



# Maternal Health: An Assessment of Different Districts of Assam

Ahmod Hussain Laskar  
Assistant Teacher  
Raja G.C. Memorial H.S. School, Barkhola

## ABSTRACT

The health condition of women during pregnancy, childbirth and postpartum period is referred to as maternal health. It is a clear indicator of basic health care services available at a place. According to Millennium Development Goal - 2015 report, Maternal Mortality Rate (MMR) in India is 140 per 1,00,000 live births and the state of Assam shows worst performance in reducing Maternal Mortality Rate (MMR). The Maternal Mortality Rate (MMR) is 304 per 1,00,000 live births in Assam. <sup>[1]</sup> This calls for rigorous analysis of maternal mortality figures in Assam and to identify the maternal health care in the different districts of Assam. The present work looks into a district-wise variation in maternal health care which is measured through an index on the basis of the Fourth National Family Health Survey of India (NFHS-4).

**Keywords:** Maternal Health Care, NFHS-4, Assam, Composite Index, Demography, multiple comparison.

## Introduction

Maternal health is the health of women during pregnancy, childbirth and postpartum period. It encompasses the health care dimensions of family planning, pre-conception, prenatal and postnatal care in order to ensure a positive and fulfilling experience and thus reducing maternal mortality. <sup>[2]</sup> The progress of maternal health is measured by the improvement of life expectancy of mother and reduction in infant mortality. Since, the health problem of a mother directly affect the health of her child, and so, health issues may be considered as an important obstacle in the socio-economic development of a nation. "Reproductive and child health and mortality has been viewed as an indicator of socio-economic wellbeing. Thus, reducing maternal mortality becomes an important goal of public health programme throughout the world" (Rajula, 2014) <sup>[3]</sup>.

Assam is a state in North-East of India. The state has a rich variety of population pattern. Therefore, to justify the accountability of the government's health related policies to reduce the maternal mortality rate,

quantitative indicator is used to identify the extent of health care facilities available in the different districts of Assam. It reflects the variation across the different total district-wise picture and district-wise rural picture of maternal health. Accordingly, total district-wise ranking and district-wise rural ranking is done separately.

The National Family Health Survey (NFHS) in India is a large scale, multi-rounded survey conducted in a represented sample of household throughout India. The survey provide states and national information for India on facility, infant and child mortality, the picture of family planning, maternal and child health, reproductive health, nutrition, anemia, utilization and quality of health and family planning services.<sup>[4]</sup>

The latest NFHS survey was completed in 2015-16 and the fact sheets provide national, state as well as district level data related to child and maternal health care. The present work attempts to utilize these data to classify the different total districts pictures in terms of maternal health care facilities and also to study the different districts rural picture in Assam.

### Objective of the Study

The paper is planned to attain the following objectives:-

- (i) To develop a Composite Index to be named as maternal health care weighted index (MHCWI) based on several maternal health related parameters collected during NFHS-4.
- (ii) To rank different districts of Assam on maternal health care facilities available as a whole and also as a district-wise rural ranking.

### Methodology

**Data Source:** The data used in this study are collected from the National Family Health Survey (NFHS-4) fact sheets [<http://rchiips.org/nfhs/As.Shtml/>] that is conducted under the stewardship of the Ministry of Health and Family Welfare, co-ordinated by the International Institute of Population Sciences, Mumbai and implemented by a group of survey organizations and population research centers following a rigorous selection procedure.

### Health Care Parameters

The following parameters are identified to use as a measure of maternal health care.

P<sub>1</sub> : Mothers who had antenatal check-up in the first trimester (%).

P<sub>2</sub> : Mothers who had at least 4 antenatal care visits (%).

P<sub>3</sub> : Mothers whose last birth was protected against neonatal tetanus (%).

P<sub>4</sub> : Mothers who consumed iron folic acid for 100 days or more when they were pregnant.

P<sub>5</sub> : Mothers who had full antenatal care (%).

P<sub>6</sub> : Registered pregnancies for which the mother received mother and child protection (MCP) Card (%).

$P_7$ : Mothers who received postnatal care from a doctor/ nurse/ LHV/ ANM/ midwife/ other health personnel within 2 days of delivery (%).

Here, all the parameters mentioned above (i.e.,  $P_1$  to  $P_7$ ) are in positive dimension. It means higher the value of the parameter, better is the performance.

### Maternal Health Care Weighted Index (MHCWI)

Notation and terminology of maternal health care weighted index construction depends on clarification of variables and subscript below.

Let,  $P_{ij}$  represent the percentage of mothers enjoying the  $j^{\text{th}}$  facility in the  $i^{\text{th}}$  district.

$$i = 1, 2, \dots, 27. \text{ (no of districts)}$$

$$j = 1, 2, \dots, 7. \text{ (no of parameters)}$$

Let,  $\max(P_{.j})$  denote the maximum percentage of mothers enjoying the  $j^{\text{th}}$  parameter value over all the districts,  $j = 1, 2, \dots, 7$

Similarly,  $\min(P_{.j})$  denote the minimum of  $j^{\text{th}}$  parameter value over all the districts.

The Health Indicator ( $HI_{ij}$ ) for the  $j^{\text{th}}$  parameter in the  $i^{\text{th}}$  district is given by -

$$HI_{ij} = \frac{\max(P_{.j}) - P_{ij}}{\max(P_{.j}) - \min(P_{.j})}, \dots(1)$$

$$i = 1, 2, \dots, 27$$

$$j = 1, 2, \dots, 7$$

The value of  $HI_{ij}$  varies from zero to one, where the value of 0 implies that the given district's position is the best one in the case of maternal health care facilities and in case the value nearer to 1 implies worst (or poorer) position of maternal health care facilities for mothers.

To construct the maternal health care index for the district comparison, one must recognize the fact that all the indicators are not equally important. Thus, a simple average of the seven indicator values should be avoided in the index construction. However, Morris and Liser (1977) advocated the use of weighted average when developing the physical Quality of Life Index (PQLI)<sup>[5]</sup>. Another important contributor to this issue is Iyengar and Sudarshan (1982)<sup>[6]</sup> who assumed that the weights varies inversely as the variation in the respective variable. Based on these, the Maternal Health Care Weighted Index (MHCWI) for the  $i^{\text{th}}$  district, ( $i= 1, 2, 3, \dots, 27$ ), is given by:-

$$MHCWI_i = W_1 \times HI_{i1} + W_2 \times HI_{i2} + \dots + W_7 \times HI_{i7}, \text{ with } \sum_{i=1}^7 W_i = 1 \dots(2)$$

Iyengar and Sudarshan (1982), further linked the weight to variance. They postulated that:-

$$W_j = \frac{C}{\sqrt{\text{var}(HI.j)}} \quad \dots(3)$$

Where C is a normalizing constant and is given by:-

$$C = \left[ \sum_{j=1}^7 \frac{1}{\sqrt{\text{var}(HI.j)}} \right]^{-1} \quad \dots(4)$$

The choice of the weights in this manner would ensure that large variation in any one of the indicators would not unduly dominate the contribution of the rest of the indicators and distort the inter-district comparisons [Iyengar and Sudarshan (1982)]

The value of Maternal Health Care Index so obtained lies between 0 and 1. The smaller the value of the index, better is the position of the district in the case of maternal health care facilities and vice versa. Similarly, the index value nearer to 1 (one) implies poorer position of the district in the case of maternal health care.

### Calculation and Results

The values of different parameters collected from NFHS-4 of the district level fact sheet of Assam are presented in Appendix A.

Consequently, the Health Indicator (HI) value is obtained using the formula (1) for the above Table and it is provided in Appendix B.

Now to calculate the weights of the different parameters, we have to find the variance.

First we find the variances and weights from the district level (Rural figures) which are as under:

$$\text{Variance } (HI.1)_R = 0.0531, \sqrt{\text{var}(HI.1)_R} = 0.2304$$

$$\text{Var } (HI.2)_R = 0.0694, \sqrt{\text{var}(HI.2)_R} = 0.2634$$

$$\text{Var } (HI.3)_R = 0.0510, \sqrt{\text{var}(HI.3)_R} = 0.2258$$

$$\text{Var } (HI.4)_R = 0.0469, \sqrt{\text{var}(HI.4)_R} = 0.2166$$

$$\text{Var } (HI.5)_R = 0.0514, \sqrt{\text{var}(HI.5)_R} = 0.2267$$

$$\text{Var } (HI.6)_R = 0.0640, \sqrt{\text{var}(HI.6)_R} = 0.2530$$

$$\text{Var } (HI.7)_R = 0.0684, \sqrt{\text{var}(HI.7)_R} = 0.2615$$

And,

$$C = \left[ \sum_{i=1}^7 \frac{1}{\sqrt{\text{var } H_{ij}}} \right]^{-1} = \left[ \frac{1}{0.2304} + \frac{1}{0.2634} + \dots + \frac{1}{0.2615} \right]^{-1}$$

$$= [29.3701]^{-1} = 0.0340$$

Accordingly the weights are provided in Table 3 below:

W <sub>1</sub>	W <sub>2</sub>	W <sub>3</sub>	W <sub>4</sub>	W <sub>5</sub>	W <sub>6</sub>	W <sub>7</sub>
0.1476	0.1291	0.1506	0.1570	0.1500	0.1344	0.1300

Accordingly, the Maternal Health Care Weighted Index (MHCWI) values and their ranks for the Rural district level figure in table 4.

**Table 4 : Maternal Health Care Weighted Index values & Their Ranks  
(Rural Figures)**

Sl. No.	District	MHCWI(R)	Rank
1	Baksa	0.3394	6
2	Barpeta	0.5903	22
3	Bongaigaon	0.5669	18
4	Cachar	0.5871	20
5	Chirang	0.5276	13
6	Darrang	0.5902	21
7	Dhemaji	0.3448	7
8	Dhubri	0.9308	27
9	Dibrugarh	0.1842	2
10	Dima Hasao	0.7066	26
11	Goalpara	0.5488	15
12	Golaghat	0.2642	4
13	Hailakandi	0.5837	19
14	Jorhat	0.0344	1
15	Kamrup Metropolitan	0.4011	9
16	Kamrup	0.6140	24
17	Karbi Anglong	0.6478	25
18	Karimganj	0.6135	23
19	Kokrajhar	0.5662	17
20	Lakhimpur	0.2678	5
21	Morigaon	0.5365	14
22	Nagaon	0.5548	16
23	Nalbari	0.4118	11
24	Sivasagar	0.2405	3
25	Sonitpur	0.4113	10
26	Tinsukia	0.3856	8
27	Udalguri	0.4943	12

Similarly, to find the MHCWI for total (or overall) district level values & their ranks we find the variances & weights which are as under: -

$$\text{Var} (HI_{.1})_T = 0.0516, \sqrt{\text{var}(HI_{.1})_r} = 0.2272$$

$$\text{Var} (HI_{.2})_T = 0.0592, \sqrt{\text{var}(HI_{.2})_r} = 0.2433$$

$$\text{Var} (HI_{.3})_T = 0.0527, \sqrt{\text{var}(HI_{.3})_r} = 0.2296$$

$$\text{Var} (HI_{.4})_T = 0.0506, \sqrt{\text{var}(HI_{.4})_r} = 0.2249$$

$$\text{Var} (HI_{.5})_T = 0.0531, \sqrt{\text{var}(HI_{.5})_r} = 0.2304$$

$$\text{Var} (HI_{.6})_T = 0.0582, \sqrt{\text{var}(HI_{.6})_r} = 0.2412$$

$$\text{Var} (HI_{.7})_T = 0.0669, \sqrt{\text{var}(HI_{.7})_r} = 0.2587$$

$$\text{And } C = \left[ \sum_{i=1}^7 \frac{1}{\sqrt{\text{var } HI_{ij}}} \right]^{-1} = \left[ \frac{1}{0.2272} + \frac{1}{0.2433} + \dots + \frac{1}{0.2587} \right]^{-1}$$

$$= [29.6651]^{-1} = 0.0337$$

Accordingly the weights are: Table 5

<b>W<sub>1</sub></b>	<b>W<sub>2</sub></b>	<b>W<sub>3</sub></b>	<b>W<sub>4</sub></b>	<b>W<sub>5</sub></b>	<b>W<sub>6</sub></b>	<b>W<sub>7</sub></b>
0.1483	0.1385	0.1468	0.1498	0.1463	0.1397	0.1303

Thus, the MHCWI values and their ranks for the overall district level figures are given in Table 6 as under –

**Table 6: MHCWI values and their Ranks (for total overall district)**

Sl. No.	District	MHCWI Values	Rank
1	Baksa	0.3482	6
2	Barpeta	0.5953	20
3	Bongaigaon	0.5813	18
4	Cachar	0.5916	19
5	Chirang	0.5509	16
6	Darrang	0.6065	22
7	Dhemaji	0.4130	9
8	Dhubri	0.9255	27
9	Dibrugarh	0.1752	2
10	Dima Hasao	0.6129	23
11	Goalpara	0.5277	13
12	Golaghat	0.2622	4
13	Hailakandi	0.5973	21
14	Jorhat	0.0288	1
15	Kamrup Metropolitan	0.4478	11
16	Kamrup	0.6213	25
17	Karbi Anglong	0.6538	26
18	Karimganj	0.6204	24
19	Kokrajhar	0.5588	17
20	Lakhimpur	0.2837	5
21	Morigaon	0.5294	14
22	Nagaon	0.5295	15
23	Nalbari	0.4076	8
24	Sivasagar	0.2301	3
25	Sonitpur	0.4171	10
26	Tinsukia	0.3813	7
27	Udalguri	0.5062	12

Now, for comparative analysis, we combine these two Table 4 and Table 6 in one Table as below.

**Table 7: Comparing ranks of Districts in terms of MHCWI for Rural as well as overall.**

Sl. No.	District	MHCWI (overall)	Ranks	MHCWI (Rural)	Rank
1	Jorhat	0.0288	1	0.0344	1
2	Dibrugarh	0.1752	2	0.1842	2
3	Sivasagar	0.2301	3	0.2405	3
4	Golaghat	0.2622	4	0.2642	4

5	Lakhimpur	0.2837	5	0.2678	5
6	Baksa	0.3482	6	0.3394	6
7	Tinsukia	0.3813	7	0.3856	8
8	Nalbari	0.4076	8	0.4118	11
9	Dhemaji	0.4130	9	0.3448	7
10	Sonitpur	0.4171	10	0.4113	10
11	Kamrup Metropolitan	0.4478	11	0.4011	9
12	Udalguri	0.5062	12	0.4943	12
13	Goalpara	0.5277	13	0.5488	15
14	Morigaon	0.5294	14	0.5365	14
15	Nagaon	0.5295	15	0.5548	16
16	Chirang	0.5509	16	0.5276	13
17	Kokrajhar	0.5588	17	0.5662	17
18	Bongaigaon	0.5813	18	0.5669	18
19	Cachar	0.5916	19	0.5871	20
20	Barpeta	0.5953	20	0.5903	22
21	Hailakandi	0.5973	21	0.5837	19
22	Darrang	0.6065	22	0.5902	21
23	Dima Hasao	0.6129	23	0.7066	26
24	Karimganj	0.6204	24	0.6135	23
25	Kamrup	0.6213	25	0.6140	24
26	Karbi Anglong	0.6538	26	0.6478	25
27	Dhubri	0.9255	27	0.9308	27

## Conclusion

From the table, it is clear that Jorhat district is the top in the maternal health care facilities for mothers, and on the contrary, the worst position in the maternal health care is Dhubri. The top six ranking districts are Jorhat, Dibrugarh, Siva Sagar, Golaghat, Lakhimpur and Baksa for overall district facility for mothers. The figure is same as in the case of rural district ranking also.

Again, from the bottom, Dhubri, Karbi Anglong, Kamrup and Karimganj are the four districts having poorer maternal health care in the case of total district level. However, there are slight changes in the case of rural district maternal health care. There are Dhubri, Dima Hasao, Karbi Anglong and Kamrup districts. It is to be mentioned here that Dima Hasao rural ranking is 26 but the total (or overall) district ranking is 23. It means the rural mothers are poorer maternal health care than the urban areas.

In the middle, there are no any remarkable changes in the ranking of total (or overall) and rural district ranking.

As it is evident from the above that the Dhubri district maternal health care is the poorest one, and so, the govt should take initiative to develop the maternal health cares for mothers. Similar steps should be taken for the districts of Karbi Anglong, Kamrup, Dima Hasao & Karimganj also to develop the maternal health care for the mothers.

For future research, the model developed in this study can be used to conduct comparative study on the parameters of child health literacy, population and household profile etc.

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## Appendix - A

## District Level Values of Parameters Maternal Health Data, Based on NFHS-4

Parameters Districts		P <sub>1</sub>		P <sub>2</sub>		P <sub>3</sub>		P <sub>4</sub>		P <sub>5</sub>		P <sub>6</sub>		P <sub>7</sub>	
		Rural	Total												
1	Baksa	60.9	60.6	49.7	49.8	92.5	92.6	39.9	39.7	21.5	21.4	99.1	99.1	69.6	70.1
2	Barpeta	63.8	60.6	46.3	47.5	86.1	86.8	18.8	18.6	9.7	10.2	96.5	96.4	33.6	36.6
3	Bongaigaon	53.4	54.6	24.5	24.2	88.0	87.9	34.5	35.5	12.6	12.5	98.0	97.6	46.4	47.5
4	Cachar	37.0	37.3	51.2	50.9	88.1	88.5	17.8	18.7	11.1	12.2	98.0	97.6	61.5	62.8
5	Chirang	61.2	61.9	41.4	41.2	86.8	86.3	34.0	34.3	11.7	10.9	98.5	97.9	35.1	36.6
6	Darrang	60.7	61.5	38.2	39.9	95.5	95.7	25.6	25.1	12.0	11.7	91.8	92.0	38.8	40.8
7	Dhemaji	57.6	58.6	47.3	49.1	94.1	94.5	33.8	34.9	21.5	22.5	95.7	96.0	64.4	65.4
8	Dhubri	34.5	36.3	23.7	26.0	69.8	71.4	11.4	13.0	4.8	5.5	94.1	94.6	20.4	22.1
9	Dibrugarh	68.6	71.3	67.0	67.6	91.7	92.8	54.1	55.2	37.2	39.3	98.2	97.7	72.1	71.5
10	Dima Hasao	39.3	44.8	26.0	35.1	83.6	85.9	30.0	34.8	12.0	17.5	94.4	95.3	40.1	48.5
11	Goalpara	54.8	57.5	39.4	42.1	82.4	83.4	30.9	31.6	15.4	16.4	96.8	97.2	56.0	58.8
12	Golaghat	51.4	52.9	61.7	62.5	93.7	94.2	44.7	44.6	29.9	30.5	99.3	99.3	78.9	78.3
13	Hailakandi	49.4	49.6	34.0	34.5	96.5	96.6	24.2	24.3	9.9	9.7	96.4	96.6	38.7	39.3
14	Jorhat	81.8	82.0	72.3	75.8	95.3	95.2	65.6	63.3	48.0	48.0	97.9	98.3	75.5	77.1
15	Kamrup Metropolitan	66.9	64.9	59.6	56.6	86.1	85.8	47.3	45.8	30.7	28.0	88.8	90.1	72.9	71.4
16	Kamrup	48.3	49.0	42.2	40.4	80.2	80.1	22.2	23.5	11.1	11.5	96.3	96.7	58.9	61.3
17	Karbi Anglong	48.2	47.4	37.2	38.1	87.0	87.2	23.1	25.1	10.4	11.6	95.4	95.5	38.1	40.5
18	Karimganj	45.3	47.3	38.2	37.1	96.7	96.9	17.7	18.2	5.1	5.2	97.5	97.7	35.2	36.1
19	Kokrajhar	44.9	46.7	37.2	39.1	86.2	86.9	25.8	26.7	15.8	16.8	97.6	97.7	56.6	57.8
20	Lakhimpur	69.8	68.8	58.9	59.0	94.2	94.5	44.4	43.9	26.9	27.1	98.0	97.5	66.2	67.8
21	Morigaon	46.7	48.9	40.8	43.1	93.7	94.2	36.5	37.9	21.4	22.6	92.2	92.8	52.8	53.9
22	Nagaon	53.0	55.1	43.1	46.2	93.7	94.0	29.3	31.2	15.5	18.3	93.5	93.8	44.7	47.7
23	Nalbari	60.4	62.3	47.9	49.2	94.1	94.6	34.2	33.8	16.9	17.1	99.2	99.3	49.9	50.5
24	Sivasagar	66.9	66.9	69.9	70.8	94.9	95.3	39.9	42.6	27.7	30.7	97.7	97.5	73.9	74.3
25	Sonitpur	53.5	54.6	42.2	42.0	96.9	97.1	40.2	39.7	18.0	18.1	98.4	98.5	54.7	55.5
26	Tinsukia	63.4	64.1	54.5	56.1	91.9	90.6	36.0	39.8	19.5	23.1	96.5	95.9	67.4	66.9
27	Udalguri	44.6	45.2	36.0	37.0	94.1	94.4	29.4	29.9	13.7	13.3	98.9	98.6	62.2	61.7

## Appendix B

## Normalized values (Health Indicator for different parameters)

Parameters Districts		P <sub>1</sub>		P <sub>2</sub>		P <sub>3</sub>		P <sub>4</sub>		P <sub>5</sub>		P <sub>6</sub>		P <sub>7</sub>	
		Rural	Total	Rural	Total	Rural	Total	Rural	Total	Rural	Total	Rural	Total	Rural	Total
1	Baksa	0.4419	.4683	.4650	.5039	.1624	.1751	.4742	.4692	.6134	.6215	.0190	.0217	.1590	.1459
2	Barpeta	.3805	.3873	.5350	.5484	.3985	.4008	.8635	.8887	.8866	.8832	.2667	.3152	.7744	.7420
3	Bongaigaon	.6004	.5996	.9835	1	.3284	.3579	.5738	.5527	.8194	.8294	.1238	.1848	.5556	.5480
4	Cachar	.9471	.9781	.4342	.4826	.3247	.3346	.8819	.8867	.8542	.8364	.2762	.2826	.2974	.2758
5	Chirang	.4355	.4398	.6358	.6705	.3727	.4202	.5830	.5765	.8403	.8668	.0762	.1522	.7487	.7420
6	Darrang	.4461	.4486	.7016	.6957	.0517	.0545	.7380	.7594	.8333	.8481	.7143	.7935	.6855	.6673
7	Dhemaji	.5116	.5120	.5144	.5174	.1033	.1012	.5867	.5646	.6134	.5958	.3429	.3587	.2479	.2206
8	Dhubri	1	1	1	.9651	1	1	1	1	1	.9930	.4952	.5109	1	1
9	Dibrugarh	.2791	.2341	.1090	.1589	.1919	.1673	.2121	.1610	.2500	.2033	.1048	.1739	.1162	.1210
10	Dima Hasao	.8985	.8140	.9527	.7888	.4908	.4358	.6568	.5666	.8333	.7126	.4667	.4348	.6632	.5302
11	Goalpara	.5708	.5361	.6770	.6531	.5350	.5330	.6402	.6302	.7546	.7383	.2381	.2283	.3915	.3470
12	Golaghat	.6427	.6368	.2181	.2578	.1181	.1128	.3856	.3718	.4190	.4089	0	0	0	0
13	Hailakandi	.6850	.7090	.7881	.8004	.0148	.0195	.7638	.7753	.8819	.8949	.2762	.2935	.6872	.6940
14	Jorhat	0	0	0	0	.0590	.0739	0	0	0	0	.1333	.1087	.0581	.0214
15	Kamrup Metropolitan	.3150	.3742	.2613	.3721	.3985	0.4397	.3376	.3479	.4005	.4673	1	1	.1026	.1228
16	Kamrup	.7082	.7221	.6193	.6860	.6162	.6615	.8007	.7912	.8542	.8528	.2857	.2826	.3419	.3025
17	Karbi Anglong	.7136	.7571	.7222	.7306	.3653	.3852	.7841	.7594	.8704	.8505	.3714	.4130	.6974	.6750
18	Karimganj	.7717	.7593	.7016	.7500	.0074	.0078	.8838	.8966	.9931	1	.1714	.1739	.7470	.7509
19	Kokrajhar	.7801	.7724	.7222	.7112	.3948	.3969	.7343	.7276	.7454	.7290	.1619	.1739	.3812	.3648
20	Lakhimpur	.2537	.2888	.2774	.3256	.0996	.1012	.3911	.3857	.4884	.4883	.1238	.1957	.2171	.1868
21	Morigaon	.7421	.7243	.6481	.6337	.1181	.1128	.5369	.5050	.6157	.5935	.6762	.7065	.4462	.4342
22	Nagaon	.6089	.5449	.6008	.5736	.1181	.1206	.6697	.6382	.7616	.6939	.5524	.5978	.5846	.5445
23	Nalbari	.4524	.4311	.5021	.5155	.1033	.0973	.5793	.5865	.7199	.7220	.0095	0	.4957	.4947
24	Sivasagar	.3150	.3304	.0494	.0969	.0738	.0700	.4742	.4115	.4699	.4042	.1524	.1957	.0855	.0714
25	Sonitpur	.5983	.5996	.6193	.6550	0	0	.4686	.4692	.6944	.6986	.0857	.0870	.4137	.4057
26	Tinsukia	.3890	.3917	.3662	.3818	.1956	.2529	.5461	.4672	.6957	.5818	.2667	.3696	.1966	.2028
27	Udalguri	.7865	.8053	.7469	.7519	.1033	.1051	.6677	.6640	.7940	.8107	.0381	.0761	.2855	.2954
$\Sigma =$		15.2737	15.2649	14.8512	15.2265	6.7459	6.9376	16.2339	15.8527	18.7026	18.3248	7.4286	8.1306	11.3797	10.9067