

**Table 1.** Initial matrix for MCDM

Criteria <i>i</i>		<i>z</i>	Measur ement	Weight	Alternatives <i>j</i>									
					<i>A</i> <sub>1</sub>	<i>A</i> <sub>2</sub>	<i>A</i> <sub>3</sub>	<i>A</i> <sub>4</sub>	<i>A</i> <sub>5</sub>	<i>A</i> <sub>6</sub>	<i>A</i> <sub>7</sub>	<i>A</i> <sub>8</sub>	<i>A</i> <sub>9</sub>	<i>A</i> <sub>10</sub>
1	House prices in relation to income	-	Ratio	0.063135	3.5	4.9	4.7	4.9	5.1	4	4.8	3.6	3.8	4.7
2	Rental costs in relation to income	-	%	0.063135	19	30	24	28	28	24	29	30	23	25
3	Interest rates and mortgage availability	-	%	0.058055	60	60	60	60	60	60	60	60	60	60
4	Availability of rented accommodation	+	%	0.058055	1.3	0.4	0.32	0.82	0.3	0.6	0.1	1.1	0.7	1.4
5	Availability of low cost homeownership products	+	Points	0.051524	2	1	1	1	2	2	3	3	1	2
6	Availability of market value home ownership products	+	%	0.04717	1.1	2.8	2.3	2.7	2.7	2.5	1.3	1.1	2.3	3
7	Crime	-	Rate	0.044267	135	39	58	41	57	56	65	135	89	75
8	Access to employment	+	Points	0.053701	3	3	3	3	3	2	3	3	3	3
9	Access to public transport	+	Points	0.049347	4	3	4	5	4	4	4	5	5	6
10	Access to good quality schools	+	Points	0.050073	5	6	5	5	4	4	3	5	6	6
11	Access to shopping facilities	+	Points	0.045718	3	1	2	2	3	1	2	3	1	3
12	Access to health services	+	Points	0.047896	9	9	9	9	9	9	9	9	9	9
13	Access to child care	+	Points	0.046444	6	6	6	5	6	6	6	6	6	6
14	Access to leisure	+	Points	0.039913	6	3	5	5	4	5	4	5	4	4
15	Access to open green public space	+	Points	0.043541	3	3	3	3	3	3	3	3	3	3
16	Presence of environmental problems	-	%	0.044267	24	1.5	29.3	4	21.1	19.4	15.9	13	46.6	30.5
17	Quality of housing in area	+	%	0.055152	72.4	70.3	69.1	79.4	86.2	89.9	77.5	72.8	89.1	82.9
18	Energy efficiency of housing in area	+	%	0.05225	60	55	57	53	57	64	63	66	61	68
19	Waste management in area	+	%	0.04209	35	35	35	35	35	35	35	35	35	35
20	Deprivation in area	-	%	0.044267	97.6	5	5.2	3.1	0	38.8	83.5	93.7	62.1	22.1

\* The sign (+/-) indicates that a greater/lesser criterion value satisfies sustainable housing affordability

**Table 2.** Initial matrix for MCDM with all criteria calculated as benefit criteria\*~~with all benefit criteria~~

Criteria <i>i</i>		Z	Weight	Alternatives <i>j</i>									
				1	2	3	4	5	6	7	8	9	10
1	House prices in relation to incomes	+	0.063135	5.1	3.7	3.9	3.7	3.5	4.6	3.8	5	4.8	3.9
2	Rental costs in relation to incomes	+	0.063135	30	19	25	21	21	25	20	19	26	24
3	Interest rates and mortgage availability	+	0.058055	60	60	60	60	60	60	60	60	60	60
4	Availability of rented accommodation	+	0.058055	1.3	0.4	0.32	0.82	0.3	0.6	0.1	1.1	0.7	1.4
5	Availability of low cost homeownership products	+	0.051524	2	1	1	1	2	2	3	3	1	2
6	Availability of market value home ownership products	+	0.04717	1.1	2.8	2.3	2.7	2.7	2.5	1.3	1.1	2.3	3
7	Crime	+	0.044267	39	135	116	133	117	118	109	39	85	99
8	Access to employment	+	0.053701	3	3	3	3	3	2	3	3	3	3
9	Access to public transport	+	0.049347	4	3	4	5	4	4	4	5	5	6
10	Access to good quality schools	+	0.050073	5	6	5	5	4	4	3	5	6	6
11	Access to shopping facilities	+	0.045718	3	1	2	2	3	1	2	3	1	3
12	Access to health services	+	0.047896	9	9	9	9	9	9	9	9	9	9
13	Access to child care	+	0.046444	6	6	6	5	6	6	6	6	6	6
14	Access to leisure	+	0.039913	6	3	5	5	4	5	4	5	4	4
15	Access to open green public space	+	0.043541	3	3	3	3	3	3	3	3	3	3
16	Presence of environmental problems	+	0.044267	24.1	46.6	18.8	44.1	27	28.7	32.2	35.1	1.5	17.6
17	Quality of housing in area	+	0.055152	72.4	70.3	69.1	79.4	86.2	89.9	77.5	72.8	89.1	82.9
18	Energy efficiency of housing in area	+	0.05225	60	55	57	53	57	64	63	66	61	68
19	Waste management in area	+	0.04209	35	35	35	35	35	35	35	35	35	35
20	Deprivation in area	+	0.044267	0	92.6	92.4	94.5	97.6	58.8	14.1	3.9	35.5	75.5

\*Table 2 only relates to WSM, WPM and revised AHP 1 since such methods can only use benefit criteria.

Table 31. Data obtained by ranking of the alternatives using different MCDM methods

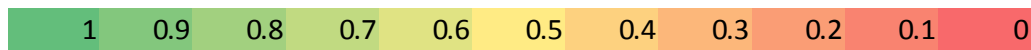
Method	Alternatives									
	$A_1$	$A_2$	$A_3$	$A_4$	$A_5$	$A_6$	$A_7$	$A_8$	$A_9$	$A_{10}$
WSM rank	0.1015	0.0972	0.0962	0.1055	0.1013	0.0989	0.0903	0.1024	0.0932	0.1134
	4	7	8	2	5	6	10	3	9	1
WPM rank	0	0.0923	0.0932	0.1029	0.0981	0.0972	0.0811	0.0905	0.0835	0.1105
	10	6	5	2	3	4	9	7	8	1
Revised AHP 1 rank	0.81	0.7812	0.7816	0.832	0.8121	0.7937	0.7407	0.8131	0.7682	0.8884
	5	8	7	2	4	6	10	3	9	1
Revised AHP 2 rank	0.9222	0.8434	0.8445	0.9824	0.9278	0.8775	0.7326	0.9308	0.8079	1.1365
	5	8	7	2	4	6	10	3	9	1
TOPSIS rank	0.4713	0.629	0.4889	0.7909	0.6148	0.5445	0.299	0.5271	0.252	0.8092
	8	3	7	2	4	5	9	6	10	1
COPRAS rank	0.099	0.1015	0.0961	0.1096	0.1021	0.0982	0.0891	0.1009	0.0912	0.1123
	6	4	8	2	3	7	10	5	9	1

Table 42. Priority of alternatives determined using different MCDM methods

Priority of alternatives	Methods				
	WSM	WPM	Revised AHP (approaches 1 and 2)	TOPSIS	COPRAS
1	$A_{10}$	$A_{10}$	$A_{10}$	$A_{10}$	$A_{10}$
2	$A_4$	$A_4$	$A_4$	$A_4$	$A_4$
3	$A_8$	$A_5$	$A_8$	$A_2$	$A_5$
4	$A_1$	$A_6$	$A_5$	$A_5$	$A_2$
5	$A_5$	$A_3$	$A_1$	$A_6$	$A_8$
6	$A_6$	$A_2$	$A_6$	$A_8$	$A_1$
7	$A_2$	$A_8$	$A_3$	$A_3$	$A_6$
8	$A_3$	$A_9$	$A_2$	$A_1$	$A_3$
9	$A_9$	$A_7$	$A_9$	$A_7$	$A_9$
10	$A_7$	$A_1$	$A_7$	$A_9$	$A_7$

**Table 5.** Correlation between alternative rankings computed using different MCDM methods.

Methods	WSM	WPM	Revised AHP 1/2	TOPSIS	COPRAS
WSM	1.000	.179	.995	.860	.944
WPM	.179	1.000	.189	.389	.306
Revised AHP 1	.995	.189	1.000	.831	.925
Revised AHP 2	.995	.189	1.000	.831	.925
TOPSIS	.860	.389	.831	1.000	.969
COPRAS	.944	.306	.925	.969	1.000



Similarity matrix is represented as a heat-map (shown below table 5) that shows the level of correlation between ranking results. The colour red indicates the most dissimilar rankings. MCDM method pairs with absolutely equal rankings has a Pearson correlation value equal to “1” and are indicated in the colour green.

**Table 6.** Distribution of sensitivity coefficients  $SC^*$ s:

MCDM method	Change of criterion weight											
	-5%			+5%			-50%			+50%		
	Sensitivity coefficient SC*											
	0	1	>1	0	1	>1	0	1	>1	0	1	>1
	Occurance of sensitivity coefficient amongst 20 criteria											
WSM	19	1	0	17	3	0	12	5	3	12	5	3
WPM	20	0	0	20	0	0	13	5	2	16	2	2
Revised AHP 1	15	5	0	15	5	0	6	7	7	10	4	6
Revised AHP 2	15	5	0	15	5	0	6	7	7	10	4	6
TOPSIS	19	0	1	19	1	0	14	0	6	14	0	6
COPRAS	20	0	0	20	0	0	11	3	6	8	7	5