GOVERNMENT OF INDIA
MINISTRY OF JAL SHAKTI
DEPARTMENT OF WATER RESOURCES, RIVER DEVELOPMENT AND GANGA REJUVENATION
CENTRAL GROUND WATER BOARD

GROUND WATER YEAR BOOK

PUNJAB STATE & CHANDIGARH UT
2023-24

CENTRAL GROUND WATER BOARD
NORTH WESTERN REGION
CHANDIGARH

NOVEMBER 2024

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FOREWORD

Central Ground Water Board has been monitoring ground water levels and ground water quality of the country since 1968 to depict the spatial and temporal variation of ground water regime. The changes in water levels and quality are result of the development pattern of the ground water resources for irrigation and drinking water needs. Analyses of water level fluctuations are aimed at observing seasonal, annual and decadal variations. Therefore, the accurate monitoring of the ground water levels and its quality both in time and space are the main pre-requisites for assessment, scientific development and planning of this vital resource.

Central Ground Water Board, North Western Region, Chandigarh has established Ground Water Observation Wells (GWOW) in Punjab State & Chandigarh UT for monitoring the ground water levels. As on 31.3.2023 there were 488 Ground Water Observation Wells in Punjab which include 115 dug wells and 373 piezometers for monitoring shallow & deeper aquifers. There are 23 observation wells in Chandigarh (1 dug wells and 22 Piezometers for monitoring shallow & deeper aquifers). These observation wells are being monitored four times a year in the months of Jan, June, August and November being undertaken simultaneously throughout the country. This report presents the observations and findings for the period from June 2023 to January 2024.

Mr. Ayush Kesharwani, Scientist 'B' (Hydrogeology) has made concerted efforts to compile and analyse the data and prepare the report in the present form. The chapter on hydrometeorology has been compiled and contributed by Sh Aditya Sharma, Scientist 'B' (Hydrometeorology).

This report incorporates all the analytical data on ground water monitoring done in Punjab State & Chandigarh UT and provides valuable information on prevailing ground water regime to the user agencies and other stakeholders as well.

(Vidya Nand Negi)
Head of Office

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1.0 INTRODUCTION

The Punjab State is located between North latitudes 29º 32' and 32º 28' and East longitudes 73 º 50' and 77 º 00'. The total geographical area of the state is 50476 sq. km. It is surrounded by the states of Himachal Pradesh in the northeast, Jammu and Kashmir in the north and Haryana and Rajasthan in the south and southwest respectively. The State has a flat alluvial plain except a narrow belt along the southwestern parts where stable sand dunes are seen dotting the landscape. The area occupied by the mountains (Himalayan foothills) in northeast, is about 1243 sq km. Perennial Rivers Sutlej, Beas, Ravi and ephemeral river Ghaggar drain the state. It has a vast network of canal system. With the inception of canals, the fertile land of the State started converting into green fields and experienced spectacular achievement in agricultural production with emphasis on cultivation of paddy and high yielding varieties of crops, as a consequence demand for water increased manifold resulting in over exploitation of ground water resources.

The State has been divided into four main divisions viz. Jalandhar, Patiala, Ferozpur and Faridkot, which are further sub-divided into 22 districts, which are further divided into 77 sub-divisions /tehsils and 146 community development blocks.

1.1 PHYSIOGRAPHY

The State forms a part of vast Indo-Genetic alluvial plain. Physiographically, the State can be divided into seven distinct units, which run parallel to each other.

- **I.** Hilly area: Siwalik Hills on the north and northeastern part.
- **II.** Eroded hills with flat land (Plateau): forms top of hills.
- **III.** Intermountain valleys
- **IV.** Piedmont area: (Kandi zone) immediately southwest of hills.
- **V.** Sirowalzone: lies further southwest of Kandi area which merges with the alluvium of Ravi, Beas, Sutlej and Ghaggar rivers.
- **VI.** Sand Dunes: Covering southwest part.
- **VII.** Bar upland areas: Higher elevated land which remained beyond the reach of rivers but are composed of ancient river channels deposits (older alluvium) plains.
- **VIII.** Alluvial plains: Active/recent flood plains include meanders and present flood plains. Abandoned flood plains include terraces of rivers, abandoned during Recent age.

1.1.1 HILLY AREA

The outermost low-lying Siwalik Hills of the Himalayas occupy the NE part. These are the deposits of the Indus River and comprised of alluvial, derived from the higher mountains, which were swept down by their numerous rivers systems and part of Siwalik rock formations have been involved in the latest Himalayan tectonic movements by which they have been folded, faulted and elevated into their outermost foothills. These occupy northern and northeastern part of Gurdaspur, Hoshiarpur, Nawanshahr and Ropar (Roopnagar) districts. These hills traverse NW – SE direction and forms the boundary with neighboring State of Himachal Pradesh. In Gurdaspur district, the hills extend from Ravi River on northwest to Beas River on the southeast. In Hoshiarpur and Nawanshahr districts, the hills cover northeast parts and extend from Beas to Satluj Rivers. These foot hills separate the main Himalayan ranges from the vast Indo- Genetic alluvial plains. The hilly region is intersected with numerous streams which remain dry during major part of the year except during rainy season when

these carry flood water. The highest peak in the area is 900 m above M.S.L. The hills present uneven topography and at places are highly eroded. The gradient is varying in the hilly areas.

1.1.2 ERODED HILLS WITH FLAT LAND

These areas lie within Upper Siwalik formations and locally known as `Beet' meaning waterless. The flat surface lands (plate or table lands) occur in Hoshiarpur district and these are fertile land composed of sandy clay and support irrigational activities.

1.1.3 INTERMOUNTAIN VALLEYS

Intermountain Satluj valleys extend from Nagal to Roper along the Satluj River. It is a longitudinal valley and about 40 Km. in length having an average width of 5 Km. High land river terraces are seem on the north east and eastern part of the area which have been deeply eroded and furrowed to form " bad land" topography. The thickness of valley fill is very limited and here an average of 50 m below ground level. Another valley known as " Soon nadir valley " is an intermountain valley in the outer Himalayas extending from Daulatpur in Himachal Pradesh to Hazipur (Punjab). It runs in southeast-northwest direction and follows the general strike direction of the mountain ranges. It has a length of 20 Km and width ranges between 1.5 km to 3 km and in Punjab State. This valley portion extend along the left bank of Soon nadir and along its right bank, Siwalik Hills are exposed.

1.1.4 PIEDMONT AREAS

The transitional area between the alluvial plains and mountainous range of the Himalayan foot hills forms the Piedmont area shown in Plate-1.2. These consist of alluvial fans which have been dissected by hill torrents and small perennial streams; much of the detritus material has been reworked separately by sheet flooding. The lower southeast slopes of the piedmont forms 'Sirowal zone'. In Punjab State, piedmont area is known as "Kandi", and occupies Southwest part of lower Siwalik Hills. The gradient is steeper near the hills and gentler towards plains. The width of 'Kandi belt' varies from 6-10 km. having rolling type of the topography. In Gurdaspur district, the spring line runs parallel to the southwestern boundary with 'Sirowal zone'. But in Hoshiarpur, and Ropar districts, the spring line (auto flow) do not exist hence boundary between Kandi and Sirowal could not be precisely demarcated.

1.1.5 SIROWAL ZONE

It lies further southwest of Kandi belt. The topographic gradient is gentler as compared to Kandi and presents very low relief. In Gurdaspur district, the Sirowal zones occupy immediately SW of spring line and have an undulating topography.

1.1.6 ALLUVIAL PLAINS

This forms a dominant physiographic unit and consists of alluvium of the Indus River with its present and ancestral tributaries. The alluvium was deposited by Ravi, Satluj, Beas and Ghaggar rivers. The plains have altitude of less than 300 m above M.S.L. The master slope is towards southwest and matches with the course of the rivers. The alluvial plains have been further divided into three sub-physiographic units based on the present relationship of the surface features to the rivers. These are as follows:

- Recent Flood Plains
- Abandoned Flood Plains
- Bar Upland Areas

RECENT FLOOD PLAINS

These include the meandering zone and present flood plains of the rivers. The meanders, scars, sandbars, natural levees and back water swamps are the conspicuous features of the flood plains. Along the major rivers, there are low flood plains locally called 'Bet'. The recent flood plains are often separated from the upland plains by steep slopes. The water levels are shallow in 'Bet' area.

ABANDONED FLOOD PLAINS

These are parallel to the rivers and are a few meters higher than the recent flood plains. They represent flood plains that have been abandoned in recent times by the major rivers.

BAR UPLANDS

These are large areas of relatively older alluvium and found in the Upper Bari Doab area and are elevated lands above the bordering flood plains. These remain beyond the reach of flood waters of the present river systems and are termed as "Bar Uplands" These are the most significant physiographic features of the alluvial plain. Typically, the bar uplands rise abruptly from the abandoned flood plains and are bordered by steep scarps. In Gurdaspur district, bar upland areas are characterized by undulating topography, dendritic drainage pattern and predominance of nodular "kankar".

1.1.7 SAND DUNES

These occupy southwestern part of the state which experiences semiarid type of climate and constitute about 28% of the area. These are spread over about 10-15 percent of the area and cover parts of Firozpur, Mansa, Bathinda, Muktsar, Kapurthala, Sangrur, Faridkot and Patiala districts. The area is bounded by 29^{o}33' and 30^{o}36' north latitudes and 74^{o}18' & 76^{o}12' east longitudes. These dunes are mostly isolated type and vary in size and height. The sand dunes form a thin layer over the alluvium.

1.2 DRAINAGE

The Ravi, Beas, Satluj and Ghaggar rivers along with West and East Beins and the non-perennial choes and Khads drain the Punjab State. The Ravi flows along the northwestern boundary and forms the international boundary with the Pakistan. The Satluj forms the international boundary with Pakistan in the south-western part of the State. Ghaggar river flows along the southeast boundary of the State and forms the boundary with Haryana State except at a few places where villages of Punjab lies on the left bank of Ghaggar river and Haryana villages occupy right bank of the river. All rivers flow in the southwest direction except the Satluj River which roughly flows from east to west up to Harike and from Harike it assumes southwesterly trend uptoFazilka. The Satluj and Beas rivers have been damed by construction of Bhakra dam and Pong dam respectively. After the Construction of Ropar headworks barrage, the Satluj River has water only during the rainy season on downstream of Ropar. At Harike Patten, it carries the flow regenerated by ground water effluent seepages. Soannadi originates near Daulatpur (H.P) and all the choes from the Western slopes of ChintaPurni range (H.P.) flow into it. The Soan nadir joins the Satluj near village Bhalan. All the rivers rise from Himalayas and after traversing long courses, they debouch into the plains. Apart from the perennial rivers, there are other important seasonal streams, choes and drains. The sub-montainous zone is traversed by a number ofchoes. Some of them contribute to the rivers while others terminate without merging into any river. These 'choes' remain dry for most part of the year. Their discharge is irregular and runoff during the monsoon period.

In Upper Bari Doab tract, ChakkiKhad a perennial tributary of the Beas drains mainly the 'Kandi' belt. The Naumuni and Kiran are two tributaries of the Ravi and drain north western parts of this tract. The Patti nala drains the southwestern part of the area and joins the Satluj River. The Kiran nadir originates in north of village Isarampur in the close vicinity of KeshopurChhamb. It is fed by ground water seepage and the excess water of Upper Bari Doab canal is also diverted into it. In addition to these tributaries, there are several khads traversing 'Kandi' belt which remain dry except during rainy season. Some of the major Khads like 'PungotriKhad' traverse even beyond the spring line. Such Khads gain water through ground water effluent seepage. The Bist Doab tract is traversed by about 85 hill torrents known as choes, which debouch into plains. There are two main drainage patterns in this tract and both are perennial.

- Eastern or white bein
- The western or black bein.

The eastern or White Bein originates near Garhshankar village of Hoshiarpur district and joins Satluj River near Lohian after traversing the Bist Doab tract. The Nasrala, Mehlanwali, Rajni Devi, Mehandpur, Jaijonchoes join the east Bein at different places. The Western or Black Bein rises at Chhamb near Dasuya in Hoshiarpur district and joins the Beas river near Durgapur which is located upstream of its confluence with Satluj at Harike. Janauri, Mehngerwala and Kingranwala join the West Bein. In Ropar district BudkiNadi, Haripur nala, Sugh Rao, SiswanNadi, Jainti Devi Ki Rao and Patiali Ki Rao forms the major drainage system. These all meets Satluj River except Patiali Ki Rao and Jainti Devi Ki Rao which gives water to Ghaggar River. The third zone forming the southeastern part of the State is drained by Ghaggar River which is perennial. Tangri nadir, Budha nala and Lissara nala are the main seasonal streams in the area. In south western part, some of the important drains are the Phidda drain, Chand Bhanja drain and Jallalabad drain etc.

1.3 SOILS

The soils of Punjab have largely developed on alluvium- the material laid by the rivers, under the dominant influence of climate followed by topography and time. The details of the soils found in the state are as follows.

1.3.1 REDDISH CHESTNUT SOILS:

These soils occur on stable terraces in the north and north eastern Parts of the state and are found in Pathankot Tehsil of Gurdaspur district, parts of Hoshiarpur, Dasuya and Garh Shankar Tehsil of Hoshiarpur district, Balachaur Tehsil of Nawanshahr district and Ropar, Anandpur Sahib and Kharar Tehsils of Ropar district. These soils are loamy to clay –loamy in nature and are decalcified. Erosion of oils due to water is a very serious problem. The soils are mildly acidic to neutral in reaction. These soils are found in areas having normal rainfall of 800 to 1000mm.

1.3.2 TROPICAL ARID BROWN SOILS (WEAKLY SOLONISED):

These soils are found in remaining areas of Gurdaspur, Hoshiarpur, Nawanshahr and Ropar districts and most parts of Jalandhar, Kapurthala, Patiala, and whole of Ludhiana, Fatehgarh Sahib Districts and in parts of Amritsar and Sangrur districts. These soils are found in areas having normal annual rainfall of 750 to 1000mm.

1.3.3 ARID BROWN SOILS, (SOLONISED):

These soils are found in lower parts of Amritsar, Kapurthala, Jalandhar, Patiala, Sangrur, Ferozpur districts and entire Moga district where the normal rainfall varies from 500 to 700mm. Salinity and alkalinity are the serious problem in these soils. These soils are calcareous in nature and in most cases Kankar layer occurs at 1.0 to 1.5m depth.

1.3.4 SIEROZEM SOILS:

These soils are found in Bathinda, Faridkot, Ferozpur, Mansa and Muktsar districts, where normal rainfall varies 300 500mm. Salinity and alkalinity are the serious problems particularly in the canal irrigated areas. Wind erosion is also a common feature in this soil. These soils are calcareous in nature and usually have a massive Kankar layer at a depth of 0.75 to 1.25m.

1.3.5 DESERT SOILS:

These soils are found in southern parts of Ferozpur and Muktsar districts where the normal annual rain fall is less than 300mm. Wind erosion is a serious problem here.

2.0 HYDROMETEOROLOGY:

2.1 CLIMATE

Climate of Punjab State is semi-humid to semi-arid in the north, arid in the south & southwest and semi-arid in the remaining part of the State. The state experiences four seasons in the year namely cold season from November to March, hot season from April to June, southwest monsoon season from last week of June to mid of September and post monsoon season from September to beginning of November. During cold weather season, seasons of western disturbances affect the climate of the state and bring rainfall of light intensity.

Chandigarh (UT) has a humid subtropical climate characterised by a seasonal rhythm: very hot summers, mild winters, unreliable rainfall and great variation in temperature. The city also receives occasional winter rains from the western disturbance originating over the Mediterranean Sea. The western disturbances usually bring rain predominantly from mid-December to till end of April which can be heavier sometimes with strong winds and hails if the weather turns colder (during March–April months) which usually proves disastrous to the crops. Cold winds usually tend to come from the north near Shimla, and from the State of Jammu and Kashmir, both of which receive their share of snowfall during winter time.

2.2 TEMPERATURE

Most of the year, the climate of Punjab & Chandigarh (UT) is of a pronounced continental character, very hot in summer and markedly cold in winter. In between are the pleasant months of spring. Punjab is extremely hot in summer at around 45 °C and mild in winter. The hottest months are May and June and the coldest are December and January. Chandigarh (UT) has a humid subtropical climate having very hot summers, mild winters, unreliable rainfall and great variation in temperature (−1 °C to 46 °C). The hot weather season commences in the month of March and continues through April to June. In the month of May the diurnal range of temperature increases more and the day become hotter. January is the coldest month. The normal minimum temperature ranges from 3°C to 9°C. Temperature dips to freezing point during the month of December / January.

2.3 HUMIDITY

The air over the entire State / UT is dry during the greater part of the year. Humidity is high in the monsoon months. April and May are the driest months with relative humidity of about 30% in the morning and less than 20% in the afternoons.

2.4 WINDS

Winds are generally light during the post monsoon and winter months. They strengthen during the summer and monsoon months. Except during the monsoon months, winds are predominantly from a westerly or northwesterly direction and tend to be more northerly in the afternoon. Easterly and southeasterly winds are more common in the monsoon months.

2.5 RAINFALL:

There are two seasons of rainfall in the state. The south-west monsoon season, the principal source of ground water sets in last week of June and withdraws towards end of September and contributes about 80% of annual average rainfall. Another period of rainfall is winter rain from December to March is about 20% of total rainfall which is mostly absorbed into the soil. More than 50% of the annual rainfall received in the four rainy months for June to September, only there by leading to large variations on temporal scale. Rainfall is highly variable in time and space. The Normal Rainfall for the State of Punjab State is 646 mm & for Chandigarh (UT) 1078 mm, but it has great spatial variations. Rainfall Normals computed using rainfall records of 30 years as per IMD. The statistics is provided on 4 seasons i.e. Winter (Jan-Feb), Pre-Monsoon (Mar-May), Southwest (SW) Monsoon (Jun-Sep) and Post-Monsoon (Oct-Dec), and on annual basis.

2.5.1 SEASONAL & ANNUAL RAINFALL STATISTICS:

Punjab State

Entire Punjab State received actual annual rainfall of 629 mm in 2021 and 691 mm in 2022 and 439 mm in 2023. In 2022, during Winter - Season, entire Punjab State received 148 mm rainfall and during Pre – Monsoon 25 mm rainfall and in SW-monsoon 500 mm and during Post Monsoon 18 mm rainfall.

Chandigarh UT

Entire Chandigarh (UT) received Actual Annual Rainfall of 1563 mm in 2023, 1210 mm in 2022 and 819 mm in 2021. In 2022, 243 mm rainfall during Winter – Season and 34 mm rainfall in pre – monsoon and 893 mm rainfall in SW-monsoon and during post monsoon 40 mm rainfall received.

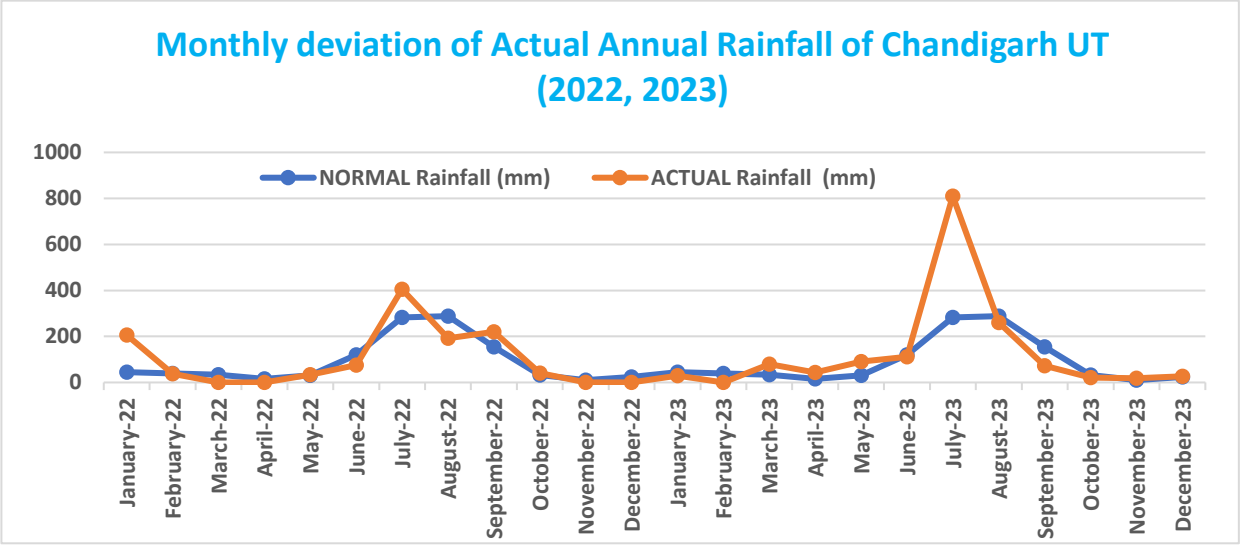
Table 1: Seasonal and Actual Annual Rainfall & its departure for Chandigarh UT:

YEAR	NORMAL R/F (mm) - CHANDIGARH	ACTUAL R/F (mm) CHANDIGARH -2022	ACTUAL R/F (mm) CHANDIGARH -2023	% Departure 2022- CHANDIGARH	% Departure 2023- CHANDIGARH
WINTER	84	243	29	188	-66
PRE-MONSOON	80	34	213	-58	166
SW - MONSOON	847	893	1256	5	48
POST-MONSOON	67	40	66	-39	-1
ANNUAL	**1078**	**1210**	**1563**	**12**	45

Table 2: South West Monsoon Rainfall & its deviation from normal (Chandigarh UT):

STATE	NORMAL R/F - CHANDIGARH UT	Observed Rainfall CHANDIGARH UT (mm) - 2022	Observed Rainfall CHANDIGARH UT (mm) - 2023	% Departure 2022- CHANDIGARH UT	% Departure 2023- CHANDIGARH UT
JUN	120	75	112	-37	-7
JUL	283	405	810	43	186
AUG	288	192	261	-34	-9
SEP	155	221	73	42	-53
SW MON	**847**	**893**	1256	**5**	48

Fig 1: Monthly deviation of Actual Annual Rainfall of Chandigarh UT (2022, 2023)



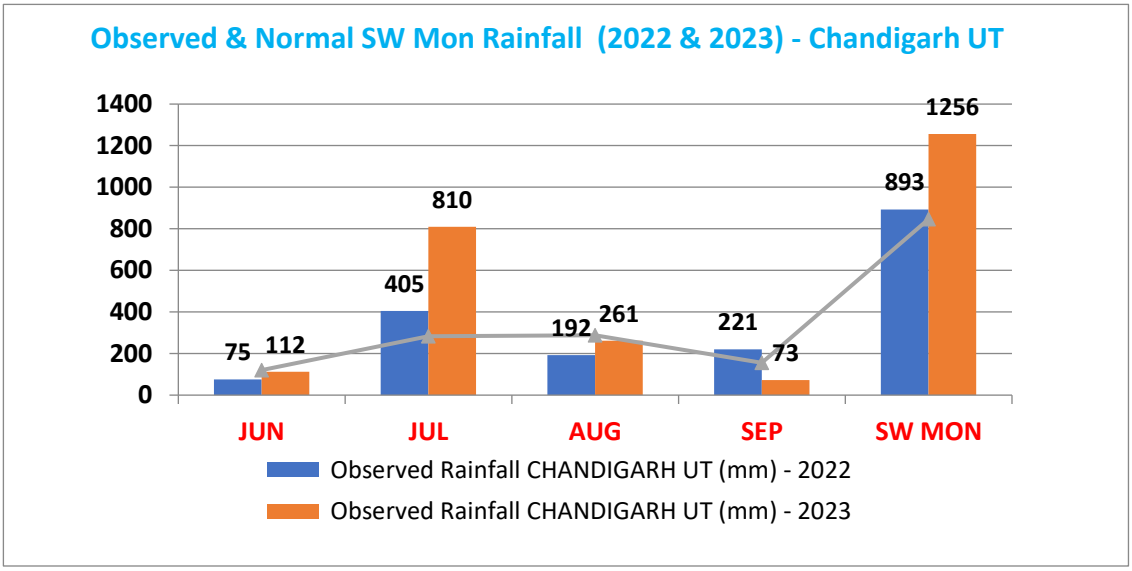


Fig 2: Observed & Normal SW Mon Rainfall (2022 & 2023) - Chandigarh UT

Fig 3: Percentage departure in SW Mon Rainfall (Chandigarh UT)-2022 & 2023

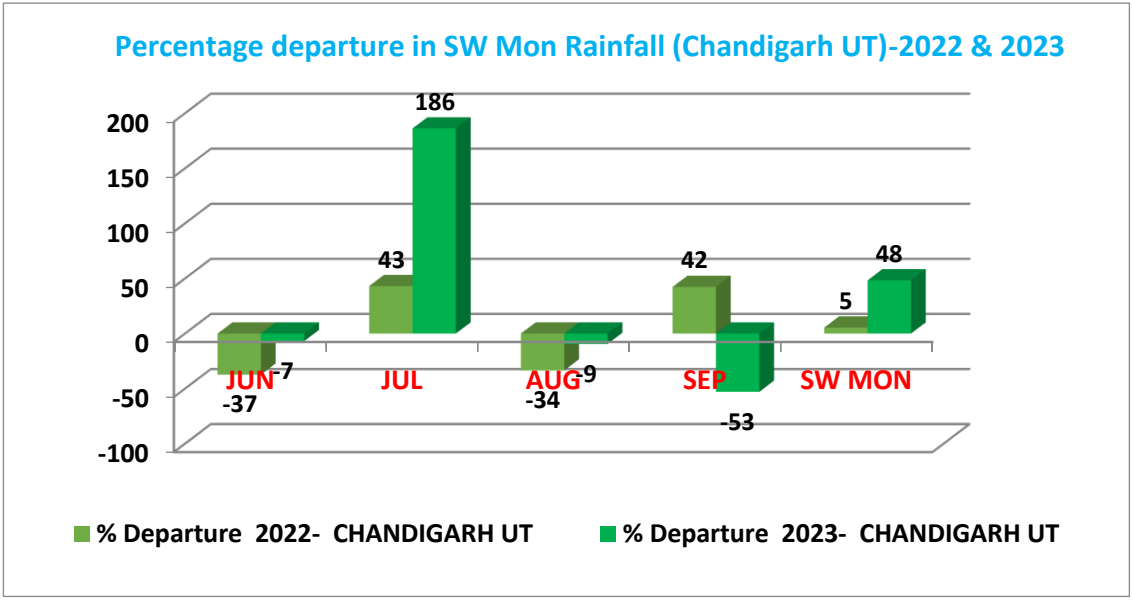


Fig 4: Isohyetal normal rainfall map of punjab & chandigarh (UT)

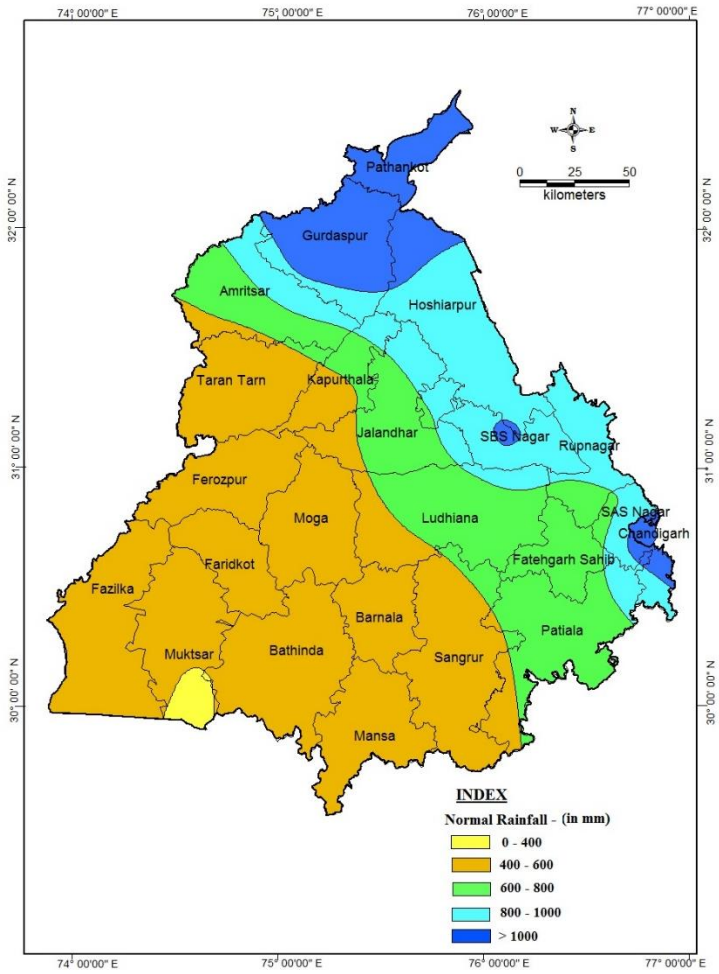
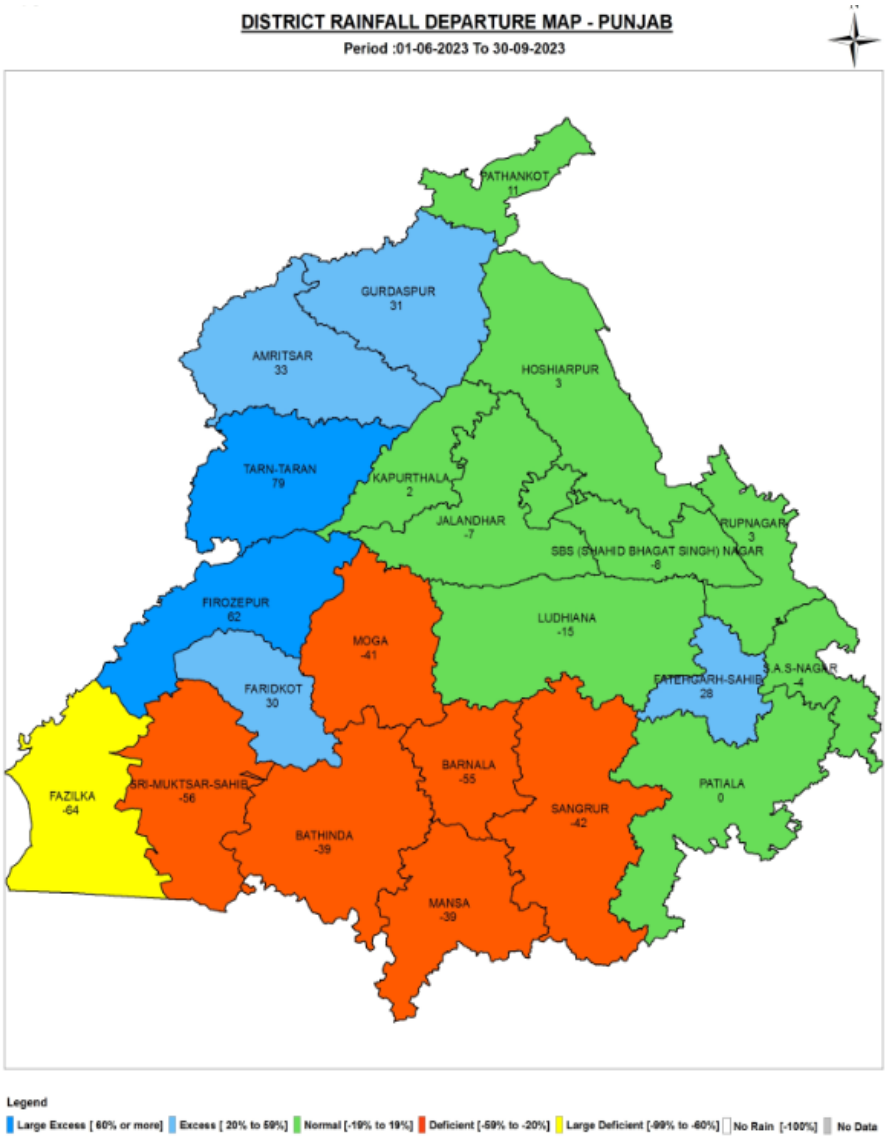


Fig 5: Departure in South Western Monsoon Rainfall of Punjab State (2023)



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1. http://hydro.imd.gov.in/hydrometweb/(S(osdeiu45tfdt1vesfkqaypze))/DistrictRaifall.aspx **(Indian Meteorological Department)**
2. https://indiawris.gov.in/wris/#/ **(India WRIS)**

3.0 GENERAL GEOLOGY

The great Indo-Gangetic plain with an area of about 8,50,000 sq. km lies between the Peninsular India and the Himalayas. On the basis of seismic and borehole data, Rao (1973) divided the Indo-Gangetic Plain into five parts, which from west to east are (I) The Indus Basin in Pakistan, (ii) the Indo-Gangetic Basin in Punjab and Haryana, (iii) The Ganga Basin in Uttar Pradesh and Bihar, (iv) The Brahmaputra Basin in Assam, and (v) The Ganga- Brahmaputra Basin in West Bengal and Bangladesh. These basins have been delineated on the basis of subsurface ridges or highs. In the Indo-Gangetic Basin the Quaternary alluvium has been deposited at places on semi-consolidated Tertiary rocks (Siwalik Group) or on a basement of metamorphic and igneous rocks of Precambrian age. The alluvial sediments were laid down by the rivers since Pleistocene in the "fore deep" or a down warp formed in front of the rising Himalayan ranges and thus represents the younger geological formation.

3.1 GEOLOGICAL SET UP

The rock formations ranging in age from middle Miocene to Recent are exposed. They are represented by Siwaliks and Alluvium deposits. The Siwaliks (Middle Miocene to Pleistocene) form hilly tract running in northern and northeastern part of the State. The alluvium deposits (Pleistocene to Recent) constitute the plains of Punjab. The Siwaliks are divided into three lower, middle and upper Siwaliks on the basis of lithology and vertebrate fossils. The Siwalik formations have been folded and faulted due to tectonic activities. The various stratigraphic units exposed in the state are as under:

3.2 AEOLIAN SAND (WIND BLOWN SAND)

These are medium to fine grained and buff colored sand. They occur in the form of Dunes which are formed as the disintegrated product of the older rocks and found in the southwestern part of the State. The dunes are elongated in shape and are blown sand forming fixed dunes and sandy flats. The dunes are oriented in N-S direction forms ridges which rise from a meter to about ten meters above the surrounding land surface. These sands are brought from the Rajasthan desert and ultimately deposited and shaped by the southwesterly winds which blow across the area from April to June. Generally, the sand dunes contain loose and unconsolidated sand and at places where vegetation has come up these have been fixed. The sand grains are generally well rounded in shape and mainly consist of quartz and ferromagnesian minerals with flakes of mica.

3.3 ALLUVIUM

The greater part of Punjab is occupied by alluvial plains, covering over about 76% of area. The Quaternary alluvial sediments were deposited on semi-consolidated Tertiary rocks and conceals underneath the fringes of Peninsular and extra- Peninsular rocks. This vast expanse of plains is constituted by fluvial sediments of Indus River system. Beneath thick alluvium cover, there are southwestern extensions of Siwalik, which are exposed only in northeastern hilly tract of the State. The Siwalik rocks are expected to extend Bathinda which in fact separates the northeastern Punjab plains form Southwestern Rajasthan plains. Based on O.N.G.C. data, the contact between the plains and the Siwalik Hills is believed to be normal in Gurdaspur district and is faulted in Hoshiarpur and Ropar district areas. The thickness of alluvium varies from place to places due to irregularities and undulations. The maximum thickness of 4500 m has been reported near Dasuya in Hoshiarpur district. The thickness of alluvium increases towards northeast. It is comparatively less in the southwestern parts where the rocks of Pre- Cambrian age occur as buried ridges. In the intermountain

valleys in north east part, the valley fill is estimated to be around 200 m thick underlain by rocks of Siwalik system. The alluvium comprising sand, gravel and clay is deposited by the Indus River system. In accordance with their mode of deposition by large constantly shifting river, the alluvial deposits are heterogeneous in nature and individual strata have limited horizontal and vertical continuity. The alluvial complex of Pleistocene and Recent age represents the latest phase of sedimentation. It consists principally of fine to medium sand, silt and clay. Beds of gravel and coarse sand are uncommon. It is also associated with fine grained strata, concretionary zones or nodules of kankar. The sand gravel or sand bodies embodied in the clay- silt mixture in the alluvial deposits are usually either small or big lentoid bodies with longitudinal part either normal or nearly normal to the Himalayan and Siwalik strike i.e. NW-SE. Sheet like bodies of sand, sand and gravel had been deposited in the central part of the State and are regionally extensive. In southwestern and southern parts of the State, ground water is brackish to saline. The rivers have deposited their coarser material in higher reaches, so the flood plain deposits developed in southwestern parts were richer in finer sediments. The alluvium is normally divided in two groups viz:
I) Newer Alluvium, ii) Older Alluvium. It is not possible to clearly indicate any distinct /demarcation line of separation between the two units

3.3.1 NEWER ALLUVIUM (KHADDAR)

It occurs in the active flood plains of present-day river courses and is generally confined to the neighborhood of river channels. Along the major rivers in plain areas, there exist low flood plain areas which are locally called khaddar of 'bet'. These flood plains are often separated from upland plains by a steep slope of the order of 1m to 2m per km. The Newer alluvium is light colored and poor in calcareous matter. It consists of coarse gravel near the foot hills and ventricular beds of sand and clay along the old river course and silt and clay in the flatter parts of the river plains. It is of Upper Pleistocene to Recent age. The aquifers comprised of medium to coarse sand and gravel. The clays serve as aquitards. The various aquifers are interconnected. However, the deeper horizons show confined to semi- confined conditions. There is wide variation of the hydraulic conductivity and Transmissivity of the aquifers due to rapid changes in their texture and thickness.

3.3.2 OLDER ALLUVIUM (BHANGAR):

It is confined to the abandoned flood plains and bar upland regions. It consists of sandy clay, clay-silt and fine to medium sand. It consists of pale reddish brown colored beds of clay. Kankar is found disseminated more or less throughout the beds of sand and clays. The kankar bands are generally more in the older alluvium. At places extensive and massive beds of kankar also exist. It is of middle to Upper Pleistocene in age. Older alluvium forms good ground water reservoir/aquifer.

3.3.3 UPPER SIWALIKS

These formations are exposed throughout the hilly tract starting right from northwest of Pathankot through Hoshiarpur, Ropar to Chandigarh. They are composed of soft grey medium to coarse-grained sandstones, yellowish brown and brown clays. The sandstones are poorly lithified, soft and friable. They are brownish grey in colour and contain a large proportion of mica flakes and concretions of clay. They also consist of conglomerates, boulders and pebbles of quartzite and yellowish clays. The conglomerates consist mainly of cobbles and pebbles of quartzites. The pebbles of granite limestone, sandstone and lumps of claystones are also present. The conglomerate beds do not show clear stratification and occur as wedge shaped or lenticular bands. The formations of Upper Siwaliks are prone to easy weathering and there is considerable collection of sand as talus cones. These formations yield good to moderate supplies of water.

3.3.4 MIDDLE SIWALIKS

These are exposed in Dhar and Dunera area of Pathankot Tehsil of Pathankot district, north and northeast of Kiratpur in Ropar district. These are comprised of grey micaceous, medium grained soft sandstones interbedded with red, orange and yellowish (buff colored) clays. The sandstones occasionally contain pebbles of calcareous clay, shale and quartzite. The Middle Siwaliks are poor in yields of ground water due to poor permeability.

3.3.5 LOWER SIWALIKS

These are exposed in Dhar and Dunera area of Pathankot Tehsil of Pathankot district, constitute massive grey to light grey, micaceous sandstones interbedded with dark red to maroon clays grading upward in to micaceous sandstone with thick beds of red clays. The rocks of Lower Siwaliks have poor yields of ground water. However small springs of low discharge occur on the hill slopes they confine their position at the bedding contacts where the argillaceous bed is underlain by arenaceous bed.

4.0 GROUND WATER REGIME MONITORING

The Central Ground Water Board, North Western Region, has established 512 Ground water observation wells in Punjab State and Union Territory of Chandigarh for monitoring water level. As on 31.3.2023 there were 488 Ground Water Observation Wells of CGWB in Punjab which include 115 dug wells and 373 piezometers for monitoring shallow & deeper aquifers in Punjab. There are 23 observation wells in Chandigarh, 1 dug well and 22 Piezometers for monitoring shallow & deeper aquifers.

About 80% of the Ground water observation wells fall in the canal command areas of various canal systems, the areas falling out of the major command is part of Pathankot, Hoshiarpur, Nawanshahr, Ropar and SAS Nagar districts, parts of Gurdaspur, Jalandhar and Ludhiana districts. The district wise details of Ground water observation wells are given in Table 3 and location of these Ground water observation wells is shown in Fig. 7 and breakup is given in Fig. 6.

Fig 6: District Wise Number and type of Ground Water Observation Well

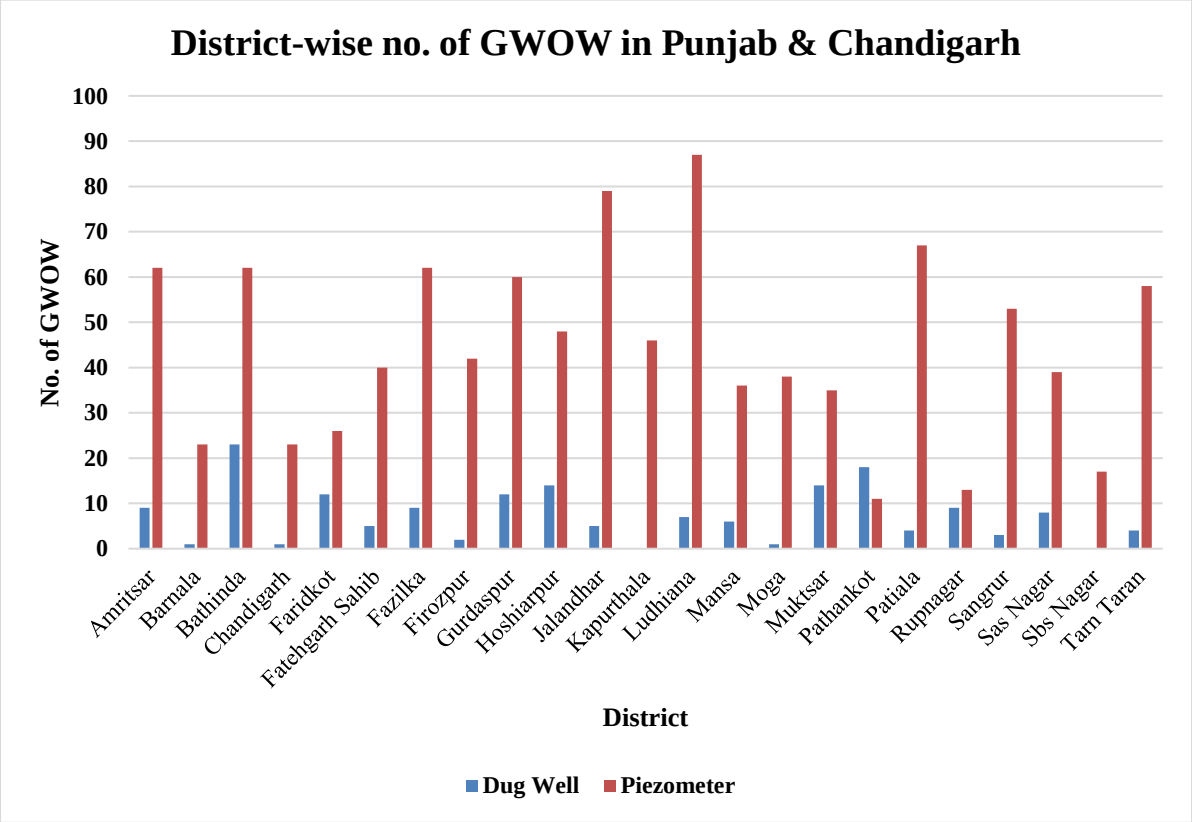


Table- 3 District wise ground water observation wells, Punjab State and Chandigarh

Total no. GWOW as on 31.3.2023							
S no	**District**	**Dug Well**		**Piezometer**		**Total**	
		CGWB	**State**	**CGWB**	**State**	**CGWB**	**State**
1	AMRITSAR	3	6	14	48	17	54
2	BARNALA	0	1	7	16	7	17
3	BATHINDA	14	9	18	44	32	53
4	FARIDKOT	11	1	10	16	21	17
5	FATEHGARH SAHIB	3	2	14	26	17	28
6	FAZILKA	7	2	18	44	25	46
7	FIROZPUR	2	0	19	23	21	23
8	GURDASPUR	10	2	21	39	31	41
9	HOSHIARPUR	13	1	17	31	30	32
10	JALANDHAR	2	3	39	40	41	43
11	KAPURTHALA	0	0	18	28	18	28
12	LUDHIANA	4	3	32	55	36	58
13	MANSA	4	2	15	21	19	23
14	MOGA	1	0	14	24	15	24
15	MUKTSAR	7	7	8	27	15	34
16	PATHANKOT	12	6		11	12	17
17	PATIALA	4	0	35	32	39	32
18	RUPNAGAR	7	2	8	5	15	7
19	SANGRUR	1	2	28	25	29	27
20	SAS NAGAR	8	0	10	29	18	29
21	SBS NAGAR	0	0	9	8	9	8
22	TARN TARAN	2	2	19	39	21	41
	Total	**115**	**51**	**373**	**631**	**488**	**682**
23	CHANDIGARH	1	0	23	0	24	0
	Grand total	**116**	**51**	**396**	**631**	**512**	**682**

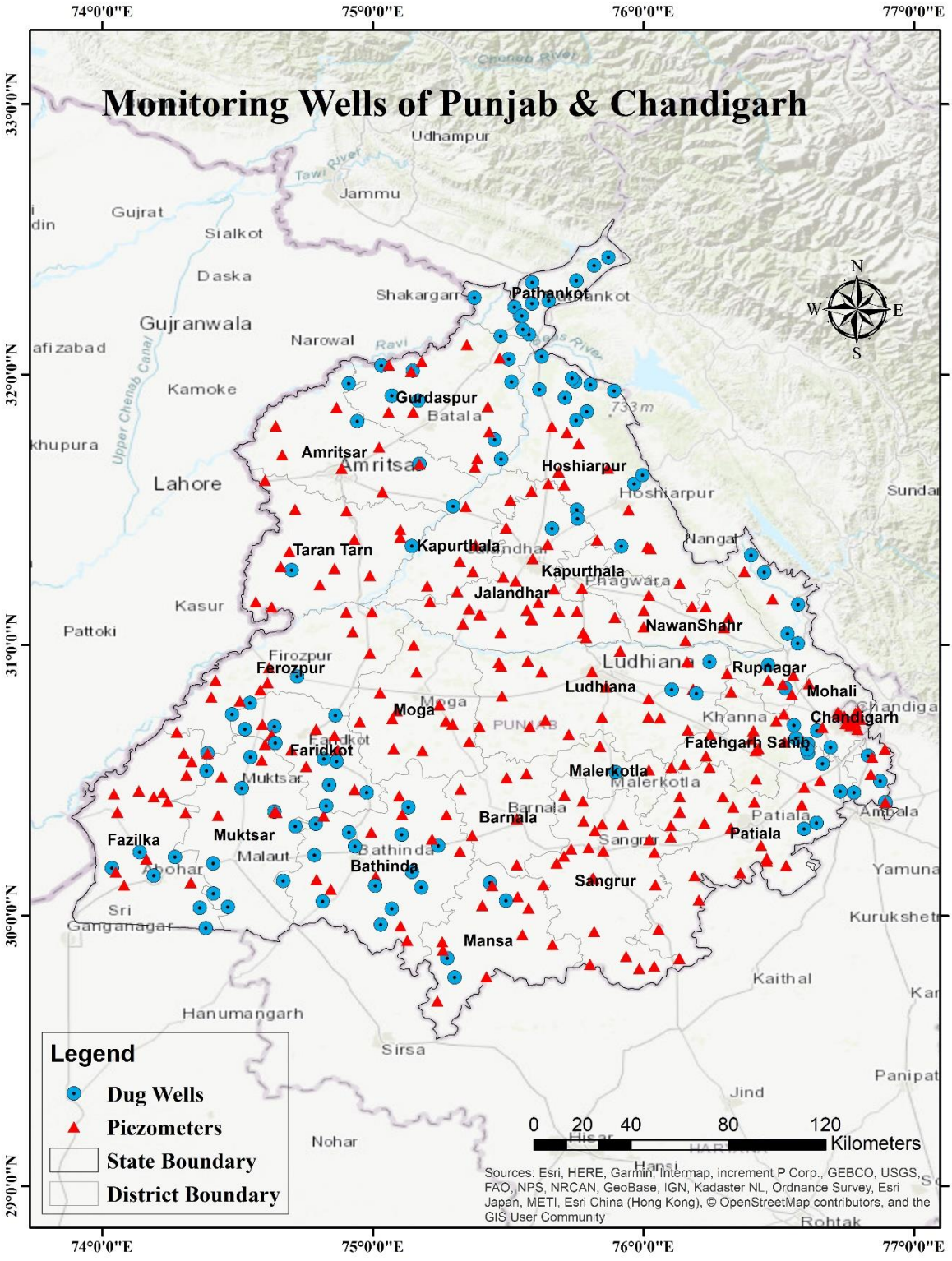


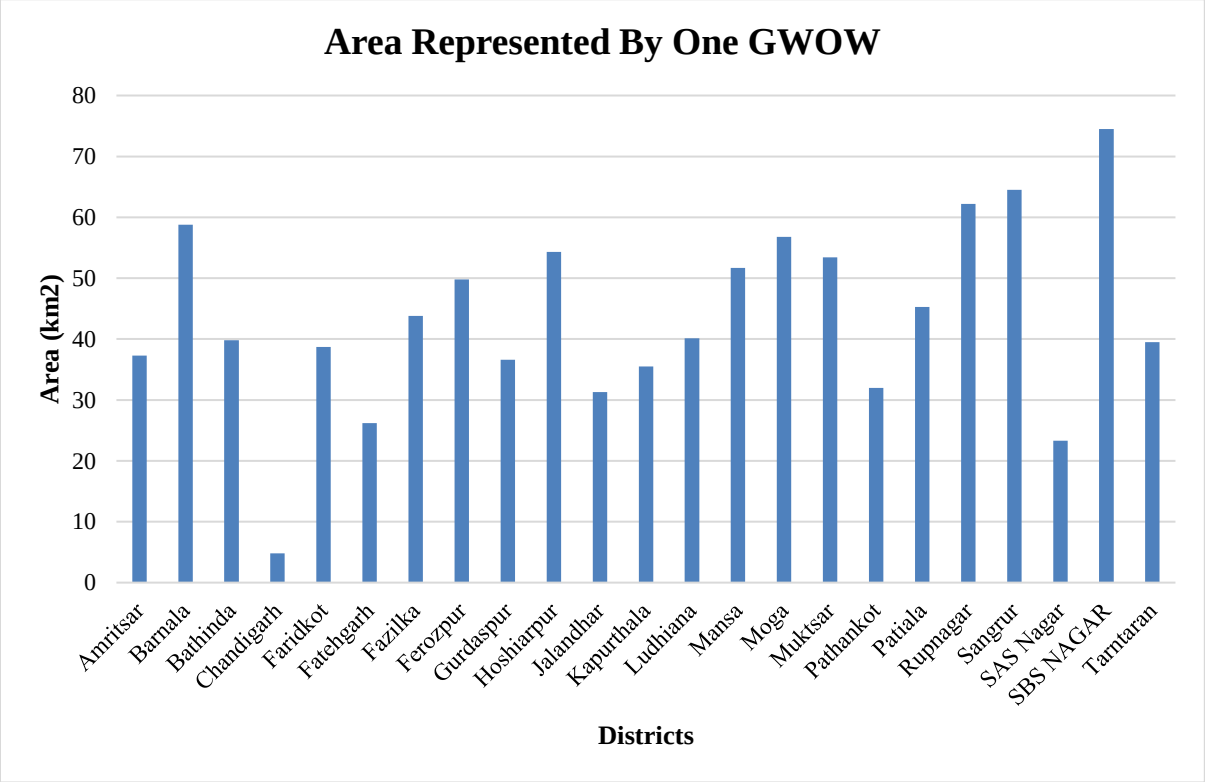
Fig 7: Location of Monitoring stations in Punjab & Chandigarh UT

The area represented by single Ground water observation wells being monitored in the state of Punjab and Chandigarh is given in Table 4 and depicted in Fig. 8.

Table 4. Area represented by single ground water observation well

S. No.	District	Area (sq km)	No. of GWOWs	Area represented by one GWOW (sq km)
1	Amritsar	2647	71	37.3
2	Barnala	1410	24	58.8
3	Bathinda	3385	85	39.8
4	Faridkot	1469	38	38.7
5	Fatehgarh	1180	45	26.2
6	Fazilka	3113	71	43.8
7	Ferozpur	2190	44	49.8
8	Gurdaspur	2635	72	36.6
9	Hoshiarpur	3365	62	54.3
10	Jalandhar	2632	84	31.3
11	Kapurthala	1632	46	35.5
12	Ludhiana	3767	94	40.1
13	Mansa	2171	42	51.7
14	Moga	2216	39	56.8
15	Muktsar	2615	49	53.4
16	Pathankot	929	29	32.0
17	Patiala	3218	71	45.3
18	Rupnagar	1369	22	62.2
19	Sangrur	3610	56	64.5
20	SAS Nagar	1093	47	23.3
21	SBS NAGAR	1267	17	74.5
22	Tarntaran	2449	62	39.5
23	Chandigarh	114	24	4.8
Total		50476	1194	-

Fig 8: District Wise Area Represented By Single Ground Water Observation Well



5.0 BEHAVIOUR OF WATER LEVEL OF UNCONFINED AQUIFER

In order to assess the quantitative change in ground water resources, water levels were monitored as a routine of four times in a year. The behaviour of water level in June 2023, August 2023, November 2023 and January 2024 is discussed in following paragraphs. The maximum and minimum water levels recorded in different season is given below in Table 5.

Table 5 The maximum and minimum water levels during all four seasons

Range	June 2023	August 2023	November 2023	January 2024
Minimum	0.67m bgl Balocha Khera in (Muktsar district)	0.30m bgl Gangi S (Gurdaspur district)	0.03m bgl Bassma Pipla (Patiala district)	0.18mbgl Ganji (Gurdaspur district)
Maximum	62.81m bgl Sundran S (SAS Nagar district)	54.05m bgl Sector-10C (Chandigarh)	85.07m bgl Sundran D (SAS Nagar District)	85.84mbgl Sundran D (SAS Nagar district)

It is evident from the above Table 5 that shallowest water level conditions prevail in southwest parts mainly in Muktsar districts. While deepest water level conditions exist in the SAS Nagar districts. The water level data of all four seasons is discussed below.

5.1 DEPTH TO WATER LEVEL

5.1.1 JUNE 2023

The behavioral pattern of water level in June 2023 along with depth to water level map (Fig.9) is discussed below. The depth to water level lies between 0.67 m bgl at Balocha khera in Muktsar district and 62.81 m bgl at Sundran S in SAS Nagar district. Very shallow water levels of 0-2 m (causing water logging) occur in 3% of wells and 1.5% area of the state in isolated patches in Muktsar and Fazilka districts. Shallow water levels of 2-5 m have been observed in 12% of the wells and 10.1% of the total area that lies in south western parts of state i.e Muktsar, Fazilka, Faridkot, Ferpzepur and parts of Gurdaspur, Pathankot & Rupnagar districts. These are mainly canal command areas and use canal water for their agricultural needs. The water levels between 5-10 m are observed in Fazilka, Faridkot, Muktsar, Ferozepur, Bathinda, Mansa, Gurdaspur, Pathankot, Amritsar, Hoshiarpur & Rupnagar districts. About 16% of wells and 14.9% of the area fall in this range. Moderately Deep-water levels (10-20 m) are observed in 26% wells covering about 29.4% area of the State Pathankot, Gurdaspur, Amritsar, SBS Nagar, Hoshiarpur, Jalandhar, Tarn Taran, Kapurthala, Moga, Ludhiana, Fazilka, Ferozpur, Faridkot, Bathinda, Mansa, Rupnagar & SAS Nagar districts. Deep water levels (20-40 m) are observed in parts of Amritsar, Taran taran, Jalandhar, Kapurthala, SBS Nagar, Hoshiarpur, Bathinda, Mansa, Moga, Ludhiana, Fatehgarh Sahib, Patiala, Sangrur, Barnala and SAS Nagar districts and observed in 37% wells covering about 39.9% area of the state. Very deep-water levels (>40 m) are observed in 5% wells as patches in Sangrur, Barnala, Patiala & SAS Nagar districts covering 4.2% area of the State. Summarized details of depth to water level in different ranges are given in table below.

Depth to water level range	Wells monitored		Area covered	
	No.	%age	Sq. Km.	%age
0-2	19	3	768	1.5
2-5	81	12	5097	10.1
5-10	106	16	7496	14.9
10-20	171	26	14852	29.4
20-40	239	37	20125	39.9
>40	33	5	2138	4.2

Table 6 Depth to water level, June 2023

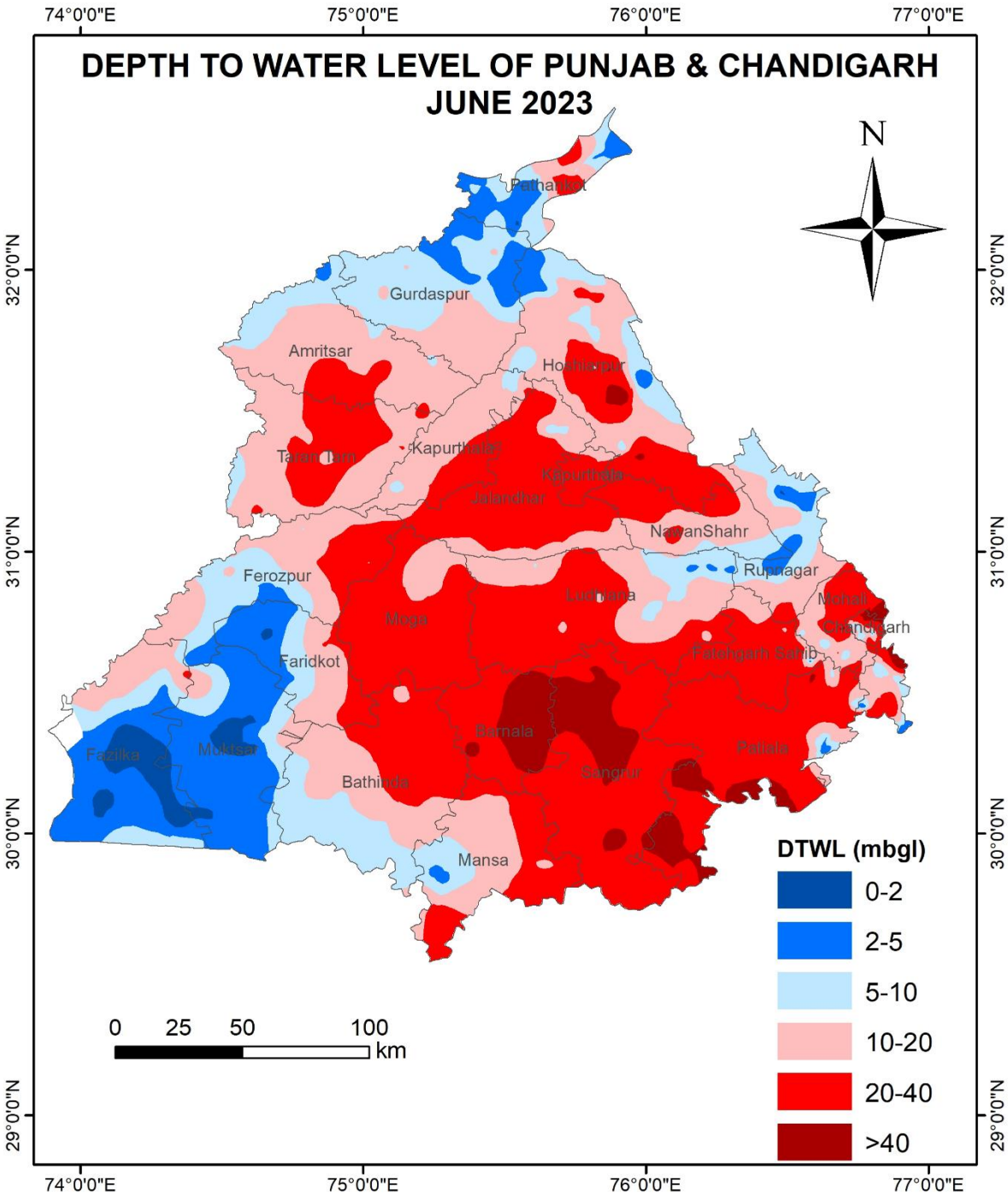


Fig. 9 Depth to Water Level Map of Punjab and Chandigarh June 2023

5.1.2 AUGUST 2023

The behavioral pattern of water level in August 2023 along with depth to water level map (Fig.10) is discussed below. The depth to water level lies between 0.30 m bgl at Gangi S in Gurdaspur district and 54.05 m bgl at Sec 10 C in Chandigarh UT. Very shallow water levels of 0-2 m (causing water logging) occur in 8% of wells and cover nearly 2% area of the state in isolated patches in Fazilka, Muktsar, Pathankot, Gurdaspur & Rupnagar districts. Shallow water levels of 2-5 m have been observed in 21% of the wells and 14.6% of the total area that lies in parts of Fazilka, Muktsar, Faridkot, Pathankot, Gurdaspur, Hoshiarpur, Rupnagar, SAS Nagar & Ludhiana districts. These are mainly canal command areas and use canal water for their agricultural needs. The water levels between 5-10 m are observed in the northern and north eastern parts (parts of Pathankot, Gurdaspur, Hoshiarpur), south western parts (Fazilka, Ferozpur, Faridkot, Muktsar, Bathinda and Mansa districts), eastern parts of Ludhiana, SBS Nagar, SA Nagar & Rupnagar districts. About 17% of wells and 17% of the area fall in this range. Moderately Deep-water levels (10-20 m) are predominant and observed in 21% wells covering about 21.8% area of the State in Amritsar, Taran taran, Kapurthala, SBS Nagar, Gurdaspur, Hoshiarpur, Bathinda, Mansa, Ferozepur, Faridkot, Fazilka, Ludhiana, Rupnagar and SAS Nagar districts. Deep water levels (20-40 m) are also observed covering parts of Amritsar, Taran taran, Jalandhar, Kapurthala, Bathinda, Moga, Ludhiana, Fatehgarh Sahib, Patiala, Sangrur, Barnala, SAS Nagar, Ferozepur & Mansa districts and observed in 28% wells covering about 35.7% area of the State. Very deep-water levels (>40 m) are observed in 5% wells as patches in Sangrur, Barnala & Patiala districts covering 9% area of the State. Summarized details of depth to water level in different ranges are given in table below.

Depth to water level range	Wells monitored		Area covered	
	No.	%age	Sq. Km.	%age
0-2	20	8	1008	2.0
2-5	51	21	7369	14.6
5-10	42	17	8556	17.0
10-20	51	21	10983	21.8
20-40	70	28	17995	35.7
>40	13	5	4565	9.0

Table 7 Depth to water level, August 2023

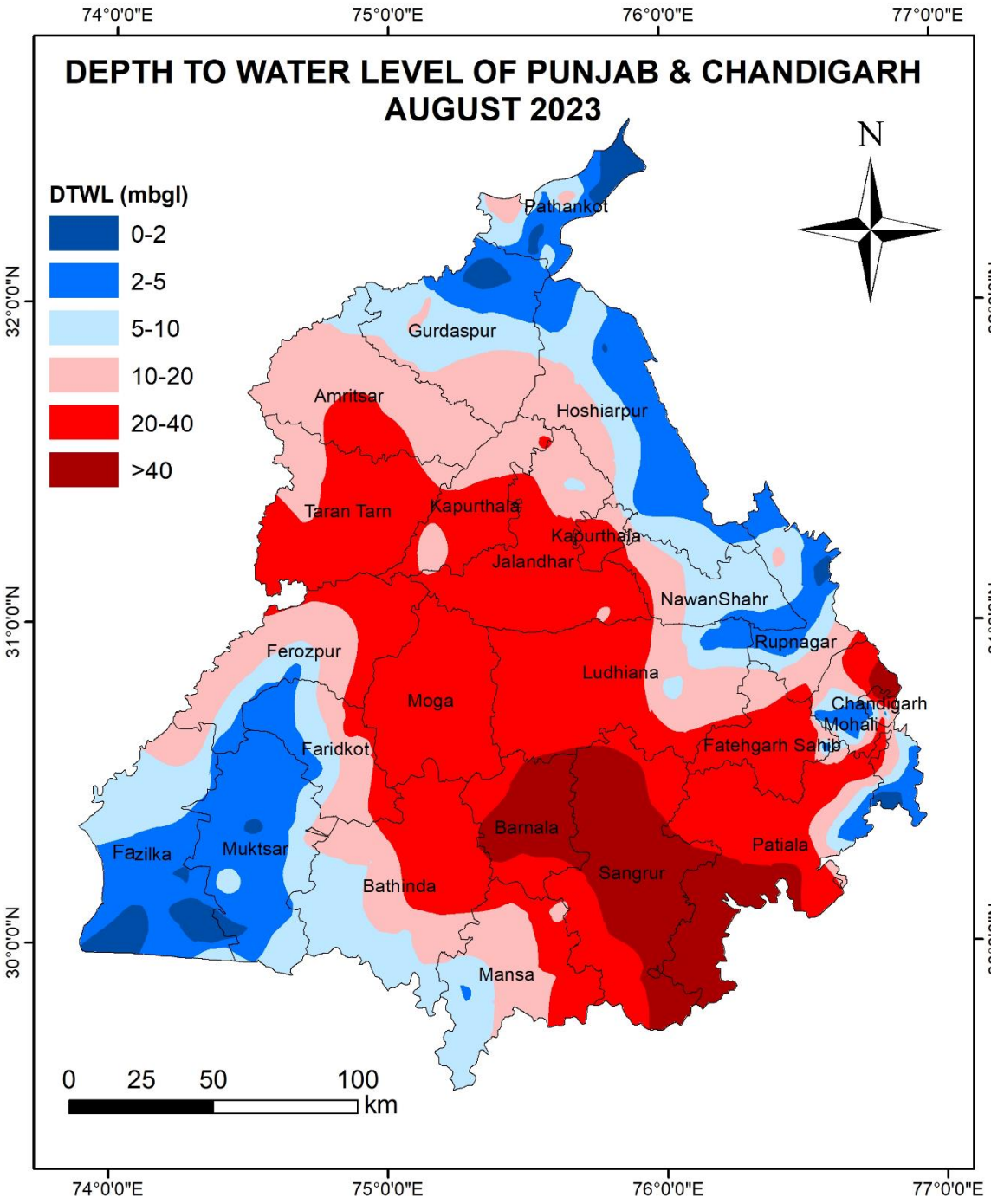


Fig. 10 Depth to Water Level Map of Punjab and Chandigarh Aug 2023

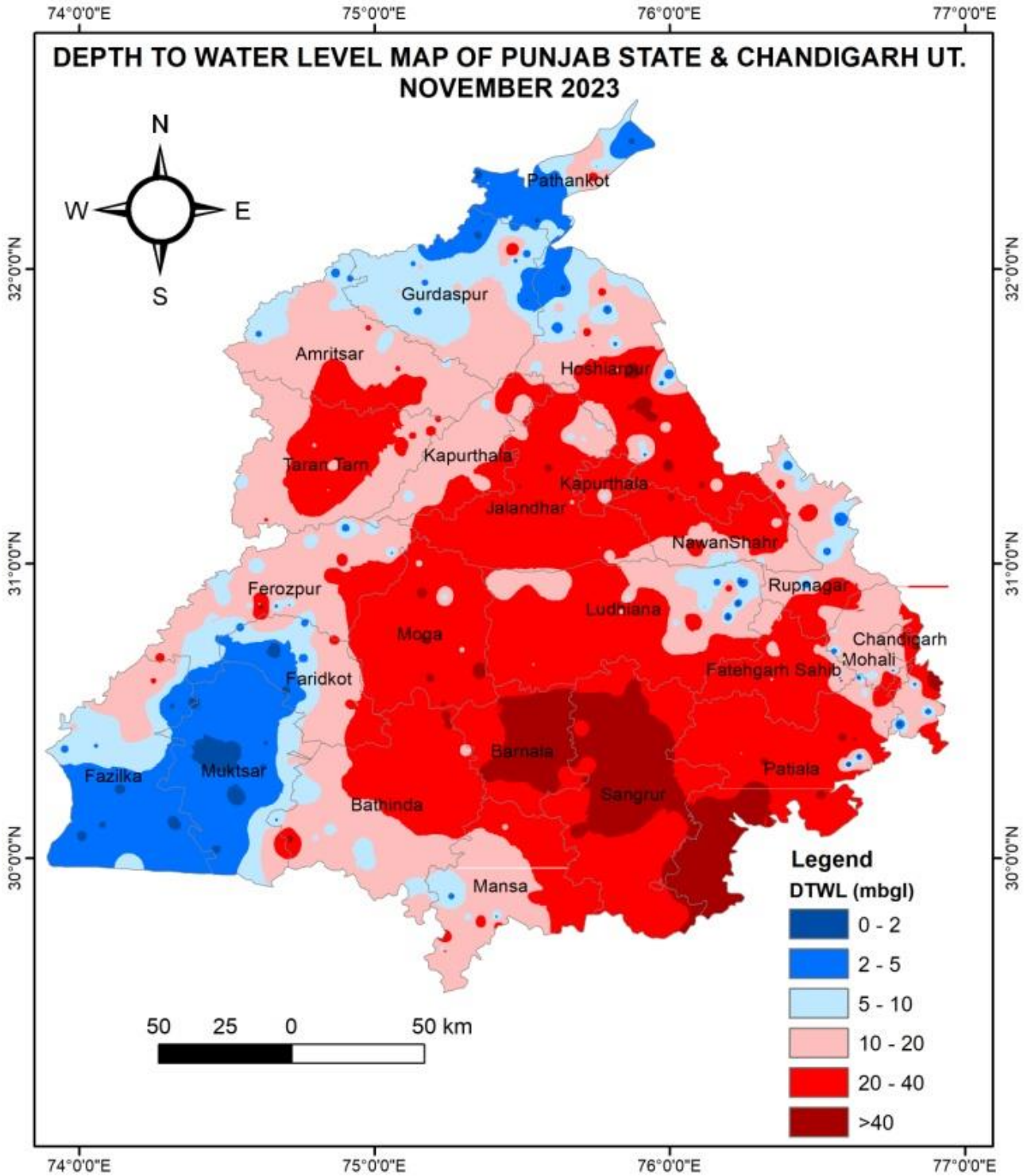
5.1.3 NOVEMBER 2023

The behavioral pattern of water level in Nov 2023 along with depth to water level map (Fig.11) is discussed below. The depth to water level lies between 0.03 m bgl at Bassma pipla in Patiala district and 85.07 m bgl at Sundran D in SAS Nagar district. Very shallow water levels of 0-2 m (causing water logging) occur in around 5% of wells and cover 2% area of the state as isolated patches in Muktsar, Fazilka, Faridkot & Rupnagar districts. Shallow water levels of 2-5 m have been observed in 12% of the wells and 12% of the total area that lies in south western parts of Muktsar, Fazilka, Faridkot, and in northern parts of Gurdaspur and Pathankot districts. The area in south western parts is mainly canal command and use canal water for their agricultural needs. The water levels between 5-10 m are observed in the northern parts (Pathankot, Gurdaspur, Amritsar, and Hoshiarpur districts), south and south western parts (Fazilka, Ferozpur, Faridkot, Muktsar, Bathinda and Mansa districts), eastern parts of Rupnagar, Ludhiana and SAS Nagar districts. About 12% of wells and 16% of the area fall in this range. Deep water levels (10-20 m) are predominant and are observed in 24% wells covering about 32% area of the State in North western, eastern, south western parts. Very deep water levels (20-40 m) are observed covering parts of Taran Tarn, Amritsar, Kapurthala, Jalandhar, Hoshiarpur, Nawanshahr, Moga, Ludhiana, Rupnagar, Fatehgarh Sahib, Bathinda, Barnala, Sangrur, Mansa and Patiala districts and few patches in Ferozpur, Gurdaspur, Pathankot and SAS Nagar observed in 38% wells covering about 38% area of the State. Very deep water level (>40m) is observed in 9% wells and less than 1% area falling in Barnala, Sangrur and Patiala Districts and few isolated patches in Hoshiarpur and SAS Nagar.

Depth to water level range	Wells monitored		Area covered	
	No.	%age	Sq. Km.	%age
0-2	43	5	968	2
2-5	96	12	6167	12
5-10	98	12	7860	16
10-20	192	24	16194	32
20-40	307	38	19230	38
>40	75	9	57	<1

Table 8 Depth to water level, November 2023

Fig 11 Depth to water level map of Punjab & Chandigarh, November 2023



5.1.4 JANUARY 2024

The behavioral pattern of water level in January 2024 along with depth to water level map (Fig.12) is discussed below. The depth to water level lies between 0.18 m bgl at Ganji D in Gurdaspur district and 85.84 m bgl at Sundran D in SAS Nagar district. Very shallow water levels of 0-2 m (causing water logging) occur in 6% of wells and 1.6% area of the state in isolated patches in Muktsar and Fazilka districts. Shallow water levels of 2-5 m have been observed in 20% of the wells and 12.3% of the total area that lies in south western parts of state i.e Muktsar, Fazilka, Faridkot, Ferozepur and parts of Gurdaspur, Pathankot & Rupnagar districts. These are mainly canal command areas and use canal water for their agricultural needs. The water levels between 5-10 m are observed in Fazilka, Faridkot, Muktsar, Ferozepur, Bathinda, Mansa, Gurdaspur, Pathankot, Amritsar, Hoshiarpur & Rupnagar districts. About 18% of wells and 15.7% of the area fall in this range. Moderately Deep water levels (10-20 m) are observed in 23% wells covering about 26.2% area of the State Pathankot, Gurdaspur, Amritsar, SBS Nagar, Hoshiarpur, Jalandhar, Tarn Taran, Kapurthala, Moga, Ludhiana, Fazilka, Ferozpur, Faridkot, Bathinda, Mansa, Rupnagar & SAS Nagar districts. Deep water levels (20-40 m) are observed in parts of Amritsar, Taran taran, Jalandhar, Kapurthala, SBS Nagar, Hoshiarpur, Bathinda, Mansa, Moga, Ludhiana, Fatehgarh Sahib, Patiala, Sangrur, Barnala and SAS Nagar districts and observed in 26% wells covering about 35.8% area of the state. Very deep water levels (>40 m) are observed in 7% wells in Sangrur, Barnala, Patiala districts covering 8.4% area of the State. Summarized details of depth to water level in different ranges are given in table below.

Depth to water level range	Wells monitored		Area covered	
	No.	%age	Sq. Km.	%age
0-2	18	6	829	1.6
2-5	55	20	6195	12.3
5-10	51	18	7927	15.7
10-20	64	23	13210	26.2
20-40	73	26	18050	35.8
>40	21	7	4265	8.4

Table 9 Depth to water level, January 2024

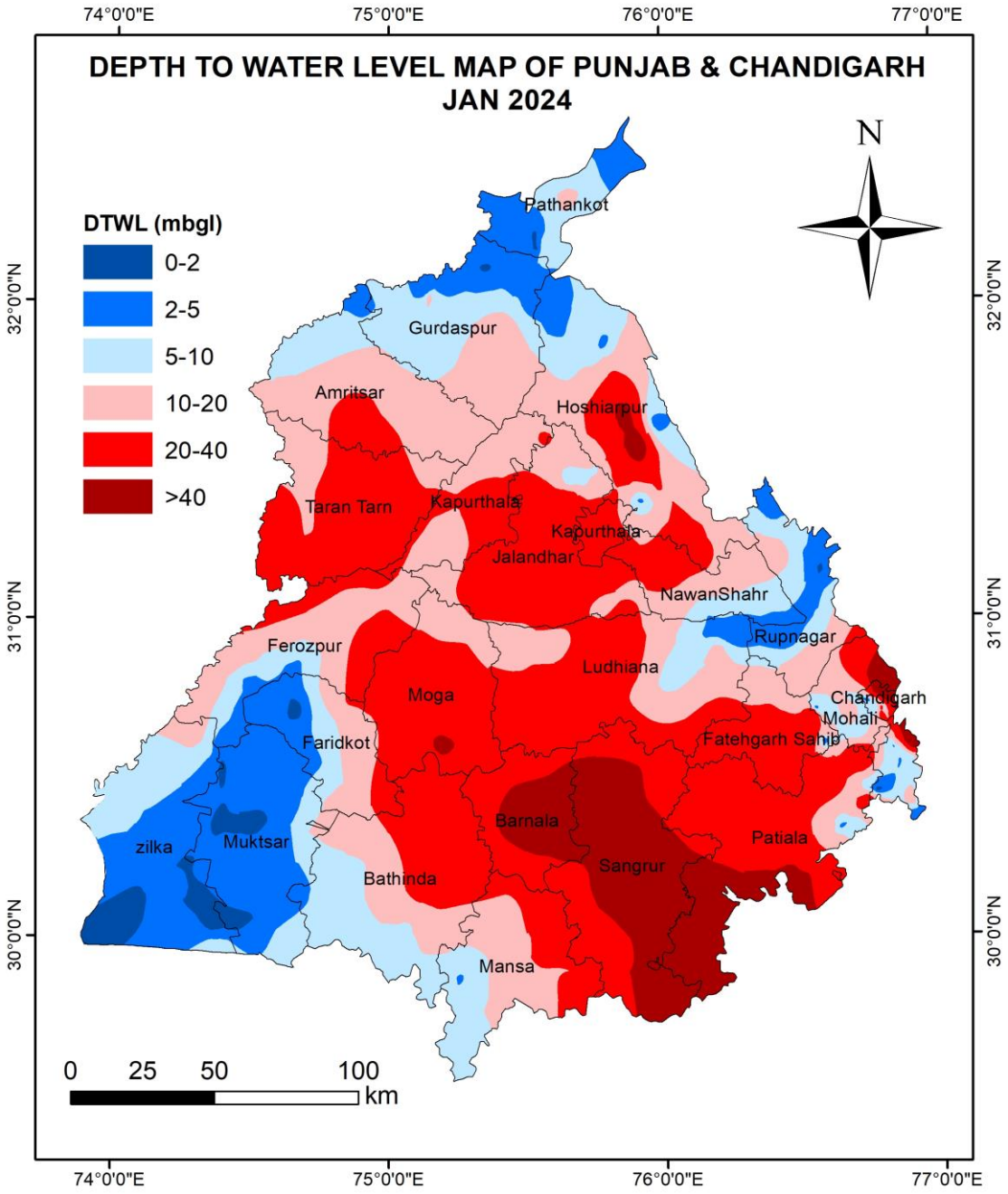


Fig 12 Depth to Water Level Map of Punjab State & Chandigarh (UT), January 2024

5.2 SEASONAL FLUCTUATIONS:

On comparing Water level data of current measurement with previous measurement data is termed as seasonal water level fluctuations. The water level data of all four measurements are compared to previous measurement and seasonal water level fluctuations are determined.

5.2.1 JANUARY 2023 – JUNE 2023

Water level data of June 2023 when compared with previous measurement data i.e. January 2023 is termed as seasonal water level fluctuations. The behavioral pattern of this seasonal fluctuation is discussed below. The map depicting seasonal water level fluctuations is shown in Fig. 13.

The seasonal fluctuation shows that there is a general decline of water levels in 75% of wells monitored and covering 73% area of the State. The decline has been observed in all districts except some isolated patches scattered over the state. Water level decline in the range of 0-2 m is observed in 66% of wells and 69.4% of area. Water level decline in the range of 2-4 m is observed in 7% of wells and 3.7% of area. Water level decline of >4m is observed in 2% of wells and less than 1% of area as isolated patches in Fatehgarh sahib & Faridkot districts.

The water level rise has been recorded in 25% of wells monitored and covering 23.8% area of the State. Water level rise in the range of 0-2 m is observed in 23% of wells and 2.6% of the area. Water level rise 2-4m is observed in none of the wells & 3% area. Water level rise of >4m is observed in 2% wells and less than 1% area as isolated patches in Bathinda & Kapurthala districts.

Water Level Fluctuation Range		Wells Monitored		Area Covered	
		No.	%age	Sq. Km.	%age
Decline	0-2	155	66	35013	69.4
	2-4	16	7	1868	3.7
	>4.0	4	2	106	0.2
Rise	0-2	53	23	11990	23.8
	2-4	0	0	1308	2.6
	>4.0	4	2	191	0.4

Table 10 Seasonal water level fluctuation, January 2023 – June 2023

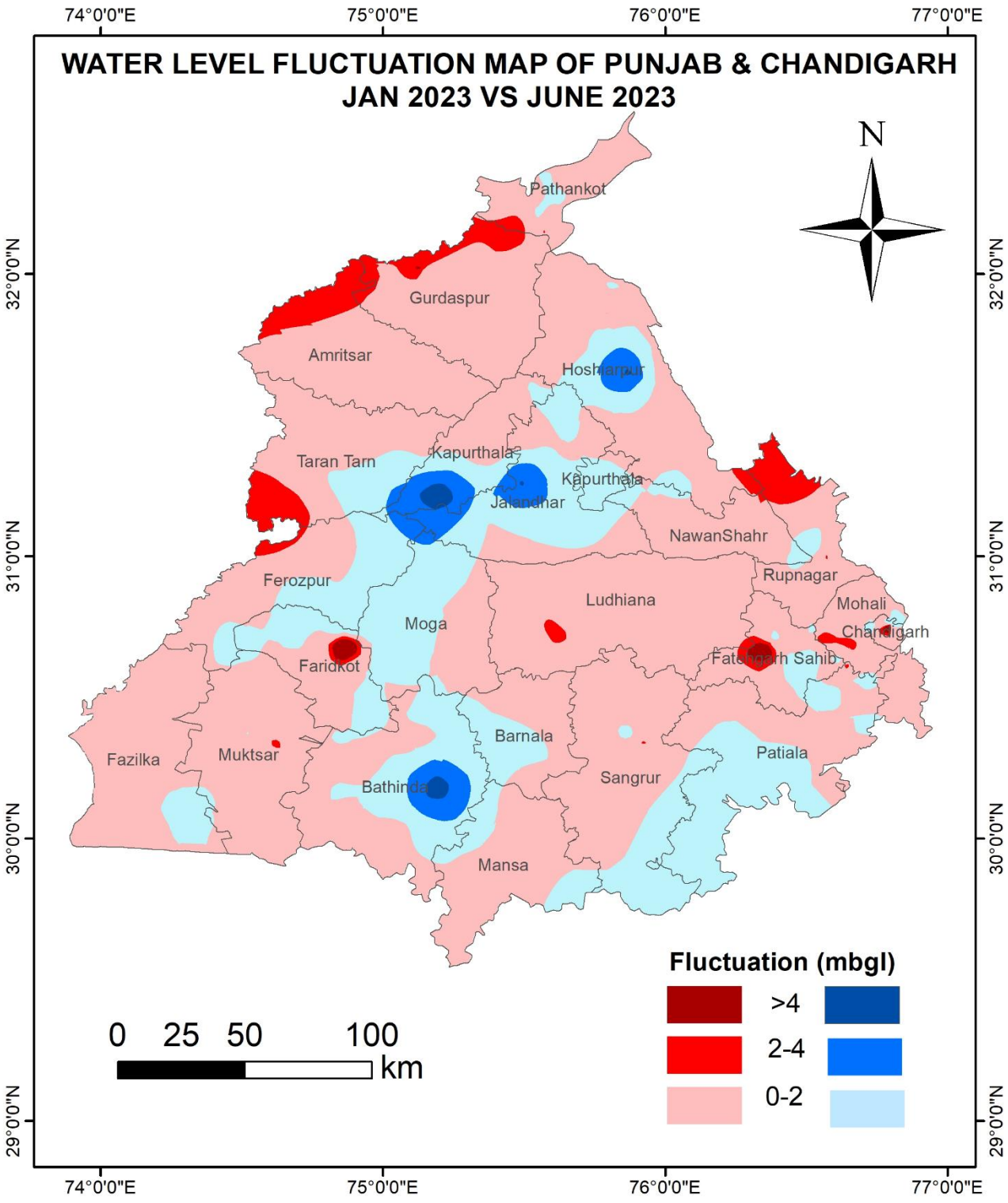


Fig. 13 Seasonal Water Level Fluctuation Map of Punjab and Chandigarh (January 2023 vs June 2023)s

5.2.2 JUNE 2023 - AUGUST 2023

Water level data of August 2023 when compared with previous measurement data i.e. June 2023 is termed as seasonal water level fluctuations. The behavioral pattern of this seasonal fluctuation is discussed below. The map depicting seasonal water level fluctuations is shown in Fig. 14.

The seasonal fluctuation shows that there is a general decline of water levels in 54% of wells monitored and covering 72% area of the State. The decline is spread across entire state except the northern & eastern districts. Water level decline in the range of 0-2 m is observed in 50% of wells and 48% of area. Water level decline in the range of 2-4 m is observed in 16% of wells and 20% of area. Water level decline of >4m is observed in 7% of wells and 3% of area as isolated patches in Sangrur, Patiala & Jalandhar districts.

The water level rise has been recorded in 46% of wells monitored and covering 28% area of the State. Water level rise in the range of 0-2 m is observed in 22% of wells and 22% of the area. Water level rise 2-4m is observed in 4% wells and 6% of area during the period. Water level rise of >4m is observed in 1% wells and 1% area as isolated patches in Pathankot, Hoshiarpur, Rupnagar, Sangrur & Mansa districts.

Water Level Fluctuation Range		Wells Monitored		Area Covered	
		No.	%age	Sq. Km.	%age
Decline	0-2	65	31	24322	48
	2-4	30	14	10145	20
	>4.0	18	9	1551	3
Rise	0-2	69	33	10846	22
	2-4	20	10	2785	6
	>4.0	7	3	713	1

Table 11 Seasonal water level fluctuation, June 2023 – August 2023

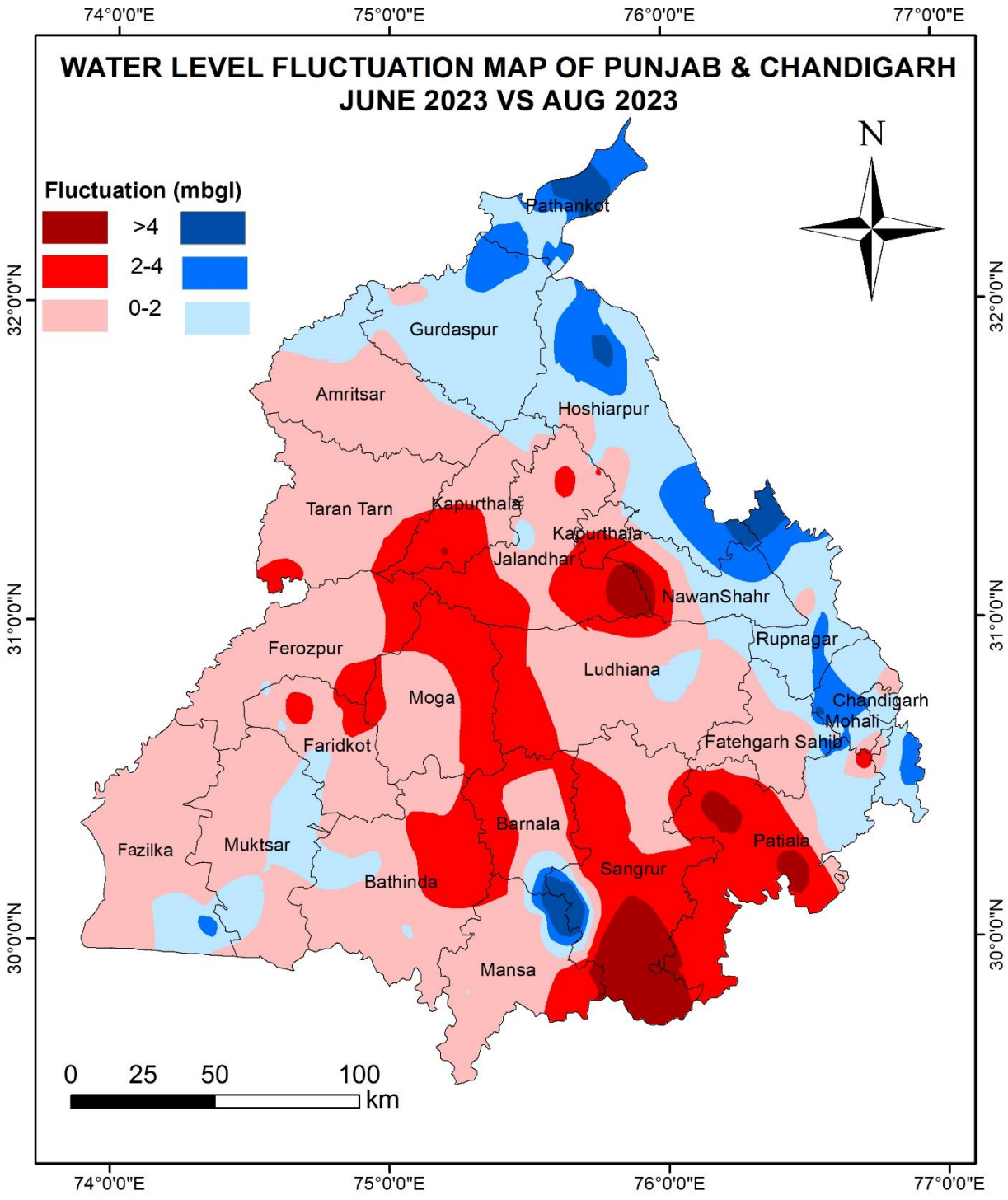


Fig. 14 Seasonal Water Level Fluctuation Map of Punjab and Chandigarh (June 2023 vs August 2023)

5.2.3 JUNE 2023 - NOVEMBER 2023

Water level data of Nov 2023 when compared with previous measurement data i.e. June 2023 is termed as seasonal water level fluctuations. The behavioral pattern of this seasonal fluctuation is discussed below. The map depicting seasonal water level fluctuations is shown in Fig. 15.

The seasonal fluctuation between June 2023 and Nov 2023 shows that there is a general decline of water levels in 57% of wells monitored and covering 68% area of the State. The fall has been observed mainly in south, NW and central part of the state and in some isolated patches scattered over the state. Water level decline in the range of 0-2 m is observed in 36% of wells and 56% of area. Water level decline in the range of 2-4 m is observed in 15% of wells and 10% of area whereas, water level decline of >4m is observed in 6% of wells and 2% of area during the period.

The water level rise has been recorded in 43% of wells monitored and covering 32% area of the State. Water level rise in the range of 0-2 m is observed in 33% of wells and 28% of the area. Water level rise 2-4 m is observed in 6% wells and 3% of area during the period, whereas, water level rise of >4m is observed in 4% of wells and 1% of area during the period. The rise in water level has been reported in Northern, NE and south western parts of the state.

Water Level Fluctuation Range		Wells Monitored		Area Covered	
		No.	%age	Sq. Km.	%age
Rise	0-2	173	33	14224	28
	2-4	31	6	1478	3
	>4.0	20	4	488	1
Decline	> 4	31	6	1142	2
	2 to 4	78	15	5033	10
	0 to 2	190	36	27997	56

Table 12 Seasonal water level fluctuation, June 2023 – November 2023

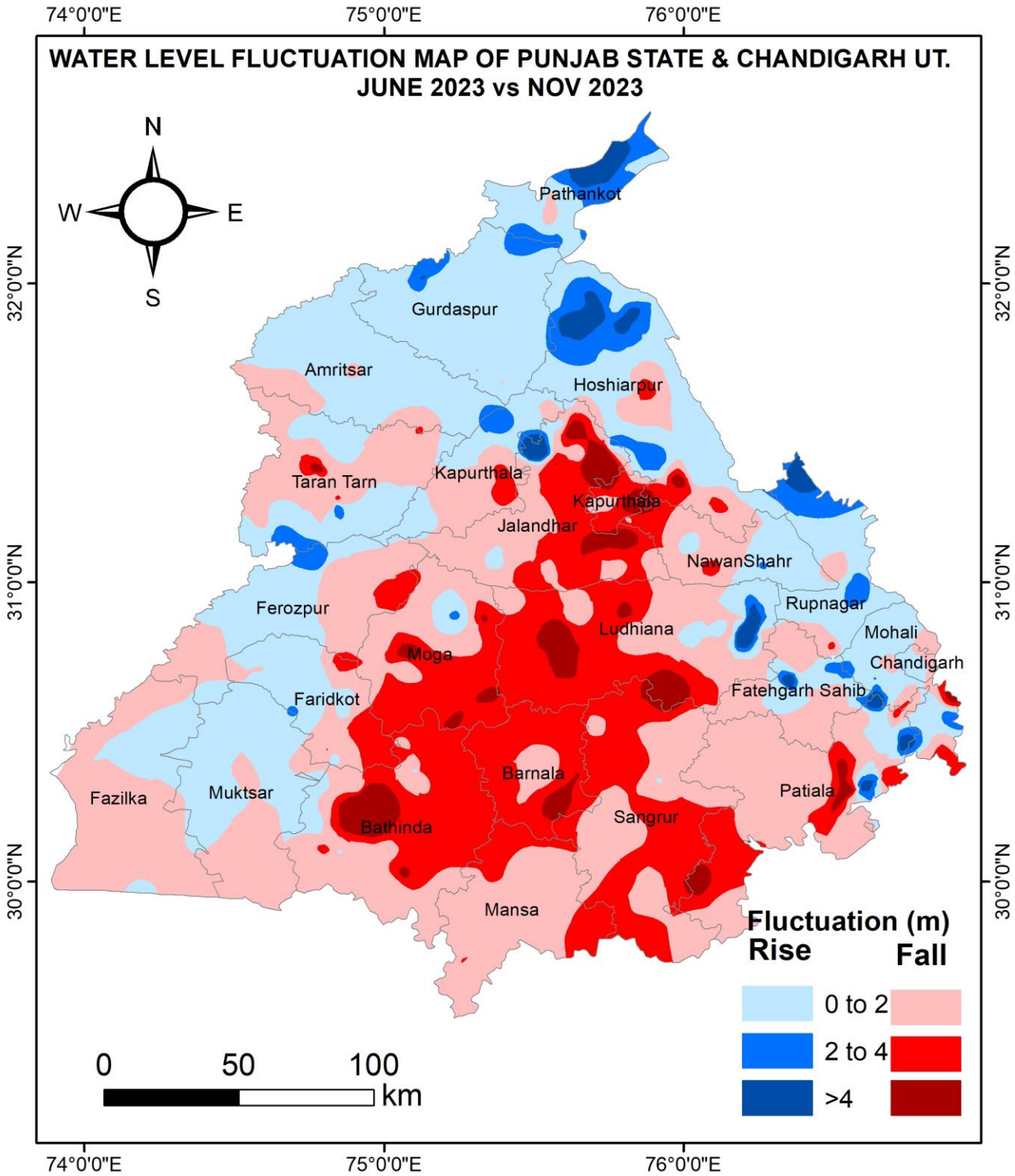


Fig 15 Water level fluctuation map of Punjab & Chandigarh, June, 2023-vs-Nov 2023

5.2.4 NOVEMBER 2023 - JANUARY 2024

Water level data of January 2024 when compared with previous measurement data i.e. November 2023 is termed as seasonal water level fluctuations. The behavioral pattern of this seasonal fluctuation is discussed below. The map depicting seasonal water level fluctuations is shown in Fig. 16.

The seasonal fluctuation between November 2023 and January 2024 shows that there is a general decline of water levels in 40.1% of wells monitored and covering 36.68% area of the State. The fall has been observed mainly in west and eastern part of the state and in some isolated patches scattered over the state. Water level decline in the range of 0-2 m is observed in 33.6% of wells and 26.84% of area. Water level decline in the range of 2-4 m is observed in 2.6% of wells and 3.79% of area whereas water level decline of >4m is observed in 3.9% of wells and less than 6.05% of area in isolated patch in Tarn Taran, Ferozpur, Ludhiana & Patiala districts.

The water level rise has been recorded in 59.9% of wells monitored and covering 63.32% area of the State. Water level rise in the range of 0-2 m is observed in 53.9% of wells and 57.10% of the area. Water level rise 2-4 m is observed in 3% wells and 4.14% of area during the period, whereas, water level rise of >4m is observed in 3% of wells and 2.05% of area during the period falling in districts of Bathinda, Kapurthala, Jalandhar, Ludhiana and Barnala districts. The rise in water level has been reported in all the districts except the eastern and western-most districts.

Water Level Fluctuation Range		Wells Monitored		Area Covered	
		No.	%age	Sq. Km.	%age
Decline	>4	9	3.9	3061.8	6.05
	4-2	6	2.6	1915.6	3.79
	2-0	78	33.6	13566.3	26.84
Rise	0-2	125	53.9	28860.9	57.10
	2-4	7	3.0	2095.6	4.14
	>4	7	3.0	1038.7	2.05

Table 13 Seasonal water level fluctuation, November 2023 – January 2024

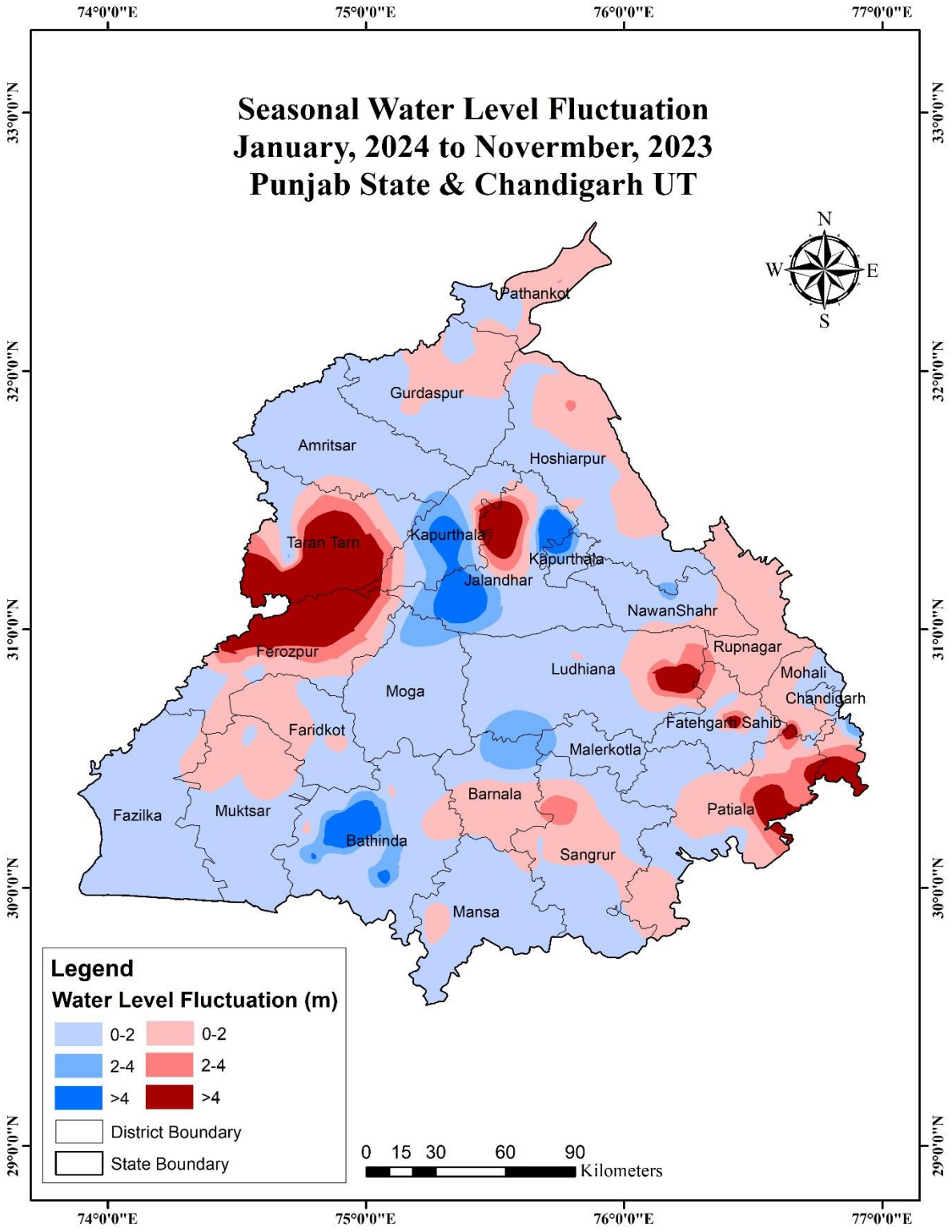


Fig 16 Seasonal Water Level Fluctuation Map of Punjab State & Chandigarh (UT) (November 2023 vs Jan 2024)

5.3 ANNUAL WATER LEVEL FLUCTUATIONS

In order to know the impact of rainfall and ground water withdrawal during last one-year, annual water level data for given period in current year is compared with water level data of corresponding period of last year and annual water level fluctuations are determined.

5.3.1 JUNE 2022 – JUNE 2023

In order to know the impact of rainfall and ground water withdrawal during last one-year, annual water level fluctuations for period June 2022 and June 2023 are calculated. The behaviour of annual fluctuations is discussed in the following paragraph and depicted in Fig. 17.

The annual fluctuation depicts general decline of water levels in 52% of wells monitored and covering 52% area of the State. The decline has been observed in all districts of the state. Water level decline the range of 0-2 m is observed in 48% of wells and 50% of the area. Water level decline in the range of 2-4 m is observed in 3% of wells and 2% of the area. Whereas, the water level decline of >4m is observed in 1% of wells and less than 1% of the area during the period, as isolated patches in Faridkot, Bathinda, Rupnagar, Tarn taran districts.

The water level rise has been recorded in 48% of wells monitored and covering 48% area of the State. Water level rise in the range of 0-2 m is observed in 41% wells and 45% of area. Water level rise 2-4m is observed in 4% wells and 3% of area. The water level rise of >4m is observed in 3% wells and 1% of area as isolated patches in Hoshiarpur, SAS Nagar, Patiala districts.

Water Level Fluctuation Range		Wells Monitored		Area Covered	
		No.	%age	Sq. Km.	%age
Decline	0-2	282	48	24972	50
	2-4	15	3	861	2
	>4.0	8	1	110	0.2
Rise	0-2	242	41	22465	45
	2-4	21	4	1608	3
	>4.0	17	3	346	1

Table 14 Annual water level fluctuation, June 2022 – June 2023

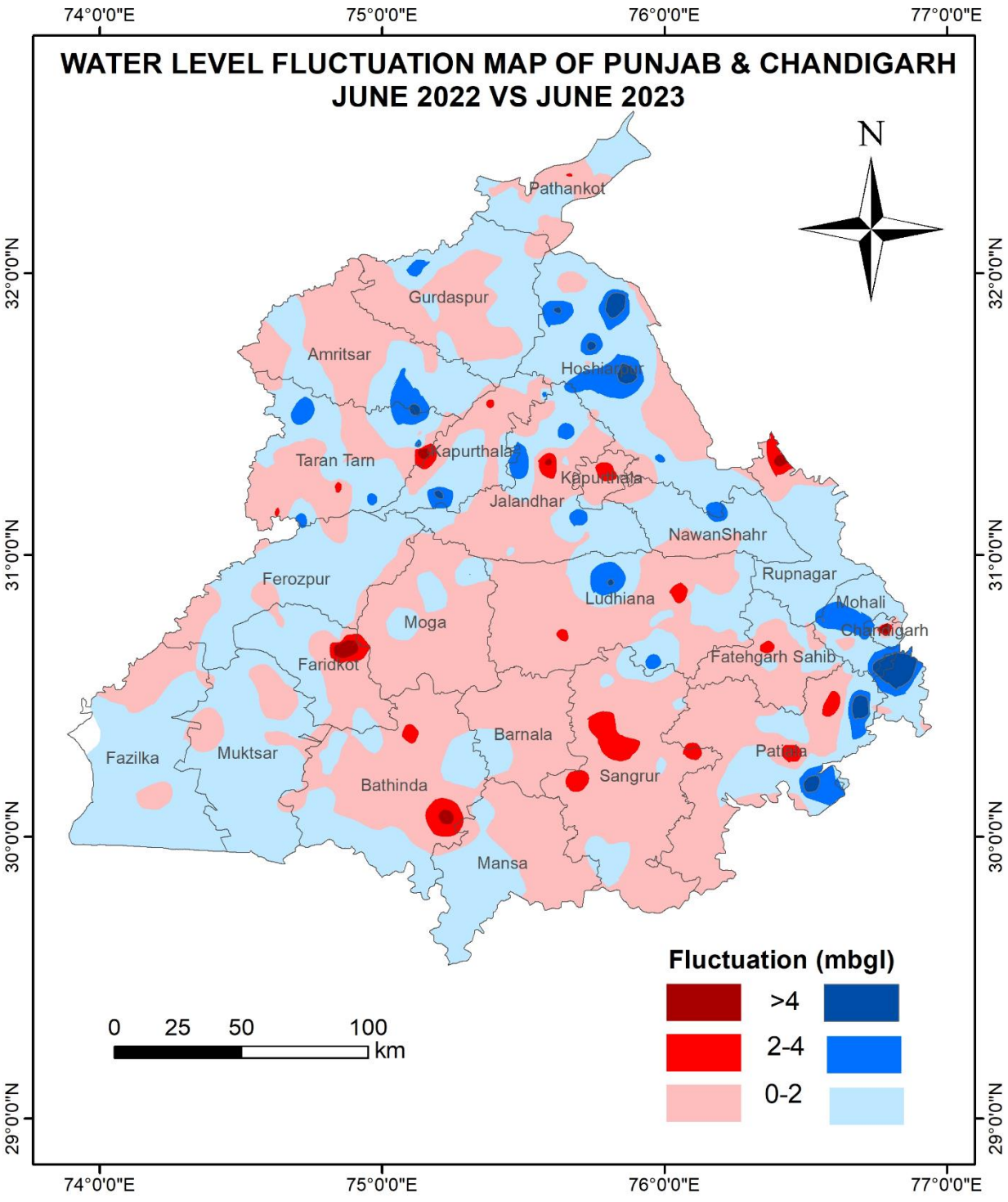


Fig. 17 Annual Water Level Fluctuation Map of Punjab and Chandigarh (June 2022 vs June 2023)

5.3.2 AUGUST 2022 - AUGUST 2023

In order to know the impact of rainfall and ground water withdrawal during last one year, annual water level fluctuations for period August 2022 and August 2023 are calculated. The behaviour of annual fluctuations is discussed in the following paragraph and depicted in Fig. 18.

The annual fluctuation depicts general decline of water levels in 47% of wells monitored and covering 26% area of the State. Water level decline in the range of 0-2 m is observed in 40% of wells and 45% of the area. Water level decline in the range of 2-4 m is observed in 5% of wells and 2% of the area as isolated patches in Patiala, Sangrur, Mansa, Faridkot & Kapurthala districts. Whereas, the water level decline of >4m is observed in 2% of wells and less than 1% of the area during the period, as isolated patch in Patiala & Faridkot district.

The water level rise has been recorded in 53% of wells monitored and covering 55% area of the State. Water level rise in the range of decline 0-2 m is observed in 44% wells and 47% of area. Water level rise 2-4m is observed in 5% wells and 6% of area in parts of Hoshiarpur, Moga, Ferozepur, SBS Nagar & SAS Nagar districts. The water level rise of >4m is observed in 4% wells and 2% of area as isolated patches in Hoshiarpur, Moga, Sangrur & Mansa districts.

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Water Level Fluctuation Range		Wells Monitored		Area Covered	
		No.	%age	Sq. Km.	%age
Decline	0-2	76	40	20898	41
	2-4	9	5	1592	3
	>4.0	3	2	91	0.2
Rise	0-2	84	44	23821	47
	2-4	9	5	2894	6
	>4.0	8	4	1066	2

Table 15 Annual water level fluctuation, August 2022 – August 2023

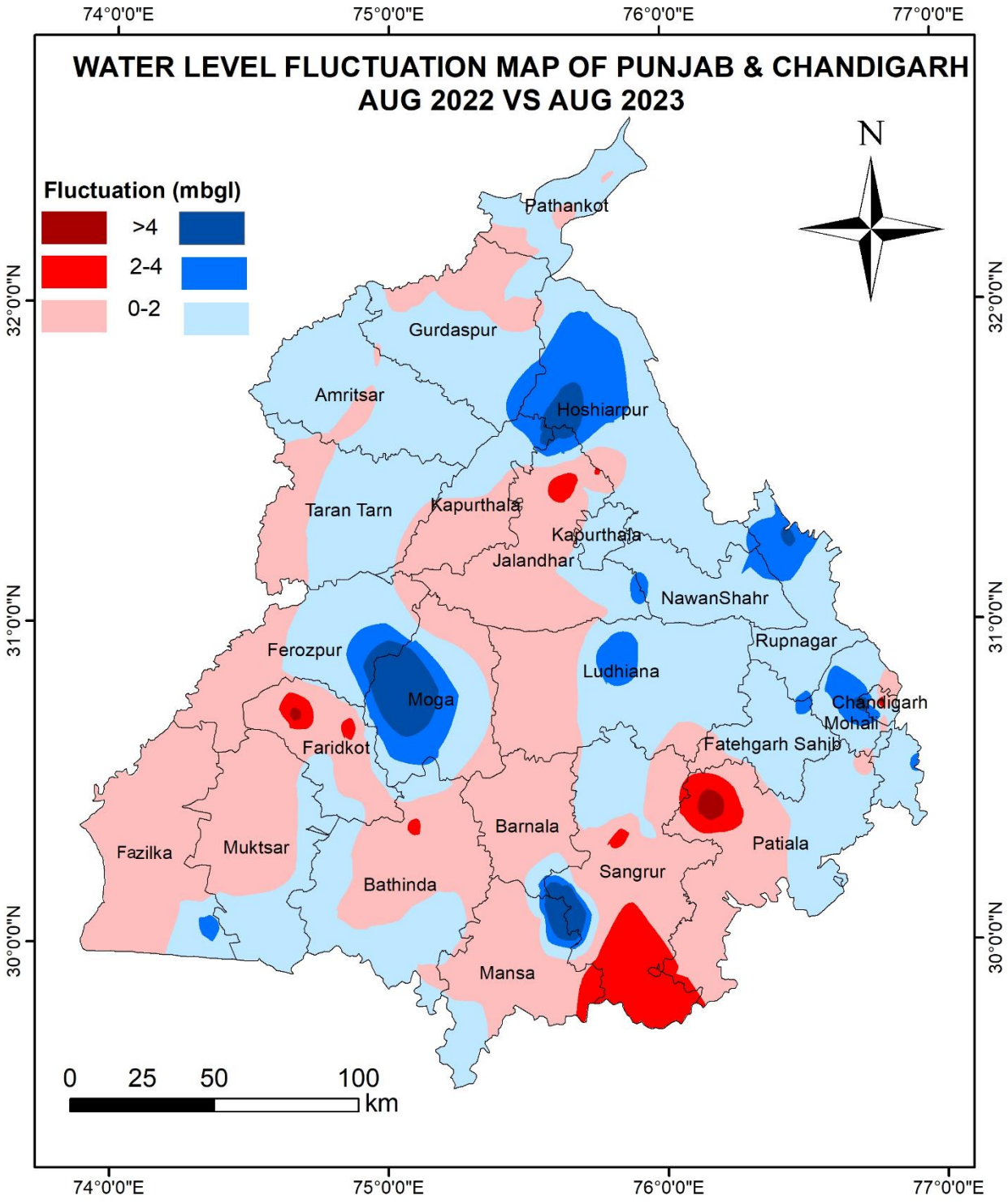


Fig. 18 Annual Water Level Fluctuation Map of Punjab and Chandigarh (August 2022 vs August 2023)

5.3.3 NOVEMBER 2022 – NOVEMBER 2023

In order to know the impact of rainfall and ground water withdrawal during last one-year, annual water level fluctuations for period Nov 2022 and Nov 2023 are calculated. The behaviour of annual fluctuations is discussed in the following paragraph and depicted in Fig. 19.

The annual fluctuation shows that there is a general decline of water levels in 60% of wells monitored and covering 64% area of the State. Water level decline the range of 0-2 m is observed in 45% of wells and 39% of the area in almost all of the districts. Water level decline in the range of 2-4 m is observed in 11% of wells and 21% of the area mainly in central part of the State, whereas, water level decline >4m is observed in 4% of wells and 3% of the area in Kapurthala, Jalandhar, Ludhiana and Bathinda districts during the period.

The water level rise has been recorded in 39% of wells monitored and covering 36% area in Northern, East and South western parts of the State. Water level rise in the range of rise 0-2 m is observed in 32% wells and 31% of area in almost all of the districts except Barnala, Mansa, Sangrur & Ludhiana. Water level rise of more than 2-4m is observed in 4% wells and 4% of area in Tarn Taran, Gurdaspur, Pathankot, Hoshiarpur, Kapurthala, Jalandhar, Rupnagar, SAS Nagar and Patiala districts, whereas, water level rise >4m is observed in 3% of wells and 1% of the area as isolated patches in Tarn Taran, Gurdaspur, Pathankot, Hoshiarpur, Kapurthala, Ludhiana, Rupnagar and Patiala disticts during the period.

Water Level Fluctuation Range		Wells Monitored		Area Covered	
		No.	%age	Sq. Km.	%age
Rise	0-2	154	32	15688	31
	2-4	17	4	1891	4
	>4.0	15	3	610	1
Decline	> 4	19	4	1577	3
	2 to 4	53	11	10752	21
	0 to 2	212	45	19844	39

Table 16 Annual water level fluctuation, November 2022 – November 2023

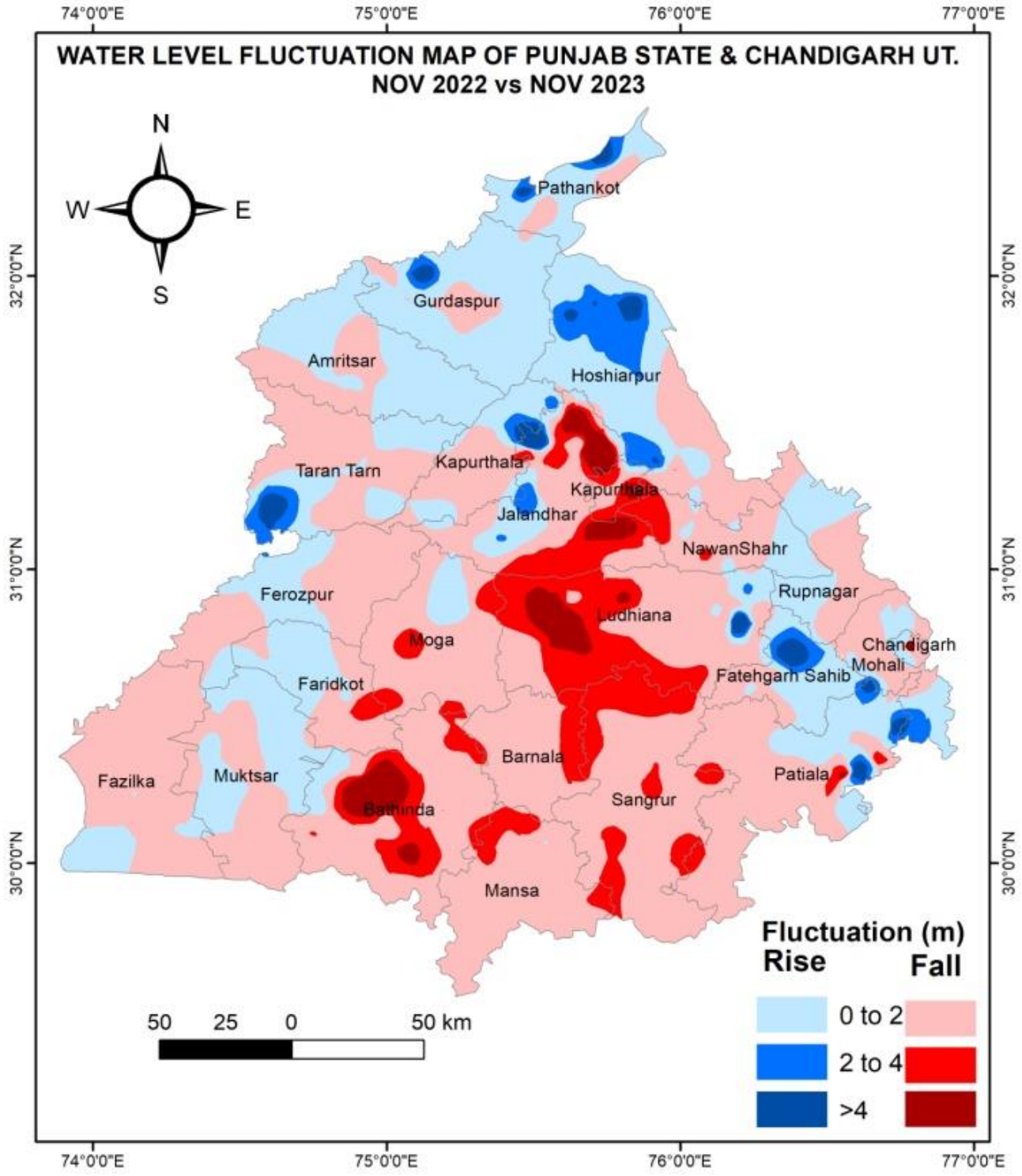


Fig. 19 Annual Water Level Fluctuation Map of Punjab and Chandigarh (Nov 2022 vs Nov 2023)

5.3.4 JANUARY 2023 - JANUARY 2024

In order to know the impact of rainfall and ground water withdrawal during last one-year, annual water level fluctuations for period January 2023 and January 2024 are calculated. The behaviour of annual fluctuations is discussed in the following paragraph and depicted in Fig. 20.

The annual fluctuation shows that there is a general decline of water levels in 48.1% of wells monitored and covering 78.1% area of the State. The decline has been observed in parts of all districts except Amritsar. Water level decline the range of 0-2 m is observed in 42.1% of wells and 68.3% of the area. Water level decline in the range of 2-4 m is observed in 3.4% of wells and 6.9% of the area, whereas, water level decline of >4m is observed in 2.6% of wells and 2.9% of the area falling in isolated patches in Kapurthala, Tarn Taran, Sangrurm Hoshiarpur and Jalandhar districts during the period.

The water level rise has been recorded in 51.9% of wells monitored and covering 21.9% area of the State. The water levels rise has been observed in Amritsar, Gurdaspur, Kapurthala, Tarn Taran districts mainly. Water level rise in the range of rise 0-2 m is observed in 48.5% wells and 20.8% of area. Water level rise of 2-4m is observed in 2.6% wells and 0.9% of area while rise of >4m is observed in <1% wells and <1% of area in isolated patches in Amritsar, Tarn Taran, Gurdaspur districts of Punjab.

Water Level Fluctuation Range		Wells Monitored		Area Covered	
		No.	%age	Sq. Km.	%age
Decline	>4	6	2.6	1460.2	2.9
	4-2	8	3.4	3484.2	6.9
	2-0	99	42.1	34400.7	68.3
Rise	0-2	114	48.5	10467.4	20.8
	2-4	6	2.6	501.5	0.9
	>4	2	0.9	2.6	<0.1

Table 17 Annual water level fluctuation, January 2023 – January 2024

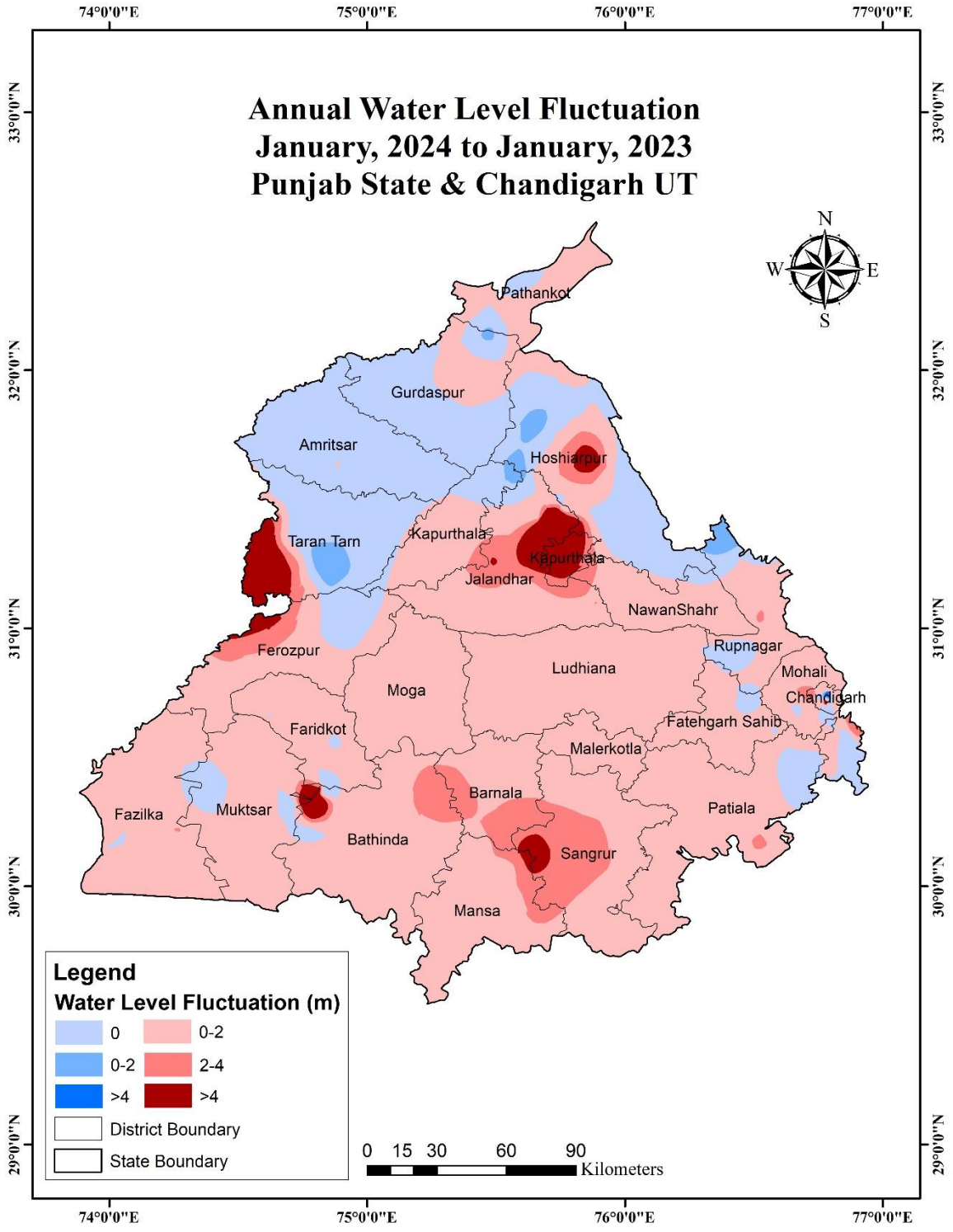


Fig 20 Annual Water level Fluctuation Map of Punjab State & Chandigarh (UT) (Jan 2023 vs Jan 2024)

5.4 DECADAL MEAN WATER LEVEL FLUCTUATION

Changes in water level behaviour since last one decade are determined using decadal mean data. Water level mean of past one decade for each ground water observation well is computed and compared with the respective water level data of the given monitoring to determine the decadal mean water level fluctuation.

5.4.1 MEAN OF JUNE (2013:2022) & JUNE 2023

Changes in water level behaviour since last one decade are determined using decadal mean data. Water level mean of past one decade (2013-2022) for each ground water observation well is computed and compared with the respective water level data of June 2023. The behaviour of water level over the period under reference is discussed in paragraph below along with Fig. 21.

The decadal mean fluctuations show that decline in 66% of observation wells monitored covering about 80% area of the state. The decline has been observed in all districts of the state. The decline of 0-2 m has been observed in about 48% of wells and 44% of area. Water level decline of 2-4 m is observed in 13% of the wells and 21% of the area. Water level decline of >4m is observed in 5% of the wells and 14% of area during the period, in Moga, Barnala, Sangrur, Bathinda, Mansa, Patiala & Jalandhar districts.

The decadal mean fluctuations show that rise in 34% of observation wells monitored covering about 20% area of the state. Water level rise in the range of 0-2 m is observed in 29% of wells and 19% of the area. Water level rise of 2-4m is observed in 3% of wells and 1% of the area. Water level rise of >4m is observed in 2% of wells and less than 1% of the state area as isolated patch in Hoshiarpur district.

Water Level Fluctuation Range		Wells Monitored		Area Covered	
		No.	%age	Sq. Km.	%age
Decline	0-2	304	48	22339	44
	2-4	84	13	10824	21
	>4.0	30	5	7279	14
Rise	0-2	139	29	9336	19
	2-4	9	3	520	1
	>4.0	8	2	64	0.1

Table 18 Decadal water level fluctuation, June (2013:2022) & June 2023

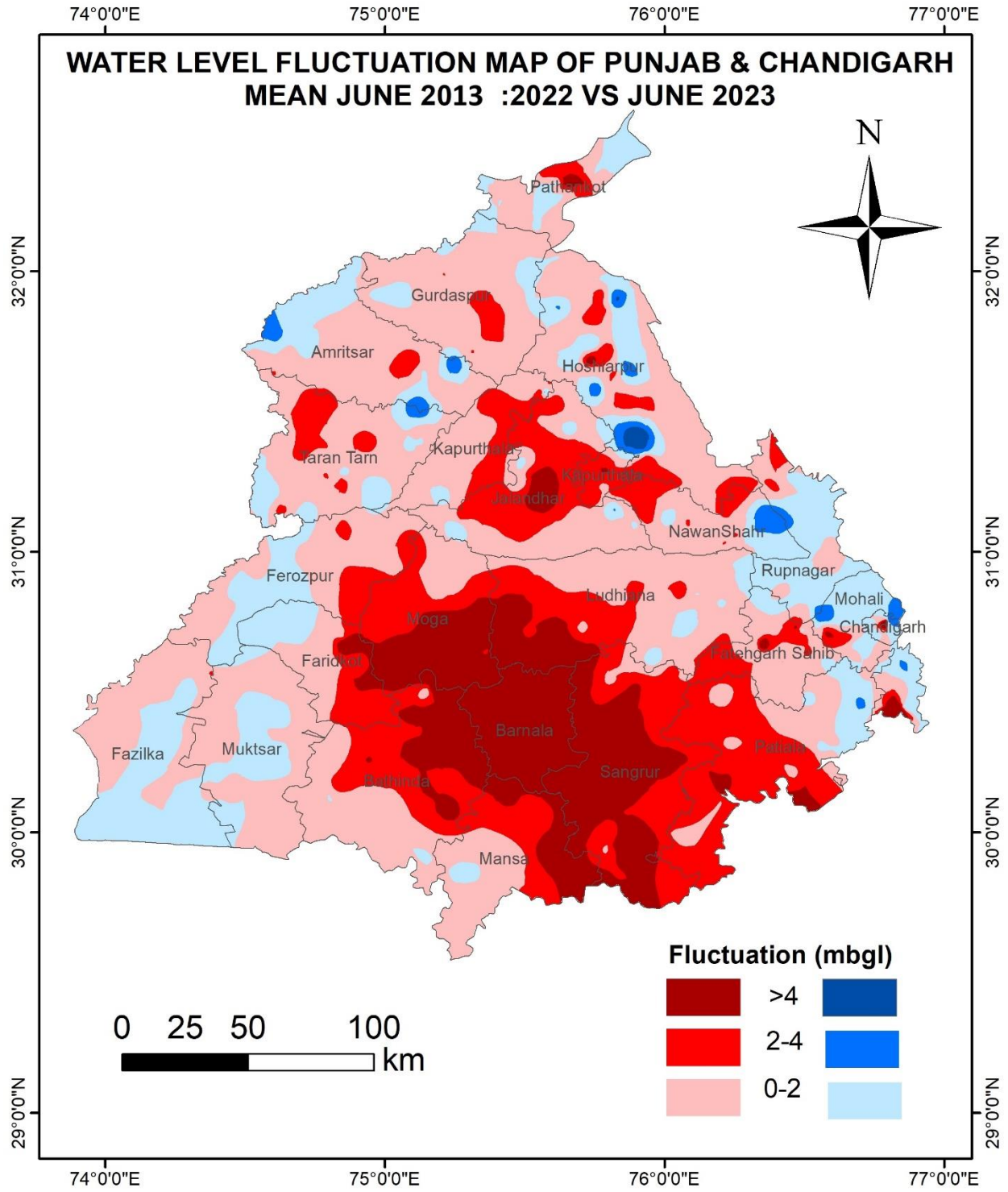


Fig. 21 Decadal Water Level Fluctuation Map of Punjab and Chandigarh (June 2013-2022 vs June 2023)

5.4.2 MEAN OF AUGUST (2013:2022) & AUGUST 2023

Changes in water level behaviour since last one decade are determined using decadal mean data. Water level mean of past one decade (2013-2022) for each ground water observation well is computed and compared with the respective water level data of August 2023. The behaviour of water level over the period under reference is discussed in paragraph below along with Fig. 22.

The decadal mean fluctuations show that decline in 62% of observation wells monitored covering about 73% area of the state. The decline has been observed in all the districts of the state except Rupnagar. The decline of 0-2 m has been observed in about 37% of wells and 44% of area. Water level decline of 2-4 m is observed in 13% of the wells and 13% of the area. Water level decline of >4m is observed in 12% of the wells and 16% of area in Barnala, Sangrur & parts of Ludhiana, Bathinda, Patiala, Mansa, Moga & Faridkot districts.

The decadal mean fluctuations show that rise in 38% of observation wells monitored covering about 27% area of the state. Water level rise in the range of 0-2 m is observed in 32% of wells and 22% of the area. Water level rise of 2-4m is observed in 4% of wells and 4% of the area. Water level rise of >4m is observed in 2% of wells and 1% of the state area as small isolated patches in Hoshiarpur, Moga, Mansa & Sangrur districts.

Water Level Fluctuation Range		Wells Monitored		Area Covered	
		No.	%age	Sq. Km.	%age
Decline	0-2	145	28	22387	44
	2-4	95	19	6520	13
	>4.0	165	32	8028	16
Rise	0-2	91	18	10930	22
	2-4	10	2	1821	4
	>4.0	7	1	676	1

Table 19 Decadal water level fluctuation, August (2013:2022) & August 2023

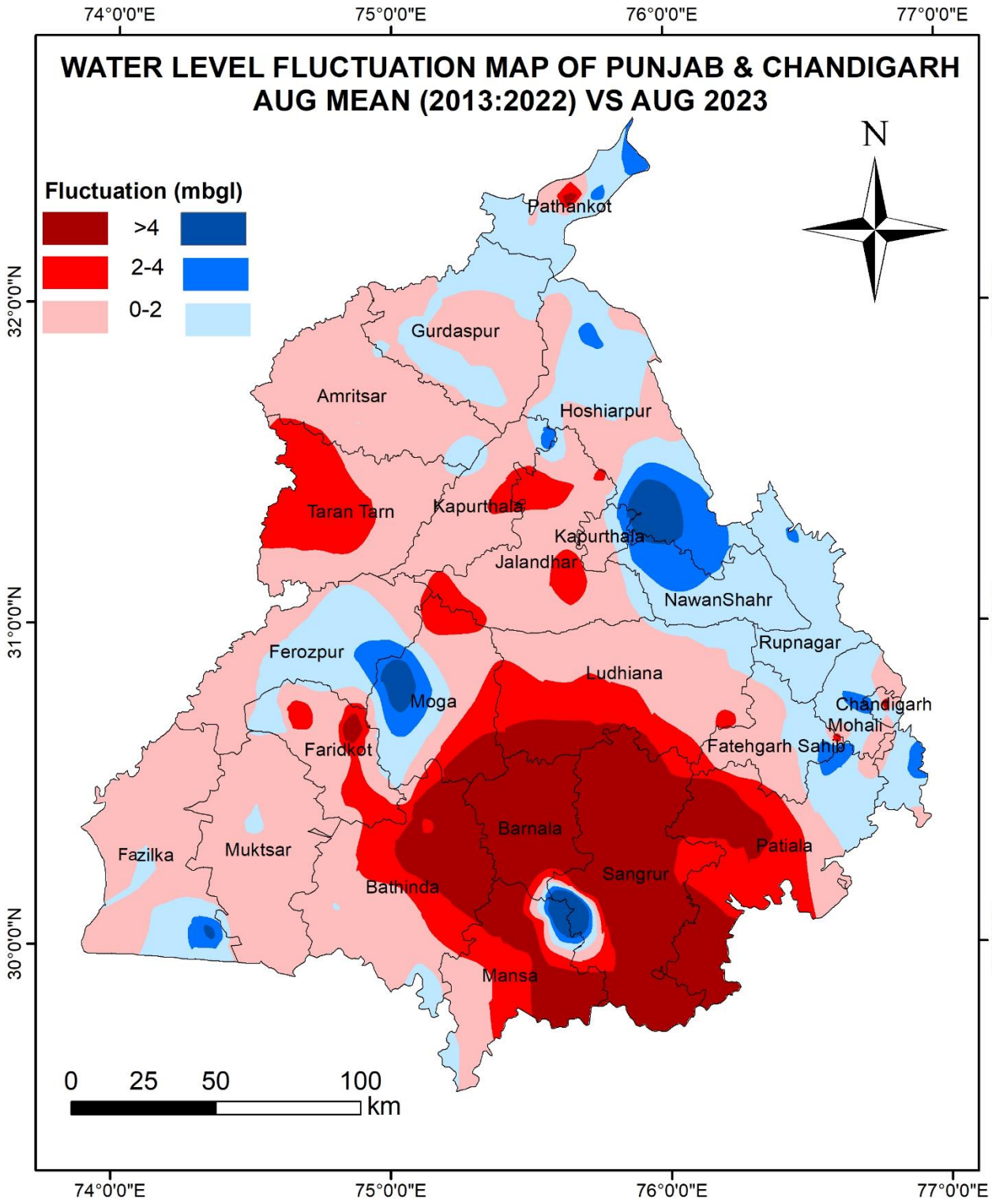


Fig. 22 Decadal Water Level Fluctuation Map of Punjab and Chandigarh (Aug 2013-2022 vs Aug 2023)

5.4.3 MEAN NOVEMBER (2013:2022) & NOVEMBER 2023

Changes in water level behaviour since last one decade are determined using decadal mean data. Water level mean of past one decade (2013-2022) for each ground water observation well is computed and compared with the respective water level data of Nov 2023. The behaviour of water level over the period under reference is discussed in paragraph below along with Fig. 23.

The comparison of mean water level of last 10 years (decadal mean of Nov 2013 - 2022) with water level data of Nov 2023 shows decline in 68% of observation wells monitored covering about 72% area of the state. The decline of 0-2 m has been observed in about 33% of wells and 33% of area in almost all of the districts except Sangrur & Barnala. Water level decline of 2-4 m is observed in 17% of the wells and 16% of the area mainly in central part of the State and few isolated patches in Tarn Taran, Fazilka, Ferozpur, Rupnagar and Mohali districts. Water level decline of >4m is observed in about 18% of the wells and 22% of area mainly in Mansa, Moga, Barnala, Ludhiana, Sangrur, Bathinda and Patiala districts and few isolated patches in Jalandhar, Kapurthala, Rupnagar, Tarn Taran and Ferozpur Districts.

Rise in water level has also been observed in 32% of wells and 28% of area. The rise has been observed in northern part of state and in small patches to the east and southwest of state. Water level rise in the range of 0-2 m is observed in 25% of wells and 25% of the area in Pathankot, Gurdaspur, Hoshiarpur, Amritsar, Tarn Taran, Kapurthala, Jalandhar, Firozpur, Faridkot, Muktsar, Fazilka, Rupnagar, Nawan Shahr, Ludhiana, SAS Nagar and Patiala districts. Water level rise of 2-4 m is observed in 4% of wells and **3**% of the area as isolated patches in Hoshiarpur, Amritsar, Tarn Taran, Ferozpur, Nawan Shahr, Rupnagar, Ludhiana, Patiala, Mohali and Fatehgarh Saheb districts. whereas, water level rise >4m is observed in 3% of wells and less than 1% of the area as isolated patches in Barnala, Sangrur, Patiala, Ludhiana, Nawan Shahr, Hoshiarpur and Jalandhar.

Water Level Fluctuation Range		Wells Monitored		Area Covered	
		No.	%age	Sq. Km.	%age
Rise	0-2	146	25	12433	25
	2-4	22	4	1336	3
	>4.0	15	3	444	0.9
Decline	> 4	106	18	11300	22
	2 to 4	96	17	8113	16
	0 to 2	188	33	16736	33

Table 20 Decadal water level fluctuation, November (2013:2022) & November 2023

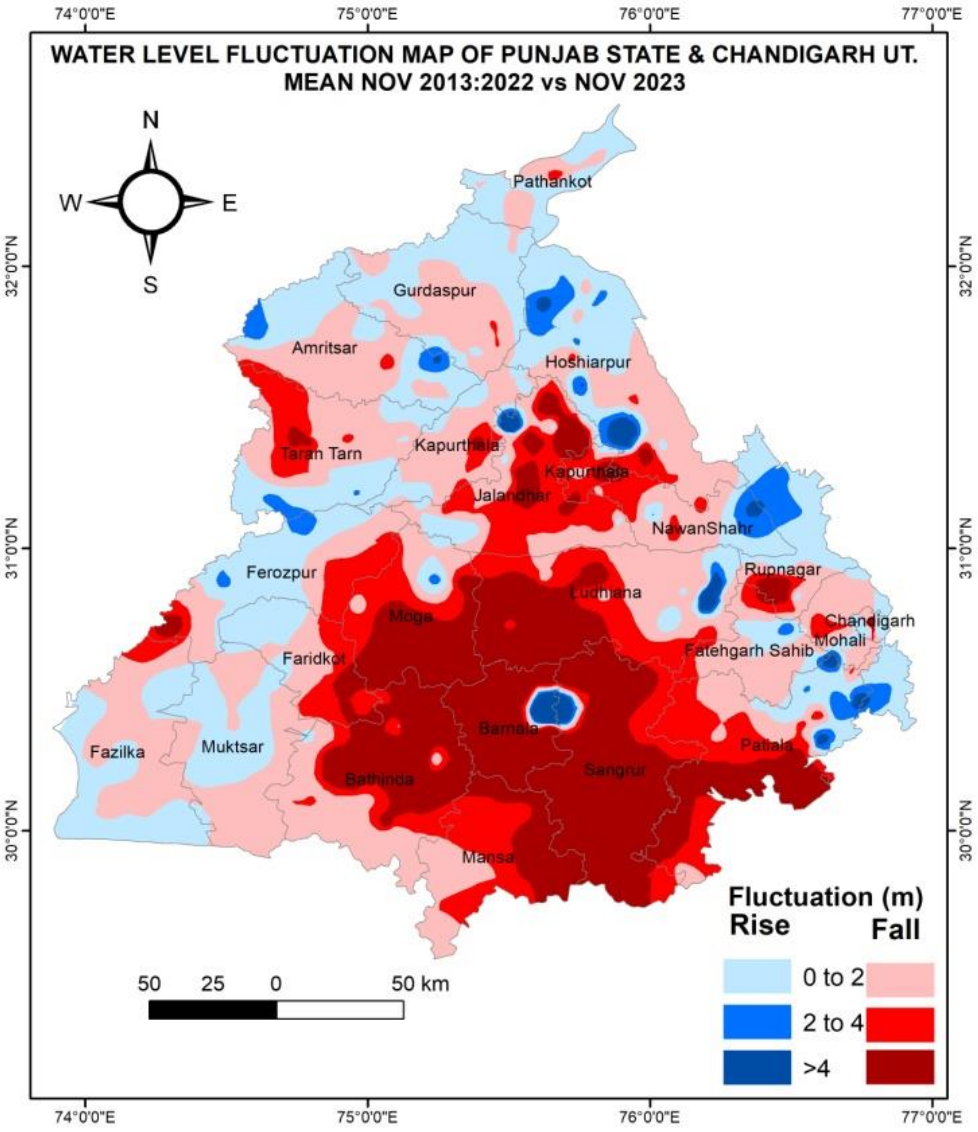


Fig. 23 Decadal Water Level Fluctuation Map of Punjab and Chandigarh (Nov 2013-2022 vs Nov 2023)

5.4.4 MEAN JANUARY (2014:2023) & JANUARY 2024

Changes in water level behaviour since last one decade are determined using decadal mean data. Water level mean of past one decade (2014-2023) for each ground water observation well is computed and compared with the respective water level data of January 2024. The behaviour of water level over the period under reference is discussed in paragraph below along with Fig. 24.

The comparison of mean water level of last 10 years (decadal mean of January 2014 - 2023) with water level data of January 2024 shows decline in 65.8% of observation wells monitored covering about 79.5% area of the state. The decline has been observed in all the districts. The decline of 0-2 m has been observed in about 38.4% of wells and 39.3% of area. Water level decline of 2-4 m is observed in 13.3% of the wells and 15.2% of the area. Water level decline of >4m is observed in about 14.1% of the wells and 25% of area mainly in Barnala, Sangrur, Patiala, Moga, Mansa, Ludhiana, Bathinda and Tarn Taran Districts.

Rise in water level has also been observed in 34.2% of wells and 20.5% of area. The rise has been observed in eastern part of state. The districts showing rise in water level are Fazilka, Ferozpur, Amritsar, Gurdaspur, Hoshiarpur, Jalandhar, Kapurthala, Rupnagar, Patiala, SAS Nagar, Chandigarh districts. Water level rise in the range of 0-2 m is observed in 30.8% of wells and 18.9% of the area. Water level rise of 2-4 m is observed in 2.3% of wells and 1% of the area, whereas, water level rise >4m is observed is observed in 1.1% of wells and less than 1% of the area falling in parts of Patiala & Hoshiarpur during the period.

Water Level Fluctuation Range		Wells Monitored		Area Covered	
		No.	%age	Sq. Km.	%age
Decline	>4	37	14.1	12579.7	25.0
	4-2	35	13.3	7690.6	15.2
	2-0	101	38.4	19788.7	39.3
Rise	0-2	81	30.8	9516.1	18.9
	2-4	6	2.3	546.7	1.0
	>4	3	1.1	176.0	0.3

Table 21 Decadal water level fluctuation, January (2014:2023) & January 2024

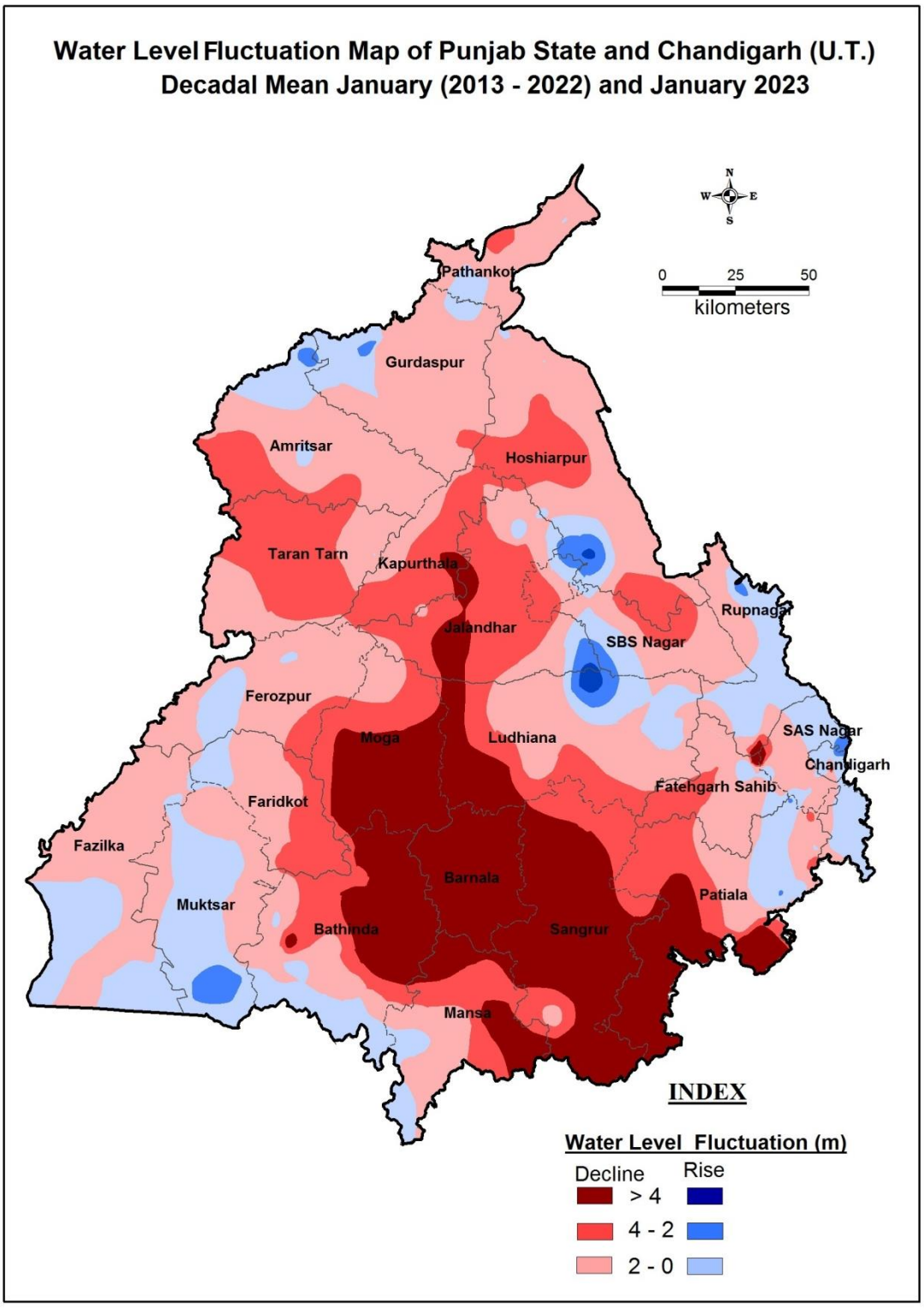


Fig 24 Decadal Water Level Fluctuation Map of Punjab State & Chandigarh (UT) (Jan 2014-2023 vs Jan 2024)

6.0 WATER LEVEL BEHAVIOUR OF CONFINED AQUIFER

6.1 JUNE 2023

The behavioral pattern of water level in June 2023 along with depth to water level map (Fig. 25) is discussed below. Very shallow water levels of 0-2 m (causing water logging) occur in 02 nos. of wells only comprising less than 1% area of the state. Shallow water levels of 2-5 m have been observed in 3.3% of the wells and 2.95% of the total area. The water levels between 5-10 m are about 5.5% of wells and 14.7% of the area fall in this range. Moderately Deep-water levels (10-20 m) are observed in 21.1% wells covering about 29.3% area of the State. Deep water levels (20-40 m) are observed in 54.4% wells covering about 47.8% area of the state. Very deep-water levels (>40 m) are observed in 13.3% covering 5% area of the State. Summarized details of depth to water level in different ranges are given in table below.

Depth to water level range	Wells monitored		Area covered	
	No.	%age	Sq. Km.	%age
0-2	2	2.22	51.2	0.10
2-5	3	3.33	1478.4	2.95
5-10	5	5.56	7424.2	14.79
10-20	19	21.11	14744.96	29.38
20-40	49	54.44	23994.1	47.81
>40	12	13.33	2544.0	5.07

Table 22 Depth to water level of confined aquifers, June 2023

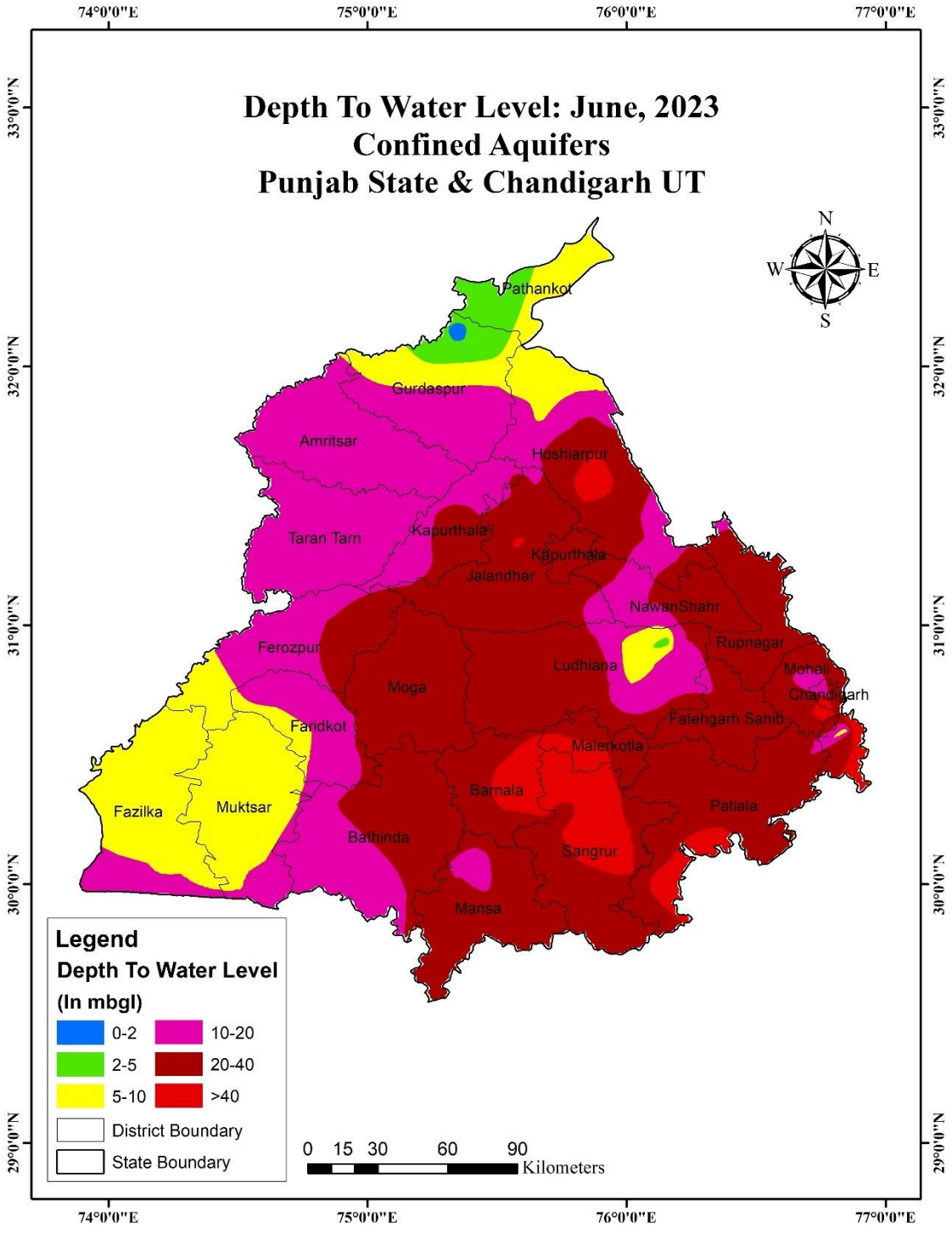


Fig. 25 Depth to Water Level Map of Punjab and Chandigarh June 2023

6.2 AUGUST 2023

The behavioral pattern of water level in August 2023 along with depth to water level map (Fig. 26) is discussed below. Very shallow water levels of 0-2 m (causing water logging) occur in 3.5% of wells and just more than 1% area of the state. Shallow water levels of 2-5 m have been observed in 4.7% of the wells and 4.1% of the total area. The water levels between 5-10 m are observed in about 2.3% of wells and 12.2% of the area fall in this range. Moderately Deep-water levels (10-20 m) are observed in 21.1% wells covering about 28.7% area of the. Deep water levels (20-40 m) are also observed in 41.1% wells covering about 41.2% area of the State. Very deep-water levels (>40 m) are observed in 27% wells covering 12.3% area of the State. Summarized details of depth to water level in different ranges are given in table below.

Depth to water level range	Wells monitored		Area covered	
	No.	%age	Sq. Km.	%age
0-2	3	3.53	663.6	1.34
2-5	4	4.71	2052.7	4.13
5-10	2	2.35	6094.9	12.26
10-20	18	21.18	14288.1	28.75
20-40	35	41.18	20486.9	41.22
>40	23	27.06	6112.4	12.30

Table 23 Depth to water level of confined aquifers, August 2023

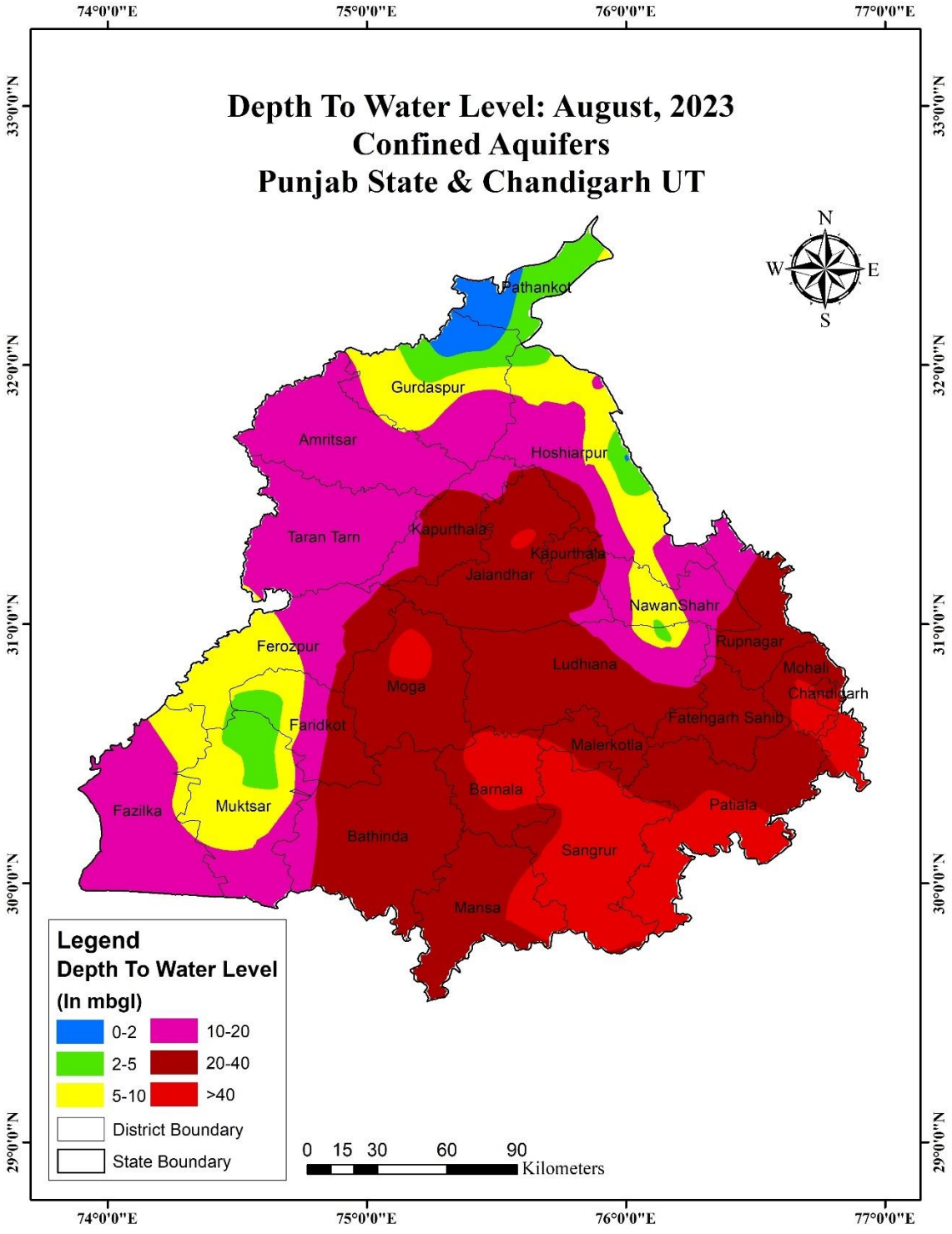


Fig. 26 Depth to Water Level Map of Punjab and Chandigarh Aug 2023

6.3 NOVEMBER 2023

The behavioral pattern of water level in Nov 2023 along with depth to water level map (Fig. 27) is discussed below. Very shallow water levels of 0-2 m (causing water logging) occur in around 3.2% of wells and cover 2.6% area of the. Shallow water levels of 2-5 m have been observed in 4.3% of the wells and 12% of the total area. The water levels between 5-10 m are observed in about 2.1% of wells and 11% of the area fall in this range. Deep water levels (10-20 m) are observed in 23.6% wells covering about 26.3% area of the State. Very deep-water levels (20-40 m) are observed in 43% wells covering about 39.3% area of the State. Very deep-water level (>40m) is observed in 23.6% wells and 8.6% area.

Depth to water level range	Wells monitored		Area covered	
	No.	%age	Sq. Km.	%age
0-2	3	3.23	1315	2.65
2-5	4	4.30	5988	12.05
5-10	2	2.15	5482	11.04
10-20	22	23.66	13078	26.33
20-40	40	43.01	19529	39.31
>40	22	23.66	4282	8.62

Table 24 Depth to water level of confined aquifers, November 2023

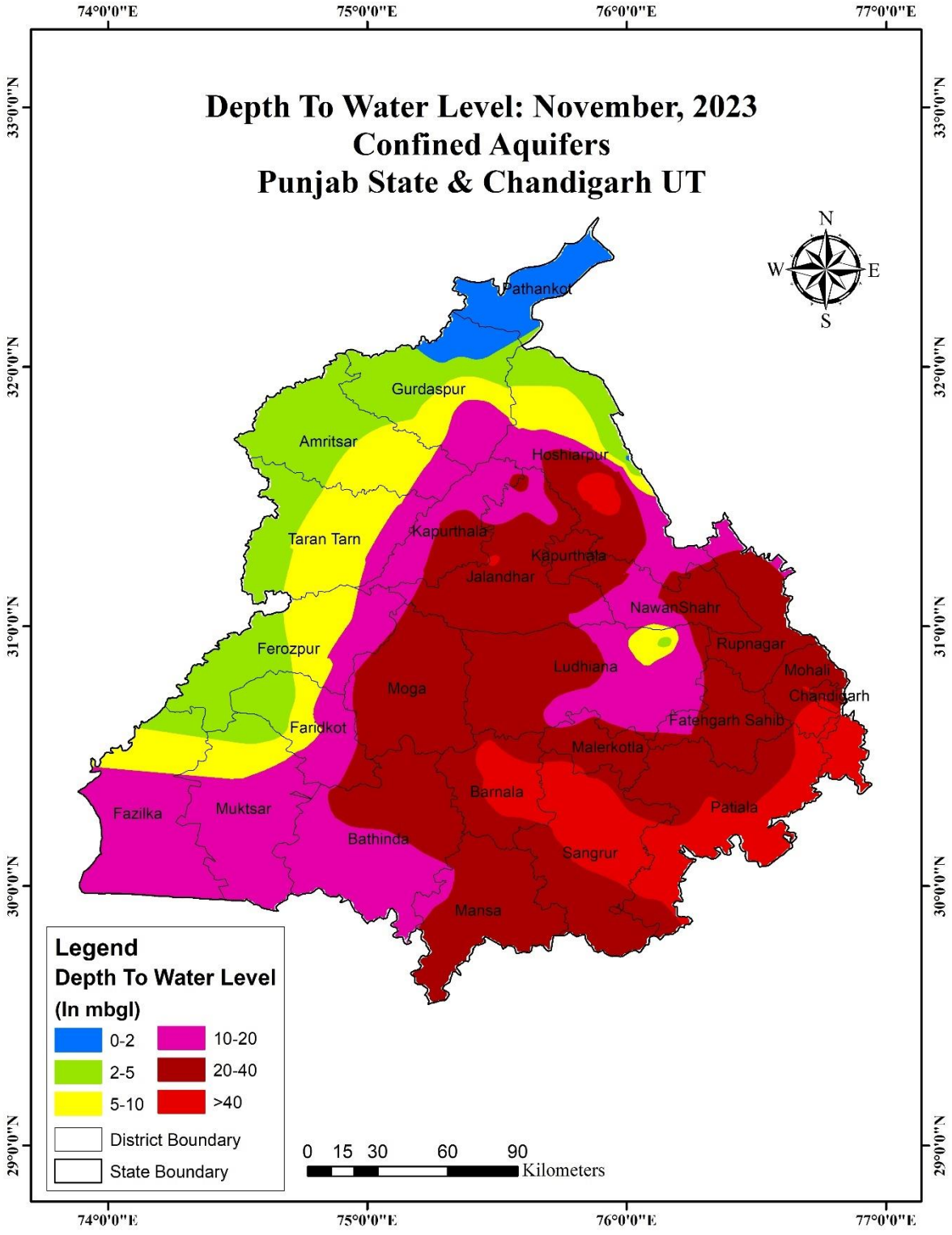


Fig. 27 Depth to Water Level Map of Punjab and Chandigarh Nov 2023

6.4 JANUARY 2024

The behavioral pattern of water level in January 2024 along with depth to water level map (Fig. 28) is discussed below. Very shallow water levels of 0-2 m (causing water logging) occur in 3.3% of the wells covering 2.6% of the state's area. Shallow water levels of 2-5 m have been observed in 4.4% of the wells and 3.5% of the total area. The water levels between 5-10 m are observed in about 5.4% of wells and 13.3% of the area fall in this range. Deep water levels (10-20 m) are observed in 23% wells covering about 29.1% area of the State. Very deep-water levels (20-40 m) are observed in 45% wells covering about 41.2% area of the State. Very deep-water level (>40m) is observed in 18.6% wells and 10% area.

Depth to water level range	Wells monitored		Area covered	
	No.	%age	Sq. Km.	%age
0-2	3	3.30	1338.1	2.69
2-5	4	4.40	1744.2	3.51
5-10	5	5.49	6623.5	13.32
10-20	21	23.08	14508.1	29.17
20-40	41	45.05	20509.7	41.24
>40	17	18.68	5009.6	10.07

Table 25 Depth to water level of confined aquifers, January 2024

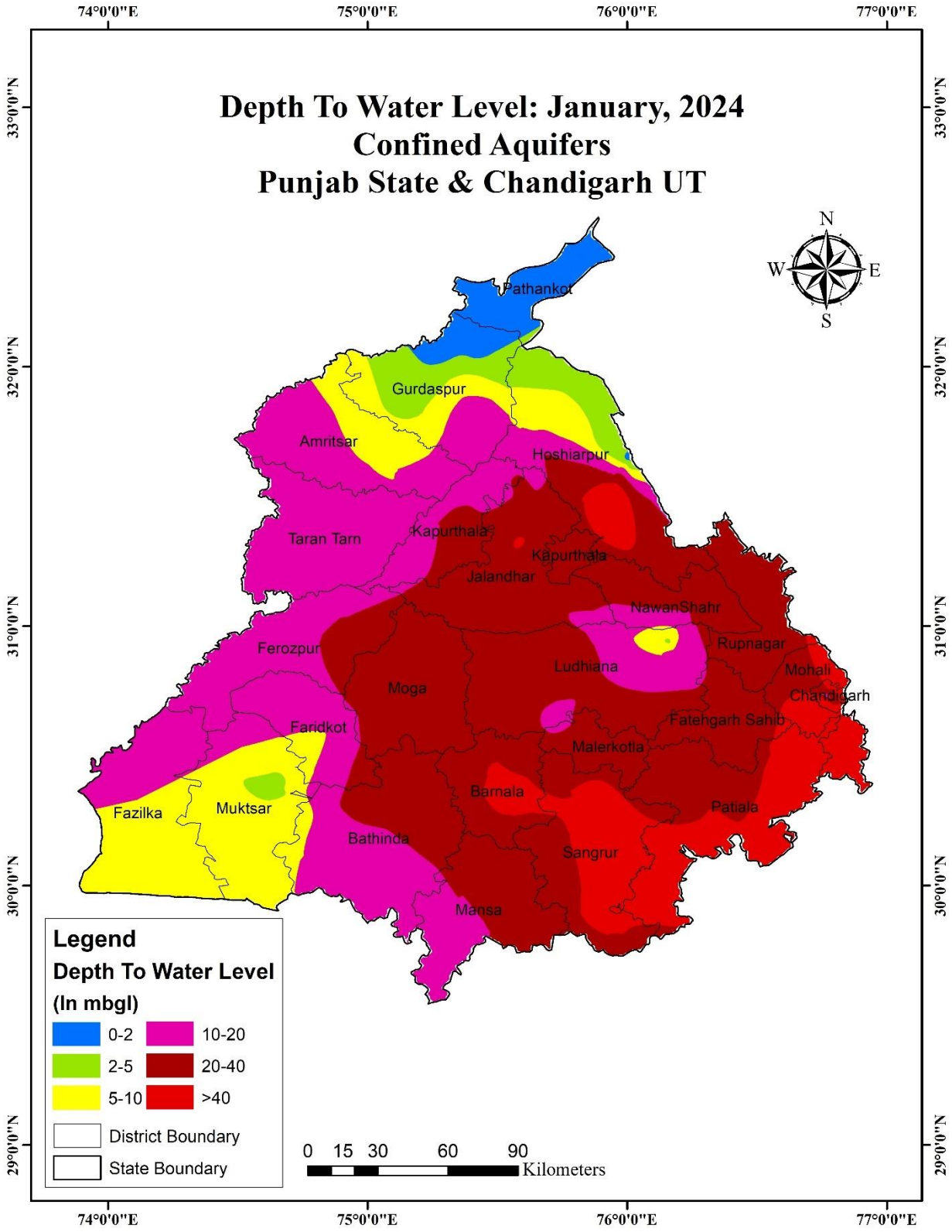


Fig. 28 Depth to Water Level Map of Punjab and Chandigarh Jan 2024

7.0 LONG TERM HYDROGRAPHS:

Fig. 29 Site Gulabgarh S, District Bathinda, Punjab

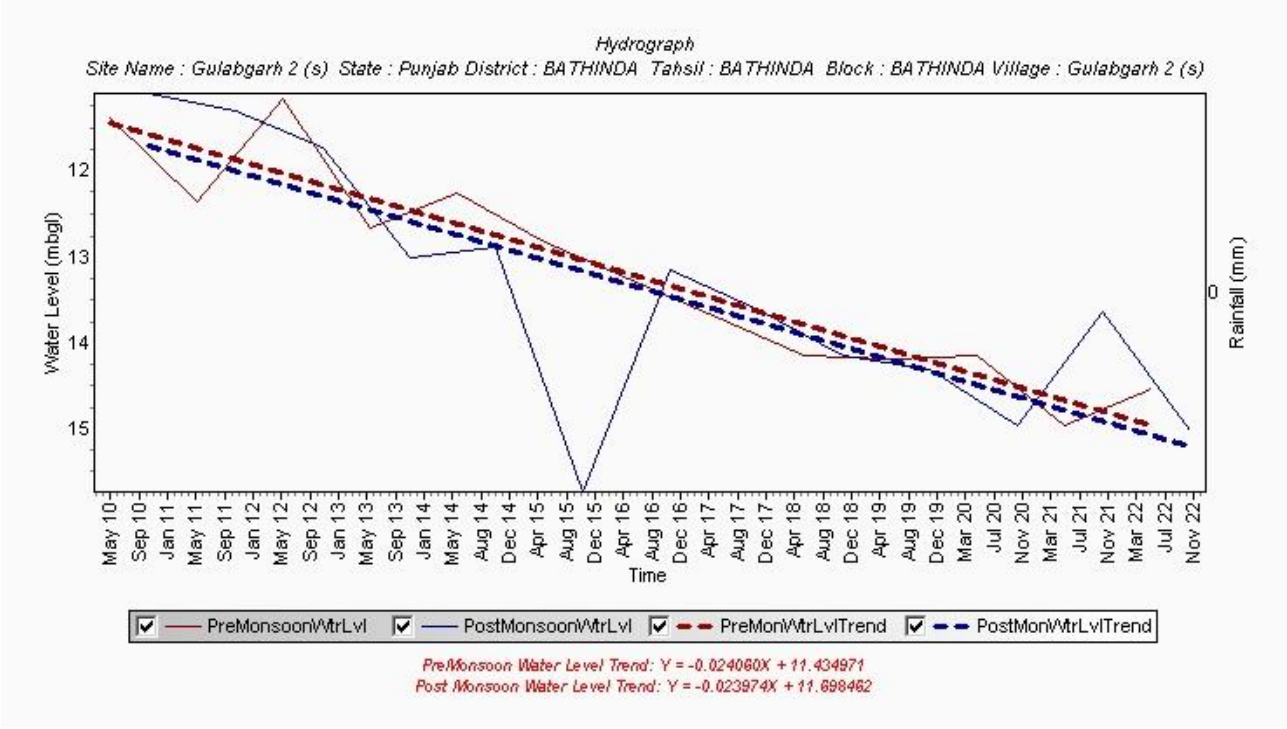


Fig. 30 Site Jhanduke, District Bathinda, Punjab

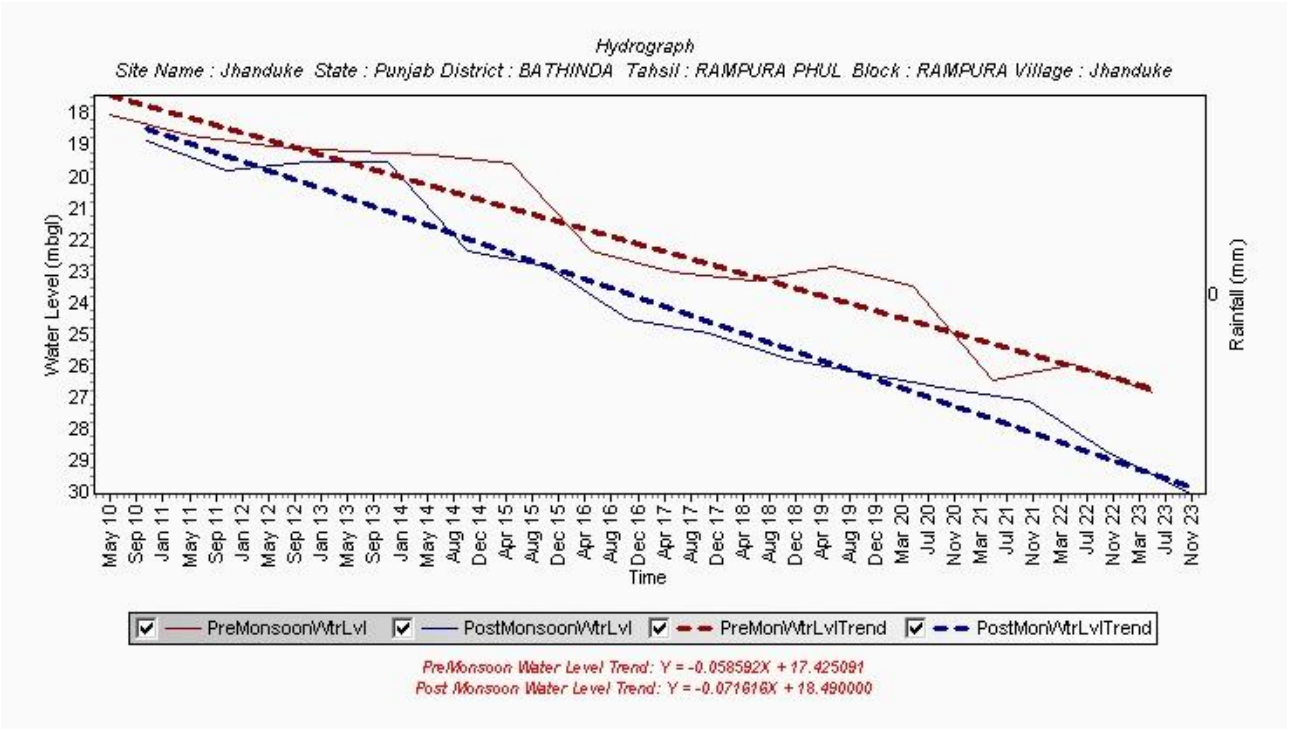


Fig. 31 Site Ladda pz, District Sangrur, Punjab

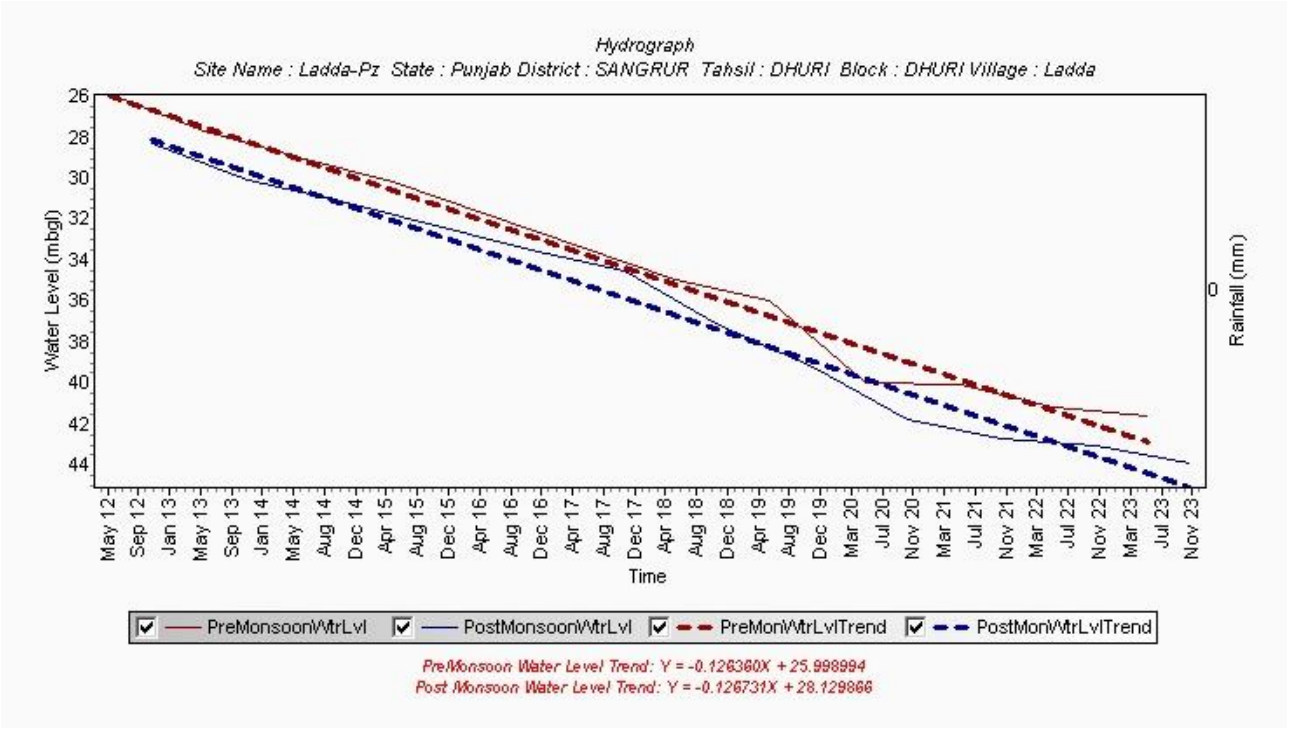


Fig. 32 Lalliana pz, District Bathinda, Punjab

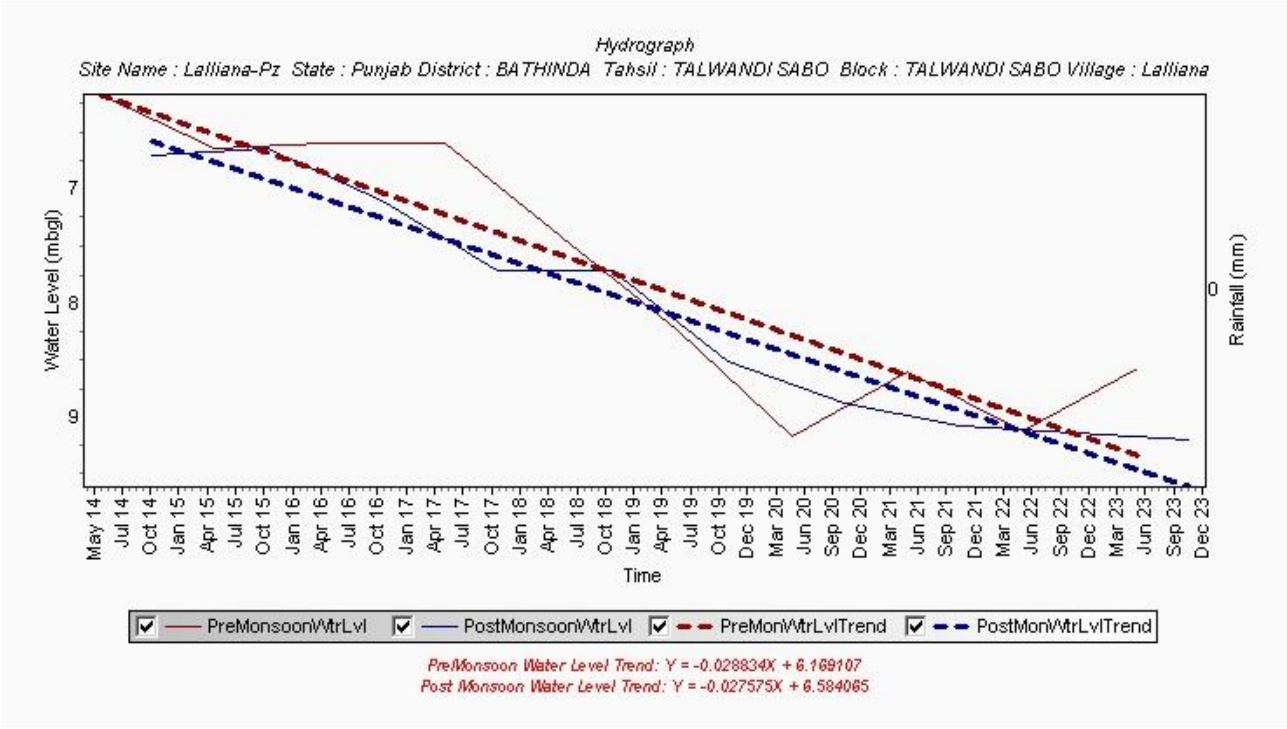
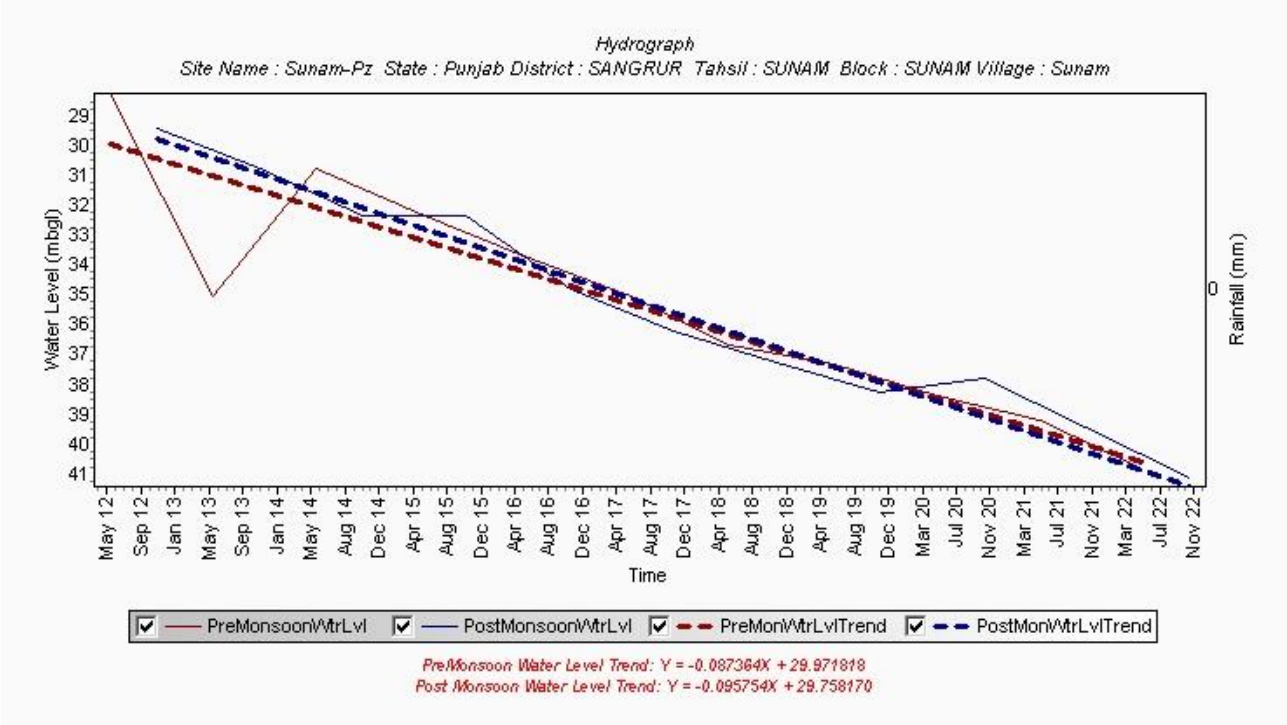


Fig. 33 Site Sunam-pz, District Sangrur, Punjab



DISCUSSION

Above 5 nos. of water level hydrographs of the Punjab State are representatives of the typical long-term depth to water level trend of the state's aquifers. The decline in depth to water level is attributed to the extraction of groundwater specially for irrigation purposes as evident from GWRE 2022-23 () (CGWB, NWR, Chandigarh, 2023). Although groundwater extraction for domestic and industrial purposes is also increasing due to the increase in population, urban settlements and industrialization respectively, irrigation-led groundwater extraction is exceeded by multiple folds. Typical Kharif cropping pattern of the state is Paddy (Rice) which is water intensive crop and requires multiple cycles of irrigation as well throughout the cropping period from sowing to harvesting.

Concerned state government departments are dissemination the information pertaining to the sowing of DSR variety of paddy (Direct Seeded Rice) which is less water intensive and increases the irrigation return flow.

Apart from the groundwater extraction, declining depth to water level trend may also be attributed to the decreased rainfall through previous years and also, less rainfall intensity as compared to previous years.

8. DEPTH TO WATER LEVEL DATA

S. No.	District	Well Name	Jun, 2023	Aug, 2023	Nov, 2023	Jan, 2024
1	AMRITSAR	Amritsar	26.73			
2	AMRITSAR	Amritsar-D	22.85	23.53		22.11
3	AMRITSAR	Amritsar-M	24.9	25.34	24.52	24.1
4	AMRITSAR	Amritsar-S	25.6	25.31		24.82
5	AMRITSAR	Bal Kalan-Pz	18.06		18.37	
6	AMRITSAR	Bhattaywad-Pz	12.06			
7	AMRITSAR	Boparai Khurd-Pz	17.92		19.34	
8	AMRITSAR	Chogawan1	14.37			
9	AMRITSAR	Dhulika-Pz	18.75		18.53	
10	AMRITSAR	Gill wali-Pz	22.92		22.77	
11	AMRITSAR	Jethuwal-Pz	17.3		16.67	
12	AMRITSAR	Kandowali-Pz	15.07		14.46	
13	AMRITSAR	Karyal-Pz	9.78		8.72	
14	AMRITSAR	Mahima-Pz	21.13		20.4	
15	AMRITSAR	Majitha-Pz	14.32		13.46	
16	AMRITSAR	Mehleykey-Pz	5.02		4.13	
17	AMRITSAR	Mehta-Pz	9.34		8.66	
18	AMRITSAR	Miran Chak-Pz	21.55		20.35	
19	AMRITSAR	Nangal Sahaul-Pz	4.37		3.67	
20	AMRITSAR	Nawan Tanal- Pz	13.86	13.9		11.83
21	AMRITSAR	Pakharpura-Pz	10.89		10.08	
22	AMRITSAR	Ramdas	8.7	8.14		4.55
23	AMRITSAR	Sathiala-Pz	17.6			
24	AMRITSAR	Shabura-Pz	15.13		16.26	
25	AMRITSAR	Sham Nagar-Pz	9.65		7.86	
26	AMRITSAR	Tarsika-Pz	16.08		14.82	
27	AMRITSAR	Ugar Aulakh-Pz	15		14.17	
28	AMRITSAR	Urdhan-Pz-S	11.9	12.51		9.09
29	AMRITSAR	Vadala Kalan-Pz	17.3		17.06	
30	AMRITSAR	Wandala Bittewad-Pz	17.76		17.51	
31	BARNALA	Amla Singh Wala-PZ	44.66		49.99	
32	BARNALA	Barnala (m)	45.15	46.47	46.82	46.57
33	BARNALA	Barnala (s)	45.16	46.37	45.69	46.89
34	BARNALA	Chananwal	37.28	42.06	41.12	39.11
35	BARNALA	Dhanaula-Pz	35.61		37.26	

36	BARNALA	Kurar-Pz	43.45		46.48	
37	BARNALA	Lohgarh-Pz	36.78			
38	BARNALA	Pakho Ke-Pz	36.75			
39	BARNALA	Shekha	42.86		46.93	
40	BARNALA	Tappa Mandi-Pz	41.6	45.04	45.55	
41	BATHINDA	Ablu	14.25	14.64	13.8	13.09
42	BATHINDA	Aleke Jalal-Pz	32.88		36.23	
43	BATHINDA	Bagher Mohabat Singh-Pz	12		14.6	
44	BATHINDA	Bahman Kaur Singh-D	8.58	9.2		9
45	BATHINDA	Bahman Kaur Singh-M	9.63	10.14		10
46	BATHINDA	Bahman Kaur Singh-S	9.29	9.68	10.16	9.61
47	BATHINDA	Balianwali-Pz	28.05		30.88	
48	BATHINDA	Balluana1	6.6	6.17	5.39	5.65
49	BATHINDA	Balluana-Pz	7.51		7.76	
50	BATHINDA	Bhagibandar	9.22	9.09	14.4	9.03
51	BATHINDA	Burj Gill-Pz	33.32		36.14	
52	BATHINDA	Deratapp	10.23	9.95	28.13	10.29
53	BATHINDA	Dhapali-Pz	32.73	34.83	35.05	
54	BATHINDA	Dialpura- Mirza	32.93			
55	BATHINDA	Ganga-Pz	16.37	17.42	16.88	15.98
56	BATHINDA	Ghudda-Pz	9.86		10.26	
57	BATHINDA	Gurusar	9.67			
58	BATHINDA	Harraipur-Pz	21.02		24.1	
59	BATHINDA	Jajjal_DW	8.54	8.75	12.85	8.37
60	BATHINDA	Jassi Bhagwali	7.39	7.92	8.2	7.77
61	BATHINDA	Jhanduke	26.84	29.16	30.03	28.09
62	BATHINDA	Jhanduke-Pz	26.14			
63	BATHINDA	Kalayan Sukha-S	31.28	33.18	32.96	31.83
64	BATHINDA	Kalyan Sukha	32.22	34.86	31.97	32.64
65	BATHINDA	Kalyan Sukha-M	32.03	35.16	34.29	33.01
66	BATHINDA	Kheliwala (d)	21.37	30.32	23.2	21.29
67	BATHINDA	Koir Singh Wala-Pz	31.23			
68	BATHINDA	Kot Bhaktu-Pz	6.46		7.36	
69	BATHINDA	Kot Shamir	15.42	16.06	16.38	15.91
70	BATHINDA	Kothaguru-Pz	30.52	31.81	32.56	31.77
71	BATHINDA	Lalliana-Pz	8.56		9.19	
72	BATHINDA	Maihma Bhagwan-PZ	11.65			
73	BATHINDA	Maisar Khana-Pz	18.77			
74	BATHINDA	Maluka-Pz	27.14		30	
75	BATHINDA	Mandi Kalan-Pz	29.64		31.9	

76	BATHINDA	Maur Kalan-Pz	18.36			
77	BATHINDA	Maur Mandi	10.37			
78	BATHINDA	Mehta-Pz	7.94		8.66	
79	BATHINDA	Multania-Pz	7.68		8.48	
80	BATHINDA	Nahinwala	14.82	15.47	15.4	15.13
81	BATHINDA	Nathena-Pz	6.75		7.29	
82	BATHINDA	Phulla	25.13			
83	BATHINDA	Phullo Khari-Pz	7.76			
84	BATHINDA	Phullo Mithi-D	7.76	7.1	6.97	6.66
85	BATHINDA	Phullo Mithi-M	6.67	7.85	6.98	6.8
86	BATHINDA	Phullo Mithi-S	7.53	7.96	7.74	7.34
87	BATHINDA	Raike Kalan	4.79	5.09	4.79	3.92
88	BATHINDA	Salabatpur-Pz	37.67		40.68	
89	BATHINDA	Tungwali-Pz	18.62		21.84	
90	FARIDKOT	Baja Khana	21.73	23.25	24.26	23.18
91	FARIDKOT	Bead Sikhanwala- Pz	12.17	12.7	11.41	11.09
92	FARIDKOT	Behabal Kalan-Pz	17.93		21.2	
93	FARIDKOT	Chahd Baja	18.82	21.8	22.3	20.99
94	FARIDKOT	Chak Kalan-Pz	3.7		1.47	
95	FARIDKOT	Dal Singh Wala	17.84			
96	FARIDKOT	Dalsinghwala1	17.84			18.39
97	FARIDKOT	Deepsinghwala	4.6			
98	FARIDKOT	Deviwala-M	13.14		10.83	10.29
99	FARIDKOT	Deviwala-S	11.48	13.28	10.54	10.22
100	FARIDKOT	Dhilwan Kalan	13.19	13.2	12.2	13.22
101	FARIDKOT	Dhudi-Pz	14.9		16.86	
102	FARIDKOT	Fatehgarh-Pz	21.92		24.24	
103	FARIDKOT	Ghuiana-Pz	4.26			
104	FARIDKOT	Jand Sahib-Pz	2.8	3.85	2.9	
105	FARIDKOT	Karirwali	14.81	15.02	14.3	13.44
106	FARIDKOT	Killi-Pz	4.41	4.23	3.73	
107	FARIDKOT	Kot Kapura	10.02	10.19	10.24	10.15
108	FARIDKOT	Matta	10.86	12.33	12	10.05
109	FARIDKOT	Mehmuana	0.93	4.93	0.45	0.74
110	FARIDKOT	Nangal-Pz	20.62	23.92	2.88	11.4
111	FARIDKOT	Pahluwala-Pz	4.52		3.66	
112	FARIDKOT	Rorian Kapura-Pz	12.78		14.87	
113	FARIDKOT	Sadiq-Pz	3.98	4.15	4.07	4.07
114	FARIDKOT	Sher Singh Wala- Pz	3.49	3.14	2.5	2.64
115	FARIDKOT	Sukhwala-Pz	3.28	3.77	2.73	

116	FARIDKOT	Tehna-Pz	10.1	10.52	9.68	9.65
117	FARIDKOT	Wara Dwarka-Pz	4.73	4.42	4.14	4.64
118	FATEHGARH SAHIB	Alipur Sodhian-Pz	20.78		19.75	
119	FATEHGARH SAHIB	Badalialasingh	38.93	39.93	39.98	39.34
120	FATEHGARH SAHIB	Bagga Kalan	27.93		29.39	
121	FATEHGARH SAHIB	Bassi Pathana	20.78	20.9	21.26	20.75
122	FATEHGARH SAHIB	Bhaddal Tuha	27.02			26.92
123	FATEHGARH SAHIB	Bhagrana	3.85	0.72	1.62	1.88
124	FATEHGARH SAHIB	Bhateri	34.15	33.7		
125	FATEHGARH SAHIB	Chandiala-Pz	17.49			
126	FATEHGARH SAHIB	Chunni Kalan	14.21		11.68	12.1
127	FATEHGARH SAHIB	Fatehgarh Sahib-Pz	29.42		21.31	21.24
128	FATEHGARH SAHIB	Inayatpur-PZ-M	21.08	21.56	22.48	22.01
129	FATEHGARH SAHIB	Inayatpur-PZ-S	21.46	21.75	21.64	29.84
130	FATEHGARH SAHIB	Jai Singh Wala	23.22			
131	FATEHGARH SAHIB	Jhambela	25.19		25.75	
132	FATEHGARH SAHIB	Khamanon-pz	19.66			
133	FATEHGARH SAHIB	Khera-Pz	28.81		29.79	
134	FATEHGARH SAHIB	Lohar Majra	22.79			
135	FATEHGARH SAHIB	Mianpur-Pz	22.39			
136	FATEHGARH SAHIB	Nalini-Pz	22.48	23.58	23.52	22.66
137	FATEHGARH SAHIB	Nandpur Kalaur-Pz	33.87			
138	FATEHGARH SAHIB	Pawala	13.55	14.14	13.37	13.25
139	FATEHGARH SAHIB	Sado Majra	20.88	21.28	20.86	20.42
140	FATEHGARH SAHIB	Sirhind-Pz	23.14		22.18	

141	FATEHGARH SAHIB	Talwara	22.05		22.19	
142	FATEHGARH SAHIB	Tibbi Ow	28.48	29.8	30.36	29.84
143	FATEHGARH SAHIB	Timber Pur-Pz	22.7			
144	FAZILKA	Abohar	2.88	3.03	3.11	2.85
145	FAZILKA	Asifwala-Pz	4.61		4.74	
146	FAZILKA	Bannawala	2.17		3.58	
147	FAZILKA	Bazirdpura	6.95	7.07		6.94
148	FAZILKA	Chak Khere Wala-Pz	7.69			
149	FAZILKA	Danewal Satkosi	3.08	3.31	3.53	3.15
150	FAZILKA	Danger Khera-Pz	2.73			
151	FAZILKA	Dhaban Kokrian-D	1.3	1.53	1.38	1.21
152	FAZILKA	Dhaban Kokrian-M	1.8	2.4	2.07	1.89
153	FAZILKA	Dhaban Kokrian-S	1.37	1.7	1.53	1.47
154	FAZILKA	Dipulana-Pz	6.67	7.38	6.23	5.99
155	FAZILKA	Fattu Wala-Pz	22.79			
156	FAZILKA	Hamed Saidoke-Pz	16.49		16.76	
157	FAZILKA	Himmatpura-Pz	3.94		4.24	
158	FAZILKA	Jand Wala Johian-Pz	4.45		3.31	
159	FAZILKA	Kaler Khera-Pz	3.47		3.49	
160	FAZILKA	Kauranwali-D	4.93	6.84	7.47	7.77
161	FAZILKA	Kauranwali-M	4.89	5.19	4.65	4.71
162	FAZILKA	Kauranwali-S	5.02	5.24	3.98	4.06
163	FAZILKA	Khuiansarwar	1.48			1.5
164	FAZILKA	Khuiansarwar- Pz	1.48	1.88	1.82	
165	FAZILKA	Kundal1	1.19	1.86	2.5	1.92
166	FAZILKA	Malukpur-Pz	2.67		2.45	
167	FAZILKA	Nihalkhera	1.48	2.16	1.69	2.18
168	FAZILKA	Pancha Wali-Pz	9.48		9.46	
169	FAZILKA	Pattiwalla-Pz	1.82		3.36	
170	FAZILKA	Ramsara-Pz	3.81		4.17	
171	FAZILKA	Sherewala-Pz	6.98		6.83	
172	FAZILKA	Singhpura-Pz	1.16			
173	FAZILKA	Sitoganno	0.73	2.52		0.77
174	FAZILKA	Sohangarh Ratte	2.78	2.87	2.7	2.96
175	FAZILKA	Sohangarh Ratte-D	2.13	2.42	1.38	2.22
176	FAZILKA	Sohangarh Ratte-M	1.79	2.71	1.53	1.96
177	FAZILKA	Sohangarh Ratte-S	2.26	2.77	1.71	2.27
178	FAZILKA	Swah Wala- Pz	11.16	11.93	11.58	10.97

179	FAZILKA	Tehqualandar	11.73	15.2	10.27	9.92
180	FIROZPUR	Bara Mansur Wala-Pz	30.51		32.34	
181	FIROZPUR	Chak Kandhe Shah-Pz	12.52			
182	FIROZPUR	Chamb-Pz	19.85		22.56	
183	FIROZPUR	Dulchi Ke-Pz	8.41		7.36	
184	FIROZPUR	Gogiani-Pz	20.91		22.03	
185	FIROZPUR	Jang-Pz	7.8			
186	FIROZPUR	Lauhke Kalan- Pz	19.13	20.52		17.55
187	FIROZPUR	Lohere Khurd-Pz	20.38		21.32	
188	FIROZPUR	Mallanwala Khas-Pz	12.44		13.79	
189	FIROZPUR	Malluwala-Pz	25.75		28.16	
190	FIROZPUR	Malsian-Pz	12.58	14.33	13.16	12.28
191	FIROZPUR	Mana Singh Wala-Pz	4.53		4.09	
192	FIROZPUR	Mohre Wala-Pz	6.7	7.28	6.22	6.03
193	FIROZPUR	Mudki-Pz	15.42		17.09	
194	FIROZPUR	Piyarana	3.93	4.24	3.85	4.4
195	FIROZPUR	Rala Hazi- Pz	7.48		5.59	
196	FIROZPUR	Rukne Wala-Pz	9.86		6.26	
197	FIROZPUR	Sadhusha Wala-Pz	13.15		12.77	
198	FIROZPUR	Tibbi Kalan-Pz	7.7		7.49	
199	FIROZPUR	Wage Wala-Pz	10.97		10.96	
200	GURDASPUR	Bariyar	10.85		10	
201	GURDASPUR	Bhagowal	8.82	8.17	7.58	7.61
202	GURDASPUR	Bham	17.47	16.99	16.65	16.12
203	GURDASPUR	Bilasbal-Pz	17.52		17	
204	GURDASPUR	Chahal Kalan-Pz	10.25		9.28	
205	GURDASPUR	Chahgill-Pz	10.52		9.55	
206	GURDASPUR	Chone-Pz	14.02		12.01	
207	GURDASPUR	Choranwali-D	9	8.65	8.13	7.96
208	GURDASPUR	Choranwali-M	8.84	8.56	7.68	7.86
209	GURDASPUR	Choranwali-S	5.78	5.58	4.04	4.33
210	GURDASPUR	Dera Baba Nanak	7.32	7.42	7.33	6.2
211	GURDASPUR	Dhianpur	10.85	10.32	10.41	10.07
212	GURDASPUR	Dinanagar	7.49	3.41	3.72	3.94
213	GURDASPUR	Dostpur-Pz	4.77		2.76	
214	GURDASPUR	Gajikort-Pz	5.08		3.67	
215	GURDASPUR	Ganji D	1.2	0.29	0.41	0.81
216	GURDASPUR	Ganji M	1.72	0.55	0.68	0.49
217	GURDASPUR	Ghumani Khurd-Pz	8.18		7.76	
218	GURDASPUR	Gurdaspur-Pz	9.98		8.91	

219	GURDASPUR	Harchowal-Pz-M	15.38	14.35	13.6	13.44
220	GURDASPUR	Hargobindpur	19.65	19.04	18.59	18.55
221	GURDASPUR	Hassanpur Kalan-Pz	10.5			
222	GURDASPUR	Jhabkra	3.23		1.94	
223	GURDASPUR	Jhandalbana-Pz	2.87		1.91	
224	GURDASPUR	Kalanaur	8.84			
225	GURDASPUR	Kalanaur-DW	12.26	11.18	11.39	11.19
226	GURDASPUR	Kalanaur-Pz	8.54	8.8	4.21	3.91
227	GURDASPUR	Kaure-Pz	16.24		16.33	
228	GURDASPUR	Khan Fatta-Pz	6.42			
229	GURDASPUR	Khanmalik-Pz	13.46		12.83	
230	GURDASPUR	Khatgarh-Pz	5.96		4.07	
231	GURDASPUR	Lakankala-Pz	7.12		6.25	
232	GURDASPUR	Langurwal-Pz	8.64		8.03	
233	GURDASPUR	Madipur Fatehgarhchuria	10.67	11.01	10.26	9.89
234	GURDASPUR	Malikpur-Pz	9.96		9.16	
235	GURDASPUR	Maman-Pz	7.75		6.72	
236	GURDASPUR	Masana-Pz	6.11		5.33	
237	GURDASPUR	Massit-Pz	3.52		2.1	
238	GURDASPUR	Nangal-Pz	3.57	23.92	2.88	11.4
239	GURDASPUR	Naushera	4.08			
240	GURDASPUR	Pandoritalab	2.76	2.39	2.69	2.69
241	GURDASPUR	Parcha-Pz	6.09		5.33	
242	GURDASPUR	Raipur	4.16			
243	GURDASPUR	Saidowal Kalan-DW	4.18	3.84	3.03	3.31
244	GURDASPUR	Shahpur-Pz	5.28		4.44	
245	GURDASPUR	Tikriwala-Pz	12.13			
246	HOSHIARPUR	Aallo Batti-Pz	4.1		1.24	
247	HOSHIARPUR	Argowal-Pz	21.75		20.51	
248	HOSHIARPUR	Badla-Pz	10.59		6.57	
249	HOSHIARPUR	Baghora	56.25			49.04
250	HOSHIARPUR	Baghora exp well	56.25		55	
251	HOSHIARPUR	Baichan-Pz	23.15		21.97	
252	HOSHIARPUR	Bajwara-Pz	19.63		19.8	
253	HOSHIARPUR	Barota-PZ	4.29		2.4	
254	HOSHIARPUR	Bassi Ballo-D	58.26		58.53	57.66
255	HOSHIARPUR	Bassi Ballo-M	33.7		27.09	46.21
256	HOSHIARPUR	Bassi Ballo-S	30.7		46.83	28
257	HOSHIARPUR	Bersa	14.94		13.37	
258	HOSHIARPUR	Bhanowal-Pz	21.88		20.37	

259	HOSHIARPUR	Bhatolian-Pz	27.51		26.84	
260	HOSHIARPUR	Bisu Chak	17.96		12.11	
261	HOSHIARPUR	Budhi Pind-Pz	13.95			
262	HOSHIARPUR	Chak Sheru-DW	4.02	3.05	2.62	2.67
263	HOSHIARPUR	Chohal	3.86	3.62	3.72	3.7
264	HOSHIARPUR	Dadan-Pz	40.36		40.51	
265	HOSHIARPUR	Dallewal-Pz	18.93		18.04	
266	HOSHIARPUR	Dasuya1 (d)	9.5		7.51	7.13
267	HOSHIARPUR	Dasuya2 (s)	11.1		7.42	7.49
268	HOSHIARPUR	Durimiwal	8.96		6.37	6.58
269	HOSHIARPUR	Fattowal-Pz	22.19		21.77	
270	HOSHIARPUR	Garhshankar (s)	26.25		27.11	25.76
271	HOSHIARPUR	Grahaya-Pz	24.98		24.14	
272	HOSHIARPUR	Hajipur	9.14	5.63		
273	HOSHIARPUR	Haler Rampur-DW	6.72	1.67	1.65	3.98
274	HOSHIARPUR	Hazipur	15.75		13.72	8.32
275	HOSHIARPUR	Hazipur	9.14		13.72	8.32
276	HOSHIARPUR	Heer Beh-PZ	24.02		18.95	
277	HOSHIARPUR	Hoshiarpur (m)	31.79		32.27	
278	HOSHIARPUR	Ittian-Pz	8.14			
279	HOSHIARPUR	Jahidpur-PZ	10.59		6.02	
280	HOSHIARPUR	Jalalpur-Pz	5.95		5.47	
281	HOSHIARPUR	Jattpur-Pz	14.63		14.3	
282	HOSHIARPUR	Jhir Da Khuh-DW	5.8	4.93	5.35	6.1
283	HOSHIARPUR	Kaloya	21.9		21.61	20.56
284	HOSHIARPUR	Khera-Pz	43.26		29.79	
285	HOSHIARPUR	Mahil Baltohian-Pz	37.63		39.54	
286	HOSHIARPUR	Mahilpur	21.48			
287	HOSHIARPUR	Mahilpur-Pz	21.48		20.03	20.1
288	HOSHIARPUR	Naharpur-Pz	6.2		2.36	
289	HOSHIARPUR	Nangal Bihala- DW	13.38	9.74	8.05	9.39
290	HOSHIARPUR	Nangal Thathal-Pz	24.83			
291	HOSHIARPUR	Pandori Mehal-Pz	26.11		27.63	
292	HOSHIARPUR	Satnoh-PZ.	40.06		42.68	
293	HOSHIARPUR	Sham Chaurasi	12.96	12.43	12.01	11.83
294	HOSHIARPUR	Sibo Chak- DW	8.99	6.41	7.09	7.03
295	HOSHIARPUR	Simbli- OW	19.64		19.95	19.18
296	HOSHIARPUR	Simbli-Pz	20.2		21.63	17.81
297	HOSHIARPUR	Talwara1	12.03		10.27	10.87
298	HOSHIARPUR	Talwara2	8.21	10.37		

299	HOSHIARPUR	Thakarwala	5.28	3.64	3.76	3.71
300	JALANDHAR	Adampur 1(d)	26.56	39.02	9.15	26.05
301	JALANDHAR	Adampur 2(m)	24.33		25.63	23.29
302	JALANDHAR	Adampur 3(s)	9.35	9.47	28.74	9.07
303	JALANDHAR	Adarman-Pz	21.37		24.46	
304	JALANDHAR	Akalpur-Pz	18.6		19.91	
305	JALANDHAR	Allawalpur	6.36	9.01	6.17	6.84
306	JALANDHAR	Billi Chaharmi M	35.6	36.58	34.31	
307	JALANDHAR	Billi Chaharmi S	37.57	39.78		38.4
308	JALANDHAR	Billi Chahrami-Pz	38.07		39.76	33.1
309	JALANDHAR	Chania-Pz	35.68		37.64	
310	JALANDHAR	Dhanda-Pz	35.88		37.13	
311	JALANDHAR	Fateh Jalal-Pz	30.97		31.43	
312	JALANDHAR	Gehlan-pz	18.12			
313	JALANDHAR	Gillian-Pz	34.82		36.12	
314	JALANDHAR	Goraya- D Pz	24.18	30.63	28.98	26.28
315	JALANDHAR	Goraya-Pz	23.95	28.9	28.7	
316	JALANDHAR	Hardo Sheikh-Pz	33.37		35.92	
317	JALANDHAR	Jalandhar-Pz(D)	41.03	41.5	41.53	41.16
318	JALANDHAR	Jalandhar-Pz(VS)	39.7			
319	JALANDHAR	Jalbhe	11.46	13.79	8.26	9.06
320	JALANDHAR	Jandiala-Pz	32.4	34.49	34.83	34.09
321	JALANDHAR	Jandu Singha-Pz	31.85		35.58	
322	JALANDHAR	Janian-Pz	26.48		27.47	
323	JALANDHAR	Jhandu Singh M	31.35			31.76
324	JALANDHAR	Kakar Kalan-Pz	21.26		20.68	
325	JALANDHAR	Kala-Pz	20.73		26.88	
326	JALANDHAR	Kalyanpur-Pz	37.75		39.63	
327	JALANDHAR	Kang Sahib Rai-Pz	35.43			
328	JALANDHAR	Kartarpur 1(d)	22.02	27.67	13.42	21.83
329	JALANDHAR	Kartarpur 2(s)	23.29	24.07	7.55	22.91
330	JALANDHAR	Kharal Kalan Pz- D	17.43	21.38	17.5	15.45
331	JALANDHAR	Kharal Kalan Pz-M	16.21	18.91		15.23
332	JALANDHAR	Kharal Kalan Pz-S	16.11	17.88	16.91	16.13
333	JALANDHAR	Kot Wadal Khan-Pz	25.6		27.18	
334	JALANDHAR	Kurla-Pz	25.2		24.7	
335	JALANDHAR	Lallian kalan Pz-D	37.24	36.82	40.85	35.5
336	JALANDHAR	Lallian kalan Pz-S	34.92	34.37	36.63	39.26
337	JALANDHAR	Mahmuwal-Pz	35.81		37.2	
338	JALANDHAR	Malsian-D Pz	29.37	29.97	36.85	25.04

339	JALANDHAR	Malsian-M Pz	24.47	25.89	26.21	29.71
340	JALANDHAR	Mehsampur-Pz	22.49		24.63	
341	JALANDHAR	Nangal Shaman	35.64			
342	JALANDHAR	Nasirpur-Pz	11.36		9.23	
343	JALANDHAR	Nussi-Pz	32.95		37.1	
344	JALANDHAR	Pathial-Pz	17.19		16.77	
345	JALANDHAR	Rahimpur-Pz	27.48		28.53	
346	JALANDHAR	Rurka Kalan- Pz	25.6		31.31	
347	JALANDHAR	Samarahi-Pz	21.9		24.04	
348	JALANDHAR	Sarih Pz -D	31.03	35.25	33.63	28.82
349	JALANDHAR	Sarih Pz-M	28.7	29.84	29.13	32.72
350	JALANDHAR	Shahkot(d)	27.73	30.15	29.8	28.56
351	JALANDHAR	Skarar Pur-Pz	26.8		33.81	
352	JALANDHAR	Talwan-Pz	20.51		23.29	
353	JALANDHAR	Thanda-Pz	24.35			
354	JALANDHAR	Turaan-D	18.64	25.26	21.56	19.85
355	JALANDHAR	Turaan-M	18.9	24.6	19.83	18.74
356	JALANDHAR	Turaan-S	19.61	25.64	20.32	18.22
357	KAPURTHALA	Bauril Harnampur-Pz	16.4		17.78	
358	KAPURTHALA	Begowal-Pz	7.43			
359	KAPURTHALA	Bhanoki-Pz	28.98		32.03	
360	KAPURTHALA	Bhatnura Khurd- D	14.17		16.42	13.72
361	KAPURTHALA	Bhatnura Khurd- M	16.28	18.61	16.58	16.28
362	KAPURTHALA	Bhatnura Khurd- S	17.62	15.54	16.74	15.26
363	KAPURTHALA	Bhawanipur-Pz	11.69		11.73	
364	KAPURTHALA	Bholath D	10.49	11.87	10.88	10.5
365	KAPURTHALA	Bholath M	11.74	11.88	11.09	9.89
366	KAPURTHALA	Bholath S	11.26	11.09	10.77	10.45
367	KAPURTHALA	Chakoke-Pz	10.05		6.33	
368	KAPURTHALA	Hamira-Pz	13.99		13.74	
369	KAPURTHALA	Hazipur-Pz	8.62		7.27	
370	KAPURTHALA	Hussainpura-D Pz	24.34	27.38	26.25	24.27
371	KAPURTHALA	Hussainpura-M Pz	24.1	25.39	23.23	21.26
372	KAPURTHALA	Hussainpura-S Pz	21.56	22.48	23.25	23.69
373	KAPURTHALA	Kapurthala1 (d)	23.01		24.97	25.4
374	KAPURTHALA	Kapurthala2 (s)	24.87	26.56	27.7	23.62
375	KAPURTHALA	Karnail Ganju-Pz	10.35			
376	KAPURTHALA	Kishanpur	28.17		28.94	
377	KAPURTHALA	Maheru-Pz	24.37		26.15	
378	KAPURTHALA	Miani Bola-Pz	10.33		10.14	

379	KAPURTHALA	Nathu Chahal-Pz	34.17		36.79	
380	KAPURTHALA	Nurpur Janoa-Pz	10.73			
381	KAPURTHALA	Phagwara D Pz	30.22	32.79		
382	KAPURTHALA	Phagwara(deep)	30.22		33.25	31.71
383	KAPURTHALA	Phagwara(shallow)	29	31.55	31.68	31.34
384	KAPURTHALA	Phagwara2 (s)	29			
385	KAPURTHALA	Rawalpindi-Pz	24.92		27.06	
386	KAPURTHALA	Sangatpur-Pz	23.72		33.3	
387	KAPURTHALA	Sultanpur1 (d)	18.96	20.02	18.22	17.5
388	KAPURTHALA	Sultanpur2 (s)	14.43	18.51	14.88	13.68
389	KAPURTHALA	Thikriwali-Pz	10.06		10.41	
390	LUDHIANA	Alamgir-Pz	23.08		24.42	
391	LUDHIANA	Aliwal-Pz	9.17		11.02	
392	LUDHIANA	Basian Bet-D	19.3	21.43	19.43	18.6
393	LUDHIANA	Basian Bet-M	18.82	19.86	19.13	18.15
394	LUDHIANA	Basian Bet-S	18.24	19.79	17.96	17.7
395	LUDHIANA	Bhagwanpur-Pz	15.55		17.63	
396	LUDHIANA	Bharthala Randhawa-Pz	25.16		27.07	
397	LUDHIANA	Bhikhi Khatron-Pz	16.46			
398	LUDHIANA	Bilaspur-Pz	10.69		42.03	
399	LUDHIANA	Chankoian Khurd-Pz	9.4			
400	LUDHIANA	Chaunta-Pz	7.44		7.52	
401	LUDHIANA	Chhapar-Pz	27.37		31.17	
402	LUDHIANA	Dinnamder-Pz	23.27		25.67	
403	LUDHIANA	Dodpur-Pz	21.5		21.93	
404	LUDHIANA	Doraha	7.77			
405	LUDHIANA	Doraha-Pz	7.77	7.45	7.44	7.43
406	LUDHIANA	Galibkalan-Pz	28.5		31.81	
407	LUDHIANA	Hallawara-Pz-M	31.39		33.22	32.57
408	LUDHIANA	Hallawara-Pz-S	32.8			32.78
409	LUDHIANA	Hambowal-Pz	5.82		5.58	
410	LUDHIANA	Harnampur	21.52		21.97	
411	LUDHIANA	Hedon-Pz	18.81		19.55	
412	LUDHIANA	Ikloha-Pz	25.21	26	26.43	26.07
413	LUDHIANA	Jagraon 2(s)	27.91			
414	LUDHIANA	Kalsian	34.59		38.11	
415	LUDHIANA	Katanikalan-Pz	9.68		9.68	
416	LUDHIANA	Khandur	25.53		28.46	
417	LUDHIANA	Kishangarh-Pz	21.31		21.96	
418	LUDHIANA	Kishanpur-Pz	25.7		32.76	

419	LUDHIANA	Lalan1	11.54	10.82		
420	LUDHIANA	Lil- II Pz	17.42			
421	LUDHIANA	Lodhiwal-Pz	14.41		15.22	
422	LUDHIANA	Lohara-Pz	32.99		33.85	
423	LUDHIANA	Maksudra	12.93		13.53	
424	LUDHIANA	Maksudra-Pz	12.93	13.75		
425	LUDHIANA	Manak Majra-Pz	22.96		23.45	
426	LUDHIANA	Manewal S	3.7	3.68	3.5	4.62
427	LUDHIANA	Manewal-M	3.7	3.65	3.26	4.14
428	LUDHIANA	Mangat-Pz-D	13.72		13.47	12
429	LUDHIANA	Mangat-Pz-S	12.2			
430	LUDHIANA	Mushkabad	13.5		0.8	
431	LUDHIANA	Nelokalan	5.42		4.89	
432	LUDHIANA	Nurpur-Pz	33.2			
433	LUDHIANA	P.A.U.Ludhiana 1(d)	36.07	36.24	32.08	31.83
434	LUDHIANA	P.A.U.Ludhiana 2(s)	31.66	32.58	36.32	36.37
435	LUDHIANA	Pabbian-Pz	22.66		27.15	
436	LUDHIANA	Pandori-Pz	23.93		28.43	
437	LUDHIANA	Payal-Pz	14.27		15.68	
438	LUDHIANA	Raikot-Pz	35.38		38.37	
439	LUDHIANA	Rajona Khurd	32.52		37.1	
440	LUDHIANA	Rashin	31.11			
441	LUDHIANA	Rasulpur D	34.32	36.98	36.45	34.98
442	LUDHIANA	Rasulpur M	33.86	36.94	36.32	34.9
443	LUDHIANA	Rasulpur-S	33.8	36.32	36.49	35.55
444	LUDHIANA	Rattewal-Pz	28.13		31.96	
445	LUDHIANA	Roomi-Pz	30.35		33.78	
446	LUDHIANA	Samrala 1(d)	15.4	15.85	15.27	15.2
447	LUDHIANA	Samrala 2(s)	15.5		15.56	15.47
448	LUDHIANA	Sanewal-Pz	17.93		18.07	
449	LUDHIANA	Sangatpura-Pz	19.81	36.06	19.87	32.67
450	LUDHIANA	Sherian	4.09	3.82	0.56	2.64
451	LUDHIANA	Sherpur Bhet	4.42			
452	LUDHIANA	Talwandi Kalan-Pz	23.43		28.71	
453	LUDHIANA	Udonwal-Pz	5.6		5.28	
454	LUDHIANA	Upplan	9.4		9.7	
455	LUDHIANA	Utlan	10.99	12.48	0.4	11.38
456	MANSA	Aklia-Pz	27.52		29.66	
457	MANSA	Alampur Mandran-Pz	12.38		14.13	
458	MANSA	Alisher Khurd-Pz	18.66		20.68	

459	MANSA	Bahadur Pur-Pz	22		24.24	
460	MANSA	Bareh-Pz	13.29		14.69	
461	MANSA	Bhikhi 1 (s)	21.5	22.08	22.72	22.48
462	MANSA	Budhlada-Pz	20.14	20.75	21.88	21.47
463	MANSA	Burj Bhalaike	3.49	3.42		
464	MANSA	Burj Rathi-Pz	17.06		19.34	
465	MANSA	Dailpura M	20.42	39.52	22.9	21.5
466	MANSA	Dialpura S	19.12	22.13		20.06
467	MANSA	Fattamaluka	6.73	6.91		
468	MANSA	Hero Kalan-Pz	33.38	18	35.58	35.87
469	MANSA	Hirke-Pz	23.39			
470	MANSA	Jheryan Wali	3.87	4.95	4.45	4.57
471	MANSA	Khokhar Kalan-Pz	11.17		13.32	
472	MANSA	Kotra	16.5	17.3		
473	MANSA	Lakhiwal-Pz	23.2		25.01	
474	MANSA	Makha-[PZ	8.38		8.96	
475	MANSA	Mofar-Pz	21.15	23.95	23.48	19
476	MANSA	Ralla	17.26	19.13		
477	MANSA	Ralla D	20.33	30.13	23.31	27.58
478	MANSA	Tibbi Hari Singh-PZ	20.62		22.7	
479	MOGA	Bilaspur-PZ	37.75		42.03	
480	MOGA	Chand Nawan-PZ	32.96		39.61	
481	MOGA	Damru Khurd	24.58			
482	MOGA	Dhudi Ke-PZ	35.14		39.57	
483	MOGA	Dinna-PZ	35.22		40.13	
484	MOGA	Himatpura-Pz	38.5			
485	MOGA	Indergarh-Pz	22.06		24.2	
486	MOGA	Jai Singh Wala D	33.53	35.95	33.78	31.42
487	MOGA	Jai Singh Wala S	29.44	30.85	30.93	29.81
488	MOGA	Jhandewala-Pz	38.48		40.94	
489	MOGA	Kamalke-Pz	14.02			
490	MOGA	Khokri Kalan-Pz	31.86		34.22	
491	MOGA	Khosa Randhir-Pz	32.59		33.8	
492	MOGA	Mandar-Pz	10.31		7.91	
493	MOGA	Mangewala-Pz	24.81		25.05	
494	MOGA	Meemana-PZ	39.47		43.67	
495	MOGA	Nathu Wala-Pz	25.49		27.45	
496	MOGA	Raonke Kalan-Pz	33.27			
497	MOGA	Samad Bhai-Pz	28.51		30.64	
498	MOGA	Samalsar-Pz	25.1			

499	MOGA	Thathe Bhai-Pz	26.17		29.46	
500	MOGA	Tota Singh Wala-Pz	11.19			
501	MUKTSAR	Abulkharana-Pz	2.72		3.37	
502	MUKTSAR	Balocha Khera(rasoolpur)	0.67	1.4	1.35	1.17
503	MUKTSAR	Bhaliana	10.94	10.83	10.63	9.98
504	MUKTSAR	Bhiti Wala-Pz	2.99		4.68	
505	MUKTSAR	Chaktam Kot-Pz	1.98		1.33	
506	MUKTSAR	Dhalkot-Pz	8.5		8.93	
507	MUKTSAR	Doda	2.1		1.1	2.71
508	MUKTSAR	Doda S	4.78	4.17	3.64	4.03
509	MUKTSAR	Doda-M	4.71	4		3.78
510	MUKTSAR	Doda-Pz	4.78	3.86		3.49
511	MUKTSAR	Dohak	1.57	2.05	2.11	
512	MUKTSAR	Husnar-Pz	2.9		2.95	
513	MUKTSAR	Kattianwali-Pz	3.18		2.45	
514	MUKTSAR	Khunde Halal-Pz	2.98	3.02	1.86	1.85
515	MUKTSAR	Kollian Wali-pz	2.36		2.56	
516	MUKTSAR	Labanianwali	3.97	4.85	3.42	3.35
517	MUKTSAR	Muktsar	4.12	4.4	3.96	3.97
518	MUKTSAR	Phulu Khera-Pz	1.88		2.78	
519	MUKTSAR	Sheikh-Pz	1.81		1.69	
520	PATHANKOT	Bamyal	5.2	3.48	4.62	4.48
521	PATHANKOT	Bhoa	4.63	3.34	4.37	4.06
522	PATHANKOT	Gharotakalan	9.29	6.62	7.02	7.03
523	PATHANKOT	Ghoh	19.6			12.34
524	PATHANKOT	Jainpur-PZ	3.33		2.2	
525	PATHANKOT	Jandwala	28.08		24.8	
526	PATHANKOT	Jhakolahri	2.06	0.81	3.19	2.36
527	PATHANKOT	Khanikhui	1.46	1.37		1.78
528	PATHANKOT	Khogaki Chaka-PZ	2.73		1.53	
529	PATHANKOT	Kiari- DW	3.89	0.96	2.36	3.46
530	PATHANKOT	Kirian Khurd-PZ	8.4			
531	PATHANKOT	Kui-DW	3.78	0.99	1.77	2.88
532	PATHANKOT	Kuther-PZ	27.63			
533	PATHANKOT	Matti-PZ	26.23		16.35	
534	PATHANKOT	Mirthal-DW	4.65			
535	PATHANKOT	Narot Jaimalsingh-Pz	6.56		5.07	
536	PATHANKOT	Nawan Pind	8.5	4.66	6.53	6.71
537	PATHANKOT	Parmota-DW	9.1	1.56	4.87	6.96
538	PATHANKOT	Pathankot1	4.7	3.43	3.22	

539	PATHANKOT	Philora-PZ	1.8		1.93	
540	PATHANKOT	Rakawal-PZ	4.93		4.03	
541	PATHANKOT	Rani Pur-PZ	14.92		9.62	
542	PATHANKOT	Sujanpur-PZ	3.7		3.05	
543	PATIALA	Allowal pz	22.47	23.63	22.7	22.34
544	PATIALA	Bahmna exp	38.8	43.52	41.23	
545	PATIALA	Bassma Pipla	6.81	5.4	0.3	5.1
546	PATIALA	Belbehra-D	37.71	40.63	39.92	39.24
547	PATIALA	Belbehra-M	47.97	44.64	42.45	41.65
548	PATIALA	Belbehra-S	41.6	43.63	42.86	42.57
549	PATIALA	Bhankhar-Pz	33.76		38.8	
550	PATIALA	Bhojo majri 07pz	26.67	31.45	27.6	
551	PATIALA	Bhunerheri M	38.24	44.18	41.42	40.42
552	PATIALA	Bhunerheri S	38.26	43.72	41.23	40.7
553	PATIALA	Bhunerheri-Pz	38.26		43.08	
554	PATIALA	Challeta-PZ	25.45		26.13	
555	PATIALA	Chehal-Pz	25.75	27.69		
556	PATIALA	Devigarh 1Pz	38.6			41.1
557	PATIALA	Devigarh IIPz	38.53			41.2
558	PATIALA	Devigarh-III Pz	37.84			41.35
559	PATIALA	Dhaneta-PZ	37.81		40.68	
560	PATIALA	Duggal Kalan	43.32		48.71	
561	PATIALA	Gharam-PZ	42.66		44.2	
562	PATIALA	Gulwatti-PZ	35.19		36.65	
563	PATIALA	Haluka	7.95		6.92	
564	PATIALA	Hari Majra	7.13	5.73	0.37	10.25
565	PATIALA	Jainagar-PZ	27.66		29.42	
566	PATIALA	Jogewal-PZ	39.92		40.72	
567	PATIALA	Kalyan 07pz	28.98	31.27		
568	PATIALA	Kami Khurd-PZ	16.95		21.13	
569	PATIALA	Karan Pur	24.16		30	
570	PATIALA	Kheri Pandte-PZ	27.6		33.01	
571	PATIALA	Kulburcha-Pz	41.97		44.15	
572	PATIALA	Lacharu Kalan	4.87	3.27	0.99	3.35
573	PATIALA	Lachkani-Pz	24.88	28.05	25.2	25.84
574	PATIALA	Mardaheri	38.37	43.5	41.27	39.85
575	PATIALA	Mehmood Pur-PZ	32.89			
576	PATIALA	Mongowal-PZ	27.14		28.44	
577	PATIALA	Nanhera-Pz	24.91		24.2	
578	PATIALA	Nariana	10.55	7.3	1.15	9.13

579	PATIALA	Passiana-PZ	27.31		27.92	
580	PATIALA	Rajgarh	27.59			28.25
581	PATIALA	Rajpura deep Pz	29.4	28.12	27.56	
582	PATIALA	Rajpura-PzSt	37.98			
583	PATIALA	Rambirpura	28.14			
584	PATIALA	Ramgarh	34.59	37.91	37.37	36.48
585	PATIALA	Saghraur-PZ	42.72		44.09	
586	PATIALA	Samana-Pz	40.53		42.24	42.06
587	PATIALA	Samaspur-Pz	26.18		27.38	
588	PATIALA	Sanaur	40.04		40.1	
589	PATIALA	Sangatpura-Pz	31.27	36.06	19.87	32.67
590	PATIALA	Sauja-PZ	32.91		33.96	
591	PATIALA	Surala Kalan-PZ	2.49			
592	PATIALA	Thua	33.46	32.86	33.58	33.6
593	RUPNAGAR	Ahmedpur	7.7	5.48	5.21	5.75
594	RUPNAGAR	Amrali-PZ	18.13			
595	RUPNAGAR	Attari-PZ	5.76			
596	RUPNAGAR	Bains	14.03		13.7	
597	RUPNAGAR	Bera Chauta	3.4	1.85	2.58	2.68
598	RUPNAGAR	Bhatto-PZ	6			
599	RUPNAGAR	Braham Pur	7.76	2.22	3.21	3.67
600	RUPNAGAR	Chakdera	3.08	3.9	4.1	4.15
601	RUPNAGAR	Dhair	8.98	6.56	5.9	7.39
602	RUPNAGAR	Hardinamoh	2.43	1.18	1.76	1.75
603	RUPNAGAR	Kakrali	19.02	17.05	17.19	17.77
604	RUPNAGAR	Klwan-PZ	12.93			
605	RUPNAGAR	Kotla	1.38			
606	RUPNAGAR	Morinda-PZ	25.41		28.07	
607	SANGRUR	Balang-PZ	37.21			
608	SANGRUR	Banbhaura-PZ	31.28			
609	SANGRUR	Benra-M	41.66	43.84	43.85	43.15
610	SANGRUR	Benra-PZ-S	42.06	44.46		
611	SANGRUR	Bhojowali-Pz	43.78	44.64	43.44	42.89
612	SANGRUR	Bhunerheri-PZ	41.23		43.08	
613	SANGRUR	Bugra (main)	38.63	40.25	40.75	40.1
614	SANGRUR	Bugra 1	38.89	41.84	40.75	44.1
615	SANGRUR	Chatha Nanhera-PZ	34.58		36.84	
616	SANGRUR	Chural Kalan M	34.12	38.54	37.29	36.14
617	SANGRUR	Dharamgarh-Pz	35.98		37.52	
618	SANGRUR	Ghanauri Kalan-Pz	47.13	49.79		47.16

619	SANGRUR	Haryao-DW	26.28			
620	SANGRUR	ITI Sunam M	42.16	45.1	44.03	
621	SANGRUR	ITI Sunam S	43.07	44.5	43.88	43.26
622	SANGRUR	Kala Jhar-Pz	37.64		39.69	
623	SANGRUR	Kheri Naran-PZ	37.6		40.7	
624	SANGRUR	Khurni-PZ	40.82		43.5	
625	SANGRUR	Kila Hakima	35.09		37.22	
626	SANGRUR	Kokahar-PZ	29.98		32.78	
627	SANGRUR	Kuler Khurd-Pz	40.09		41.91	
628	SANGRUR	Ladda-Pz	41.64		43.89	43.93
629	SANGRUR	Lehragaga-PZ	31.14	37.5	33.85	32.95
630	SANGRUR	Longowal	37		38.16	
631	SANGRUR	Longowal-Pz	37	38.2	38.16	38.09
632	SANGRUR	Majji-PZ	38.24	40.26	39.77	39.43
633	SANGRUR	Malerkotla(deep)	41.13			
634	SANGRUR	Malerkotla-DW	41.13	42.49	42.8	41.46
635	SANGRUR	Mandvi Ow	38.42	40.45		39.25
636	SANGRUR	Manjhi Gp	38.24			
637	SANGRUR	Manvi-Pz	26.17	27.6	27.36	26.86
638	SANGRUR	Panjgaraian- Pz	43.95		45.4	
639	SANGRUR	Rampur Channa-Pz	30.68			
640	SANGRUR	Rurgarh-PZ	46.51		49.12	
641	SANGRUR	Rurki Kalan-Pz	26.05			
642	SANGRUR	Sekhpur Khurd-PZ	39.09			
643	SANGRUR	Sekhwas-PZ	44.26		44.27	
644	SANGRUR	Sherpur Pz	49.78	51.66		
645	SANGRUR	Sikandarpur-PZ	42.47			
646	SAS NAGAR	Antala	3.44	2.7		2.24
647	SAS NAGAR	Balongi-PZ	43.23		44.38	
648	SAS NAGAR	Barauli-PZ	33.78		36.13	
649	SAS NAGAR	Dera Bassi 07pz	11.65			9.16
650	SAS NAGAR	Dheri	5.99	4.94	5.22	5.57
651	SAS NAGAR	Gharoon	11.41			
652	SAS NAGAR	Ghoga	6.11	1.33	2.2	3.73
653	SAS NAGAR	Issapur	3.11			
654	SAS NAGAR	Issapur- DW	5.56		3.75	4.5
655	SAS NAGAR	Joli	6.66	3.7	3.19	5.18
656	SAS NAGAR	Kurrha-Pz	21.62		23.83	
657	SAS NAGAR	Landran Pz	18.9		18.21	
658	SAS NAGAR	Malkpur-Pz	14.73		13.31	

659	SAS NAGAR	Manoli-PZ	20.8		21.26	
660	SAS NAGAR	Mirpur-Pz	32.21			
661	SAS NAGAR	Raipur Kalan	15.53		14.9	
662	SAS NAGAR	Sawara	5.99	3.66	3.93	4.45
663	SAS NAGAR	Sirsini	2.3	0.56	0.86	1
664	SAS NAGAR	Sundram S	62.81		68.18	64.87
665	SAS NAGAR	Sundran D	78.5		85.07	85.84
666	SAS NAGAR	Sundran M	77.9		83.98	80.41
667	SBS NAGAR	Alowal-Pz	8.52		7.29	
668	SBS NAGAR	Aur-PZ	11.97		12.97	
669	SBS NAGAR	Bahara-Pz	18.13		18.85	
670	SBS NAGAR	Bahua-Pz	24.15		25.73	
671	SBS NAGAR	Balachore	15.47			
672	SBS NAGAR	Balaipur-PZ	23.06		25.83	
673	SBS NAGAR	Bhadi-PZ	19.27		18.74	
674	SBS NAGAR	Dugri Garol-PZ	7.8		6.09	
675	SBS NAGAR	Hakimpur-Pz	20.09		22.16	
676	SBS NAGAR	Jethu Majra-PZ	19.25			
677	SBS NAGAR	Kariam-Pz	18.18		18.69	
678	SBS NAGAR	Langoya-PZ	18.08		19.13	
679	SBS NAGAR	Mahalpur-PZ	15.58		13.47	
680	SBS NAGAR	Mahendpur-Pz	36.03		31	29.11
681	SBS NAGAR	Mauhra-Pz	29.79		26.78	26.25
682	SBS NAGAR	Raipur Dhaba-Pz	18.92		20.03	18.95
683	SBS NAGAR	Torewal-PZ	26.22		26.35	
684	TARAN TARAN	Bakipur-Pz	23.64		23.04	
685	TARAN TARAN	Bath-PZ	22.71		23.33	
686	TARAN TARAN	Bhagala-Pz	12.94		10.37	
687	TARAN TARAN	Bhagwanpur-Pz	17.52		17.63	
688	TARAN TARAN	Bhalaipur-Pz	21.11		20.51	
689	TARAN TARAN	Bhikiwind- Pz	18.6	19.28	19.29	
690	TARAN TARAN	Bhura-Pz	14.77		15.24	
691	TARAN TARAN	Bhure-Pz	23.2		30.63	
692	TARAN TARAN	Bhusse-Pz	18.4		19.09	
693	TARAN TARAN	Chakkare Khan-Pz	16.53		18.77	
694	TARAN TARAN	Chola Sahib-Pz	22.97	24.23	19.56	35.69
695	TARAN TARAN	Chuselawad-Pz	23.02		24.39	
696	TARAN TARAN	Fatehabad- PZ	19.8		20.4	
697	TARAN TARAN	Gandi Wind-Pz	17.08	17.64	16.37	15.61
698	TARAN TARAN	Goindwal	20.35	20.68		

699	TARAN TARAN	Jandoke-Pz	22.1		23.25	
700	TARAN TARAN	Kairon-PZ	20.79		21.64	
701	TARAN TARAN	Kalsia Kalan	19.3			
702	TARAN TARAN	Kalsia Kalan	19.3			
703	TARAN TARAN	Khadur Sahib-Pz	19.9	20.75	20.25	19.29
704	TARAN TARAN	Khalra-Pz	14.29		15.31	
705	TARAN TARAN	Kotbudda-Pz	11.78			
706	TARAN TARAN	Kotli Sur Singh-Pz	17.84		19.14	
707	TARAN TARAN	Mahendipur-Pz	17.94			
708	TARAN TARAN	Marhona-Pz	18.14		17.05	
709	TARAN TARAN	Mari Kamboke-Pz	11.64		12.06	
710	TARAN TARAN	Patti	24.06		26.42	
711	TARAN TARAN	Pindan-Pz	17.45		17.46	
712	TARAN TARAN	Rajoke-Pz	7.03		7.36	
713	TARAN TARAN	Ratoke-Pz	22.94	25.13	20.75	34.42
714	TARAN TARAN	Sabran-Pz	22.74		22.81	
715	TARAN TARAN	Sahab Pura- Pz	23.41	24.3	23.63	
716	TARAN TARAN	Sugga-Pz	21.01		22.77	