

**JHA-01.00 : District Level Planning Tools**

**JHA-01.01 : Food and Nutrition**

**Requirement of one person per annum**

<b>Items</b>	<b>Based on IMA report on Calorie intake</b>	<b>Based on Average available in India</b>
Cereals	164 kg	188 kg
Pulses	11 kg	12.7 kg
Fat & Gil	18 kg	17.7 kg
Fruits & Vegetables	113 kg	88.1 kg
Milk	80 kg	61.9 kg
Sugar	38.5 kg	36.5 kg
Meat, Fish	20 kg	12.8 kg
Egg	180 nos.	9 nos.

*Ref. : FAO report June, 1999.*

## JHA-01.00 : District Level Planning Tools

### JHA-01.02 : Seed Security

Realising that timely supply of quality seeds will be crucial for agriculture, a small team of Agriculture experts planned out the process for seed security in the State. The base of calculation is as follows :

#### Land for Agriculture

Out of 80 lakh ha., 31.0 lakh ha. is available for agriculture divided as

- (a) Tarn I & II (40%) : 12.4 lakh ha.
- (b) Tarn III & Don III (30%) : 9.3 lakh ha.
- (c) Don I & II (30%) : 9.3 lakh ha.

#### Maximum Production Envisaged

Paddy	:	62.0 lakh ton.
Wheat & Coarse Cereals	:	8.0 lakh ton.
Pulses	:	4.0 lakh ton.
Oilseeds	:	2.0 lakh ton.
Vegetables	:	60.0 lakh ton.
Fruits	:	18.0 lakh ton.

#### Yield to Seed Ratio

Sl. No.	Name of Crop	Seed rate in Kg/ha.	Yield in Quintal/ha.	Ratio
1.	Paddy	60	30	1 : 50
2.	Marua	10	25	1 : 250
3.	Maize	20	40	1 : 200
4.	Wheat	125 to 150	Irri. – 40 Non irri. – 20 30 Qntl.	1 : 20
5.	Barley	100	30	1 : 30
6.	Gundali	10	8	1 : 80
7.	Arhar	20	12.5	1 : 62
8.	Urad	30	12	1 : 40
9.	Mung	30	10	1 : 34
10.	Kurthi	20	10	1 : 50
11.	Gram	75	20	1 : 27
12.	Pea	75	Grain – 20 Pod – 90	1 : 27 1 : 120
13.	Masur	30	15	1 : 50
14.	Groundnut	90	20	1 : 20

### JHA-01.00 : District Level Planning Tools

Sl. No.	Name of Crop	Seed rate in Kg/ha.	Yield in Quintal/ha.	Ratio
15.	Soyabean	80	20	1 : 25
16.	Sarguja	6	6	1 : 100
17.	Kusum	20	10	1 : 50
18.	Til	5	3	1 : 60
19.	Linseed	20	7	1 : 35
20.	Sugarcane	600	800	1 : 14
21.	Potato	300	300	1 : 10

### Land & Seed requirement

Sl. No.	Item	Target Production, lakh ton	Area, lakh ha.	Seed
1.	Paddy	60.0	20	1.2 lakh ton
2.	Wheat	4.0	1.3	0.2 lakh ton
3.	Marua	4.0	1.6	16 lakh kg
4.	Maize	4.0	1.0	20 lakh kg
5.	Arhar	4.0	3.2	64 lakh kg
6.	Mustard	2.0	3.0	64 lakh kg

### Seed Cycle Strategy

Some of the important data for Jharkhand are :

- (a) Jharkhand has 22 District, 212 Blocks, 3744 Panchayats.
- (b) Rural households : 374 lakh  
Main cultivators : 26.5 lakh (M + F)  
Main agri. labour : 10.5 lakh (M + F)  
Main other workers : 14.0 lakh (M + F)
- (c) To cover every farmer with improved paddy seed, every Panchayat needs 32 tons every year, produced from 10 ha.
- (d) The main source of Foundation seed is BAU.
- (e) At least 100 block level Seed Multiplication farm with 4 ha. area and infrastructures are available to produce 120 MT of second level seed.
- (f) Seed must be of quality and available on time. A Panchayat level seed control mechanism will ensure quality and availability.
- (g) It will be good to have an enterprise based approach.

**JHA-01.00 : District Level Planning Tools****JHA-01.03 : Probability of Rainfall**

<b>Week</b>	<b>Less then 7mm</b>	<b>Less then 14mm</b>	<b>Less than 21mm</b>	<b>Less then 28mm</b>	<b>Less than 35mm</b>
1 <sup>st</sup>	17%	10%	7%	7%	3%
2 <sup>nd</sup>	13%	10%	10%	3%	3%
3 <sup>rd</sup>	27%	13%	7%	7%	3%
4 <sup>th</sup>	20%	10%	3%	3%	3%
5 <sup>th</sup>	33%	30%	23%	10%	10%
6 <sup>th</sup>	37%	27%	10%	7%	7%
7 <sup>th</sup>	30%	235	7%	3%	3%
8 <sup>th</sup>	37%	23%	20%	13%	7%
9 <sup>th</sup>	30%	23%	10%	0%	0%
10 <sup>th</sup>	17%	13%	10%	7%	3%
11 <sup>th</sup>	37%	27%	17%	13%	13%
12 <sup>th</sup>	33%	23%	23%	13%	7%
13 <sup>th</sup>	23%	135	13%	10%	10%
14 <sup>th</sup>	33%	17%	10%	7%	7%
15 <sup>th</sup>	17%	13%	10%	7%	3%
16 <sup>th</sup>	13%	10%	10%	7%	3%
17 <sup>th</sup>	23%	20%	17%	10%	7%
18 <sup>th</sup>	20%	10%	3%	0%	0%
19 <sup>th</sup>	43%	37%	30%	23%	20%
20 <sup>th</sup>	27%	13%	10%	3%	3%
21 <sup>st</sup>	47%	235	20%	10%	7%
22 <sup>nd</sup>	50%	40%	30%	30%	27%
23 <sup>rd</sup>	63%	53%	47%	33%	335
24 <sup>th</sup>	80%	73%	67%	67%	60%
25 <sup>th</sup>	90%	83%	73%	70%	60%
26 <sup>th</sup>	93%	93%	83%	80%	70%
27 <sup>th</sup>	97%	93%	87%	87%	80%
28 <sup>th</sup>	100%	100%	97%	93%	80%
29 <sup>th</sup>	100%	97%	93%	90%	87%
30 <sup>TH</sup>	100%	100%	97	93%	90%

**JHA-01.00 : District Level Planning Tools**

<b>Week</b>	<b>Less than 7mm</b>	<b>Less than 14mm</b>	<b>Less than 21mm</b>	<b>Less than 28mm</b>	<b>Less than 35mm</b>
31 <sup>ST</sup>	97%	93%	93%	90%	80%
32 <sup>ND</sup>	100%	90%	87%	77%	73%
33 <sup>RD</sup>	100%	90%	87%	87%	83%
34 <sup>TH</sup>	97%	97%	93%	77%	77%
35 <sup>TH</sup>	93%	935	87%	77%	73%
36 <sup>TH</sup>	97%	935	935	83%	87%
37 <sup>TH</sup>	935	935	83%	77%	635
38 <sup>TH</sup>	77%	67%	67%	63%	57%
39 <sup>TH</sup>	77%	73%	60%	53%	50%
40 <sup>TH</sup>	67%	57%	50%	47%	40%
41 <sup>ST</sup>	70%	635	47%	47%	37%
42 <sup>ND</sup>	57%	40%	37%	23%	20%
43 <sup>RD</sup>	37%	30%	13%	7%	7%
44 <sup>TH</sup>	30%	27%	20%	10%	7%
45 <sup>TH</sup>	17%	13%	7%	7%	7%
46 <sup>TH</sup>	10%	7%	7%	7%	3%
47 <sup>TH</sup>	7%	7%	3%	35	0%
48 <sup>TH</sup>	3%	3%	3%	3%	3%
49 <sup>TH</sup>	3%	3%	0%	0%	0%
50 <sup>TH</sup>	3%	3%	3%	3%	3%
51 <sup>ST</sup>	3%	3%	0%	0%	0%
52 <sup>ND</sup>	35	0%	0%	0%	0%

**JHA-01.00 : District Level Planning Tools**

**JHA-01.04 : Crop Saving Irrigation**

Water requirement of different crops (mm) in Jharkhand

<b>Sl. No.</b>	<b>Crop</b>	<b>Total Water requirement</b>	<b>Crop saving Irrigation requirement</b>	<b>Remarks</b>
1.	Paddy	1375	545.0	12 mm/day on Clayey soils 18 mm/day on loamy soil
2.	Maize	500	40.0	Usually rain fed required 2-3 irrigation
3.	Sugar cane	1250	-	For one year crop
4.	Bersee	1125	-	Irrigation at 7 to 10 days interval
5.	Jowar	600	100.0	Usually rain fed
6.	Onion	700	940.0	12-15 irrigation for October planting.
7.	Potato	625	435.0	First irrigation is applied after germination is complete subsequent irrigation- 10-12 days interval
8.	G.Nut	625	53.0	Usually rain fed
9.	Wheat	325	577.0	4-5 irrigation of 7.5 cure alluvial soil. 6-7 irrigation of 5 cm sandy loom soil
10.	Linseed	300	428.0	
11.	Millet	500	-	
12.	Mustard		400.0	
13.	Lentil		458.0	
14.	Pea		427.0	
15.	Safflower		505.0	

**JHA-01.00 : District Level Planning Tools**

<b>Sl. No.</b>	<b>Crop</b>	<b>Total Water requirement</b>	<b>Crop saving Irrigation requirement</b>	<b>Remarks</b>
16.	Soya been	-	82.07	Rain fed crop
17.	Jute	600	-	
18.	Bhindi	500	-	12-13 irrigation
19.	Tomato	950	646	
20.	Radish	225	130	
21.	Carrot	-	866	
22.	Beal root	330	-	
23.	Turnip	245	-	
24.	Cauliflower	-	350	

**JHA-01.00 : District Level Planning Tools**

**JHA-01.05 : Mandays for Different Crops**

Crop	Labour Use per Acre in Mandays			
	Male	Female	Child	Total
Food grains	26.0	12.8	2.5	41.3
Rice	28.0	15.0	2.5	45.5
Wheat	24.0	12.0	3.0	39
Maize	27.0	13.5	3.5	44
Coarse Cereals	21.0	7.5	2.0	30.5
Pulses	26.0	12.8	2.5	41.3
Oilseeds	26.0	15.0	4.0	45
Groundnut	26.0	15.8	4.0	45.8
Mustard	30.0	18.0	5.5	53.5
Soyabean	21.0	12.0	2.0	35
Vegetables	64.0	42.0	15.0	121
Potato	77.0	49.5	16.0	142.5
Onions	80.0	65.3	29.0	174.3
Tomato	59.0	35.3	11.5	105.8
Lady Finger	55.0	45.0	18.5	118.5
Brinjal	67.0	9.8	15.0	91.8
Peas	39.0	30.8	12.5	82.3
Cauliflower	75.0	50.3	17.0	142.3
Flowers	67.0	45.0	13.5	125.5
Bela	104.0	56.3	15.0	175.3
Marigold	73.0	53.3	18.0	144.3
Rose	75.0	59.3	13.0	147.3
Gladiolus	36.0	29.4	11.5	76.9
Fruits	71.0	38.3	8.5	117.8
Guava	49.0	22.5	8.5	80
Mango	50.0	33.0	16.5	99.5
Lemon	83.0	60.0	31.5	174.5

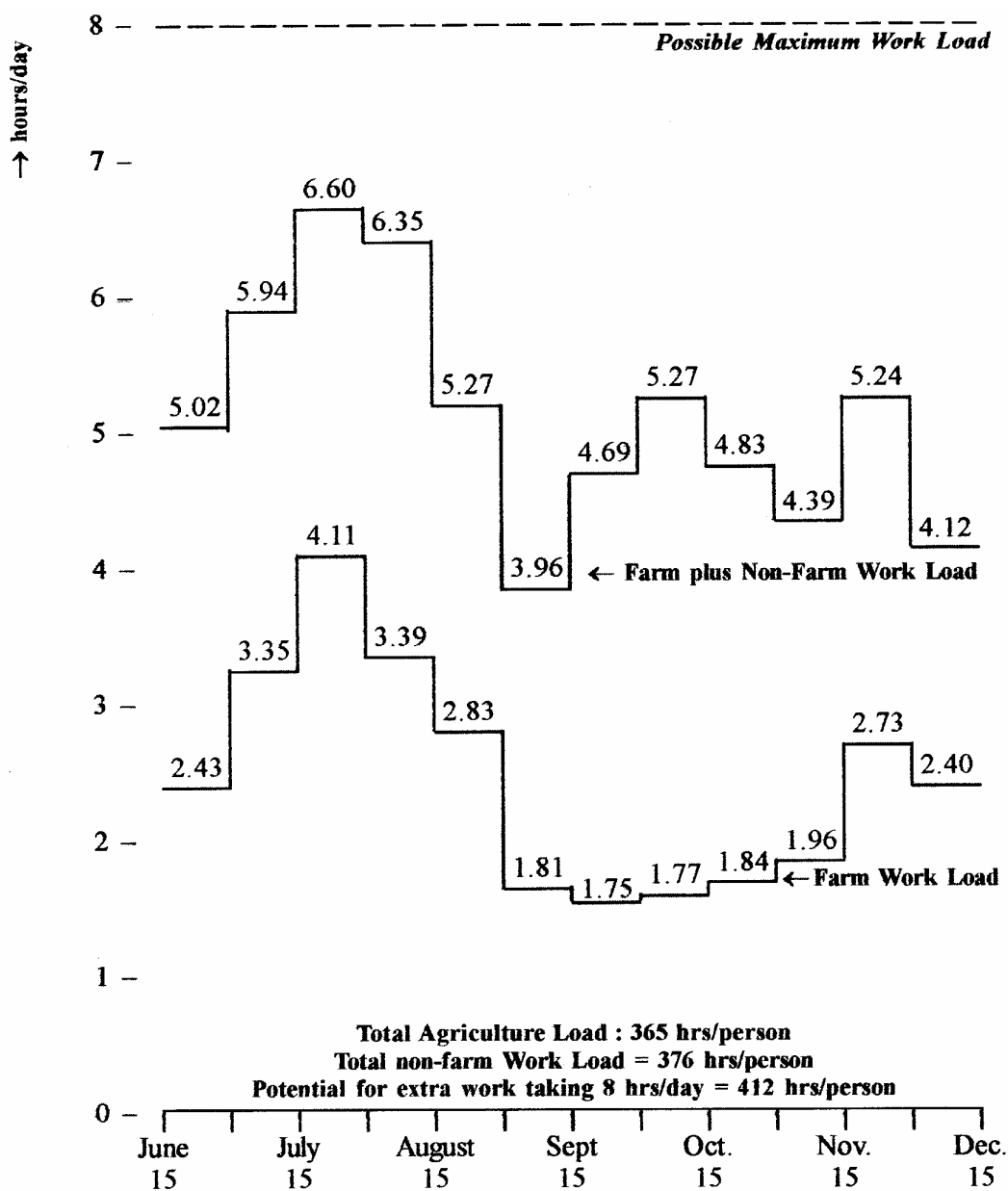
**Note** : Mandays have been calculated by assuming 1 manday equal women to put in 0.75 man day and child provides 0.5 man day per day of working..

**Source** : National Institute for Manpower Planning, N. Delhi

**Report** : Vision 2020 : Engineering Technology for Rural Development P-....



**JHA-01.06 : Kharif time workload for Men**



**Workload of Tribal Men for Income Generation**

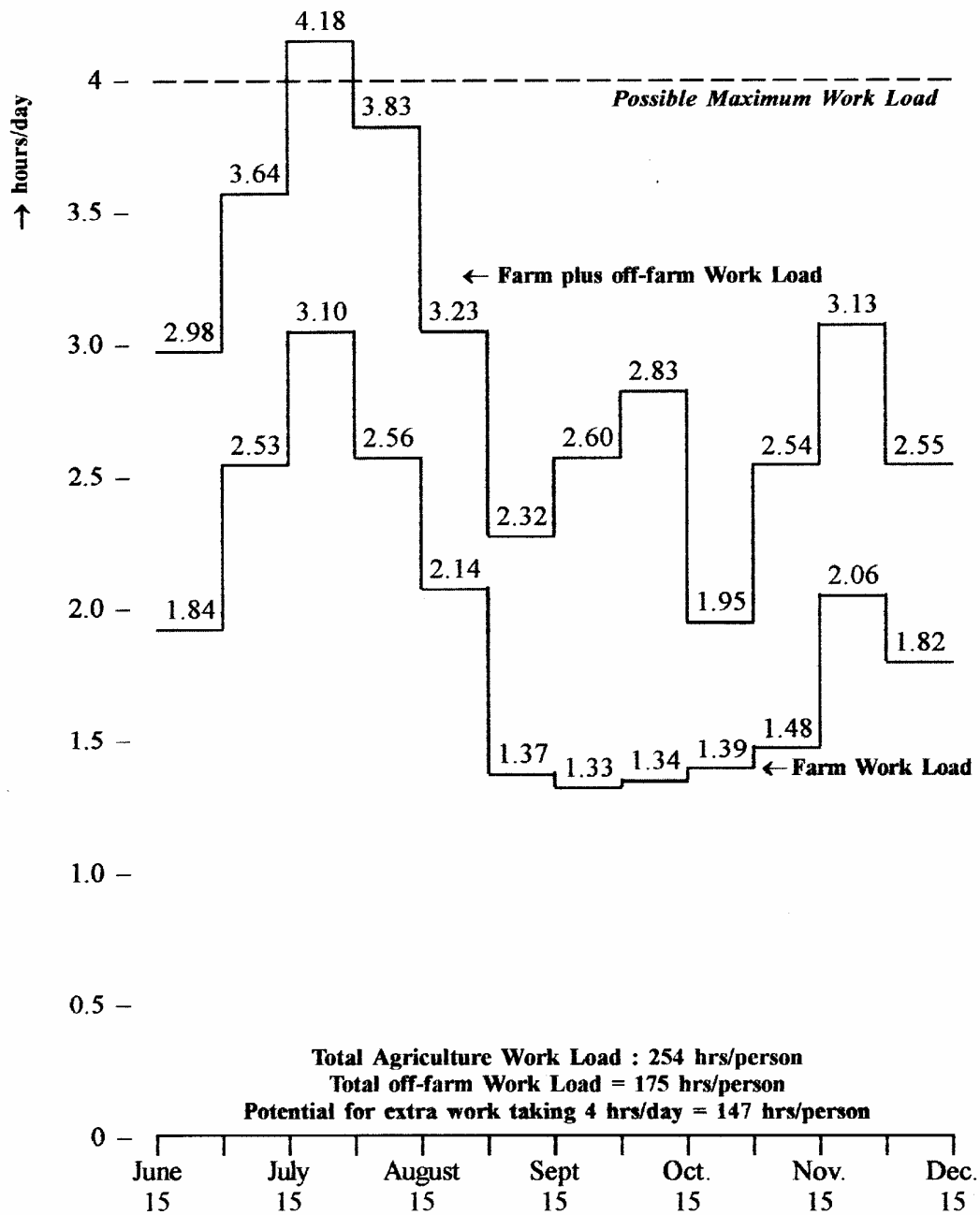
No. 148 men in 50 families, Av. Load holding : 3.65 acre

Every fortnight = 12 working days.

Based on data collection by SRI

Ref. : Starts in the Midday Sky by Dr. A. K. Basu. P-145

**JHA-01.00 : District Level Planning Tools**  
**JHA-01.07 : Kharif time workload for Women**



**Workload of Tribal Women for Income Generation**  
**No. 120 women in 50 families, Av. Load holding : 3.65 acre**  
**Every fortnight = 12 working days.**  
**Based on data collection by SRI**  
**Ref. : Starts in the Midday Sky by Dr. A. K. Basu. P-146**

**JHA-01.00 : District Level Planning Tools****JHA-01.08 : Economics of Crops**

Crop-wise Gross Value of Output, Cost of Cultivation and Net Value of Output per Acre on Sample Farms (Rs.)

<b>Crops Group</b>	<b>Gross Value of Output</b>	<b>Cost of Cultivation</b>	<b>Net Value of Output</b>	<b>Output-Input Ratio</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Food grains</b>	5280	1978	3302	2.67
Rice	5269	2042	3227	2.58
Wheat	5352	2187	3165	2.45
Maize	4164	1456	2708	2.86
Coarse Cereals	8704	1321	7383	6.59
Pulses	6597	1397	5200	4.72
<b>Oilseeds</b>	7330	2109	5221	3.48
Groundnut	10145	1901	8244	5.34
Mustard	8282	2454	5828	3.37
Soyabean	3778	1808	1970	2.09
<b>Vegetables</b>	19688	5907	13781	3.33
Potato	23039	8405	14634	2.74
Onion	16776	4706	12070	3.56
Tomato	24270	6991	17279	3.47
Lady Finger	12483	2562	9921	4.87
Brinjal	9926	3013	6913	3.29
Peas	11652	3364	8288	3.46
Cauliflower	19627	4994	14633	3.93
<b>Flowers</b>	25297	7993	17304	3.16
Bela	45996	14243	31753	3.23
Marigold	18750	6140	12610	3.05
Rose	35037	6682	28355	5.24
Gladiolus	16597	5893	10704	2.82

**JHA-01.00 : District Level Planning Tools**

<b>Crops Group</b>	<b>Gross Value of Output</b>	<b>Cost of Cultivation</b>	<b>Net Value of Output</b>	<b>Output-Input Ratio</b>
<b>Fruits</b>	18875	7245	11630	2.61
Guava	11634	3012	8622	3.86
Mango	29599	6389	23210	4.63
Lemon	14087	5712	8375	2.47

Our study reveals the high potential of crop diversification for income enhancement of farmers. Thus, three to five times increase in net income is possible if the farmers shift their area from food grains to horticultural crops. On an average, a shift of one acre from food grains to flowers will bring an additional income of Rs. 14,002 while a shift in favour of vegetables and fruits will bring an additional net income of Rs. 10,476 and Rs. 8,328 respectively.

Ref. : Crop Diversification as a strategy of Raising Farm Income & Employment : Paper by Prof. A. K. Singh, Member Finance Commission U.P. Engineering Technology for Rural Development, P-82.

**JHA-01.09 : Average Nutrient depletion due to agricultural output of 1.0 ton**

*Ref. : 2020 Perspective of Agriculture by ICAR*

Nitrogen : 300 kg

Phosphate : 12.0 kg

Potash : 58. kg

The above is for 1 MT of Grain Plus Straw.

**JHA-01.00 : District Level Planning Tools**

**JHA-01.10 : Popular & Botanical Names**

<b>Sl. No.</b>	<b>English name</b>	<b>Botanical name</b>	<b>Hindi name</b>
<b>I.</b>	<b>Cereals</b>		
	1. Paddy	Oryza sativa	Dhan
	2. Wheat	Triticum sativum	Gahun
	3. Barley	Hordeum vulgare	Jau
	4. Oat	Avena sterilis Avena sativa	Jaie
<b>II.</b>	<b>Millets</b>		
	1. Maize	Zea Mays	Makai
	2. Great millet Sorghum	Andropogon sorghum	Jawar
	3. Bulrush millet Spiked millet Pearl millet	Pennisetum typhoidis	Bajra
	4. Barnyard millet	Echinochloa colona	Sawan
	5. Kodo millet	Pespolum scrobiculatum	Kodo
	6. Common millet Proso millet Hog millet	Panicum maleacenum	Chena
<b>III.</b>	<b>Pulses</b>		
	1. Black gram	Phasaolus mungo	Urad
	2. Chickling vetch	Lathyrus sativas	Khesari
	3. Cowpea	Vigna catjong	Lobia
	4. Field Pea	Pisum arvense	Matar
	5. Gram, Bengal gram	Cicer arietinum	Chana
	6. Green gram	Phoseshus aureus	Mung
	7. Horse gram	Dolichos oiflorus	Kulthi
	8. Lentil	Lens eseulenta	Masur
	9. Pigeon Peas	Cajanus cajan	Rahar
<b>IV.</b>	<b>Oil Seeds</b>		
	1. Black mustard	Brassica nigra	Kali sarson
	2. Brown Sarson	Brassica compastris	Sarson

**JHA-01.00 : District Level Planning Tools**

<b>Sl. No.</b>	<b>English name</b>	<b>Botanical name</b>	<b>Hindi name</b>
	3. Castor	Bicinus communis	Rehri
	4. Groundnut	Arachis hypogaea	Mungphali
	5. Indian mustard, Mustard	Brassica juncea	Rai
	6. Linseed	Linum usitatissimum	Tisi
	7. Niger	Guizotia abyssinico	Sarguja
	8. Soyabean	Glycine hispida	Soyabean
	9. Sunflower	Helianthus annuus	Suryamukhi
	10. Sesame	Sesamum indicum	Til
<b>V.</b>	<b>Fibre Crop</b>		
	1. Cotton	Gossipium spp	Kapas
	2. Brown hemp	Hibiscus eannabinus	Patsan
	3. Jute	Corchorus spp	Jute
	4. Sunhemp	Crotolaria juncea	Sanai
	5. Sesal hemp	Agave spp.	Sann
<b>VI.</b>	<b>Sugar &amp; Starch</b>		
	1. Sugarcane	Saccharum officinarium	Ekh
	2. Tapioca	Manihot utilissima	Taprica
<b>VII.</b>	<b>Vegetables</b>		
	1. Ash gourd	Benincasa carifera	Bhatua
	2. Beet gourd	Beta vulgaris	Chukandar
	3. Bitter gourd	Momordica charantio	Karela
	4. Bottle gourd	Lagenaria leucantha	Kaddu
	5. Brinjal	Solanum melongena	Baigan
	6. Broad bean	Vicia faba	Baakla
	7. Cabbage	Brassica oleracea	Patta Kobi
	8. Carrot	Daucus carota	Gajar
	9. Cauliflower	Brassica oleracea	Kobi
	10. Cucumber	Cucumis sativus	Kheera
	11. Drum stick	Movinga pterigosperma	Munga
	12. French bean	Phascolus vulgaris	Jungli sim
	13. Goose foot	Chenopodium album	Bathua
	14. Indian bean	Dolichos lablab	Sem
	15. Knol khol	Brassica oleracea	Ganth gobi

**JHA-01.00 : District Level Planning Tools**

<b>Sl. No.</b>	<b>English name</b>	<b>Botanical name</b>	<b>Hindi name</b>
	16. Lady's finger	Hibiscus esculantus	Bhindi
	17. Lettuse	Lactuca sativa	Salad
	18. Little Gourd	Coccinia indica	Kudru
	19. Musk melon	Cucumis melo	Kharbuja
	20. Onion	Allium cepa	Pyaz
	21. Potato	Solanum tuberosum	Aalu
	22. Pumpkin	Cucurbita pepa	Konhra
	23. Radish	Raphamrs sativus	Muli
	24. Ridge gourd	Luffa acutangula	Jhingi
	25. Snake gourd	Trichosanthes anguina	Chichinge
	26. Spinach	Spinacia oleracea	Palak
	27. Sweet potato	Ipomea batata	Shakarkand
	28. Tomato	Lycopersicum esculantum	Tamatar
	29. Turnip	Brassica compastris	Salgum
	30. Velvet bean	Mucuna cochinchinensis	Tohar sem
<b>VIII.</b>	<b>Fruits</b>		
	1. Apple	Pyrus malus L	Seo
	2. Banana	Musa paradici	Kela
	3. Custard Apple	Annona squamosa	Sharifa
	4. Grape Fruit	Citrus paradisi M	Grape Fruit
	5. Grape vine	Vitis vinifera L	Angoor
	6. Guava	Pisidium guajava L	Amrood
	7. Jackfruit	Artocarpus integrifolia	Katahal
	8. Jujube	Ziziphus jujuba L	Ber
	9. Lemon	Citrus limonia	Bara Nimboo
	10. Lime	Citrus aurantifolia	Kagzi Nimboo
	11. Litchi	Litchi chinensis S	Litchi
	12. Mango	Mangifera indica	Am
	13. Papaya	Carica papaya L	Papita
	14. Mulberry	Morus alba L	Shahtoont
	15. Orange	Citrus reticulata	Narangi
	16. Pine Apple	Annanas Sativa S	Annanas

**JHA-01.00 : District Level Planning Tools**  
**JHA-01.11 : Soil Selection for Wheat**

*Ref. : Land Evaluation, Part-III, by Prof. Ir. C. Sys*

**Ideal Condition :**

Slope	:	3.8%
Drainage	:	Well
Texture	:	Clayey
Depth	:	100-150 cm.
Rainfall	:	Annual total above 1000 mm.
Fertility	:	Medium
pH	:	6.5

For Non-ideal, the following are suggested weightages

<b>Slope</b>	<b>0-3 %</b>	<b>1-3 %</b>	<b>3-8 %</b>	<b>8-15 %</b>
Weightage	0	0	1	2

<b>Drainage</b>	<b>Well</b>	<b>Medium</b>	<b>Excessive</b>	<b>Poor</b>
Weightage	0	1	2	3

<b>Texture</b>	<b>C &amp; L</b>	<b>G L</b>
Weightage	1	2

<b>Soil Depth</b>	<b>&gt; 150 cm</b>	<b>100-150 cm</b>	<b>75-100 cm</b>	<b>25-50 cm</b>
Weightage	0	0	0	2

<b>Rainfall</b>	<b>1000 mm &amp; Normal</b>	<b>1000 mm &amp; less Normal</b>	<b>770</b>
Weightage	1	2	3

<b>Fertility</b>	<b>Good</b>	<b>Medium</b>	<b>Low Medium</b>	<b>Low</b>
Weightage	1	2	3	3

Based on the above weightages, selection is based on

<b>Total Weightage</b>	<b>4</b>	<b>5-9</b>	<b>10</b>	<b>10-12</b>	<b>Above 12</b>
Suitability	High	Moderate	Marginally	Modifiedly	Unsuitable



**JHA-01.00 : District Level Planning Tools**

**JHA-01.12 : Soil Selection for Maize**

Weightage

<b>Rainfall</b>	<b>Ideal, 1000 mm<sup>+</sup></b>	<b>Below 800</b>
Weightage	0	1

<b>Slope</b>	<b>Ideal, 0-3 %</b>	<b>3-8 %</b>	<b>8-15 %</b>
Weightage	0	1	2

<b>Drainage</b>	<b>Ideal, Medium</b>	<b>Well</b>	<b>Excessive</b>
Weightage	0	1	3

<b>Texture</b>	<b>Ideal, Clayey</b>	<b>L</b>	<b>GL</b>
Weightage	0	2	3

Selection

<b>Total Weightage</b>	<b>1-3</b>	<b>4-5</b>	<b>6-8</b>	<b>9 +</b>
Suitability	High	Moderate	Marginal	Modifiedly