

# DISTRIBUTION AND AVAILABILITY OF SOURCES OF WATER SUPPLY IN RURAL AREAS OF MIZORAM

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## *Abstract*

*Sources of water supply in rural areas of Mizoram can be broadly classified into four categories; among the water sources, public piped water points and village spring sources constitute major sources of water supply in rural areas while drilled water points and rain harvesting are less significant because firstly, rain water harvesting is done only during rainy seasons and secondly, drilled water point can be set up only in those rural areas which are either connected by national or state highway.*

*It is well understood that the region owing to its tropical location and falls under the direct influence of the south west monsoon, it receive adequate amount of rainfall, besides, the region is endowed with several rivers, streams and their tributaries. In spite of the available water resources, several rural areas face acute and perpetual problem of water supply. This is mainly because several water sources are dried up mainly due to human occupation, settlement, large-scale deforestation and the impact of traditional practices like shifting cultivation.*

**Keywords:** *rural, water, water point, public, government*

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## Introduction:

Provision of drinking water in the rural areas is the responsibility of the state government and funds have been provided in the state budget right from the commencement of the First Five Year Plan in 1951. Taking into account the magnitude of the problem and in order to accelerate the pace of coverage of villages without water supply, Government of India introduced the *Accelerated Rural Water Supply Programme* (ARWSP) in 1972-73. The states and Union Territories were assisted with cent per cent grants-in-aid to implement the schemes in villages without water supply.

In 1974-75 with the introduction of *Minimum Needs Programme*, ARWSP was withdrawn. However, it was reintroduced in 1977-78 when it was found that the progress of safe drinking water to the villages was not as per expectation. In August 1985, the subject of Rural

Water Supply was transferred from the Ministry of Urban Development to the Department of Rural Development with the objective of securing quick implementation and better integration with other rural development Programmes. *The National Drinking Water Mission* was launched as one of the five societal missions in 1986. The Mission was renamed as *Rajiv Gandhi National Drinking Water Mission*.

From 1990 onwards, a minimum of 25 per cent ARWSP funds have been earmarked for provision of water supply for SC's and 10 per cent for drinking water supply for ST's. Such funds cannot be diverted for any other purpose. As a part of Dr. Baba Saheb Ambedker Centenary programme, Government of India allocated further special assistance of Rs 60 crore in 1991-92 to 24 states for the coverage of 30,000 SC\ST habitations with safe drinking water facilities.

The Government of India also provides assistance to the state under the programme of Accelerated Rural Water Supply Programmes while insisting upon State Government to provide equally matching share under Minimum Needs Programme. Under this programme, water supply to the rural habitation is provided based upon locally resource available through piped water supply scheme, installation of hand pump, tube wells, construction of rainwater harvesting tanks, improvement of village spring sources and construction of impounding reservoirs. Besides, rural schools are also to be covered with drinking water facilities under this programme.

### **Types of Rural Water Supply in Mizoram:**

Public piped water point, village spring source and drilled water point constitute the main types of water supply in rural areas of Mizoram. These are the three importance sources of water in rural areas in which water is obtained by the villagers for their daily domestic uses. Notably, among the three types of rural water supply, spring water (tuikhur) and public piped water point are the most common sources of water supply, apart from this; drilled water point also contribute to a certain extend. During rainy season, rain water harvesting has been done on a large scale which provides an important source of water supply for domestic consumption. Types of water supply in rural areas of Mizoram are briefly analyzed as follows:

#### **1. Public-Piped water Point:**

There are two types of public piped water points such as gravity feed system and pumping system. Gravity feed public piped water point is a simple method in which water is obtained from the nearby perennial stream or spring which are located at a higher elevation. Several G.I. pipes or polythene pipes are joined at each ends and a small dam is

made across the stream or spring where water would accumulate and by connecting the required number of pipes between the small dam and the main storage reservoir, water began to flow from the dam and accumulates into the reservoir.

This system comprises of conveyance main storage reservoir, distribution network and several taps stands to the consumers end. Pumping system is the method of lifting water from the river or stream through high lift pump driven by power in which water is transported to the storage reservoir. The location of reservoir is selected at the higher elevation and distribution point is also selected at convenient place from where water is distributed to the consumers.

*a). Block-Wise Coverage of Village by Public Piped Water Points:*

Public piped water points; both gravity feed and pumping system constitutes one of the important source of water supply in rural areas of Mizoram. Block-wise coverage of village by public piped water points shows that 401 (59.14%) village were covered by public piped water point in 2014. The overall coverage indicated that while more than half i.e. 59.14 % of the villages were covered by public piped water points, at the same time 277 villages still remained uncovered by this facility.

Block-wise availability of public piped water points shows that 17 R.D. Blocks has attained higher coverage than the overall average and it is lower in 9 R.D. Blocks. A part from the above analysis, share of public piped water points both by households and persons has been be examined; this will enable us to understand the spatial variation of water supply in rural areas of Mizoram.

Table-1

**Coverage of Village by Public Piped Water Point, Village Spring Source and Drilled water Points in Mizoram, 2014**

	Name of Block	No. of Villages	No. of Village Covered by Public Piped water Point	No. of Village Covered by Spring Water	No. of Village Covered by Drilled Water
1	Reiek	22	16 (72.7 %)	21 (95.4%)	5 (22.7 %)
2	W. Phaileng	19	9 (47.3 %)	17 (89.4%)	3 (15.7 %)
3	Zawlnuam	40	15 (37.5)	37 (92.5%)	3 (7.5 %)
4	Bilkhawthlir	17	17 (100)	16 (94.1%)	2 (11.7 %)
5	Thingdawl	15	13 (86.6)	15 (100%)	5 (33.3 %)
6	Aibawk	20	5 (25)	20 (100%)	9 (45 %)
7	Darlawn	27	15 (55.5)	24 (88.8%)	9 (33.3 %)
8	Phullen	12	12 (100)	11 (91.6%)	4 (33.3 %)
9	Thingsulthliah	16	14 (87.5)	15 (93.7%)	4 (25 %)
10	Tlangnuam	11	7 (63.6)	11 (100%)	4 (36.3 %)
11	Champhai	10	9 (90)	8 (80%)	0 (0 %)
12	Khawbung	25	25 (100)	23 (92%)	5 (20 %)
13	Khawzawl	30	27 (90)	27 (90%)	9 (30 %)
14	Ngopa	14	14 (100 %)	14 (100%)	5 (35.7 %)
15	E. Lungdar	11	8 (72.7 %)	11 (100%)	5 (45.4 %)
16	Serchhip	23	20 (86.9 %)	23 (100%)	3 (13.04 %)
17	Bunghmun	35	4 (11.4 %)	35 (100%)	0 (0%)
18	Hnahthial	21	18 (85.7 %)	21 (100%)	7 (33.3 %)
19	Lunglei	38	26 (68.4 %)	37 (97.3%)	4 (10.5 %)
20	Lungsen	62	25 (40.3 %)	59 (95.1%)	0 (0 %)
21	Bungtlang South	28	19 (67.8 %)	28 (100%)	0 (0 %)
22	Chawngte	69	17 (24.6 %)	19 (27.5%)	0 (0 %)
23	Lawngtlai	33	2 (6.06 %)	33 (100%)	0 (0 %)
24	Saiha	19	15 (78.9 %)	15 (78.9%)	4 (21.05 %)
25	Sangau	21	18 (85.7 %)	18 (85.7%)	1 (4.7 %)
26	Tuipang	40	31 (77.5 %)	26 (65%)	6 (15 %)
	<b>Total</b>	<b>678</b>	<b>410 (59.14 %)</b>	<b>584 (86.13%)</b>	<b>97 (14.30 %)</b>

*Sources: Calculated from Block Level Statistics, 2008-2014*

*b) Block-Wise Share of Public Piped Water Point / Household:*

In 2014, the total number of public piped water points in rural areas was 3,433, out of the total water sources; public piped water points contributed 58.77 % of the total water sources in Mizoram. At the Block level the share of public piped water point on an average is 31.14 households. Block-wise availability of public piped water point / household again differs significantly from one Block to the other; the share of public piped water point at the Block level shows that 15 Blocks has a higher share than the overall average while 11 Blocks has a lower share.

Table-2

**Share of Public Piped Water Point / Household and Persons, 2014**

	Name of Block	No. of Water Point	Total Population	Total Households	Share / person	Share / Household
1	Reiek	78	14,231	2,854	182.44	36.58
2	W. Phaileng	27	21,657	4,244	802.11	157.18
3	Zawlnuam	201	32,688	6,853	162.62	34.09
4	Bilkhawthlir	194	15,238	3,455	87.54	17.8
5	Thingdawl	211	19,758	3,943	93.63	18.68
6	Aibawk	46	18,167	3,455	394.93	75.1
7	Darlawn	194	24,353	4,309	125.53	22.21
8	Phullen	129	14,624	2,523	113.63	19.55
9	Thingsulthliah	244	24,108	4,322	98.8	17.71
10	Tlangnuam	38	14,317	2,951	376.76	77.65
11	Champhai	106	9,808	1,827	92.52	17.23
12	Khawbung	337	24,416	4,568	72.45	13.55
13	Khawzawl	244	26,396	5,047	108.8	20.68
14	Ngopa	103	20,555	3,607	199.56	35.01

	Name of Block	No. of Water Point	Total Population	Total Households	Share / person	Share / Household
15	E. Lungdar	89	12,002	2,253	134.85	25.31
16	Serchhip	319	22,120	4,039	69.34	12.66
17	Bunghmun	43	19,616	3,445	456.18	80.11
18	Hnahthial	180	22,245	4,018	123.58	22.32
19	Lunglei	124	22,105	4,433	178.26	35.75
20	Lungsen	146	27,791	7,591	190.34	51.99
21	Bungtlang South	36	17,876	3,584	496.55	99.55
22	Chawngte	96	43,508	9,384	453.2	97.95
23	Lawngtlai	7	20,034	4,160	2863	594.28
24	Saiha	43	12,363	2,441	287.51	56.76
25	Sangau	108	19,098	3,527	176.83	32.65
26	Tuipang	90	20,873	4,103	231.92	45.58
	<b>Total</b>	<b>3,433</b>	<b>5,41,137</b>	<b>1,06,932</b>	<b>157.62</b>	<b>31.14</b>

*Sources: Calculated from Block Level Statistics, 2008-2014*

*c). Block-Wise Share of Public Piped Water Point / Person:*

A detailed study of public piped water point / person in rural areas is also quite evident. On an average, the share of public piped water point for the whole R.D. Blocks in Mizoram is 157.62 persons. The overall share of public piped water point indicated that it is lower in 11 R.D. Blocks whereas it is higher in 15 R.D. Blocks. It is interesting to note that one public piped water point is shared by 2,863 persons in Lawngtlai R.D Block, the share is comparatively lower in Serchhip R.D. Block which recorded the lowest share; where one public piped water point is shared by 69.34 persons only.

From the above analysis it can be observed that the availability of public piped water point at the Block level is

characterized by uneven share as indicated by both households and persons. Thus it can be assumed that water supply in rural areas through public piped water point is sufficient in some R.D. Blocks, at the same time it is well understood that water supply from public piped water point in some rural areas is far from satisfactory and continue to remain a serious problem in certain rural areas. It should however, be noted that public piped water point do not provide continuous water supply especially gravity feed water point. The nature of water supply by gravity feed water point differs from one village to the other; availability of water from the public piped water point may be once or twice a week, sometimes only once a month.

## **2. Spring Water:**

By far the most important source of water supply in rural areas of Mizoram is spring water, with a few exceptions; in every village there are spring water sources. It is largely used for drinking, cooking, cleaning and washing. Water is collected manually from the spring by using bucket or by any other convenient materials available. Generally young men and women including children upto 12 years and above took the responsibility of collecting water and the frequency of fetching water depends on the size of the family members; usually 4 to 5 times a day. The dependence on village spring water is very high especially during summer when the water sources become dry. The number of spring water varies according to the size of the village and population.

Improvement and construction of spring water source nearby or within village has been undertaken by the state Government under National Rural Water Drinking programme and it has been named as Improvement of Village Spring Source (IVSS). The system of construction consists of RCC or stone masonry structure in rectangular shape with GCI roofing. In



2010-2011 according to the report on Village Level Statistic published by Directorate of Economic and Statistic; the total number of village spring source in the entire rural areas was 2,194.

*a). Block-Wise Coverage of Village by Village Spring Source:*

In 2014, 584 villages were covered by village spring source; this shows that 86.13 % of the village is covered by village spring source. The remaining 94 villages continue remained uncovered. Block-wise coverage by village spring source shows that it is generally high, 21 R.D. Blocks recorded a higher coverage than the overall average. The lowest coverage is recorded by Chawngte R.D. Block (27.5 %) followed by Tuipang R.D. Block (65 %).

*b). Block-Wise Share of Spring Water / Household:*

Block-wise share of village spring source on an average is 48.73 households but the availability of spring source differs when comparison is made from one Block to the other. The lowest share of spring water / household is found in Reiek R.D. Block, where one spring source is share by 26.18 households. The study of spatial coverage of village by spring source clearly reveals that the share of village spring water / household is very high in Chawngte R.D. Block, on an average one spring source is share by 110.40 households. At the Block level for the whole Mizoram, 13 R.D. Blocks has recorded higher share of village spring source / household, while 13 R.D. Blocks has a lower share than the overall average.

Table: 3

**Share of Village Spring Water/Household and Person,  
2014**

	Name of Block	No. Spring Water	Total Population	Total Households	Share / Person	Share / Household
1	Reiek	109	14,231	2,854	130.55	26.18

	Name of Block	No. Spring Water	Total Population	Total Households	Share / Person	Share / Household
2	W. Phaileng	62	21,657	4,244	349.3	68.45
3	Zawlnuam	126	32,688	6,853	259.42	54.38
4	Bilkhawthlir	71	15,238	3,455	214.61	48.66
5	Thingdawl	102	19,758	3,943	193.7	38.65
6	Aibawk	116	18,167	3,455	156.61	29.78
7	Darlawn	103	24,353	4,309	236.43	41.83
8	Phullen	61	14,624	2,523	239.73	41.36
9	Thingsulthliah	112	24,108	4,322	215.25	38.58
10	Tlangnuam	86	14,317	2,951	166.47	34.31
11	Champhai	47	9,808	1,827	208.68	38.87
12	Khawbung	72	24,416	4,568	339.11	63.44
13	Khawzawl	107	26,396	5,047	246.69	47.16
14	Ngopa	48	20,555	3,607	428.22	75.14
15	E. Lungdar	45	12,002	2,253	266.71	50.06
16	Serchhip	117	22,120	4,039	189.05	34.52
17	Bunghmun	105	19,616	3,445	186.81	32.8
18	Hnahthial	84	22,245	4,018	264.82	47.83
19	Lunglei	134	22,105	4,433	164.96	33.08
20	Lungsen	147	27,791	7,591	189.05	51.63
21	Bungtlang South	59	17,876	3,584	302.98	60.74
22	Chawngte	85	43,508	9,384	511.85	110.4
23	Lawngtlai	55	20,034	4,160	364.25	75.63
24	Saiha	30	12,363	2,441	412.1	81.36
25	Sangau	48	19,098	3,527	397.87	73.47
26	Tuipang	63	20,873	4,103	331.31	65.12
	Total	2,194	5,41,137	1,06,932	246.64	48.73

*Sources: Calculated from Block Level Statistics, 2008-2014*

*c). Block-Wise Share of Village Spring Water / Person:*

As mentioned above village spring source constitute a major source of water supply in rural areas where an overwhelming population obtained water for their daily requirement. Block-wise share of village spring water / person is by and large very high in almost all the R.D. Blocks. On an average 1 village spring source is share by 246.64 persons but a closer examination again indicated that the share of village spring source also differs quite significantly. Thus, the highly dependence on village spring sources in rural areas can be observed from the share of village spring source by taking into account the share by both the households and persons. It can be observed from the table given above that the share of village spring source / person is generally high, as compared to the overall average for the whole state, 14 R.D. Blocks has a lower share while it is higher in 12 R.D. Blocks.

**3. Drill Water Point:**

The ground water exploration and extraction is being conducted by PHED, Mizoram since 1987 by using drilling rig mounted on a truck. Bores are drilled upto an average of 50 meters depth and Indian mark-III is installed for lifting ground water from the bore hole. The record shows that 2,889 nos of bore holes were drilled so far out of which 1806 nos. of bore holes are successful and fitted with hand pump. Thus the success percentage have been achieved satisfactory that is more than 60 % and it is useful and important in the field of water supply system in Mizoram and having significant contribution of water supply level.

However, it could be assumed through field investigation and observation that bore hole, wells drilled and construction of hand pumps in the state of Mizoram were shallow tube well mainly controlled by localized potential with secondary structure

possessing of independent parameters. Therefore, it is difficult to arrive at any relevant conclusion regarding the nature and thickness of aquifers, depth of the ground water table, yield etc. So it can be understood that any information that can be tapped in hilly region like Mizoram is bounded to produce only limited yields. But somehow it is sufficient to supplement domestic water supply.

*a). Block-Wise Coverage of Village by Drill Water Point:*

As compared to the Block-wise coverage of village with other types of water supply, drill water point covered only a mere 14.30 % of the village in Mizoram. This may be attributed to various factors like inaccessibility, lack of infrastructure, hilly terrain, depth of ground water table and so on. Besides, bores cannot be drilled in those villages which are not connected by truckable road because bores are drilled by using drilling rig mounted on a truck. Most of the drilled water points are found in those villages which are connected by either National Highway or State Highway.

In 2014, there were no drill water point in 6 R.D. Blocks and only 97 villages were covered by drill water point. Eventhough, drilled water point is set up in 20 R.D. Blocks; an in-depth study shows that it is generally low throughout all the rural areas of Mizoram. Of the three water sources mentioned above drill water point comprise only 8.96 % of the total water sources in rural areas of Mizoram.

**Conclusion:**

In Mizoram, provision of water supply and Sanitation in rural areas is undertaken by the State Public Health Engineering Department which was set up in 1975. The main objective is to provide safe water supply and sanitation facilities to all citizens

in the State of Mizoram. Field investigation by conducting proper survey, planning and design, construction of dams, impounding reservoirs, rain water harvesting tanks etc. and quality control, operation and maintenance are the responsibilities of this Department to achieve its specific objectives.

As already stated, Mizoram had undergone several administrative changes in the past, it also remains as disturbed area for about 20 years, therefore, it is not possible to present the achievement of the previous programmes and projects with reference implementation of rural water supply mainly due to lack of proper records, data and relevant information. The previous programmes such as ARWSP, Swajhaldara and others though it was taken up in Mizoram but lack of records and information hinders to examine and bring out the implementation and achievement of rural water supply under various centrally sponsored schemes. The only available and relevant information is the latest and the present programme known as '*National Rural Drinking Water Programme*'.

An important measures implemented under NRDWP includes installation of hand pump, construction of rainwater harvesting tanks, and construction of impounding reservoirs. Besides, planning and design, construction and quality control, operation and maintenance, creating awareness among the local people regarding safe and clean water supply in rural areas of Mizoram also comes under NRDWP to achieve its specific objectives.

In 2008-09, the Central Government sanctioned a sum of Rs 5,419.26 lakhs for the implementation of NRDWP in Mizoram; after thorough and proper investigations 56 villages from different R.D. Blocks were selected for the implementation of this programme. In 2009-10 *National Rural Water Drinking*

*Programme* was again implemented in 124 villages, the total fund allocated for this programme was Rs 5,435.93 lakhs, the record showed that and all the fund was utilized for providing water supply in the rural areas. In 2010-11, another 96 villages were selected for the implementation adequate water supply under NRDWP; the total fund allocated in this year was Rs 4,369.83.93 lakhs. From 2008-2011, under NRDWP 276 villages were provided with adequate and safe water supply. Within a period of four years about 40 percent of the villages in Mizoram were covered with NRWDP.

A part from this another 128 villages were proposed to provide with adequate water supply in 2011-2012 under NRDWP. Thus if the present trend continue regarding the implementation of NRDWP for providing safe drinking water in the rural areas, by the end of 2012; 59.58 percent of the village will be benefitted by the above mentioned water supply programme.

Finally, the present investigation only endeavours to study availability and sources of water supply in rural areas. It is hoped that this study will provide basic materials for an in-depth study towards ways and means for the improvement of adequate water supply in the rural areas. Nevertheless, there is enough scope for improvement upon the present work and this required further research and detailed field study covering every nook and corner of the state.

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