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GREEN CITY INITIATIVES: HUMAN-NATURE INTERACTION

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Abstract

Interaction with Nature [IN] refers to the urge or preference to be close to the natural environment, attentiveness and knowledge of the natural environment, and health associated attributes in relation to surroundings. ***Issue*****:** Since the vision of green city was introduced, Melaka has made great strides toward building a sustainable, green city. With the ongoing development towards reduction of carbon intensity 2020, IN of Melaka public needs to be evaluated to determine the human-nature connection with respect to the green initiative efforts. ***Purpose*****:** This paper aims to compare the IN of Melaka residents to residents of other states in Malaysia. ***Approach*****:** One-Way MANOVA was generated to determine the mean distribution of 10 IN items, across Malaysia States. ***Findings*****:** There were significant differences within subjects of the 10 IN items between-subjects of Malaysia States. The Post-Hoc Test indicated majority of the means of IN items for Melaka were significantly higher than other states. However, in relation to other states, Melaka was slightly shy on (i) IN2, *being able to recall experiences in the natural environment*, and (ii) IN5, *being able to notice scientific details of nature*.

Keywords: Melaka Green City, interaction with nature

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INTRODUCTION

The Melaka Green City Action Plans (MGCAP) 2014 reflects Melaka's long-term commitment to pursue low-carbon growth, improve environmental quality, and strengthen economic competitiveness. The plan delivers a clear direction on what Melaka needs to do in the coming years. The MCGAP provides a set of action plans aiming at maintaining Melaka's competitiveness as a popular tourist and investment destination, keeping environmental challenges to a minimum, and establishing the state as a role model for liveability in the region. Towards becoming a green city, Melaka needs to increase climate resilience, improve natural resource management and upgrade infrastructure for low carbon growth. Green cities are liveable, drivers of economic growth, climate resilient, have low carbon footprint and practices ecological approach to urban planning. Among many challenges to the implementation of MGCAP include miscoordination between multiple government agencies, private sector, community organizations and citizens.

In this paper, the human-nature interaction of the Melaka citizen with respect to the green initiative efforts is assessed in opposition to other states in Malaysia. The second dimension of the 'Human Interdependence with the Environment' model by Abu Bakar, et al., (2017) is adopted to examine the Melaka respondents' interaction with nature in comparison to respondents from other states of Malaysia.

LITERATURE REVIEW

Measures of individuals functionality and contributions to their social and environmental contexts that in turn influence the well-being of the individuals is known as Human Interdependence [HI] (Abu Bakar et al., 2019a; 2019b; 2019c; Abu Bakar et al., 2020a; 2020b; 2020c). Detailed studies on HI found that HI predicts 70% of Subjective Well-Being, suggesting that a huge source of individual well-being exists in the course of imparting well-being to social and environment surroundings (Abu Bakar et al., 2015; 2016a; 2016b; 2017a; 2017b; 2017c; 2017d; 2017e; 2017f; 2018). This paper focuses on Human Interdependence with the Environment [HIE].

HIE dimensions are recognized from a review of The World Book of Happiness (Bormans, 2010). The book reviews leading discoveries of well-being research across the glove. In order to emphasize on HIE manifestation viable for Malaysia, a number selected Asian articles are reviewed and tabulated. HI potential determinants and conditional factors are extracted from the main inferences of the articles. HIE are found in four overlapping and interconnected dimensions. This paper focuses on the second dimension of HIE, which is Interaction with Nature.

The second dimension indicates the personal contact with close and familiar relationships which contains a range of qualities representing emotional intimacy, closeness, familiarity, display of affection, involuntary acts and many others. In the environmental context, the instances of HI manifestations include the urge or preference to be close to the natural environment, attentiveness and knowledge of the natural environment, and health associated attributes in relation to surroundings. The manifestations are observed in the voluntary as well as the involuntary Interaction with Nature [IN]. Studies on outdoor environment and contact with nature are concerned on individuals' relationship with the natural environment. Case studies selected from Asian articles emphasised potential determinants and qualities of IN (refers to Table 1).

Table 1: Conditional Factors to Interaction with Nature

Conditional Factors	Potential Determinants	References
Communal belief: The forest living quarter, subsistence source of living, spiritual realm, physical fulfilment and ancestral sentiment to be defended	Stability of social life (health and spiritual) in relation to natural setting	(Kamarul Zahari et al., 2011)
Unmaintained outdoor space: murky water that provides a place for mosquito breeding, too dense vegetation, and tall and bushy that blocked views.	Emotions and feelings (safety and security) induced in natural elements	(Maruthaveeran, 2012)
Motivation (to experience nature, to enjoy fresh air, to participate in sports, to enjoy natural beauty, to gain knowledge and to build confidence, to unwind, to rest and to gain social network); activities (appreciating nature, trekking and hill climbing, observing sunrise, observing hilltop scenery, making friends, and pampering self).	Feeling the urge to be in the nature, acquiring knowledge and ability to cope with the outdoors, and equipped physically, emotionally and intellectually for staying outdoor	(Zainol et al., 2012)
Housing value depended on a variety of park elements, conceptual or design of the park, distance to the park, views towards the park, and active areas in the park facing the house.	The inclination to be close to natural or outdoor areas, the urge to spend time in the outdoor environment	(Shukur et al., 2011)
Health condition and availability of natural environmental: Views and accessibility partly influenced conducive healing environment to outdoor natural environment facing patients' window.	Health-related condition, the need to see, hear, notice and experience in outdoor nature while being indoor for a long period of time	(Ghazali & Abbas, 2011)
Physical well-being (active living); cognitive well-being (relief emotion, comfort, relaxed, and calmness, sense of privacy, solitude, and safety); and social well-being (social interaction with neighbours, participation, friendliness)	Having pleasant experience in natural setting, feeling relieved and relaxing emotions, and feeling energetic and healthy	(Mansor et al., 2012)
Accessibility to green open space (outdoor natural environment), and corresponding social health and behaviour (physical symptoms, stress, and anxiety disorder)	Health-related condition depending on outdoor environment, and the need for sufficient contact and IN	(Khotdee et al., 2012)
Stimulation of natural elements to encourage game-playing motivation (connectedness and continuity of green areas and flexibility of spaces and diversity of natural elements)	Sense of curiosity of natural elements and feeling engaged, creative and active in natural setting	(Faizi et al., 2013)
Age, gender, health-related conditions (stamina, health issues) and facilities in outdoor areas	Physical health and capability in outdoor areas	(Inani et al., 2013)
The physical setting of outdoor space: characteristics of groundcovers, open spaces, and tree foliage.	Ability to adapt and adjust to natural surrounding	(Ngesan et al., 2013)
Uniqueness of natural features and distinct character of landscape elements such as tree trunks, water fountain, and presence of animals	Curiosity of natural features (ability to see, hear, notice details of environment)	(Mahidin & Maulan, 2012)

IN manifests in the internal and external emotions and aptitudes towards the natural environment expressed in the contact between human and the ecological nature. Qualities adhere to IN include (i) health concerns resolved through access to nature, (ii) knowledge, senses and emotions encountered in the natural environment and (iii) physical and social activities in an outdoor (Abu Bakar et al., 2020a; 2020b; 2020c) (refer to Table 2 and Table 3).

Table 2: Manifestation and Determinants of Interaction with Nature

Determinants	Qualities inferred through Indicators
health-related concerns resolved through access to the natural environment	the health-related condition, the need to see, hear, notice and experience to natural surroundings while being indoor or after being indoor for a while, having a pleasant experience in natural setting, feeling energetic and healthy in the natural environment, ability to adapt and adjust to natural surrounding
knowledge, senses and emotions encountered in the natural environment	emotions and feelings, feeling the urge to be in natural environment, ability to see, hear, notice details of environment, acquiring knowledge and ability to cope with outdoor surrounding, equipped physically, emotionally and intellectually for staying outdoor, and feeling calm and relaxed in nature, sense of curiosity of natural features and ecological elements
physical and social activities in an outdoor environment	the urge to spend time in the outdoor environment, the inclination to be close to natural or outdoor areas, social interaction in a natural setting, feeling engaged, creative and active in natural setting

Table 3 Indicators of Interaction with Nature

Definition of IN	Components	Indicators	Code
The internal and external emotions and aptitudes towards the natural environment expressed in the contact between human and the ecological nature.	Nature Attachment	outdoor environment determining own health and wellness	IN1
		being able to recall experiences in the natural environment	IN2
	Knowledge and Capability	being able to adapt to various outdoor surroundings	IN3
		being able to see and hear what others usually miss in nature	IN4
		being able to notice scientific details of nature	IN5
		being able to cope with the outdoor environment	IN6
	Inclination towards Nature	feeling the urge to spend time in the natural environment	IN7
		tending to lose concentration without contact with nature	IN8
		tending to have objects from the outdoors in personal space	IN9
		spending time planting at home	IN10

The indicators were developed into statements in questionnaires to be answered by respondents across states in Malaysia.

METHODS

A sample of 4315 was gathered after the data screening process. The Malaysian respondents were given an 11-point Likert scale to respond to questionnaire items which consist of statements relating to the ten (10) IN items. One-Way Multivariate Analysis of Variance [MANOVA] was generated to determine the multivariate effect of Malaysia States on IN items. It is hypothesized that different states respond differently towards each of the 10 IN items. The following sections provide empirical evidence on the statistical interaction

between Malaysia States and the IN items with attention to Melaka in opposition to other states.

RESULTS

One-Way MANOVA using Statistical Package for the Social Sciences [SPSS] was generated to determine the mean distribution of the dependent variables which were the 10 IN items, across the subjects of the independent variable, which was Malaysia States.

Prior to the One-Way MANOVA test, the data was screened for (i) missing cases, (ii) unengaged responses (SD ≠ 0), (iii) univariate and extreme outliers (boxplot and SD < 3.0), (iv) normality (skewness < 1.5, kurtosis < 3.0) and (v) linearity (r > 0.30). The data was also screened for (vi) multicollinearity (VIF < 3.0) and (vii) multivariate normality and influential outliers (Cook's Distance < 1.0). Since each state consists of more than 30 cases (>200 respondents), the MANOVA test was robust against violations of homogeneity of variance-covariance matrices assumption. It is also to note that the multivariate homogeneity of variance between group assumption using Levene's Test was violated ($p < .001$). Therefore, a stricter alpha level was used ($\alpha = 99.9\%$, $p = .001$) to interpret the univariate ANOVAs (Allen & Bennett, 2008).

One-Way MANOVA was conducted to determine significant differences within-subjects of IN items combined, between-subjects of Malaysia States. The deduced statistical hypothesis was:

> H_0: *There were no significant differences within subjects of the 10 IN items between-subjects of Malaysia States. That is, Malaysia States have no multivariate effects on the 10 IN items.*

The statistical output revealed that **at 99% confidence level there was a statistically significant mean differences within-subjects of IN items between-subjects of states, F (140, 43000) = 5.552, p < .00001; Pillai's Trace V = .178, partial η2 = 018. The null hypothesis was rejected.** There were significant differences within-subjects of the 10 IN items between-subjects of Malaysia States. That is, Malaysia States had statistically significant multivariate effects on the 10 IN items, and the effect size was medium.

The One-Way MANOVA outputs, in essence, suggested that residents across the states reacted differently to each of the IN items. That is, the outcome, i.e. the mean values of each of the IN items were distinct from each other due to the different state they were coming from.

Table 4 shows the mean values of IN items across states. A radar chart was generated to demonstrate the difference in means of IN items across states. The chart shows that Melaka had high mean values for IN1, IN3, IN4, IN6, IN7, IN8, IN9 and IN 9 in relation to other states. On the contrary, Melaka had

moderate to low mean values for IN2 and IN5 in relation to other states. Table 4 tabulates the Tests Between-Subject Effects and Post-Hoc Comparison of Melaka Mean Values for IN items against other states.

Table 4: Descriptive Statistics: Mean Values of IN items

IN	**MEL**	PUT	KL	SEL	N9	JOH	PAH	TER	KEL	PER	PEN	KED	PERL	SAB	SAR
IN1	9.13	7.59	8.24	8.36	9.03	8.40	8.43	8.48	8.79	8.01	8.02	8.43	8.51	7.61	7.48
IN2	8.83	7.49	8.24	8.22	8.71	8.35	8.33	8.50	8.86	7.80	8.08	8.22	9.19	7.55	7.21
IN3	8.71	7.39	7.64	7.68	8.43	8.12	8.02	8.01	8.32	7.38	7.40	7.74	8.20	7.62	7.20
IN4	8.61	7.59	7.57	7.65	8.30	8.05	7.92	8.03	8.13	7.37	7.36	7.57	8.16	7.45	7.17
IN5	7.86	7.59	7.10	7.16	8.19	7.63	7.63	7.62	7.47	7.01	7.07	7.29	7.61	7.33	7.08
IN6	8.42	7.46	7.48	7.58	8.36	8.07	7.88	8.01	8.10	7.36	7.43	7.59	8.41	7.47	7.20
IN7	8.56	7.56	7.61	7.93	8.64	8.19	7.96	8.00	8.42	7.47	7.76	7.90	8.63	7.43	7.25
IN8	8.45	7.56	7.54	7.75	8.33	7.99	7.91	8.01	8.14	7.36	7.73	7.72	8.35	7.29	7.18
IN9	8.61	7.78	7.34	7.55	8.25	7.89	7.69	7.97	8.15	7.39	7.42	7.55	8.36	7.19	7.04
IN10	8.41	7.88	7.15	7.40	8.05	7.81	7.74	7.78	8.03	7.26	7.52	7.59	7.85	7.33	7.26

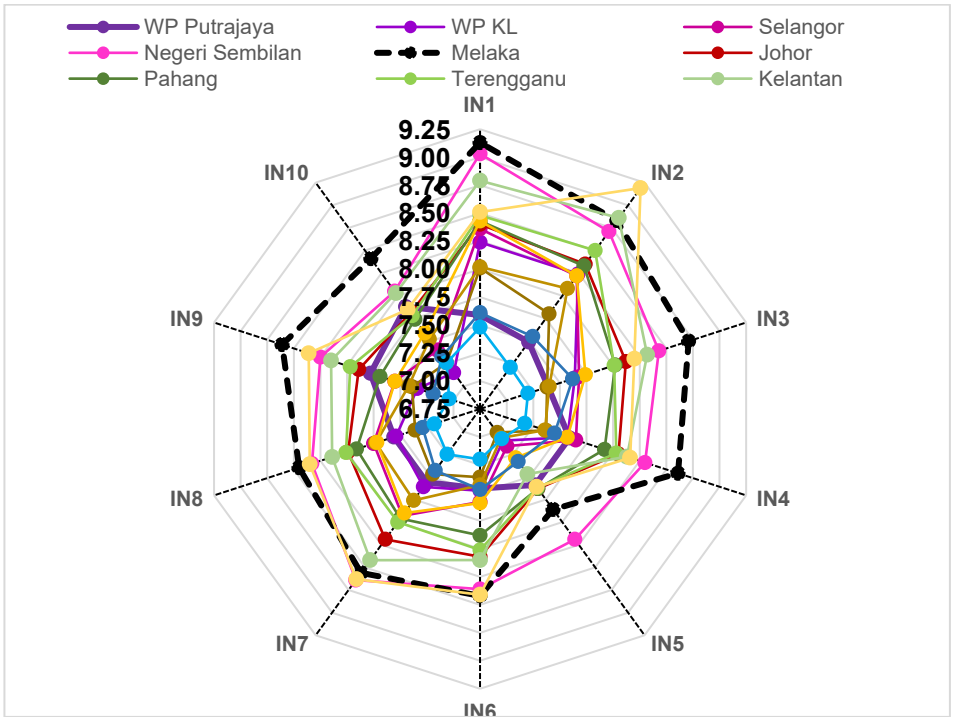

Figure 1: Radar Chart of IN Items Mean Values Across States

Table 5: Univariate ANOVAs and Post-Hoc Comparison of Melaka Mean Values

UNIVARIATE ANOVAs

DV	Type III Sum of Squares	df	Mean Square	F	Sig.	η2
IN1	832.982	14,4300	59.499	19.275	.000	.059
IN2	1044.855	14,4300	74.633	23.756	.000	.072
IN3	667.462	14,4300	47.676	17.017	.000	.052
IN4	607.713	14,4300	43.408	15.029	.000	.047
IN5	408.280	14,4300	29.163	8.551	.000	.027
IN6	602.052	14,4300	43.004	16.108	.000	.050
IN7	741.881	14,4300	52.992	16.414	.000	.051
IN8	585.079	14,4300	41.791	13.358	.000	.042
IN9	75.554	14,4300	53.611	12.760	.000	.040
IN10	449.624	14,4300	32.116	9.610	.000	.030

POST-HOC TESTS: MEAN DIFFERENCE OF MELAKA AGAINST OTHER STATES

IN		PUT	KL	SEL	N9	JOH	PAH	TER	KEL	PER	PEN	KED	PERL	SAB	SAR
IN1	MD	**1.550**	**.890**	**.77**	.100	**.730**	**.700**	*.65*	*.340*	**1.120**	**1.101**	**.700**	*.620*	**1.520**	**1.650**
	p	**.001**	**.001**	**.001**	.999	**.001**	**.002**	*.011*	*.766*	**.001**	**.001**	**.001**	*.032*	**.001**	**.001**
IN2	MD	**1.34**	*.590*	**.61**	*.130*	*.480*	*.500*	*.330*	*-.030*	**1.030**	**.750**	*.610*	*-.360*	**1.290**	**1.620**
	p	**.001**	*.034*	**.002**	*.999*	*.101*	*.130*	*.831*	*.999*	**.001**	**.001**	*.012*	*.772*	**.001**	**.001**
IN3	MD	**1.32**	**1.070**	**1.03**	.280	**.590**	**.690**	**.70**	*.390*	**1.330**	**1.310**	**.970**	*.520*	**1.090**	**1.510**
	p	**.001**	**.001**	**.001**	.941	**.003**	**.001**	**.002**	*.485*	**.001**	**.001**	**.001**	*.117*	**.001**	**.001**
IN4	MD	*1.03*	**1.040**	**.96**	.310	**.560**	**.690**	*.59*	*.480*	**1.240**	**1.260**	**1.040**	*.450*	**1.160**	**1.440**
	p	*.031*	**.001**	**.001**	.877	**.009**	**.001**	*.028*	*.167*	**.001**	**.001**	**.001**	*.310*	**.001**	**.001**
IN5	MD	*.270*	**.760**	**.70**	-.330	*.230*	.230	*.240*	*.390*	**.850**	**.790**	**.570**	*.250*	*.530*	**.780**
	p	*.999*	**.001**	**.001**	.895	*.985*	.991	*.993*	*.638*	**.001**	**.001**	**.042**	*.990*	*.050*	**.001**
IN6	MD	*.96*	**.940**	**.84**	.060	*.350*	.540	*.410*	*.320*	**1.060**	**.990**	**.830**	*.020*	**.950**	**1.220**
	p	*.045*	**.001**	**.001**	.999	*.458*	.024	*.368*	*.758*	**.001**	**.001**	**.001**	*.999*	**.001**	**.001**
IN7	MD	*.999*	**.950**	**.63**	-.080	*.370*	.600	*.560*	*.140*	**1.090**	**.800**	**.660**	*-.070*	**1.130**	**1.310**
	p	*.077*	**.001**	**.001**	.999	*.534*	.023	*.077*	*.999*	**.001**	**.001**	**.004**	*.999*	**.001**	**.001**
IN8	MD	*.890*	**.910**	**.70**	.120	*.460*	.540	*.440*	*.310*	**1.090**	**.720**	**.720**	*.100*	**1.160**	**1.270**
	p	*.179*	**.001**	**.001**	.999	*.149*	.063	*.407*	*.877*	**.001**	**.002**	**.001**	*.999*	**.001**	**.001**
IN9	MD	*.830*	**1.270**	**1.070**	.370	**.720**	**.920**	*.640*	*.470*	**1.220**	**1.190**	**1.060**	*.250*	**1.420**	**1.570**
	p	*.532*	**.001**	**.001**	.889	**.004**	**.001**	*.082*	*.519*	**.001**	**.001**	**.001**	*.996*	**.001**	**.001**
IN10	MD	*.530*	**1.25**	**1.001**	.360	**.600**	**.67**	**.620**	*.380*	**1.140**	**.890**	**.810**	*.550*	**1.070**	**1.150**
	p	*.937*	**.001**	**.001**	.805	**.013**	**.006**	**.033**	*.680*	**.001**	**.001**	**.001**	*.139*	**.001**	**.001**

Note. MD= Mean Difference; p = p/significant value at 99% confidence level

MATRIX COMPARISON: MEAN VALUES OF MELAKA AGAINST OTHER STATES

IN	Putra-jaya	K.Lum-pur	Sela-ngor	N.Sem-bilan	Johor	Pa-hang	Tereng-ganu	Kelan-tan	Perak	P.Pi-nang	Kedah	Perlis	Sabah	Sara-wak
IN1	+*	+*	+*	+	+*	+*	+	+	+*	+*	+*	+	+*	+*
IN2	+*	+	+*	+	+	+	+	—	+*	+*	+	—	+*	+*
IN3	+*	+*	+*	+	+*	+*	+*	+	+*	+*	+*	+	+*	+*
IN4	+	+*	+*	+	+*	+*	+	+	+*	+*	+*	+	+*	+*
IN5	+	+*	+*	—	+	+	+	+	+*	+*	+*	+	+	+*
IN6	+	+*	+*	+	+	+	+	+	+*	+*	+*	+	+*	+*
IN7	+	+*	+*	—	+	+	+	+	+*	+*	+*	—	+*	+*
IN8	+	+*	+*	+	+	+	+	+	+*	+*	+*	+	+*	+*
IN9	+	+*	+*	+	+*	+*	+	+	+*	+*	+*	+	+*	+*
IN10	+	+*	+*	+	+*	+*	+*	+	+*	+*	+*	+	+*	+*

Note. +* = Melaka has significantly higher mean; + = Melaka has higher mean; — = Melaka has lower mean.

Table 5 shows that at 99% confidence interval there were statistically significant difference in all of the IN items between states and the effect sizes were all medium ($\eta 2 = .010 < .031$ to $.052 < .138$). The Post-Hoc Test exhibits the mean difference in IN items of Melaka in opposition to other states. The Post-Hoc Test on Melaka shows that majority of the mean difference of Melaka compared to other states were positive.

The Comparison Matrix indicates that majority of IN items' means for Melaka were higher than IN items' means for other states. Out of the 140 cells, 135 cells revealed that Melaka had statistically higher means of IN items than other states and 82 out of the 135 cells were statistically significant. Table 6 shows the interpretation of the result.

Table 6: Result Interpretation

Items	Statements	Interpretation
IN1	*outdoor environment determining own health and wellness*	Melaka had significantly higher means of IN1 than (i) Putrajaya, (ii) Kuala Lumpur, (iii) Selangor, (iv) Johor, (v) Pahang, (vi) Perak, (vii) Pulau Pinang, (viii) Kedah, (ix) Sabah, and (x) Sarawak.
IN2	*being able to recall experiences in the natural environment*	Melaka had significantly higher means of IN2 than (i) Putrajaya, (ii) Selangor, (iii) Perak, (iv) Pulau Pinang, (v) Sabah and (vi) Sarawak.
IN3	*being able to adapt to various outdoor surroundings*	Melaka had significantly higher means of IN3 than (i) Putrajaya, (ii) Kuala Lumpur, (iii) Selangor, (iv) Johor, (v) Pahang, (vi) Terengganu, (vii) Perak, (viii) Pulau Pinang, (ix) Kedah, (x) Sabah, and (xi) Sarawak.
IN4	*being able to see and hear what others usually miss in nature*	Melaka had significantly higher means of IN4 than (i) Kuala Lumpur, (ii) Selangor, (iii) Johor, (iv) Pahang, (v) Perak, (vi) Pulau Pinang, (vii) Kedah, (viii) Sabah and (ix) Sarawak.
IN5	*being able to notice scientific details of nature*	Melaka had significantly higher means of IN5 than (i) Kuala Lumpur, (ii) Selangor, (iii) Perak, (iv) Pulau Pinang, (v) Kedah, and (vi) Sarawak.
IN6	*being able to cope with the outdoor environment*	Melaka had significantly higher means of IN6 than (i) Kuala Lumpur, (ii) Selangor, (iii) Perak, (iv) Pulau Pinang, (v) Kedah, (vi) Sabah and (vii) Sarawak.
IN7	*feeling the urge to spend time in the natural environment*	Melaka had significantly higher means of IN7 than (i) Kuala Lumpur, (ii) Selangor, (iii) Perak, (iv) Pulau Pinang, (v) Kedah, (vi) Sabah and (vii) Sarawak.
IN8	*tending to lose concentration without contact with nature*	Melaka had significantly higher means of IN8 than (i) Kuala Lumpur, (ii) Selangor, (iii) Perak, (iv) Pulau Pinang, (v) Kedah, (vi) Sabah and (vii) Sarawak.
IN9	*tending to have objects from the outdoors in personal space*	Melaka had significantly higher means of IN9 than (i) Kuala Lumpur, (ii) Selangor, (iii) Johor, (iv) Pahang, (v) Perak, (vi) Pulau Pinang, (vii) Kedah, (viii) Sabah and (ix) Sarawak.
IN10	*spending time planting at home*	Melaka had significantly higher means of IN10 than (i) Kuala Lumpur, (ii) Selangor, (iii) Johor, (iv) Pahang, (v) Terengganu, (vi) Perak, (vii) Pulau Pinang, (viii) Kedah, (ix) Sabah and (x) Sarawak.

The positive and significant higher means of majority of IN items suggests that Melaka residents are highly agreeable on IN items compared to other states. However, in relation to other states, Melaka falls slightly short on (i) IN 2, *being able to recall experiences in the natural environment* and (ii) IN5, *being able to notice scientific details of nature*.

DISCUSSION

The human-nature connection measures the interrelationships between human and nature at individual level. Connections with nature is a vital groundwork of one's ecological behaviours (Abu Bakar et al., 2018). The benefits of human-nature connection are delivered through human multisensory experiences. Sight benefits of nature are reduced anxiety, reduced stress, shorter hospital stays, lower heart rate, and increased directed attention. Nature sounds have therapeutically served to relieve stress, recover attention, decrease anxiety and agitation. The smell of nature has profound effects on human mood, behaviour, and cognition (Corraliza & Collado, 2011; Duron-Ramos et al., 2020; Franco et al., 2017). Sights, sounds and smells of botanical gardens, water, wind, forests, animals, rural landscapes, are much preferred over human-activities such as traffic, recreations, and industrial noise (Franco et al., 2017). Rural residents spend more time in the natural environment hence they tend to recall the experiences as positive (Chawla & Derr, 2012; Gifford & Nilsson, 2014). Those residing in rural areas and whose livelihoods depend on the natural resources has frequent and habitual contact with nature compared to urban dwellers. Pleasant experiences in natural surrounding boost environmental responsibilities and nature-attachment. The greater the nature connection, the greater the interest in taking care of the natural resources (Abu Bakar et al., 2020; da Silva et al., 2015).

Melaka was sought over for centuries for its strategic location in the Malacca Straits. The state is renowned globally as a historic city worthy of its UNESCO heritage status. However, due to large-scale land reclamation, among other build-ups, the urban areas of Melaka have grown in size, especially in the south. Several large-scale futuristic land reclamation projects are underway on the coast of the Malacca Straits, among which is the Melaka Gateaway. On a total of 1,366 acres, developers are creating a new land from dredged sea sand for a deep-sea port, a cruise terminal, a financial centre and a maritime industrial park. Although the green initiatives have shown applaudable outcomes, it does not change the fact that natural environment in Melaka is still ongoingly exploited to make ways for urban expansions of a 'developed city'. As a result, species are facing extinction and natural system is eroding while the advertisement promotes 'new, improved nature' in the Green City of Melaka.

The Melaka respondents lack ability to recall experiences in the natural environment especially compared to Perlis and Kelantan respondents. Like other states, Melaka respondents were withdrawn from noticing nature scientific details. In light of the current scenario, perhaps the lower scores of the two items is sourced from the diminishing natural environment to begin with. Moving forward, as well as (i) addressing the environmental threats and mitigations of the ongoing development; the state government should (ii) listen more to communities whose livelihoods are changing drastically due to the rapid development in the natural setting they used to have close contact with.

CONCLUSION

This paper compares the Interaction with Nature, the second dimension of Human Interdependence with Environment, of Melaka residents in relation to other states. It was discovered that Melaka respondents are agreeable to most of the statements implying human-nature interaction in comparison to other states. However, in relation to other states, Melaka was slightly shy from being able to recall experiences in the natural environment and being able to notice scientific details of nature. Future studies exploring the constructs elaborated in this paper via structural causal modelling and expand the findings through moderation effects of Malaysia States in relation to local environmental policies would be productive.

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