Since independence, India has made significant advancement in developing its water resources and supporting infrastructure. In the last six decades after Independence, India has built its capacity to store about 200 Billion Cubic Meters (BCM) of water, an irrigated area of about 90 Million Hectares (Mha), and an installed hydropower capacity of about 30,000 Mega Watts (MW) (World Bank, 2005). It has invested in large-scale dams used to transform hydropower and irrigation, and yet water storage infrastructure in India remains one of the lowest in the world.

In spite of a substantial water resource base and vast land resource, due to rapid development, increasing population and iniquitous distribution of water, the demand for this natural resource far outweighs its supply. As an end result India continues to struggle to meet its water sector infrastructure requirements, including operation and maintenance costs. There is visibly a lack of a unified perspective in planning, management and use of water resources. India has about 16 percent of the world's population as compared to only 4 per cent of its water resources. With the present population of more than 1,000 million, the per capita water availability is around 1,170 cum/person/year (NIH, 2010).305

Sectoral demands for water are growing rapidly in line with urbanisation (estimates suggest that by 2025, more than 50 per cent of the country’s population will live in cities and towns), population increases, rising incomes and industrial growth, and urban India is fast emerging as centres of demand growth.306 The water sector in India today faces numerous issues and challenges such as: (a) erratic distribution of rainfall, often leading to floods and droughts in various areas; (b) water use inefficiency; (c) unregulated groundwater extraction; (d) water pollution; and (e) decreasing water quality due to poor waste management laws, inter-state river disputes, growing financial crunch for development of resources and scarce safe drinking water.

The performance level of the water service delivery is furthermore affected by inadequate institutional reforms and ineffective implementation of existing provisions. In recent years there has been an escalation in conflict situation between users in the agricultural and industrial sectors, as also the domestic sector. The situation is made worse due to the effects of climate change. It is further predicted that the situation could worsen due to a disturbed hydrological cycle and regional climatic variability. The lack of water availability and poor management practices have also manifested in poor sanitation facilities, one among the biggest environmental and social challenges India faces today.307

INSTITUTIONAL STRUCTURE

The Constitution and the Legislature

The Constitution retained the basic scheme chosen by the Government of India Act 1935, and gave the states a leading role in water regulation. States have the exclusive power to regulate water supplies, irrigation and canals, drainage and embankments, water storage, water power and fisheries.308 The constitutional division of powers between the Union and the states constitutes the basic framework for formal water law in India.

However, on several issues the centre can intervene:

1. Article 262 allows the parliament to legislate on inter-state water issues.

2. Certain powers in the 7th schedule, reserves powers for the parliament to regulate inter-state rivers.309

3. Article 252 allows the parliament to adopt a legislation in any field in which states are competent to legislate, provided that the states have given their assent.

4. The Union has used less formal mechanisms to prod states into adopting certain measures. For instance, in view of progress in the provision for drinking water in rural areas, the Union implemented Accelerated Rural Water Supply Programme (ARWSP) in the early 1970s and had it mainstreamed through the provision of finances for drinking water schemes by the Union government to the states.

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308 Constitution Schedule 7, List @, Entries 17, 21.
309 For instance, under this provision, the River Boards Act, 1956 was enacted.
5. The Union has also other-related powers that it can exercise, for instance, in the context of the impact assessment of large projects that require an environmental clearance.\footnote{Environmental Impact Assessment Notification, 2006.}

Water supply and sanitation is a State responsibility under the Constitution of India and following the 73\textsuperscript{rd} and 74\textsuperscript{th} Constitutional Amendments, the state legislation may give responsibility in rural areas to \textit{panchayati raj} institutions powers and responsibilities over drinking water supply, minor irrigation, water management, watershed development, and fisheries. In urban areas, municipalities have been given powers over water supply for domestic, industrial, and commercial purposes.\footnote{P. Cullet, & S. Koonan, (2011). \textit{Water Law in India: An Introduction to Legal Instruments}. p.3.}

\section*{Legal component in water resource management}

India does not have any separate water legislation, but has water-related legislation dispersed across various sectors between central and state provisions. Besides constitutional matters, water law consists of a variety of laws and other legal instruments at the Union and state level. Three major characteristic of water law in India are:

1. There is no instrument that brings together the general principles of water law. As a result, different principles adopted in different contexts co-exist or contradict each other. Water issue is relatively complex because laws have developed through a number of sub-branches that are not necessarily conceived as belonging to an overall cohesive body of law. Moreover certain laws such as environmental laws, infrastructure laws, and municipal laws addresses water but do not formally constitute water laws.

2. The wide variety of water laws addressing different issues cannot mask the limitations of existing water law particularly with regard to fundamental rights and environmental laws. (For instance, the Constitution includes a right to water, yet there is no law that specifically seeks to foster the realization of this fundamental right, nor is there a framework drinking water legislation that would give specific content to it.) \footnote{Ibid. p. 3-4.}
Management at the Centre and the State levels

The present arrangement to manage water in India exists at two levels—central government and state governments. The centre has been responsible, through the Five Year Plans, for guiding much of the investment in the water sector as well as establishing other organisations to lend to the States. The designated apex body for water resource management is the union Ministry of Water Resources (MoWR), at the centre. The ministry is responsible for the overall development, conservation and management of water, treating it as a national resource. This includes formulating general policies on water resource development and providing technical assistance to all states in irrigation, multipurpose projects, groundwater exploration and exploitation, command area development, drainage, flood control, water logging, coastal and riverbank erosion problems, dam safety, and hydraulic structures for navigation and hydropower. Additionally, it also oversees the regulation and development of inter-state rivers.  

Various other central ministries also carry out different functions in the water sector.

1. Urban Water Supply and Sewage Disposal – Ministry of Urban Development (MoUD)
2. Rural Water Supply and Rural Sanitation – Ministry of Drinking Water and Sanitation (MoDWS)
3. Hydro-electric and Thermal Power – Ministry of Power (MoP)
4. Pollution and Environment Control – Ministry of Environment and Forests (MoEF)

In addition, the Indian National Committee of Irrigation and Drainage (INCID) works in close coordination with its parent organisation, the International Commission on Irrigation and Drainage (ICID), to further promote research in relevant areas. The watershed development programmes, its funding and implementation is managed by the Ministry of Agriculture and Cooperation (MoAC).

Since water is a state subject, the governments at the state level are primarily responsible for its use, conservation and control. The state agencies though various programmes administratively control and take responsibility for development of water

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and management of water resources through water related sectoral units (agriculture, forest, rural development, urban development), other than the Ministry of Water Resources.\textsuperscript{314} 

1. Major and medium irrigation: Irrigation/water resources departments.

2. Minor irrigation: Water resources departments, minor irrigation corporations, zilla parishads/Panchayats, and other departments like agriculture.


4. Rural water supply: Gram Panchayats.

5. Government tube wells: Constructed and managed by irrigation/water resources department or by tube well corporations set up for the purpose.


States also generally plan, design and execute water supply schemes and often continue to operate through their State Public Health Engineering Department (or for some states Panchayati Raj Engineering Department or Rural Development Engineering Departments) and Water Boards. Even at this level, though there are diverse departments and agencies involved over water resource management but their role remains fragmented (World Bank, 1998).

**Sector Agencies outside of Government**

The involvement of the private sector is mainly in supply of materials and construction and to small extent maintenance of the water related projects. The state agencies also employ the help of private consulting firms (and NGOs) although on a very limited basis. The private sector with its involvement in construction under government projects through contracts comprises a considerable part of capital investments. Services from private firms amounts to more than two thirds of annual investment in the sector. The state government through its agencies manages bore well drilling and hand pump installation. But the groundwater development sector particularly the drilling of irrigation tube wells has depended largely on the private sector with a huge network of private drilling contractors. In the rural sector, local private contractors & local private mechanics provide maintenance and repair services for farmers’ irrigation tube wells.

\textsuperscript{314} Ibid.
The sector in India receives assistance and aid from numerous external multilateral and bilateral agencies. Some of the external support agencies (ESAs) include the bilateral agencies of Japan, the United Kingdom, the United States, Denmark, Sweden, Germany, Australia, Netherlands, etc. and multilaterals such as the World Bank, WHO, UNICEF, Water and Sanitation Program – South Asia, UNDP, and the European Union.315

National Policy on Water

The first National Water Policy316 (NWP) was adopted in 1987 but it was later revised in 2002. According to the policy, planning, development and management of water resources need to be governed by national perspectives. The emphasis is more on river-based planning for water use. For water allocation main priority has been given to drinking water followed by irrigation (agriculture), hydropower, ecology, navigation, and industrial or other uses. The priorities could be modified if necessary by the area /region specific considerations. As water resources development is a state-governed subject, the states are required to formulate their own state water policies within the realm of the NWP, followed by set up a plan for water resources development. Presently, several states in India have come up with their own water policies.317 Few among the apparent trends of the policy are the increased private sector involvement in water control and use from planning, development, and administration of water resource projects.318 Particularly the urban water supply is singled out for private sector involvement.319

Water Governance in Transition

For more effective dealing with emerging challenges in the water sector today, structural changes are in progress to see that there is appropriate governance in water and also its management. In more recent years there is also sustained demand from various quarters of society asking for the government to transform its role from a service provider to facilitator so it can provide the required level of financial and

315 India Assessment 2002. p.27.
policy support to communities and community-based institutions, thus fulfilling services at desired levels on a sustainable and equitable basis. Such changes in processes are being reflected in the Indian government's policy through various water sector reforms.

**Water Sector Reforms**

Water sector reforms promote the integrated management of water resources and though broadly conceived, are not necessarily comprehensive. It involves primarily the need to conceive water as an economic good or commodity, to seek its ‘efficient’ use to deal with scarcity. Another dimension is the drive for institutional reforms with reduction in the influence of the states, through a decentralisation process and participation of water users; it also includes calls for private sector participation. Responses to the water sector reforms have differed sector to sector and areas, also according to context. It has not been mainstreamed to a vast extent in India, as combinations of factors have led to its opposition, for instances cases where outright privatization of water services was introduced and limitations of project-by-project reforms. Few of the major reforms\(^{320}\) include:

1. The Accelerated Rural Water Supply Programme (ARWSP), the first major initiative commenced in the year 1972-73. A Technology Mission on Drinking Water was subsequently launched in 1986 to give coverage to the programme. The mission was renamed the Rajiv Gandhi National Drinking Water Mission in 1991-92. The Department of Drinking Water Supply (DDWS) 1999 was formed under the Ministry of Rural Development (MoRD). The first major sector reform project (SRP) was started the same year. The department was renamed the Department of Drinking Water and Sanitation in 2010. Finally, in 2011, it was conferred the status of a ministry. This ministry is the nodal department for all activities in the sector, ranging from overall policy planning, funding and coordination of programmes focused on drinking water and sanitation in the country.

2. The Integrated Watershed Management Programme (IWMP) is an initiative of the Department of Land Resources (DoLR) of the Ministry of Rural Development MoRD. The IWMP under the Eleventh Plan (2007-12), is a format incorporating three watershed programmes, viz. integrated wastelands Development Programme, Drought Prone Areas Programme, and Desert Development Programme; implemented under the Common Guidelines on Watershed Development, 2008. The aim of the programme is towards restoration of the ecological balance through harnessing, conserving and developing degraded natural resources like soil, vegetative cover and water.

3. Participatory Irrigation Management (PIM) an essential part of any systemic reforms, aims at involving all stakeholders and is acknowledged as an element of policy. Department of Water Resource (DoWR) brought out a Model Act in 1998, which was to be adopted by state legislatures for enacting new irrigation acts or amending existing acts for facilitating PIM.

4. Ever since the Government in 1991 opened up the power sector to private players, hydro power, irrigation, water supply and industrial water supply have also opened up to private sector. The Eleventh Five Year Plan document of the Planning Commission of India emphasises private sector investments improving infrastructure and public utility systems through various Public-Private Partnerships (PPPs).

5. A new change in the water sector is the advent of the Independent Regulatory Authorities or IRAs at the state level. Some of the focus areas of the IRA are in five prime areas of governance: (a) tariffs; (b) distribution through entitlements and allotment; (c) resource planning; (d) private sector participation; and (e) public participation.

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321 Other ministries Ministry of Agriculture (MoA) and Minstry of Environment and Forest (MoEF) are also involved.

322 Fifteen state governments (Andhra Pradesh, Assam, Bihar, Chhattisgarh, Goa, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Sikkim, Tamil Nadu, and Uttar Pradesh) have enacted a new PIM Act or made amendments to their existing ones. The remaining state governments, including Punjab, Haryana, Himachal Pradesh, Manipur, and Arunachal Pradesh are in the process of taking action (Planning Commission, 2010).
6. In the last 15 years the states and Union territories have started to adopt ground water legislation according to the Model Bill (originally circulated from the 1970’s onwards) due to the existing importance of groundwater.

7. A sanitation programme for rural areas the Total Sanitation Campaign or TSC in 1999 was launched after the restructuring of the Comprehensive Rural Sanitation Programme. The major objectives of the TSC comprises of improving the general quality of life and increasing sanitation coverage in rural areas by access to toilets for all by 2012 through motivation of communities and panchayati raj Institutions.

8. The National Urban Sanitation Policy was launched by the MoUD in 2008. Its main focus is not simply infrastructural development but also on outcomes and behavioural changes. Under this policy, all the states in the country are required to develop state sanitation strategies as per the national guidelines.

**MANAGEMENT OF WATER RESOURCES IN NAGALAND**

In Nagaland traditional land ownership system, governed by customary law, is directly related to the ownership or management of water resources. The community or privately owned lands consist of nearly 90% of the total land area. The main occupation in the state is agriculture with over 70 percent of population living in rural areas with dependence on agriculture and allied activities. 88 per cent of the forests are owned and managed by the village councils, communities or privately while the government has control over only 11.7 per cent of the forests.323 According to the 2011 census, the State has a predominantly rural population at 71.03 percent of the population living in villages, while the rest consist of the urban population. In such a scenario the distinct sanction granted by the Article 371(A) of the constitution, with protection of its customary laws and procedure, (including ownership of land and its resources) gives an overriding supremacy over the national statutes.

In Nagaland, due to the topography, it has proved to be a challenge to develop and protect and manage water resources. It has not been viable to connect many villages, hamlets and even distant towns with proper drinking water supply facility. As a result many of these places continue to depend on their own traditional streams and wells.

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for their water needs. In numerous areas it has been difficult for the Government to implement water supply schemes due to land disputes or land ownership issues and liabilities connected to it.

Immediately following the Statehood in 1963, without proper planning water supply schemes were implemented and executed by departments such as Public Works Department, Rural Development Department, and Agriculture Department etc. It was the Public Works Department which started piped water supply system in a few rural and urban areas and this was done without sufficient technical supervision.

The most recent statistics on water supply coverage, in Nagaland, show that so far only 25% are Fully-covered, 72% are Partially-covered and the remaining 3% are Not-covered, with water supply. These ‘Not covered’ villages include the Problem villages where there is either no water source within feasible distance or the available source is disputed or feasibility is only by pumping. Pumping schemes are technically feasible, but economically neither viable nor sustainable; especially in rural areas.324

The State Government presently works within this very limited framework and implementation of water sector policies and plans are often slowed down or thwarted due to the prevailing land ownership patterns. The key institutional agencies involved in the water management in the state are listed below.

**Department of Public Health and Engineering (PHED)**

The Public Health and Engineering Department (PHED) is the nodal agency of the State Government for water supply and sanitation. All work related to safe/portable drinking water supply, safe disposal of solid and liquid waste and environmental hygiene is executed by the department.325 As the implementing agency, the funding for the department is obtained from centrally sponsored programs of Accelerated Urban Water Supply Programme (AUWSP) of the JNNURM326 and the MoUD-ADB327-North Eastern Capital Cities Development Programme (NECCDP), and the

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325 Annual Administrative Report, 2012-2013, Department of Public Health and Engineering, Nagaland.
326 Jawaharlal Nehru National Urban Renewal Mission (JNNURM)
327 Ministry of Urban Development (MoUD) - Asian Development Bank (ADB).
Bharat Nirman – Rural Drinking Water programme (National Drinking Water Mission) in addition to State Plan. The department also does conservation of water resources in and around their catchment areas, institutionalizing community participation in the implementation and management of rural water supply projects, restoration and revival of old water bodies such as wells and lakes, etc.  

1. For Rural water supply a total 1460 habitations have been covered till 2012-13 report. This has been augmented and further made possible through schemes under (NLCPR) DONER Ministry and Environmental & Forest Ministry. It covers Chen EAC headquarter, Chenwetnyu village and 24 villages of Chiephobozou block. The expenditure on this project till February 2013 is Rs. 1800.98 lakhs (i.e. Central+ Rs. 1692.15 lakhs + State= Rs. 108.83 lakhs.)

2. The state capital Kohima with an increase in urban population has had water crises in recent times prompting the Government to augment its water supply by the introduction of a scheme under the North East Region Development Programme. The project involves pumping of water from the Zarü Stream of Dzüü River to a reservoir at Kigwema Village. From this reservoir the water will be conveyed to the Kohima by gravity. Another urban project is installation of Metering system in Dimapur Town.

3. Under Urban Sewerage and sanitation schemes the department has initiated the pollution abatement of Dhansiri and Diphu Rivers at Dimapur.

4. Under the PHED 1232 habitations have been communitized upto 2011-12 out of the total 1460 habitations. The department supervises the communitisation of water supply and sanitation in consonance with the Sector Reforms Programme of the Department of Drinking Water Supply, Ministry of Rural Development, Government of India. The communitisation of these basic services is carried out by way of handing over the Urban Water and Sanitation schemes to the Municipal/Town Councils and the Rural schemes to the Water and Sanitation (WATSAN) Committees.

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329 Department of North Eastern Region.

5. The Department has initiated water testing in two levels, through training of village level functionaries in on testing water quality with Field Testing Kits, and it has functional laboratories in 11 districts to do the same. Mobile water Testing Laboratories is also engaged in all districts particularly the rural areas.

Department of Soil and Water Conservation

The Department of Soil & Water Conservation is an Agriculture & Allied Sector Department. It was bifurcated from the Department of Agriculture and duly established as a full fledged Department in 1968. The primary focus of the Department is for conservation of water resources with a focus on enhancing agriculture production and its sustainability in the state and increasing drinking water potential in the rural areas. Such protection measures are implemented through adaptation of appropriate scientific soil and water conservation measures. Under the state plan some of the programmes and projects of the department includes:

1. The objective of Integrated Water Resources Development & Management scheme is to provide safe drinking water to the rural areas by developing existing water sources and their catchment areas, building upon traditional technology where gravitational water supply is not available.

2. The main objective of the Integrated Watershed Management Project (IWMP) scheme is to conserve, develop and manage soil and water resources on watershed basis in relation to soil moisture conservation, water conservation, and land management. Under the scheme, a mini-watershed of about 200 Ha. area is to be taken up as a project in each Rural Development Block.

3. Under the Stream Bank Erosion Control (SBEC) the department administers a comprehensive multi-purpose and multi-dimensional river management plan which is linked to anti-erosion and anti-soil runoff; with stream bank erosion control to protect river banks from heavy rainfall runoff, due to floods and change in river course.

4. The department is also involved in conservation of water bodies, renovation of traditional wells and water holes, lakes and building water conservation structures.
5. The department on a regular basis monitors meteorological parameters, soil status and land use across the state using remote sensing technology and though soil testing laboratory and testing of other parameters through cartographic laboratory and meteorological stations.

6. The department involved in the augmentation of drinking water sources in rural areas through construction of rooftop water harvesting structures, and through catchment area treatment of springs in some areas of the state.

7. The River Valley Project (RVP) a Centrally Sponsored Scheme is being implemented in Dhansiri River Catchment for prevention of land degradation, prevention of soil erosion and and also to reduce flood peaks and volumes of runoff. It’s operated under guidelines issued by Ministry of Agriculture, Department of Agriculture & Co-operation (National Rural Mission) Government of India.

8. Water harvesting ponds construction have been implemented under another central scheme the Rastriya Krishi Vikas Yojana (RKVY) commencing from 2007-08. It envisages using the impounded runoff water for agriculture, drinking water and other purposes.

9. With the help of the North Eastern Council (NEC), Shillong, implementation of a watershed treatment for flood mitigation & livelihood has started by the year 2013. It has among other things drought proofing, assured irrigation, flood mitigation and ground water augmentation.

**Department of Irrigation and Flood Control**

The Department of Irrigation and Flood Control is a water resource department. Major programme of the Department are funded under Ministry of Water Resources (MoWR), Govt. of India. The technical appraisal and proposals for implementation of its programme are vetted through the agencies of the MoWR such as Brahmaputra Board (BB) and Central water Commission (CWC). Hence, in various Committee of the Department the representative of the BB and CWC are standing members. As such, due consultation is always taken with the concerned central agencies mentioned above. The Irrigation and Flood Control Department was formed out of Agriculture Department on 1st April 1988 as an Engineering Department to take up various works.

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331 Department of Flood and Irrigation Control “Disclosures Under Sec 4 of Right to Information Act 2005”.

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in irrigation sector, flood mitigation and erosion control in the State. It deals mostly with augmentation of infrastructure for irrigation projects under the Government of Nagaland for all round water resource development. Furthermore, the Department undertakes the civil works of Land Record & Survey Department, and Land Resources Development Department Nagaland.

The department is involved in the construction of irrigation projects; groundwater development, command area development and flood management through Anti-erosion/Drainage/Flood Mitigation works. The Department also conducts Irrigation Census every five years in consonance with all the States of the country. Funds from the Accelerated Irrigation Benefit Programme (AIBP), the Bharat Nirman Programme (BNP), the Command Area Development and Water Management Programme (CADWMP) of MoWR, the NLCPR -Non Lapsable Central Pool Resources, and the State Plan are available for the above activities. Anti erosion works along the rivers of Dhansiri, Chathe, Nkwareu, Milak, Tizit and Dikhu to protect Dimapur area, suburban areas of dimapur district, Jalukie area, Tuli town, Tizit town, and Naganimora town respectively have also been undertaken under the Flood Management Programme of MoWR.  

**Nagaland Pollution Control Board**

The Nagaland Pollution Control Board monitors the discharge of sewage and trade effluents in rivers or streams as per laid down standards. The department has taken initiative under special campaigns to monitor water quality in three rivers in Nagaland, namely, Dhanasiri in Dimapur, Chathe in Medziphema and Dzu-u in Kohima. According to a report of the Central Pollution Control Board, it has 28 Water Quality Monitoring Stations in Nagaland, with 16 rivers; 2 Lakes, 10 Groundwater tested 18 times per year and another 10 half yearly monitoring through stations in States. The main source of funding of these activities is the National Water Quality Monitoring Programme (NWMP).

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333 Monitoring of Indian National Aquatic Resources, Series: MINARS/2010-11

*Status of Water quality in India- 2010*, Central Pollution Control Board, Ministry of Environment & Forests.
The Private Sector
While the state faces acute drinking water during the lean period, fairly large sections of the population become reliant on the supply of the unregulated private water entrepreneurs. These players are operating individually owned business not yet established to the level of an association or corporation. The private players usually access water from perennial streams originating in privately owned lands and sell the water to general public. In places like Kohima, Mokokchung, Wokha and Mon town beside growing number of places, the private distributors supply water either through their own network of rubber pipelines (many overhead); or supply through tankers; or even though pushcart system, selling by the small container. There is no regulatory mechanism to guide the supply and demand side management of water from these sources.

EXISTING SITUATIONAL CHALLENGES OF THE WATER SECTOR IN NAGALAND
Due to the traditional land ownership hold in Nagaland, the pattern of water management has a dual characteristic. The privately owned land and water sources are independently managed and by and large out of the reach of the Government which is contained in formulating policies and even imposing it through its various agencies within these areas. Implementation of plans or projects usually needs the authorization of the traditional land owners. A case to state is the Dzükou bulk water supply scheme project for Kohima; the lands required are in the possession of the southern Angami villages, therefore, the Southern Angami Public Organization (SAPO) as the authorized agency on behalf of these villages has to be consulted at each stage of field investigation. Without their consent and support, this project cannot be completed. Besides this, the prolonged unstable socio-political situation in the state has also prevented implementation of any major project. As a result the State Government’s water management programmes have not been pervasive throughout the state and sectoral differences are existent. Policy implementation has not taken off as rapidly as expected.

Water sector reforms have been initiated in India though the National Water Policy 2002 providing a unified direction and a general frame work for water resource management, development and regulation. Following this, over the past decade, a few states in India have formulated their own reforms through water policies tailored to suit its own specifications. Yet all water policies, including the national policy, are
based on similar set of principles with stronger emphasis on integrated water resource management and a focus on encouraging private sector participation. Most of the states which have implemented a water policy have done it in the interest of their own states, in order to have a streamlined water policy, to have a clear dictate in how they develop their resources especially pertaining to that of sharing of waters in interlinking river projects. The neighbouring state of Assam is one among the 11 states which has adopted their own water policy. However, this has been far from reality in Nagaland State, where the Government has not been able to adopt its own water policy, due to the complexity of socio-political issues yet to be addressed, and in addition that of the issue of traditional land ownership set up.

Topographical features consisting of a hilly terrain with a succession of steep ridges, with a few rivers and streams separating the deep valleys are generally small both in width and length. The major drainage system consisting of the Doyang, Dhansiri and Dikhu Rivers flowing westward into the Brahmaputra and the Tizu River flowing eastward into the Chindwin River in Myanmar, due its size and volume of water does not have the capacity to put mega-power projects into operation. It has the capacity to implement only smaller power projects like the 75 MW Doyang Hydro Electric Project. The Central Policy on power sharing has benefitted the state as since it has a limited hydro power potential, and is getting power at cheaper rates cheaper rate from Central projects like Loktak hydro project in Manipur, Kopili Hydro Electric Project Umrongso, North Cachar Hills, Assam; Ranganadi Hydro-Electric Power Plant (RHEP), at Yazali in Lower Subansiri district of Arunachal Pradesh and other hydro and thermal plants in the North Eastern region. The state is buying power from its North Eastern neighbours for about Rs 160crores but its revenue generation is only about Rs 82.50 crores. After counting every purchase and expenditure details of the state it has been found out that that the state is not able to meet 80% of the expenditure (i.e. 80% loss) of supplying power to the people of Nagaland.\(^{334}\)

It has recent a policy of the Indian Government, particularly the Ministry of Water Resources (MoWR) with the National Water Policy (2002), to encourage states to implement multipurpose water projects, having an integrated management aspect, and

many states have done so making water plans according to their own situational needs and conditions. However, Nagaland state continues to suffer in this aspect. There are governmental agencies like Soil and Water Conservation (DSWC) and the Department Irrigation and Flood Control (DIFC) whose programmes do not provide a comprehensive coverage to the state as a whole. Growth has been slow and departmental plans have been singular in approach. Till now, implementations of the projects are localized and sectoral in character. Scientific assessments are in want and data collection is still in its nascent stage as procurement of laboratory and testing equipments for all districts are still in the ‘earmarked sector schemes’ particularly in the instance of Soil & Water Conservation Department.\textsuperscript{335} The Public Health Engineering Department (PHED) and the Soil and Water conservation Department (SWCD) working towards ensuring drinking water security still struggles to build up its infrastructure and technical proficiency for maximized utilization of water, particularly from runoffs during the monsoon. In the same manner, the Irrigation and Flood Control Department has not come up with an up to date, detailed map showing soil erosion and land slide prone regions in Nagaland thereby this is a hindrance to the proper implementation of anti land slide works and mitigation measures for soil erosion. Under the Water Resource Division, Planning Commission of India, certain provisions have been made for enhancement of powers of the State Governments for sanction of Flood Control, Drainage, anti-water logging and anti-sea erosion scheme, but even such provisions is not applicable in totality to the Nagaland state as it has not encountered any flooding, and sea erosion due to its topography.

Whether in the case of hydro-power projects or irrigation projects, Nagaland Government has had to work within certain limitations as stated above. So far most the projects are either small scale projects or compact area projects. For instance, 86 percent of the cultivable area in Nagaland is under traditional Jhum and terrace rice cultivation system and rest under commercial and other crops. Until 2006-07, a total irrigation potential of 103217 ha had been created, only 60963 ha have been developed.\textsuperscript{336} Due to the physical terrain and cultivation method in Nagaland,
irrigation projects cannot be planned or implemented in an extensive scale like in other states.

It is also apparent that overlapping responsibilities between the various departments is an impediment to proper management of water, as overlapping area coverage in some areas/districts, leaves out some parts of the state from benefitting from the projects. Besides this, in many cases development is also incremental as central funds or schemes are released in a phase wise manner with a caution that improper implementation of the work will lead to delay in the release of more funds. Some projects which would have greatly benefitted the people have been delayed due to this factor. While there are some integrated central projects under implementation in the water sector, in Nagaland such integrated projects are still new, exploratory and experimental by nature. The integrated approach is seen mostly in central projects, while in the planning and implementation of projects under the state plan the departments usually take unitary approach. As a result, there is clearly a lack of a unified perspective in planning, management and use of water resources.

Nagaland gets on an average 1800-2250mm of rainfall during the monsoon from May to October. It has presently 15 meteorological centres located in various districts of the state. Together with some north eastern states like Arunachal Pradesh at 2,782mm; Assam and Meghalaya 2,818mm and Manipur and Mizoram at 1,881mm, Nagaland has an average rainfall much higher than the rest of the country except in the coastal regions. Yet during the lean season without rainfall from November to April, the entire state faces acute water shortage showing that there is a systematic failure to conserve or harvest rain water. For instance, in the year 2010, due to acute water shortage all over Nagaland, the PHED rationed water supply. It supplied water through tankers on a rotational basis to residential areas, excluding supply to business establishments and individuals; besides a strict directive was issued that the supply water was to be used for cooking and drinking purposes only. Due to existing conditions as this, the unregulated private sector is playing an increasing role in water supply during the lean season in Nagaland.

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(Figure 1)

Respondents were mainly from the Konyak tribe, all residing in Mon district and as seen in figure 1, from 19 colonies/wards stretched across Mon town.
Figure 2 shows the gender of the respondents from Mon district. 59% of the respondents were male and 41% female. Figure 3 shows the range of age of the respondents; 32% were from 31-40 age group, 31% between 20-30 years, 21% between 41-50 years, 7% below 20 years of age, 7% were 51 years and above, and 3% were 60 years and above. The data indicates that males made a 59% majority of the respondents from Mon district while female respondents were relatively lesser. The respondents were from all age brackets, but the 20-30 years and 31-40 years, made up 31% and 30% respectively. Respondents from the lower and older age group were lesser in number.

<table>
<thead>
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<td>12. Typist</td>
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44 31 75

The respondents were from 12 different kinds of professions/occupations as seen in figure 4. 14 respondents were from the teaching profession, 7 from the business background, 20 were students, 11 government employees’, 1 involved in religious activity, 1 politician, 3 housewives, 7 farmers’, 5 unemployed, 3 from Non Governmental Organisations’, 2 nurses, 1 typist. This data indicates that the
respondents’ were spread across all line of work, although respondents from the education sector were more with 20 students’ and 14 teachers’.

A vast majority 83% of the respondents’ stated that they reside in their own private residence, 16% resided in rented houses and 1% in home of a relation as seen in figure 5. The total numbers of occupants in a household are listed in figure 6. 56% said 5-10 members, 39% 1-5 members, 5% 10-15 members. The responses shows that in Mon district, 83% of the respondents resided in their own homes and more than half of the respondents (56%) came from households having 5-10 members, 5% even had 10-15 members. This shows that a typical household in Mon district had a fairly large number of occupants which may have included besides the immediate family, relatives and others.

A question was raised as seen in figure 7 as to which agency should be responsible for public distribution of water, and the responses varied; 93% replied that the governmental agencies should be responsible for the public distribution of water; 5% replied ‘municipal councils’, and 2% ‘private suppliers/distributors’. The type of water usage as seen in figure 8 according to the respondents were for 68% ‘drinking,
cooking and washing’, 26% ‘for livestock’, 4% for ‘other uses’ such as ‘washing vehicle’, ‘flower business’, etc., and 2% ‘for agriculture’. The above data indicates that 93% respondents in Mon district strongly feel the government should play a pivotal role as the main agency for public distribution of water. Water usage was mainly confined for 68% to basic daily needs such ‘drinking, cooking and washing’, other uses such as ‘for livestock’, ‘agriculture’, etc. had been mentioned. This indicates moderate water usage for basic needs, and no lavish need or use was noticeable.

The respondents’ came from households with diverse range of incomes as seen in figure 9. 24% said Rs.30,000 and above, 21% replied Rs.20,000- Rs.30,000, 20% Rs.15,000-Rs.20,000, 23% Rs.10,000-Rs.15,000, 5% Rs.5,000-Rs.10,000, and 7% Rs.100-Rs.5000. Figure 10 shows the expenditure incurred for purchase of water. 61% of respondents spent Rs. 100-Rs.1, 000, 21% Rs.1, 000-Rs.5, 000, and 17% Rs.5, 000-Rs.10, 000. The above statements indicate that income of the household’s in Mon district were reasonably spread out among which the higher range of 24% respondents’ were from households earning Rs.30, 000 and above. A majority 61% of the households incurred a monthly expenditure of Rs.100-Rs.1, 000 on purchase of water for their household’s.
Responses are shown in Figure 11, assessing the volume of water consumed by a person per day, 73% consumed 50-100 litres’ per day, 25% consumed 100-300 litres’, 1% consumed 300 litres’ and above. Figure 12 shows the volume of water consumed in a day by a single household in Mon district. 71% of respondents replied 100-1000 litres’ per day, 16% 1100-2000 litres’ per day, 8% 2100-3000 litres’ per day and 5% 3100- 4000 litres’ per day. The above data illustrates that a majority of the respondents in Mon district, namely 73%, consumed 50-100 litres’ per day, and only 1% consumed 300 litres’ and above. Also 71% of the respondents’ said that daily consumption per day for their households was 100-1000 litres; showing minimal usage of water, only 5% said that usage was from 3100- 4000 litres’ per day.

Out of the total respondents, as in Figure 13, 60% of the respondents said that water scarcity was due to ‘poor management of water resources’, 19% due to ‘large scale corruption’. 11% ‘scarcity of rainfall’ and 11% have mentioned ‘all of the above. Based on the respondent’s opinions Figure 14 shows out of the total 75 respondents in Mon District; 65% of the respondents faced water scarcity and another 35% of the respondents, to some extent. The responses indicate that all the 75 respondents felt
there was water scarcity or at least scarcity to some extent in Mon district. An interesting point to note was that there was none among the respondents who said they did not face water scarcity. Most of them (60%) felt that the scarcity was mainly because of poor management of water resources.

Out of the lot as in figure 14.1, a majority 59% experienced water scarcity during the months of September to November, 24% March to May, 10 % all year round and 1% June to August. As all of the respondents from Mon stated that they faced water scarcity some way or the other, the question of ‘whether water scarcity, a reality?’ as seen in figure 14.2 was not applicable to them. Therefore, according to the data illustrated above, it can be deduced that a majority 59% of the respondents experienced scarcity of water during the months of September to December. Another point to note is that 16% faced water scarcity all year round.

In response to the question of reliability of public water distribution system in their locality as in figure 15, an overwhelming 92% replied ‘No’ and 8% replied ‘yes’. Figure 16 shows that out of the total respondents, 85% purchased water from water suppliers, whether it was through the governmental agency (PHED) or private...
suppliers. Another 15 percent made use of water source they owned (tube well/ring well/pond). The above data indicates that 92% of the respondents from Mon district thought that the public water distribution system in their locality was totally unreliable. 85% also purchased water either from the governmental agency (PHED) or private suppliers.

Figure 16.1 shows that out of the total respondents who purchased water, 77% purchased water from the PHED, another 23% from the private suppliers. Those who purchased water from PHED, when asked about the total time of supply of water as seen in Figure 16.2, 80% said they got less than 1 hour of water per day, 18% replied 2-3 hours and 2% replied 3-4 hours. The above figures show that the out of the samples collected in Mon district, a majority 77% depended on the governmental agency - PHED for supply and purchase of water and a smaller minority depended on the supply of water from private groups of suppliers. 80% of the respondents said that the PHED supply enabled them to get less than 1 hour supply of water per day, only a miniscule 2% said that they received 3-4 hours of supply per day.

Figure 17

When the respondents were asked if PHED water meters had been installed in their households (Figure 17) in order to gauge the supply and purchase of water, 65%
replied ‘yes’ and 35% ‘no’. 89% of the respondents’ replied ‘no’ to the question of whether the quality of water supplied by the PHED in Mon district was of a satisfactory quality (figure 18). Only 11% replied ‘yes’, that they were satisfied with the quality of water supplied. The responses indicate that many households’ (65% of respondents) had installed PHED water meters. However, an overwhelming 89% of the respondents’ generally expressed dissatisfaction with the quality of water supplied in Mon district by the PHED.

**Figure 19**

Figure 19 shows responses to the question of whether the respondents were satisfied with the quality of service provided by the PHED in Mon district; 84% replied ‘no’ and 16% replied ‘yes’. The reasons given by the respondents for their dissatisfaction were listed as (in figure 19.1) ‘erratic water supply’ for 59% of the respondents, 32% stated that it was ‘very expensive’ and 10% gave ‘other reasons’ for dis-satisfaction which included ‘no repair of rusted water pipes’, ‘unable to get connection despite repeated appeals’, ‘department has less concern over struggle of people over water issue’. A very high majority of the respondents expressed dissatisfaction with the quality of service provided by the PHED. The main reason for discontentment for 59% was given as ‘erratic supply’ and 32% said it was ‘very expensive’ and other reasons were lack of general maintainence of water pipe line and apathy of department officials towards the genuine complains of the public.
Figure 20 shows responses to the question of whether the respondents had made alternative arrangements to augment their water requirements; 60% replied ‘no’ and 40% ‘yes’. Out of those that replied in the affirmative as in figure 20.1, 27% said they collected water from natural springs/ponds in their locality, 23% said they made use of ring wells, 20% said they collected water for usage from natural springs/ponds from a locality other than their own; 17% collected it from pond at home; 13% from river. The above responses indicates that a fairly good number (40%) of respondents made arrangements to augment the intake of water for their households; although on the other hand, a bigger majority 60% replied that they were totally dependent on the supply of either the governmental agencies/ private suppliers for their requirements.

Figure 21 shows the responses to the question of whether water harvesting units were installed in the households of the respondents; 71% replied ‘yes’ and 21% ‘no’. Responses are shown in figure 22, about the question of pilferage of water from the water source and 71% had replied ‘yes’ and 29% ‘no’. The above data indicates that due to scarcity of water in Mon district, most of the respondents’ had to resort to some
kind of water conservation; and therefore 71% had said that they had installed some kind of water harvesting unit to be used for their household. A vast number of respondents’ (71%) also replied that cases of pilferage of water from their reserves was common for them; this is an indicator that scarcity of water was a crucial issue that may perhaps have had produced contention in society.

In figure 23, when asked about their main source of water during off-season, 52% said ‘pond’, 36% ‘nearby stream’, 5% ‘nullah’, 7% ‘other reasons’ which included ‘public well’, and ‘drawing from river nearby’. The data gathered from the responses in Mon district shows that the main reason for inaccessibility of private water suppliers to the houses of the respondents’ was lack of motorable road. During monsoon off-season, all types of water source were utilised to gather water for use; but mainly drawing water from ponds for 52% of the respondents’ and also 7% ‘other reasons’ which included ‘drawing from river nearby’. In figure 23.1, responses are shown to the question as to who draws water from the alternate source of water, 7% replied ‘mother’, 1% ‘father’, 40% ‘sister’, 12% ‘brother’ and 40% ‘self’ out of which 16 respondents were male and 14 female.
As seen in figure 23.1. (a) the gender of the total respondents from Mon district were 53% male and 47% female. The responses indicate that in Mon district, although the whole family was engaged in fetching of water to be used for the household; more females 65% (figure 23.1) were engaged in fetching water as compared to 35% males. 62% respondents from Mon district expressed inconvenience they faced while fetching/drawing water from source, 13% replied ‘sometimes’ and 25% said ‘no’ to the question seen in figure 24.

Also in figure 24.1, responses are shown as to the time when respondents usually fetch/draw water from their usual source; 39% said ‘3:00 a.m. - 5:00 a.m.’, 28% ‘4:00 a.m. - 6:00 a.m.’, 11% ‘2:00 a.m. – 4:00 a.m.’, 7% ‘5:00-7:00 a.m.’, 7 % ‘9:00 p.m.- 1:00 a.m.’, 4% ‘6:00-8:00 a.m.’ and 4% ‘no specific time’. The timing shows that 39% woke up early to fetch water ‘3:00 a.m. - 5:00 a.m.’ in the morning; 28% from ‘4:00 a.m. - 6:00 a.m.’. There were some 7% who fetched water at midnight between ‘9:00 p.m.- 1:00 a.m.’. This shows not just great inconvenience caused to the entire household of the respondents but also shows a complete wastage of time. The respondents were asked if they faced a situation where there was depletion of water in
their common water source as seen in figure 25. 54% replied ‘sometimes’, 27% ‘yes’ and 19% ‘no’. The responses indicate that there were occasional incidences of water depletion in the water source as according to the 54% responses, and 27% who said they faced it regularly. This reveals a situation of scarcity as depletion of water volume shows that it was not enough to satiate the needs of the locality of the respondents’. 

Figure 26
Figure 27

Figure 26 shows responses to the question whether the respondents were concerned over the looming water scarcity in the future; a vast majority 93% replied ‘yes’ and 7% replied ‘no’. A question was raised as to whether there were cases of monopoly over water source by either individuals or groups; responses seen in figure 27 shows that 65% respondents replied ‘yes’, that they were aware of such cases; 24% said ‘sometimes’ such cases occurred and 8% said ‘no’, they were not aware of the existence of such monopoly. Also data shows that almost all the respondents’ from Mon district pertaining to 93% said that they were apprehensive about the looming water crises perceived to become a reality in the near future. From the responses gathered, 68% respondents’ said that monopoly over water source was prevalent in general; only 8% said that there were no such cases.
In figure 28, 50% said that they did not have any kind of water conflict with other public over sharing of water, 37% had some water conflict issues and 13% had no conflict over water with others in their neighborhood or locality. Conflicts over water source though prevalent seems to be fewer in Mon district as a whole since only 13% said they had knowledge of such water conflict situations. As seen in figure 29, a total 87% of the respondents know of cases of water conflict specifically in their locality. Only a small minority 13% say they did not know of any kind of water conflict in the mentioned places.

For 55% the reason for the water conflict as seen in figure 29.1 was ‘scarcity of water’, 22% because of ‘high population’, 20% ‘monopoly over source by a few people’ and 3% quoted ‘other reasons’ such as ‘some villagers damaged PHED water reservoir in our locality’, and ‘conflict situation caused because of ownership issue’. Whenever there was water conflict, a resolution to the problem as in figure 30 would come to 58% ‘from gaonbora of the locality’, for 17% from the elders of the locality’, for 13% ‘Chairman of the area’, and for 12% ‘resolution made between two or more parties involved in the conflict’. The above data shows that at least more half of the respondents (58%) were involved in some kind of water conflict situations, thereby needing some sort of conflict resolution taking the above mentioned steps. Thereby acquisition of water was not simplistic in its mode, but involved some hurdles for the general public.
**KOHIMA DISTRICT**

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<td><strong>Total</strong></td>
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*(Figure 1)*

Respondents were mainly from the Angami tribe, all residing in Kohima district and as seen in *figure 1*, from 18 colonies/wards stretched across Kohima town and from 5 villages out of which 10 respondents from Kohima village belonged to the T-Khel, L-Khel and D-Khel.
Out of the total number of 75 respondents as shown in figure 2 from Kohima district, 47% consisted of male respondents whereas female respondents were slightly higher in number with a total of 53%. Both male and female respondents were spread across an irregular age group. Figure 3, shows the respondents below 20 years as 9%, 20 to 30 years as 39%, 31-40 years as 23 %, 41-50 years as 21%, 51 to 60 years as 7%, and 60 years and above as 1%. This indicates female respondents were more than the male respondents and that the majority of the respondents 39% were from the age group 20 to 30 years, closely followed 23% in 31-40 age group. The least number of respondents 1 % were from 60 and above age group.

<table>
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As shown in figure 4, respondents both male and female were engaged in diverse occupations out of which a majority 16 was from the teaching profession, and another 15 were government servants serving in different capacities as officials. 12 college
students from different streams were also a part of the survey. Other occupations included, 9 business persons, 6 housewives, and 4 pensioners, 3 involved in religious activity, 2 engineers, 2 nurses, 2 beauticians, 1 doctor, 1 social worker, and 1 tour operator. Only 1 of the respondent was listed as unemployed.

A total of 48% of the respondents resided in their own private houses, 43% in rented houses, 4 percent as a resident in a relative’s house and 1% stay in a hostel and 4% indicates ‘others’ as shown in figure 5. The 4% ‘others’ included the owner and resident of a hotel, and residents of guest houses. As the survey indicates in a typical household in Kohima district as in figure 6, 53% had 1 to 5 members, 43% 5 to 10 members, 1% had 10 to 15 members and 3% had above 15 members. This indicates that a majority of the respondents 48% resided in their own, and a lesser number 43% in rented houses ; more than half of the respondents (53%) were from a family/household size of 1 to 5 members in total. The 1% of respondents with 10 to 15 members and 3% of residents indicating a household of above 15 members may have included not just the immediate family but relatives and other dependents.

As shown in figure 7, a majority of the respondents 61% said that public water distribution for Kohima district should be taken up by governmental agencies, 27% by Municipal Councils.
the municipal councils, 7% by private suppliers and 5% said it should be own responsibility. Daily use of water includes drinking, cooking and washing for 76% and 21% for livestock and the rest for agriculture and other uses as in figure 8. The 2% ‘other uses’ includes usage of water in maintenance of hotel and watering lawn of park. Data indicates that maximum usage of water 76% was pertaining to daily basic need such as drinking, cooking and washing only. Data shows that the nature of water usage per day was minimal in Kohima district and it is also clear that a majority 61% of the respondents thought that it is the responsibility of the government to make provision for regular water supply.

![Figure 9](image)

![Figure 10](image)

The total number of respondents as seen in figure 9, 24% had a monthly income of more than Rs.30,000 and above, followed closely by 23% with Rs.5,000 to 10,000 and another 20% with Rs.20,000 to 30,000. Only 1% had an income from Rs. 100 to 5,000. As seen in figure 10 monthly amount spent for a majority of the respondents 63% was Rs. 100 to 1,000 for purchase of water. Another 35% spent Rs. 1000 to 5,000, and 1% spent Rs.5000 to 10,000 and 1%, Rs. 10,000 to 20,000. This indicates that in Kohima district, a higher number 24% of respondents’ income were in the range of Rs. 30,000 and above, and monthly 63% spent Rs. 100 to 1000 for buying water both from governmental and private agencies. A lesser number, 1% was seen as spending Rs.5000 to 10,000 and another 1% spending a huge amount of Rs. 10,000 to 20,000 on buying water for various uses/needs for their household.
Figure 11 shows average amount water consumed by a respondent per day. 72% used 50-100 liters per day, another 23%, 100-300 litres and 5%, 300 and above. Daily water consumption as shown in figure 12 for a high 88% of the households in Kohima District, was 100 - 1000 litres, and for 12%, 1100-2000 litres. The above figures show that most of the respondents 72% did not use more than 50-100 litres per day. Out of the total number of respondents there was none who consumed water of 300 litres and above and there was also no household that consumed from 2100 – 3000 litres or more water in a day. Therefore, water consumption per person was a minimum at 50-100 litres per day (72% respondents), and 100-1000 litres per household (88% of respondents).

Figure 13

Various reasons have been given for the prevalent water scarcity in Kohima district as in figure 13. 69% of the respondents’ stated that it was due to poor management of water resources, 5% scarcity of rainfall, 4% large scale corruption, and 21% said it was a culmination of all the above reasons. When asked if they themselves faced water scarcity, as given in figure 14, 67% said ‘yes’, 20% to ‘some extent’ and 13% ‘no’. This indicates that a majority 67% faced water scarcity and 20% to some extent, however, 69% thought water scarcity was not because of the lack of water but poor
management of water resources. Looking at the minimal 5% stating scarcity of rainfall as a reason for water scarcity, it is clear that 95% did not think poor rainfall is a factor for water scarcity in Kohima district.

![Period of water scarcity](image1)

![Water scarcity, a reality?](image2)

Out of those (as in figure 14) who have stated that they face water scarcity, in a typical year 74% said scarcity is felt most from December-February, 15% March-May, 3% September-November, 8% all year round as seen in *figure 14.1*. Out of the respondents who have stated ‘No’ (as figure 14) saying they do not face water scarcity, 40% said water scarcity is a speculative situation created by environmentalist and conservationists, 30% said it is a situation created by private water suppliers to increase demand of water, another 30% said it is a situation created by the public as in *figure 14.2*. The data indicates that water scarcity in Kohima district was felt most during December to February-74%, a lean season indicated by lack of rainfall. Only an 8% said they face water scarcity all year round. For some of the respondents, water scarcity was a non issue, rather it was a situation created by environmentalist and conservationists, private water suppliers, and the public.

![Reliability of water supply](image3)

![Source of water to residence](image4)

In response to the question of reliability of public water distribution system in their locality as in *figure 15*, an overwhelming 83% said ‘No’ and 17% said ‘yes’. As given
in *figure 16*, 53% of respondents said that water is purchased, either through governmental agency or private supplier, and 32% said they have their own supply, and 15% said ‘other source’ which includes drawing water from natural springs, or ponds in and around the locality. The above data indicated that a vast 83% majority of the respondents in Kohima district considered the public water distribution system as unreliable. A little more than half of respondents (53%) bought water from various sources, but the rest relied on their own water source, whether from a private well or from natural ponds and springs open to the public.

![Figure 16.1](image1)

![Figure 16.2](image2)

For the respondents who have stated that they purchase water (in figure 16) for use in household, 60% said it is from private suppliers, and 40% from PHED supply as shown in *figure 16.1*. Those who purchased water from PHED, when asked about the total time of supply of water, 75% said they get less than 1 hour of water per day, another 25% said 2-3 hours as seen in *figure 16.2*. According to the available data, the respondents from Kohima district therefore, purchased water more from private suppliers i.e., 60%, than the PHED shown as 40%. Also a majority 75% who purchased water from the PHED, got less than an hour of supply daily, another 25% for 2-3 hours, suggesting that PHED supply was not more than the maximum stated hours. There was no case of whole day continuous water supply to any of the respondents (from 18 colonies /wards and 5 villages) from Kohima district.
As shown in *figure 17*, a majority 79% of the respondents from Kohima district said they did not have a water meter installed by the PHED in their household, only 21% had this facility. Out of the total respondents as in *figure 18*, 67% said that they were not satisfied with the quality of water supplied by the PHED, only 33% said it is of satisfactory quality. This data indicated the 79% majority of respondents’ from Kohima district did not have water meters installed in their households, this suggests that their water supply was from a source other than the PHED. Furthermore 67% respondents’ expressed their dis-satisfaction with the quality of water generally supplied by the PHED in Kohima district.

An overwhelming 91% majority of the respondents expressed dis-satisfaction with quality of service provided by the PHED in supplying water. Only 9% say they were satisfied with the service provided as seen in *figure 19*. The main reasons for dis-satisfaction as in *figure 19.1*, for 63% of the respondents was erratic water supply, 3% ‘very expensive' and 34% ‘other reasons’ for dis-satisfaction. Other comments included ‘there is no supply or facility in the colony’ another ‘due to irregular supply’, and ‘service does not reach village’, ‘staff from department is irresponsible towards their duty’. The data indicates that a vast 91% majority of the respondents were dissatisfied with the service provided by the PHED, while most of them stated the reason
being ‘erratic supply of water’ others said that service was not available in some localities, and that departmental staff were not responsible towards their duty.

When asked whether alternative arrangements had been made to supplement their monthly regular water supply, 28% said ‘yes’ and 72% ‘no’ as seen in figure 20. Out of those that replied in the affirmative, 40% said they had rain harvesting units, 30% said they made use of ring wells, 25% said they collected water from natural springs/ponds in their locality and 5% said they had to collect water for usage from natural springs/ponds from a locality other than their own as in figure 20.1. Perhaps as a result of insufficient supply, 28% of the respondents felt the necessity to make alternative arrangements to supplement what they had been already been receiving as a regular supply. Further out of this, 40% of the respondents had made provisions for storing up rain water during the monsoon, while others made use of wells and other sources to store up water for their households.

As seen in figure 21, out of the total respondents in Kohima district 60% said they did not have water harvesting units installed in their households, while 40% said they had such installations. When asked whether there were cases of pilfering from their private
water source as seen in **figure 22**, only 10% said ‘yes’, 17% ‘sometimes’ and 73% ‘no’. The above data indicates that a good amount of respondents in Kohima district (40%), had the knowledge and means of storing up rain water during monsoon season to be used for their household when required. Pilfering from private water source did not seem to be common as 73% of the respondents said they did not face any such case, only a small minority claimed to have faced such instances.

In **figure 23**, when asked about their main source of water during off-season, 47% said ‘pond’, 12% ‘nearby stream’, 1% ‘nullah’, 40% ‘other reasons’ included ‘drawing from public well’, and ‘drawing from spring in other locality’. Most of the respondents were dependent on alternative water source during off-season, since their primary supply source was not sufficient however some of them voiced their difficulties and said at times ponds and wells in locality were locked up by certain individuals, clans, or groups, making it difficult for them to draw water. As given in **figure 23.1**, out of the total respondents from Kohima district who were dependent on alternative sources of water, when asked who took the responsibility to draw water from the source, 11% said ‘mother’, 7% ‘father’, 17% ‘sister’, 13% ‘brother’ and 52% ‘self’ which were 18 males respondents and 21 female respondents. The above data figures show that respondents in Kohima district had to depend and rely on other alternate source for water, often involving the family unit as a whole.
Also out of the total respondents as seen in Figure 23.1 (a) 56% were female and 44% were male. The above data shows that for a family dependent on drawing water from alternate source, all members of the family were involved in fetching water; total 44% male and 56% female respondents. In terms of gender, female respondents as generally seen in the rest of India, were a majority group involved in fetching water even over long distances, to be used by their household. When asked about inconveniences faced while drawing water from common water source, 37% said ‘yes’, 36% ‘no’ and 27% ‘sometimes’ as seen in Figure 24. Some of the respondents even specifically mentioned certain inconveniences such as ‘having to go to other locality to draw water’, ‘staying up late and waking up very early to draw water from neighbourhood source’.

In Figure 24.1 data shows the timing of respondents from Kohima district who drew/fetched water from common source. 25% said ‘2:00 a.m. – 4:00 a.m.’, another 25% ‘4:00 a.m. - 6:00 a.m.’, 18% ‘3:00 a.m. - 5:00 a.m.’, 11% ‘5:00 a.m.-7: a.m.’, another 11% ‘9:00 p.m.- 1:00 a.m.’, 7% ‘no specific time’, 3% ‘6:00 a.m.- 8:00 a.m.’ Most respondents had to wake up very early to fetch water for their household, some even staying up at midnight to collect water from neighbourhood springs or wells. This shows that the public water distribution system does not meet the requirements of the
public in general, who have to take great trouble, in time consuming effort to supplement their water consumption. The respondents as in figure 25 when asked if water gets overdrawn or if the respondents face a situation when water is drawn exceeding the maximum limit, 51% said ‘yes’, 33% ‘sometimes’ and 16% ‘no’. According to the data collected in 18 colonies and 5 villages in Kohima district, 51% said they faced situations when the water in their common source was exhausted by the time their turn came to draw water, suggesting that the natural springs/wells in various localities/villages did not suffice the needs of the respondents.

As in figure 26 when asked if they had concern over looming water scarcity in future, 95% said ‘yes’, 3% ‘sometimes’ and 2% ‘no’. Also an overwhelming 95% of the respondents in Kohima district said that they were concerned over the looming water scarcity in the future, their concern corresponding to a situation already prevalent in Kohima district. When the respondents of Kohima district were asked if any kind of monopoly existed over water sources, 62% said ‘yes’, 21% ‘no’, and 17% said ‘sometimes’, as seen in figure 27.

In terms of conflict and contestation over water in Kohima district in general, as seen in figure 28, 51% said ‘no’ that they had no knowledge, 29% ‘yes’ and 20%
‘sometimes’. The above data shows that a majority 62% of the respondents said that there was some kind of monopoly by some agents over water sources in Kohima district. The data also indicates that there are some incidences of conflict and contestation over water sources in Kohima district, although it is not generic by nature. When asked specifically, if there was water conflict in the locality as in **figure 29**, 56% of the respondents said ‘yes’ and 44% ‘no’. The data illustrates that for the majority 56% of the respondents from Kohima district, water conflict was prevalent in their locality.

![Figure 29.1](image1)

**Figure 29.1** shows the responses to reasons of conflict over water, 52% said ‘scarcity of water’, 36% ‘monopoly over source by a few people’, and 12% blamed it on the high population. Although other reasons were also stated, the common issue for this prevalence was given as ‘scarcity of water’ by 52% of the respondents. This data also indicates that water scarcity in Kohima district was a significant issue of conflict and contestation. For resolution in cases of water conflict, as in **figure 30**, 73% said ‘resolution is made between the two or more parties involved’, 15% ‘chairman of the locality’, 7% ‘elders of village/town/colony’, and 5% ‘gaonbora’. This data indicates as per the responses of 56% of respondents who said ‘yes’, and another 44% who said ‘no’, that water conflict and contestation is common in pockets of Kohima town and the district as a whole. The above data shows that there are systems established in society to address such issues if and when it presents itself. However, in most cases, as seen in the data, if two or more parties are involved, the respondents say that resolution is made by the parties themselves. A lesser percentage chose to involve other parties such as the chairman of the locality, the goanbora or the elders of the village/ town or colony.
## WOKHA DISTRICT

<table>
<thead>
<tr>
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</tr>
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<tbody>
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<td>9. Etsuchukha</td>
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</tr>
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<tr>
<td>15. Lower CMHS</td>
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<td>27. Upper Zuvotong Colony</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>75</strong></td>
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</tbody>
</table>

*Figure 1*

Respondents were mainly from the Lotha tribe, all residing in Wokha district and as seen in *figure 1*, from 22 colonies/wards stretched across Wokha town and from 5 villages in Wokha district.
The gender of the respondents’ from Wokha district is shown in figure 2, 60% respondents’ was male and 40% female. As seen in figure 3, they were randomly selected from various age groups to give a uniform representation; 52% were from 20-30 age group, 27% 31-40 age group, 13% from 41-50 years of age, 4% 51 and above, 3% 60 years and above and 1% below 20 years. The above responses indicate that from Wokha district, male respondents were a 60% majority and the 20-30 years age group made up for a majority as more than half (52%) came from this group; followed by 27% from the 31-40 age group. As was the case with the other districts such as Kohima; Mokokchung; and Mon; respondents’ from Wokha district from the ‘below 20 years’ age group and older age group mentioned above were fewer.

<table>
<thead>
<tr>
<th>(Figure 4)</th>
<th>Occupation:</th>
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<th>Female</th>
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<td>1</td>
</tr>
<tr>
<td>6.</td>
<td>Social Worker</td>
<td>2</td>
<td>----</td>
<td>2</td>
</tr>
<tr>
<td>7.</td>
<td>Unemployed</td>
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<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8.</td>
<td>Engineer</td>
<td>1</td>
<td>----</td>
<td>1</td>
</tr>
<tr>
<td>9.</td>
<td>Farmer</td>
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<tr>
<td>10.</td>
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<td>2</td>
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<tr>
<td>11.</td>
<td>NGO</td>
<td>3</td>
<td>----</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>45</td>
<td>30</td>
<td>75</td>
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</table>

In figure 4 data shows that the respondents were from 10 occupations, and one category was from the unemployed. 21 were teachers, 19 Government employees, 12 business men and women, 7 farmers, 4 were students, 3 working in the Non-Governmental sector, 3 unemployed, 2 social workers, and 2 retired government servant and 1 pharmacist, 1 engineer. Therefore the data shows that the respondents from Wokha district had been randomly selected to show a background of diverse of range of professions/occupations.
77% of the respondents from Wokha district stayed in their own private residences, 16% in rented houses, and 5% in the home of a relation; 1% in hostel as seen by the responses in Figure 5. Responses to the question of the total numbers of occupants in a household are given in Figure 6; 59% of the respondents’ said they come from a household of 1-5 occupants, 39% said ‘5-10 occupants’ and 3% said ‘above 15’. The above responses show that most of the respondents (77%) from Wokha district stayed in their own private residences and a good number (59%) of the household have had 1-5 members, and 39% had even bigger households with 5-10 members.

When asked the question of which agency should be responsible for public water distribution as seen in Figure 7; 59% replied ‘the governmental agencies’, 28% replied ‘municipal councils’, 9% ‘own responsibility’ and 4% ‘private suppliers/distributors’. Figure 8 shows the responses to the question of types of water usage, 71% said their daily water usage pertained mostly to drinking, cooking and washing; 18% for livestock, 8% for ‘agriculture’ and 4% for ‘other uses’ such as ‘floriculture’, ‘gardening’, ‘cleaning of shops’ etc. The above data indicates that 59% respondents had the opinion that ‘the governmental agencies’ should be accountable for public...
water distribution, and another 28% had the opinion that it should be ‘municipal councils’. Also, considering the type/nature of water usage is shown in figure 8, 71% said it was confined to basic needs only such as drinking, cooking and washing, others mentioned other uses such as agriculture, livestock and other uses such as for floriculture, gardening and cleaning of their business establishment.

Figure 8

Responses to the question about the household income is seen in figure 9, 29% of the respondents replied Rs.30, 000 and above, 24% Rs. 20,000-Rs.30, 000, 21% Rs.15, 000-Rs. 20,000, 12% Rs. 10,000- Rs. 15,000, 11% Rs.5,000- Rs.10,000, and 3% Rs.100- Rs.5000. Next, responses to the question of total amount spent on water is shown in figure 10, whereby 73% spent Rs.100- Rs.1,000, 25% Rs.1,000-Rs.5,000, 1% Rs.5,000- Rs.10,000. The above statistics show that the highest income group from Wokha district was 29% respondents with income of Rs.30, 000 and above, followed by 24% with income of Rs. 20,000-Rs. 30,000; the statistics shows among the respondents there was only slight variation in the income quoted. Also most of the amount spent on water was between the brackets of Rs. 100- Rs.1, 000 as quoted by 73% of the respondents. There were no respondents who spent out of the range of Rs.10, 000- Rs.20, 000. Data shows that water consumption was generally limited, and so also the amount spent.
Water consumption per person per day is shown in figure 11. 52% said they consumed 50-100 litres, 37% quoted 100-300 litres, and 11% quoted 300 litres and above. Figure 12 shows daily water consumption per household; 77% respondents said they consumed 100-1000 litres, 13% 1100-2000 litres, 5% 2100-3000 litres, 1% 4100-5000 litres and 3% above 5000 litres. Perhaps due to water scarcity, 52% said they consumed 50-100 litres per day, only 11% quoted usage of 300 litres and above. Even for households daily consumption was limited to 100-1000 litres for 72% respondents; however, 1% household consumed 4100-5000 litres and 3% above 5000 litres showing that some household had requirement for as such.

The responses to the question of the main reasons for scarcity of water are seen in figure 13; 61% stated ‘poor management of water resources’, 24% stated ‘all of the above’, 8% stated ‘scarcity of rainfall’; and 7% ‘large scale corruption’. Another question was raised as whether the respondents in Wokha district faced scarcity as seen in figure 14; 72% responded ‘yes’, that they faced scarcity, 19% ‘to some extent’, and 9% ‘no’, that they did not face such a situation. The above data indicates that although other reasons were also stated; a greater part consisting of 61% of the respondents felt that water scarcity in Wokha district was mainly due to poor
management of water resources. 72% also stated that they faced water scarcity; only 9% said that they did not face scarcity of water in any way.

The respondents (as seen in figure 14) who had stated that they faced water scarcity, 59% said scarcity was felt mainly from December-February, 38% March-May, 3% ‘all year round’ as seen in figure 14.1. From the respondents who had stated ‘No’ (as seen in figure 14) saying they did not face water scarcity, 14% said water scarcity was a speculative situation created by environmentalist and conservationists, 29% said it was a situation created by private water suppliers to increase demand of water, another 57% said it was a situation created by the public as in figure 14.2. The data indicates for the majority 59%, water scarcity in Wokha district was felt most during December to February; a scene reflective in the rest of the Nagaland state during the same months. Only 3% said they faced water scarcity all year round. For some of the respondents, the issue of water scarcity was a creation of the public who made speculations and the rest put the responsibility environmentalists and conservationists and private water suppliers.

A question was raised about the reliability of public water distribution system in their locality as seen in figure 15, a greater part of the respondents consisting of 59% replied ‘no’ and 41% replied ‘yes’. Responses to the question regarding the source of
water to the residence of the respondent are seen in Figure 16, 60% replied that had purchased it either from the governmental agency or from private suppliers; 40% replied that they used water from their own source, which was tube well/ring well/pond etc. The data shows some kind of discontentment of the respondents from Wokha district as 59% said that generally the public water distribution system was unreliable. 60% of the respondents purchased water either from the governmental agency or from private suppliers to suffice the needs of their households.

![Figure 16.1](image1)

![Figure 16.2](image2)

Out of those respondents who had purchased water (as seen in figure 16) 66% said that they purchased water from private suppliers and 34% said they made their purchases from the PHED as in Figure 16.1. Responses to the question assessing the total time of PHED water supply is shown in Figure 16.2; 100% made mention than the total time of supply was ‘less than 1 hour’. The data indicates that respondents were dependent more on the supply of the private water suppliers in Wokha district as 66% said that their purchase was made from private water suppliers. All the respondents (100%) who were availing the services of the PHED said that total time of supply per day was ‘less than 1 hour’.

![Figure 17](image3)

![Figure 18](image4)

Respondents from Wokha district were asked if they had installed PHED water meters in their households; as seen in Figure 17 a greater part consisting of 81% of
respondents replied ‘no’ and 19% replied ‘yes’. A question was raised to check satisfaction with quality of water supplied by the PHED as seen in figure 18, 83% replied ‘no’ and 17% ‘yes. The above responses show that 19% those who were purchasing water from PHED supply had installed water meters to gauge the output and to make payments. 83% of respondents from Wokha district expressed dissatisfaction with the quality of water supplied by the PHED; it was noted that only 17% expressed satisfaction with the quality of water.

In wokha district 45% of the respondents expressed satisfaction with quality of service provided by the PHED in supplying water. Another 55% said that they were dissatisfied with the service provided as seen in figure 19. The main reasons for dissatisfaction as in figure 19.1, for a high 85% of the respondents was erratic water supply, 2% ‘very expensive’ and 12% gave ‘other reasons’ for dis-satisfaction. Other comments included ‘no supply in the colony’ and ‘poor quality of pipes/leakages from water pipes’. The data indicates that 45% of the respondents were satisfied with the service provided by the PHED, while more than half expressed their dissatisfaction. Those who were dissatisfied besides giving other reasons such as the high cost and poor maintenance of supply pipes, however, (85%) have clearly stated that the main reason was because of ‘erratic supply’ of water.
When asked whether alternative arrangements had been made to supplement their monthly regular water supply, 28% said ‘yes’ and 72% ‘no’ as seen in figure 20. Out of those that replied in the affirmative, 24% said they made use of ring wells, 33% said they collected water from natural springs/ponds in their locality and 14% said they had to collect water for usage from natural springs/ponds from a locality other than their own, and 5% said they made use of river water as in figure 20.1. Perhaps as a result of insufficient supply, 28% of the respondents felt the necessity to make alternative arrangements to supplement what they had been already been receiving as a regular supply. It can be seen that all available resources were put to use to satiate the requirements of the respondents; such as natural springs, ponds, ring well, and even including river water.

When asked if water harvesting units had been installed in their residences as seen in figure 21, almost half consisting of 47% of the respondents from Wokha district replied ‘yes’ and 53% replied ‘no’. Figure 22 shows responses to the question, of whether incidences of pilferage were experienced by the respondents. 64% replied ‘no’, that did not encounter any such case, 24% replied ‘sometimes’ and 12% replied ‘yes’. Data indicates that 47% of the respondents from Wokha district had made provisions for water conservation through installation of water harvesting units. A
consequence of water scarcity was shown by the episodes of pilferage cases; 12% stating that they had experienced it and 24% saying that they had experienced the same sometimes.

When asked about the source of water during off-season, respondents gave various reasons as listed in figure 23; 35% ‘pond’ 33% ‘nearby stream’, 15% ‘nullah’ meaning drain water, and 17% gave ‘other reasons’ which included ‘ancient community well in the jungle’, and ‘from water source in forests’. The respondents made use of every kind of water source available and the most preferred one for 35% majority were ‘ponds’. Figure 23.1, shows responses to the question as to who draws water from the alternate source of water, 20% replied ‘mother’, 5% ‘father’, 21% ‘sister’, 13% ‘brother’ and 40% ‘self’ out of which 18 respondents were male and 12 female.

As seen in figure 23.1. (a) the gender of the total respondents from Wokha district were 60% male and 40% female. From the above data, deduction can be made that the family unit as a whole was engaged in fetching water from the water source. In Wokha district, more females 58% (figure 23.1) were engaged in fetching water as compared to 43% of males. Figure 24 shows the responses given to the question of whether inconvenience was faced by the respondents while drawing water from
common water source; 36% replied ‘sometimes’, 32% replied ‘no’, and another 32% ‘yes’.

Figure 24.1 shows responses as to the time when respondents usually fetch/draw water from their usual source; 42% ‘4:00 a.m. - 6:00 a.m.’, 13% ‘no specific time’, 12% ‘3:00 a.m. - 5:00 a.m.’, another 12% said ‘2:00 a.m. – 4:00 a.m.’, 8% ‘9:00 p.m.-1:00 a.m.’. This shows that the most preferred timing for 42% majority was ‘4:00 a.m.-6:00 a.m.’. This data indicates that a most of the respondents from Wokha district had to bear the inconvenience of fetching water at the above mentioned time, only 32% said they faced no inconveniences as such. Data shows that 42% had to wake up as early as 4:00 am-6:00 a.m. to fetch their daily water requirement; 8% had to wait even at midnight between 9:00 p.m.-1:00 a.m., causing great inconvenience and wastage of time. Figure 25 shows responses to the question about whether there was cases of depletion of water in the common water source used by the respondents; 52% replied ‘yes’, 35% ‘sometimes’ and 13% ‘no’. It is evident from the responses that most of the respondents, who made arrangements for collection of water from common water source, had faced incidences of depletion of water; only 13% replied that they did not encounter such a situation.
Another question was raised to assess the observation of the respondents to the looming water scarcity in the future; yet a phenomenon already evident to some degree in recent times. As in figure 26, 95% expressed their concern over the issue by saying ‘yes’ and 5% mentioned ‘sometimes’. Another point to note was that there was not a single respondent from Wohka district who did not voice out concern over the looming water scarcity as 95% said ‘yes’ and 5% ‘sometimes’. A question was asked in order to evaluate if there were cases of monopolisation of water source by individuals/groups in Wokha district, responses are seen in figure 27; whereby 52% said ‘yes’, 32% ‘no’ and 16% ‘sometimes’. As seen by the data, 52% of the respondents said there were incidences of monopolisation over water source.

Responses are seen in figure 28, to a question with an objective to assess conflict situations over water in Wokha district. Out of the total, 60% replied ‘no’, 28% ‘sometimes’ and 12% ‘yes’. In case of issues of conflict over water, a majority 60% replied that there were no such cases in Wokha district; only 12% clearly stated the prevalence of such cases. Figure 29 shows responses to a more specific question asked to determine whether water conflict was prevalent in the locality of the respondents; 53% replied ‘yes’ and 47% ‘no’. The above responses indicate that in
some localities there were incidents of water conflict such as seen by the response of 53% who replied in the affirmative.

Corresponding to this, respondents gave various reasons for conflict situation in their locality as seen in figure 29.1. The main issue stated by 62% was ‘water scarcity’, 23% ‘monopoly over source by a few people’, 12% ‘over populated’ and 3% gave ‘other reasons’, which included answers such as ‘breaking of water supply line/pipes’, and ‘diverting water to other source’. Various reasons were quoted for such episodes; however the major cause of conflict according to the 62% response was ‘scarcity of water’. The important issue of conflict resolution is seen in figure 30, where 44% respondents were quoted saying that ‘resolution is made between the two/ or more parties involved’, 24% ‘chairman of the locality’, 16% ‘elders of the village/town/colony’, 12% ‘goanbora’ of the locality, and 4% ‘other reasons’, which included responses such as ‘conflict continues as no one resolves the issue’, and ‘between villagers involved’. The responses shown in figure 30 shows different systems established in society to address such issues if and when it presents itself; although in Wokha district the most common response was 44% saying ‘resolution is made between the two or more parties involved’. However, among the ‘other responses’ an interesting comment was ‘conflict continues as no one resolves the issue’.
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<tr>
<td>3. Sangtemla Ward</td>
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<tr>
<td>4. Salangtem Ward</td>
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<tr>
<td>5. Sungkomen Ward</td>
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<tr>
<td>6. Tongdentsuyong Ward</td>
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<tr>
<td>7. Kumlong Ward</td>
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<tr>
<td>8. Dilong Ward</td>
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<td>9. Arkong Ward</td>
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<td>10. Aongza Ward</td>
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<td>11. Penli Ward</td>
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</tr>
<tr>
<td>12. Mongsenbai Ward</td>
<td>3</td>
</tr>
<tr>
<td>13. Alempang Ward</td>
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</tr>
<tr>
<td>14. Alongmen Ward</td>
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</tr>
<tr>
<td>15. Mokokchung Compound</td>
<td>1</td>
</tr>
<tr>
<td>16. Alijen Town</td>
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</tr>
<tr>
<td>17. Mokokchung Village</td>
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</tr>
<tr>
<td>18. Ungma Village</td>
<td>4</td>
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<td>19. Chuchuyimpang Village</td>
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<td>20. Khensa Village</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>75</td>
</tr>
</tbody>
</table>

*(Figure 1)*

Respondents were mainly from the Ao tribe, all residing in Mokokchung district and as seen in *figure 1*, from 15 colonies/wards stretched across Mokokchung town and from Alijen town and 4 villages in Mokokchung district.
In the above data as seen in figure 2 from the district of Mokokchung, 41% of the respondents were male and 59% were female. They were all in various age groups as in figure 3, 11% were below 20 years of age, 52% were between 20-30 years, 29% were between 31-40 years, 4% between 41-50 years, 1% between 51-60 years, 3% were 60 years and above. The above data indicates that a majority 59% of the respondents were female. A bulk of the respondents 52% were from the age group of 20-30 years of age, followed by 29% in the age bracket of 31-40 years of age. Respondents from the older age group both male and female group were minimal.

<table>
<thead>
<tr>
<th>Occupation</th>
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<th>Female</th>
<th>Number Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teaching</td>
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<td>15</td>
<td>25</td>
</tr>
<tr>
<td>2. Business</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>3. Student</td>
<td>9</td>
<td>16</td>
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</tr>
<tr>
<td>4. Government Employee</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>5. Religious activity</td>
<td>1</td>
<td>------</td>
<td>1</td>
</tr>
<tr>
<td>6. Retired Government Servant</td>
<td>1</td>
<td>------</td>
<td>1</td>
</tr>
<tr>
<td>7. Social Worker</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8. Politician</td>
<td>2</td>
<td>------</td>
<td>2</td>
</tr>
<tr>
<td>9. Housewife</td>
<td>------</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>10. Farmer</td>
<td>------</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>11. Unemployed</td>
<td>------</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>31</strong></td>
<td><strong>44</strong></td>
<td><strong>75</strong></td>
</tr>
</tbody>
</table>

In figure 4 data shows that the respondents were from 10 occupations, and one category was from the unemployed. 25 were teachers, 25 were students, 6 business men and women, 4 Government employees, 3 social workers, 3 housewives, 3 farmers, 2 politicians, 1 involved in some religious activity and 1 retired government servant and 2 unemployed. Therefore the data shows a diverse of range of professions/occupations of the respondents from Mokokchung district.
72% of the respondents lived in their own private residences, 9% in the home of a relation, 15% in rented houses, 1% in hostel, and 3% as a paying guest as seen in [Figure 5]. From this division as seen in [Figure 6], a high 72% lived in a household of 1 to 5 members, 27% has 5 to 10 members in household and 1% above 15 members. The above data indicates that a 72% of the respondents lived in their own private residences, and another majority 72% had a household unit consisting of 1 to 5 members. The random data collected from Mokokchung district shows that most of the households’ were average sized except for a few large sized household, probably the immediate family, relatives and other dependents.

In Mokokchung district as seen in [Figure 7], 67% said that the governmental agencies should take responsibility for public water distribution, 23% municipal councils, 8% private suppliers/distributors, and 2% said it should be own responsibility. When asked about the type of water usage as in [Figure 8], 79% of respondents said their usage was mainly confined to drinking, cooking and washing, 15% said they used it also for livestock, 4% for agriculture, and 2% ‘other uses’, which included, ‘for hotel use’ and ‘commercial establishment’. The data indicates a 67% majority in Mokokchung district had the opinion that public water distribution should be done by the governmental agencies alone, and a lesser 23% said municipal councils. The water
usage data also indicates that apart from basic utilization, the respondents from the district either keep or are compelled to keep their water usage to minimum, due to a variety of reasons discussed in the following data.

The household income of the respondents is shown in **Figure 9**, 11% had an income range between Rs. 100 to Rs. 5,000, 12 % Rs. 5,000 – Rs. 10,000, 15% Rs. 10,000 – Rs. 15,000, 29% Rs. 15,000- Rs.20,000, 21% Rs. 20,000- Rs. 30,000 and 12% Rs. 30,000 and above. Out of the income, 45% spent Rs. 100 – Rs. 1,000 on water, 53% Rs. 1,000 – Rs. 5,000 and 1% Rs. 5,000 – Rs. 10,000 as shown in **Figure 10**. The data from Mokokchung district indicates that the income range was not consistent, 29% were in the range Rs. 15,000- Rs.20,000, and 21% Rs. 20,000- Rs. 30,000. Others were all divided almost uniformly in the income range indicated above. Also, 53% of the respondents spent Rs. 1,000 – Rs. 5,000 on monthly purchase of water. This amount indicates that there may have been purchase of water from multiple agencies, for instance purchase both from the PHED and private suppliers as well.

**Figure 9**

**Figure 10**

Water consumption per day among the respondents is shown in **Figure 11**. 60% used 50- 100 litres, 29% 100- 300 litres, 11% 300 litres and above. **Figure 12** shows daily water consumption per household, 79% used 100- 1000 litres per day, 17% 1100-
2000 litres, 4% 2100-3000 litres. The above data shows the responses from Mokokchung district, and it indicates that for a majority 60% water usage was minimal per person as daily consumption was limited to 50-100 litres per day. Only 11% of the respondents stated that they used up 300 litres and above per day. As in the case with households of respondents, a high 79% said that daily water usage was confined to 100-1000 litres, on a smaller margin 4% said that their household’s used 2100-3000 litres per day. None of the respondents lived in a household, with water usage more than 2100-3000 litres per day.

As given in figure 13, the main reasons for water scarcity in Mokokchung district were listed by 73% respondents as poor management of water resources, 7% scarcity of rainfall, 5% large scale corruption, and 15% all of the above. In figure 14, responses are seen to the question of whether the respondents face water scarcity, 77% said ‘yes’, 16% ‘to some extent’, and 7% ‘no’. Data indicates a widely prevalent state of water scarcity as only 7% said they did not face scarcity, as opposed to 93% who faced scarcity in varying degrees. The main reason for this condition was stated by a majority 73% as poor management of water resources by the concerned authorities. This shows that the condition of scarcity in Mokokchung district was seen a result of improper administration of resources.
Figure 14.1 shows the period of water scarcity in Mokokchung district. According to 87% it was between December to February, for 12% it was all year round, 1% March to May. Some of the respondents did not agree to the view that there was a situation of water scarcity in the district as seen in figure 14.2. 20% said that it was ‘a speculative situation created by environmentalist/conservationist’, another 20% said that it was ‘a speculative situation created by private water suppliers to increase demand’, and 60% gave ‘other reasons’ some of them which included ‘it is a natural situation’ another said ‘scarcity will not be there if resources are managed properly by oneself’. The data shows that a greater part of the respondents (87%) faced scarcity from December to February, and for 12% it was for all year round. Only a few respondents said that there was no scarcity of water in Mokokchung district.

When the question was asked as to if the water supply system was reliable 61% said ‘no’ and 39% said ‘yes’ as seen in figure 15. As also shown in figure 16, 81% said the source of water to residence was purchased through certain agencies, 19% said they had their own water source for their households. The above data indicates firstly, that more than half of the respondents (61%) said that in Mokokchung district supply of water was unreliable while a lesser 39% disagreed to this view. Data indicates that most of the respondents from the district (81%) were wholly dependent on
govermental agencies and private agencies for supply of water to their residences, thereby leaving them vulnerable to a great deal of inconvenience if supply was irregular and bills inflated.

![Agency of water supply](image1)

Figure 16.1

As seen in figure 16.1 for 67% private suppliers are the agency for water supply in Mokokchung district, and for 33% PHED, no other source was mentioned. When the question was raised about the total time of PHED water supply, 100% said ‘less than one hour’, as in figure 16.2. The above details show that respondents from Mokokchung district are mostly dependent on private water suppliers as 67% purchased water from them for their household needs. Out of the smaller 33% minority who purchased water from the PHED, all of the respondents said that the total time for supply of water to their households was ‘less than one hour’; this response shows that the time of supply by the PHED was nominal, and inconsistent.

![Total time of PHED supply](image2)

Figure 16.2

Out of the total respondents who purchased water only 27% had a meter to gauge the supply and purchase of water, the other 73% said they did not have any meter installed in their households as seen in figure 17. When asked if they were satisfied with the quality of water supplied by the PHED as in figure 18, 70% of the respondents’ said ‘yes’ and 30% ‘no’. The data from Mokokchung district indicates
that most of the respondents depended on private water suppliers and also had made their own arrangements for a constant supply of water as only 27% had a PHED water meter installed in their houses. For 70% of the respondents, the quality of water supplied by the PHED was satisfactory and only a part of the respondents’ expressed dis-satisfaction.

As seen in figure 19, only 21% of the respondents expressed some kind of satisfaction with quality of service provided by PHED, otherwise 79% expressed their dissatisfaction. The reasons or causes given for their dissatisfaction as shown in figure 19.1 was ‘erratic supply’ for 86% respondents, 3% ‘very expensive’ and 10% ‘other reasons’, which included ‘old pipelines not replaced despite repeated complains’, ‘indifferent attitude of staff towards consumers genuine complains’, etc. The above data indicates that generally 79% of the respondents were not satisfied with the quality of service provided by the PHED, and while other reasons were also stated, 86% very distinctly gave ‘erratic supply’ as being the main reason for dissatisfaction.

When asked if alternative arrangements have been made for water supply, as seen in figure 20, 63% respondents replied ‘no’ and 37% ‘yes’. Corresponding to the question in figure 20, of whether additional arrangements had been made for supply
of water. *figure 20.1* shows that 29% were also dependent on natural springs/ponds in locality, 28% had dug a ring well for their residence, 25% from natural springs in another locality, 18% pond at home. This data indicates that the 63% respondents who had not made alternative arrangements for supply of water were totally dependent on either PHED or private water suppliers. The other 37% despite having a supply source from both the agencies, had to make additional arrangements to suffice their requirements.

When the respondents from Mokokchung district were asked if they had water harvesting units installed in their households as seen in *figure 21*, 60% said ‘yes’ and 40% ‘no’. In *figure 22*, respondents were asked if there were cases of pilfering from water source in their households, and 80% replied ‘no’ 12% ‘sometimes’ and 8% ‘yes’. From the responses given above, data indicates that installation of water harvesting units is widespread in the district as 60% have said that they had such units in their households in order to conserve and store water. Although water scarcity was seen as an actuality in the district, only 12% from among the respondents said they had faced pilfering from their water source at their home. Therefore, it can be deduced that water scarcity was also a cause for a number of social problems as is apparent from the pilferage cases mentioned above.
When asked about the source of water during the monsoon off-season, 45% replied ‘pond’, 29% replied ‘nearby stream’, 15% other reasons included ‘public water reservoir tank’, ‘neighbour’s ring well’, ‘tube well’ etc., 11% replied ‘nullah’ as seen in figure 23. For those respondents dependent on other sources during the off-season, a variety of responses were given with no single distinct answer, showing that the respondents had to depend on whatever sources were available and convenient for them. In figure 23.1, responses are shown to the question as to who draws water from the alternate source of water, 7% replied ‘mother’, 20% ‘father’, 5% ‘sister’, 25% ‘brother’ and 43% ‘self’ out of which 18 respondents were male and 14 female.

As seen in figure 23.1. (a) the gender of the total respondents from Mokokchung district were 59% male and 41% female. From the above data, deduction can be made that the family unit as a whole was engaged in fetching water from the water source. In Mokokchung district, more males 69% (figure 23.1) were engaged in fetching water as compared to 31% of females. Data in figure 24 shows the responses given to the question of whether inconvenience was faced by the respondents while drawing water from common water source; 37% replied ‘no’, 35% ‘sometimes’ and 28% ‘yes’.
Also in *figure 24.1*, responses are shown as to the time when respondents usually fetch/draw water from their usual source; 38% said ‘2:00 a.m. – 4:00 a.m.’, another 5% ‘4:00 a.m. - 6:00 a.m.’, 24% ‘3:00 a.m. - 5:00 a.m.’, another 14% ‘9:00 p.m.-1:00 a.m.’, 19% ‘no specific time’. This shows that the most preferred timing for 38% majority was ‘2:00 a.m. – 4:00 a.m.’ and 24% ‘3:00 a.m. - 5:00 a.m.’. This data indicates that a majority of the respondents from Mokokchung district had to bear the inconvenience of fetching water at the above mentioned time, indicating that accountability of the public water distribution was not clear as to which agencies/governmental agency should look to the needs the public in general as seen by the examples of the random samples taken from areas spread over 15 colonies/wards and 5 villages in Mokokchung district.

Responses to the question of whether water was overdrawn in common water source is given in *figure 25*. 37% replied ‘yes’, 35% ‘sometimes and 28% ‘no’. The above responses illustrates that (figure 25 - 72%) respondents had to often face a situation where water was deficient in their common water source, and they struggled to get their required quota. Only 28% said they did not encounter such a situation.
Responses are also shown in figure 26 to the question of whether there were concerns over looming water scarcity in the future; 87% replied ‘yes’ and 13% ‘no’. Also 87% of the respondents said that were deeply concerned over the looming water crises situation, perhaps seen as a reflection of the situation prevalent in their own district. 43% of the respondents’ from Mokokchung district said that there was monopoly over water source, 25% said ‘sometimes’ there were such cases and 32% said ‘no’ as seen in figure 27. The above responses in figure 27 indicates that monopoly over water sources by certain individuals/groups have become more common over the years; 43% said such monopolization was prevalent and 25% said ‘sometimes.’

Figure 28 shows responses to the question of whether there were water conflicts over the water source, 72% replied ‘no’, 21% ‘sometimes’ and 7% ‘yes’. Conflicts over water source though prevalent seems to be less common in Mokokchung district as 72% responded saying they had no knowledge, nor had they encountered such incidences; only 7% said they had knowledge of such water conflict situations. Responses to the question of whether water conflict was prevalent more specifically in their own localities are seen in figure 29; 59% of the respondents replied ‘no’ and
41% ‘yes’. The 41% responses in the affirmative from Mokokchung district shows that water conflict was prevalent in some of the localities, out of the total from where data samples were taken.

When the question of the reason for conflict was raised (figure 29.1), 48% replied ‘scarcity of water’, 29% ‘over populated’ and 23% ‘monopoly over source by a few people’. Although a number of reasons were stated for such a situation such as over population in the localities, and monopoly by few over water source, 48% majority said it was because of ‘scarcity of water’ in the district. Figure 30 shows the responses to the mode of conflict resolution in Mokokchung district; 30% of the respondents said ‘chairman of the locality’, 28% ‘resolution is made between the two/or more parties involved’, 25% ‘elders of village/town/colony, and 17% replied the ‘gaonbora’. The above responses show that in case of conflict situations, resolution was made according to the nature or severity of the problem; the responses also show the systems established in society to address such issues which had developed over the years. In the case of Mokokchung district, responses were almost equally divided; there was no category mentioned above seen as distinct by itself.
Management of Water Resources

*Data from chart with figure 1-6, and 17, has been omitted as it concerns general information of the respondents from the four districts. Nevertheless the charts and data given in chapter 5 will make clear if necessary, any query on the general information. Shown here are findings from charts with figure number 7-30.

Figure 7: Agency for public distribution of water
1. 93% respondents in Mon district, 67% Mokokchung district, 61% Kohima and 59% in Wokha district stated that the government through PHED should play a pivotal role as the main agency for public distribution of water.
2. 28% in Wokha district, 27% Kohima district and 5% Mon district stated that municipal corporations should be the main agency for public distribution of water.
3. It was surprising that although the four districts were so heavily dependent on private water suppliers to satiate their water need, only 5% from Kohima district, 4% Wokha district and 2% each from Mon and Mokokchung responded that private suppliers/distributors should be the main agency for public water distribution. This suggests that they would rather prefer private operators than governmental agencies for supply of water.
4. There was mention by 9% from Wokha district, 5% Kohima district and 2% from Mokokchung district that water lookout should be the individuals own responsibility.

Figure 8: Type of water usage
1. The water usage data from the four districts shows only basic utilization of water used for drinking, cooking and washing for 79% from Mokokchung, 76% Kohima, 71% Wokha and 68% Mon district. Other uses stated were ‘for hotel use’ and ‘commercial establishment’; ‘floriculture’, ‘for livestock’; and ‘agriculture’.
2. The respondents from the four districts kept their water usage to minimum and this indicates moderate water usage for basic needs, no lavish water need or usage was noticeable.
Figure 9: Household income
1. The data for income range was taken in order to determine and compare how much expenditure was being incurred for purchase of water. 29% in Wokha, 24% in Mon and Kohima district, 12% were in the Rs. Rs.30,000 and above income bracket (highest income group). The rest were evenly distributed across the different lower income brackets; with only a slight variation for each category.

Figure 10: Total amount spent on water
1. 73% from Wokha district, 63% Kohima, 61% Mon district and 45% from Mokokchung district spent Rs.100-Rs.1000 buying water in a month.
2. However, in Mokokchung 53% spent Rs. 1,000 – Rs. 5,000 for monthly purchase of water.
3. In Kohima 1% was shown spending a huge amount of Rs. 10,000 to 20,000 on buying water, no other district had shown any indication/response in this category.
4. The amount indicates that expenditure on purchase of water was comparatively high in all the four districts and there may have been purchase of water from multiple agencies, for instance purchase both from the PHED and private suppliers as well.

Figure 11: Daily water consumption per person
1. For most respondents daily water consumption was limited to 50-100 litres’ per day; this was seen from the 73%, responses from Mon district, 72% Kohima, 60% Mokokchung district and 52% from Wokha district. Water usage was therefore for most basic daily needs only like cooking, drinking, for toilet etc. Water insufficiency also plays a role in lack of proper hygienic habits as many in these water stressed areas are forced to limit taking regular daily bath in order to conserve water.
2. 1% in Mon district, 11% Wokha and Mokokchung district consumed 300 litres’ and more daily. No data was found from Kohima in this category showing the severe nature of water scarcity existent particularly in Kohima the capital city of Nagaland.
**Figure 12: Daily water consumption per household**

1. Daily consumption for a household showed usage of 100-1000 litres from 88% respondents in Kohima district, 79% Mokokchung district, 72% Wokha district, and 71% from Mon district. Water usage was kept to a minimum.

2. Kohima district was again distinct in its response showing that no household consumed from 2100 – 3000 litres or more water in a day. Showing the severe nature of water scarcity.

**Figure 13: Main reasons for water scarcity**

1. 5% from Kohima district; 7% Mokokchung district, 8% Wokha district, and 11% from Mon district, stated that scarcity of rainfall was a reason for water scarcity.

2. 19% in Mon attributed it to large scale corruption; 7% in Wokha, 5% in Mokokchung and 4% in Kohima district mentioned the same.

3. However despite other reasons, the main reason stated for this condition by a majority 73% in Mokokchung district was poor management/ improper management of water resources; 69% Kohima district, 61% Wokha district and 60% in Mon district had the same opinion.

**Figure 14: Water scarcity**

1. 77% from Mokokchung district, 75% Mon district, 72% Wokha and 67% from Kohima district responded that they faced water scarcity; showing that most of the districts were having to deal with a reeling scarcity situation.

2. Only 13% in Kohima, 9% Wokha and 7% Mokokchung district stated that they did not face scarcity. An interesting point to note was that there was none among the respondents from Mon district who said they did not face water scarcity.

**Figure 14.1: Period of water scarcity**

1. 87% from Mokokchung, and 74% from Kohima district said that the most severe scarcity was found during the lean period i.e. December-February (post-monsoon season).

2. 16% from Mon district, 12% Mokokchung district, 8% Kohima district and 3% from Wokha district said that they faced scarcity all year round. This situation was unusual given the fact that Nagaland state as a whole gets a
healthy volume of monsoon rain every year. Scarcity was seen to be largely
due to poor management in the districts stated above.

**Figure 14.2: Water scarcity, a reality?**
1. Out of the 13% from Kohima district, 9% Wokha district, and 7% from
Mokokchung district who stated that they did not face any water scarcity (as
shown in figure14); reasons for scarcity were attributed to three conditions
namely, that it was a speculative situation created by environmentalist and
conservationists, by private water suppliers to generate more business, and the
public in general.

**Figure 15: Reliability of water supply (PHED)**
1. An overwhelming majority consisting of 92% from Mon district, and 83%
from Kohima district, expressed that they found the public water distribution
through the PHED utterly unreliable. A lesser but equally significant number
from Mokokchung with 61% and 59% from Wokha district also expressed the
same.

**Figure 16: Source of water to residence**
1. 85% of respondents from Mon district, 81% Mokokchung district, 60%
Wokha district and 53% Kohima district purchased water primarily from the
PHED or the private suppliers for their household water needs.
2. But 47 % respondents from Kohima, and 40% Wokha district, stated that they
relied on their own water sources such as ring wells, natural ponds, and
springs in their vicinity. This shows that certain localities and residences in
were still out of the reach of the piped water supply of the governmental
agencies.

**Figure 16.1: Agency of water supply**
1. The data indicates that respondents were dependent more on the supply of the
private water suppliers as shown by 67% from Mokokchung district, 66% from
Wokha district, and 60% from Kohima district who stated that they purchased
water from private suppliers.
2. Only Mon district showed a variation in response as 77% of the respondents
were completely dependent on the PHED water supply.

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Figure 16.2: Total time of PHED supply
1. There was no case of whole day continuous water supply to the respondents from any of the mentioned four districts.
2. 100% of those who were availing the services of the PHED from Wokha and Mokokchung district stated that total time of supply was less than one hour daily.
3. 80% from Mon district and 75% from Kohima district stated that total time of supply in a day was also less than an hour.
4. This shows that PHED supply was infrequent (supply confined to two or three days a week), and insufficient in all the four districts.

Figure 18: Satisfaction with quality of water supplied by the PHED
1. 89% from Mon district, 83% Wokha district, and 67% from Kohima district expressed dissatisfaction with the quality of water supplied by the PHED. Some of whom stated that there should be more stringent quality check by the PHED and for old rusty broken water pipe lines to be replaced, and for leakages to be repaired.
2. However 70% from Mokokchung district stated that quality of water supplied by the PHED was satisfactory.

Figure 19: Satisfaction with quality of service supplied by the PHED
1. 91% in Kohima district, 84% Mon district, 79% Mokokchung district and 55% from Wokha district expressed dissatisfaction with the service of the PHED, the nodal governmental agency for supply of water to all parts of Nagaland, particularly the rural areas.

Figure 19.1: Reasons for dissatisfaction
1. The main reason for dissatisfaction was given as erratic supply by the majority of respondents; 86% Mokokchung district, 85% Wokha district, 63% Kohima and 59% from Mon district.
2. 34% in Kohima district and 12% Wokha district, 10% in Mokokchung and Mon district gave other reasons such as high cost and poor maintenance of supply pipes, lack of supply in village/locality, and PHED staff being irresponsible towards duty. Some even complained that they were unable to get connection despite repeated appeals to the concerned department. They went on
to say that old pipelines were not replaced despite repeated complains and the problem was further compounded due to the indifferent attitude of staff towards consumers genuine complains.

**Figure 21: Alternative arrangements made for water supply**

1. A regular feature in Nagaland are citizens making their own arrangements to augment the water supply or finding new sources to get more water for daily needs. This alternative arrangement quoted was to supplement the PHED or private water supply. 40% in Mon district, 37% Mokokchung district, and 28% in Kohima and Wokha district made such alternative arrangements.

**Figure 20.1:** Corresponding to the previous question in chart 20, alternative arrangements made by the respondents included making their own ring wells, gathering from natural ponds/ springs, etc. Some respondents even mentioned that they had to go to another locality at midnight or before dawn to avail the water from the sources mentioned above.

**Figure 21: Installation of water harvesting units**

1. 71% in Mon district, 60% Mokokchung district, 47% Wokha district and 40% in Kohima district had made some provision to collect the rain water during the monsoon season.

2. However data also shows that 60% in Kohima district and 53% in Wokha district did not make such provisions leading to wastage of water because it was not collected or harvested properly.

**Figure 22: Pilfering from water source**

1. A consequence of water scarcity was shown by the episodes of pilferage from their water reservoir/tank/ wells at home; 12 % from both Wokha district and Mokokchung district and 10% from Kohima district had experienced it.

2. In Mon district 71% respondents replied that they faced cases of pilferage. It can therefore be deduced that water scarcity was also a cause for a number of social problems as is apparent from the pilferage cases mentioned above.

**Figure 23: Source of water during off season**

1. Those respondents who could not spent money to make/dig their own well were dependent on alternate water source during off-season, since their
primary supply source was not sufficient. Many had to search for water from public water source in their own locality or in another locality.

2. An interesting point to note is 15% in Wokha district, 11% in Mokokchung district, 5% in Mon district and 1% in Kohima district collected water from the ‘nullah’, which means open drain. At the cost of their own health, during severe scarcity they had to resort to such means. Although the water would not be used for drinking purpose, it would be used for cleaning, for toilet and other household uses.

3. Other sources mentioned included collection of water from river in Mon district; ‘ancient community well in the jungle’, and ‘from water source in forests’ in Wokha district etc.

4. Many of them in the four districts voiced their difficulties and said at times ponds and wells in locality were locked up by certain individuals, or groups, making it difficult for them to draw water.

**Figure 23.1: Who draws water from source?**

1. The data shows that during the lean season (off-monsoon) the whole family was involved in fetching water from the sources mentioned. Mentioned was made that this was done mostly at early morning hours and at midnight when there were more chances to get water as other neighbours would be sleeping.

**Figure 23.1(a): Gender of the respondents fetching water**

1. In terms of gender, 65% from Mon district, 58% Wokha district and 56% from Kohima district were females fetching water for their families. They had to walk over long distances and face great difficulty to fetch water at night or early morning hours. Many times the water source would be dried up due to excessive withdrawal, thereby not allowing the water to be replenished for further supply.

2. The only variation was seen in Mokokchung district where 69% were males who fetched water for household use.

**Figure 24: Inconvenience faced drawing water from common source**

1. Some of the respondents from Kohima district even specifically mentioned certain inconveniences such as ‘having to go to other locality to draw water’,
‘staying up late and waking up very early to draw water from neighbourhood source’.

2. As seen by the responses given above despite the great difficulties included in fetching water for the family, apart from 62% in Mon district who said ‘yes’, the other responses were few with 37% from Kohima, 36% from Wokha and 28% from Mokokchung district. The rest seemed to have conditioned themselves to the prevailing situation created water scarcity.

Figure 24.1: Timing for collection of water for household

1. In Mon district the most preferred time was ‘3:00 a.m. - 5:00 a.m.’ in the morning as 39% woke up early to fetch water at this time. In Kohima district 25% said ‘2:00 a.m. – 4:00 a.m.’, another 25% ‘4:00 a.m. - 6:00 a.m.’; in Wokha district 42% had to wake up as early as 4:00 am-6:00 a.m. to fetch their daily water requirement. Finally in Mokokchung38% said ‘2:00 a.m. – 4:00 a.m.’.

2. 7% in Mon district, 11% Kohima district, 8% Wokha and 14% in Mokokchung district said that water was collected at midnight between ‘9:00 p.m.- 1:00 a.m.’.

3. Most respondents had to wake up very early to fetch water for their household, some even staying up at midnight to collect water from neighbourhood springs or wells. This shows that the public water distribution system did not meet the requirements of the public in general, who had to take great trouble, in time consuming effort to supplement their water consumption.

4. This data indicates accountability of the public water distribution was not clear as to which agencies/ governmental agency should look to the needs of the public in general as seen by the examples of the responses taken from areas spread across four districts.

Figure 25: Water depletion in common source

1. According to the data collected 52% in Wokha district, 51% Kohima district, 37% Mokokchung district, 27% in Mon district said that they faced situations when the water in their common source was exhausted by the time
their turn came to draw water, suggesting that the natural springs/wells in various localities/villages did not suffice the needs of the respondents.

2. Only 28% in Mokokchung district, 19% Mon district, 16% in Kohima and 13% in Wokha district said there was no depletion of water in their regular source.

**Figure 26: Concern over looming water scarcity in the future?**

1. Due to the prevailing condition of water depletion in the state, there is great concern over severe scarcity as seen in the responses from the four districts under study. 95% from both Kohima and Wokha, 93% Mon district, 83% from Mokokchung district expressed great concern over the situation.

**Figure 27: Monopoly over water source**

1. From the responses gathered, 68% respondents in Mon district, 62% Kohima district, 52% Wokha district and 43% in Mokokchung district stated that monopoly over water source was prevalent in general. The responses indicate that monopoly over water sources by certain individuals/groups have become more common over the years in many districts in Nagaland.

2. Only 8% from Mon district, 16% Wokha district, 17% Kohima and 32% from Mokokchung district stated that they had not encountered such a case.

**Figure 28: Conflict over water source**

1. Conflict and contestation over water resources are increasingly becoming common in Nagaland over the years showing a transition from the earlier times when water resources were shared without any restriction or reservation. Conflicts can be over smaller water sources like natural ponds or springs, wells or even over sharing of larger streams or rivers. 29% from Kohima district, 13% Mon district, 12% Wokha district, and 7% Mokokchung district stated that there were clear cases of water conflict in their area.

**Figure 29: Water conflict in locality**

1. The responses indicate that there were incidents of water conflict in some localities in the four districts as seen by the response of 87% from Mon district, 56% Kohima district, 53% Wokha district, and 41% from Mokokchung district who replied in the affirmative. This data indicates water conflict and contestation is common in pockets of the four districts as a whole.
Figure 29.1: Reason for conflict

1. Scarcity of water seems to be the main reason stated by most of the respondents from the four districts; 62% from Wokha district, 55% Mon district, 52% from Kohima district and 48% from Mokokchung district gave this very reason for conflict in their areas.

2. Monopoly over water resources was quoted by 36% from Kohima, 23% each from Wokha and Mokokchung districts, and 20% from Mon district.

3. Interestingly, responses from Mon district such as 'damage of PHED water reservoir during general election period in locality’, shows the emerging trend of politicization of water as such incidents were caused between opponent parties in the elections.

4. Conflict was also caused over ownership issue, breaking of water supply line/pipes’, and ‘diverting water to other source’.

Figure 30: Conflict resolution

1. In Mon district 58% said conflict resolution over water was done with the intervention from Gaonbora of the locality; Kohima district shows a more democratic style of resolution as 73% said resolution is made between the two or more parties involved; this trend is also seen in Wokha district with 44% saying it was done the same way. 30% of the respondents from Mokokchung said ‘chairman of the locality’, and 28% stated ‘resolution is made between the two/or more parties involved’ and 25% ‘elders of village/town/colony.

2. The above data shows that there are systems established in Naga society to address such issues if and when it presents itself.

3. The above responses show that in case of conflict situations, resolution was made according to the nature or severity of the problem; the responses also show the systems established in society to address such issues which had developed over the years.

4. Intervention in a more urban set up (towns/cities) was done by ‘chairman of the colony’, elders, the gaonbora (village elder,) or the parties concerned. However, usually in a rural set up, the village council, the concerned khel members and representatives, or individuals involved, all collectively continue to resolve conflict cases in Nagaland.