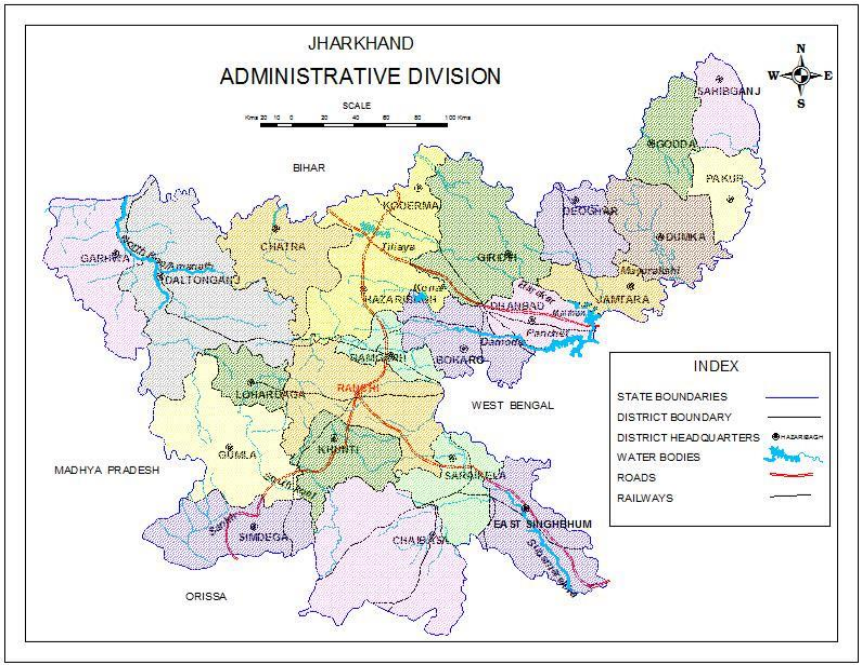
भारत सरकार
जल संसाधन, नदी विकास और गंगा संरक्षण मंत्रालय
केंद्रीय भूमि जल बोर्ड

GOVERNMENT OF INDIA
MINISTRY OF WATER RESOURCES, RD & GR
CENTRAL GROUND WATER BOARD

वार्षिक भूजल पुस्तिका, झारखण्ड

(2014 – 2015)

GROUND WATER YEAR BOOK, JHARKHAND (2014 - 2015)



मध्य – पूर्वी क्षेत्र, पटना
राज्य एकक कार्यालय

MID-EASTERN REGION, PATNA
STATE UNIT OFFICE, RANCHI

December 2015

भारत सरकार

जल संसाधन, नदी विकास और गंगा संरक्षण मंत्रालय

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(2014 & 2015)

GROUND WATER YEAR BOOK, JHARKHAND
(2014 - 2015)

PREPARED BY

S. S. PURTY
SCIENTIST – 'B'
Central Ground Water Board
Mid-Eastern Region
Patna

GROUND WATER YEAR BOOK, JHARKHAND (2014-2015)

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FOREWORD

To understand the groundwater situations in diverse hydrogeological environments, changes in various facets of ground water, like variation in water level and water quality to be monitored. A regular monitoring of ground water regime through a network of observation wells i.e. Ground water Monitoring Well (GWMW) is being carried out by Central Ground Water Board, MER Patna for the state of Jharkhand. Initially the task was taken up with the help of a few GWMW but gradually the number of stations were increased, which now totals 326 GWMW (as on March 2014) which represents all 24 districts and almost all blocks of the state.

This is an attempt to make a presentation in the form of a report for Jharkhand State where the scenarios of water levels for the year 2014-2015 has been produced. The comparisons with decadal mean, seasonal & annual fluctuation, chemical quality of ground water, different maps along with data have been, incorporated.

Periodic water level measurements were taken 4 times in a year in 2014-2015, (i.e. in the months of January, May, August and November `14 and January `15). Water samples from the GWMW were collected during the month of May-2014 to study the changes in hydrochemical regime.

The scientific officers and technical personnel of the state unit office and the Mid Eastern Regional office, systematically collected field data from the GWMW as required for monitoring purposes and collected water samples during the premonsoon period which were latter analysed in the monitoring and chemical cells of this region.

The assignment of compiling and analyzing data, its retrieval, evaluation, preparation of suitable maps and their reproduction in the form of present report has been carried out by Sh. S. S. Purty, Jr. Hydrogeologist. The work related to chemical analysis of ground water was done at Chemical Laboratory, Central Ground Water Board, Patna.

It is sincerely hoped that the appended write up, maps and basic information in this report would be very useful to the concerned beneficiaries.

(G.K.Roy)
Head of Office

ABSTRACT

In Jharkhand state ground water levels of 326 Ground Water Monitoring Wells (GWMW) were monitored four times in the year 2014 - 2015 as a part of regime monitoring of phreatic aquifer in different hydrogeological and agro-climatic zones. The water level monitoring was carried out in the months of May'14, August'14, November'14, and January'15, and ground water samples were collected in pre-monsoon period (May 2014) for chemical analysis. In the state the phreatic aquifer consists of weathered mantle, saprolite zone, and fractures in hard rocks underneath. Over 78% area of the state is underlain by rocks of Chotanagpur Gneissic Complex (CGGC) suit. Hence, most of the GWMW represented water level in weathered CGGC. A few GWMW represented water level of phreatic aquifer of Gondwana Super Group and Tertiary Formation.

The observed water level data had been grouped into four categories viz. 0 -2m, 2-5m, 5-10m and >10m. Thematic maps depicting ground water levels measured in different periods have been prepared. The water levels have been further analysed to study its change with respect to measurement of pre-monsoon period of the same year, previous year water level data of corresponding period, and decadal mean water level data of the corresponding period. The fluctuations have been shown under rise and fall categories. In each category there are three groups viz. 0-2 m, 2-4 m and >4 m. Thematic maps had been prepared for each category.

The depth to water level data of all the Ground Water Monitoring Wells collected during the four measurements are also presented along with the general well information. The water samples collected during May 2014 measurements were chemically analysed and the data generated has been presented in the tabular form, while iso-cloride and iso-conductance were presented in the form of maps in this report.

During 2014-15 the water level in the State ranges between 0.10 to 17.03 mbgl. The minimum and the maximum depth to water levels during premonsoon have been recorded as 0.10 m bgl at W. Singhbhum district and 17.03 m bgl at E.Singhbhum and in general the water level throughout the State varies in the range of 5 – 10 m bgl. During postmonsoon the minimum and the maximum depth to water levels have been recorded as 0.80 m bgl in Gumla district, and 15.03 m bgl in E. Singhbhum district and in general the water level throughout the State varies in the range of 2 – 5 m bgl.

The annual fluctuation of water level between May 2014 and May 2014, the major part of the state shows general rise in water level in the range between 0-2 m bgl (48%) and fall (27%). The annual fluctuation of water level between November 2014 and November 2014, the major part of the state shows general rise in water level in the range between 0-2 m fall (61%) and fall (10%).

The fluctuation of water level of May 2014 with respect to decadal mean water level of May indicate the fall (27%) as well as rise (51%) in water level in the range of 0 – 2 m. The fluctuation of water level of November 2013 with respect to decadal mean water level of November indicate the fall (56%) as well as rise (26%) in water level in the range of 0 – 2 m. However, overall regional fluctuation of water level in the entire state is mainly restricted within 2 m only which is normal phenomenon and no abnormal rise or fall in water level is observed except in few localized well.

The pH of ground water ranged between 7.0 and 8.90. The water was mildly alkaline in nature in most of the wells. The Electrical Conductivity (EC) varies between 13.1 microS/cm (Nala, Jamtara distt.) and 3320 (Daru, Hazaribagh distt.) microS/cm. Spatially in major part of the state EC rested in the range of 61-500 micro S/cm. In majority of the samples the concentration of chloride in ground water is within the desirable limit for drinking water of 250 mg/l.

The district wise water level data are tabulated under 18 undivided districts and the thematic maps are prepared for this report with all the 24 districts of Jharkhand State.

GROUND WATER YEAR BOOK OF JHARKHAND

(2014 – 2015)

1.0 INTRODUCTION:

Jharkhand state, was created on 15th November 2000, consists of districts falling on Chotanagpur Plateau of erstwhile Bihar on the birthday of legendary tribal freedom fighter Birsa Munda. Presently it consists of 24 districts and 210 administrative blocks. The capital of the state is located at Ranchi. The state spreads over 79714 sq km, between Latitude 21º 55′ 00″ and 25º 15′ 00″ and Longitude 83º 15′ 00″ and 87º 55′ 00″. The state is bounded by Bihar in the north and by West Bengal in the east. The other two sides, west and south, are bounded by Chhattisgarh and Orissa states respectively (Fig.1).

The population of the state as per 2011 census is 03.30 crore. The population density is 414 person/km^2. The urban population is 79.12 million and the rural population is 250.54 million. The tribal population constitutes about 28% of total population. The state is moderately urbanized with Ranchi as its capital city. Nearly 24% of total population of the state lives in urban areas. Important urban centers are in the state are Jamshedpur, Dhanbad, Hazaribagh, Daltonganj, Dumka and Deoghar.

To acquire a detailed knowledge vis–a–vis scenario of ground water level with respect to behaviour, availability and quality, Ground Water monitoring is essential in time and space. Thus, the data so collected during monitoring gives an important input for ground water management. Periodical monitoring of ground water regime covering different geomorphic, hydrogeological units is an effort to get information on the behavior of ground water levels and chemical quality of formation water through representative sampling. Monitoring of ground water regime includes: (a) monitoring ground water levels, (b) monitoring ground water quality and (c) temperature of ground water.

Monitoring is being carried out by establishing suitable *Ground Water Monitoring Well* (GWMW) based on Geomorphology, Geology, Hydrogeology and status of ground water resource of the area with a view to observe the trend of water level and change of chemical quality with time and space. It is also very useful to estimate the dynamic ground water resources and to demarcate the water logged as well as drought prone areas.

2.0 BACKGROUND:

The Central Ground Water Board, State Unit office, Ranchi, is at present monitoring 326 GWMW (Ground water monitoring wells) to delineate the behavior of ground water level with time and space covering 24 districts in the State of Jharkhand (**Plate – I)** four times a year, viz January (from 1st to 10th), May (from 20th to 30th), August (from 20th to 30th) and November (from 1st to 10th). The locations of GWMW are shown in **Plate – II**.

The district-wise status of GWMW (operational and monitored) in Jharkhand during the period from May '2014 to January '2015 is given in **Table 1 and 2**. The district-wise water level data of GWMW for the period May 2012; August 2012; November 2012 and January 2013 are given in **Annexure- I.**

The Trend of ground water level data (2005-2014) is presented in **Annexure-II.**

The results of chemical analysis of water samples collected during May 2014 is also discussed and analytical data is given in **Annexure – III**.

3.0 GEOLOGY AND HYDROGEOLOGY:

The generalized geological succession of Jharkhand state is given in **Table 1**.

Table 1 - Generalized geological succession of Jharkhand state.

Age	Formation	Broad Lithology
Quaternary	Alluvial deposits	Sand, clay, silt and occasional gravels.
Tertiary	Dhalbhumgarh Formation	Boulder, pebbly grits, sand, and mottled clay
L-Cretaceous U-Jurassic	Rajmahal Trap	Basalt flows with inter-trappean sedimentary beds
Cretaceous Carboniferous	Gondwana Supergroup	Sandstone, shale, clay conglomerate and coal beds.
L-Cambrian Proterozoic	Vindhyan Supergroup	Sandstone, quartzite, shale, limestone etc.

Proterozoic	Younger Granite, Granophyre and Soda Granite. Chhotanagpur Granite Gneissic Complex. Kolhan Group, Singhbhum Group, Gangpur Group. Mahakosal Group. Volcano-Sedimentary Sequence. Iron Ore Group. Singhbhum Granite.	Granites, granite gneiss, schists, phyllites, dolomites, basic lavas, amphibolites, gabbro anorthosite
Archean	Older Metamorphics Gneiss, Older Metamorphic Tonalite Gneiss	Gneiss, schists, arenites, amphibolites

Granite - gneiss, schist, phyllite, and other rocks belonging to CGGC

It covers nearly 85 % of the geographical area of the state. The phreatic aquifer in this formation consists of weathered mantle and underlying secondary porosities like fractures, joints and fissures. In general, the thickness of weathered zone varies between 10 and 25 m, however in localized patches it is > 35 m. The weathered zone is the main repository of ground water. Exploratory wells of CGWB reveal that the fractures underlying the weathered zones form the potential phreatic aquifer. The fracture zones (generally beyond 100 m depth) are exploited particularly in urban areas. In general 2-5 sets of fractures have been encountered within 150 m bgl. In a few wells, fractures have been encountered beyond 150 m depth. The ground water occurs under semi-confined to confined condition in the fractures situated at a deeper level. In this formation discharge from negligible to 30 lps has been recorded from the bore wells.

Vindhyan Supergroup

The rocks of this group are exposed in Palamu and Garhwa districts over a limited aerial extent, in the south of the river Son. The sandstones are hard and compact. The ground water occurs within the secondary porosities like fractures and joints. The fractured sandstone has good ground water potential in comparison to the shale. The ground water occurs under unconfined condition in weathered zone. The yield potential of sandstone is poorer than granite gneiss.

Volcanic Rocks

The volcanic rocks occur mainly in the northeastern part of the state in Sahebganj, Pakur and Godda districts, and in southeastern part of the state in East & West Singhbhum, and Saraikela districts. The Rajmahal trap is a series of flows horizontally disposed. In an individual flow, the lower part is massive and the upper part is vesicular. In some cases, vesicles are filled with secondary material. Partially filled interconnected vesicles form the potential aquifers. Thin inter-trappean beds

are also observed between the flows. The ground water occurs under unconfined conditions in upper vesicular flows, which are exposed generally at the ground level. In the vesicular layers disposed at deeper levels the ground water occurs under semi-confined to confined condition.

Gondwana Supergroup

The Gondwana Super Group ranging in age from Upper Carboniferous to Cretaceous is considered as semi-consolidated formation. Ground water occurs within inter-granular space as well as within the secondary porosities like fractures and joints. Rocks of this unit are exposed as patches in the districts of Hazaribagh, Dhanbad, Giridih, Bokaro, Ranchi, Dumka, Jamtara, Latehar, Godda and Garhwa districts. The sandstones form repository of ground water. The exploratory drilling of CGWB and other agencies indicate that ground water occur in semi-confined to confined condition in aquifers situated at deeper level, and under unconfined condition at shallow level. At few places, the piezometric head rises above the ground level to give rise to auto flow condition.

Laterites and Tertiary Sediments.

The Dhalbhumgarh Formation of Tertiary age occur in Chakulia- Bahragora-Dhalbhumgarh tract of East Singhbhum district. Exploration to a depth of 120 m indicates presence of 2 to 4 sedimentary layers. These sedimentary layers are repository of ground water, which occurs under unconfined condition in aquifers disposed at shallow level and under confined to semi-confined condition in aquifers situated at deeper levels.

Younger Alluvium

The Younger Alluvium deposits are confined mainly to the bordering area of the state and occur in patches in the districts of Godda, Sahebganj and Pakur in the northeast and in Latehar, Palamu, Deoghar and Garhwa districts. In the bordering areas alluvial patches is extension of the Gangetic Plain. There is a patch of alluvial deposit in Ranchi district also. The ground water occurs under unconfined condition in aquifer disposed at shallow level. The depth of dug wells ranges between 10 –15 m in general while the depth of shallow tube well ranges between 20 - 40 m. The hydrogeological map & Geological map of Jharkhand is given in Plate III & IV.

4.0 SCENARIO OF DEPTH TO WATER LEVELS IN JHARKHAND DURING 2014 – 2015:

MAY, 2014

The study for water levels during May, 2014 from 290 wells (out of 326 existing wells) was carried out. The district-wise status of distribution of ground water monitoring wells with different ranges of depth to water level is presented in ***Table-3***

The minimum and the maximum depth to water levels have been recorded as 0.10 m bgl at W. Singhbhum district and 17.03 m bgl at E.Singhbhum. In general the water level throughout the State varies in the range of 5 – 10 m bgl and has been observed in the 197 wells (68%) out of 290 analysed wells whereas, water level between 2 to 5 m bgl m bgl has been observed in the 56 wells (19%). The water level more than 10 m bgl has been observed in the 11% of the wells. The water level below 2 m has been observed only in 6 well.

Based on the data collected during the period a map has been prepared, depicted in **Plate V,** which shows that in the entire state water level varies between 5 and 10 mbgl. Water level above 10 mbgl is mainly observed in localize areas.

AUGUST 2014

Water levels during August, 2014 were monitored from 310 wells (out of 326 existing wells). The district-wise status of distribution of ground water monitoring wells with different ranges of depth to water level is presented *in* ***Table-4.***

The minimum and the maximum depth to water levels have been recorded as 0.10 m bgl in W Singhbhum and 11.45 m bgl in Dhanbad district. In general the water level throughout the State varies in the range of 0 - 2 (30 %) & 2 – 5 (46 %) m bgl from analysed wells. Secondly, the water level in the range of 5 – 10 m bgl has been observed in the 21 % of the wells. Water level >10 m bgl has been observed only in the 7 well (2 %) out of which, 4 in in Dhanbad district and one each in Ranchi, Chatra and Palamu district. (***Table 4)***

The map prepared from the collected data shows that water level range of 2 to 5 m bgl spread in the major part (63 % area) of the State. Second largest area (20 % area) observed in the range of 0 to 2 m bgl in major and bordering area of Hazaribagh, Giridih, W singhbhum and Kharsawan district and at many disseminated location as patches. Rest of the areas are categorized in 5 to 10 m bgl range of water level.

NOVEMBER 2014

A total of 310 GWMW has been monitored during post-monsoon period in November 2013, five groupings were made based on the range of water level data viz. 0-2, 2-5, 5-10, 10-20 and 20-

40 m bgl.The district-wise status of distribution of ground water monitoring wells with different ranges of depth to water level is presented *in* ***Table-5.***

Minimum and the maximum depth to water levels have been recorded as 0.80 m bgl and 15.03 m bgl in E Singhbhum district respectively. In about 55% of GWMW, water level rests in range of 2 – 5 m bgl which covers almost entire Jharkhand State. The water level in the range of 5 – 10 m bgl has been observed in the 112 wells out of 310 analysed wells, which occurs mainly in northern part of the State. Ground water level in 0 – 2 mbgl depth range occurs mainly in the southern part of the State. In 4 wells (each in Bokaro, Chatra, Dhanbad and E Singhbhum) water level observed more than 10 m bgl. (**Plate VII).**

JANUARY, 2015

To study the water levels of recession period data were collected during January, 2015 from 293 wells (out of 326 existing dug wells). The district-wise status of distribution of ground water monitoring wells with different ranges of depth to water level is presented *in* ***Table-6.***

The minimum and the maximum depth to water levels have been recorded as 0.50 m bgl and 15.48 m bgl in Gumla district and E.Singhbhum respectively. The water level in general varies between 5 and 10 mbgl whereas the water level in the range of 2 – 5 m bgl has been observed in the 108 wells (37 %) out of the analysed wells and the water level in the range of 10 – 20 m bgl has been observed in the 9 wells (3 %) of wells. The water level below 2 m has been observed in isolated patches of the State.. **Plate VIII.**

5.0 SCENARIO OF ANNUAL FLUCTUATIONS IN JHARKHAND DURING 2014 – 2015:

The annual fluctuation in water levels for the periods of (1) May 2013 and May 2013, (2) August 2013 and August 2014, (3) November 2013 and November 2014 and (4) January 2013 and January 2014 have been analysed to study the net status of ground water conditions during the previous and current year.

MAY 2013 AND MAY 2014

The annual fluctuation in water level between May ’2013 and May ’2014 indicates the net status of ground water condition during the previous year and current summer measurement and the same is presented in **Plate IX**. The district wise statement of frequency of distribution of ground water monitoring wells falling in different ranges of water level fluctuation is presented in ***Table-7.***

About 62% of the analysed wells have shown rise in water level. The major part of the state shows general fall in water level in the range between 0-2 m bgl (48%) and rise (27%). Total 38

wells out of 143 analysed well comes under 0-2 m falling zone category, on the other hand 68 wells show rise within 2 m, which may indicate that the regional fluctuation of the state is mainly restricted within 2 m (74%). The next higher magnitude of fluctuation is of 2 - 4 mbgl fall in water level in the state (14%) is observed in some localized areas of the State.

AUGUST 2013 AND AUGUST 2014

The annual fluctuation in water level between Aug '2013 and Aug '2014 indicates the net status of ground water condition during the previous year and current monsoon measurement and the same is presented in **Plate X**. The district wise statement of frequency of distribution of ground water monitoring wells falling in different ranges of water level fluctuation is presented in ***Table-8***.

A general rise in water level (71%) has been observed throughout the State. Fall in Water level out of 171 analysed well, recorded in 24% wells within 2 m, 3% wells ranges between 2 – 4 m and only 1 % wells above 4 m bgl. Out of 105 wells showing rise in water level, 67 well, 29 wells and 9 wells are categorized under 0 to 2, 2 to 4 and more than 4 m range.
Overall major part of the State is categorized under rise in water level upto 2 m. The northern part of the State has shown rise in water level more than 2 m whereas fall upto 2 m is also observed as patches in few locations in the State.

NOVEMBER 2013 AND NOVEMBER 2014

The Annual fluctuation in water level between November 2013 and November 2014 indicates the net status of ground water conditions during the previous and current post-monsoon year and the same is presented in Plate XI. The district-wise statement of distribution of ground water monitoring wells in different ranges of water level fluctuation is presented in ***Table-9.***

The comparison of fluctuation in water level between November 2013 with November 2014 shows fall in 87% GWMW as well as rise in 13% GWMW of the total analysed wells during the period. The major part (68%) of the state has shown a general fall in water level within 2.00 m. Similarly, rise in water level within 2.00 m observed only in 10% area of the State. The fall in water level in the range of 2 – 4 m bgl has been observed in the 22% of the 224 analysed wells. The higher magnitude (>4mbgl) of fall has been recorded only in 4% of the wells analysed. No well has shown rise in water level more than 4 m.

JANUARY 2014 AND JANUARY 2015

The annual fluctuation in water level between January '2014 and January '2015 indicates the net status of ground water condition during the previous year and current measurement and the same is presented in **Plate XII**. The district wise statement of frequency of distribution of

ground water monitoring wells falling in different ranges of water level fluctuation is presented in ***Table 10.***

The majority of the analysed wells (58%) shows general fall in water level between 0-2 m as well as rise (22%) which may indicate that the regional fluctuation (78% of the analysed well) of the state is mainly restricted within 2 m. Total 30 wells out of 217 analysed well comes under 2-4 m falling category, on the other hand only 4 wells show rise within 2 to 4 m, Only one well, located in Palamu district has shown rise in water level more than 4 m whereas 6 wells have been categorized under the range of more than 4 m fall.

6.0 SCENARIO OF SEASONAL FLUCTUATIONS IN JHARKHAND DURING THE GROUND WATER YEAR 2014 – 2015:

An attempt has been made to compare the pre-monsoon water levels of May, 2014 with water levels of August 2014 and November 2014 and January 2015 to delineate the impact of rainfall as well as ground water development on ground water regime in the state during the above period.

MAY 2014 AND AUGUST 2014

The fluctuation in water level between May 2014 and August 2014 indicates the change in water level from pre-monsoon measurement to monsoon measurement and the same is presented in **Plate XIII**. Fluctuation in water level maps for May 2014 and August 2014 have been prepared from 265 analyzed wells. The district wise statement of frequency distribution of network hydrograph stations falling in different ranges of water level fluctuation is presented in ***Table-11.***

During this period the entire state of Jharkhand shows a general rise in water level, which is mainly due to recharging of ground water on onset of monsoon from June 2012. Out of 265 analysed wells, 244 wells shows rise in water level throughout the state, which is mainly due to normal monsoon during the present year. However, 20 wells shows fall in water level which may be mainly due to temporal withdrawal of ground water in those areas.

MAY 2014 AND NOVEMBER 2014

The seasonal fluctuation in water level between May 2014 and November 2014 indicates the change in water level from pre-monsoon measurement to post-monsoon measurement and the same is presented in **Plate XIV**. The district-wise statement of distribution of ground water monitoring wells in different ranges of water level fluctuation is presented in ***Table-12***

Fluctuation in water level for November 2014 compared with May 2014 shows rise in water level (91%) for the entire State of Jharkhand where in the tune of 0.02 - 2.00 m (36%), 2.00 - 4.00 m (35%) and above 4 m (20%) during the period, which is a normal phenomenon due to recharge of ground water, as a result of onset of monsoon and rapid recharge due to moderate to steep slope in undulating tracts. A fall in water level is recorded in 23 wells out of 273 wells of the State which is mainly due to temporal withdrawal of ground water in those areas.

MAY 2014 AND JANUARY 2015

The fluctuation in water level between May 2014 and January 2015 indicates the change in water level from pre-monsoon measurement to January measurement and the same is presented in **Plate XV**. Fluctuation in water level maps for May 2014 and January 2015 have been retrieved from 195 analyzed wells. The district wise statement of frequency distribution of ground water monitoring wells falling in different ranges of water level fluctuation is presented in ***Table-13.***

During the period the entire state of Jharkhand shows a general rise in water level in the range of 0.00 to 2.00 m(56%) and 2.00 to 4.00 m (23%) and > 4 mbgl (4%) which is mainly due to recharge on ground water for onset monsoon from June 2014 and rainfall upto November & December 2014. However 43 wells of the state shows fall in water level, out of which 8 wells have shown fall ranged from 2 to 4 m , which may be due to temporal withdrawal of ground water.

7.0 SCENARIO OF DECADAL WATER LEVEL FLUCTUATIONS WITH THE GROUND WATER YEAR 2014 – 2015:

DECADAL MEAN AND MAY 2014

Water level fluctuation map (**Plate XVI**) has been prepared by comparing the water level data (147 wells) for May Mean (2004-2013) with the depth to water level data May 2014. The district wise statement of frequency distribution of ground water monitoring wells falling in different ranges of water level fluctuation is presented in ***Table-14.***

The fall (12%) as well as rise (51%) in water level in the range of 0 – 2 m shows variation in almost the entire state. The higher magnitude (>4m) of fall also recorded in 1 well located in East Singhbhum which may be due to hydrogeological condition on that area.

However, overall regional fluctuation of water level in the entire state is mainly restricted within 2 m only which is normal phenomenon and no abnormal rise or fall in water level is observed except in few localized well.

DECADAL MEAN AND AUGUST 2014

Water level fluctuation map (**Plate XVII**) has been prepared by comparing the water level data (162 wells) for August Mean (2004-2013) with the depth to water level data August 2014. The district wise statement of frequency distribution of network hydrograph stations falling in different ranges of water level fluctuation is presented in ***Table-15.***

The rise (54%) as well as fall (23%) in water level in the range of 0 – 2 m shows variation almost in the entire State. The rise in water level in the range of 2 – 4 m and > 4 m is recorded in 12 % and 2% wells respectively. Only 11wells have shown fall between 2 and 4 m. No well has shown fall of water level > 4 m.
However, overall regional fluctuation of water level in the entire state is mainly restricted within 2 m only which is normal phenomenon and no abnormal rise or fall in water level is observed except in few localized well. Fall > 2 m may be due to irregularities of rainfall during last 3 to 4 years.

DECADAL MEAN AND NOVEMBER 2014

The fluctuation map of water level between November Mean and November 2014 (Plate XVIII) has been prepared on the basis of available Mean water level data of November for last 10 years (2004-2013) with the present water level data for Jharkhand. The district-wise statement of distribution of network hydrograph stations in different ranges of water level fluctuation is presented in ***Table 16.***

The entire state shows rise as well as fall in water level below 2 m covering more than 90% of the area of the State. Fall in water in the range between 0.03 m and 2 m has been recorded in more than 56% of the wells analysed whereas rise in only 26% of the wells.

However, overall regional fluctuation of water level in the entire state is mainly restricted within 2 m only which is normal phenomenon and no abnormal rise or fall in water level is observed except in few localized well.

DECADAL MEAN AND JANUARY 2015

Water level fluctuation map (**Plate XIX**) has been prepared by comparing the water level data (147 wells) for January Mean (2005-2014) with the depth to water level data January 2015. The district wise statement of frequency distribution of ground water monitoring wells falling in different ranges of water level fluctuation is presented in ***Table-17.***

The rise (35%) as well as fall (53 %) in water level in the range of 0 – 2 m has been observed in almost entire State, covering 92% area of the State. Rise in water level in the range of 2 – 4 m has been observed in 2% and fall in 6% well of total analysed wells.

However, overall regional fluctuation of water level in the entire state is mainly restricted within 2 m only which is normal phenomenon and no abnormal rise or fall in water level is observed except in few localized well.

8.0 TREND OF GROUND WATER LEVEL

Trend of ground water level map (**Plate XX**) has been prepared by comparing the water level trend data (217 wells) for the period of 2005 to 2014. The Trend of ground water level data is presented in **Annexure-II.**

The observation shows the percentage of rising trend of ground water level is 41 and fall is 59. The trend of ground water level of the entire state (79%) is mainly restricted within 0.2 m only which is normal phenomenon and no abnormal rise or fall in water level is observed except in few localized well of the state.

9.0 HYDROCHEMESTRY:

The chemical quality of groundwater is dependent on the source of water and on the course over which it flow. Ground water carries a higher mineral content than surface water due to the slow circulation and longer period of contact with the formation. In order to assess the chemical quality of ground water of phreatic aquifers of Jharkhand state ground water samples have been analysed for major 15 parameters viz. EC, pH, HCO_3, CO_3, Cl, TH, Ca, Mg, K, Na, F, SiO_2, PO_4 and NO_3. The chemical analysis data of ground water samples collected (185) during the period May 2014 from Ground Water Monitoring wells are given in **Annexure III**.

Ground water samples throughout the state found to be slightly alkaline in nature as the pH mostly varies between 7.0 – 8.9. The quality of ground water in most of part of the state is potable with low mineral contents having electrical conductance varying from 13.1 (recorded at Dhalbhumgarh, W.Singhbhum) to 3320 (at Daru, Hazaribagh) µS/cm at 25^0c. Previous year range of EC has been recorded from 61 (Dhalbhumgarh, W.Singhbhum) to 4095 (at Daru, Hazaribagh) µS/cm at 25^0c The samples found to be suitable for drinking and irrigation purposes. As observed during previous year, the current year also, 4 samples are having electrical conductivity greater than 2000 µS/cm, which can be treated as brackish water. Spatially in major part of the state EC rested in the range of 500-1000 µS/cm. In most of the samples the concentration of chloride is within the desirable limit of drinking water (250

mg/l). Concentration of chloride in ground water >250 mg/l is recorded in 17 locations in W Singhbhum, Dumka, Sahebganj, Latehar, Chatra, Hazaribagh and Koderma districts.

Thus it is observed that in general, the quality of ground water in shallow aquifers in the entire state is suitable for drinking, irrigation and industrial purposes except in arsenic & fluoride infested areas. No remarkable change has been observed when compare to the previous year.

WATER LEVEL DATA OF NETWORK STATIONS MEASURED BY CENTRAL GROUND WATER BOARD, STATE UNIT OFFICE, RANCHI

District	Location	2014			2015
		May	Aug.	Nov.	Jan.
		in meter below ground level			
Bokaro	Chandrapura	3	1.4	1.95	2.5
Bokaro	Phusro_Bermo	3.45	0.6	1.4	2.54
Bokaro	Chandankiyari	6.8	1.1	2.5	4.75
Bokaro	Bijulia	-	2.65	3.39	4.85
Bokaro	Pachaura Sersadih	-	1.65	2.32	5.02
Bokaro	Pindarjora new	-	2.35	3.3	5.77
Bokaro	Pupunki	5.55	1.7	2.45	4
Bokaro	Gomia	7.1	0.9	3.23	3.93
Bokaro	Chas	12.65	9.45	10.5	-
Bokaro	Jaina More	9.98	4.95	6.08	7.75
Bokaro	Nawadih	7.3	2.55	3.17	6.25
Bokaro	Petarbar	9	5.1	5.88	5.1
Bokaro	Tenughat	5.4	1.65	2.79	4.05
Chatra	Chatra1	6.78	3.2	4.55	4.89
Chatra	Itkhori1	9.86	4.3	5.16	5.8
Chatra	Pitij	7.54	5	6.05	6.7
Chatra	Bagra	12.95	11.08	11.6	11.96
Chatra	Birhu	11.1	3.78	9.35	6.43
Chatra	Simaria	12.72	5.41	8.18	9.18
Chatra	Tutilawa1	7.18	2.26	5.2	5.87
Chatra	Tandwa	13.9	3.59	-	5.86
Deoghar	Deoghar new	5.96	2.95	-	7.28
Deoghar	Ghormara	7.6	3.2	3.77	4.15
Deoghar	Jasidih	7.3	4.02	5.5	6.02
Deoghar	Madhupur1	6.71	1.72	3.86	-
Deoghar	Palajori	9.37	4.27	4.99	5.45
Deoghar	Sarath	6.59	2.86	4.13	5.03
Deoghar	Sarawan	6.47	9.14	4.57	8.12
Dhanbad	Baghmaranew	13.6	10.19	10.03	10.72
Dhanbad	Katras1	14.6	7.77	9.1	-
Dhanbad	Mahuda	10.1	4.72	6.55	8.82
Dhanbad	Rajganj	6.8	2.74	3.4	3.08
Dhanbad	Balajee mandir	9.4	11.45	5.3	9.35
Dhanbad	Basudeopur Cisf Camp	8.6	9.6	4.45	6.64
Dhanbad	Bhuli A Block	11.4	10.6	6.1	-
Dhanbad	Chiragora Hirapur	8.4	9.3	6.49	6.75
Dhanbad	Dbl Buglow	7.1	6.5	2.3	4.2
Dhanbad	Dhanbad New	6.15	1.73	2.6	3.98
Dhanbad	Matkuria	4.2	5.7	3.2	3.45
Dhanbad	Nirsa ecl l.qtr	3.65	0.97	2.1	2
Dhanbad	Panderpalli	8.2	8.4	3.4	-
Dhanbad	Pkroy College	6.35	3.6	1.2	4
Dhanbad	Purandih Jorapokhar	12.3	10.4	5.1	10.7

Dhanbad	Sindri Goushala More	6	7.6	3.6	3.9
Dhanbad	Sunil Talkies	9.4	6.6	5.05	3.1
Dhanbad	Govindpur	7.3	2.16	2.49	-
Dhanbad	Bagha_Jharia	1.74	0.96	1.05	0.79
Dhanbad	Sindri Gosalmore	5.8	2.66	3.56	3.9
Dhanbad	Topchanchi	7.45	3.11	4.44	5.36
Dhanbad	Tundi	-	2.61	2.8	3.62
Dumka	Dumka(db ib)	7.06	3.5	4.7	5.15
Dumka	Masanjor	3.14	0.96	3.58	4.01
Dumka	Gopikandar	6.26	7.9	6.42	8.3
Dumka	Maheshpur templ	-	-	-	-
Dumka	Chikania	8.18	3.25	5.76	6.65
Dumka	Jama1	8.97	3.93	5.73	6.65
Dumka	Kathikund	7.06	5.6	6.61	6.94
Dumka	Jamatara	8.74	3.4	6.04	8.13
Dumka	Mihijam db ib	-	-	-	7.55
Dumka	Mihijam New	4	4.99	2.67	7.55
Dumka	Jarmundi db.ib	7.74	3.9	5.41	6.35
Dumka	Kundahit	6.33	1.4	3.6	4.85
Dumka	Masalia	7.26	3.55	4.37	4.65
Dumka	Nala	5.5	2.22	4.97	4.45
Dumka	Gamharia	10.6	-	5.37	-
Dumka	Nunihaat	2.36	1.25	2.79	1.09
Dumka	Ramgarh	-	6.88	-	1.29
Dumka	Raneswar	6.75	2.9	4.83	5.4
Dumka	Hansdiha pwdib	7.28	3.95	4.64	-
Dumka	Patabari	6.5	3.39	5.01	6.64
Dumka	Sikaripara	7.73	5.1	6.65	7.08
Garhwa	Bhawanathpur	-	3.95	5.35	6.15
Garhwa	Garhwa	16.5	4.93	8.84	8.89
Garhwa	Manjhian	3.15	2.17	3.38	4
Garhwa	Godarmana	-	4.26	-	5.14
Garhwa	Ranka	5.96	3.47	7.28	7.42
Garhwa	Nagaruntari	6.3	5.6	6.35	6.34
Garhwa	Ramna1	5.86	6.25	6.5	6.94
Giridih	Bagodar	6.51	1.78	4.08	3.86
Giridih	Birini	5.15	0.79	3.3	6.69
Giridih	Dhanwar	5.1	0.65	2.25	3.7
Giridih	Saraiya new	6.97	1.4	3.25	5.73
Giridih	Bengabad	8.37	0.75	3.5	5.01
Giridih	Dewri	5.1	-	1.7	4.27
Giridih	Dumri	8.9	5.58	5.63	6.66
Giridih	Gandey1	8.43	1.74	4.23	-
Giridih	Maheshmunda1	5.57	1.3	2.5	-
Giridih	Pandri	5.26	2.63	3.64	4.74
Giridih	Dhanidih	7.2	1.05	3	5.73
Giridih	Giridih	7.32	3	3.75	5.18
Giridih	Bandhutanr	7.67	1.14	3.4	5.25
Giridih	Jamua pwd ib	10.5	3.56	5.13	6.93
Giridih	Chirki (pirtanr)	10.55	5.95	-	8.01

Giridih	Khijri	4.62	-	1.94	4.73
Giridih	Tisri	3.26	-	2	3.23
Godda	Lalmatia	9.11	6.23	7.28	7.63
Godda	Godda1	5.46	1.45	5.63	4.38
Godda	Jainipaharpur	5.94	2.7	5.89	5.5
Godda	Maheshpur2	7.4	1.35	4.05	4.05
Godda	Bara borijore	5.95	1.65	3.11	3.65
Godda	Mahagama1	9.9	6.65	5.87	6.55
Godda	Doi	-	1.75	2.51	2.95
Godda	Pathargama	4.7	1.75	3.7	4.1
Godda	Poraiyahaat	8.41	9.1	4.95	9.2
Godda	Sundar Pahari	12.91	6.94	5.55	9.39
Gumla	Bano	6.08	-	-	5.33
Gumla	Adar	5.08	-	3.8	4.45
Gumla	Chainpur1	-	3.34	4.31	4.33
Gumla	Ghagra	8.17	5.7	6.5	7.29
Gumla	Anjam gram	3.6	1.86	2.48	3.03
Gumla	Gumla1	7.76	6.26	6.99	7.17
Gumla	Kharke	4.72	6.6	6.92	7.62
Gumla	Biru	5.2	-	3.05	5.4
Gumla	Jaldega	5.76	-	3.45	5.05
Gumla	Tengratuku	6.22	-	2.35	3.1
Gumla	Baisia	8.11	1.85	2.05	5.86
Gumla	Kolebira	7.24	-	4.7	7.19
Gumla	Lachargarh	-	-	3.7	5.88
Gumla	Puthritoli	3.25	-	0.8	1.05
Gumla	Baghma	6.63	2.46	4.61	5.32
Gumla	Palkot	7.47	3.2	6.4	7.26
Gumla	Kasir	1.15	0.83	0.85	0.5
Gumla	Raidih	6.51	2.65	4.65	4.53
Gumla	Bishnupur	7.42	4.7	6.1	6.82
Gumla	Simdega	-	-	2.5	4.89
Gumla	Nagfeni	7.44	3.65	6.3	6.8
Gumla	Sisai	6.7	2.51	3.92	5.83
Gumla	Thethai Thangar	2.27	-	1.25	2.03
Gumla	Bharno bdo	5.19	2.76	4.02	4.29
Hazaribag	Barhi	9.3	3	4.8	6.8
Hazaribag	Padma	10.5	7	9.3	9.95
Hazaribag	Barkagaon	10.8	7	8.4	10.6
Hazaribag	Urimari	6.5	2.15	4.4	6.2
Hazaribag	Barkatha	5.8	1.5	2.75	3.9
Hazaribag	Sakrej	7.5	2.5	4.7	6.55
Hazaribag	Tatijharia	4.1	1.1	3.05	4.7
Hazaribag	Dari	8.55	2.05	3.7	6.25
Hazaribag	Chitarpur	8.2	4.1	4.4	5.72
Hazaribag	Gola	8.9	5.75	5.9	7.3
Hazaribag	Amritnagar	7.43	9.96	7.75	6.73
Hazaribag	Battom Bazar	-	-	1.77	3.57
Hazaribag	College More	-	4.28	2.15	4.15
Hazaribag	Daru	6.2	0.9	3.1	4.2

Hazaribag	Habib nagar	9.85	7.99	4.78	-
Hazaribag	Hatyari	3.9	1.3	2.6	3.7
Hazaribag	Hazaribagh	9.6	1.1	2.5	5.65
Hazaribag	Hirabag	9.12	4.38	4.86	-
Hazaribag	Kanhari Road	9.57	6.25	4.32	-
Hazaribag	Korrah Chowk	3.23	5.45	2.88	6.83
Hazaribag	Kud Ashram	9.06	0.5	1.46	-
Hazaribag	Masipiri	-	3.4	5.55	4.5
Hazaribag	Meru(Silwar)	9.55	3.2	6	8.35
Hazaribag	Old Bus Stand	8.96	6.65	3.2	-
Hazaribag	Simra Rest House	4.05	0.62	0.97	1.16
Hazaribag	Sindur	8.41	3.86	1.83	4.79
Hazaribag	Ichak more	5.7	3.8	4.8	5.85
Hazaribag	Bhurkunda	11.8	3.3	3.55	5.86
Hazaribag	Garrikalan	6	1.3	2.4	5.45
Hazaribag	Keradari	6.15	1.6	2.15	4.8
Hazaribag	Barkachumba	5.4	1.95	-	4.2
Hazaribag	Kanjgi	8.7	2.1	5.8	4.75
Hazaribag	Kuju	5.5	3	3.6	5.62
Hazaribag	Mandu	6.75	2.95	4.35	5.6
Hazaribag	Sirka	9.47	3.1	7.2	8.15
Hazaribag	Thakur Gora	-	2.3	2.3	2.85
Hazaribag	Barwatola	2.45	-	-	1.75
Hazaribag	Patratu	-	-	1.9	4.5
Hazaribag	Saunda(Budhbazar)	8.4	4.3	4.9	-
Hazaribag	Sayal	6.1	2.6	5.85	5.93
Hazaribag	Barkakhana	4.1	2.1	2.95	3.3
Hazaribag	Ramgarh2A	7	5.7	6	
Kodarma	Chandwara	4.8	0.5	3.1	6.55
Kodarma	Chauparan1	-	-	-	
Kodarma	Jhumri Tilaiya	7.05	2	3.6	5.25
Kodarma	Kodarma	7.1	2.17	4.35	5.65
Lohardaga	Bhandara	6.79	4.26	7.9	7.75
Lohardaga	Kisko1	10.96	-	-	1.95
Lohardaga	Hinjla	6.86	7.02	6.2	6.19
Lohardaga	Kuru1	6.78	5.35	5.38	6.93
Lohardaga	Rudh1	-	5.35	6.5	7.55
Lohardaga	Barwatoli Chowk	-	4.68	-	-
Lohardaga	Hesal	-	3.8	6.7	6.98
Lohardaga	Irgaon	-	-	6.12	6.4
Lohardaga	Lohardaga(Patra Toli)	7.35	4.66	4.68	6.3
Lohardaga	Lohardaga(pwdib	5.37	2.4	9.1	6.05
Lohardaga	Senha Bdo	4.57	6	-	2.83
Pakaur	Amrapara	6.75	-	2.35	-
Pakaur	Hiranpur	4.96	1.25	2.54	7.4
Pakaur	Litipara	8.16	-	6.8	7.42
Pakaur	Maheshpur2	6.27	6.5	-	6.79
Pakaur	Pakur1	-	4.1	8.6	9.6
Pakaur	Pakuria	-	0.89	3.03	2.72
Pakaur	Salgapara	5.61	1.9	4.26	5.08

Palamu	Balumath	10.59	7.51	9.3	9.86
Palamu	Barjatu	7.5	3.4	5.05	6.01
Palamu	Barwadih	8.33	4.29	6.3	7
Palamu	Betla	-	9.52	-	13
Palamu	Satbarwa	8.5	5.1	7.98	7.9
Palamu	Bishrampur	-	3.07	4.49	5.18
Palamu	Rajhara	9.85	3.43	6.15	6.5
Palamu	Baraw	5.82	4.71	5.75	7.7
Palamu	Mandal	-	2.64	-	5.21
Palamu	Chandwa	6.68	-	4.24	6.24
Palamu	Chhatarpur	10.86	7.77	9.69	9.93
Palamu	Hariharganj	8.28	4.72	7.35	6.33
Palamu	Kanda	6.8	4.42	5.72	5.32
Palamu	Daltenganj	8.9	4.17	-	5.13
Palamu	Garu	-	3.78	-	6.41
Palamu	Haidernagar	8.05	3.54	6.1	4.94
Palamu	Japla	13.4	3.25	5.67	2.97
Palamu	Sandha	5.93	4.75	5.55	5.85
Palamu	Latehar	5.95	4.29	5.19	5.97
Palamu	Lesliganj	5.94	6.61	7.2	8.07
Palamu	Mahuadanr	-	1.77	-	4.36
Palamu	Netarhat	-	-	-	3.25
Palamu	Manika	4.01	1.44	2.7	3.88
Palamu	Panki	5.87	4.32	3.42	4.53
Palamu	Sagalim	9.23	2.69	7.25	7.11
Palamu	Kajri	13	10.7	-	11.03
Palamu	Nawadih1	15	-	-	7.5
Palamu	Patan	-	8	5.72	-
W Singhbhum	Kandra	5.7	0.95	3.35	4
W Singhbhum	Kereikela	8.75	0.7	5.55	7.5
W Singhbhum	Bandgaon	8	2.4	4.55	3.07
W Singhbhum	Bandgaonnew	7.36	1.81	3.62	6.45
W Singhbhum	Chaibasa	12.2	6.7	8.1	10.4
W Singhbhum	Chakradharpur	6.11	2.57	3.97	-
W Singhbhum	Chandil	5.93	1.3	2.65	3.75
W Singhbhum	Rajnagar	11.65	2.33	7.4	9
W Singhbhum	Jagannathpur	9.2	5	8.12	8.45
W Singhbhum	Jaitgarh	5.4	2.8	4.98	5.16
W Singhbhum	Hat Gamhariya	7.62	1.17	3.78	5.72
W Singhbhum	Jhinkpani	7	1.15	4.35	6.45
W Singhbhum	Kharsawan	7.4	1.75	4.4	5.1
W Singhbhum	Khuntpani	6.35	0.65	4.2	5.9
W Singhbhum	Pandrasalai	3.52	1.55	3.25	3.75
W Singhbhum	Keshargaria	5.68	0.93	1.13	2.44
W Singhbhum	Jamdih	7	1.45	3.65	-
W Singhbhum	Nimdih_Jamdih	-	-	-	4.66
W Singhbhum	Barajamda	4.95	1.1	1.5	2.33
W Singhbhum	Noamundi	0.1	0.1	2.35	3.6
W Singhbhum	Saraikela	3.35	0.45	1.5	2
W Singhbhum	Kokcho	8.35	1.4	4.75	6.5

W Singhbhum	Hesadih	5	1.55	2.65	3.25
E. Singhbhum	Baharagora	13.86	2.73	7.68	11.98
E. Singhbhum	Ghatsila	6.63	1.6	3.8	6.05
E. Singhbhum	Hana Bautia	6.4	2.45	5.2	7.87
E. Singhbhum	Chakulia	17.03	8.93	15.03	15.48
E. Singhbhum	Jamshedpur	2.4	-	-	-
E. Singhbhum	Kalapathar	8.9	2.95	7.65	8.35
E. Singhbhum	Pithajudi	4.37	2.75	3.87	4.58
E. Singhbhum	Dhalbhumgarh	10.5	6.5	5.9	8.35
E. Singhbhum	Galudih	8.25	2.25	3.3	4.45
E. Singhbhum	Amar J Sch Mango	4.6	3.15	3	6
E. Singhbhum	Baridih	4.1	2	4.1	5
E. Singhbhum	Burmamines Thana	2.2	1.7	2.1	2.2
E. Singhbhum	Deen Bandhu Shiv Mandir	1.45	3.89	-	3.9
E. Singhbhum	Garhabasha Jua	2	1	1.2	1.2
E. Singhbhum	Golmuri	3	1.9	3.4	1.4
E. Singhbhum	Jmsdpr Bloodbank Jua	2.4	1.8	2.3	-
E. Singhbhum	Jugsalai Thana Jua	4.6	2.1	2.8	3.9
E. Singhbhum	Paridih	9.3	5.13	3.6	8.49
E. Singhbhum	Rankini Madir Jua	2.9	1.9	3.2	4.3
E. Singhbhum	Shitla Mandir Sackchi	3	2.9	3.1	3.1
E. Singhbhum	Shree Maria Mandir	3.4	1.5	2.9	3
E. Singhbhum	Sundarnagar	10.4	3.63	5.55	9.1
E. Singhbhum	Sundarnagar1	9.1	4.2	7.55	-
E. Singhbhum	Telco Zone	4.3	1.7	3.3	3.1
E. Singhbhum	Mosabani	3.5	0.85	1.25	2.6
E. Singhbhum	Sakshi_Mosabani1	3.28	2.53	2.53	2.5
E. Singhbhum	Kalikapur	5.66	1	1.68	3.4
E. Singhbhum	Potka	7.65	1.95	4.05	-
E. Singhbhum	Ramgarh1	5.85	1.08	3.6	6
Ranchi	Angara1	7.79	3.6	5.8	6.8
Ranchi	Gondlipokhar	6.64	1.88	4.3	-
Ranchi	Jonha	4.89	4.15	4.3	3.95
Ranchi	Berro	9.32	7.26	7.6	9.95
Ranchi	Chachgura	9.25	5.2	7.3	7.77
Ranchi	Itki NAM	-	5.7	8.2	8.48
Ranchi	Kurgi	9.93	5.66	-	6.78
Ranchi	Bundu		1.3	5.4	6.78
Ranchi	Karapurti	-	3.2	-	-
Ranchi	Taimara	9.67	-	4.4	7.58
Ranchi	Burmoo	-	6.62	7.2	7.86
Ranchi	Bijupara Tangar	-	2.79	3.3	4.02
Ranchi	Sonsbazar	5.93	-	-	-
Ranchi	Bit More	6.97	2.11	2.95	-
Ranchi	Harmu	10.81	9.04	9.08	-
Ranchi	Kanke1	1.47	1.4	2.7	-
Ranchi	Pithoria	4.6	2.35	3.38	3.76
Ranchi	Bala	-	1.86	2.55	6.73
Ranchi	Gobidpur	-	7.2	7.6	6.5
Ranchi	Jaltanda	-	-	7.1	6.64

Ranchi	Kakriya	-	4.02	6.3	6.55
Ranchi	Kalimati	-	2.48	4.5	5.53
Ranchi	Karra1	-	3.32	7.3	7.74
Ranchi	Lodma	4.5	-	-	3.99
Ranchi	Lodma1	-	5.2	6.72	4.4
Ranchi	Masmano	-	2.41	6.6	4.24
Ranchi	Nawatoli	-	3.4	4.8	5.02
Ranchi	Pokta	-	2.06	4.28	4.92
Ranchi	Putkaltoli	-	1.61	2.01	2.4
Ranchi	Khunti	8.18	2.86	5.1	6.03
Ranchi	Bandhea	-	8.54	-	-
Ranchi	Bishakhatanga	-	1.65	2.81	3.3
Ranchi	Mandar	5.22	2.1	3.46	4.3
Ranchi	Murhu	3.29	4.2	6.1	5.39
Ranchi	AG Office	-	6.55	-	-
Ranchi	Bunti	2.38	2.82	3.75	-
Ranchi	Hatia1	9.7	2.5	5.2	-
Ranchi	Kharsidag	6.41	3.85	5.5	-
Ranchi	Lalganj	7.1	2.42	5.4	-
Ranchi	Lowadih	6.6	4.42	5.3	-
Ranchi	Namkom Bz Chowk	3.62	2.6	3.4	-
Ranchi	Ormanji	5.48	2.2	4.2	4.54
Ranchi	Rampur	4.7	1.2	2.75	-
Ranchi	Ranchi	4.04	-	-	3.5
Ranchi	Ranchi1	4.85	-	3.65	-
Ranchi	Siramtoli	9.03	3.78	5.8	-
Ranchi	Sithipokhartoli	5.57	-	4.26	-
Ranchi	Baridih(Utkramit)	-	2.19	-	2.42
Ranchi	Chutupalu	9.53	1.55	2.62	5.76
Ranchi	Hombai	-	6	6.7	-
Ranchi	Ukrid	-	3.05	3.98	4.14
Ranchi	Bajra	6.6	3.88	5.02	-
Ranchi	Hurhuri	-	2.5	5.36	5.67
Ranchi	Kantitanr	3.56	2.1	3.7	3.58
Ranchi	Kita	6	1.18	2.12	4.16
Ranchi	Patrahatu	1.85	1.14	1.3	2.14
Ranchi	Silli	7.04	3.9	5.28	5.76
Ranchi	Barwadag	5.3	3.15	4.12	-
Ranchi	Seringathu	6.4	2.96	-	-
Ranchi	Sonahatu1	6.54	1.9	2.9	-
Ranchi	Rangamati	6.37	2.65	3.81	5.35
Ranchi	Tamar	10.7	0.95	1.85	8.29
Ranchi	Dorma	5.34	1.25	4.58	4.84
Ranchi	Dorma1	-	-	6.15	-
Ranchi	Pelloal	-	3.29	-	5.75
Ranchi	Torpa	7.63	4.9	-	6.89
Sahibganj	Barhait	6.86	5.31	6.76	6.66
Sahibganj	Barharwa	9.26	6.05	-	9.2
Sahibganj	Borio	4.27	3.8	4.3	4.37
Sahibganj	Mandro	2.49	-	3.12	3.17

Sahibganj	Sahebganj1	8.56	5.95	6.85	7.15
Sahibganj	Sakrigali	6.91	1.82	2.82	3.12
Sahibganj	Ranga	7.4	2.8	4.31	5.25
Sahibganj	Ghat Selumpur	7.51	2.45	3.3	5.6
Sahibganj	Rajmahal	4.05	1.67	3.31	3.59
Sahibganj	Taljhari	-	-	-	3.2
Sahibganj	Taljhari1	3.91	1.6	4.23	3.2
Sahibganj	Udvababutala	7.28	2	6.17	3.43

Note:- District wise water level data are given under 18 undivided districts.

Water Level Trend from 2005 to 2014 (m/year)							
District	**Location**	**Pre-monsoon**		**Post-monsoon**		**Annual**	
Bokaro		*Rise*	*Fall*	*Rise*	*Fall*	*Rise*	*Fall*
1	Chas		0.1429		0.1729		0.1685
2	Petarbar	0.1097		0.203		0.2033	
3	Jaina More		0.0935	0.0152			0.0324
4	Tenughat	0.074		0.0763		0.0834	
5	Chandrapura	0.9075		0.3559		0.3206	
6	Gomia		0.0543		0.0128	0.1267	
7	Nawadih			0.1466		0.0048	
Chatra							
1	Tutilawa		0.2761		0.2418		0.2052
2	Bagra		0.2032		0.2106		0.2345
3	Simaria		0.3625	0.2541			0.0709
4	Chatra		0.5164		0.3893		0.2431
5	Itkhori		0.4998		0.3411		0.4952
Deoghar							
1	Sarath	0.0646		0.1338		0.1214	
2	Jasidih	0.1064		0.0756		0.048	
3	Madhupur1	0.0379		0.1362		0.1623	
4	Palajori		0.041		0.0462		0.0411
5	Sarawan		0.0811	0.0578			0.2118
6	Ghormara		0.1997	0.0176			0.0539
7	Deoghar		0.1094		0.2175		0.1221
Dhanbad							
1	Topchanchi	0.0232			0.0324	0.0263	
2	Tundi		0.0111		0.0198	0.0305	
3	Sindri	0.0067			0.1904		0.1181
4	Jharia	0.0475			0.139		0.0441
5	Nirsa ecl l.qtr	0.2832		0.2065		0.2093	
6	Govindpur		0.1945	0.0181			0.0346
7	Mahuda	0.1824			0.0461	0.0508	
8	Rajganj	0.0586		0.0173		0.0912	
Dumka							
1	Kundahit		0.2079		0.1428		0.2129
2	Jamatara		0.1878		0.1446		0.1411
3	Raneswar		0.1157		0.2058		0.0715
4	Nala		0.1608		0.1198		0.0583
5	Masanjor	0.083			0.0237	0.0497	
6	Masalia		0.0215	0.0111		0.0374	
7	Patabari	0.0849			0.0576		0.0061
8	Sikaripara		0.1745		0.3133		0.1691
9	Chikania		0.1272		0.0851		0.0277
10	Kathikund		0.1011		0.1759		0.107
11	Dumka(db ib)	0.1074			0.0384	0.0884	
12	Jama1		0.1072	0.0137			0.0669
13	Jarmundi db.ib		0.0989		0.1315		0.1225
14	Maheshpur templ		0.4508				
15	Nunihaat		0.0193		0.1096		0.0252
16	Gopikandar	0.1645		0.0361			0.0034
17	Hansdiha pwdib		0.174		0.0582		0.1317

18	Mihijam db ib		0.203		0.4893		0.2721
Garhwa							
1	Garhwa		0.9605		0.1447		0.2835
2	Nagaruntari	0.5167		0.0411		0.1097	
3	Bhawanathpur		0.1392				0.022
Giridih							
1	Pandri	0.0541		0.0276		0.0094	
2	Bagodar	0.0627		0.1582		0.1703	
3	Birini	0.2108		0.3541		0.2795	
4	Dhanwar	0.2319		0.2161		0.239	
5	Giridih	0.2259		0.0302		0.1069	
6	Dhanidih		0.1235		0.0309		0.0174
7	Bengabad		0.0649	0.1359		0.1246	
8	Bandhutanr		0.058	0.1243		0.1231	
9	Jamua pwd ib		0.179		0.0546		0.0815
10	Dumri	0.4088		0.1658		0.2147	
Godda							
1	Maheshpur2		0.2542			0.0293	
2	Pathargama		0.0423	0.0017		0.0407	
3	Bara borijore		0.041		0.0794	0.0243	
4	Mahagama1		0.162		0.2712		0.2208
5	Lalmatia		0.1616		0.2416		0.1308
6	Doi	0.0812		0.0114		0.1266	
7	Poraiyahaat		0.0262		0.148		0.1808
8	Sundar Pahari		0.0854		0.0495		0.1617
9	Godda1	0.0249			0.1444		0.0757
Gumla							
1	Thethai Thangar	0.1496		0.0438		0.0086	
2	Jaldega		0.0585		0.1064		0.1468
3	Simdega		0.1152	0.0508		0.0722	
4	Lachargarh		0.3427	0.0834			0.0562
5	Bano	0.1738		0.0493		0.0071	
6	Bishnupur	0.1587			0.1559	0.1033	
7	Kolebira	0.0895		0.0454		0.0061	
8	Palkot	0.0293			0.0853	0.0391	
9	Baisia		0.3573		0.163		0.1606
10	Raidih	0.0803			0.1189		0.0061
11	Gumla1	0.0984			0.0803	0.0211	
12	Anjam gram		0.1476		0.1918		0.1423
13	Chainpur1	0.0238			0.1945		0.0143
14	Sisai	0.0677		0.0127		0.0271	
15	Bharno bdo	0.3342		0.0937		0.1404	
16	Ghagra		0.1209		0.1258		0.0779
17	Nagfeni	0.1032			0.0336		0.9214
Hazaribag							
1	Hazaribagh		0.0629	0.2393		0.196	
2	Ichak				0.5153		0.2774
3	Barkatha		0.0458		0.011	0.0263	
4	Barhi		0.2905		0.1553		0.2212
5	Gola		0.0963	0.0123			0.0728
6	Barkakhana	0.15		0.029		0.0417	
7	Ramgarh2		0.119		1.0501		0.2671
8	Patratu			0.1527			

9	Mandu	0.2766		0.038		0.1045	
Kodarma							
1	Chauparan		0.284				0.4026
Lohardaga							
1	Bhandara	0.3259			0.1965		0.019
2	Senha Bdo	0.0883		0.1651		0.1112	
3	Lohardaga(pwdib	0.1688			0.2534		0.0406
4	Hinjla		0.3186		0.3692		0.3155
5	Kuru1	0.0767			0.1171	0.0096	
Pakaur							
1	Pakuria		0.2006		0.1288	0.0951	
2	Salgapara	0.1104			0.0559	0.0198	
3	Maheshpur2		0.0374		0.3241		0.1496
4	Amrapara		0.1476		0.0617	0.0186	
5	Pakur1		0.1671		0.1093		0.0246
6	Litipara	0.0313			0.0573		0.0246
7	Hiranpur	0.1365		0.1997		0.1374	
Palamu							
1	Barjatu		0.0987		0.0216		0.0614
2	Betla	0.3527			0.0206		0.0434
3	Lesliganj	0.7775		0.2127		0.1581	
4	Daltenganj		0.1066		0.2441		0.1449
5	Kajri		0.0224		0.3837		0.1221
6	Nawadih1	0.009			0.3655		0.4101
7	Rajhara		0.1494	0.2917		0.0935	
8	Patan		0.0044	0.2403		0.0464	
9	Bishrampur		0.4554		0.0755		0.2069
10	Hariharganj		0.4464		0.1942		0.1399
11	Kanda	0.143			0.1007		0.0108
12	Chhatarpur	0.1064			0.2751		0.0257
13	Japla	0.1082		0.0381		0.1662	
14	Sandha	0.3415			0.0743	0.1308	
15	Chandwa	0.1657		0.059		0.0572	
16	Latehar	0.1172			0.1579		0.0263
17	Balumath		0.2346		0.0731		0.0475
18	Satbarwa		0.0391		0.0769		0.0831
19	Manika	0.135		0.1023		0.1097	
20	Barwadih		0.1446		0.1941	0.0737	
W. Singhbhum							
1	Keshargaria	0.164		0.4994		0.3443	
2	Jhinkpani	0.0114		0.1032		0.1197	
3	Kokcho	0.021		0.0984		0.151	
4	Hesadih	0.123		0.1024		0.1115	
5	Chaibasa		1.3432		0.7958		1.0487
6	Rajnagar		0.154	0.2002		0.1776	
7	Hata_Tirin		0.0511	0.1165		0.0774	
8	Pandrasalai	0.0153		0.1223		0.0648	
9	Chakradharpur	0.1961		0.4165		0.3266	
10	Saraikela		0.1562	0.1394		0.057	
11	Kharsawan	0.1938		0.309		0.2407	
12	Bandgaon	0.1229		0.1125		0.1501	
13	Kereikela	0.1193		0.1959		0.1559	
14	Kandra		0.0284		0.0217	0.0433	

15	Chandil	0.5392		0.1112		0.2529	
E. Singhbhum							
1	Ghatsila	0.4005		0.0654		0.1314	
2	Baharagora		0.104	0.2824		0.1951	
3	Jamshedpur	1.1155				1.0507	
4	Chakulia	0.0696		0.1999		0.4462	
5	Dhalbhumgarh	0.0542			0.0032	0.0206	
6	Sakshi_Mosabani1	0.1609			0.0721	0.0421	
7	Kalikapur	0.2301		0.172		0.2026	
8	Potka	0.0174		0.1948		0.1445	
9	Galudih	0.0245		0.0057		0.038	
10	Ramgarh1	0.1045			0.0057	0.0591	
11	Sundarnagar		0.1749		0.076		0.1413
Ranchi							
1	Silli	0.1837		0.0418		0.0917	
2	Bunti	0.0244			0.0572		0.0009
3	Angara		0.1704		0.144		0.0549
4	Mandar	0.0272			0.0557	0.0472	
5	Chutupalu	0.0369			0.182		0.0741
6	Murhu		0.0357		0.4188		0.2382
7	Khunti	0.5889		0.064		0.3624	
8	Tamar		0.167	0.2236		0.0967	
9	Karra1	0.1298		0.2015		0.2285	
10	Bundu	0.013		0.2847		0.1581	
11	Kalimati		0.2225		0.0053		0.0111
12	Lodma	0.2409		0.1774		0.1749	
13	Barwadag	0.0717			0.0203	0.0662	
14	Berro		0.0001		0.2115		0.0566
15	Hatia1		0.293		0.0005		0.0244
16	Ormanji		0.1422		0.1515		0.0795
17	Ranchi1	0.0539		0.004		0.0229	
Sahibganj							
1	Rajmahal	0.1736			0.1678	0.045	
2	Borio	0.3377			0.0492	0.0825	
3	Taljhari1	0.5158			0.0935	0.355	
4	Sahebganj1		0.2197		0.2747		0.1536
5	Sakrigali		0.1605		0.2121		0.0356

Note:- District wise water level data are given under 18 undivided districts.

MAJOR CHEMICAL PARAMETERS OF GROUND WATER SAMPLES OF GWMS COLLECTED DURING PRE-MONSOON 2014 IN JHARKHAND STATE

District	Block	Location	E.C.	pH	CO3	HCO3	Cl	F	N03	SO4	TH	Ca	Mg	Na	K	Si02	P04
			micro Siemens/cm @25°C		mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	as CaCO 3 mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
W Singhbhum	Bandgaon	Bandgaon.	1497	8.21	0	123	390.5	0.27	61	44	375	70	48.6	167	17	27	ND
W Singhbhum	Bandgaon	Hesadih	373	7.7	0	147.6	21	0.17	12	16	160	38	15.79	12	14	24	ND
W Singhbhum	Kereikala	Kereikala	665	8.2	0	159	95.71	0.28	27	48	280	60	32	28	18	41	ND
W Singhbhum	Chakradharpur	Chakradharpur	919	7.83	0	356.7	99	0.26	28	15	350	64	46	54	1.1	40	ND
W Singhbhum	Khuntpani	Khuntpani	920	8.22	0	412	67	0.38	40	9	400	104	34	32	1.8	48	ND
W Singhbhum	Khuntpani	Pandrasalai	872	7.85	0	378	67	0.25	7	0	275	72	23	52	7.7	25	ND
W Singhbhum	Kharsawan	Kharsawan	1257	8.3	0	488	106	0.47	24	24	310	16	65	111	35	27	ND
W Singhbhum		Kandra	1578	7.05	0	258.3	277	0.22	35	70	470	202	57	46	3.5	28	ND
W Singhbhum	Jamshedpur	Sundarnagar	852	8.38	18	110	167	0.29	20	34	350	66	45	28	3.2	31	ND
Saraikela	Potka	Hata/Tirin	1212	8.62	36	305	159	0.5	21	0	400	140	12	70	30	38	0.28
Saraikela	Rajnagar	Keshargaria	638	8.21	0	220	71	0.28	18	0	230	52	24	33	2.7	18	ND
Saraikela	Jantnagar	Kokcho	621	7.65	0	207	71	0.22	5	0	220	52	23	24	6.6	50	ND
Saraikela	Chaibasa	Chaibasa	977	7.7	0	500	92	0.8	0	0	245	68	18.22	104	44	52	ND
Saraikela	Jhinkpani	Jhinkpani	735	7.95	0	153	149	0.38	7	0	220	36	31	31	55	28	ND
Saraikela	Hatgamaria	Hatgamaria	1046	8.21	0	221.4	216.4	0.84	42.61	32	260	58	27.94	99.38	2.09	20	ND
Saraikela	Jagnathpur	Jagnathpur	569	8.58	18	123	63.81	1.05	34.88	14	210	48	21.87	31.63	0	26	ND
Saraikela	Noamundi	Noamundi	682	8.26	0	190.65	77.99	0.51	18.32	28	245	50	29.16	58.68	4.6	10.55	ND
Saraikela	Bada Jamda	Noamundi	445	8.43	21	116.85	35.45	1.17	37.7	22	185	36	23	24.45	3.29	8	ND
Saraikela	Bangaon	Bangaon	452	8.54	15	166.05	35.45	0.68	8.03	14	195	46	19.44	15.81	16.54	13.93	ND
Saraikela	Jaitgarh	Jaganathpur	562	8.63	18	116.85	96	1.02	3	4	130	32	12.15	57	3.53	10	ND
E. Singhbhum	Jamshedpur	Sakshi	1436	7.24	0	378	135	0.41	87	154	490	140	34	86	14	21	ND
E. Singhbhum	Ghatsila	Galudih	456	8.27	0	98.4	78	0.92	13	6	200	46	8.5	42.4	8.65	16	ND
E. Singhbhum	Dalbhum-Garh	Dalbhumgarh	115	7.66	0	61	7	nil	2.4	0	36	8	3.9	9.4	2.4	12	ND

E. Singhbhum	Chakulia	Chakulia	320	7.51	0	85	39	0.16	28	13	125	32	11	12	1.2	11.25	ND
E. Singhbhum	Kalapathar	Chakulia	534	8.22	0	116.85	78	0.96	15	24	175	52	10.93	54.8	1.25	13.23	ND
E. Singhbhum	Bhargora	Bhargora	404	8.54	12	79.95	70	1.27	2	2	155	42	12.15	19.36	0	9.36	ND
E. Singhbhum	Bahragora	Hanabantia	225	8.23	0	73.8	24.81	0.14	14	0	80	18	8.5	18	3.5	18	ND
E. Singhbhum	Chakulia	Pithajudi	278	8.26	0	141	24.81	nil	2.4	0	70	16	7.2	32	11	17	ND
E. Singhbhum	Ghatsila	Ghatsila	862	8.17	0	313	99	0.51	4	0	310	84	24	44	16	21	ND
E. Singhbhum	Mosabani	Musabani	1431	7.11	0	378	135	0.34	72	155	490	140	34	86	13	22	ND
E. Singhbhum	Potka	Kalikapur	1844	7.12	0	430	350	0.92	21	0	540	150	40	152	26	27	ND
E. Singhbhum	Potka	Potka	1033	8.68	36	354	71	0.65	3	35	400	60	61	48	1.6	34	ND
E. Singhbhum	Jamshed-Pur	Ramgarh	1062	8.48	48	293	81.53	0.3	8	106	500	52	65.61	33	11	33	ND
E. Singhbhum	Chandil	Chandil	811	8.44	36	171	128	0.23	4	0	300	88	19	40	4.3	19	ND
E. Singhbhum	Nimdih	Jamdih	567	8.48	24	183	67	0.27	17	0	220	60	17	40	3.8	25	ND
Deogarh		Jasidih	1444	7.98	nil	461	177	0.32	20	33	465	80	64.39	94	2.1	34	ND
Deogarh		Deoghar	1148	7.7	nil	464	128	0.55	31	15	375	84	40.09	103	1.3	20	ND
Deogarh		Jarmundi	830	8.11	nil	344.4	120	0.34	36	4	330	80	31	71	0.9	25	ND
Deogarh		Jama	581	8.11	nil	295.2	50	0.23	15	ND	230	36	34	44	1.2	13	ND
Deogarh		Madhupur	1444	7.8	nil	430	206	0.5	79	36	475	80	66	103	0.9	33	ND
Deogarh		Sarat	1038	8.01	nil	323	149	0.22	52	9.6	425	80	54	39	3.7	42	ND
Deogarh		Sarwan	976	7.95	nil	252	128	0.65	18	ND	320	88	24	66	3.1	30	ND
Deogarh		Palajori	1011	7.25	nil	369	142	0.32	25	9.6	425	70	60	63	2.8	26	ND
Deogarh		Ghormara	1032	7.33	nil	405.9	92	0.54	82	10	350	64	46	94	0.44	31	ND
Dumka		Kahikund	638	7.66	nil	196.8	92	0.21	23	3	175	56	8.5	52	6.1	15	ND
Dumka		Dumka	1310	8	nil	350	177	0.87	7.4	32	360	44	60	98	1.1	28	ND
Dumka		Hasidih	224	7.5	nil	95	28	0.15	14	ND	90	16	12	10	3.8	21	ND
Dumka		Masanjor	261	7.85	nil	146	7	0.44	48	4	90	16	12	17	0.8	21	ND
Dumka		Gamharia	1034	7.67	nil	104	262	0.45	78	5	290	88	12	71	8	30	ND
Dumka		Raneswar	436	8.21	nil	146	35	0.27	nil	5	150	50	6.075	25	0.6	40	ND
Dumka		Masalia	710	7.77	nil	207	92	0.65	20	ND	160	24	24	66	1.3	10	ND
Dumka		Patabadi	1138	8.01	nil	403	120	0.68	30	22	430	52	72	55	3.7	31	ND
Dumka		Doi	1420	7.66	nil	317	284	0.34	16	38	350	60	48	126	66	51	ND

Dumka		Pataragam	1044	7.62	nil	305	170	0	10	ND	240	52	26	93	41	32	ND
Dumka		Lalmatia	649	8.08	nil	274	64	14	8	ND	215	28	35	42	17	44	ND
Dumka		Sundarpa	625	7.44	nil	305	24	0.17	2	ND	160	24	24	51	12	45	ND
Dumka		Poria Hat	1082	7.6	nil	350.55	120	0.24	20	9.6	300	64	34	80	7.5	62	ND
Dumka		Maheshpu	369	7.12	nil	147.6	28	0.8	1.58	ND	65	16	6	44	1.4	17	ND
Dumka		Amarpara	362	8.06	nil	172.2	28	0.22	nil	ND	160	12	31	7	1	18	ND
Dumka		Latipara	1488	7.88	nil	305	312	nil	nil	19	415	116	30	96	66	52	ND
Dumka		Gopikandar	317	7.74	nil	178	21	0.35	4	ND	120	20	17	23	11	14	ND
Dumka		Barharb	278	7.22	nil	134	21	0.29	30	ND	80	24	4.8	26	3.1	19	ND
Dumka		Bdvababut	695	7.96	nil	281	50	nil	nil	ND	230	8	50	28	7.8	14	ND
Sahebganj		Borio	1255	7.9	nil	356.7	220	0.15	nil	0.48	210	44	24	143	58	24	ND
Sahebganj		Mandra	1236	7.44	nil	282.9	255	0.44	nil	0.78	330	72	36	94	52	12	ND
Sahebganj		Sakrigali	997	8.18	nil	305	149	0.19	2.5	19	240	64	19	69	65	44	ND
Sahebganj		Sahebganj	536	7.6	nil	250	42	0.49	nil	ND	180	32	24	30	16 I	20	ND
Sahebganj		Rajmahal	650	7.31	nil	295.2	50	0.21	0.93	ND	215	20	40	32	11	20	ND
Sahebganj		Talajodi	1118	8.11	nil	461.25	113	0.32	nil	24	305	84	23	96	41	34	ND
Sahebganj		Ranga	1065	8.2	nil	317	135	1.38	nil	ND	275	80	18	87	7.8	24	ND
Sahebganj		Berhait	424	7.75	nil	195	28	0.22	4.4	ND	175	32	23	14	1.6	22	ND
GODDA		Boarojore	567	7.52	nil	293	21	0.11	8	ND	150	24	22	37	25	30	ND
Pakur		Pakur	992	8.01	nil	461	92	0.24	12	ND	280	28	9.6	95	65	24	ND
Pakur		Hiranpur	348	7.64	nil	184.5	21	0.18	0.68	ND	120	20	17	33	1.2	17	ND
Jamtara		Mihijam	925	8.11	nil	305	106	0.3	24	ND	335	72	37	51	3.8	29	ND
Jamtara		Kundahit	680	7.6	nil	184.5	92	0.87	76	ND	230	52	24	29	1.8	36	ND
Jamtara		Jamtada	911	7.7	nil	320	106	0.45	6	9.6	290	88	17	70	0.7	31	ND
Jamtara		Nala	13.1	7.8	nil	172.2	156	0.0.70	1.9	ND	390	60	58	104	1.1	35	ND
Ranchi	Mandar	Mandar	678	7.13	0	140	142	0.06	0	55	250	80	12	13	9	5.31	ND
Ranchi	Bero	Berro	254	7.08	0	140	11	0.04	1	2	100	30	6	9	5	17.94	ND
Ranchi	Angara	Barwadag	759	7.1	0	300	79	0.28	1	18	360	100	27	26	3	9.42	ND
Ranchi	Silli	Silli	635	7.09	0	360	34	1.18	0	10	230	80	7	25	5	9.83	ND
Ranchi		Seringhatu	705	7.06	0	92.25	128	0.00	37	85	235	66	17	44	4	19.06	ND

Ranchi	Angara	Angara	631	7.33	0	360	14	0.70	0	34	245	60	23	16	6	12.04	ND
Ranchi	Kanke	Bunti	398	6.96	0	140	11	0.04	0	58	140	38	11	14	6	3.81	ND
Ranchi	Namkum	Hatia	191	6.97	0	100	14	0.01	0	2	70	20	5	6	3	9.03	ND
Ranchi	Ratu	Kantitanr	495	7.05	0	220	60	0.14	0	8	170	60	5	26	5	7.77	ND
Ranchi	Ormanjhi	Chutupalu	452	7.08	0	123	70	1.40	0	45	180	64	5	29	7	8.66	ND
Ranchi	Sonahatu	Sonahatu	365	7.02	0	180	34	0.08	1	6	145	37	13	14	4	5.69	ND
Ranchi	Itki	Chachgura	180	7.3	0	40	34	0.01	1	0	50	16	4	19	1	4.05	ND
Ranchi	Angara	Jonha	404	7.01	0	200	14	0.50	0	4	160	35	17	26	7	23.6	ND
Ranchi	Kanke	BIT More	368	7.04	0	100	60	0.11	0	8	115	35	7	34	9	5.02	ND
Ranchi	Silli	Kita	414	7.1	0	140	68	0.44	0	18	190	50	16	10	4	19.35	ND
Ranchi	Silli	Patrahatu	397	6.97	0	140	57	0.19	0	20	140	50	4	29	6	9.91	ND
Ranchi	Bundu	Taimara	336	7.12	0	200	11	0.23	0	4	120	40	7	11	8	13.24	ND
Ranchi	Namkom	Namkom Bz Chowk	481	7.09	0	280	25	0.31	1	11	200	76	2	16	2	6.87	ND
Ranchi	Kanke	Kanke	470	7.21	0	160	62	0.38	1	40	196	59	12	14	4	6.69	ND
Ranchi	Kanke	Harmu	220	7.12	0	100	20	1.28	0	8	64	24	1	19	6	12.33	ND
Ranchi		Sons Bazar	1307	7.31	0	252.15	205.61	0.07	51.64	75	325	84	27.94	125	24	10.03	ND
Ranchi		Lalganj	920	7.24	0	375.15	77.58	0.13	12.49	22	260	66	23.08	71.17	5.6	8.19	ND
Ranchi		Lowadih	244	6.95	0	147.6	7.1	0.33	1.47	2	85	18	9.72	20.66	3.6	8.22	ND
Ranchi		Rampur	687	7.31	0	338.25	60	0.00	11.1	5	180	50	13.36	60.84	3.3	6.27	ND
Ranchi		Kharsidag	890	7.21	0	135.3	116.98	0.00	7.7	118	265	68	23.08	69.73	2.63	7.22	ND
Ranchi		Sitio Pokhar Toli	343	7.7	0	141.45	28.36	0.40	16.02	3	110	18	15.79	20.01	4.16	8.12	ND
Ranchi		Sriham Toli	983	7.41	0	387.45	109.85	0.33	21.88	50.75	265	28	47.38	60.6	73.63	5	ND
Ranchi		Burmoo	225	7.11	0	100	20	1.20	0	8	64	24	1	19	6	3	ND
Latehar	Chandwa	Chandwa	635	7.62	0	146	106	0.25	53	0	190	72	2.4	55	1.5	43	ND
Latehar	Latehar	Latehar	590	7.7	0	146	106	0.11	25	0	200	76	2.4	32	59	30	ND
Latehar	Manika	Manika	1020	7.45	0	61	241	0.62	29	72	350	108	19	66	11	34	ND
Latehar	Balumath	Balumath	760	7.9	0	256	92	0.24	43	0	210	72	7.3	47	35	54	ND
Latehar	Barwadih	Barwadih	1900	7.73	0	378	355	0.26	144	48	780	212	61	86	9	29	ND
Latehar	Balumath	Bariatu	776	7.9	0	256	99	0.38	4.3	0	280	76	22	38	39	41	ND

Latehar		Nagarutari	598	8.35	2	329	35	0.23	14	12	250	24	46	16	1	17	ND
Latehar		Ramna	1665	7.45	0	541.2	251.69	0.14	34	22	530	140	37.66	115.6	2.42	38	ND
Latehar		Manjhan	812	7.86	0	424.35	35.45	0.12	5	10	340	80	34.02	50.83	0.54	14	ND
Chatra	Simaria	Tutilawa	858	7.52	0	264	78	0.00	39	32	425	56	69	22	4	10	ND
Chatra	Chatra	Chatra	2403	7.29	0	351	532	0.05	41	5	730	132	97	229	3	21	ND
Chatra	Itkhori	Itkhori	837	7.58	0	488	35	0.11	8	8	300	40	49	42	6	14	ND
Chatra	Simaria	Bagra	674	7.66	0	177	85	0.20	39	12	215	26	36	63	11	5	ND
Chatra	Simaria	Birhu	303	8.77	8	85	32	0.02	31	14	115	16	18	17	2	21	ND
Chatra	Itkhori	Pitij	1478	7.50	0	281	358	0.09	4	52	220	50	23	201	3	17	ND
Palamu	Chhatarpur	Chhatarpur	1951	7.35	0	634	206	0.94	8	250	600	140	61	209	19	42	ND
Palamu	Panki	Panki	1200	7.78	0	305	234	0.61	6	48	530	176	22	47	4	42	ND
Palamu	Satabarwa	Satabarwa	1028	8.2	0	439	106	0.46	3.8	ND	355	112	18	56	8.4	34	ND
Palamu	Patan	Kanda	640	7.62	0	342	21	1.41	1	15	210	64	12	62	2	37	ND
Palamu	Hariharganj	Sanda	677	8.38	4	6	35.45	0.58	17	5	240	64	19.44	58	3	21	ND
Palamu	Panki	Sagalim	660	7.77	0	366	32	0.31	4	12	240	60	22	55	2	28	ND
Palamu	Haidarnagar	Haidarnagar	1021	7.98	0	342	149	0.70	2	72	380	72	49	81	7	26	ND
Palamu	Chainpur	Baraw	1058	7.9	0	390	99	1.36	46	70	400	60	61	82	4.6	49	ND
Gumla	Gumla	Gumla	1260	7.2	0	427	163	0.21	0.8	70	430	96	46	94	1.7	12.96	ND
Gumla	Sisai	Sisai	1020	7.4	0	159	184	0.01	147	0	230	76	9.7	114	15	8.33	ND
Gumla	Bharno	Bharno	200	7.6	0	55	28	0.05	16	0	50	18	1.2	21	2.9	18.33	ND
Gumla	Ghagra	Ghagra	2304	7.8	0	354	341	0.10	380	2.1	860	214	79	160	19	11.09	ND
Gumla	Bishunpur	Bishunpur	745	7.6	0	207	141	0.14	75	0	240	92	2.4	53	2	18.11	ND
Gumla	Palkot	Palkot	325	8.2	0	159	21	0.12	2.7	ND	120	32	9.7	22	1.7	25	ND
Gumla	Raidih	Raidih	532	8	0	214	50	0.19	2.9	32	150	40	12	41	18	25	ND
Gumla	Chainpur	Chainpur	800	7.8	0	165	114	0.14	88	22	260	76	17	52	12	14.59	ND
Gumla	Bharno	Nagfeni	535	7.6	0	177	64	0.22	21	0	150	58	1.2	50	36	22.85	ND
Gumla	Ghaghra	Adhor	1795	8.2	0	317	362	0.73	89	100	530	112	61	150	73	36	ND
Gumla	Gumla	Anjan Gram	340	8.1	0	146	28	0.08	10	11	105	28	8.5	34	0.08	31	ND
Gumla	Palkot	Baghma	480	7	0	122	64	0.10	34	33	150	40	12	46	8.3	20	ND
Gumla	Raidih	Kasir	550	7.6	0	189	57	0.22	26	25	200	40	24	37	3.1	35	ND

Gumla	Gumla	Kharke	200	7.5	0	55	32	0.28	12	0	50	6	8.5	23	0.06	10.94	ND
Gumla	Rangmati	Tamar	1025	7.1	0	200	170	0	1	92	456	56	76	31	2	10	ND
Gumla	Basai	Basai	717	7.82	0	258.3	46.08	0.12	32	29	150	40	50	38	4.1	21	ND
Gumla		Puthritoli	173.5	8.25	0	73.8	7.35	0.83	11	4	75	10	12.15	9.36	0	0	ND
Gumla	Simdega	Koleberia	585	7.7	0	141	74	0.06	18	38	160	20	27	56	5.3	32	ND
Gumla	Simdega	Lachraghar	631	7.93	0	183	92	0.05	8	22	235	60	21	37	1.8	34	ND
Gumla	Bano	Bano	580	7.7	0	281	43	ND	3.5	0	185	52	13	48	3.2	33	ND
Gumla	Simdega	Jaldega	744	8.25	0	182	114	0.12	23	48	260	76	17	52	1.6	30	ND
Gumla	Simdega	Tengrakuttu	329	8.21	0	116	35.45	0.17	9.7	20	110	18	16	28	0.9	34	ND
Gumla	Simdega	Thethaiangar	216	7.22	0	85	28	0.18	2.5	8	70	24	2.4	18	1.1	20	ND
Gumla	Simdega	Simdega1	206	8.1	0	67	21	ND	7.8	5	75	20	6	13	1	34	ND
Gumla	Simdega	Biru	540	7.78	0	190	74.44	0.26	5.2	0	195	36	13.75	26	21	33	ND
Hazaribagh	Barhi	Barhi	1205	8.08	Nil	122	291	0.66	41	18	545	78	85	52	2	25	ND
Hazaribagh	Hazaribagh	Hazaribagh	1220	8.12	Nil	314	177	0.2	41	48.66	405	72	55	72	4	16	ND
Hazaribagh	Chowparan	Chowparan	2120	7.53	Nil	394	432	0.35	40	0	615	96	91	217	8	18	ND
Hazaribagh	Barkatha	Barakatha	283	8.14	Nil	122	32	0.43	11	0	120	20	17	14	3	11	ND
Hazaribagh	Ichak	Ichak More	645	8.22	Nil	165	96	1.42	40	0	230	32	36	51	3	36	ND
Hazaribagh	Barkagaon	Barkagan	827	7.72	Nil	314	67	0.28	33	9.27	320	44	51	53	3	16	ND
Hazaribagh	Keredari	Keredari	968	7.72	Nil	409	99	1.02	6	0	310	24	49	82	4	10	ND
Hazaribagh	Keredari	Garrikalan	1014	8.10	Nil	350	152	0.31	8	5.1	295	36	47	74	17	12	ND
Hazaribagh	Hazaribagh	Meru(Silwar)	475	8.88	6	80	67	0.23	38	13.03	175	26	27	21	4	16	ND
Hazaribagh	Daru	Daru	3320	7.72	Nil	332	819	0.66	37	53	835	84	153	438	12	21	ND
Hazaribagh	Padma	Padma	433	8.20	4	202	46	0.53	11	4	195	24	21	25	2	20	ND
Hazaribagh		Tatijharia	345	8.28	Nil	92	32	1.12	28	14	155	22	24	14	1	12	ND
Hazaribagh	Dari	Darj	802	8.44	27	308	78	1.22	18	21	110	70	16	52	12	27	ND
Hazaribagh	Hazaribagh	Hatyari	477	8.28	Nil	122	35	1.02	50	28	235	20	45	13	1	13	ND
Hazaribagh	Barkatha	Barakatha	307	8.20	Nil	122	32	0.41	14	0	120	20	17	14	3	14	ND
Hazaribagh	Koderma	Koderma	426	7.3	Nil	92	60	0.46	14	24	150	28	19	21	3.8	44	ND
Koderma	Koderma	Chandwara	1010	7.53	Nil	283	145	0.17	13	32	205	44	23	155	0	24	ND
Koderma		Jhumritilaiya	991	8.3	Nil	153.75	251.34	0.94	38	36	220	60	17.01	105	2.63	24.81	ND

Ramgarh	Ramgarh	Ramgarh	998	8.2	Nil	227.55	216	1.17	28	40	225	72	10.93	108.5	1.12	28	ND
Ramgarh	Mandu	Mandu	621	7.75	Nil	195	71	0.69	55	0	180	64	5	51	2.8	22	ND
Ramgarh	Patratu	Patratu	497	8.11	Nil	92	110	1.31	32	0	145	56	1	46	1.1	47	ND
Ramgarh	Gola	Gola	417	7.65	Nil	79	74	1.75	31	0	100	38	1	44	3	48	ND
Ramgarh	Ramgarh	Barkakana	1135	7.65	Nil	332	184	1.39	14	4	450	120	36	39	1	28	ND
Ramgarh	Ramgarh	Chitarpur	731	7.10	Nil	277	50	0.18	18	21	300	66	33	42	2	24	ND
Ramgarh	Patratu	Bhukunda	794	7.78	Nil	159	113	1.06	68	24	260	72	19	57	4.2	31	ND
Ramgarh	Mandu	Kuju	756	7.55	Nil	226	106	0.68	45	0	275	104	3.64	39	1.6	32	ND
Ramgarh	Mandu	Sirka	1137	6.96	Nil	234	216	0.27	31	27	335	84	28	97	27	25	ND
Ramgarh	Patratu	Saunda	524	7.23	Nil	203	57	1.07	2	7	165	48	11	41	2	21	ND
Ramgarh	Patratu	Sayal	641	7.15	Nil	234	64	0.15	10	8	165	54	7	60	19	21	ND
Ramgarh	Barkagaon	Urimari	445	7.33	Nil	203	39	0.14	5	4	160	54	1	28	1	18	ND
Ramgarh	Mandu	Barka Chumba	488	8.27	Nil	105	64	0.41	53	48	125	48	1	44	0	18	ND
		Minimum	13.1	7	0	6	7	0	0	0	36	6	0.96	6	0	0	0.3
		Maximum	3320	8.9	48	634	818.9	14	380	250	860	214	153.1	438	73.6	62	0.3
		Average	781	8	3	235	108	1	24	23	256	59	27	57	10	23	0

PLATE – I


JHARKHAND
ADMINISTRATIVE DIVISION
SCALE
N
W
E
S
BIHAR
WEST BENGAL
MADHYA PRADESH
ORISSA
SAHIBGANJ
GODDA
PAKUR
DEOGHAR
DUMKA
KODERMA
CHATRA
GIRIDH
GARHWA
DALTONGANJ
HAZARIBAGH
DHANBAD
JAMTARA
BOKARO
RAMGARH
RANCHI
LOHARDAGA
GUMLA
KHUNTI
SARAIKELA
EAST SINGHBHUM
SIMDEGA
CHAIBASA
INDEX
STATE BOUNDARIES
DISTRICT BOUNDARY
DISTRICT HEADQUARTERS
WATER BODIES
ROADS
RAILWAYS

PLATE – II

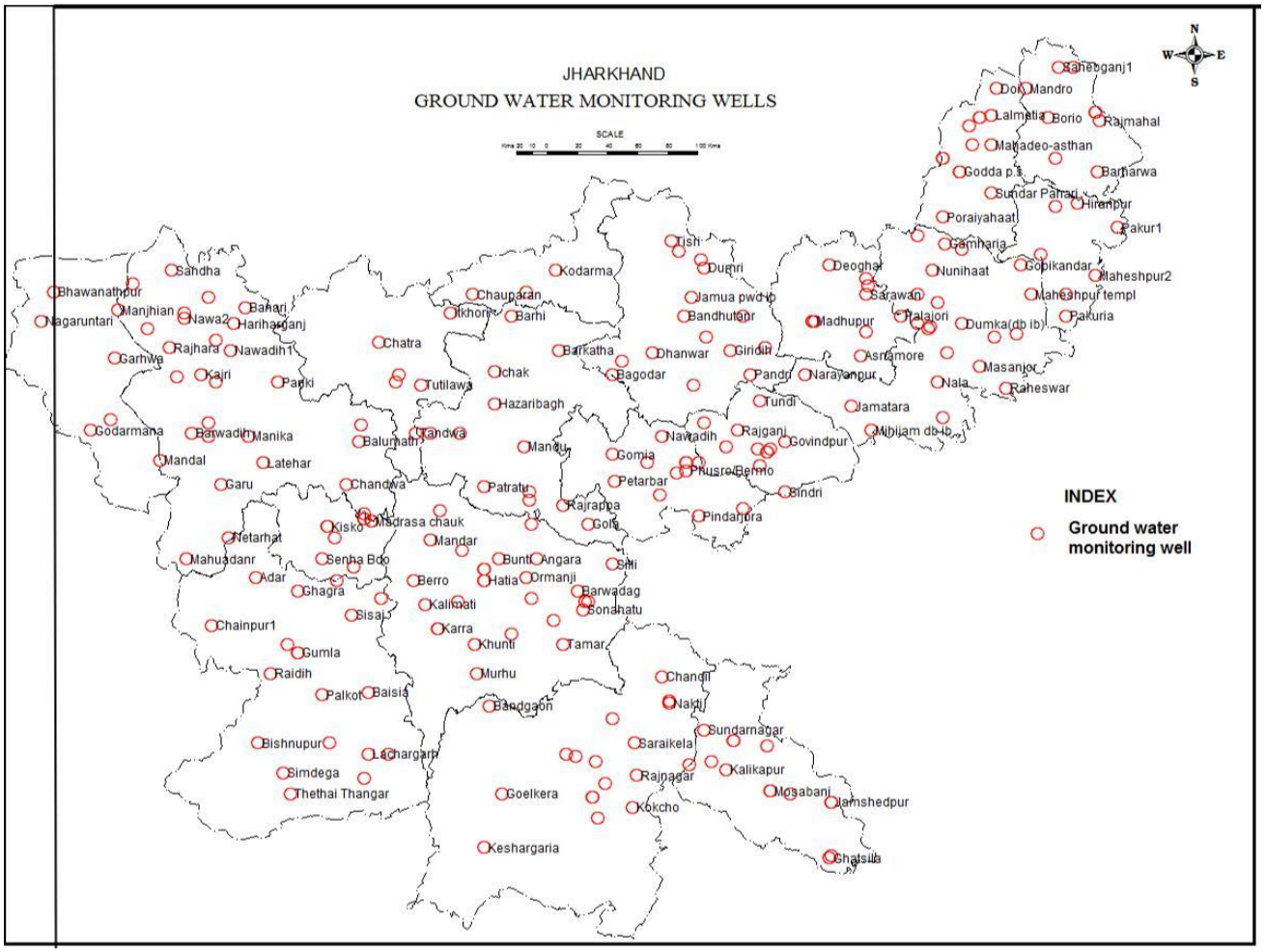
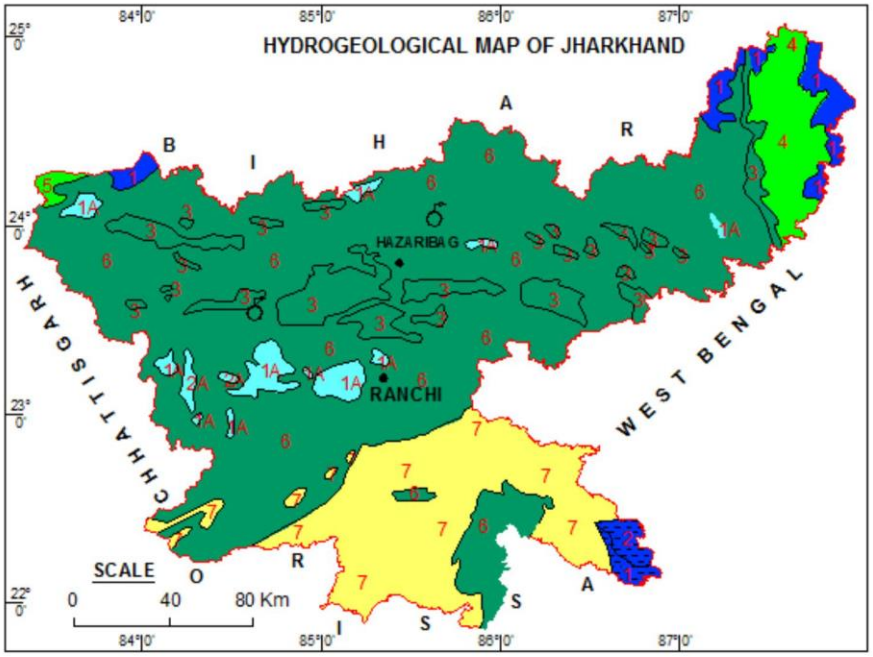

JHARKHAND
GROUND WATER MONITORING WELLS
SCALE
N
W
E
S
INDEX
Ground water monitoring well
Sahebganj1
Dok Mandro
Lalmatia
Borio
Rajmahal
Mahadeo-asthan
Godda p.s
Barharwa
Sundar Pahari
Hiranpur
Poraiyahaat
Pakur1
Gamharia
Gopikandar
Maheshpur2
Maheshpur templ
Pakuria
Dumka(db ib)
Nunihaat
Deoghar
Jamua pwd ib
Sarawan
Palajori
Madhupur
Bandhutdih
Tish
Dumri
Kodarma
Chauparan
Ikhori
Barhi
Barkatha
Dhanwar
Giridih
Bagodar
Chak
Hazaribagh
Tutilawa
Chatra
Sandha
Bhawanathpur
Manjhian
Nagaruntari
Nawa2
Banari
Harihanganj
Rajhara
Nawadih1
Garhwa
Kairi
Panki
Godarmana
Barwadih
Manika
Mandal
Latehar
Garu
Balumath
Tandwa
Chandwa
Patratu
Rajrappa
Golfa
Pindarjora
Mandu
Gomia
Petarbar
Phusro/Bermo
Navadih
Rajgani
Govindpur
Sindri
Tundi
Jamatara
Mihijam db ib
Ashramore
Pandri
Narayanpur
Masanjor
Nala
Raheswar
Kisko
Madrasa chauk
Mandar
Netarhat
Mahuadanr
Senha Bdo
Adar
Ghagra
Berro
Bunti Angara
Hatia
Ormanji
Barwadag
Sonahatu
Kalimati
Sisai
Chainpur1
Karra
Khunti
Tamar
Gumla
Raidih
Murhu
Palkot
Balsia
Bandgaon
Nakti
Chandil
Sundarnagar
Saraikela
Kalikapur
Rajnagar
Kokcho
Goelkera
Bishnupur
Lachargarh
Simdega
Thethai Thangar
Keshargaria
Mosabani
Jamshedpur
Ghatsila

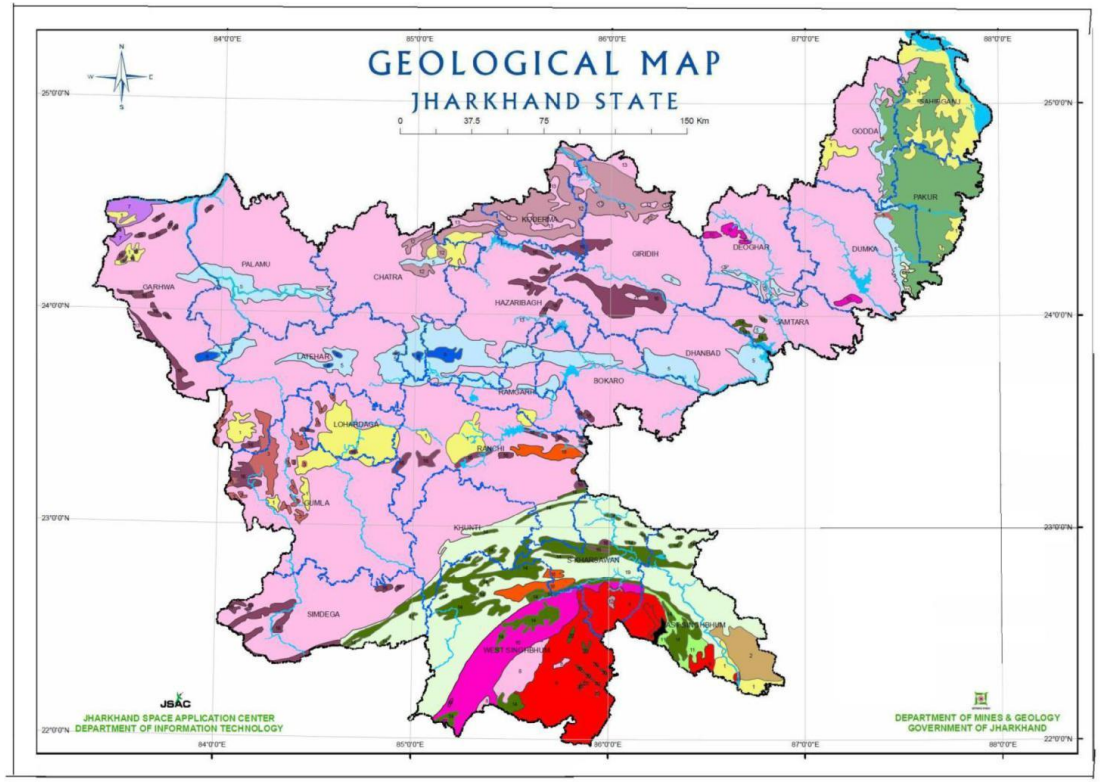
PLATE – III



FISSURED & SEMI-CONSOLIDATED FORMATIONS

UNITS	AGE GROUP	FORMATION	COLOUR	LITHOLOGY	GROUN WATER POTENTIAL
1	QUATERNARY	ALLUVIUM		CLAY, SILT, GRAVEL, PEBBLES & CALC	>40 m³/hr
1A	QUATERNARY	ALLUVIUM		CLAY, SILT & SAND	1-10 m³/hr
2	PLEISTOCENE TERTIARY	LATERITES		LATERITES & LITHOMARGE	1-10 m³/hr
2A	PLEISTOCENE TERTIARY	TERTIARY		SAND, SILT, CLAY, PABLE & GRAVEL	10-40 m³/hr
3	CARBONIFEROUS E CRETACEOUS	GONDWANA		CLAY, SILT, GRIT, SANDSTONE & SHALE	1->25 m³/hr
4	L JURASSIC E CRETACEOUS	RAJMAHAL BASALT		BASALT FLOWS WITH INTERTRAPPEANS	1-25 m³/hr
5	PROTEROZOIC E CAMBRIAN	VINDHYAN		QUARTZITE, LIMESTONE, SANDSTONE, DOLOMITE & SHALE	1-25 m³/hr
6	PROTEROZOIC ARCHEAN	CHHOTNAGPUR GNEISSC COMPLEX		GNEISSES & GRANITES	1->25 m³/hr
7	PROTEROZOIC ARCHEAN	VOLCANO-SEDIMENTARY		SCHISTS, PHYLLITES, BASIC & ACIDIC INTRUSIVES	1-15 m³/hr

PLATE – IV



INDEX

1, Alluvium, Soil/Boulder Conglomerate, Older Alluvium & Laterite
2, Tertiary Gravels
3, Laterite
4, Rajmahal Trap/Intertrappean Beds/Trap Dykes
5, Lower Gondwana System/Carbonaceous Shale/Sandstone/Coal Seams
6, Upper Godwana System/Sandstone/Red Clay
7, Lower Vindhyan System/Limestone/Shale
8, Kolhan Series/Limestone/Sandstone/Quartzite
9, Singhbhum Granite
10, BHQ/BHJ/Metavolcanics/Metasedimentary
11, Dhanjori Quartzite and Conglomerate
12, Micaschist, Phyllite, Quartzite/Metamorphic of Chhotanagpur
13, Chhotanagpur Gneiss & Granophyre
14, Dhanjori Lava/Dalma Lava/ Basic rocks
15, Sandstone, Shale (Dubrajpur Formation)
16, Basic & Ultrabasic
17, Gabbro -Anorthosite
18, Granite
19, Volcanogenic Meta-sediments and Metasedimentary rocks
20, Newer Dolerite
River/Water Body
District Boundary
State Boundary

PLATE V

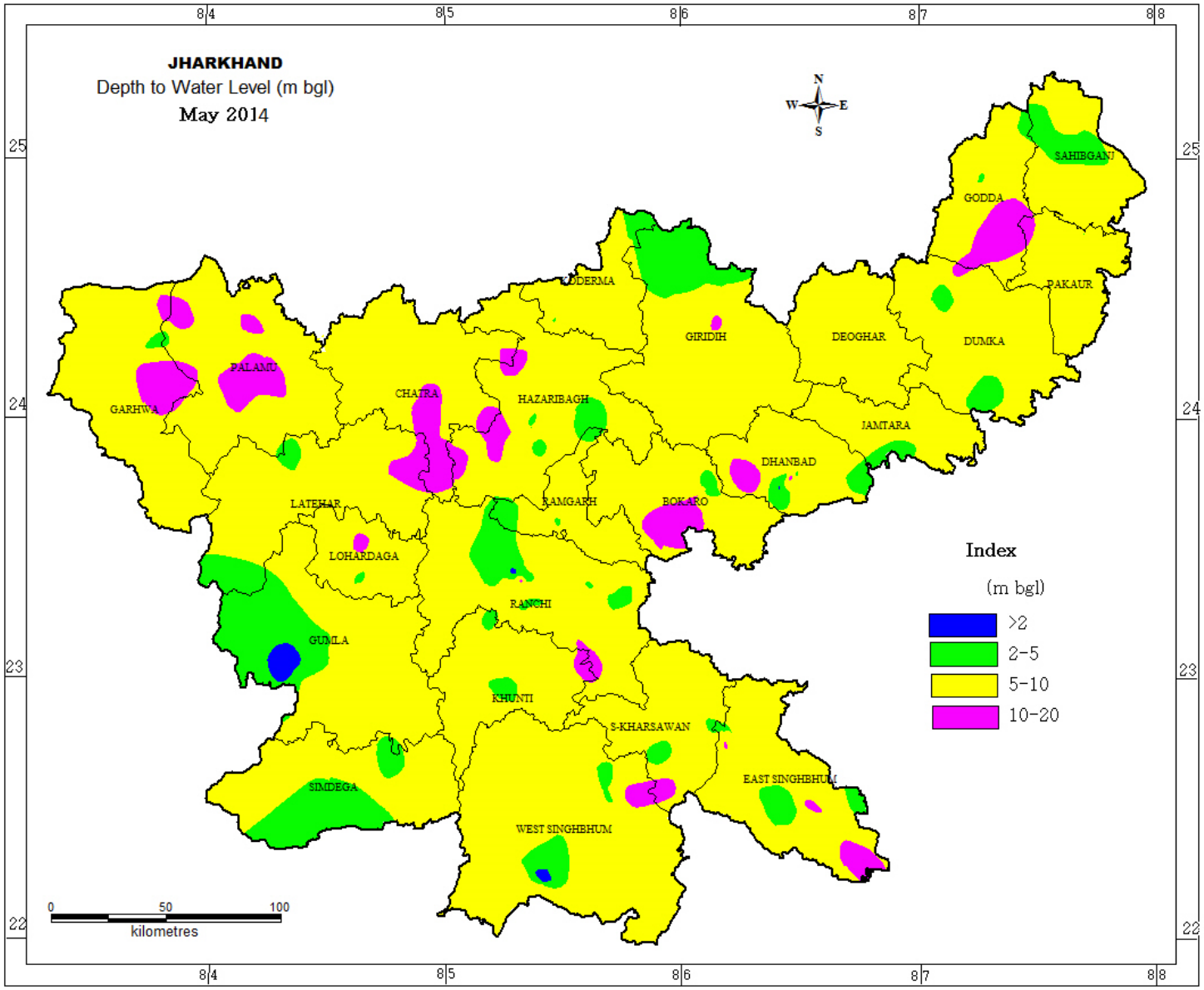

JHARKHAND
Depth to Water Level (m bgl)
May 2014
N
W
E
S
84
85
86
87
88
25
24
23
22
SAHIBGANJ
GODDA
PAKAUR
DUMKA
DEOGHAR
GIRIDIH
KODERMA
PALAMU
GARHWA
CHATRA
HAZARIBAGH
JAMTARA
DHANBAD
LATEHAR
RAMGARH
BOKARO
LOHARDAGA
RANCHI
GUMLA
KHUNTI
S-KHARSAWAN
EAST SINGHBHUM
SIMDEGA
WEST SINGHBHUM
Index
(m bgl)
>2
2-5
5-10
10-20
0
50
100
kilometres

PLATE VI

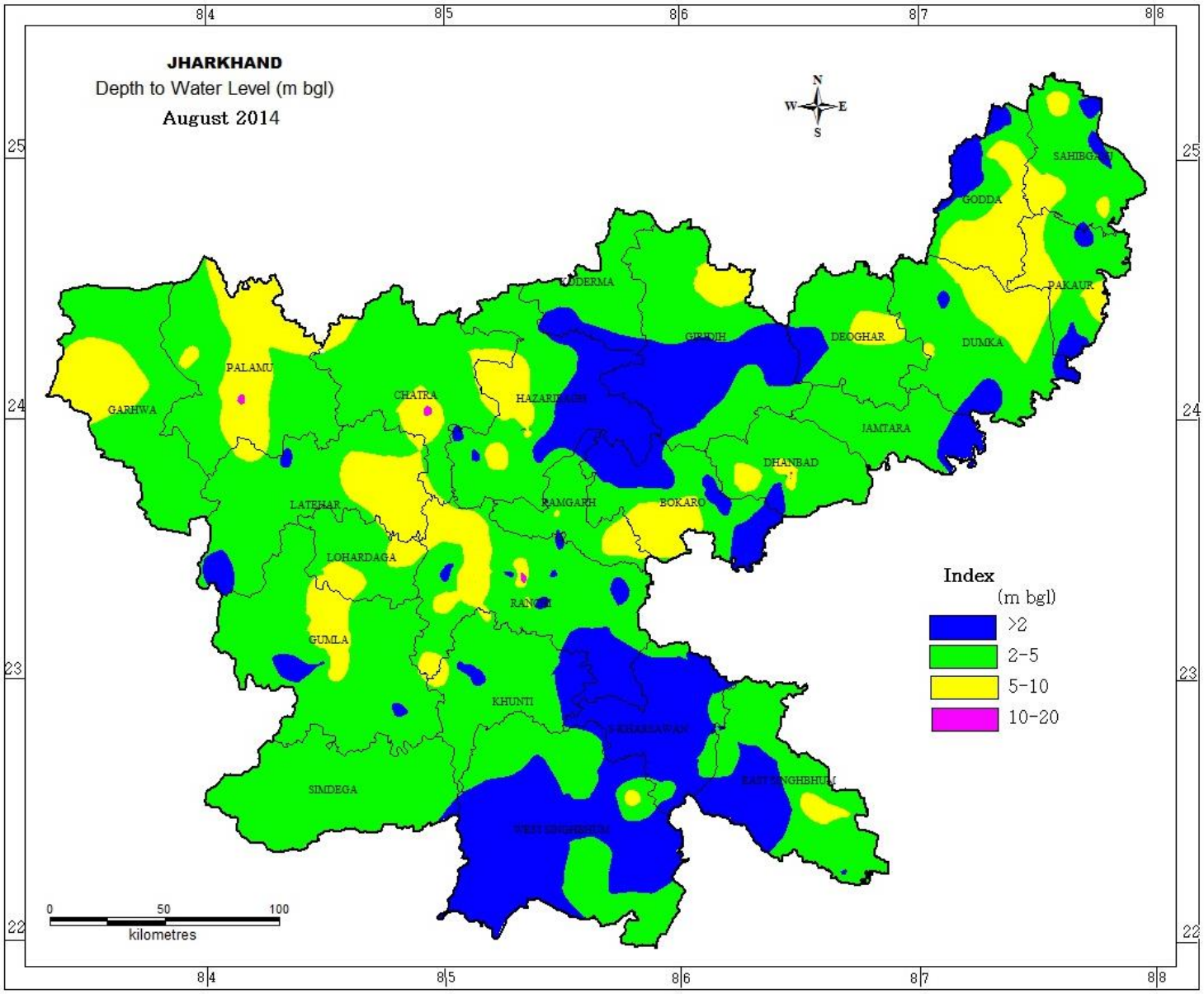

JHARKHAND
Depth to Water Level (m bgl)
August 2014
N
W
E
S
84
85
86
87
88
25
24
23
22
SAHIBGA
GODDA
PAKAUR
DUMKA
DEOGHAR
GIRIDIH
JAMTARA
DHANBAD
BOKARO
RAMGARH
HAZARIBAGH
CHATRA
PALAMU
GARHWA
LATEHAR
LOHARDAGA
GUMLA
KHUNTI
SIMDEGA
Index
(m bgl)
>2
2-5
5-10
10-20
0
50
100
kilometres

PLATE VII

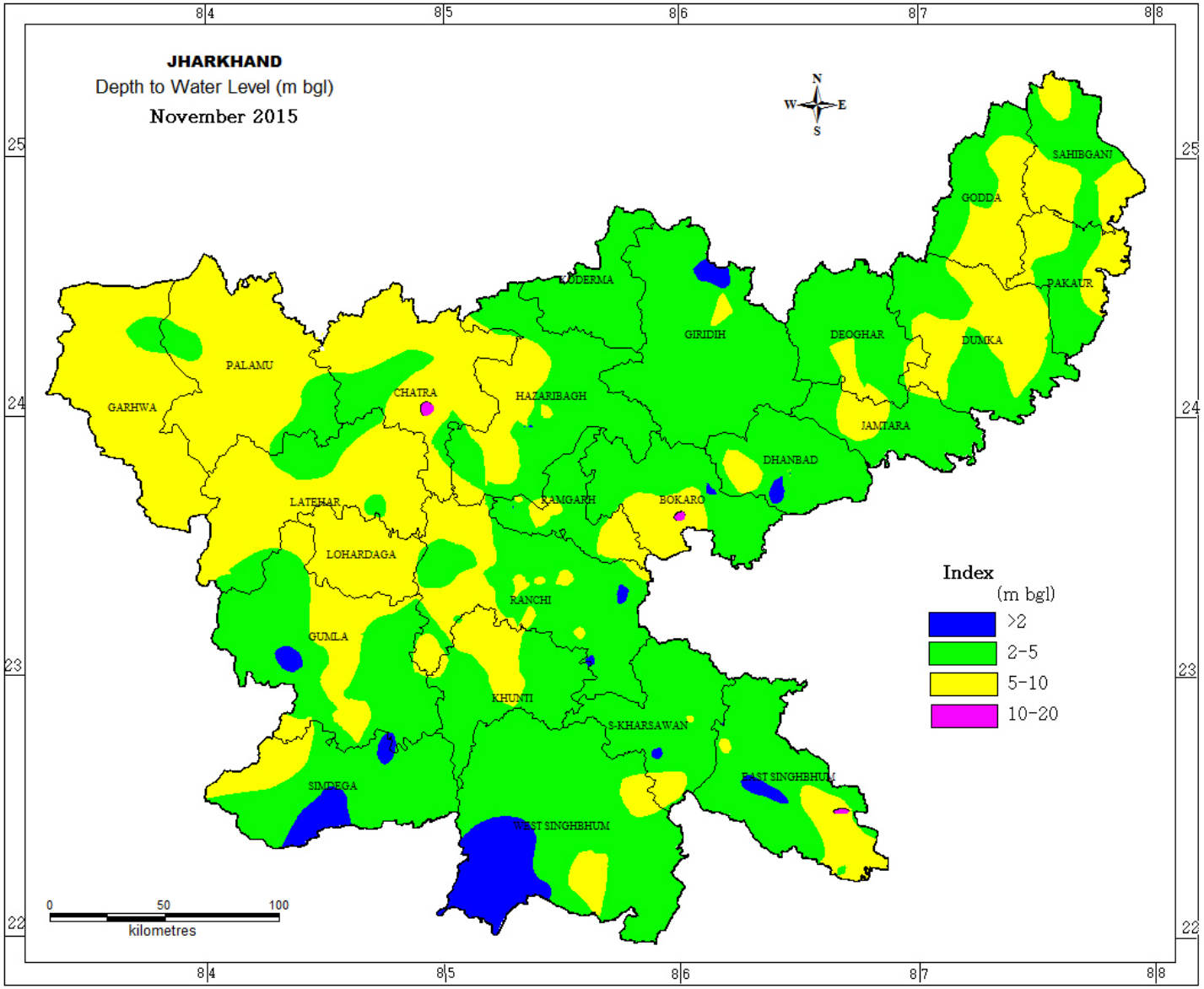

JHARKHAND
Depth to Water Level (m bgl)
November 2015
N
W
E
S
84
85
86
87
88
25
24
23
22
SAHIBGANJ
GODDA
PAKAUR
DUMKA
DEOGHAR
JAMTARA
GIRIDIH
KODERMA
CHATRA
HAZARIBAGH
PALAMU
GARHWA
DHANBAD
BOKARO
RAMGARH
LATEHAR
LOHARDAGA
RANCHI
GUMLA
KHUNTI
S-KHARSAWAN
EAST SINGHBHUM
SIMDEGA
WEST SINGHBHUM
Index
(m bgl)
>2
2-5
5-10
10-20
0
50
100
kilometres

PLATE VIII

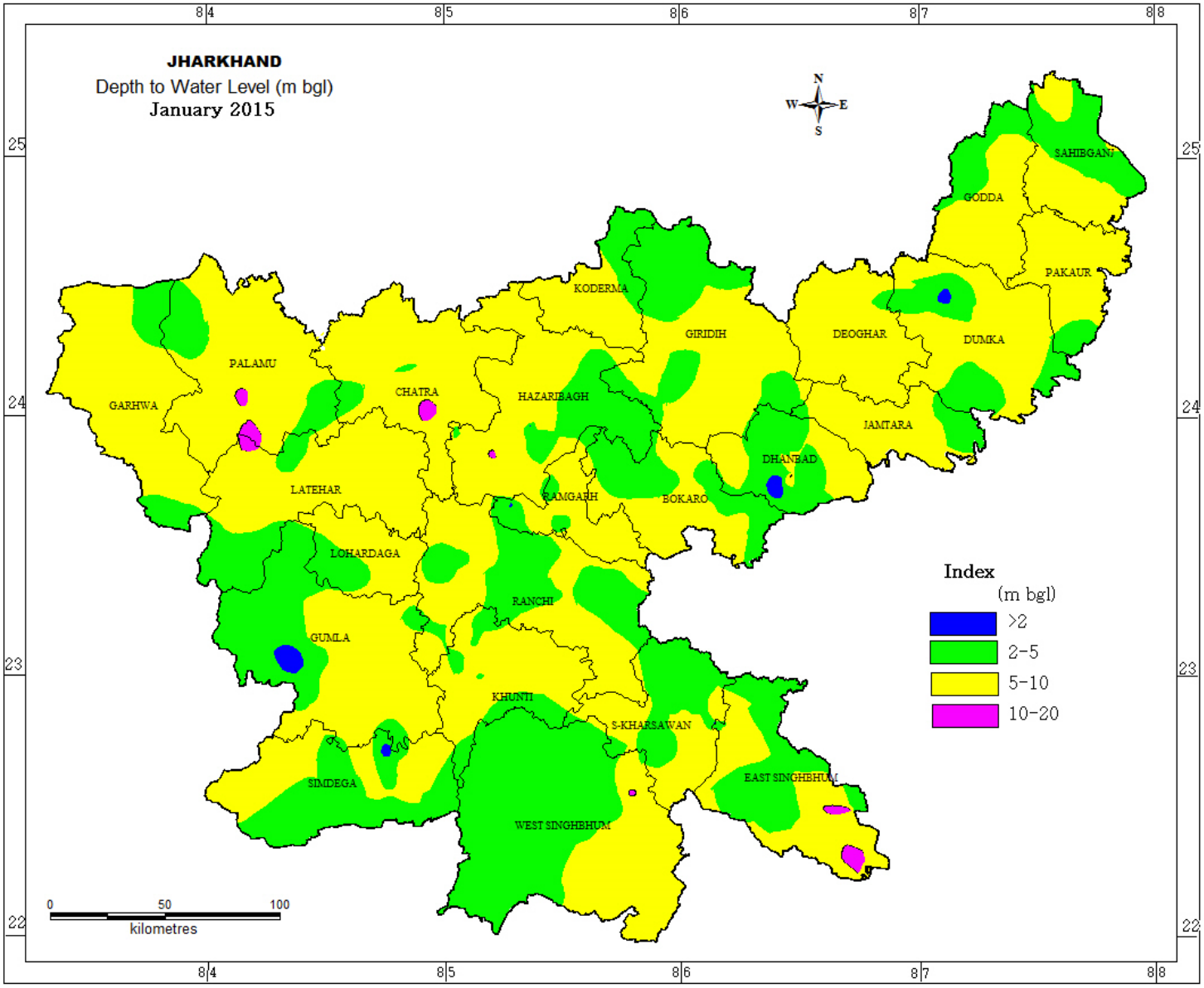

JHARKHAND
Depth to Water Level (m bgl)
January 2015
N
W
E
S
84
85
86
87
88
25
24
23
22
SAHIBGANJ
GODDA
PAKAUR
DUMKA
DEOGHAR
GIRIDIH
KODERMA
HAZARIBAGH
CHATRA
PALAMU
GARHWA
LATEHAR
JAMTARA
DHANBAD
BOKARO
RAMGARH
LOHARDAGA
RANCHI
GUMLA
KHUNTI
S-KHARSAWAN
EAST SINGHBHUM
SIMDEGA
WEST SINGHBHUM
Index
(m bgl)
>2
2-5
5-10
10-20
0
50
100
kilometres

PLATE IX

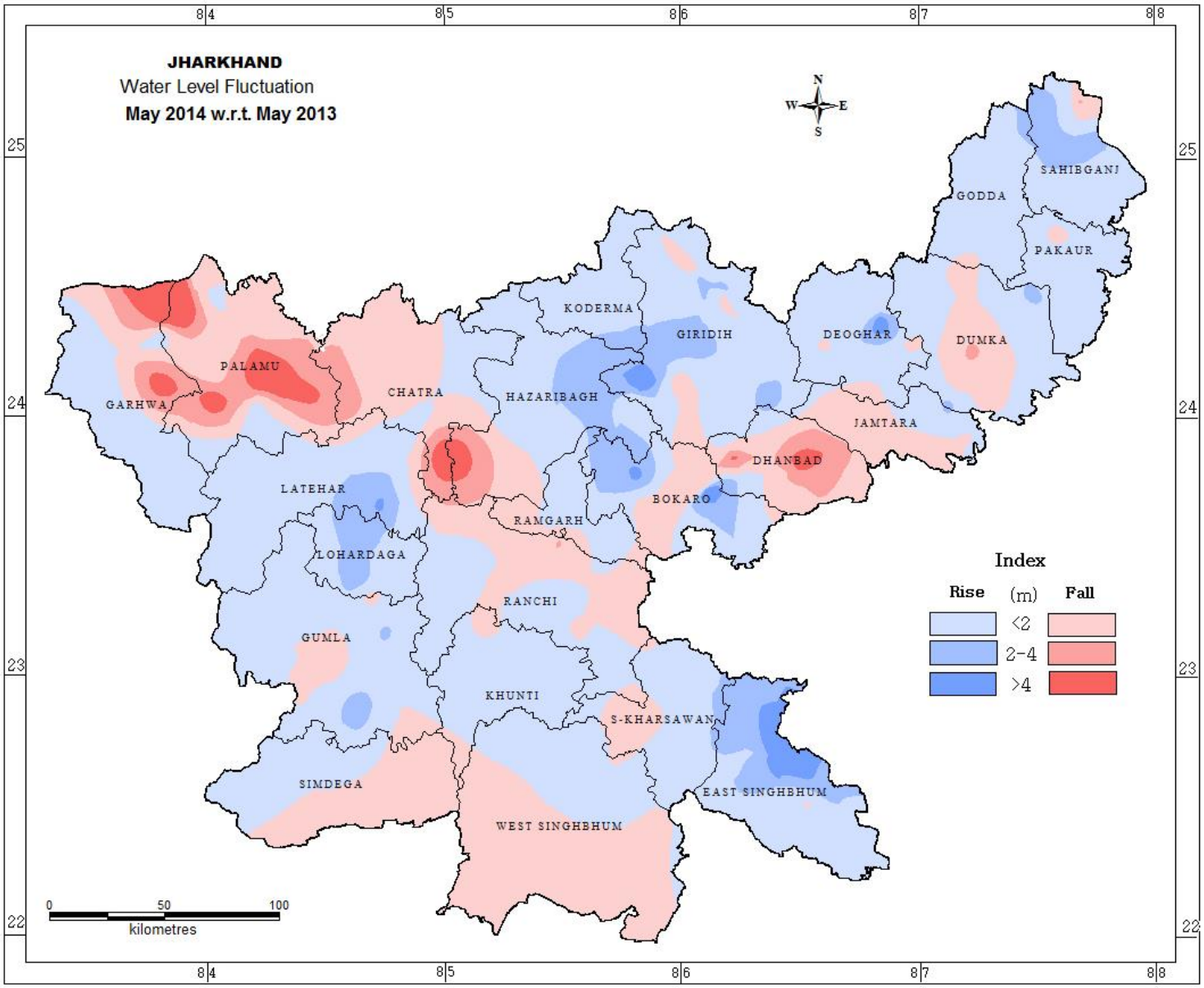

JHARKHAND
Water Level Fluctuation
May 2014 w.r.t. May 2013
N
W
E
S
84
85
86
87
88
25
24
23
22
SAHIBGANJ
GODDA
PAKAUR
KODERMA
GIRIDIH
DEOGHAR
DUMKA
PALAMU
GARHWA
CHATRA
HAZARIBAGH
JAMTARA
DHANBAD
LATEHAR
BOKARO
RAMGARH
LOHARDAGA
RANCHI
GUMLA
KHUNTI
S-KHARSAWAN
SIMDEGA
EAST SINGHBHUM
WEST SINGHBHUM
Index
Rise
(m)
Fall
<2
2-4
>4
0
50
100
kilometres

PLATE X

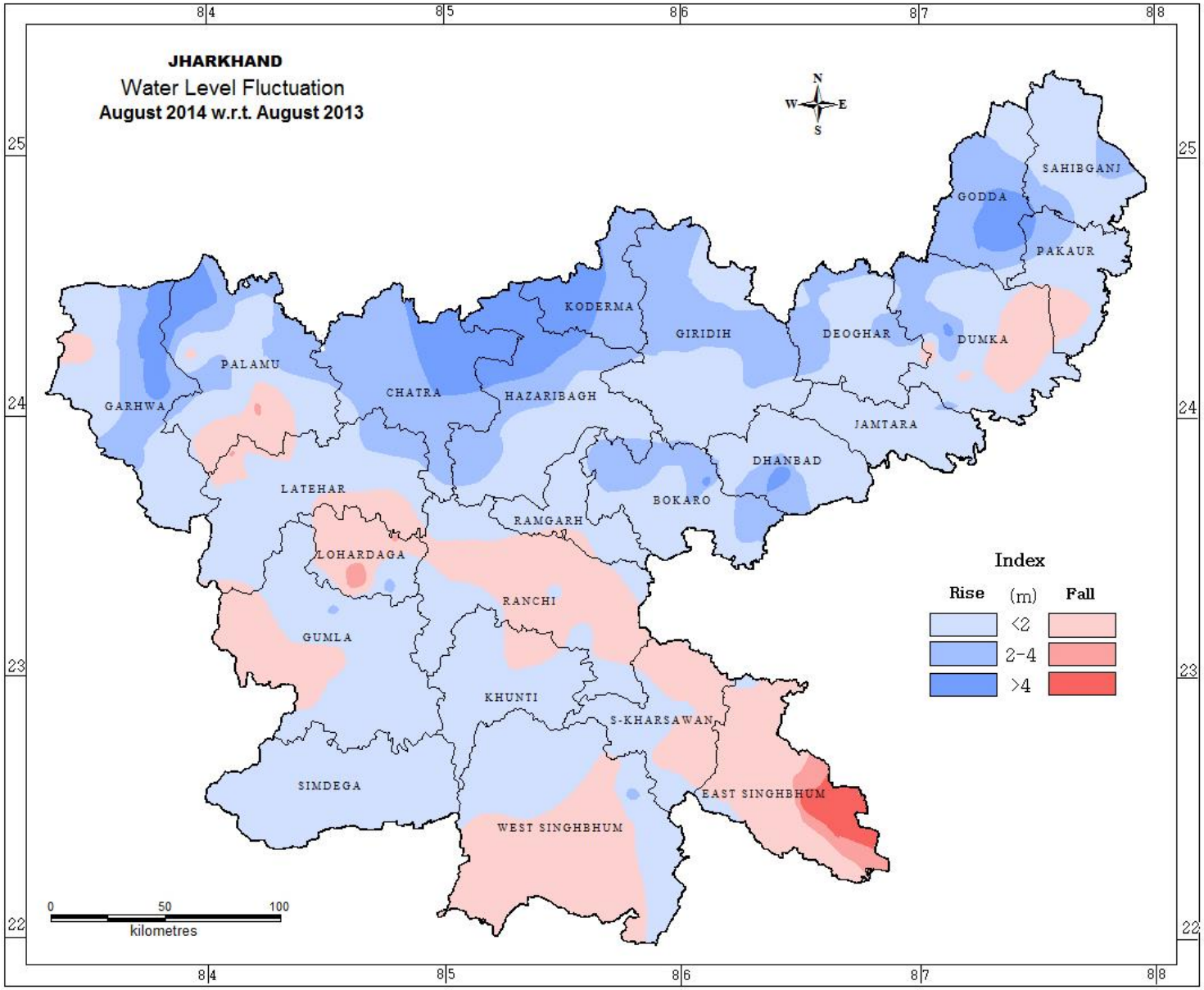

JHARKHAND
Water Level Fluctuation
August 2014 w.r.t. August 2013
N
W
E
S
SAHIBGANJ
GODDA
PAKAUR
KODERMA
GIRIDIH
DEOGHAR
DUMKA
PALAMU
GARHWA
CHATRA
HAZARIBAGH
JAMTARA
DHANBAD
LATEHAR
BOKARO
RAMGARH
LOHARDAGA
RANCHI
GUMLA
KHUNTI
S-KHARSAWAN
SIMDEGA
EAST SINGHBHUM
WEST SINGHBHUM
Index
Rise (m) Fall
<2
2-4
>4
0 50 100
kilometres
84 85 86 87 88
25 24 23 22

PLATE XI

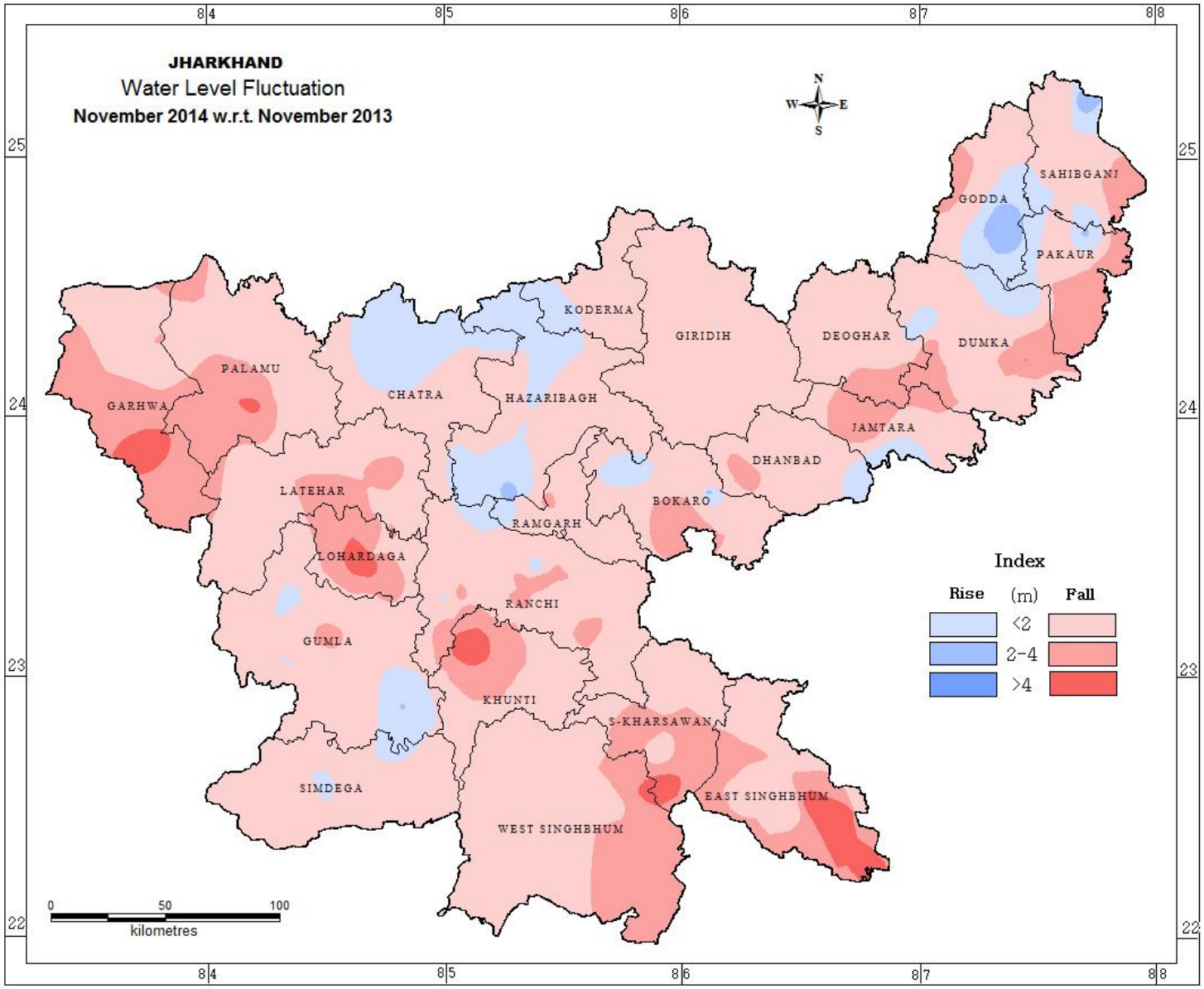

JHARKHAND
Water Level Fluctuation
November 2014 w.r.t. November 2013
N
W
E
S
SAHIBGANJ
GODDA
PAKAUR
KODERMA
GIRIDIH
DEOGHAR
DUMKA
PALAMU
GARHWA
CHATRA
HAZARIBAGH
JAMTARA
DHANBAD
LATEHAR
BOKARO
RAMGARH
LOHARDAGA
RANCHI
GUMLA
KHUNTI
S-KHARSAWAN
SIMDEGA
EAST SINGHBHUM
WEST SINGHBHUM
Index
Rise (m) Fall
<2
2-4
>4
0 50 100
kilometres
84 85 86 87 88
25 24 23 22

PLATE XII

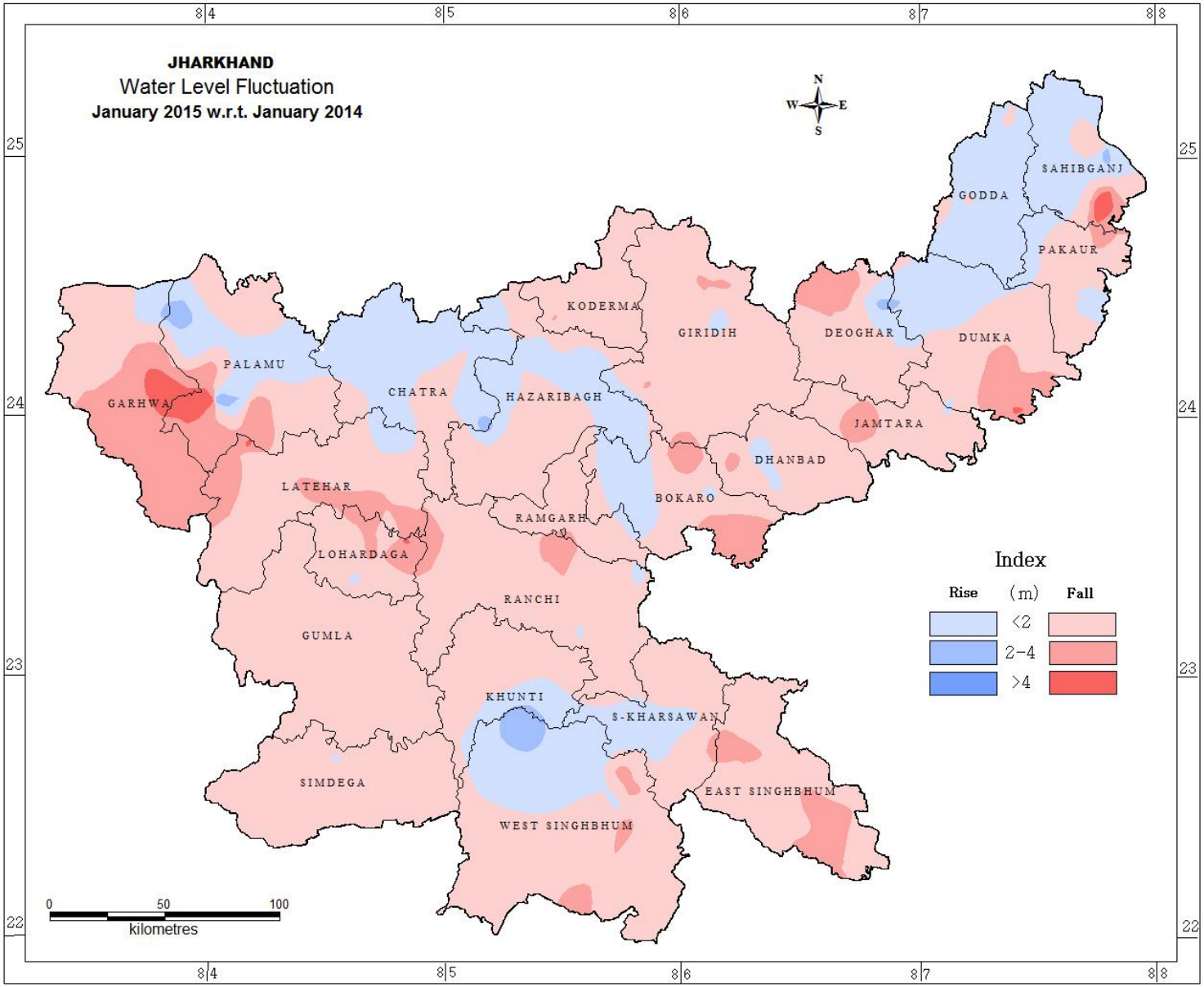

JHARKHAND
Water Level Fluctuation
January 2015 w.r.t. January 2014
N
W
E
S
84
85
86
87
88
25
24
23
22
SAHIBGANJ
GODDA
PAKAUR
KODERMA
GIRIDIH
DEOGHAR
DUMKA
PALAMU
GARHWA
CHATRA
HAZARIBAGH
JAMTARA
DHANBAD
LATEHAR
BOKARO
RAMGARH
LOHARDAGA
RANCHI
GUMLA
KHUNTI
S-KHARSAWAN
SIMDEGA
EAST SINGHBHUM
WEST SINGHBHUM
Index
Rise (m) Fall
<2
2-4
>4
0
50
100
kilometres

PLATE XIII

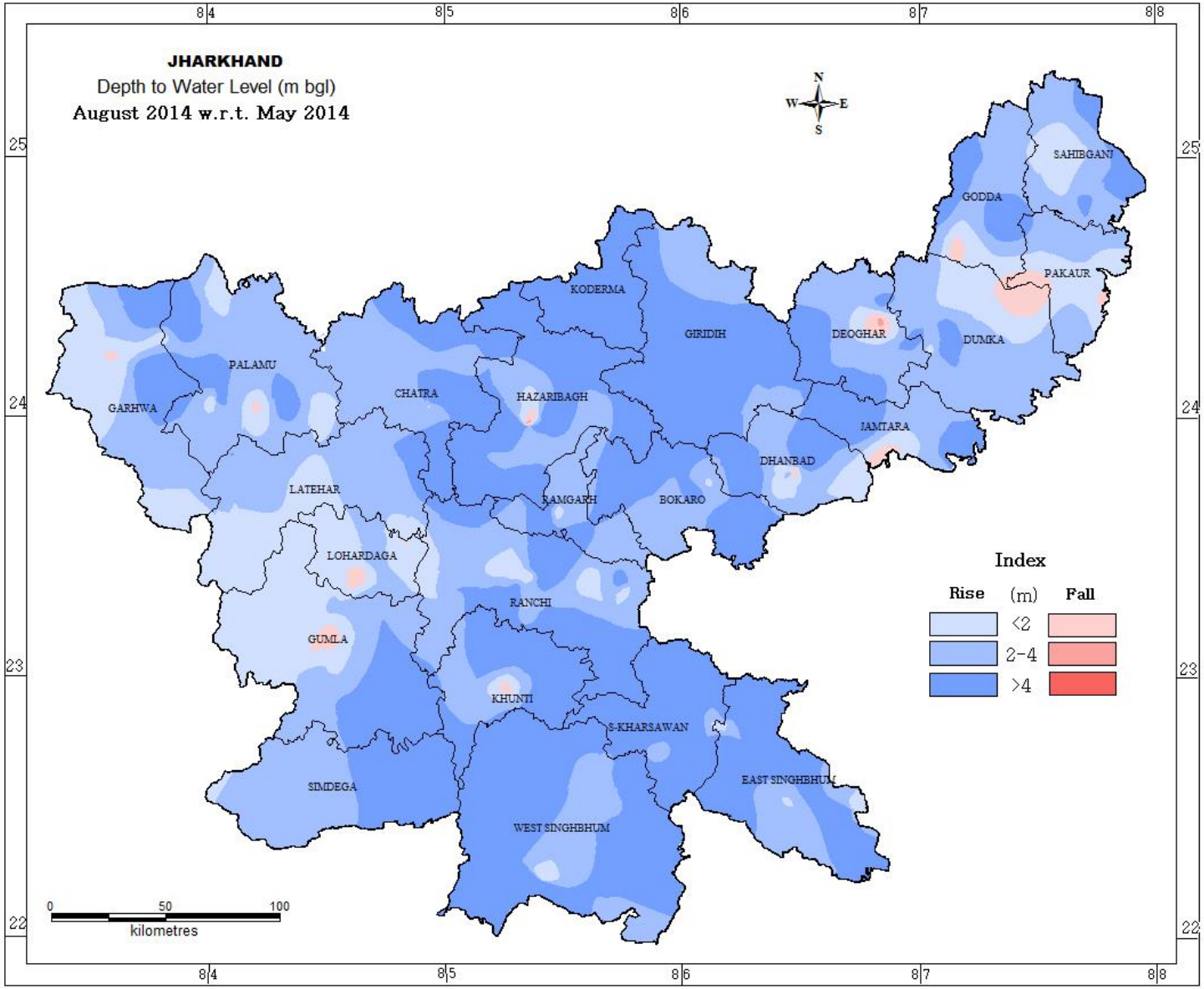

JHARKHAND
Depth to Water Level (m bgl)
August 2014 w.r.t. May 2014
N
W
E
S
SAHIBGANJ
GODDA
PAKAUR
DUMKA
DEOGHAR
GIRIDIH
KODERMA
PALAMU
GARHWA
CHATRA
HAZARIBAGH
JAMTARA
DHANBAD
LATEHAR
RAMGARH
BOKARO
LOHARDAGA
RANCHI
GUMLA
KHUNTI
S-KHARSAWAN
EAST SINGHBHUM
SIMDEGA
WEST SINGHBHUM
Index
Rise (m) Fall
<2
2-4
>4
0 50 100
kilometres
84
85
86
87
88
25
24
23
22

PLATE XIV

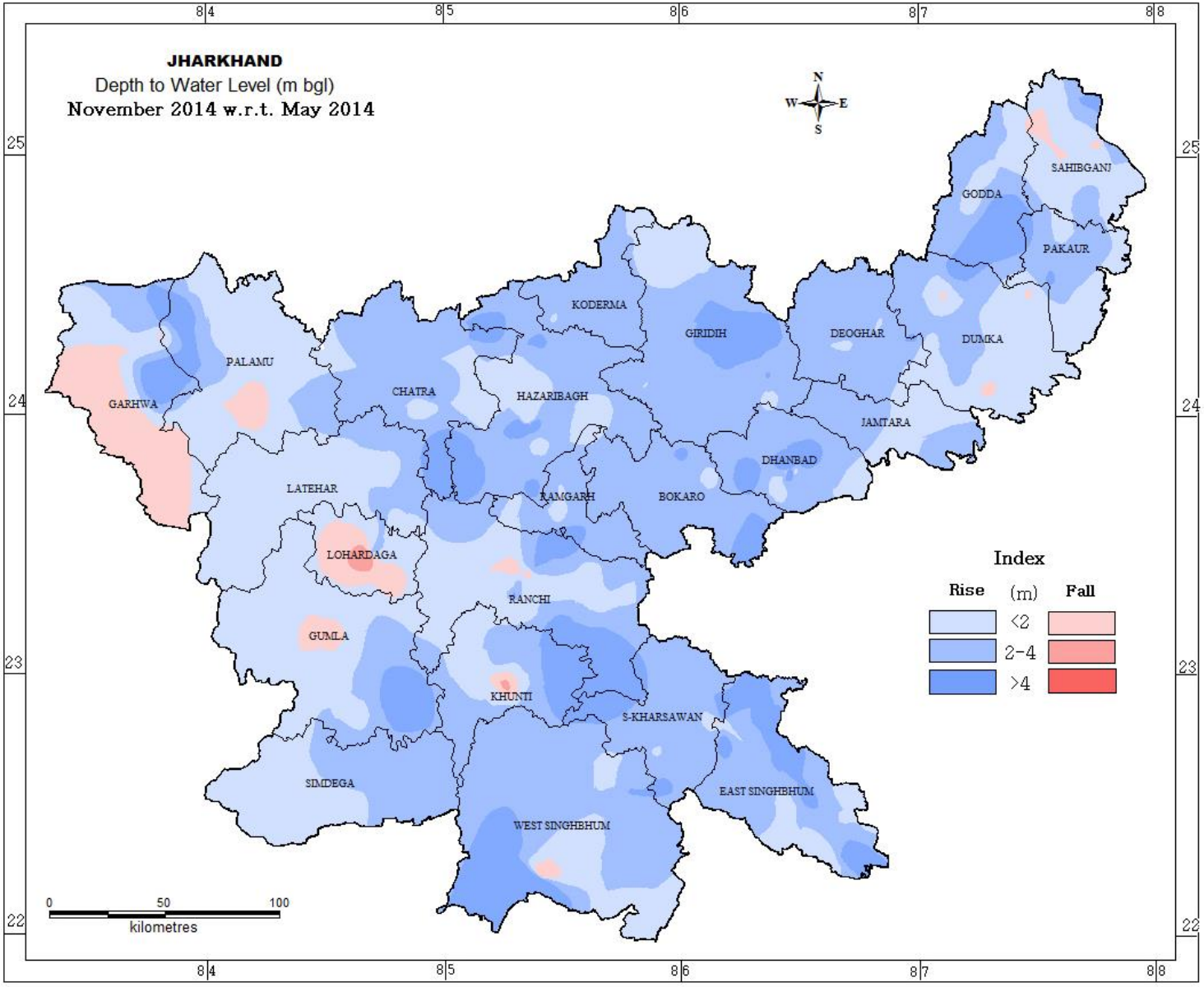

JHARKHAND
Depth to Water Level (m bgl)
November 2014 w.r.t. May 2014
N
W
E
S
SAHIBGANJ
GODDA
PAKAUR
KODERMA
GIRIDIH
DEOGHAR
DUMKA
PALAMU
GARHWA
CHATRA
HAZARIBAGH
JAMTARA
DHANBAD
LATEHAR
RAMGARH
BOKARO
LOHARDAGA
RANCHI
GUMLA
KHUNTI
S-KHARSAWAN
SIMDEGA
EAST SINGHBHUM
WEST SINGHBHUM
Index
Rise (m) Fall
<2
2-4
>4
0 50 100
kilometres
84 85 86 87 88
25 24 23 22

PLATE XV

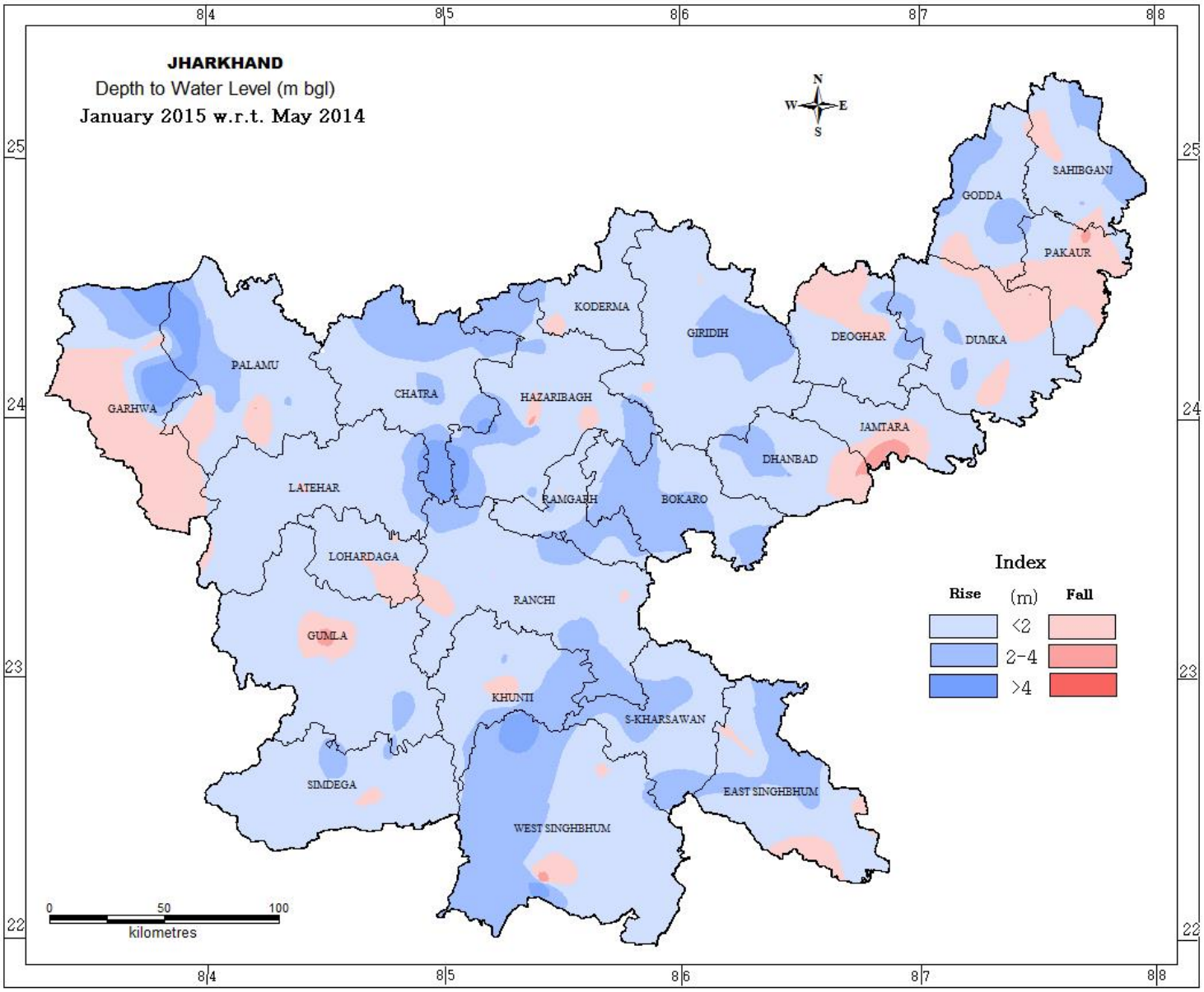

JHARKHAND
Depth to Water Level (m bgl)
January 2015 w.r.t. May 2014
N
W
E
S
84
85
86
87
88
25
24
23
22
SAHIBGANJ
GODDA
PAKAUR
KODERMA
GIRIDIH
DEOGHAR
DUMKA
PALAMU
CHATRA
HAZARIBAGH
GARHWA
JAMTARA
DHANBAD
LATEHAR
RAMGARH
BOKARO
LOHARDAGA
RANCHI
GUMLA
KHUNTI
S-KHARSAWAN
SIMDEGA
EAST SINGHBHUM
WEST SINGHBHUM
Index
Rise
(m)
Fall
<2
2-4
>4
0
50
100
kilometres

PLATE XVI

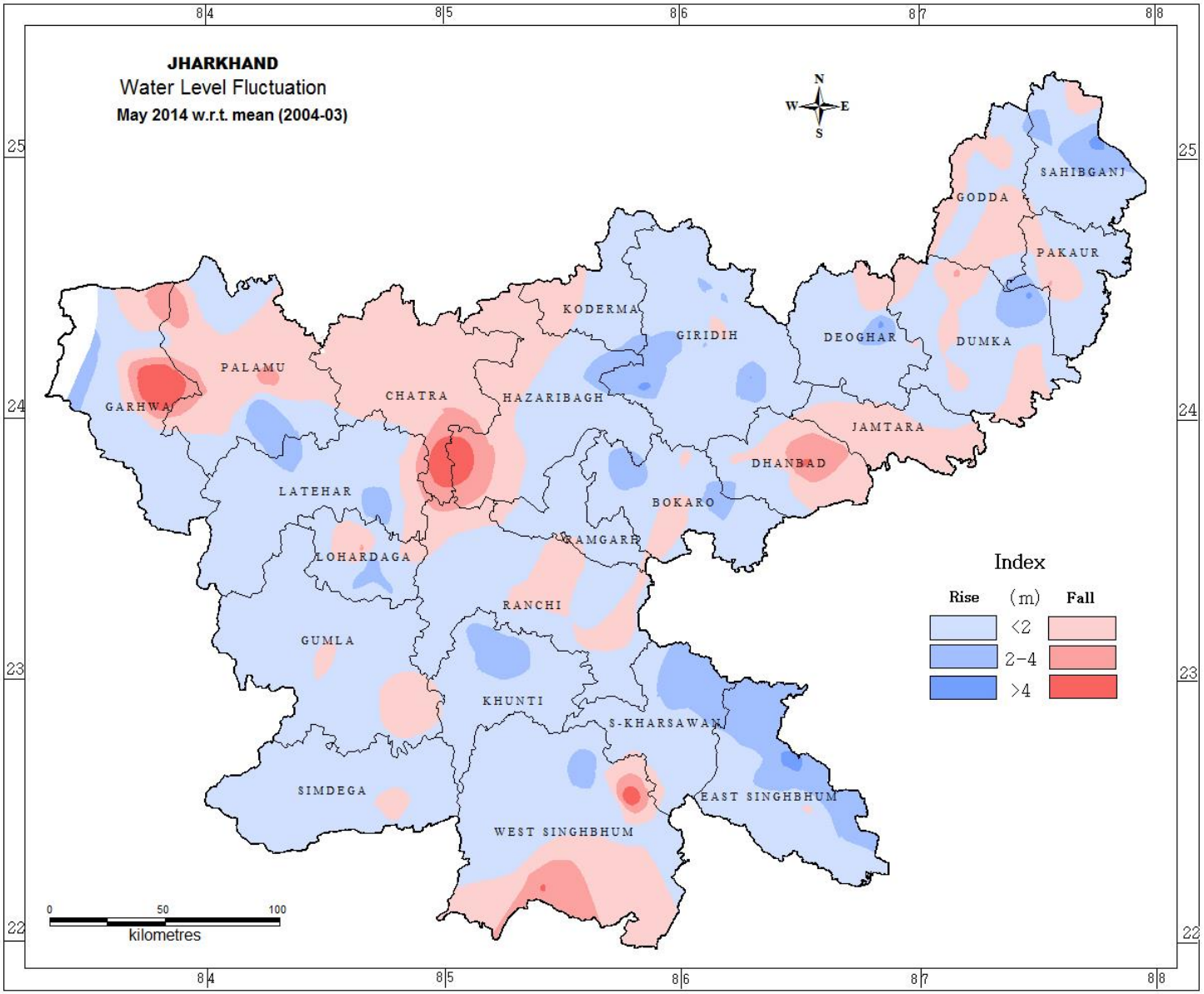

JHARKHAND
Water Level Fluctuation
May 2014 w.r.t. mean (2004-03)
N
W
E
S
SAHIBGANJ
GODDA
PAKAUR
KODERMA
GIRIDIH
DEOGHAR
DUMKA
PALAMU
GARHWA
CHATRA
HAZARIBAGH
JAMTARA
DHANBAD
LATEHAR
BOKARO
RAMGARH
LOHARDAGA
RANCHI
GUMLA
KHUNTI
S-KHARSAWAN
SIMDEGA
EAST SINGHBHUM
WEST SINGHBHUM
Index
Rise (m) Fall
<2
2-4
>4
0 50 100
kilometres
84 85 86 87 88
25 24 23 22

PLATE XVII

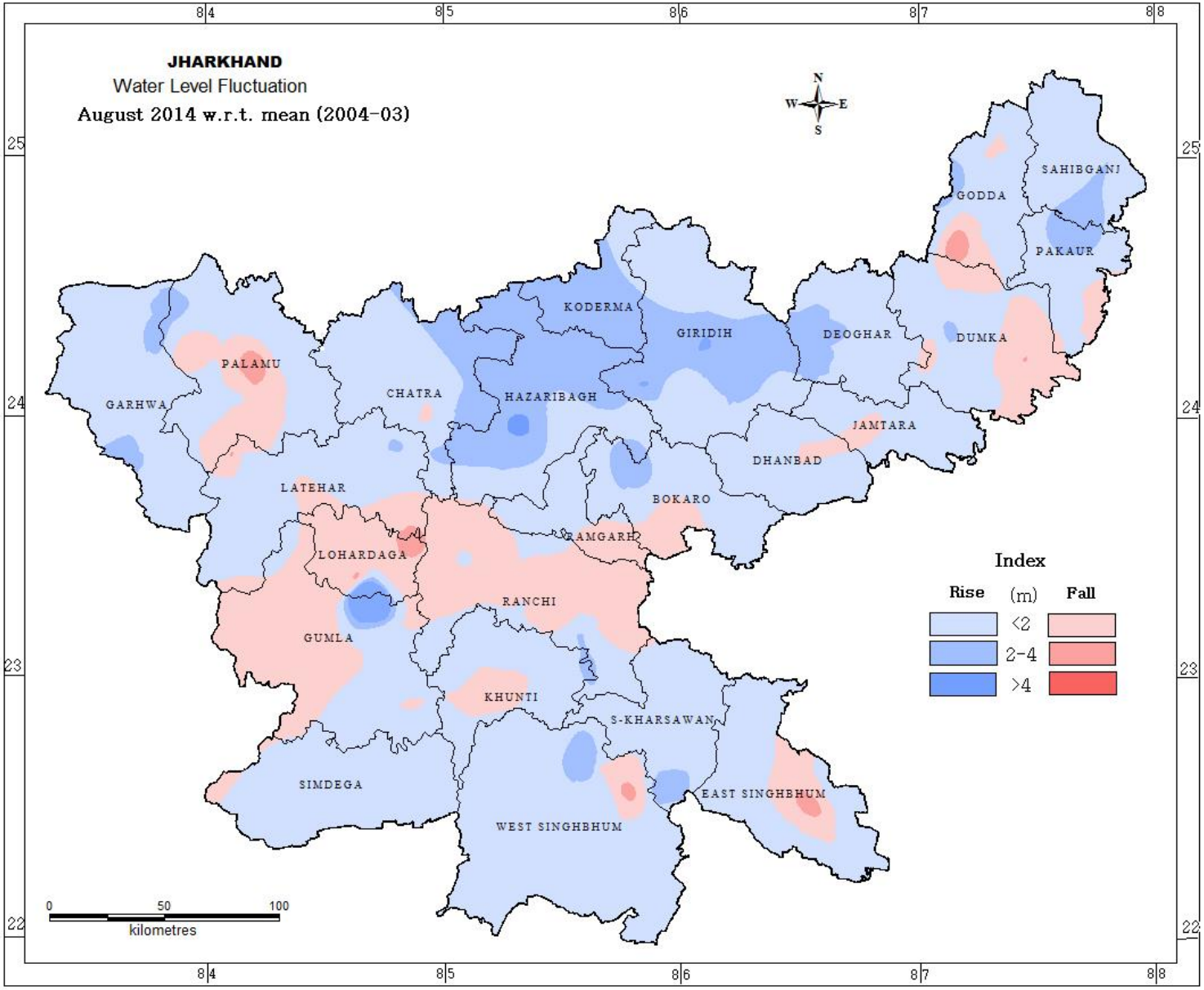

JHARKHAND
Water Level Fluctuation
August 2014 w.r.t. mean (2004-03)
N
W
E
S
SAHIBGANJ
GODDA
PAKAUR
KODERMA
GIRIDIH
DEOGHAR
DUMKA
PALAMU
GARHWA
CHATRA
HAZARIBAGH
JAMTARA
DHANBAD
LATEHAR
BOKARO
RAMGARH
LOHARDAGA
RANCHI
GUMLA
KHUNTI
S-KHARSAWAN
SIMDEGA
EAST SINGHBHUM
WEST SINGHBHUM
Index
Rise (m) Fall
<2
2-4
>4
0 50 100
kilometres
84 85 86 87 88
25 24 23 22

PLATE XVIII

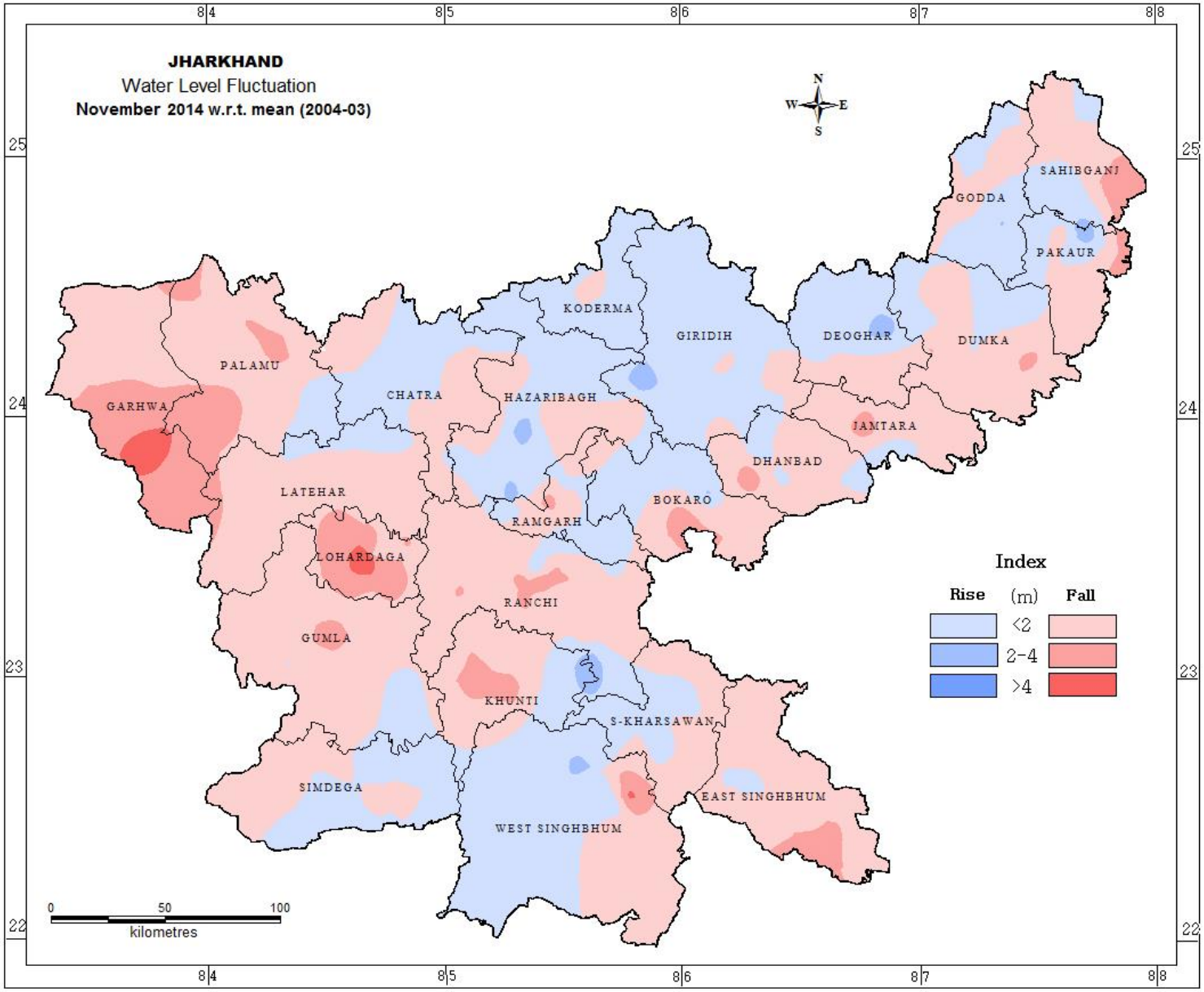

JHARKHAND
Water Level Fluctuation
November 2014 w.r.t. mean (2004-03)
N
W
E
S
84
85
86
87
88
25
24
23
22
SAHIBGANJ
GODDA
PAKAUR
KODERMA
GIRIDIH
DEOGHAR
DUMKA
PALAMU
CHATRA
HAZARIBAGH
GARHWA
JAMTARA
DHANBAD
LATEHAR
BOKARO
RAMGARH
LOHARDAGA
RANCHI
GUMLA
KHUNTI
S-KHARSAWAN
SIMDEGA
EAST SINGHBHUM
WEST SINGHBHUM
Index
Rise (m) Fall
<2
2-4
>4
0 50 100
kilometres

PLATE XIX

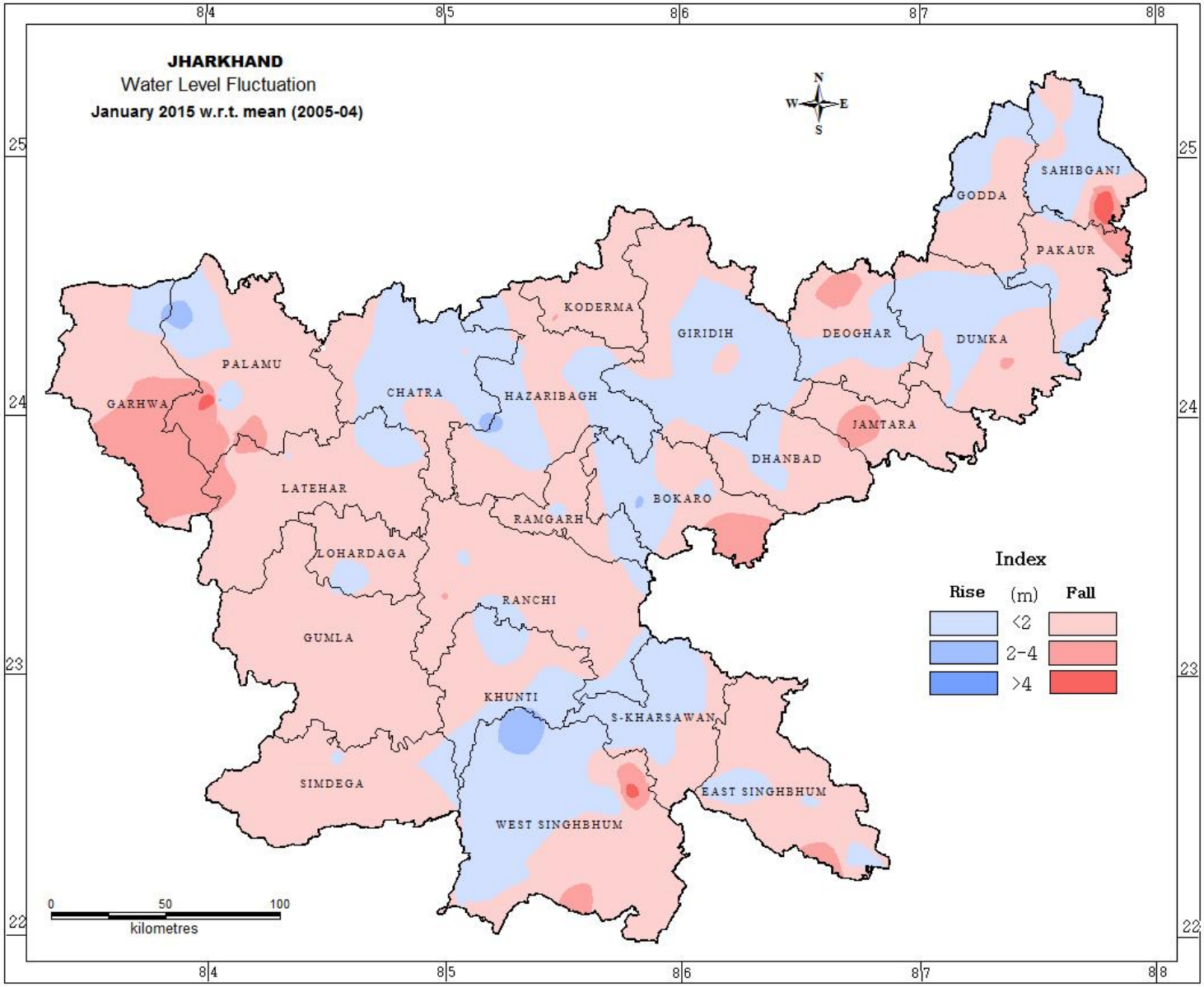

JHARKHAND
Water Level Fluctuation
January 2015 w.r.t. mean (2005-04)
N
W
E
S
SAHIBGANJ
GODDA
PAKAUR
KODERMA
GIRIDIH
DEOGHAR
DUMKA
PALAMU
GARHWA
CHATRA
HAZARIBAGH
JAMTARA
DHANBAD
LATEHAR
BOKARO
RAMGARH
LOHARDAGA
RANCHI
GUMLA
KHUNTI
S-KHARSAWAN
SIMDEGA
EAST SINGHBHUM
WEST SINGHBHUM
Index
Rise
(m)
Fall
<2
2-4
>4
0
50
100
kilometres
84
85
86
87
88
25
24
23
22

Table 3: Depth to Water Level - May 2014												
Sl No.	District	No. of wells analysed	Depth to water level (m bgl)		No./Percentage of wells Showing Depth to Water Level in the Range of							
					0 to 2		2 to 5		5 to 10		10 to 20	
			Min	Max	No	%	No	%	No	%	No	%
1	Bokaro	10	3.00	12.65	0	0	2	20	7	70	1	10
2	Chatra	8	6.78	13.90	0	0	0	0	4	50	4	50
3	Deoghar	7	5.96	9.37	0	0	0	0	7	100	0	0
4	Dhanbad	21	1.74	14.60	1	5	2	10	13	62	5	24
5	Dumka	18	2.36	10.60	0	0	3	17	14	78	1	6
6	Garhwa	5	3.15	16.50	0	0	1	20	3	60	1	20
7	Giridih	16	3.26	10.50	0	0	2	13	13	81	1	6
8	Godda	9	4.70	12.91	0	0	1	11	7	78	1	11
9	Gumla	21	1.15	8.17	1	5	4	19	16	76	0	0
10	Hazaribag	37	2.45	11.80	0	0	6	16	28	76	3	8
11	Kodarma	3	4.80	7.10	0	0	1	33	2	67	0	0
12	Lohardaga	7	4.57	10.96	0	0	1	14	5	71	1	14
13	Pakaur	5	4.96	8.16	0	0	1	20	4	80	0	0
14	Palamu	22	4.01	15.00	0	0	1	5	16	73	5	23
15	W. Singhbhum	22	0.10	12.20	1	5	4	18	15	68	2	9
16	E. Singhbhum	28	2.00	17.03	1	4	14	50	9	32	4	14
17	Ranchi	40	1.47	10.81	2	5	9	23	27	68	2	5
18	Sahibganj	11	2.49	9.26	0	0	4	36	7	64	0	0
	Total	**290**	**0.10**	**17.03**	**6**	**2**	**56**	**19**	**197**	**68**	**31**	**11**

Table 4: Depth to Water Level - August 2014														
Sl No.	District	No. of wells analysed	Depth to water level (m bgl)		No./Percentage of wells Showing Depth to Water Level in the Range of									
					0 to 2		2 to 5		5 to 10		10 to 20		20 to 40	
			Min	Max	No	%	No	%	No	%	No	%	No	%
1	Bokaro	13	0.60	9.45	7	54	4	31	2	15	0	0	0	0
2	Chatra	8	2.26	11.08	0	0	6	75	1	13	1	13	0	0
3	Deoghar	7	1.72	9.14	1	14	5	71	1	14	0	0	0	0
4	Dhanbad	22	0.96	11.45	3	14	7	32	8	36	4	18	0	0
5	Dumka	18	0.96	7.90	3	17	11	61	4	22	0	0	0	0
6	Garhwa	7	2.17	6.25	0	0	5	71	2	29	0	0	0	0
7	Giridih	13	0.65	5.58	9	69	3	23	1	8	0	0	0	0
8	Godda	10	1.35	9.10	4	40	2	20	4	40	0	0	0	0
9	Gumla	14	0.83	6.60	3	21	8	57	3	21	0	0	0	0
10	Hazaribag	38	0.50	9.96	10	26	19	50	9	24	0	0	0	0
11	Kodarma	3	0.50	2.17	2	67	1	33	0	0	0	0	0	0
12	Lohardaga	9	2.40	7.02	0	0	5	56	4	44	0	0	0	0
13	Pakaur	5	0.89	6.50	3	60	1	20	1	20	0	0	0	0
14	Palamu	25	1.44	10.70	2	8	15	60	7	28	1	4	0	0
15	W. Singhbhum	22	0.10	6.70	16	73	5	23	1	5	0	0	0	0
16	E. Singhbhum	27	0.85	8.93	13	48	10	37	4	15	0	0	0	0
17	Ranchi	59	0.95	9.04	13	22	34	58	11	17	1	2	0	2
18	Sahibganj	10	1.60	6.05	4	40	3	30	3	30	0	0	0	0
	Total	**310**	**0.10**	**11.45**	**93**	**30**	**144**	**46**	**66**	**21**	**7**	**2**	**0**	**0**

Table 5: Depth to Water Level - November 2014													
Sl. No.	District	No. of wells analysed	Depth to water level (m bgl)		No./Percentage of wells Showing Depth to Water Level in the Range of								
					0 to 2		2 to 5		5 to 10		10 to 20		
			Min	Max	No	%	No	%	No	%	No	%	
1	Bokaro	13	1.40	10.50	2	15	8	62	2	15	1	8	
2	Chatra	7	4.55	11.60	0	0	1	14	5	71	1	14	
3	Deoghar	6	3.77	5.50	0	0	5	83	1	17	0	0	
4	Dhanbad	22	1.05	10.03	2	9	12	55	7	32	1	5	
5	Dumka	18	2.67	6.65	0	0	9	50	9	50	0	0	
6	Garhwa	6	3.38	8.84	0	0	1	17	5	83	0	0	
7	Giridih	16	1.70	5.63	3	19	11	69	2	13	0	0	
8	Godda	10	2.51	7.28	0	0	6	60	4	40	0	0	
9	Gumla	23	0.80	6.99	3	13	14	61	6	26	0	0	
10	Hazaribag	39	0.97	9.30	5	13	25	64	9	23	0	0	
11	Kodarma	3	3.10	4.35	0	0	3	100	0	0	0	0	
12	Lohardaga	8	4.68	9.10	0	0	1	13	7	88	0	0	
13	Pakaur	6	2.35	8.60	0	0	4	67	2	33	0	0	
14	Palamu	20	2.70	9.69	0	0	4	20	16	80	0	0	
15	W. Singhbhum	22	1.13	8.12	3	14	15	68	4	18	0	0	
16	E. Singhbhum	27	1.20	15.03	3	11	17	63	6	22	1	4	
17	Ranchi	54	1.30	9.08	2	4	28	52	24	44	0	0	
18	Sahibganj	10	2.82	6.85	0	0	7	70	3	30	0	0	
	Total	**310**	**0.80**	**15.03**	**23**	**7**	**171**	**55**	**112**	**36**	**4**	**1**	

Table 6: Depth to Water Level - January 2015												
SN	District	No. of wells analysed	Depth to water level (m bgl)		No./Percentage of wells Showing Depth to Water Level in the Range of							
			Min	Max	0 to 2		2 to 5		5 to 10		10 to 20	
					No	%	No	%	No	%	No	%
1	Bokaro	12	2.50	7.75	0	0	7	58	5	42	0	0
2	Chatra	8	4.89	11.96	0	0	1	13	6	75	1	13
3	Deoghar	6	4.15	8.12	0	0	1	17	5	83	0	0
4	Dhanbad	18	0.79	10.72	2	11	9	50	5	28	2	11
5	Dumka	17	1.09	8.30	1	6	4	24	12	71	0	0
6	Garhwa	7	4.00	8.89	0	0	1	14	6	86	0	0
7	Giridih	15	3.23	8.01	0	0	6	40	9	60	0	0
8	Godda	10	2.95	9.39	0	0	5	50	5	50	0	0
9	Gumla	24	0.50	7.62	2	8	8	33	14	58	0	0
10	Hazaribag	35	1.16	10.60	2	6	13	37	19	54	1	3
11	Kodarma	3	5.25	6.55	0	0	0	0	3	100	0	0
12	Lohardaga	9	2.83	7.75	0	0	1	11	8	89	0	0
13	Pakaur	6	2.72	9.60	0	0	1	17	5	83	0	0
14	Palamu	26	2.97	13.00	0	0	7	27	17	65	2	8
15	W. Singhbhum	21	2.00	10.40	1	5	9	43	10	48	1	5
16	E. Singhbhum	26	1.20	15.48	2	8	12	46	10	38	2	8
17	Ranchi	38	2.14	9.95	0	0	16	42	22	58	0	0
18	Sahibganj	12	3.12	9.20	0	0	7	58	5	42	0	0
	Total	293	0.50	15.48	10	3	108	37	166	57	9	3

Table 7: District wise Water Level Fluctuation - May 2014 w.r.t. May 2013																				
SN	District	No. Of wells	Range in Fluctuation (m)				No. of Wells/Percentage Showing Fluctuation												Total No. of Wells	
			Rise		Fall		Rise						Fall							
							0 to 2		2 to 4		>4		0 to 2		2 to 4		>4		Rise	Fall
			Min	*Max*	*Min*	*Max*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	No.	No.
1	Bokaro	8	0.07	6.68	0.28	0.75	1	13	0	0	2	25	4	50	0	0	0	0	3	4
2	Chatra	3	0.85	0.85	5.75	5.75	1	33	0	0	0	0	0	0	0	0	1	33	1	1
3	Deoghar	6	0.15	5.58	0.03	0.5	2	33	0	0	1	17	3	50	0	0	0	0	3	3
4	Dhanbad	5	0.15	0.15	1.3	5.18	1	20	0	0	0	0	2	40	0	0	2	40	1	4
5	Dumka	15	0.24	2.33	0.04	2.3	5	33	2	13	0	0	7	47	1	7	0	0	7	8
6	Garhwa	4	1.02	1.64	5	5	3	75	0	0	0	0	0	0	0	0	1	25	3	1
7	Giridih	13	0.33	5.67	0.11	0.45	5	38	4	31	1	8	3	23	0	0	0	0	10	3
8	Godda	3	0.04	1.63	-	-	3	100	0	0	0	0	0	0	0	0	0	0	3	0
9	Gumla	12	0.49	2.68	0.14	1.82	4	33	2	17	0	0	5	42	0	0	0	0	6	5
10	Hazaribag	6	0.35	3.10	-	-	5	83	1	17	0	0	0	0	0	0	0	0	6	0
11	Lohardaga	5	0.41	3.20	-	-	4	80	1	20	0	0	0	0	0	0	0	0	5	0
12	Pakaur	3	1.19	1.71	0.26	0.26	2	67	0	0	0	0	1	33	0	0	0	0	2	1
13	Palamu	17	0.49	4.27	0.69	8.82	8	47	0	0	1	6	3	18	2	12	3	18	9	8
14	W. Singhbhum	14	0.13	1.95	0.15	1.45	10	71	0	0	0	0	3	21	0	0	0	0	10	3
15	E. Singhbhum	10	0.25	6.45	0.1	0.1	6	60	2	20	1	10	1	10	0	0	0	0	9	1
16	Ranchi	13	0.69	1.91	0.13	2.17	6	46	0	0	0	0	6	46	1	8	0	0	6	7
17	Sahibganj	6	1.52	3.61	2.14	2.14	2	33	3	50	0	0	0	0	1	17	0	0	5	1
	Total	**143**	**0.04**	**6.68**	**0.03**	**8.82**	**68**	**48**	**15**	**10**	**6**	**4**	**38**	**27**	**5**	**3**	**7**	**5**	**89**	**50**

Table8 : District wise Water Level Fluctuation - August 2014 w.r.t. August 2013																				
SN	District	No. Of wells	Range in Fluctuation (m)				No. of Wells/Percentage Showing Fluctuation												Total No. of Wells	
			Rise		Fall		Rise						Fall							
							0 to 2		2 to 4		>4		0 to 2		2 to 4		>4		Rise	Fall
			Min	Max	Min	Max	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
1	Bokaro	8	0.14	4.49	-	-	4	50	3	38	1	13	0	0	0	0	0	0	8	0
2	Chatra	3	2.02	3.91	-	-	0	0	3	100	0	0	0	0	0	0	0	0	3	0
3	Deoghar	6	0.88	2.66	-	-	3	50	3	50	0	0	0	0	0	0	0	0	6	0
4	Dhanbad	6	0.04	5.01	-	-	5	83	0	0	1	17	0	0	0	0	0	0	6	0
5	Dumka	14	0.2	4.54	0.15	1.81	4	29	4	29	1	7	4	29	0	0	0	0	9	4
6	Garhwa	6	0.85	5.73	0.25	0.25	2	33	1	17	2	33	1	17	0	0	0	0	5	1
7	Giridih	9	0.75	3.84	-	-	5	56	4	44	0	0	0	0	0	0	0	0	9	0
8	Godda	7	0.48	6.33	-	-	2	29	4	57	1	14	0	0	0	0	0	0	7	0
9	Gumla	10	0.04	2.2	0.5	0.74	6	60	1	10	0	0	3	30	0	0	0	0	7	3
10	Hazaribag	6	0.31	5.54	-	-	5	83	0	0	1	17	0	0	0	0	0	0	6	0
11	Lohardaga	5	2.34	2.34	0.32	3.7	0	0	1	20	0	0	2	40	2	40	0	0	1	4
12	Pakaur	5	0.18	1.8	0.9	0.9	4	80	0	0	0	0	1	20	0	0	0	0	4	1
13	Palamu	20	0.2	5.45	0.07	2.21	10	50	3	15	2	10	3	15	2	10	0	0	15	5
14	W. Singhbhum	14	0.05	2.4	0.35	1.45	6	43	1	7	0	0	7	50	0	0	0	0	7	7
15	E. Singhbhum	11	-	-	0.18	6.32	0	0	0	0	0	0	9	82	0	0	2	18	0	11
16	Ranchi	14	0.05	1.37	0.2	1.95	8	57	0	0	0	0	6	43	0	0	0	0	8	6
17	Sahibganj	4	0.22	2.25	-	-	3	75	1	25	0	0	0	0	0	0	0	0	4	0
	Total	**148**	**0.04**	**6.33**	**0.07**	**6.32**	**67**	**45**	**29**	**20**	**9**	**6**	**36**	**24**	**4**	**3**	**2**	**1**	**105**	**42**

Table 9 : District wise Water Level Fluctuation - November 2014 w.r.t. November 2013																				
SN	District	No. Of wells	Range in Fluctuation (m)				No. of Wells/Percentage Showing Fluctuation												Total No. of Wells	
			Rise		Fall		Rise						Fall							
							0 to 2		2 to 4		>4		0 to 2		2 to 4		>4		Rise	Fall
			Min	Max	Min	Max	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
1	Bokaro	11	0.61	2.64	0.26	3.27	1	9	1	9	0	0	7	64	2	18	0	0	2	9
2	Chatra	7	0.49	0.68	0.35	1.65	2	29	0	0	0	0	5	71	0	0	0	0	2	5
3	Deoghar	6	0.03	0.06	1.01	1.82	2	33	0	0	0	0	4	67	0	0	0	0	2	4
4	Dhanbad	11	-	-	0.15	3.15	0	0	0	0	0	0	9	82	2	18	0	0	0	11
5	Dumka	15	0.71	1.42	0.46	4.07	3	20	0	0	0	0	7	47	4	27	1	7	3	12
6	Garhwa	6	-	-	0.95	4.3	0	0	0	0	0	0	3	50	2	33	1	17	0	6
7	Giridih	15	0.06	0.06	0.22	1.79	1	7	0	0	0	0	14	93	0	0	0	0	1	14
8	Godda	7	3.43	3.43	0.22	2.49	0	0	1	14	0	0	5	71	1	14	0	0	1	6
9	Gumla	22	0.05	2.1	0.04	3.02	3	14	1	5	0	0	17	77	1	5	0	0	4	18
10	Hazaribag	18	0.07	2.82	0.05	3.1	4	22	1	6	0	0	11	61	1	6	0	0	5	12
11	Kodarma	2	1.25	1.25	0.32	0.32	1	50	0	0	0	0	1	50	0	0	0	0	1	1
12	Lohardaga	6	-	-	1.43	6.2	0	0	0	0	0	0	3	50	2	33	1	17	0	6
13	Pakaur	6	2.38	2.38	1.18	3.68	0	0	1	17	0	0	2	33	3	50	0	0	1	5
14	Palamu	18	0.08	0.08	0.43	4.26	1	6	0	0	0	0	11	61	5	28	1	6	1	17
15	W. Singhbhum	15	-	-	0.5	5.35	0	0	0	0	0	0	6	40	8	53	1	7	0	15
16	E. Singhbhum	14	0.45	0.45	0.32	11.61	1	7	0	0	0	0	5	36	5	36	3	21	1	13
17	Ranchi	38	0.15	0.55	0.12	6.5	2	5	0	0	0	0	23	61	12	32	1	3	2	36
18	Sahibganj	7	0.16	2.83	0.5	3.69	1	14	1	14	0	0	4	57	1	14	0	0	2	5
	Total	**224**	**0.03**	**3.43**	**0.04**	**11.61**	**22**	**10**	**6**	**3**	**0**	**0**	**137**	**61**	**49**	**22**	**9**	**4**	**28**	**195**

Table 10: District wise Water Level Fluctuation - January 2015 w.r.t. January 2014																				
SN	District	No. Of wells	Range in Fluctuation (m)				No. of Wells/Percentage Showing Fluctuation												Total No. of Wells	
			Rise		Fall		Rise						Fall							
							0 to 2		2 to 4		>4		0 to 2		2 to 4		>4		Rise	Fall
			Min	Max	Min	Max	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
1	Bokaro	10	1	1.94	0.75	3.25	3	30	0	0	0	0	4	40	3	30	0	0	3	7
2	Chatra	7	0.03	2.57	0.02	1.4	3	43	1	14	0	0	3	43	0	0	0	0	4	3
3	Deoghar	6	0.27	2.52	0.81	2.68	2	33	1	17	0	0	2	33	1	17	0	0	3	3
4	Dhanbad	9	0.21	0.77	0.37	2.66	2	22	0	0	0	0	6	67	1	11	0	0	2	7
5	Dumka	16	0.02	0.86	0.04	4.11	4	25	0	0	0	0	8	50	3	19	1	6	4	12
6	Garhwa	6	-	-	1.35	4.87	0	0	0	0	0	0	4	67	1	17	1	17	0	6
7	Giridih	13	0.35	0.41	0.19	2.63	2	15	0	0	0	0	8	62	3	23	0	0	2	11
8	Godda	10	0.05	1.5	0.1	0.27	8	80	0	0	0	0	2	20	0	0	0	0	8	2
9	Gumla	20	0.15	0.15	0.17	1.87	1	5	0	0	0	0	19	95	0	0	0	0	1	19
10	Hazaribag	21	0.05	0.7	0.13	2.05	3	14	0	0	0	0	16	76	1	5	0	0	3	17
11	Kodarma	3	-	-	0.65	2.15	0	0	0	0	0	0	2	67	1	33	0	0	0	3
12	Lohardaga	6	0.2	0.2	1.1	4.24	1	17	0	0	0	0	3	50	1	17	1	17	1	5
13	Pakaur	5	0.31	0.31	0.08	1.2	1	20	0	0	0	0	4	80	0	0	0	0	1	4
14	Palamu	22	0.31	4.03	0.26	4.6	6	27	1	5	1	5	7	32	5	23	2	9	8	14
15	W. Singhbhum	20	0.15	2.88	0.26	3.85	6	30	1	5	0	0	9	45	4	20	0	0	7	13
16	E. Singhbhum	12	-	-	0.3	3.73	0	0	0	0	0	0	7	58	5	42	0	0	0	12
17	Ranchi	22	0.16	0.35	0.11	3.34	2	9	0	0	0	0	19	86	1	5	0	0	2	20
18	Sahibganj	9	0.41	3.26	0.17	6.9	4	44	1	11	0	0	2	22	0	0	1	11	5	3
	Total	**217**	**0.02**	**4.03**	**0.02**	**6.90**	**48**	**22**	**5**	**2**	**1**	**0**	**125**	**58**	**30**	**14**	**6**	**3**	**54**	**161**

Table 11: District wise Water Level Fluctuation - May 2014 to August 2014																				
SN	District	No. Of wells	Range in Fluctuation (m)				No. of Wells/Percentage Showing Fluctuation												Total No. of Wells	
			Rise		Fall		Rise						Fall							
							0 to 2		2 to 4		>4		0 to 2		2 to 4		>4		Rise	Fall
			Min	Max	Min	Max	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
1	Bokaro	10	1.6	6.2	-	-	1	10	5	50	4	40	0	0	0	0	0	0	10	0
2	Chatra	8	1.87	10.31	-	-	1	13	2	25	5	63	0	0	0	0	0	0	8	0
3	Deoghar	7	3.01	5.1	2.67	2.67	0	0	3	43	3	43	0	0	1	14	0	0	6	1
4	Dhanbad	21	0.6	6.83	0.2	2.05	4	19	5	24	6	29	5	24	1	5	0	0	15	6
5	Dumka	17	1.11	5.34	0.99	1.64	2	12	9	53	4	24	2	12	0	0	0	0	15	2
6	Garhwa	5	0.7	11.57	0.39	0.39	2	40	1	20	1	20	1	20	0	0	0	0	4	1
7	Giridih	13	2.63	7.62	-	-	0	0	2	15	11	85	0	0	0	0	0	0	13	0
8	Godda	9	2.68	6.05	0.69	0.69	0	0	5	56	3	33	1	11	0	0	0	0	8	1
9	Gumla	13	0.32	6.26	1.88	1.88	3	23	5	38	4	31	1	8	0	0	0	0	12	1
10	Hazaribag	36	1.3	8.56	2.22	2.53	4	11	12	33	18	50	0	0	2	6	0	0	34	2
11	Kodarma	3	4.3	5.05	-	-	0	0	0	0	3	100	0	0	0	0	0	0	3	0
12	Lohardaga	6	1.43	2.97	0.16	1.43	1	17	3	50	0	0	2	33	0	0	0	0	4	2
13	Pakaur	3	3.71	3.71	0.23	0.23	0	0	2	67	0	0	1	33	0	0	0	0	2	1
14	Palamu	20	1.11	10.15	0.67	0.67	4	20	8	40	7	35	1	5	0	0	0	0	19	1
15	W. Singhbhum	22	1.97	9.32	-	-	1	5	5	23	15	68	0	0	0	0	0	0	21	0
16	E. Singhbhum	27	0.1	11.13	-	-	10	37	7	26	10	37	0	0	0	0	0	0	27	0
17	Ranchi	35	0.07	9.75	0.44	0.91	6	17	13	37	14	40	2	6	0	0	0	0	33	2
18	Sahibganj	10	0.47	5.28	-	-	2	20	4	40	4	40	0	0	0	0	0	0	10	0
	Total	**265**	**0.07**	**11.57**	**0.16**	**2.67**	**41**	**15**	**91**	**34**	**112**	**42**	**16**	**6**	**4**	**2**	**0**	**0**	**244**	**20**

Table 12: District wise Water Level Fluctuation - November 2014 w.r.t May 2014																				
S N	District	No. of wells	Range in Fluctuation (m)				No. of Wells/Percentage Showing Fluctuation												Total No. of Wells	
			Rise		Fall		Rise						Fall							
							0 to 2		2 to 4		>4		0 to 2		2 to 4		>4		Rise	Fall
			Min	Max	Min	Max	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
1	Bokaro	10	1.05	4.3	-	-	1	10	7	70	2	20	0	0	0	0	0	0	10	0
2	Chatra	7	1.35	4.7	-	-	4	57	1	14	2	29	0	0	0	0	0	0	7	0
3	Deoghar	6	1.8	4.38	-	-	2	33	3	50	1	17	0	0	0	0	0	0	6	0
4	Dhanbad	21	0.69	7.2	-	-	4	19	7	33	10	48	0	0	0	0	0	0	21	0
5	Dumka	18	0.45	5.23	0.16	0.44	6	33	8	44	1	6	3	17	0	0	0	0	15	3
6	Garhwa	5	7.66	7.66	0.05	1.32	0	0	0	0	1	20	4	80	0	0	0	0	1	4
7	Giridih	16	1.26	5.37	-	-	3	19	8	50	5	31	0	0	0	0	0	0	16	0
8	Godda	9	0.05	7.36	-	-	4	44	3	33	2	22	0	0	0	0	0	0	9	0
9	Gumla	20	0.3	6.06	2.2	2.2	11	55	7	35	1	5	0	0	1	5	0	0	19	1
10	Hazaribag	35	0.25	8.25	0.32	0.32	9	26	15	43	10	29	1	3	0	0	0	0	34	1
11	Kodarma	3	1.7	3.45	-	-	1	33	2	67	0	0	0	0	0	0	0	0	3	0
12	Lohardaga	5	0.66	2.67	1.11	3.73	2	40	1	20	0	0	1	20	1	20	0	0	3	2
13	Pakaur	4	1.35	4.4	-	-	2	50	1	25	1	25	0	0	0	0	0	0	4	0
14	Palamu	19	0.07	7.73	1.26	1.26	11	58	5	26	2	11	1	5	0	0	0	0	18	1
15	W. Singhbhum	22	0.27	4.55	2.25	2.25	4	18	14	64	3	14	0	0	1	5	0	0	21	1
16	E. Singhbhum	27	0.1	6.18	0.1	0.4	11	41	7	26	5	19	3	11	0	0	0	0	23	3
17	Ranchi	36	0.22	8.85	0.14	2.81	20	56	6	17	6	17	3	8	1	3	0	0	32	4
18	Sahibganj	10	0.1	4.21	0.03	0.63	4	40	1	10	2	20	3	30	0	0	0	0	7	3
	Total	**273**	**0.05**	**8.85**	**0.03**	**3.73**	**99**	**36**	**96**	**35**	**54**	**20**	**19**	**7**	**4**	**1**	**0**	**0**	**249**	**23**

Table 13: District wise Water Level Fluctuation - January 2015 w.r.t. May 2014																				
Sl No.	District	No. of wells	Range in Fluctuation (m)				No. of Wells/Percentage Showing Fluctuation												Total No. of Wells	
			Rise		Fall		Rise						Fall							
							0 to 2		2 to 4		>4		0 to 2		2 to 4		>4		Rise	Fall
			Min	Max	Min	Max	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
1	BOKARO	9	0.5	3.9	-	-	5	56	4	44	0	0	0	0	0	0	0	0	9	0
2	CHATRA	8	0.84	8.04	-	-	4	50	1	13	3	38	0	0	0	0	0	0	8	0
3	DEOGHAR	6	1.28	3.92	1.32	1.65	2	33	2	33	0	0	2	33	0	0	0	0	4	2
4	DHANBAD	17	0.05	6.3	-	-	9	53	7	41	1	6	0	0	0	0	0	0	17	0
5	DUMKA	16	0.12	2.61	0.14	3.55	10	63	2	13	0	0	2	13	2	13	0	0	12	4
6	GARHWA	5	7.61	7.61	0.04	1.46	0	0	0	0	1	20	4	80	0	0	0	0	1	4
7	GIRIDIH	14	0.03	3.57	0.11	1.54	6	43	6	43	0	0	2	14	0	0	0	0	12	2
8	GODDA	9	0.43	3.52	0.79	0.79	4	44	4	44	0	0	1	11	0	0	0	0	8	1
9	GUMLA	21	0.05	3.12	0.2	2.9	16	76	3	14	0	0	1	5	1	5	0	0	19	2
10	HAZARIBAG	30	0.17	5.94	0.12	3.6	18	60	7	23	1	3	3	10	1	3	0	0	26	4
11	KODARMA	3	1.45	1.8	1.75	1.75	2	67	0	0	0	0	1	33	0	0	0	0	2	1
12	LOHARDAGA	6	0.67	1.74	0.15	0.96	3	50	0	0	0	0	3	50	0	0	0	0	3	3
13	PAKAUR	4	0.53	0.74	0.52	2.44	2	50	0	0	0	0	1	25	1	25	0	0	2	2
14	PALAMU	21	0.08	10.43	0.02	2.13	12	57	4	19	2	10	2	10	1	5	0	0	18	3
15	W. SINGHBHUM	20	0.24	4.93	0.23	3.5	12	60	5	25	1	5	1	5	1	5	0	0	18	2
16	E. SINGHBHUM	24	0.3	3.8	0.1	1.47	13	54	3	13	0	0	7	29	0	0	0	0	16	7
17	RANCHI	21	0.5	3.77	0.02	2.1	12	57	5	24	0	0	3	14	1	5	0	0	17	4
18	SAHIBGANJ	11	0.06	3.85	0.1	0.68	6	55	3	27	0	0	2	18	0	0	0	0	9	2
	Total	**245**	**0.03**	**10.43**	**0.02**	**3.60**	**136**	**56**	**56**	**23**	**9**	**4**	**35**	**14**	**8**	**3**	**0**	**0**	**201**	**43**

Table 14: District wise Water Level Fluctuation – May 2014 w.r.t. Mean (May 2004 to May 2013)																				
SN	District	No. of wells	Range in Fluctuation (m)				No. of Wells/Percentage Showing Fluctuation												Total No. of Wells	
			Rise		Fall		Rise						Fall							
							0 to 2		2 to 4		>4		0 to 2		2 to 4		>4		Rise	Fall
			Min	Max	Min	Max	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
1	Bokaro	8	0.09	3.62	0.1	0.63	3	38	3	38	0	0	2	25	0	0	0	0	6	2
2	Chatra	3	-	-	0.54	5.9	0	0	0	0	0	0	2	67	0	0	1	33	0	3
3	Deoghar	6	0.81	4.34	0.13	0.28	3	50	0	0	1	17	2	33	0	0	0	0	4	2
4	Dhanbad	5	0.46	0.72	0.16	4.36	2	40	0	0	0	0	2	40	0	0	1	20	2	3
5	Dumka	17	0.1	4.21	0.01	2.25	8	47	0	0	1	6	7	41	1	6	0	0	9	8
6	Garhwa	4	1.1	2.52	8.13	8.13	2	50	1	25	0	0	0	0	0	0	1	25	3	1
7	Giridih	13	0.03	4.43	0.65	0.65	7	54	3	23	2	15	1	8	0	0	0	0	12	1
8	Godda	8	0.71	0.96	0.55	1.58	4	50	0	0	0	0	4	50	0	0	0	0	4	4
9	Gumla	14	0.36	1.81	0.21	1.56	11	79	0	0	0	0	3	21	0	0	0	0	11	3
10	Hazaribag	6	0.38	2.04	0.49	0.49	4	67	1	17	0	0	1	17	0	0	0	0	5	1
11	Lohardaga	6	1.5	2.43	0.99	2.23	1	17	3	50	0	0	1	17	1	17	0	0	4	2
12	Pakaur	5	0.58	1.9	2.17	2.17	4	80	0	0	0	0	0	0	1	20	0	0	4	1
13	Palamu	19	0.11	3.8	0.09	3.5	7	37	3	16	0	0	7	37	2	11	0	0	10	9
14	W. Singhbhum	14	0.23	3.11	0.11	5.64	10	71	2	14	0	0	1	7	0	0	1	7	12	2
15	E. Singhbhum	11	0.28	6.11	0.33	0.33	8	73	0	0	2	18	1	9	0	0	0	0	10	1
16	Ranchi	15	0.33	3.68	0.01	1.16	6	40	1	7	0	0	8	53	0	0	0	0	7	8
17	Sahibganj	6	0.05	5.17	1.33	1.33	2	33	2	33	1	17	1	17	0	0	0	0	5	1
	Total	**160**	**0.03**	**6.11**	**0.01**	**8.13**	**82**	**51**	**19**	**12**	**7**	**4**	**43**	**27**	**5**	**3**	**4**	**3**	**108**	**52**

Table 15: District wise Water Level Fluctuation - August 2014 w.r.t. Mean (Aug 2004 to Aug 2013)																				
Sl No.	District	No. of wells	Range in Fluctuation (m)				No. of Wells/Percentage Showing Fluctuation												Total No. of Wells	
			Rise		Fall		Rise						Fall							
							0 to 2		2 to 4		>4		0 to 2		2 to 4		>4		Rise	Fall
			Min	Max	Min	Max	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
1	Bokaro	8	0.46	2.83	1.87	1.87	6	75	1	13	0	0	1	13	0	0	0	0	7	1
2	Chatra	3	1.59	2.36	0.94	0.94	1	33	1	33	0	0	1	33	0	0	0	0	2	1
3	Deoghar	6	0.21	3.53	-	-	5	83	1	17	0	0	0	0	0	0	0	0	6	0
4	Dhanbad	6	0.23	1.71	0.12	0.12	5	83	0	0	0	0	1	17	0	0	0	0	5	1
5	Dumka	17	0.06	2.38	0.12	2.09	10	59	1	6	0	0	5	29	1	6	0	0	11	6
6	Garhwa	6	0.55	2.46	0	0	3	50	2	33	0	0	1	17	0	0	0	0	5	1
7	Giridih	10	0.82	4.61	-	-	4	40	4	40	2	20	0	0	0	0	0	0	10	0
8	Godda	9	0.74	2.43	0.11	3.38	5	56	1	11	0	0	1	11	2	22	0	0	6	3
9	Gumla	11	0.13	20.66	0.02	0.86	3	27	0	0	1	9	7	64	0	0	0	0	4	7
10	Hazaribag	7	0.2	4.36	1.19	1.19	3	43	2	29	1	14	1	14	0	0	0	0	6	1
11	Lohardaga	5	0.17	0.17	0.01	2.72	1	20	0	0	0	0	1	20	3	60	0	0	1	4
12	Pakaur	5	0.25	2.84	0.87	0.87	3	60	1	20	0	0	1	20	0	0	0	0	4	1
13	Palamu	21	0.1	2.51	0.14	3.57	13	62	2	10	0	0	3	14	3	14	0	0	15	6
14	W. Singhbhum	14	0.19	3.35	0.04	2.8	9	64	2	14	0	0	2	14	1	7	0	0	11	3
15	E. Singhbhum	11	0.2	1.39	0.18	3.31	7	64	0	0	0	0	3	27	1	9	0	0	7	4
16	Ranchi	18	0.22	2.21	0.1	1.79	5	28	2	11	0	0	10	56	0	0	0	0	7	10
17	Sahibganj	5	0.27	1.99	-	-	5	100	0	0	0	0	0	0	0	0	0	0	5	0
	Total	**162**	**0.06**	**20.66**	**0**	**3.57**	**88**	**54**	**20**	**12**	**4**	**2**	**38**	**23**	**11**	**7**	**0**	**0**	**112**	**49**

Table 16: District wise Water Level Fluctuation - November 2014 w.r.t. Mean (Nov 2004 to Nov 2013)																				
S N	District	No. Of wells	Range in Fluctuation (m)				No. of Wells/Percentage Showing Fluctuation												Total No. of Wells	
			Rise		Fall		Rise						Fall							
							0 to 2		2 to 4		>4		0 to 2		2 to 4		>4		Rise	Fall
			Min	Max	Min	Max	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
1	Bokaro	11	0.2	2.28	0.26	2.74	6	55	1	9	0	0	2	18	2	18	0	0	7	4
2	Chatra	7	0.32	0.68	0.35	1.65	3	43	0	0	0	0	4	57	0	0	0	0	3	4
3	Deoghar	6	0.07	3.61	0.16	0.16	4	67	1	17	0	0	1	17	0	0	0	0	5	1
4	Dhanbad	11	0.35	1.18	0.03	3.15	2	18	0	0	0	0	8	73	1	9	0	0	2	9
5	Dumka	18	0.03	1.57	0.26	2.45	5	28	0	0	0	0	10	56	3	17	0	0	5	13
6	Garhwa	6	-	-	0.1	4.3	0	0	0	0	0	0	5	83	0	0	1	17	0	6
7	Giridih	15	0.18	2.96	0.21	1.38	9	60	2	13	0	0	4	27	0	0	0	0	11	4
8	Godda	9	0.29	2.04	0.62	1.09	3	33	1	11	0	0	5	56	0	0	0	0	4	5
9	Gumla	22	0.05	0.91	0.15	3.02	6	27	0	0	0	0	15	68	1	5	0	0	6	16
10	Hazaribag	22	0.25	2.82	0.05	3.1	8	36	2	9	0	0	10	45	1	5	0	0	10	11
11	Kodarma	2	1.25	1.25	0.11	0.11	1	50	0	0	0	0	1	50	0	0	0	0	1	1
12	Lohardaga	6	-	-	0.45	5.44	0	0	0	0	0	0	2	33	3	50	1	17	0	6
13	Pakaur	6	3.06	3.06	0.26	2.37	0	0	1	17	0	0	4	67	1	17	0	0	1	5
14	Palamu	20	0.16	1.51	0.17	3.68	3	15	0	0	0	0	13	65	4	20	0	0	3	17
15	W. Singhbhum	15	0	1.98	0.12	4.36	7	47	0	0	0	0	6	40	1	7	1	7	7	8
16	E. Singhbhum	14	0.16	0.39	0.1	3.85	2	14	0	0	0	0	11	79	1	7	0	0	2	12
17	Ranchi	39	0.55	3.02	0.12	3.85	2	5	1	3	0	0	27	69	9	23	0	0	3	36
18	Sahibganj	9	1.05	1.05	0.06	3.69	2	22	0	0	0	0	6	67	1	11	0	0	2	7
	Total	**238**	**0.00**	**3.61**	**0.03**	**5.44**	**63**	**26**	**9**	**4**	**0**	**0**	**134**	**56**	**28**	**12**	**3**	**1**	**72**	**165**

Table 17: District wise Water Level Fluctuation - January 2015 w.r.t. Mean (Jan 2005 to Jan 2014)																				
S N	District	No. Of wells	Range in Fluctuation (m)				No. of Wells/Percentage Showing Fluctuation												Total No. of Wells	
			Rise		Fall		Rise						Fall							
							0 to 2		2 to 4		>4		0 to 2		2 to 4		>4		Rise	Fall
			Min	Max	Min	Max	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.
1	Bokaro	10	0.13	2.21	0.51	3.25	4	40	1	10	0	0	3	30	2	20	0	0	5	5
2	Chatra	8	0.03	2.57	0.02	0.92	4	50	1	13	0	0	3	38	0	0	0	0	5	3
3	Deoghar	6	0.13	1.55	2.68	2.68	5	83	0	0	0	0	0	0	1	17	0	0	5	1
4	Dhanbad	9	0.05	1.8	0.06	1.93	4	44	0	0	0	0	5	56	0	0	0	0	4	5
5	Dumka	17	0.05	1.02	0.43	2.83	8	47	0	0	0	0	7	41	2	12	0	0	8	9
6	Garhwa	6	-	-	0.01	2.86	0	0	0	0	0	0	4	67	2	33	0	0	0	6
7	Giridih	15	0.03	1.92	0.33	0.63	12	80	0	0	0	0	3	20	0	0	0	0	12	3
8	Godda	10	0.16	1.5	0.37	1.12	6	60	0	0	0	0	4	40	0	0	0	0	6	4
9	Gumla	22	0.04	0.15	0.01	1.88	3	14	0	0	0	0	19	86	0	0	0	0	3	19
10	Hazaribag	22	0.05	1.6	0.03	2.05	5	23	0	0	0	0	15	68	1	5	0	0	5	16
11	Kodarma	3	-	-	0.65	2.15	0	0	0	0	0	0	2	67	1	33	0	0	0	3
12	Lohardaga	6	1.24	1.24	0.34	1.81	1	17	0	0	0	0	5	83	0	0	0	0	1	5
13	Pakaur	6	0.46	0.46	0.21	2.12	1	17	0	0	0	0	4	67	1	17	0	0	1	5
14	Palamu	25	0.08	3.87	0.26	4.6	8	32	2	8	0	0	12	48	1	4	2	8	10	15
15	W. Singhbhum	20	0.59	2.86	0.22	5	6	30	1	5	0	0	10	50	2	10	1	5	7	13
16	E. Singhbhum	12	0.14	0.66	0.12	3.12	3	25	0	0	0	0	8	67	1	8	0	0	3	9
17	Ranchi	24	0.12	0.75	0.3	2.15	6	25	0	0	0	0	17	71	1	4	0	0	6	18
18	Sahibganj	11	0.97	1.92	0.17	6.9	6	55	0	0	0	0	3	27	0	0	1	9	6	4
	Total	**232**	**0.03**	**3.87**	**0.01**	**6.90**	**82**	**35**	**5**	**2**	**0**	**0**	**124**	**53**	**15**	**6**	**4**	**2**	**87**	**143**