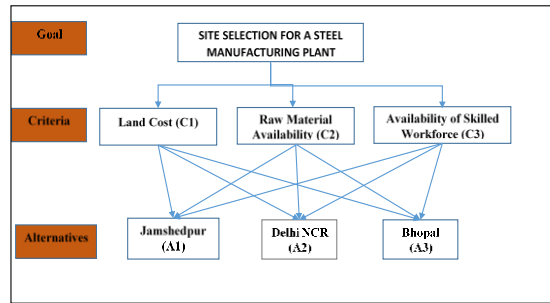


Analytical Hiererchy Process (AHP)

Intensity of importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective
3	Weak importance of one over another	Experience and judgement slightly favour one activity over another
5	Essential and strong importance	Experience and judgement strongly favour one activity over another
7	Very strong and demonstrated importance	An activity is favoured strongly over another; its dominance demonstrated in practice
9	Absolute importance	The evidence favouring one activity over another is of the highest possible order of affirmation
2,4,6,8	Intermediate values between adjacent scale values	When compromise is needed
Reciprocals of above non-zero	If activity <i>i</i> has one of the above non-zero numbers assigned to it when compared with activity <i>j</i> , then <i>j</i> has the reciprocal value when compared with <i>i</i>	A reasonable assumption
Rationals	Ratios arising from the scale	If consistency were to be forced by obtaining values to span the matrix



$$AX = \lambda_{max} X$$

Q How important is C1 with respect to C2

Land cost is more important than raw material availability

land cost=2a, raw material availability=a

	C1	C2	C3
C1	1	2	7
C2	1/2	1	5
C3	1/7	1/5	1
Sum	1.64	3.20	13.00

	C1	C2	C3
C1	0.6087	0.6250	0.5385
C2	0.3043	0.3125	0.3846
C3	0.0870	0.0625	0.0769
	1.0000	1.0000	1.0000

0.5907
0.3338
0.0755
1.0000

1.7866
1.0065
0.2266

3.024416
3.015028
3.003087

λ_{max} 3.014177

CI consistency Index = $(\lambda_{max} - n) / (n - 1)$ 0.007088
 CR Consistency ratio **if CR < 0.1 (consistent)**
 RI Random Index
CR = CI / RI 0.0136 Consistent

n	1	2	3	4	5	6	7
RI	0	0	0.52	0.88	1.11	1.25	1.35

Land Cost C1

	JAMSHED PUR	DELHI NCR	BHOPAL
JAMSHEDPUR	1	1/7	1/5
DELHI NCR	7	1	2
BHOPAL	5	1/2	1
Sum	13.00	1.64	3.20

	JAMSHED PUR	DELHI NCR	BHOPAL
JAMSHED PUR	0.0769	0.0870	0.0625
DELHI NCR	0.5385	0.6087	0.6250
BHOPAL	0.3846	0.3043	0.3125
	1.0000	1.0000	1.0000

0.0755
0.5907
0.3338
1.0000

0.2266
1.7866
1.0065

3.003087
3.024416
3.015028

λ_{max} 3.014177

$AX = \lambda_{max} X$
 CI consistency Index = $(\lambda_{max} - n) / (n - 1)$ 0.007088
 CR Consistency ratio
 RI Random Index
CR = CI / RI 0.0136 Consistent

Raw Material Availability C2

	JAMSHED PUR	DELHI NCR	BHOPAL
JAMSHEDPUR	1	9	7
DELHI NCR	1/9	1	1/2
BHOPAL	1/7	2	1
Sum	1.25	12.00	8.50

	JAMSHED PUR	DELHI NCR	BHOPAL
JAMSHED PUR	0.7975	0.7500	0.8235
DELHI NCR	0.0886	0.0833	0.0588
BHOPAL	0.1139	0.1667	0.1176
	1.0000	1.0000	1.0000

0.7903
0.0769
0.1327
1.0000

2 2/5
1/4
2/5

3.051687
3.004481
3.00946

λ_{max} 3.021876

$AX = \lambda_{max} X$
 CI consistency Index = $(\lambda_{max} - n) / (n - 1)$ 0.010938
 CR Consistency ratio
 RI Random Index
CR = CI / RI 0.0210 Consistent

Availability of Skilled Workforce C3

Decision Matrix (A)

	JAMSHED PUR	DELHI NCR	BHOPAL
JAMSHEDPUR	1	1	5
DELHI NCR	1/5	1	5
BHOPAL	1/5	1/5	1
Sum	2.20	2.20	11.00

Normalised matrix

	JAMSHED PUR	DELHI NCR	BHOPAL
JAMSHED PUR	0.4545	0.4545	0.4545
DELHI NCR	0.4545	0.4545	0.4545
BHOPAL	0.0909	0.0909	0.0909
	1.0000	1.0000	1.0000

Priority Matrix (X)
0.4545
0.4545
0.0909
1.0000

AX
1 1/3
1 1/3
1/4

AX/X
3
3
3

λmax 3

$AX = \lambda_{max} X$

CI consistency Index = $(\lambda_{max} - n) / (n - 1)$ 0

CR Consistency ratio

RI Random Index

CR = CI / RI 0.0000 Consistant

Ranking of Alternatives

	JAMSHED PUR	DELHI NCR	BHOPAL
Land Cost	0.5907	0.0755	0.3338
Raw Material Availability	0.3338	0.7903	0.1327
Availability of Skilled Workforce	0.0755	0.4545	0.0909

	JAMSHEDPUR	DELHI NCR	BHOPAL
Land Cost	0.0446	0.3489	0.1972
Raw Material Availability	0.2638	0.0257	0.0443
Availability of Skilled Workforce	0.0343	0.0343	0.0069
Overall ranking	0.3427	0.4089	0.2484