

**Table S1: The models' indices used to create the suitability maps**

<b>Fishnet Points</b>	<b>Entropy_LSI</b>	<b>AHP_LSI</b>	<b>GRA_LSI</b>
1	1.08496	1.47090	0.69808
2	1.12159	1.33667	0.68952
3	1.17356	1.47316	0.63093
4	1.14972	1.38556	0.74273
5	1.47585	1.82333	0.55756
6	1.45384	1.82334	0.55829
7	1.17786	1.75638	0.58035
8	1.16379	1.57097	0.64764
9	1.16379	1.57097	0.62036
10	1.16379	1.57097	0.62856
11	1.16379	1.57097	0.61821
12	1.16462	1.54605	0.64940
13	1.28164	2.21384	0.52344
14	1.21477	1.91686	0.60779
15	1.21394	1.94178	0.59809
16	1.08496	1.47090	0.69461
17	1.19458	1.68255	0.57018
18	1.52766	2.14430	0.57624
19	2.09373	2.26056	0.44426
20	1.17174	1.70748	0.57096
21	1.52154	2.09540	0.55335
22	1.74654	1.81647	0.52637
23	1.72982	1.89030	0.54987
24	1.43977	1.63793	0.54913
25	1.22884	2.10227	0.54905
26	1.20865	1.86796	0.57332
27	1.48463	1.93492	0.56730
28	1.17257	1.68256	0.60666
29	1.18664	1.86797	0.65576
30	1.22884	2.10227	0.52710
31	1.17174	1.70748	0.63233
32	1.13566	1.52208	0.64865
33	1.11547	1.28777	0.68931
34	2.02869	2.05119	0.50575
35	1.46262	1.93493	0.55172
36	1.22272	2.05337	0.62026
37	1.18664	1.86797	0.57717
38	1.4565	1.88603	0.57612
39	1.78267	2.12073	0.54657
40	1.46262	1.93493	0.53960

41	1.22272	2.05337	0.51154
42	1.76061	2.00188	0.52496
43	1.14178	1.57098	0.60714
44	1.46874	1.98383	0.55762
45	1.17257	1.68256	0.61132
46	1.20865	1.86796	0.62407
47	1.26758	2.35036	0.57213
48	1.46902	2.27854	0.55133
49	1.19276	1.91687	0.56029
50	1.39785	1.69834	0.53470
51	1.17257	1.68256	0.56020
52	1.17869	1.73146	0.64292
53	1.20948	1.84304	0.58618
54	1.47668	1.79841	0.55356
55	1.24473	2.05336	0.60019
56	1.27982	2.44816	0.58460
57	1.54968	2.46622	0.51447
58	1.223	2.34808	0.60807
59	1.19304	2.21158	0.62156
60	1.44883	2.04423	0.54517
61	1.1585	1.49715	0.60729
62	1.1585	1.49715	0.57439
63	1.22967	2.07735	0.59587
64	1.19458	1.68255	0.62584
65	1.19458	1.68255	0.55124
66	1.47851	1.88602	0.57807
67	1.12286	1.42198	0.70779
68	1.55762	2.28080	0.51994
69	1.21477	1.91686	0.55624
70	1.44828	2.36386	0.63067
71	1.07034	1.60512	0.69529
72	1.14333	1.95100	0.63923
73	1.23066	1.86795	0.62051
74	1.43448	1.56411	0.58441
75	1.1585	1.49715	0.62751
76	1.72457	1.61341	0.59901
77	1.41958	1.40362	0.56525
78	1.14972	1.38556	0.64702
79	1.22967	2.07735	0.59689
80	1.18874	1.92836	0.65760
81	1.15183	1.76788	0.70939
82	1.15238	1.44825	0.72836
83	1.1014	1.10236	0.64844

**Table S2: Correlation result of the models**

LC data		Landfill Suitability Models Indices							
LC	Class	En-LSA		AHP-LSA		GRA-LSA			
		En-LSI and Class	Agree(*)/Not Agree (**)	AHP-LSI and Class	Agree(*)/Not Agree (**)	GRA-LSI and Class	Agree(*)/Not Agree (**)		
0.02275	L	1.08496 L	*	1.47090 L	*	0.69808 H	**		
0.02598	L	1.12159 L	*	1.33667 L	*	0.68952 H	**		
0.02083	L	1.17356 L	*	1.47316 L	*	0.63093 H	**		
0.01338	L	1.14972 L	*	1.38556 L	*	0.74273 H	**		
0.01338	L	1.47585 L	*	1.82333 L	*	0.55756 L	*		
0.03408	L	1.45384 L	*	1.82334 L	*	0.55829 L	*		
0.03692	L	1.17786 L	*	1.75638 L	*	0.58035 L	*		
0.03136	L	1.16379 L	*	1.57097 L	*	0.64764 H	**		
0.03378	L	1.16379 L	*	1.57097 L	*	0.62036 L	*		
0.03564	L	1.16379 L	*	1.57097 L	*	0.62856 L	*		
0.03411	L	1.16379 L	*	1.57097 L	*	0.61821 L	*		
0.02460	L	1.16462 L	*	1.54605 L	*	0.64940 H	**		
0.00879	L	1.28164 L	*	2.21384 H	**	0.52344 L	*		
0.05990	L	1.21477 L	*	1.91686 L	*	0.60779 L	*		
0.08412	H	1.21394 L	**	1.94178 L	**	0.59809 L	**		
0.05336	L	1.08496 L	*	1.47090 L	*	0.69461 L	*		
0.03626	L	1.19458 L	*	1.68255 L	*	0.57018 L	*		
0.00967	L	1.52766 H	**	2.14430 L	*	0.57624 L	*		
0.03165	L	2.09373 H	**	2.26056 L	*	0.44426 L	*		
0.07327	L	1.17174 L	*	1.70748 L	**	0.57096 L	**		
0.00989	L	1.52154 H	**	2.09540 H	**	0.55335 L	*		
0.03484	L	1.74654 H	**	1.81647 L	*	0.52637 L	*		
0.05526	L	1.72982 H	**	1.89030 L	*	0.54987 L	*		
0.05720	L	1.43977 L	*	1.63793 L	*	0.54913 L	*		
0.07273	H	1.22884 L	**	2.10227 H	*	0.54905 L	**		
0.03945	L	1.20865 L	*	1.86796 L	*	0.57332 L	*		

0.04629	L	1.48463	L	*	1.93492	L	*	0.56730	L	*
0.05693	L	1.17257	L	*	1.68256	L	*	0.60666	L	*
0.07174	H	1.18664	L	**	1.86797	L	**	0.65576	H	*
0.10073	H	1.22884	L	**	2.10227	H	*	0.52710	L	**
0.01981	L	1.17174	L	*	1.70748	L	*	0.63233	L	*
0.01706	L	1.13566	L	*	1.52208	L	*	0.64865	L	*
0.04627	L	1.11547	L	*	1.28777	L	*	0.68931	H	**
0.04740	L	2.02869	H	**	2.05119	H	**	0.50575	L	*
0.05822	L	1.46262	L	*	1.93493	L	*	0.55172	L	*
0.06856	H	1.22272	L	**	2.05337	H	*	0.62026	L	**
0.06882	H	1.18664	L	**	1.86797	L	**	0.57717	L	**
0.05958	L	1.4565	L	*	1.88603	L	*	0.57612	L	*
0.03218	L	1.78267	H	**	2.12073	H	**	0.54657	L	*
0.04658	L	1.46262	L	*	1.93493	L	*	0.53960	L	*
0.03511	L	1.22272	L	*	2.05337	H	**	0.51154	L	*
0.08139	H	1.76061	H	*	2.00188	L	**	0.52496	L	**
0.08224	H	1.14178	L	**	1.57098	L	**	0.60714	L	**
0.07377	H	1.46874	L	**	1.98383	L	**	0.55762	L	**
0.04906	L	1.17257	L	*	1.68256	L	*	0.61132	L	*
0.03349	L	1.20865	L	*	1.86796	L	*	0.62407	L	*
0.04053	L	1.26758	L	*	2.35036	H	**	0.57213	L	*
0.07072	H	1.46902	L	**	2.27854	H	*	0.55133	L	**
0.07927	H	1.19276	L	**	1.91687	L	**	0.56029	L	**
0.11151	H	1.39785	L	**	1.69834	L	**	0.53470	L	**
0.08936	H	1.17257	L	**	1.68256	L	**	0.56020	L	**
0.04899	L	1.17869	L	*	1.73146	L	*	0.64292	L	*
0.01512	L	1.20948	L	*	1.84304	L	*	0.58618	L	*
0.01572	L	1.47668	L	*	1.79841	L	*	0.55356	L	*
0.01916	L	1.24473	L	*	2.05336	H	**	0.60019	L	*
0.00873	L	1.27982	L	*	2.44816	H	**	0.58460	L	*
0.03697	L	1.54968	H	**	2.46622	H	**	0.51447	L	*

0.04523	L	1.223	L	*	2.34808	H	**	0.60807	L	*
0.04982	L	1.19304	L	*	2.21158	H	**	0.62156	L	*
0.05655	L	1.44883	L	*	2.04423	H	**	0.54517	L	*
0.06561	L	1.1585	L	*	1.49715	L	*	0.60729	L	*
0.05758	L	1.1585	L	*	1.49715	L	*	0.57439	L	*
0.00711	L	1.22967	L	*	2.07735	H	**	0.59587	L	*
0.02689	L	1.19458	L	*	1.68255	L	*	0.62584	L	*
0.02448	L	1.19458	L	*	1.68255	L	*	0.55124	L	*
0.02773	L	1.47851	L	*	1.88602	L	*	0.57807	L	*
0.03807	L	1.12286	L	*	1.42198	L	*	0.70779	H	**
0.01013	L	1.55762	H	**	2.28080	H	**	0.51994	L	*
0.01668	L	1.21477	L	*	1.91686	L	*	0.55624	L	*
0.03273	L	1.44828	L	*	2.36386	H	**	0.63067	H	**
0.07094	H	1.07034	L	**	1.60512	L	**	0.69529	H	*
0.06204	L	1.14333	L	*	1.95100	L	*	0.63923	L	*
0.05905	L	1.23066	L	*	1.86795	L	*	0.62051	L	*
0.06669	H	1.43448	L	**	1.56411	L	**	0.58441	L	**
0.03907	L	1.1585	L	*	1.49715	L	*	0.62751	L	*
0.03550	L	1.72457	H	**	1.61341	L	*	0.59901	L	*
0.02818	L	1.41958	L	*	1.40362	L	*	0.56525	L	*
0.02538	L	1.14972	L	*	1.38556	L	*	0.64702	H	**
0.00875	L	1.22967	L	*	2.07735	H	**	0.59689	L	*
0.03150	L	1.18874	L	*	1.92836	L	*	0.65760	H	*
0.04118	L	1.15183	L	*	1.76788	L	*	0.70939	H	*
0.04856	L	1.15238	L	*	1.44825	L	*	0.72836	H	**
0.05539	L	1.1014	L	*	1.10236	L	*	0.64844	L	*

### S3: The calculation step of entropy model

Step 1: Decision Matrix of the criteria is produced as in equation 1

$$X = (X_{ij})_{m \times n} = \begin{pmatrix} x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ \vdots & \vdots & \cdots & \vdots \\ x_{1m} & x_{2m} & \cdots & x_{mn} \end{pmatrix}_{m \times n} \quad (1)$$

Where X = the matrix defining the alternatives and the criteria.

$X_{im}$  = possible alternatives

$X_{jn}$  = evaluation criteria

m = number of possible alternatives.

n = number of evaluation criteria

Step 2: The decision matrix is normalized as in equation (2)

$$r_{ij} = \frac{x_{ij}}{\sum_{i=1}^m x_{ij}} \quad i = 1, 2 \dots m; j = 1, 2 \dots n \quad (2)$$

Step 3: The degree of Entropy is then calculated as in equation (3)

$$e_j = -\frac{1}{\ln(m)} \sum_{i=1}^m r_{ij} \ln(r_{ij}) \quad 0 \leq e_j \leq 1 \quad i = 1, 2 \dots m; j = 1, 2 \dots n \quad (3)$$

Step 4: The degree of entropy difference is then calculated using equation (4)

$$d_j = 1 - e_j \quad j = 1, 2 \dots n \quad (4)$$

Step 5: Entropy Weight (W) is then calculated using equation (5)

$$w_j = \frac{d_j}{\sum_{i=1}^m d_j} \quad (5)$$

Note,  $\sum_{j=1}^m w_j = 1 \quad j=1, 2 \dots m.$

#### S4: The computation steps of Saaty's 1980 AHP model

Saaty introduced the AHP model in 1980 for decision making based on expert's opinions. Since the judgements will be made by comparing the evaluating criteria to each other, table 1 is commonly adopted to determine the numerical equivalence of criteria to each other based on relevance.

Table 1. Saaty's scale of relevance

Verbal judgment of relevance	Numerical rating
Equal relevance	1
Equal to moderate relevance	2
Moderate relevance	3
Moderate to strong relevance	4
Strong relevance	5
Strong to very strong relevance	6
Very strong relevance	7
Very strong to extreme relevance	8
Extreme relevance	9

The following computation frameworks are then designed;

Step 1: In order to determine hierarchical framework for the pairwise comparison of factors, eq. 6 gives the total number of comparisons that can be created given number of evaluating criteria.

$$\text{Number of comparisons} = \frac{n(n-1)}{2}, \text{ 'n' is the number of criteria being considered} \quad (6)$$

Step 2: Since the initial response was gotten from the participants/ experts', eq. 7 give the geometric mean approach normally used to compute the final consolidated comparison matrix.

$$a_{ij}^c = \left( \prod_{k=1}^n a_{ij}^k \right)^{1/n} \quad (7)$$

Where,  $a_{ij}^c$  - consolidated pairwise comparison,  $a_{ij}^k$  - is the pairwise comparison given by participant,  $\prod_{k=1}^n$  - product of the participants' inputs,  $n$  - is the number of participants,  $1/n$  - is the square root based on the number of participants.

Step 3: The largest eigenvalue ( $\lambda_{max}$ ) is calculated and the system of equation given in eq. 8 is solved to generate the AHP weight

$$w_i = \frac{1}{\lambda_{max}} \sum_{j=1}^n a_{ij} w_{ij}, i = 1, 2, \dots, n \quad (8)$$

The generated weight is normalized such that  $\sum_{i=1}^n w_i = 1$

Step 4: The generated weight is checked for consistency as in eq. 9

$$CR = \frac{CI}{RI} \quad (9)$$

where, CR is the consistency ratio and for consistent and acceptable AHP weights, CR must be  $< 0.1$ , CI is the consistency index given by,  $CI = \frac{\lambda_{max} - n}{n - 1}$ , RI is the random index (Table 2) as given by Saaty (1987).

Table 2: The Random index values by Saaty (1987)

Number of factors considered (n)	1	2	3	4	5	6	7	8	9	10
RI	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.49