra and the tributaries in the northern part are characterised by light grey clay with sand and silt.
b) Older alluvial Soil: It occurs mainly in the central part with limonite yellow to reddish yellow clay.
c) Soil cover in forest and hilly areas: It is deep reddish in colour and occurs over the older geological formation in the southern most part of the district.

The climate, vegetation and parent rock types, topography, occurance of flood and other biotic factors have considerably influenced the genesis of soil and consequently great variation in soil types have been observed in different parts of the district. Based on the soil test results, it has been found that the soil of Tinsukia district is mainly acidic. Micronutrients, especially Zn, Bo, Mo and Cu etc. were found in almost all parts of the district. The block wise soil type is shown in the following table.

Table 1-7: Block wise textural classification of soils (area in Ha.)

Blocks	Soil Type							
	Red Soil		Sandy Soil		Sandy Loam		Sandy Clay	
	Area (Ha)	%	Area (Ha)	%	Area (Ha)	%	Area (Ha)	%
Sadiya	0	0	39523	50	15809	20	23714	30
Saikhowa	0	0	12375	30	14437	35	14438	35
Hapjan	0	0	8160	20	12241	30	20402	50
Kakapathar	0	0	16640	20	24960	30	41598	50
Guijan	0	0	6299	30	4199	20	10448	50
Itakhuli	0	0	0	0	13566	35	25190	65
Margherita	23264	20	11634	10	17450	15	63985	55

1.6 Soil Erosion and Run-off Status

Soil erosion is a serious problem in Assam especially in the hilly regions and areas in the north bank of the Brahmaputra bordering Bhutan and Arunachal Pradesh. Sheet and river bank erosion of the Brahmaputra and land-slides in the hilly terrains contribute substantially to the sedimentation problem of the rivers and productivity decline of farm land covering lakhs of hectares. The catchment of the Brahmaputra is characterized by very steep hill slopes with coarse soil texture and unstable land mass. This causes high instantaneous run-off and heavy siltation in the tributaries as well as in the channels of the main river. It is also frightening that the mighty river is drifting its course now towards southern bank and causing sedimentation in the north bank.

1.7 Land Use pattern

The total geographical area of the district is 4,20,393.4 Ha out of which 40.49% is cultivable, 10.78% is forest, 59.64% is under non-agricultural use and 2.51% is barren/waste land. Area under pasture is very negligible and marginally productive due to prevailing system of open grazing since long without adding any nutrient. This area is required to be given special attention for corrective treatment to enhance the productivity. The following table gives the block wise information on land use pattern**.**

Table 1-8: Land use pattern in Tinsukia district

Name of Block	TGA	Area Under Agriculture				Area under Forest (Ha)	Area under Waste land (Ha)	Area under other uses (Ha)
		GCA	NSA	AST	CI (%)			
Sadiya	79046.4	28600	25929	2671	110	12575.2	1022	65449.2
Saikhowa	41250	17053	13154	3899	129.6	1062	907	39281
Hapjan	40804	14004.4	11260.5	2744	124	23650	423	16731
Kakapathar	83200	19810	17173	2637	115.3	87	4993	78120
Guijan	20996	7920	6133	1787	129.1	225	364	20407
Itakhuli	38760	11343	8577	2766	132	7703	415	30642
Margherita	116337	24279.4	18704.23	5575.17	129.8	0	2438	113899
Total	**420393.4**	**123009.8**	**100930.7**	**22079.17**	**122**	**45302.2**	**10562**	**364529.2**

TGA- Total Geographical Area, GCA- Gross Cropped Area, NSA- Net Sown Area, AST- Area Sown more than once, CI- Cropping Intensity

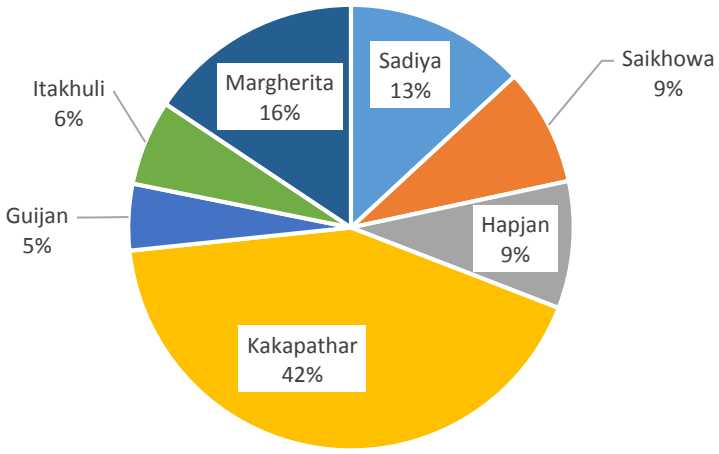


Figure 1-3: Block wise percentage of gross crop area in Tinsukia

Chapter 2 : District Water Profile

Water is vital for survival of both plants and animals. It is the central component of the planet Earth controlling the weather, climate, plant and animal kingdom. It supports agriculture, forestry, navigation, industries and hydroelectricity generation and other uses such as for recreation, water sports activities etc. The importance of water has been recognized all over the world. Water resource development and management practices are given top priorities all over the world to avoid the water crisis in future. This chapter outlines the different type of crops, productivity and irrigation status of the Tinsukia distrct.

2.1 Area wise, Crop wise, irrigation Status

Agriculture occupies a prominent place in the economy of the district and is a major source of occupation for people. Rice, the major cereal crop, covers 69,561 hectares. Other cerelas like maize, wheat, small millets are having negligible area. Rapeseed and mustard are the important oilseed crops; sesamum and linseed are also grown to a limited extent. Black gram, green gram and pea are the main pulse crops of the district. Among fibre crops, jute is grown in only some limited pockets. The district has net and gross cropped areas of 1,00,930.7 hectares and 1,23,009.8 hectares respectively, the net cropped area being just 24 percent of the total geographical area. About 22,079.17 hectares out of the gross cropped areas is put under multiple cropping with an average cropping intensity 122 percent as against 152.43 percent for the state. The crop wise irrigated and rainfed area sown in different seasons like Kharif, Rabi and Summer in the district for each block is given in Annexure I.

2.2 Production and Productivity of Major crops

The agro climatic condition of the district is very much conducive for raising all types of crops. Besides rice, rapeseed, mustard seed, black gram and green gram, vegetables etc. are other important agricultural products of the area. The chief horticultural crops are various Citrus fruits, banana, and pineapple, areca nut and various Rabi and Kharif vegetables. The block wise, area wise production and productivity of different types of crops are given in the tabular forms in Annexure II.

By default, majority of the crops both agricultural and horticultural are grown organically. So, the district has the scope of becoming pioneer in organic farming system, particularly in case of agricultural crops like paddy and horticultural crops like Citrus, pineapple, banana, areca nut, etc. In fact majority of fruit crop production can be considered as organic produce. Due to various efforts by the concerned departments to make aware about the ill effects of “Chemical

Agriculture" and promotion of organic agriculture farmers have taken up organic farming in a true sense. It is a general practice of the farmers to apply Farm Yard Manure (FYM) particularly Cow dung and compost in their crop fields.

2.3 Irrigation based classification

The irrigation potential in the district is developed both from the surface and ground water sources. The irrigation department is responsible for creation of major, medium and minor irrigation schemes. The agriculture department has also created irrigation potential in different cultivable area by way of installation of shallow tube well schemes. Gross irrigated area and net irrigated area in the district are 5,261 hectares and 4,033 hectares respectively. Thus, just 4% of the grosa cropped area is irrigated while remaining 96% of the gross cropped area is rainfed.

Table 2-1: Irrigation based classification

Block	Irrigated (Area in Ha)		Rainfed (Area in Ha)	
	Gross Irrigated Area	Net Irrigated Area	Partially Irrigated/Protective Irrigation	Un-Irrigated or Totally Rainfed
Sadiya	25	25	NA	22310.5
Saikhowa	765	513	NA	13737
Hapjan	396	265	NA	15338
Kakapathar	2870	2250	NA	69403
Guijan	28	20	NA	8190
Itakhuli	730	545	NA	9815
Margherita	447	415	NA	26170
Total	**5261**	**4033**	NA	**164963.5**

Source: Agriculture Department, Tinsukia

Chapter 3 : Water Availability in Tinsukia

Water availability is an important issue for ascertaining the demand of water for domestic, livestock, irrigation, industrial and power generation projects. The water availability depends on topography, climatic conditions, rainfall, soil profile, infiltration rate, run off and human activities over the catchment area. The changes in the water levels of the surface source are mainly because of the variations in the inflow from the upper catchments. The fluctuations constitute a sensitive indicator of past and present climate and human activities at a local and regional scale. In the hydrological point of view, the entire Tinsukia district falls under the Brahmaputra basin.

3.1 Status of Water Availability

For creating access to water source either assured or protective to each farmer will require a demand and supply assessment of crop water requirements, effective rainfall and potential source of existing and new water sources considering the geo-hydrological and agro ecological scenario of the block. The master plan will include information on all sources of available water, distribution network, defunct water bodies, new potential water sources both surface and sub surface system, application to conveyance provisions, crops and cropping system aligned to available /designed quantity of water and suitability to local agro ecology. All activities pertaining to water harvesting, water augmentation from surface ad sub surface sources, distribution and application of water including repair, renovation and restoration of water bodies, major, medium and minor irrigation works, command area development etc. are to be taken up within the frame work of this master plan. Emphasis is to be given for deriving the potential benefit from low hanging fruits like extending the reach/coverage of water source through effective distribution and application mechanism, reducing the gap between potential created and utilized through more focus on command area development and precision irrigation. Proper integration of creation of diversion head work and water harvesting structures, distribution system like canals and command area development works and precision farming is to be made for best possible use of water resources. The block wise status of surface and ground water water availability in MCM per Ha for the district is given in the table below.

Table 3-1: Status of water availability in MCM

Sources	Kharif	Rabi	Summer	Total
Surface Irrigation				
Canal (Major & medium irrigation)				
Minor Irrigation tanks				
Lift Irrigation/ Diversion	150	10	0	160

Various water bodies including Rain Water Harvesting				
Treated Effluent Received from STP				
Untreated Effluent				
Perennial sources of water				
Ground Water				
Open Well				
Deep Tube Well	150	20	0	170
Medium Tube Well				
Shallow Tube Wells	150	20	0	170
Total	**450**	**50**	**0**	**500**

The district is drained by mighty River Brahmaputra flowing NE-SW direction and its tributaries Dibru and Burhi-Dihing flowing from Naga-Patkai hill range in the south. All the rivers are ephemeral in nature and carry huge quantities of water and sediment during rainy season and cause submergence of low lying areas.

3.2 Status of Ground Water Availability

Hydrogeology

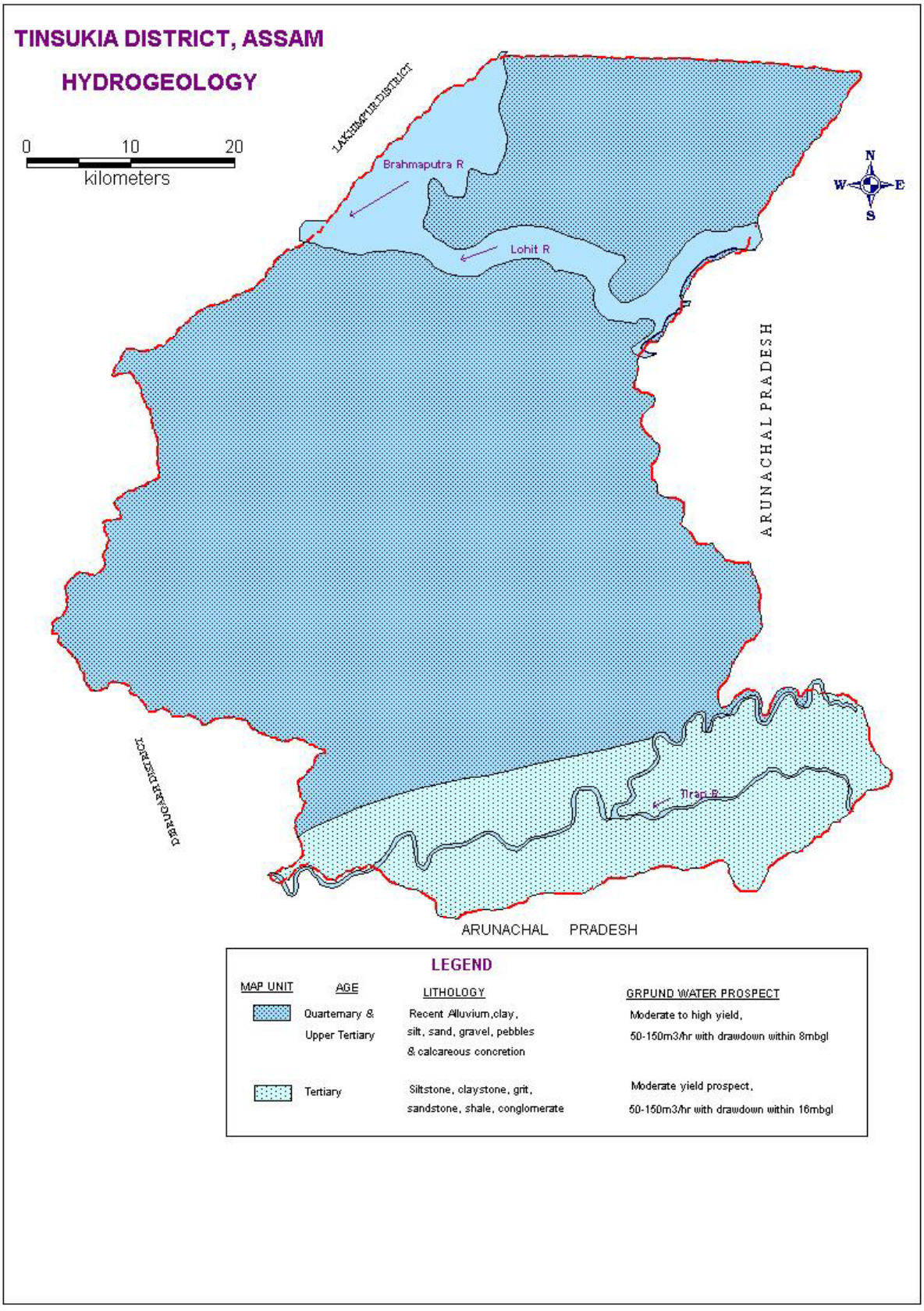
The district can be sub-divided into two broad hydrogeological Units

1. Tertiary Group of Semi-consolidated rocks
2. Quaternary alluvium of unconsolidated sediments.

Tertiary group of sedimentary rocks are confined to the southern most part of the area where ground water occurs in the shallow weathered zone and this may be developed through large diameter open wells. Ground water occurs in deeper aquifer consisting of Tipam sandstone and in boulders and gravel beds of Dihing group which are suitable for development through deep tube wells.

Alluvial plain covers major part of the district. Ground water occurs in regionally extensive aquifers down to explored depth of 250 m with a very good yield prospect. The aquifers are consisting of sands of various grades and are suitable for both shallow and deep tube wells. Ground water rests at shallow depth and in major part of the district, depth to water level varies from 2 to 5 m bgl during pre-monsoon period and from 1.68 to 4.5 m bgl during post monsoon period. The long tern water level trend study shows no significant change of water level in the last 10 years.

The shallow tube wells tapping aquifers within 50 m depth are capable of yielding 20 – 50 m3/hr at drawdown of less than 3 m. Medium to heavy duty tube wells constructed down to 100 – 150 m depth tapping 25 – 30 m of granular zones are yielding 50 – 100 m3/hr.



Map 3-1: Hydrogeology map of Tinsukia

Ground Water Resources

The dynamic ground water resources are estimated based on the methodology adopted as per GEC 1997 following water level fluctuation and rainfall infiltration factor methods. The annual dynamic ground water resources are estimated to be 159036 ha m, while the net annual ground water draft is 16697 ha m. The stage of ground water development is only 12% percent and the district is still under "safe" category. The demand of ground water for domestic and industrial use projected till 2025 is estimated to be about 4257 ham and 125230 ham water is still available for future irrigation development.

Table 3-2: Status of Ground Water Availability

District	Status of Block as per Central Ground Water Board Notification			Ground Water (MCM)		
	Critical	Semi-Critical	Safe	Draft	Recharge	Gap
Tinsukia			Safe	166.97	1590.36	1423.39

Source: CGWB, Guwahati Regional Office

Ground Water Quality

To study the quality, ground water samples were collected from GEMSs and EWs of C.G.W.B. and analysed in the Chemical Laboratory of CGWB, NER, Guwahati. The interpretation of the results of the analysis shows that ground water of the district is fresh and suitable for both domestic and irrigation purposes except higher contents of iron in some places, which requires treatment before being used for drinking purposes.

Status of ground Water Development

Ground Water development is at low key at Present. Ground water draft for irrigation purpose is 26 MCM against the vast annual dynamic resources of 1107 MCM. The net annual dynamic resources for future irrigation development are estimated to be 940 MCM.

3.3 Status of Command Area

Block wise villages covered in various command is as below.

Taluka	Villages in Command Area
Kakopathar	Madhuban,Rangpur,Messgaon,Madhabpur,Udaypur,Sitalpur,Kapang,Gutibari,Deorigaon,Rabarguri,Bargaon,Sonowal gaon,Bishnupur gaon,rangpur gaon,Rakari missing gaon.(Philobari F.I.S), Lajumgaon.(Lajumgaon D.T.W.L/S 1 pt), Bijuli Ban gaon, Maliapung,Sitalpurgaon,Rupjan gaon,Borduki gaon,Maj gaon,Padum pather gaon,Sonowal gaon,Gouripurgaon.(Malaipung S.T.W), Haru maibong Duaniya gaon,Bor Maibon Kachari gaon.(Kakapather D.T.W. I/S), Rupjan gaon,Sonowal gaon,Deuri gaon,Missing gaon,Bahir Rangdoi & Bhitor Rangdoi gaon(Phillobari Kachari Rangdoi Miri M.D.T.W), Bordirak gaon, Amguri gaon,Sunamigaon,Maithong gaon, Nabajyoti gaon.(Tangana S.T.W), Haru Maithong.(kakopather D.T.W. I/S Phase-II), Udoypur gaon,Shitalpur gaon(Gabharu bheti D.T.W), Sonowal gaon(Phillobari D.T.W I/S II points)

Guijan	Gahoripum gaon,Gabindapur gaon(Gahoripum D.T.W), Nunpuria Kaibarta gaon,Nunpuria Bangoli gaon(Nunpuria S.T.W.I/S), Nunpuri Bengoli gaon,Nunpuria Kaibazta gaon(Nunpuri D.T.W), Panitola gaon ,Nagoan(Panitula D.T.W I/S II points)
Saikhowa	Dhallakhaloi Ahom gaon (Dhallakhaloi D.T.W. I/S), Bordhadum gaon,Harudhadu gaon,Ahom gaon,Nadhadum gaon(S/dhadum B/dhadum M.D.T.W.I/S), Barpather gaon,Napather gaon.(Bonpather Napather D.T.W.I/S), Harudhadum Boudhadum(Extension of S/dhadur), Aroimuria gaon,dighal Mesaki gaon,Makumkila gaon,Buka pather gaon,Anjula gaon.(Aroimuri M.D.T.W.I/S), Laina 1 no, Laina 2 no, Laina 3 no (Laina D.T.W), Dholabojar gaon, Bhuban khal gaon, Gormora miripather gaon.(Pilot project)
Hapjan	Sukanpukhuri, Assamiya pather gaon (Tingari D.T.W.I/S 6 Pt), Assamiya pather (Assamiya Pather D.T.W.I/S), Bangoli Raidang gaon.(Tingari D.T.W. I/S Ph-II), Assamiya Bengoli gaon,Bangali Balijan gaon.(Assamiya Bengoli D.T.W), Assamiya Pather(Tingari D.T.W I/S Pt.no-7)
Sadiya	Santi pur 1 no,2 no ,3 no and 4 no gaon, Deopani Miri gaon (Jia L.I.S), Bura buri gaon(Chapakhowa Sprinkler), lasai gaon(Mulukchapani Sprinkler), Tori bori gaon,Bura buri gaon,Dora gaon & Bhabani gaon(Moradeopani F.I.S)
Margherita	Udyapur 1 no & 2 no gaon, Rampur 1 no gaon.(Rampur L.I.S), Powaimukh 1 no & 2 no. gaon.(Powai L.I.S), Mong long Bengoli gaon 1 no,2 no &3 no,Mong long pather gaon,Ledo Bengoli gaon, Khamati gaon.(Mong long Pather L.I.S), Baruah gran,Niz Makum 1 no. gaon, Majuli gaon(Niz Makum L.I.S), Alubari 1 no &2 no gaon,rajkhowa Pather gaon(Alubari L.I.S), Phulbari gaon, Parbotipur gaon(Phulbari parbotipur L.I.S), Bapupather gaon.(Bapupather D.T.W I/S), Lakang Pather gaon,Bahbari gaon, bapupather gaon,Pithaguti bari gaon.(Margherita D.T.W I/S), Golaipather 1 no &2 no gaon(Golaipather D.T.W), Hulung pather,Borhulung pather(Buridihing G.P D.T.W.I/S)

Block wise status of command area for Bordikarai Irrigation Scheme is given in Annexure III.

3.4 Existing type of Irrigation

Margherita block has the highest canal command area which is 1916 hectares while the lowest canal command area is for Guijan block which is 241 hectares only. In this region, due to high availability of the ground water, ground water extraction can increase the irrigated area. Block wise existing types of Irrigation is given in Annexure IV.

Chapter 4 : Water Requirement/Demand

Whenever an engineer is given the duty to design a water supply scheme for a particular use of the community, it becomes imperative upon him, to first of all, evaluate the amount of water available and the amount of water required/ demanded by the public. In fact, the first study is to consider the demand, and then the second requirement is to find sources to fulfil that demand. Many a times a compromise is sought between the two. It is very difficult to precisely assess the quantity of water demanded by the public since there are many variable factors affecting water consumption. The various type of water demands for a district may be as follows.

4.1 Domestic Water Demand

This includes the water requirement in private buildings for drinking, cooking, bathing, lawn sprinkling, gardening, sanitary purposes etc. The amount of domestic water consumption per person shall vary according to the living condition soft he consumers. On an average, this domestic consumption under normal conditions in Indian city is expected to be around 135 litres/day/person as per IS: 1172-1971.In a developed and an effluent country like USA, this figure goes as high as 340 litres/day/person. This is because more water is consumed in rich living, air cooling/conditioning, automatic household appliances, car washing etc. The total domestic consumption generally amounts to 55 to 60% of the total water consumption.

The total domestic water demand shall be equal to the total design population multiplied by the per capita domestic consumption i.e. 135 litre/day. As the last population census was made in 2011, the actual population of the district in 2015 is not readily available. Considering the population of the Tinsukia district as per Census, 2011 the projected population in 2020 is worked out assuming the last decadal growth of 15.47% and annual exponential growth rate of 1.55% to apply for the period 2011-2020 (9 years). The domestic water demand is given in the table below.

Table 4-1: Domestic water demand (MCM)

Blocks	Population as per 2011 census	Population in 2015	Water demand (MCM)	Projected Population in 2020	Gross Water Demand (MCM)
Sadiya	102434	108785	5.36	116724	5.75
Saikhowa	110957	117836	5.81	126436	6.23
Hapjan	211137	224227	11.05	240591	11.86
Kakapathar	214707	228019	11.24	244659	12.06
Guijan	124113	131808	6.49	141427	6.97
Itakhuli	124263	131967	6.50	141598	6.98
Margherita	253725	269456	13.28	289120	14.25

Urban Centres	186593	198162	9.76	212623	10.48
Total	**1327929**	**1410261**	**69.49**	**1513175**	**74.56**

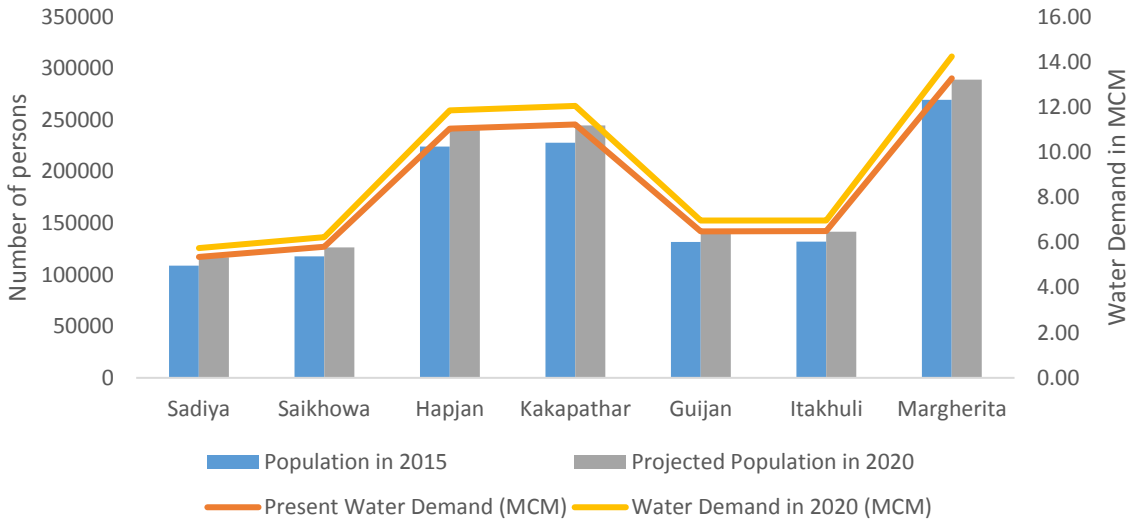


Figure 4-1: Population and domestic water requirement

4.2 Crop water demand

Water requirement of a crop means the total quantity and the way in which a crop requires water, from the time it is sawn to the time it is harvested (crop period). Different crops will have different water requirements and the same crop may have different water requirements at different places of the same country depending upon the climate, type of soil, method of cultivation and useful rainfall etc. The total quantity of water required by the crop for its full growth may be expressed in Hectare-m or in Million Cubic meter or simply as a depth to which the total supplied irrigation water would stand above the surface without percolation or evaporation. This depth is known as delta for the crop. On the other hand duty is defined as the area irrigated per cumec of discharge running for the base period. The duty helps us in designing the efficient canal irrigation system. If we know the crops area required to be irrigated and their duties, we can work out the discharge required for designing the canal.

Consumptive use for a particular crop may be defined as the total amount of water used by the plant in transpiration (building of plant tissues etc.) and evaporation from adjacent soils or from plant leaves, in any specified time. Therefore, crop water requirements are defined as "the depth of water needed to meet the water loss through evapo-transpiration of a disease free crop, growing in large fields under non restricting soil conditions including soil water and fertility and achieving full production under the given growing environment. Consumptive use for a particular crop may be defined as the total amount of water used by the plant in transpiration

(building of plant tissues etc.) and evaporation from adjacent soils or from plant leaves, in any specified time. Thus crop water requirement is nothing but the consumptive use itself, but exclusive of effective precipitation, stored soil moisture or ground water. Consumptive use or evapotranspiration depends upon all those factors on which evaporation and transpiration depend such as, temperature, sunlight, wind movement etc. The crop water requirement of different bocks in the Tinsukia district has been worked out and a statement is prepared as shown in table below which outlines the required and available water potential in the district.

Table 4-2: Crop water requirement (MCM)

Block	Area sown (Ha)	Irrigated area (Ha)	Crop Water Demand (MCM)	Water Potential Required (MCM)	Existing Water Potential (MCM)	Water Potential to be created (MCM)
Sadiya	16423.1	25	49.2693	49.2693	0.075	49.1943
Saikhowa	11683	765	35.049	35.049	2.295	32.754
Hapjan	14805	396	44.415	44.415	1.188	43.227
Kakapathar	33400	2870	100.2	100.2	8.61	91.59
Guijan	6133	28	18.399	18.399	0.084	18.315
Itakhuli	8112	730	24.336	24.336	2.19	22.146
Margherita	23241	447	69.723	69.723	1.341	68.382
Total	**113797.1**	**5261**	**341.3913**	**341.3913**	**15.783**	**325.6083**

4.3 Livestock water demand

The livestock water demand of the district is determined by multiplying the total livestock population in the district by the per capita water requirement (litres/day/No) for each category of the population. With the existing population recorded for a base year, the total projected livestock population in 2020 may be worked out by taking averagelivestock growth rate of 30% and accordingly the livestock water demand is worked out. The livestock water demand is given in the table below.

Table 4-3: Livestock water demand (MCM)

Block	Total number of live stock	Present Water demand (MCM)	Water demand in 2020 (MCM)	Existing Water potential (MCM)	Water potential to be created (MCM)
Sadiya	232784	3.40	3.87	3.40	0.47
Saikhowa	107132	1.56	1.78	1.56	0.22
Hapjan	210344	3.07	3.49	3.07	0.42
Kakapathar	224991	3.28	3.74	3.28	0.45
Guijan	101045	1.48	1.68	1.48	0.20
Itakhuli	120532	1.76	2.00	1.76	0.24
Margherita	264876	3.87	4.40	3.87	0.53
Total	**1261704**	**18.42**	**20.95**	**18.42**	**2.53**

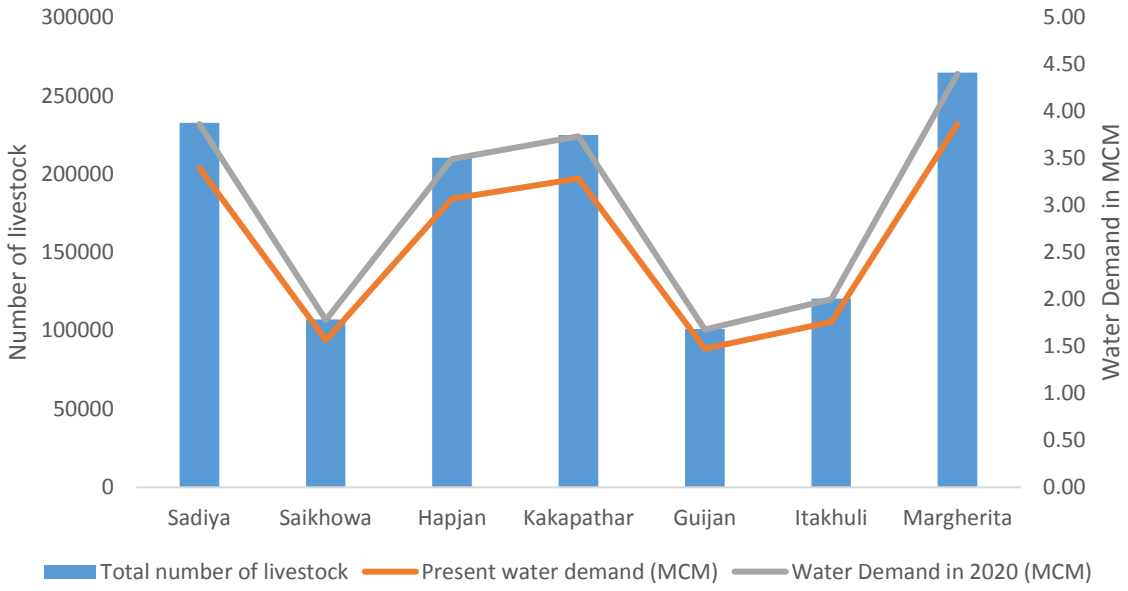


Figure 4-2: Population and water requirement of livestock

4.4 Industrial water demand

This includes the quantity of water required to be supplied to offices, factories, different industries, hostels, hospitals etc. This quantity will vary considerably with the nature of city and with the type of industries and commercial establishments present in it. On an average, a provision of 20-25% of the total water consumption is generally made in the design for these uses. In small residential communities, the industrial use may be as low as 45 /litre/day, but in industrial cities, it may be as high as 450 litres/day. Some of the industries may develop their own supplies and may place little or no demand on municipal system. Zoning of the city affects the location of the industries and may help in estimating future industrial demands. Commercial districts include office buildings, ware houses, stores, hotels etc. and their demand is not high, average about 45 litres/day/person. The industrial water demand for the Tinsukia district is given in table below.

Table 4-4: Industrial water demand (MCM)

Block	Name of Industry	Water demand (MCM)	Water demand in 2020 (MCM)	Existing Water potential (MCM)	Water potential to be created (MCM)
Sadiya	Milk Industry, Bekary	0.073	0.0803	0.073	0.0073
Saikhowa	Tea Industry, brick Industries, Automobile Servicing unit	0.1825	0.20075	0.1825	0.01825
Hapjan	Tea Industry, Food, Brick, Automobile Servicing unit, Iron Industry	2.555	2.8105	2.555	0.2555

Kakapathar	Tea Industry, Brick Industries, Praver Block etc	0.146	0.1606	0.146	0.0146
Guijan	Tea Industry, Loundry Service, Iron Industry, Food, Pravers Block, Bricks Industries	1.2775	1.40525	1.2775	0.12775
Itakhuli	Tea Industry, Food, Brick, Coke Coal, Automobile Servicing unit, Iron Industry, Transformar Making Industries,Bricks Industries	2.92	3.212	2.92	0.292
Margherita	Tea Industry, Food, Brick, Coke Coal,Automobile Servicing unit, Bricks Industries, Praver Block	4.1975	4.61725	4.1975	0.41975
Total		11.3515	12.48665	11.3515	1.13515

Source: District Industry Centre, Tinsukia

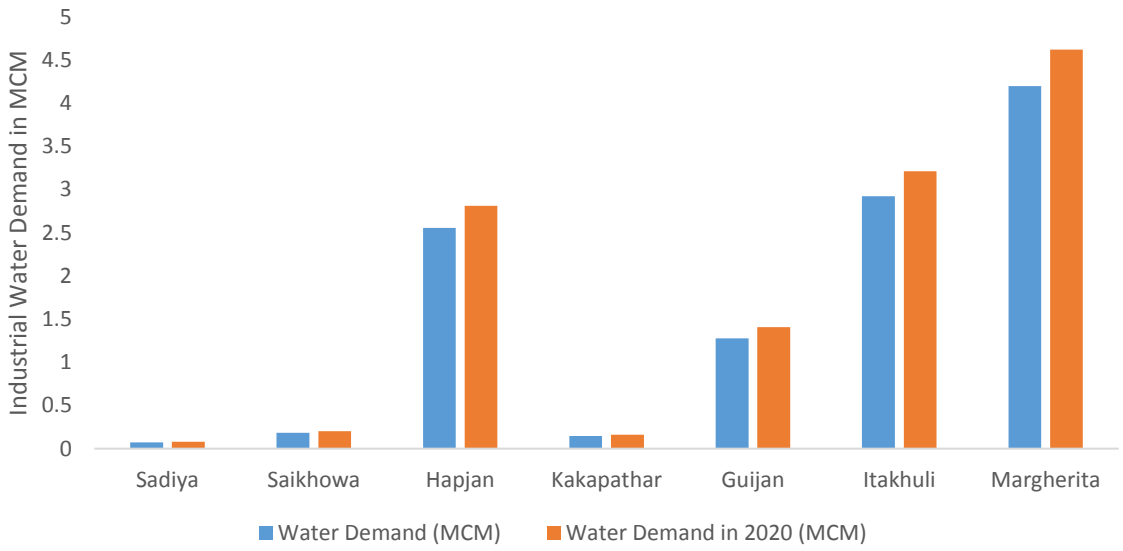


Figure 4-3: Industrial water requirement of Tinsukia district

4.5 Water demand for Power Generation

As reported by the Assam Power Distribution Ltd (APDCL), CAZ, Tinsukia, presently there is no any power plant in the Tinsukia district and in the years to come i.e. up to the year 2020, there is no any plan to tap resources for power generation and it was informed that the water requirement for power generation may be treated as nil. Hence there is no demand for water from power sector.

4.6 Total water demand of the district for various sectors

The total water demand of the district for all the sectors described in 4.1 to 4.5 are given in the are assessed by summing up all the values of water demand for domestic uses, livestock, power

and industrial/commercial uses etc. The current water demand has been indicated in Table 4-5 and the projected water demand has been depicted in Table 4-6. Total present water requirement for the district is 440.65 MCM while the total future water requirement for the district is 449.39 MCM. In present, maximum water demand is for Kakapathar block which is 114.87 MCM while minimum is for Guijan block which is 27.65 MCM. In projected future, maximum water demand is for Kakapathar block which is 116.15 MCM while minimum is for Guijan block which is 28.45 MCM.

Table 4-5: Present Water Demand of the district for various sectors

Block	Demand from Components (MCM)					Total MCM
	Domestic	Crop	Livestock	Industrial	Power generation	
Sadiya	5.36	49.2693	3.40	0.073	0	**58.10**
Saikhowa	5.81	35.049	1.56	0.1825	0	**42.60**
Hapjan	11.05	44.415	3.07	2.555	0	**61.09**
Kakapathar	11.24	100.2	3.28	0.146	0	**114.87**
Guijan	6.49	18.399	1.48	1.2775	0	**27.65**
Itakhuli	6.50	24.336	1.76	2.92	0	**35.52**
Margherita	13.28	69.723	3.87	4.1975	0	**91.07**
Urban Centres	9.76	-	-	-	0	**9.76**
Total	**69.49**	**341.39**	**18.42**	**11.35**	**0.00**	**440.65**

Table 4-6: Total Water Demand of the district for various sectors (Projected for 2020)

Block	Demand from Components (MCM)					Total MCM
	Domestic	Crop	Livestock	Industrial	Power generation	
Sadiya	5.75	49.2693	3.87	0.0803	0	**58.97**
Saikhowa	6.23	35.049	1.78	0.20075	0	**43.26**
Hapjan	11.86	44.415	3.49	2.8105	0	**62.57**
Kakapathar	12.06	100.2	3.74	0.1606	0	**116.15**
Guijan	6.97	18.399	1.68	1.40525	0	**28.45**
Itakhuli	6.98	24.336	2.00	3.212	0	**36.53**
Margherita	14.25	69.723	4.40	4.61725	0	**92.99**
Urban Centres	10.48	-	-	-	0	**10.48**
Total	**74.56**	**341.39**	**20.95**	**12.49**	**0.00**	**449.39**

4.7 Water Budget

The water budget of the district for the base year 2015-16 and 2020-21 as per water availability and demand is given in the table below. The present water availability/demand and also for 2020 are worked out as explained above and the water gap is found out. The water budget clearly shows the water gap between the water availability and requirement**.** The negative gap indicates that there is sufficient water resources for irrigation, domestic and the industrial uses without creating any deficit in our water potential.

Table 4-7: Water Budget (Volume in MCM)

Name of District	Existing water availability		Total (MCM)	Water Demand (MCM)		Water Gap (MCM)	
	Surface Water	Ground Water		Present	Projected (2020)	Present	Projected (2020)
Tinsukia	160	340	500	440.65	449.39	-59.35	-50.61

Chapter 5 Strategic Action Plan for Irrigation in District under PMKSY

5.1 Department wise, year wise plan

Total plan of Tinsukia district for four years works out to be Rs. 111226.46 lakh (Table 5-1). Maximum share of Rs. 83210.34 lakh (75%) is for Agriculture department followed by Irrigation department with Rs. 23102 lakh (21%) and Soil Conservation department with Rs. 4914.12 lakh (4%). The total plan of four years is equally divided in to 4 years i.e. 2016-17, 2017-18, 2018-19 and 2019-20. Fig.5-1 indicates department-wise year -wise share in PMKSY for four years from 2016-17 to 2019-20.

Table 5-1: Department-wise year-wise proposal under PMKSY

Department	Year				Total
	2016-17	2017-18	2018-19	2019-20	
Agriculture	21040.05	20915.10	20627.60	20627.60	**83210.34**
Irrigation	5775.50	5775.50	5775.50	5775.50	**23102.00**
Soil Conservation	1228.53	1228.53	1228.53	1228.53	**4914.12**
Total	**28044.08**	**27919.13**	**27631.63**	**27631.63**	**111226.46**

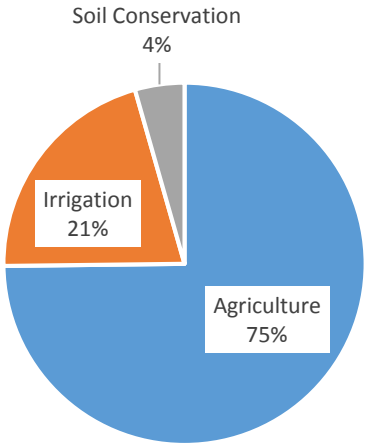


Figure 5-1: Share of departments in proposal

5.2 Component wise, year wise plan

As discussed above about various components of PMKSY, the plan is prepared accordingly. Table 5-2 shows component wise plan for 4 years starting from 2016-17 to 2019-20. AIBP component has a total proposal of Rs. 16269 lakh which is 14.63% of the total PMKSY proposal of the district. This component will be mainly executed by Agriculture and Irrigation department. Har Khet ko Pani (HKKP) component is of Rs. 83147.44 lakh (74.76%), which will be executed by Irrigation department and Agriculture department. Per Drop More Crop (PDMC) components is of Rs. 4470.90 lakh (4.02%), which will be executed mainly by

Agriculture department. Watershed component has a total proposal of Rs. 7039.12 lakh which is 6.33% of district's PMKSY proposal. This component will be implemented by Soil Conservation department and Agriculture department. Convergence with MGNREGA component is of Rs. 300 lakh which is 0.27% of the total PMKSY proposal of the district. This component will be implemented by Agriculture department. All the stakeholders need to have coordination among themselves to have the maximum irrigation efficiency and to avoid duplicity. Fig. 5-2 represents the graphical representation of various components of PMKSY, year wise plan and share.

Table 5-2: Component wise plan

Component	2016-17	2017-18	2018-19	2019-20	Total
AIBP	4067.25	4067.25	4067.25	4067.25	**16269.00**
HKKP	20824.32	20799.37	20761.87	20761.87	**83147.44**
PDMC	1117.73	1117.73	1117.73	1117.73	**4470.90**
Watershed	1834.78	1734.78	1734.78	1734.78	**7039.12**
Convergence	75.00	75.00	75.00	75.00	**300.00**
Total	**27919.08**	**27794.13**	**27756.63**	**27756.63**	**111226.46**

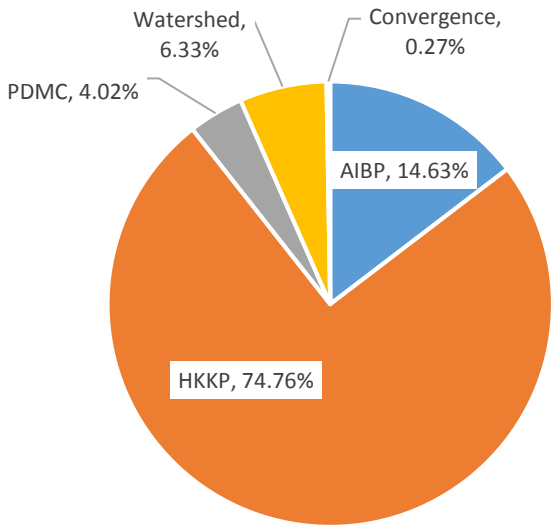


Figure 5-2: Component wise plan under PMKSY

5.3 Block wise, year wise plan

Block wise, year wise plan for the district is as shown in table below. For all the blocks, the amount has been same for each year i.e. 2016-17, 2017-18, 2018-19 and 2019-20. Overall, the maximum amount has been proposed for Saikhowa block which is Rs. 42195.48 lakh and the minimum amount is proposed for Hapjan block which is Rs. 4924.23 lakh. Block wise plan for every department has given in Annexure V.

Table 5-3: Block wise, year wise plan

Blocks	2016-17	2017-18	2018-19	2019-20	Total
Kakapathar	4106.50	4106.50	4106.50	4106.50	**16426.01**
Saikhowa	10548.87	10548.87	10548.87	10548.87	**42195.48**
Guijan	1144.68	1144.68	1144.68	1144.68	**4578.70**
Hapjan	1231.06	1231.06	1231.06	1231.06	**4924.23**
Itakhuli	2310.20	2185.25	2185.25	2185.25	**8865.95**
Sadiya	6068.38	6068.38	5780.88	5780.88	**23698.50**
Margherita	2634.40	2634.40	2634.40	2634.40	**10537.60**
Total	**28044.08**	**27919.13**	**27631.63**	**27631.63**	**111226.46**

5.4 Block wise, component wise plan

Block wise, component wise plan for the district is as shown in table below. For AIBP component, Sadiya block has the highest amount of Rs. 12837 lakh while several blocks has the nil amount. For Har Khet Ko Pani component, Saikhowa block has the highest amount of Rs. 39408.45 lakh while Guijan block has the lowest amount of Rs. 3961.00 lakh. For Per Drop More Crop component, Kakapathar block has the highest amount of Rs. 3698.00 lakh while Sadiya block has the lowest amount of Rs. 16 lakh. For PMKSY-Watershed component, Saikhowa block has the highest amount of Rs. 1949.63 lakh while Itakhuli block has the lowest amount of Rs. 100 lakh. For convergence with MGNREGA component, Saikhowa block has the highest amount of Rs. 213 lakh while several blocks has the nil amount.

Table 5-4: Block wise, component wise plan

Blocks	AIBP	HKKP	PDMC	Watershed	Convergence	Total
Kakapathar	652.00	10891.75	3698.00	1184.26	0.00	**16426.01**
Saikhowa	0.00	39408.45	624.40	1949.63	213.00	**42195.48**
Guijan	0.00	3961.00	19.50	598.20	0.00	**4578.70**
Hapjan	0.00	4289.60	56.00	496.63	82.00	**4924.23**
Itakhuli	0.00	8744.95	21.00	100.00	0.00	**8865.95**
Sadiya	12837.00	9900.00	16.00	945.50	0.00	**23698.50**
Margherita	2780.00	5951.69	36.00	1764.91	5.00	**10537.60**
Total	**16269.00**	**83147.44**	**4470.90**	**7039.12**	**300.00**	**111226.46**

5.5 Block wise, department wise plan

Block wise, component wise plan for the district is as shown in table below. Agriculture department has proposed highest amount for Saikhowa block (Rs. 32954.85 lakh) while the lowest amount for Guijan block (Rs. 2527.50). Irrigation department has proposed highest amount for Saikhowa block (Rs. 7291 lakh) while the lowest for Guijan block (Rs. 1453 lakh).

Soil Conservation department has proposed highest amount for Saikhowa block (Rs. 1949.63 lakh) while the same for Itakhuli block is nil.

Table 5-5: Block wise, department wise plan

Blocks	Agriculture	Irrigation	Soil Conservation	Total
Kakapathar	12301.75	3483.00	641.26	**16426.01**
Saikhowa	32954.85	7291.00	1949.63	**42195.48**
Guijan	2527.50	1453.00	598.20	**4578.70**
Hapjan	2846.60	1611.00	466.63	**4924.23**
Itakhuli	7254.95	1611.00	0.00	**8865.95**
Sadiya	18549.00	4591.00	558.50	**23698.50**
Margherita	6775.69	3062.00	699.91	**10537.60**
Total	**83210.34**	**23102.00**	**4914.12**	**111226.46**

5.6 Expected Output and Outcome

As stated earlier the gross irrigated area in the district is 5261 hectare which is around 4% of 1,23,009.8 hectare of the gross cropped area. Various departments of the district have proposed to bring additional 91345 hectares of land under irrigated cultivation system. Table below represents the target proposed by various department to bring additional land under irrigated cultivation through PMKSY.

Table 5-6: Block wise, component wise area in ha. to be contemplated for irrigation

	AIBP	HKKP	PDMC	Watershed	Convergence	Total
Kakapathar	840	6340	6812	3761	0	**17753**
Saikhowa	0	17034	160	9513	764	**27471**
Guijan	0	1689	4	2800	0	**4493**
Hapjan	0	2022	12	2241	200	**4475**
Itakhuli	0	3594	4	61	0	**3659**
Sadiya	7945	3880	4	8317	0	**20146**
Margherita	1310	7378	14	4587	60	**13349**
Total	**10095**	**41937**	**7010**	**31279**	**1024**	**91345**

5.7 Conclusion

The following benefits are intended from the District Irrigation Plan.

1. A total of 91345 Hectares of Irrigation potential is proposed to be created under the four components of PMKSY. Thus, 54% of cultivable area would be brought under the command of assured irrigation. It would boost up the gross crop intensity significantly as the farmers would be able to go for multiple cropping sequences throughout the year.
2. Under AIBP component of PMKSY, 10095 hectares of land is contemplated to be brought under irrigation with the total amount of Rs. 16269 lakh by Irrigation and Agriculture department.

3. Under the component ‘Har Khet Ko Pani’, 41937 hectares of land is contemplated to be brought under irrigation with the total amount of Rs. 83147.44 lakh by Irrigation and Agriculture department.
4. Under Per Drop More Crop component, 7010 hectares of land is contemplated to be brought under irrigation with the total amount of Rs. 4470.90 lakh by Agriculture department.
5. Under Watershed component, 31279 hectares of land is contemplated to be brought under irrigation with the total amount of Rs. 7039.12 lakh by Soil Conservation and Agriculture department.
6. Under Convergence with MGNREGA component, 1024 hectares of land is contemplated to be brought under irrigation with the total amount of Rs. 300 lakh by Agriculture department.

Thus, the overall economy of the district would get better and better in the days to come after the contemplated projects get implemented and yield results in terms of enhanced crop production.

Annexure I : Area wise, crop wise irrigation status

Name of the Block: Kakapathar															
Crop Type	Kharif (Area in ha)			Rabi (Area in ha)			Summer Crop(Area in ha)			Total (Area in ha)			Horticulture & Plantation Crops (Area in ha)		
	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total
A) Cereals	2200	12350	14550		50	50	160	450	610	2360	12850	15210	430	3790	4220
B) Coarse Cereals			0			0			0	0	0	0			0
C) Pulses	50	650	700	30	350	380			0	80	1000	1080			0
D) Oil Seeds			0		1550	1550			0	0	1550	1550			0
E) Fibre			0			0			0	0	0	0			0
Total	2250	13000	15250	30	1950	1980	160	450	610	2440	15400	17840	430	3790	4220
Name of the Block: Itakhuli															
Crop Type	Kharif (Area in ha)			Rabi (Area in ha)			Summer Crop(Area in ha)			Total (Area in ha)			Horticulture & Plantation Crops (Area in ha)		
	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total
A) Cereals	80	5305	5385	60	115	175	45	95	140	185	5515	5700	545	561	1106
B) Coarse Cereals		120	120		20	20			0	0	140	140			0
C) Pulses		110	110		220	220			0	0	330	330			0
D) Oil Seeds			0		120	120			0	0	120	120			0
E) Fibre			0			0			0	0	0	0			0
Total	80	5535	5615	60	475	535	45	95	140	185	6105	6290	545	561	1106
Name of the Block: Sadiya															
Crop Type	Kharif (Area in ha)			Rabi (Area in ha)			Summer Crop(Area in ha)			Total (Area in ha)			Horticulture & Plantation Crops (Area in ha)		
	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total
A) Cereals			0		12980	12980	25	3490	3515	25	16470	16495		2055	2055
B) Coarse Cereals		380	380			0			0	0	380	380			0
C) Pulses			0		2439	2439			0	0	2439	2439			0
D) Oil Seeds		40	40		5430	5430			0	0	5470	5470			0
E) Fibre			0			0			0	0	0	0			0
Total	0	420	420	0	20849	20849	25	3490	3515	25	24759	24784	0	2055	2055
Name of the Block: Saikhowa															
Crop Type	Kharif (Area in ha)			Rabi (Area in ha)			Summer Crop(Area in ha)			Total (Area in ha)			Horticulture & Plantation Crops (Area in ha)		
	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total
A) Cereals	513	10486	10999	72	167	239	56	254	310	641	10907	11548	124	567	691
B) Coarse Cereals			0			0			0	0	0	0			0
C) Pulses		43	43		129	129			0	0	172	172			0
D) Oil Seeds			0		363	363			0	0	363	363			0
E) Fibre			0			0			0	0	0	0			0
Total	513	10529	11042	72	659	731	56	254	310	641	11442	12083	124	567	691

Name of the Block: Hapjan															
Crop Type	Kharif (Area in ha)			Rabi (Area in ha)			Summer Crop(Area in ha)			Total (Area in ha)			Horticulture & Plantation Crops (Area in ha)		
	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total
A) Cereals	60	6872	6932	40	125	165	265		265	365	6997	7362		2800	2800
B) Coarse Cereals		71	71			0			0	0	71	71			0
C) Pulses		78	78	31	258	289			0	31	336	367			0
D) Oil Seeds			0		157	157			0	0	157	157			0
E) Fibre			0			0			0	0	0	0			0
Total	60	7021	7081	71	540	611	265	0	265	396	7561	7957	0	2800	2800
Name of the Block: Guijan															
Crop Type	Kharif (Area in ha)			Rabi (Area in ha)			Summer Crop(Area in ha)			Total (Area in ha)			Horticulture & Plantation Crops (Area in ha)		
	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total
A) Cereals		12500	12500			0		80	80	0	12580	12580	20	1000	1020
B) Coarse Cereals		50	50	3	37	40			0	3	87	90			0
C) Pulses		25	25	5	320	325		14	14	5	359	364			0
D) Oil Seeds			0		100	100		2	2	0	102	102			0
E) Fibre			0			0		25	25	0	25	25			0
Total	0	12575	12575	8	457	465	0	121	121	8	13153	13161	20	1000	1020
Name of the Block: Margherita															
Crop Type	Kharif (Area in ha)			Rabi (Area in ha)			Summer Crop(Area in ha)			Total (Area in ha)			Horticulture & Plantation Crops (Area in ha)		
	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total	Irrigated	Rainfed	Total
A) Cereals		12056	12056	32		32	415		415	447	12056	12503		2704.25	2704.25
B) Coarse Cereals		196	196		260	260			0	0	456	456			0
C) Pulses		48	48		558	558			0	0	606	606			0
D) Oil Seeds		17	17		878	878			0	0	895	895			0
E) Fibre		4	4			0			0	0	4	4			0
Total	0	12321	12321	32	1696	1728	415	0	415	447	14017	14464	0	2704.25	2704.25

Annexure II : Production and Productivity of major crops

Name of the Block: Kakapathar																
Season	Crop Sown				Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	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				12350	352000	2850	55393	2200	132000	6000	55993	14550	484000	3326	111386
B.Rabi				Rape & Mustard	1550	10460	675	31489					1550	10460	675	31489
Summer	Ahu Rice				450	15600	3467	56143	160	4320	2700	57150	610	19920	6167	113293
Horticulture & Plantation	Areca Nuts, Citrus, Banana, Ginger etc. (Prod. Data for Banana only)				2200	341000	15500						2200	341000	15500	
Total					16550	719060	4345		2360	136320	5776		18910	855380	4523	
Name of the Block: Itakhuli																
Season	Crop Sown				Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	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	Maize	Black gram and Green gram		5505	143697.5	1767	3012.86	80	2160	2700	44.31	5585	145857.5	2611.5936	3057.17
B.Rabi	Paddy	Maize		Mustard	475	147595	2117	177.41	60	1830	3050	33.85	535	149425	27929.907	211.26
Summer	Paddy				95	3040	3200	53.6	45	1530	3400	25.26	140	4570	3264.2857	78.86
Horticulture & Plantation	Vegetables and Others				561											
Total					6636	294332.5	4435	3243.87	185	5520	2983	103.42	6821	299852.5	4396.0196	3347.29
Name of the Block: Sadiya																
Season	Crop Sown				Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	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				3490	52350	1500	7500	25	500	2000	8500	3515	52850	1503.5562	16000
B.Rabi	Paddy				12980	129800	1000	7500					12980	129800	1000	7500
			Black gram and Green gram		2439	17073	700	4500					2439	17073	700	4500
				Rape & Mustard	5470	38290	700	5500					5470	38290	700	5500
Summer													0	0		0

Horticulture & Plantation					2055	155400	7562.0438	8200					2055	155400	7562.0438	8200
Total					26434	392913	1486.3925	33200	25	500	2000	8500	26459	393413	1486.8778	41700
Name of the Block: Saikhowa																
Season	Crop Sown				Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	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				10486	277879	2650	55393	513	13851	2700	55993	10999	291730	2652	111386
			Black gram and Green gram		43	280	650	29066					43	280	650	29066
B.Rabi	Paddy				167	4843	2900	56418	72	2196	3050	57418	239	7039	2945	113836
			Black gram and Green gram		129	968	750	29066					129	968	750	29066
				Rape & Mustard	363	2541	700	31489					363	2541	700	31489
Summer	Paddy				254	8128	3200	56143	56	1904	3400	57150	310	10032	3236	113293
Horticulture & Plantation																
Total					11442	294638	2575	257575	641	17951	2800	170561	12083	312589	2587	428136
Name of the Block: Hapjan																
Season	Crop Sown				Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	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				6872	178672	2600	55300	60	1620	2700	55900	6932	180292	2600.8656	111200
		Maize			71	1420	2000	35460					71	1420	2000	35460
			Green Gram/Black Gram		78	507	650	30750	41	287	700	31250	119	794	667.22689	62000
B.Rabi	Paddy				125	3500	2800	56400	40	1140	2850	56800	165	4640	2812.1212	113200
			Green Gram/Black Gram		258	1806	700	30750	31	232.5	750	31250	289	2038.5	705.36332	62000
				Rape & Mustard	157	1177	750	31485					157	1177	749.68153	31485
Summer	Paddy								265	8745	3300	56400	265	8745	3300	56400
Horticulture & Plantation																
Total					7561	187082	2474	240145	437	12024.5	2751	231600	7998	199106.5	2489.4536	471745
Name of the Block: Guijan																
Season	Crop Sown				Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	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				5102	147958	2900	55393					5102	147958	2900	55393

B.Rabi			Green Gram/Black Gram		2	8	400	29066					2	8	400	29066
				Rape & Mustard	46	220	478.26087	31489					46	220	478.26087	31489
Summer																
Horticulture & Plantation					1000				10				1010			
Total					6150	148186	2409.5285	115948					6150	148186	2409.5285	115948
Name of the Block: Margherita																
Season	Crop Sown				Rainfed				Irrigated				Total			
	Cereals	Coarse Cereals	Pulses	Oil Seeds	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					12321	339320	2754						12321	339320	2754	
B.Rabi					1696	48014	2831						1696	48014	2831	
Summer									415	19638	4732		415	19638	4732	
Horticulture & Plantation																
Total					14017	387334	2763		415	19638	4732		14432	406972	2820	

Annexure III : Status of Command Area

Name of the Block: Kakopather									Area in Ha	
S.No	Name of the Village	Information of Canal Command			Information on the other services Command			Total Area		
		Total area	Developed Area	Un-developed Area	Total area	Developed Area	Un-developed Area	Developed Area	Undeveloped Area	
1	Madhuban,Rangpur Messgaon,Madhabpur,Udaypur,Sitalpur,Kapang Gutibari,Deorigaon,Rabarguri,Bargaon,Sonowal gaon,Bishnupur gaon,rangpur gaon,Rakari missing gaon.(Philobari F.I.S)		566					566		
2	Lajumgaon.(Lajumgaon D.T.W.L/S 1 pt)					35		35		
3	Bijuli Ban gaon, Maliapung,Sitalpurgaon,Rupjan gaon,Borduki gaon,Maj gaon,Padum pather gaon,Sonowal gaon,Gouripurgaon.(Malaipung S.T.W)					56		56		
4	Haru maibong Duaniya gaon,Bor Maibon Kachari gaon.(Kakapather D.T.W. I/S)					60		60		
5	Rupjan gaon,Sonowal gaon,Deuri gaon,Missing gaon,Bahir Rangdoi & Bhitor Rangdoi gaon(Phillobari Kachari Rangdoi Miri M.D.T.W)					100		100		
6	Bordirak gaon, Amguri gaon,Sunamigaon,Maithong gaon,Nabajyoti gaon.(Tangana S.T.W)					210		210		
7	Haru Maithong.(kakopather D.T.W. I/S Phase-II)					60		60		
8	Udoypur gaon,Shitalpur gaon(Gabharu bheti D.T.W)					60		60		
9	Sonowal gaon(Phillobari D.T.W I/S II points)					60		60		
Name of the Block: Guijan									Area in Ha	
S.No	Name of the Village	Information of Canal Command			Information on the other services Command			Total Area		
		Total area	Developed Area	Undeveloped Area	Total area	Developed Area	Undeveloped Area	Developed Area	Undeveloped Area	
1	Gahoripum gaon,Gabindapur gaon(Gahoripum D.T.W)					35		35		
2	Nunpuria Kaibarta gaon,Nunpuria Bangoli gaon(Nunpuria S.T.W.I/S)					56		56		
3	Nunpuri Bengoli gaon,Nunpuria Kaibazta gaon(Nunpuri D.T.W)					90		90		
4	Panitola gaon ,Nagoan(Panitula D.T.W I/S II points)					60		60		
Name of the Block: Saikhowa Block									Area in Ha	
S.No	Name of the Village	Information of Canal Command			Information on the other services Command			Total Area		
		Total area	Developed Area	Undeveloped Area	Total area	Developed Area	Undeveloped Area	Developed Area	Undeveloped Area	
1	Dhallakhaloi Ahom gaon.(Dhallakhaloi D.T.W. I/S)					60		60		
2	Bordhadum gaon,Harudhadu gaon,Ahom gaon,Nadhadum gaon(S/dhadum B/dhadum M.D.T.W.I/S)					126		126		
3	Barpather gaon,Napather gaon.(Bonpather Napather D.T.W.I/S)					32		32		
4	Harudhadum Boudhadum(Extension of S/dhadur)					72		72		

5	Aroimuria gaon,dighal Mesaki gaon,Makumkila gaon,Buka pather gaon,Anjula gaon.(Aroimuri M.D.T.W.I/S)					190		190	
6	Laina 1 no, Laina 2 no, Laina 3 no (Laina D.T.W)					90		90	
7	Dholabojar gaon, Bhuban khal gaon, Gormora miripather gaon.(Pilot project)					3		3	
Name of the Block: Hapjan Block								Area in Ha	
S.No	Name of the Village	Information of Canal Command			Information on the other services Command			Total Area	
		Total area	Developed Area	Undeveloped Area	Total area	Developed Area	Undeveloped Area	Developed Area	Undeveloped Area
1	Sukanpukhuri,Assamiya pather gaon(Tingari D.T.W.I/S 6 Pt)					216		216	
2	Assamiya pather(Assamiya Pather D.T.W.I/S)					35		35	
3	Bangoli Raidang gaon.(Tingari D.T.W. I/S Ph-II)					70		70	
4	Assamiya Bengoli gaon,Bangali Balijan gaon.(Assamiya Bengoli D.T.W)					60		60	
5	Assamiya Pather(Tingari D.T.W I/S Pt.no-7)					35		35	
Name of the Block: Sadiya Block								Area in Ha	
S.No	Name of the Village	Information of Canal Command			Information on the other services Command			Total Area	
		Total area	Developed Area	Undeveloped Area	Total area	Developed Area	Undeveloped Area	Developed Area	Undeveloped Area
1	Santi pur 1 no,2 no ,3 no and 4 no gaon, Deopani Miri gaon (Jia L.I.S)		230					230	
2	Bura buri gaon(Chapakhowa Sprinkler)					40		40	
3	lasai gaon(Mulukchapani Sprinkler)					40		40	
4	Tori bori gaon,Bura buri gaon,Dora gaon & Bhabani gaon(Moradeopani F.I.S)		150					150	
Name of the Block: Margherita Block								Area in Ha	
S.No	Name of the Village	Information of Canal Command			Information on the other services Command			Total Area	
		Total area	Developed Area	Undeveloped Area	Total area	Developed Area	Undeveloped Area	Developed Area	Undeveloped Area
1	Udyapur 1 no & 2 no gaon, Rampur 1 no gaon.(Rampur L.I.S)		175					175	
2	Powaimukh 1 no & 2 no. gaon.(Powai L.I.S)		285					285	
3	Mong long Bengoli gaon 1 no,2 no &3 no,Mong long pather gaon,Ledo Bengoli gaon, Khamati gaon.(Mong long Pather L.I.S)		400					400	
4	Baruah gran,Niz Makum 1 no. gaon, Majuli gaon(Niz Makum L.I.S)		120					120	
5	Alubari 1 no &2 no gaon,rajkhowa Pather gaon(Alubari L.I.S)		310					310	
6	Phulbari gaon, Parbotipur gaon(Phulbari parbotipur L.I.S)		250					250	
7	Bapupather gaon.(Bapupather D.T.W I/S)					35		36	
8	Lakang Pather gaon,Bahbari gaon, bapupather gaon,Pithaguti bari gaon.(Margherita D.T.W I/S)					180		180	
9	Golaipather 1 no &2 no gaon(Golaipather D.T.W)					70		70	
10	Hulung pather,Borhulung pather(Buridihing G.P D.T.W.I/S)					90		90	

Annexure IV : Existing types of Irrigation

Block	Source of irrigation	Surface Irrigation (1)					Ground Water (2)				Water Extraction Devices/ Lift			Total	
		Canal Based		Tanks/ Ponds/ Reservoirs			Tube Wells		Bore Wells		Electricity Pump (4)	Diesel Pumps (5)	Others (6) DTW	Irrigation Sources (1+2+3)	Water Extracting units (4+5+6)
		Govt. Canal	Community/Pvt. Canal	Community Ponds	Individual/Pvt. Ponds	Govt. Reservoirs/Dams	Govt.	Pvt.	Govt.	Pvt.					
Margherita	No	13					11				38			24	38
	Command Area (Ha)	1540					376							1916	
Saikhowa	No						34				33	1		34	34
	Command Area (Ha)						573							573	
Guijan	No						22				6	16		22	22
	Command Area (Ha)						241							241	
Hapjan	No						12				12			12	12
	Command Area (Ha)						416							416	
Kakapathar	No	4				1	100				14	81		105	95
	Command Area (Ha)	566					641							1207	
Sadiya	No	6				1					5			7	5
	Command Area (Ha)	380												380	
Itakhuli	No				20				156	95	72	52	2 Pt.	271	126
	Command Area (Ha)				7				312	190	144	104	13	509	261

Annexure V : Strategic Action Plan for irrigation in District (Block wise)

Sadiya Block

Block	Concerned Ministry/Department	Component	Activities	Total Number/Capacity (Cum)	Command Area/Irrigation Potential (Ha)	Estimated Cost (In Rs. Lakh)	Period of Implementation 5/7 years)
Sadiya	Agriculture	AIBP	Medium Irrigation	13 Nos	6365	10497	12
			Surface Irrigation	2 Nos	580	340	
		Har Khet Ko Pani	Lift Irrigation	1 No	350	575	2
			Ground Water Development	DTW 90 Nos	2700	6750	5
		Watershed	Sluice Gate	16 Nos	4875	133	7
			Construction of drainage channel	6 Nos	775	34	5
			Farm pond	5 Nos	19900 Cu. M.	37	6
			Nalah Bund	14 Nos	26124 RM	75	7
			Excavation of drainage channel (From DPR)	13 Nos	28150 RM	108	7
	Total					18549	

Sl No	Name of the Bolcks/Sub Districts	Concerned Ministry/Department	Component(Name of the Scheme)	Activity	Total Number/ Capacity(cum)	Command Area/ Irrigation Potential(Ha)	Period of Implementation(5/7 years)	Estimated Cost(in Rs.)
1	Sadiya	MoWR	AIBP	Major Irrigation	NIL			
2		MoWR		Medium Irrigation	NIL			
3		MoWR		Surface Minor Irrigation	3	1000	5 years	2000.00
4		MoWR	Har Khet Ko Pani	Lift Irrigation	NIL			
5		MoWR		Ground water Development	16	210	5 years	460.00
6		MoWR		Repair Renovation Restoration of Water Bodies	1702	500	5 years	2035
7				Construction of Field Channels				
8		MoWR		Lined Field Channels	3	120	5 years	80.00
9		MoWR		Unlined Channels	NIL			
10		MoWR		Micro-Irrigation	NIL			
11		MOA & FW-DAC & FW	Per drop more crop (Micro Irrigation)	DPAP Drip	2 Nos.	4 H	5 Yrs	16.00
12		MOA & FW-DAC & FW		DPAP Sprinkler				
13		MOA & FW-DAC & FW		Non-DPAP Sprinkler				
14		MOA & FW-DAC & FW		Non-DPAP Sprinkler				

DIP, PMKSY
Component wise Budget Estimation for Sadiya development Block
Period 2015-16 to 2020-21

Sl. No.	Project Component	Name of IWMP	
		Tinsukia-V(Luit) IWMP	
1	Administrative cost	56.330	**56.330**
2	Institutional & Capacity Building	23.670	**23.670**
3	DPR Preparation	0.000	**0.000**

4	Eantry Point Activities	0.000	**0.000**
5	Evaluation	6.600	**6.600**
6	Monitoring	6.600	**6.600**
7	Work Phase (NRM)	320.100	**320.100**
8	Livelihood	59.400	**59.400**
9	Production System	66.000	**66.000**
10	Consolidation	19.800	**19.800**
	Total	**558.500**	**558.500**

Sl No	**Name of the Block**	**Concerned Ministry/Department**	**Component**	**Activity**	**Total Number/ Capacity (Cum.)**	**Component Area/Irrigation Potential (Ha.)**	**Estimated Cost (Rs. In Lakh)**	**Period of Implemen-tation (5/7 Yrs.)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
	Sadiya	Dolr	Tinsukia-V (Luit) IWMP	Drainage channel	50143Rm	937.9	112.5440	5 Years
1				Plantation nursery	4 Ha	53.3	6.4000	
2				Block plantation	1187 Nos	31.7	3.7984	
3				Land Development Project (Ring Bund)	13778Cum	328.1	39.3660	
4				Field Bund	20792Rm	376.6	45.1900	
5				Farm Pond	10400cum	129.0	15.4820	
6				Boulder pitching	5842 Sqm.	811.1	97.3270	
					Project Total	**2667.6**	**320.1074**	
					Sadiya Block all total		**320.1000**	

Itakhuli Block

Block	Concerned Ministry/Department	Component	Activities	Total Number/Capacity (Cum)	Command Area/Irrigation Potential (Ha)	Estimated Cost (In Rs. Lakh)	Period of Implementation 5/7 years)
Itakhuli	MoWR	Har Khet Ko Pani	LLP	20 (5 HP)		9.95	1
			DTW	95 (20 HP)	2850	7125	5
			STW	25	54	15	1
		Per Drop More Crop	Training & Awareness	10	-	5	5
	DoRD-MoRD	Watershed	Water Harvesting Tank	10	60.67	100	1
	Total					7254.95	

Sl No	Name of the Bolcks/Sub Districts	Concerned Ministry/Department	Component(Name of the Scheme)	Activity	Total Number/ Capacity(cum)	Command Area/ Irrigation Potential(Ha)	Period of Implementation(5/7 years)	Estimated Cost(Rs. In lacs)
1	Itakhuli	MoWR	AIBP	Major Irrigation	NIL			
2		MoWR		Medium Irrigation	NIL			
3		MoWR		Surface Minor Irrigation	NIL			
4		MoWR	Har Khet Ko Pani	Lift Irrigation	NIL			
5		MoWR		Ground water Development	41	690 H	5 years	1595.00
6		MoWR		Repair Renovation Restoration of Water Bodies	NIL			

7				Construction of Field Channels				
8		MoWR		Lined Field Channels	NIL			
9		MoWR		Unlined Channels	NIL			
10		MoWR		Micro-Irrigation	NIL			
11		MOA & FW-DAC & FW	Per drop more crop (Micro Irrigation)	DPAP Drip	2 Nos.	4 H	5 Yrs	16.00
12		MOA & FW-DAC & FW		DPAP Sprinkler				
13		MOA & FW-DAC & FW		Non-DPAP Sprinkler				
14		MOA & FW-DAC & FW		Non-DPAP Sprinkler				

Hapjan Block

Block	Concerned Ministry/Department	Component	Activities	Total Number/Capacity (Cum)	Command Area/Irrigation Potential (Ha)	Estimated Cost (In Rs. Lakh)	Period of Implementation 5/7 years)
Hapjan	MoWR	Har Khet Ko Pani	STW	41	80	24.6	5
			DTW	35	1050	2625	5
			Solar Pumpset	10	100	45	5
	MoA & FW	Per Drop More Crop	Drip irrigation	4	8	32	5
			Training & Awareness	-	-	8	5
	DoLR-MoRD	Watershed	Water harvesting structure	6	60	30	5
	Convergence with MGNREGA		Drainage channel	10 km	100	30	5
			Ring bund	13 km	100	52	5
	Total					2846.6	

Sl No	Name of the Bolcks/Sub Districts	Concerned Ministry/Department	Component(Name of the Scheme)	Activity	Total Number/ Capacity(cum)	Command Area/ Irrigation Potential(Ha)	Period of Implementation(5/7 years)	Estimated Cost(Rs. In lacs)
1	Hapjan	MoWR	AIBP	Major Irrigation	NIL			
2		MoWR		Medium Irrigation	NIL			
3		MoWR		Surface Minor Irrigation	NIL			
4		MoWR	Har Khet Ko Pani	Lift Irrigation	NIL			
5		MoWR		Ground water Development	44 Nos.	790 H	5 years	1595.00
6		MoWR		Repair Renovation Restoration of Water Bodies	NIL			
7				Construction of Field Channels				
8		MoWR		Lined Field Channels	NIL			
9		MoWR		Unlined Channels	NIL			
10		MoWR		Micro-Irrigation	NIL			
11		MOA & FW-DAC & FW	Per drop more crop (Micro Irrigation)	DPAP Drip	2 Nos.	4 H	5 Yrs	16.00
12		MOA & FW-DAC & FW		DPAP Sprinkler				
13		MOA & FW-DAC & FW		Non-DPAP Sprinkler				
14		MOA & FW-DAC & FW		Non-DPAP Sprinkler				

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Sl. No.	Project Component	Name of IWMP		Total
		Tinsukia IV(Daisa Balijan)	Tinsukia VII(Rupai)	
1	Administrative cost	13.1560	36.000	49.1560
2	Institutional & Capacity Building	4.8800	18.000	22.8800
3	DPR Preparation	0.0000	0.000	0.0000
4	Eantry Point Activities	0.0000	14.100	14.1000
5	Evaluation	1.3500	3.600	4.9500
6	Monitoring	1.3500	3.600	4.9500
7	Work Phase (NRM)	36.8036	224.890	261.6936
8	Livelihood	12.1500	32.400	44.5500
9	Production System	13.5000	36.000	49.5000
10	Consolidation	4.0500	10.800	14.8500
	Total	87.23964	379.390	466.6296

Sl No	Name of the Block	Concerned Ministry/Department	Component	Activity	Total Number/ Capacity (Cum.)	Component Area/Irrigation Potential (Ha.)	Estimated Cost (Rs. In Lakh)	Period of Implemen-tation (5/7 Yrs.)
1	2	3	4	5	6	7	8	9
1	Hapjan	Dolr	Tinsukia-IV (Daisa balijan) IWMP	Drainage channel	4580 Rm	85	10.25920	5 Years
2				Plantation Nursery	4 Ha	27	3.20000	
3				Farm Pond	4000 Cum.	43	5.12000	
4				Gully control	1 No	21	2.50000	
5				Road side Plantation	300 Nos.	8	0.96000	
6				Hume pipe culvert	13 Nos	60	7.15000	
				Graded bund	3158 Rm	57	6.88444	
7				Horticulture plantation	0.5 Ha	6	0.73000	
					Project Total	307	36.80364	
1	Hapjan	Dolr	Tinsukia-VIII (Rupai) IWMP	Agril bund	1000 Rm	18.3	2.1900	5 Years
2				Boulder pitching	2000 Sqm.	277.5	33.3000	
3				Drainage channel reclamation	9900 Rm	292.8	35.1400	
4				Earthen channel	6300 Rm	82.9	9.9500	
5				Field bund	2500 Rm	45.7	5.4800	
6				Graded bund	3000 Rm	54.8	6.5700	
7				Gully control project (DCP)	12.5 Sqm.	50.4	6.0500	
8				Horticulture plantation	29 Ha	349.2	41.9000	
9				periphery bund	14700 Rm	268.3	32.1900	
10				Pond	13 Nos.	128.0	15.3600	
11				R.C.C. Check Dam	13.5 Sq.m	54.4	6.5300	
12				Reclamation of Community pond	1200 Cu.m	37.8	4.5300	
13				Reclamation of Marshy land	6800 Cu.m	214.2	25.7000	

	Project Total	1874.1	224.8900		
	Hapjan Block all total	2180.8	261.6936		

Guijan Block

Block	Concerned Ministry/Department	Component	Activities	Total Number/Capacity (Cum)	Command Area/Irrigation Potential (Ha)	Estimated Cost (In Rs. Lakh)	Period of Implementation 5/7 years)
Guijan	Agriculture	AIBP	DTW	33 Nos	963	2524	5
			STW	40 Nos	120		
		Per Drop More Crop	Training & Awareness	7	-	3.5	5
	Total					2527.5	

Sl No	Name of the Bolcks/Sub Districts	Concerned Ministry/Department	Component(Name of the Scheme)	Activity	Total Number/ Capacity(cum)	Command Area/ Irrigation Potential(Ha)	Period of Implementation(5/7 years)	Estimated Cost(in Rs.)
1	Guijan	MoWR	AIBP	Major Irrigation	NIL			
2		MoWR		Medium Irrigation	NIL			
3		MoWR		Surface Minor Irrigation	NIL			
4		MoWR	Har Khet Ko Pani	Lift Irrigation	NIL			
5		MoWR		Ground water Development	31	606	5 years	1437.00
6		MoWR		Repair Renovation Restoration of Water Bodies	NIL			
7					Construction of Field Channels			
8		MoWR		Lined Field Channels	NIL			
9		MoWR		Unlined Channels	NIL			
10		MoWR		Micro-Irrigation	NIL			
11		MOA & FW-DAC & FW	Per drop more crop (Micro Irrigation)	DPAP Drip	2 Nos.	4 H	5 Yrs	16.00
12		MOA & FW-DAC & FW		DPAP Sprinkler				
13		MOA & FW-DAC & FW		Non-DPAP Sprinkler				
14		MOA & FW-DAC & FW		Non-DPAP Sprinkler				

DIP, PMKSY Component wise Budget Estimation for Guijan development Block Period 2015-16 to 2020-21			
Sl. No.	Project Component	Name of IWMP	
		Tinsukia-V(Luit) IWMP	
1	Administrative cost	60.000	60.000
2	Institutional & Capacity Building	33.000	33.000
3	DPR Preparation	0.000	0.000
4	Eantry Point Activities	24.000	24.000

5	Evaluation	6.600	6.600
6	Monitoring	6.600	6.600
7	Work Phase (NRM)	336.000	336.000
8	Livelihood	54.000	54.000
9	Production System	60.000	60.000
10	Consolidation	18.000	18.000
	Total	598.200	598.200

Sl No	Name of the Block	Concerned Ministry/Department	Component	Activity	Total Number/ Capacity (Cum.)	Component Area/Irrigation Potential (Ha.)	Estimated Cost (Rs. In Lakh)	Period of Implemen-tation (5/7 Yrs.)
1	2	3	4	5	6	7	8	9
1	Guijan	Dolr	Tinsukia-X (Dibru) IWMP	Agril Bund	1500 Rm	27	3.29000	5 Years
2				Boulder pitching	1600Sqm.	222	26.64000	
3				Drainage channel reclamation	31300 Rm	926	111.12000	
4				Fuel wood	1 Ha	2	0.27000	
5				Horticulture plantation	39.595Ha	477	57.21000	
6				Nulla bund	27400 Rm	811	97.27000	
7				pond	1 No	10	1.18000	
8				Reclamation of Community pond	5000Cum.	158	18.90000	
9				Reclamation of Marshy Land	4000 Cum.	126	15.12000	
10				Sluice gate	1No	42	5.00000	
					Project Total	2800	336.00000	
					Guijan Block all total	2800	336.00000	

Margherita Block

S. No.	Name of the blocks/ Sub district	Concerned Ministry/ Department	Component	Activity	Total Number/Capacity (cum)	Command Area/ Irrigation Potential (Ha.)	Peroid of Implementation	Estimated Cost (in Lakh)
1	Margherita	MoWR	AIBP	Major Irrigation				
2		MoWR		Medium Irrigation	52	775	12	1730
3		MoWR		Surface Minor Irrigation				
4		MoWR	HAR KhetKoPani	Lift Irrigation	27	1352	12	2077.19
5		MoWR		Ground Water develpoment	2	30	12	20
6		MoWR		RRR of Water Bodies				
7		MoWR		Construction of field channels				
7.1		MoWR		Lined Field Channels	7	143	12	87.5
7.2		MoWR		Unlined Field Channels	93	1111	12	528.5
8		MoWR		Micro-Irrigation	2485	3819	12	1242.5
9		MOA & FW-DAC & FW		DPAP Drip				
10		MOA & FW-DAC & FW	Per drop more crop (Micro Irrigation)	DPAP Sprinkler				

11		MOA & FW-DAC & FW		Non- DPAP Drip				
12		MOA & FW-DAC & FW		Non- DPAP Sprinkler				
13		MOA & FW-DAC & FW	Per drop more crop (Supplementar y water management activities)	Topping up of MGNREGA				
14		MOA & FW-DAC & FW		Drought Proofing through check Dams/Water Harvesting Structures				
15		MOA & FW-DAC & FW		Secondary Storage Structure				
16		MOA & FW-DAC & FW		On Farm Development (distribution pipe / raised bed and furrow system etc.)	2	10	12	20
17		DoLR-MoRD	PMKSY Watershed	Newly created WHS				
17.1		DoLR-MoRD		Farm Ponds	100	467	12	374
17.2		DoLR-MoRD		Check Dams	53	700	12	320
17.3		DoLR-MoRD		Nallah Bunds			12	
17.4		DoLR-MoRD		Percolation Tank	5	39	12	27.5
17.5		DoLR-MoRD		Other Ground Water Recharge structure	1	5	12	15
17.6		DoLR-MoRD		Fishery Ponds/cattle Ponds	17	187	12	157.5
18		DoLR-MoRD		Renovated WHS				
18.1		DoLR-MoRD		Farm Ponds	73	131	12	171
18.2		DoLR-MoRD		Check Dams				
18.3		DoLR-MoRD		Nallah Bunds				
18.4		DoLR-MoRD		Percolation Tank				
18.5		DoLR-MoRD		Other Ground Water Recharge structure				
18.6		DoLR-MoRD		Fishery Ponds/cattle Ponds				
19		DoRD-MoRD	Convergence with MGNREGA	Newly Created				
19.1		DoRD-MoRD		Water Conservation				
19.2		DoRD-MoRD		Water Harvesting				
19.3		DoRD-MoRD		Creation of Irrigation canals & Drains				
19.4		DoRD-MoRD		Providing Infrastructure for Irrigation				
19.5		DoRD-MoRD		Land Development				
20		DoRD-MoRD		Renovation				
20.1		DoRD-MoRD		Renovation of water bodies including desilting:	1	60	12	5
20.2		DoRD-MoRD		Renovation & Maintenance of Irrigation Canals & Drains				

21		State Planned Scheme of Irrigation						
21.1		State Irrigation Department	Name of the scheme	Major Irrigation				
21.2		State Irrigation Department	Name of the scheme	Medium Irrigation				
21.3		State Irrigation Department	Name of the scheme	Surface Minor Irrigation				
22		Irrigation Scheme of State Agriculture Department	Name of the scheme					
23		Irrigation Scheme of State Agriculture Department	Name of the scheme					
24		Externally aided projects	Name of the scheme					
25		other loan projects like NABARD	Name of the scheme					
21.1		State Irrigation Department	Name of the scheme	Major Irrigation				
21.2		State Irrigation Department	Name of the scheme	Medium Irrigation				
21.3		State Irrigation Department	Name of the scheme	Surface Minor Irrigation				
22		Irrigation Scheme of State Agriculture Department	Name of the scheme					
23		Irrigation Scheme of State Agriculture Department	Name of the scheme					
24		Externally aided projects	Name of the scheme					
25		other loan projects like NABARD	Name of the scheme					
Total budget for the block					2918	8829	180	6775.69

Sl No	Name of the Bolcks/Sub Districts	Concerned Ministry/Department	Component(Name of the Scheme)	Activity	Total Number/ Capacity(cum)	Command Area/ Irrigation Potential(Ha)	Period of Implementation(5/7 years)	Estimated Cost(in Rs.)
1	Margherita	MoWR	AIBP	Major Irrigation	NIL			
2		MoWR		Medium Irrigation	NIL			
3		MoWR		Surface Minor Irrigation	3	535	5 years	1050.00
4		MoWR	Har Khet Ko Pani	Lift Irrigation	NIL			
5		MoWR		Ground water Development	46	813	5 years	1896.00

6		MoWR		Repair Renovation Restoration of Water Bodies	NIL			
7				Construction of Field Channels				
8		MoWR		Lined Field Channels	5	110 H		100.00
9		MoWR		Unlined Channels	NIL			
10		MoWR		Micro-Irrigation	NIL			
11		MOA & FW-DAC & FW	Per drop more crop (Micro Irrigation)	DPAP Drip	2 Nos.	4 H	5 Yrs	16.00
12		MOA & FW-DAC & FW		DPAP Sprinkler				
13		MOA & FW-DAC & FW		Non-DPAP Sprinkler				
14		MOA & FW-DAC & FW		Non-DPAP Sprinkler				

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Component wise Budget Estimation for Margherita development Block
Period 2015-16 to 2020-21

Rs. In lacs

Sl. No.	Project Component	Name of IWMP		Total Fund
		Tinsukia-I (Toklong) IWMP	Tinsukia-VII (Udoypur) IWMP	
1	Administrative cost	32.0850	45.8400	77.9250
2	Institutional & Capacity Building	11.2800	19.3500	30.6300
3	DPR Preparation	0.0000	0.0000	0.0000
4	Eantry Point Activities	0.0000	0.0000	0.0000
5	Evaluation	4.8000	4.8000	9.6000
6	Monitoring	4.3200	4.8000	9.1200
7	Work Phase (NRM)	98.6500	268.8000	367.4500
8	Livelihood	30.5900	43.2000	73.7900
9	Production System	44.9900	48.0000	92.9900
10	Consolidation	24.0000	14.4000	38.4000
	Total	250.7150	449.1900	699.9050

Sl No	Name of the Block	Concerned Ministry/Department	Component	Activity	Total Number/ Capacity (Cum.)	Component Area/Irrigation Potential (Ha.)	Estimated Cost (Rs. In Lakh)	Period of Implemen-tation (5/7 Yrs.)
1	2	3	4	5	6	7	8	9
2	Margherita	Dolr	Tinsukia-I (Toklong) IWMP	Drainage channel	17690 Rm	293	35.160	5 Years
3				Field Bund/Earth bund/Graded bund	5533 Rm	138	16.600	
4				Reclamation of Marshy Land	20 HA.	30	3.640	
6				Farm Pond	17500 Cum.	144	17.300	
7				Nursery	2.84 Ha	71	8.530	
8				R.C.C. Check dam	23 Sqm.	68	8.100	
				Water Harvesting Tank	4545 Cum.	38	4.500	
9				Road side plantation	482 Rm	40	4.820	
				Total		822	98.650	
2				Ring bund	5000 Rm	148	17.750	

3			Tinsukia-VII (Udoypur) IWMP	Drainage channel	27000 Rm	355	42.660	
4				Agril bund	24400 Rm	445	53.480	
5				Boulder Pitching	2200 Sqm.	305	36.630	
6				Pond	21 Nos	206	24.810	
7				Vegitative Cover (Horticulture Plantation)	45 Ha.	541	65.030	
8				Bamboo spure	400 Sqm.	20	2.400	
9				Slab culvert	13 Nos.	108	12.980	
10				GCP	27 Sqm	108	13.060	
				Total		2236	268.800	
				Margherita Block all total		3058	367.450	

Saikhowa Block

Block	Concerned Ministry/Department	Component	Activities	Total Number/Capacity (Cum)	Command Area/Irrigation Potential (Ha)	Estimated Cost (In Rs. Lakh)	Period of Implementation 5/7 years)
Saikhowa	MoWR	Har Khet Ko Pani	Lift irrigation	65 (LLP)	195	29.25	5
			Ground water development	424 Nos DTW	12720	31800	5
				507 Nos STW	1014	304.2	5
	Moa & FW	Per Drop More Crop (Micro Irrigation)	DPAP Sprinkler	78	156	608.4	5
	DoLR-MoRD	Convergence with MGNREGA	Water Harvesting	4 Nos	87	87	5
			Land Development	Ring Bandh 2 Nos	213	20	5
				Drains 4 Nos	340	60	5
				Irrotion 1 Nos GCP with guide bandh	100	21	5
			Renovation and Maintenance of Irrigation Canals and Drains	3 Nos	24	25	5
	Total					32954.85	

Sl No	Name of the Bolcks/Sub Districts	Concerned Ministry/Department	Component(Name of the Scheme)	Activity	Total Number/ Capacity(cum)	Command Area/ Irrigation Potential(Ha)	Period of Implementation (5/7 years)	Estimated Cost (Rs. In lacs)
1	Saikhowa Block	MoWR	AIBP	Major Irrigation	NIL			
2		MoWR		Medium Irrigation	NIL			
3		MoWR		Surface Minor Irrigation	NIL			
4		MoWR	Har Khet Ko Pani	Lift Irrigation	NIL			
5		MoWR		Ground water Development	171	3105	5 years	7,275.00
6		MoWR		Repair Renovation Restoration of Water Bodies	NIL			

7				Construction of Field Channels				
8		MoWR		Lined Field Channels	NIL			
9		MoWR		Unlined Channels	NIL			
10		MoWR		Micro-Irrigation	NIL			
11		MOA & FW-DAC & FW	Per drop more crop (Micro Irrigation)	DPAP Drip	2 Nos.	4 H	5 Yrs	16.00
12		MOA & FW-DAC & FW		DPAP Sprinkler				
13		MOA & FW-DAC & FW		Non-DPAP Sprinkler				
14		MOA & FW-DAC & FW		Non-DPAP Sprinkler				

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Component wise Budget Estimation for Saikhowa development Block
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Sl. No.	Project Component	Name of IWMP					
		Tinsukia-II(Felai) IWMP	Tinsukia-IV(Daisa Balijan) IWMP	Tinsukia-VI(Dangori) IWMP	Tinsukia-VII(Rupai) IWMP	Tinsukia-IX(Na Dihing) IWMP	
1	Administrative cost	45.470	23.000	45.840	18.000	60.000	192.310
2	Institutional & Capacity Building	17.280	9.730	19.350	9.000	30.000	85.360
3	DPR Preparation	0.000	0.000	0.000	0.000	0.000	0.000
4	Eantry Point Activities	0.000	0.000	0.000	7.200	24.000	31.200
5	Evaluation	6.000	2.700	4.800	1.800	6.000	21.300
6	Monitoring	6.000	2.700	4.800	1.800	6.000	21.300
7	Work Phase (NRM)	291.400	167.888	268.800	77.510	336.000	1141.598
8	Livelihood	47.980	24.300	43.200	16.200	54.000	185.680
9	Production System	53.980	27.000	48.000	18.000	60.000	206.980
10	Consolidation	18.000	8.100	14.400	5.400	18.000	63.900
	Total	486.110	265.418	449.190	154.910	594.000	1949.628

Sl No	Name of the Block	Concerned Ministry/Department	Component	Activity	Total Number/ Capacity (Cum.)	Component Area/Irrigation Potential (Ha.)	Estimated Cost (Rs. In Lakh)	Period of Implemen-tation (5/7 Yrs.)
1	2	3	4	5	6	7	8	9
1	Saikhowa	Dolr	Tinsukia-II (Felai) IWMP	Dredging of Water body	1700Cum.	20.8	2.49	5 Years
2				Land Development Project (Ring Bund)	22500 Cum.	45.9	5.51	
3				Drainage channel	8840 Rm	117.7	14.1200	
4				Earthen embankment/Field Bund	36145 Rm	618.9	74.2700	
5				Excavated pond	37334 Cum	402.7	48.3200	
6				Earthen distribution channel	2300 Rm	27.4	3.2900	
7				Desiltation	141 Cum	4.9	0.5900	
8				Afforestation	20 Ha	82.8	9.9400	
9				Sluice Gate/Water structure	1 no	66.2	7.9400	
10				Horticulture plantation	1Ha	29.8	3.5800	
11				Block Plantation	4725 Cum.	121.3	14.5600	
12				Farm Pond	5 Nos	20.8	2.5000	
13				Bamboo plantation	5 Ha	83.6	10.0300	

14				Raised platform	82375 Cum	466.8	56.0200	
15				Brickling Drainage Channel		0.0		
16				Sand field bags	874 Rm	109.6	13.1500	
17				Wood/Bamboo Procupine	310 Nos	72.3	8.6800	
18				Nursery Raiding	1 No.	24.0	2.8800	
19				Trenching	3272 Cum.	40.1	4.8100	
20				Ipomea eradicatiion	2 Ha	20.4	2.4500	
21				Bamboo bankProtection		0.0		
22				Water harvesting tank	1 No.	50.0	6.0000	
23				Dug Well		0.0		
					Total	2428.3	291.4000	

Sl No	Name of the Block	Concerned Ministry/Department	Component	Activity	Total Number/ Capacity (Cum.)	Component Area/Irrigation Potential (Ha.)	Estimated Cost (Rs. In Lakh)	Period of Implemen-tation (5/7 Yrs.)
1	2	3	4	5	6	7	8	9
3	Saikhowa	Dolr	Tinsukia-IV (Daisa Balijan) IWMP	Drainage channel	19447 Rm	358	43.0078	5 Years
4				Land Reclamation	23 Ha	58	6.9000	
5				Graded Bund	3800 Rm	69	8.2840	
6				Road side Plantation	845 Nos.	23	2.7040	
7				Farm Pond	52600 cum	561	67.3280	
8				Nursery	10 Ha	58	7.0080	
9				Water harvesting tank	1380 Cum.	11	1.3662	
10				Tea plantation	9 Ha	110	13.1400	
11				R.C.C. Check dam		0		
12				Hume pipe culvert	33 No.	151	18.1500	
					Total	1399	167.8880	

Sl No	Name of the Block	Concerned Ministry/Department	Component	Activity	Total Number/ Capacity (Cum.)	Component Area/Irrigation Potential (Ha.)	Estimated Cost (Rs. In Lakh)	Period of Implemen-tation (5/7 Yrs.)
1	2	3	4	5	6	7	8	9
1	Saikhowa	Dolr	Tinsukia-VI (Dangori) IWMP	Field bund	2000 Rm	37	4.3800	5 Years
2				Graded Bund	9000 Rm	164	19.7100	
3				Ring bund	10500 Rm	311	37.2800	
4				Embankment	4000 Rm	118	14.2000	
5				Embankment (Renovated)	2000 Rm	36	4.3600	
6				Drainage channel	27500 Rm	362	43.4500	
7				Pond	34 Nos.	335	40.1700	
8				Sluice gate	1 no.	42	5.0000	
9				Slab culvert	42 Nos.	350	41.9500	
10				Land development	20 Ha.	20	2.4000	
11				Agro Foresty	2 Ha	19	2.3200	
12				Block plantation	150 Nos.	23	2.7000	
13				Horticulture plantation	28.98 Ha	349	41.8800	

14				Road side Plantation	500 Nos	75	9.0000	
					Total	2240	268.8000	
Sl No	Name of the Block	Concerned Ministry/Department	Component	Activity	Total Number/ Capacity (Cum.)	Component Area/Irrigation Potential (Ha.)	Estimated Cost (Rs. In Lakh)	Period of Implemen-tation (5/7 Yrs.)
1	2	3	4	5	6	7	8	9
1	Saikhowa	Dolr	Tinsukia-VIII (Rupai) IWMP	Water Harvesting Tank				5 Years
2				Land Development Project (Ring Bund)				
3				Drainage channel	5500 Rm	163	19.5300	
6				Reclamation of Marshey Land	6200 Cum.	195	23.4400	
8				Horticulture plantation	5.71 Ha	69	8.2600	
9				Periphery bund	12000 Rm	219	26.2800	
					Total	646	77.5100	
Sl No	Name of the Block	Concerned Ministry/Department	Component	Activity	Total Number/ Capacity (Cum.)	Component Area/Irrigation Potential (Ha.)	Estimated Cost (Rs. In Lakh)	Period of Implemen-tation (5/7 Yrs.)
1	2	3	4	5	6	7	8	9
1	Saikhowa	Dolr	Tinsukia-IX (Na dihing) IWMP	Water Harvesting Tank				5 Years
2				Land Development Project (Ring Bund)				
3				Drainage channel Reclamation	13200 Rm	391	46.8600	
4				Agril Bund	9500 Rm	173	20.8100	
5				Earthen channel	2000 Rm	26	3.1600	
6				Reclamation of Marshy Land	6000 Cum.	189	22.6800	
7				Horticulture plantation	36.10 Ha	435	52.1600	
8				Nulla bund	20700 Rm	612	73.4900	
9				Boulder Pitching	4500 Sqm.	624	74.9300	
10				Pond	5 Nos.	49	5.9000	
11				Sluice Gate/Water structure	1 No.	58	7.0000	
12				R.C.C. Check dam	60 Sqm.	242	29.0100	
					Project Total	2800	336.0000	
						Saikhowa Block all total	1141.5980	

Kakapathar Block

Sl No	Name of the GP	Concerned Ministry / Department	Component	Activities	Total Number / Capacity (cum)	Command Area / Irrigation Potential (ha)	Estimated Cost (In Rs)	Period of Implementation (5/7 yrs)
1	Kakopather	MoWR	AIBP	Repair and restoration of DTW at Lajum Gaon	7 pts	30	2000000	5
		MoWR / MoP&RD		Repair and reconstruction of Water canal of the above DTW command area	1		500000	5
2	Kumsang			---				
3	Maithang	MoWR		Commissioning of Maithong FIS	1	250	4000000	5
		MoWR / MoP&RD		Completion of the canal work of the above Project	2		1000000	5
		MoWR		Repair & Restoration of DTW 2nos at No1 Duwoniya Maithong and 2 nos at Bor-Maithong	4	60	1200000	5
4	Tongona			---				
5	Dirak	MoWR		Restoration of 50 nos STW at Bordirak Khatowa, Bordirak patoni and Amguri Pather	50	100	2500000	5
6	Gabharubheti	MoWR		Repairing and Restoration of Service of DTWs at Udaipur and Sitalpur pather	2	60	2000000	5
7	Bordubi	--		--				
8	Kakojan	--		--				
9	Duarmara	--		--				
10	Bijulibon	--		--				
11	Kailashpur	--		--				
12	Burhidehing	MoWR		Repair & Restoration of DTW 2nos at No1 Borhollong and 1 no at Hollonguri (DTW in installation, Repairing and	3	90	2000000	5

				11KV Electrification\ Required)				
13	Purani Pukhuri	--		--				
14	Mankhowa	--		--				
15	Rongajan	--		--				
1	Kakopather	MoWR	PMKSY _ Har Khet Ko Pani	Flow irrigation from Dangori River on No3 Kakopather Nam Uvon Pather	1	250	40000000	7
		MoWR		DTW at No.3 Kakopather Kishan Basti	1	30	5000000	5
		MoWR		DTW near No2 Borachuk playground (1 no) and Upar Uvon (3nos)	4	120	20000000	5
		MoWR		DTW at Lajum Pather	5	150	25000000	5
		MoWR		DTW at Ahom Pather (3 nos), Ujoni Da-pather (1no)	4	120	20000000	5
		MoWR		DTW at Kaujee Pather	3	90	15000000	5
		MoWR		FIS from Gela Dangori River on No1 Borali Pather	1	150	35000000	7
		MoWR		DTW at No2 Borali Pather	2	60	10000000	5
		MoWR		DTW at Molohani Pather	2	60	10000000	5
2	Kumsang	--		---				
3	Maithang	MoWR		Flow irrigation system from Maithong River to Mridongpara Pather	1	150	35000000	7
		MoWR		DTW at No3 Borpather, No2 Kachari Maithong Pather, No1 Chota Dirak, No2 Chota Dirak, No3&4 kachari Maithong, Hanhkhati Pather, No3&4 Duwonia Maithong, No1 kachari Maithong = 8 Nos	8	240	40000000	5
4	Tongona	MoWR		DTW at Kachijan, Kulibil Pather, Hatigarh Lajum Pather and Tongona = 4 Nos	4	120	20000000	5
5	Dirak	MoWR		DTW 2nos at Chapori Pather	2	60	10000000	7
		MoWR		DTW at Chumoni, Na-Chumoni, Patoni, Bordirak khutora gohain gaon, Amguri na-Mechai, Gohoraguri Bordirak, Bormechai, No2	9	270	45000000	5

				Sarumechai, No1 Sarumechai= 9Nos				
6	Gabharubheti	MoWR		Sluice Gate and lrrigation from Moilajan River at No3 Padum Pather	1	100	20000000	7
		MoWR		DTW at No2 Tongani Hunjan, Gowalabasti, Bamungaon, Rupjan Sonowal, No3 Tongani Hunjan, Fatikjan Pather = 6 nos	6	180	30000000	5
		MoP&RD		Repairing of Irrigation Main Canal from Deorigaon to Madhabpur	4500 mtr	90	675000	5
		MoP&RD		Repairing of Irrigation Main Canal from Robortoli Sonowal gaon to Bishnupur to Madhabpur	6000 mtr	120	900000	5
		MoP&RD		Repairing of Irrigation Main Canal at Mishing Gaon	1000 mtr	20	150000	5
		MoP&RD		Repairing of Irrigation Main Canal at Robortoli Sonowal Gaon	1000 mtr	20	150000	5
		MoP&RD		Repairing of Irrigation Main Canal from Roborguri to Rongpur Maj Gaon	2000 mtr	40	300000	5
		MoWR		Upgradation of Irrigation canal at Roborguri Borgaon	1	15	1000000	5
7	Bordubi	--		--				
8	Kakojan	MoWR		DTW at Kutuha, Sital Pati and Pithaguti Pather = 3Nos	3	150	15000000	5
9	Duarmara	MoWR		DTW at Nalani (3nos) & ceiling Pather (3nos) = 6Nos	6	240	30000000	5
10	Bijulibon	MoWR		DTW at natun Maithong & Padum Pather (3nos) and Duwarmara Singpho Pather (3nos) = 6Nos	6	240	30000000	5
11	Kailashpur	MoWR		Check Dam and Lift irrigation from Dirak River to Talpather	1	100	40000000	7
		MoWR		FIS from Dangri River to Madarkhat Pather	1	80	30000000	7
		MoWR		DTW at No2 Betoni Pather (1 no), Dakhin Bisampur (3 nos), Uttar Bisampur (3 nos), Tongona Nagaon	33	990	165000000	5

				(2nos), Tiniali Nagaon (2 nos), Bisampur Betoni (5 nos), Navajyoti Madhavpur (1 no), No2 Talpather (2 nos), No1 Talpather (1no), Dumsi Hatigarh (2 nos), Litong (1no), Litong Majuli (2nos), Wathoi (3nos), Namhollong Block (3nos), Madarkhat Part 2 (2nos) = 33 nos				
12	Burhidehing	MoWR		DTW at Bokapather (Raidang Pather), Doomdooma Nagaon, Tarani Pather = 3Nos	3	300	15000000	5
13	Purani Pukhuri	MoWR		DTW at Raidang Pather, Kuju Pather, Mihali Ritu, Raidang Pather,Mohong, Kuli Mohong, Deori Mohong = 9Nos	9	270	45000000	5
14	Mankhowa	MoWR		DTW at Mankhowa Pather = 3 nos	3	90	15000000	5
15	Rangajan	MoWR		DTW at Rongajan, No2 Rongajan, Rangajan Nagaon, Athengia, Rajagarh = 5 nos	5	150	25000000	5
1	Kakopather	DAC & MoA	PMKSY_Per Drop more Crop	STW with pump and delivery canals	200	400	20000000	5
		DAC & MoA		Training & Capacity building of farmers (200 farmers)	200		200000	5
2	Kumsang	DAC & MoA		STW with pump and delivery canals	100	200	10000000	5
		DAC & MoA		Training & Capacity building of farmers (100 farmers)	100		100000	5
3	Maithang	DAC & MoA		STW with pump and delivery canals	300	600	30000000	5
		DAC & MoA		LLP with delivery canals	100	200	6000000	5
		DAC & MoA		Training & Capacity building of farmers (200 farmers)	200		200000	5
4	Tongona	DAC & MoA		STW with pump and delivery canals	200	400	20000000	5
		DAC & MoA		LLP with delivery canals	100	200	6000000	5

		DAC & MoA		Training & Capacity building of farmers (200 farmers)	200		200000	5
		DAC & MoA		Drip Irrigation 20 Sets	20	20	15000000	5
		DAC & MoA		Sprinkler Irrigation 20 sets	20	20	900000	5
5	Dirak	DAC & MoA		STW with pump and delivery canals	300	600	30000000	5
		DAC & MoA		LLP with delivery canals	100	200	15000000	5
		DAC & MoA		Training & Capacity building of farmers (200 farmers)	200			5
		DAC & MoA		Drip Irrigation 20 Sets	20	20	15000000	7
		DAC & MoA		Sprinkler Irrigation 30 sets	30	30	1350000	5
6	Gabharubheti	DAC & MoA		STW with pump and delivery canals	200	400	20000000	5
		DAC & MoA		LLP with delivery canals	100	200	6000000	5
		DAC & MoA		Training & Capacity building of farmers (200 farmers)	200		200000	5
		DAC & MoA		Rain Guns 20 Sets	20	20	1200000	5
		DAC & MoA		Sprinkler Irrigation 30 sets	30	30	1350000	5
7	Bordubi	DAC & MoA		STW with pump and delivery canals	100	200	10000000	5
		DAC & MoA		Training & Capacity building of farmers (100 farmers)	100		100000	5
8	Kakojan	DAC & MoA		STW with pump and delivery canals	100	200	10000000	5
		DAC & MoA		Training & Capacity building of farmers (200 farmers)	200		200000	5
9	Duarmara	DAC & MoA		STW with pump and delivery canals	100	200	10000000	5
		DAC & MoA		Training & Capacity building of farmers (200 farmers)	200		200000	5
10	Bijulibon	DAC & MoA		STW with pump and delivery canals	200	200	20000000	5
		DAC & MoA		LLP with delivery canals	100	200	6000000	5
		DAC & MoA		Training & Capacity building of farmers (200 farmers)	200		200000	5
11	Kailashpur	DAC & MoA		STW with pump and delivery canals	150	300	15000000	5
		DAC & MoA		LLP with delivery canals	100	200	6000000	5

		DAC & MoA		Training & Capacity building of farmers (300 farmers)	300		300000	5
		DAC & MoA		Drip Irrigation 20 Sets	20	20	15000000	7
		DAC & MoA		Sprinkler Irrigation 20 sets	20	20	900000	5
		DAC & MoA		Rain Guns 20 sets	20	20	1200000	7
12	Burhidehing	DAC & MoA		STW with pump and delivery canals	200	400	20000000	5
		DAC & MoA		LLP with delivery canals	100	200	6000000	5
		DAC & MoA		Training & Capacity building of farmers (200 farmers)	200		200000	5
13	Purani Pukhuri	DAC & MoA		STW with pump and delivery canals	200	400	20000000	5
		DAC & MoA		LLP with delivery canals	100	200	6000000	5
		DAC & MoA		Training & Capacity building of farmers (200 farmers)	200		200000	5
14	Mankhowa	DAC & MoA		STW with pump and delivery canals	50	100	5000000	5
		DAC & MoA		LLP with delivery canals	50	100	3000000	5
		DAC & MoA		Training & Capacity building of farmers (100 farmers)	100		100000	5
15	Rongajan	DAC & MoA		STW with pump and delivery canals	100	200	10000000	5
		DAC & MoA		LLP with delivery canals	50	100	3000000	5
		DAC & MoA		Training & Capacity building of farmers (200 farmers)	200		200000	5
1	Kakopather	MoP&RD / DoSC	PMKSY_ Watershed Development	"Bundh" const from No.3 Kakopather to Gandhoiguri Forest	1	80	3000000	7
		MoWR		Sluice Gate at Borachuk Panipatti for surface water retention	1	100	30000000	7
		MoP&RD / DoSC		Drain with Tail end reservoir at Gandhoiguri pather	1	50	3000000	5
		MoP&RD / DoSC		Repair & reconstruction of water canals in Lajum, Teji, Borachuk and Lajum Uvon fields.	3500 RM	35	700000	5
		MoP&RD / DoSC		Repair & reconstruction of existing public water reservoir at Molohani Pather	1	70	2500000	5

2	Kumsang	---		---				
3	Maithang	MoP&RD / DoSC		Repair & Reconstruction of drain from Saru Maithong to Gandhoiguri for surface water Conservation.	5000 RM	75	1000000	5
		MoP&RD / DoSC		Repair & Reconstruction of water canal at Duonia Maithong Pather for surface water Conservation.	500 mtr	30	100000	5
4	Tongona	---						
5	Dirak	MoP&RD / DoSC		Construction of Surface Water Harvesting Reservoir at No1 Bormechai	1	30	3000000	5
6	Gabharubheti							
		MoP&RD / DoSC		Upgradation of "Dong" at Krishnapur for Surface water Harvesting	1	30	2000000	
7	Bordubi	--		--				
8	Kakojan	MoP&RD / DoSC		Deepening and Reconstruction of the Kakojan Nullah	3000 RM	45	1500000	5
9	Duarmara	--		--				
10	Bijulibon	--		--				
11	Kailashpur	--		--				
12	Burhidehing	MoP&RD / DoSC		Construction of Surface Water harvesting canal with Tail end Reservoir at Rotani, Bokapather and Tarani	3	90	7500000	
15		--						
	TOTAL					13090	1230175000	

Sl No	Name of the Bolcks/Sub Districts	Concerned Ministry/Department	Component(Name of the Scheme)	Activity	Total Number/ Capacity(cum)	Command Area/ Irrigation Potential(Ha)	Period of Implementation(5/7 years)	Estimated Cost(Rs. In lacs)
1	Kakopather	MoWR	AIBP	Major Irrigation	NIL			
2		MoWR		Medium Irrigation	NIL			
3		MoWR		Surface Minor Irrigation	1	250	5 years	500.00
4		MoWR	Har Khet Ko Pani	Lift Irrigation	NIL			
5		MoWR		Ground water Development	74 Nos.	1275	5 years	2960.00
6		MoWR		Repair Renovation Restoration of Water Bodies	NIL			
7				Construction of Field Channels				
8		MoWR		Lined Field Channels	NIL			
9		MoWR		Unlined Channels	NIL			
10		MoWR		Micro-Irrigation	NIL			
11		MOA & FW-DAC & FW	Per drop more crop (Micro Irrigation)	DPAP Drip	1 Nos.	2 H	5 Yrs	8.00
12		MOA & FW-DAC & FW		DPAP Sprinkler	2 Nos.	10 H	5 Yrs	15.00
13		MOA & FW-DAC & FW		Non-DPAP Sprinkler				
14		MOA & FW-DAC & FW		Non-DPAP Sprinkler				

DIP, PMKSY
Component wise Budget Estimation for Kakopathar development Block
Period 2015-16 to 2020-21

Sl. No.	Project Component	Name of IWMP		
		Tinsukia-III(Tongona) IWMP	Tinsukia IV(Daisa Balijan)	Total
1	Administrative cost	50.000	13.1560	63.1560
2	Institutional & Capacity Building	20.520	4.8800	25.4000
3	DPR Preparation	0.000	0.0000	0.0000
4	Eantry Point Activities	0.000	0.0000	0.0000
5	Evaluation	6.600	1.3500	7.9500
6	Monitoring	6.600	1.3500	7.9500
7	Work Phase (NRM)	320.120	55.0252	375.1452
8	Livelihood	52.780	12.1500	64.9300
9	Production System	59.380	13.5000	72.8800
10	Consolidation	19.800	4.0500	23.8500
	Total	535.800	105.4612	641.2612

Sl No	Name of the Block	Concerned Ministry/Department	Component	Activity	Total Number/ Capacity (Cum.)	Component Area/Irrigation Potential (Ha.)	Estimated Cost (Rs. In Lakh)	Period of Implemen-tation (5/7 Yrs.)
1	2	3	4	5	6	7	8	9
1	Kakopathar	Dolr	Tinsukia-III (Tongona) IWMP	Dredging of Water body				5 Years
2				Land Development Project (Ring Bund)	16272 Cum	92.2	11.065	
3				Drainage channel	34700 Rm	416.3	49.9500	
4				Earthen embankment/Field Bund	15547 Rm	282.4	33.8900	

5				Excavated pond	47819 Cum.	510.1	61.2100	
6				Water distribution channel of water body	6000 Rm	53.3	6.4000	
7				Desiltation Stream	30760 Cum.	389.5	46.7400	
8				Afforestation	45 Ha	181.1	21.7270	
9				Sluice Gate/Water structure	5 Nos.	329.2	39.5000	
10				Horticulture plantation	1 Ha	12.1	1.4500	
11				Plantation of trees	1444 Nos.	38.5	4.6200	
12				Bamboo plantation	3 Ha	43.7	5.2400	
13				Brickling Drainage Channel	700 Rm	36.0	4.3180	
14				Nursery Raising	2 No.	33.8	4.0600	
15				Hume pipe culvert	7 Nos.	51.2	6.1400	
16				Ipomea eradicatiion	1.6 Ha	4.0	0.4800	
17				Bamboo Screen	1300 Rm	62.8	7.5400	
18				Bamboo Procupine	1049 Sqm.	131.6	15.7900	

Sl No	Name of the Block	Concerned Ministry/Department	Component	Activity	Total Number/ Capacity (Cum.)	Component Area/Irrigation Potential (Ha.)	Estimated Cost (Rs. In Lakh)	Period of Implemen-tation (5/7 Yrs.)
1	2	3	4	5	6	7	8	9
1	Kakopathar	Dolr	Tinsukia-IV (Daisabalijan) IWMP	Drainage channel	8850 Rm	165.2	19.8240	5 Years
2				Farm Pond	3348 cum	45.9	5.5040	
3				Field Bund	4360 Rm	79.2	9.5048	
4				Road side Plantation	582 Nos.	15.5	1.8624	
5				Land reclamation	13.8 Ha	34.5	4.1400	
6				Tea plantation	9.36 Ha	104.5	12.5400	
7				Hume pipe culvert	3 Nos.	13.8	1.6500	
					Project Total	458.5	55.0252	
					Kakopathar Block all total		375.1452	