

Interaction effect between alternatives and public involvement affecting the overall quality of EIA reports for development cooperation projects

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Purposes

The purposes of the study are:

1. to clarify that alternatives and public involvement are determinants of EIA report quality;
2. to clarify the interaction effect between the two processes affecting the overall report quality; and
3. to propose the guidance for satisfactory EIA reports.

Introduction

1. Alternatives and public involvement could be key factors for report quality (Kamijo and Huang 2016);
2. However, little is known about the interaction effect between alternatives and public involvement affecting the overall report quality.

Interaction effect

1. Two or more independent variables work together to affect the dependent variables.
2. The overall report quality would be influenced by the interaction effect between alternatives and public involvement.

Data and methods

1. Samples of 160 EIA reports prepared by JICA – 10 per year for the years between 2001 and 2016 and the quality reviewed based on the Lee-Colley review package (Lee et al. 1999);
2. Statistical test to see the introduction effect of JICA guidelines in 2004 and 2010;

Data and methods

3. Cluster analysis and decision tree analysis to show alternatives and public involvement as determinants of the overall report quality; and
4. Regression analysis to test interaction effect between alternatives analysis and public involvement.

Assessment symbols of the Lee-Colley review package

Symbol	Explanation
A	Relevant tasks well performed, no important tasks left incomplete.
B	Generally satisfactory and complete, only minor omissions and inadequacies.
C	Can be considered just satisfactory despite omissions and/or inadequacies.
D	Parts are well attempted but must, as a whole, be considered just unsatisfactory because of omissions or inadequacies.
E	Not satisfactory, significant omissions or inadequacies.
F	Very unsatisfactory, important tasks poorly done or not attempted.
N/A	Not applicable. The review topic is not applicable or it is irrelevant in the context of the statement.

Source : Lee et al. 1999.

Report quality and three periods

Period	A	B	C	D	E	F	Total	A-C (%)	D-F (%)
2001-2004	0	0	9	26	5	0	40	23	77
2005-2010	0	10	12	30	8	0	60	37	63
2011-2016	0	11	19	24	6	0	60	50	50
Total	0	21	40	80	19	0	160	38	62

- * The p -value by the Kruskal-Wallis test is .047*; and
- * The report quality is significantly improved by introduction of JICA guidelines in 2004 and 2010 (* $p < .05$).

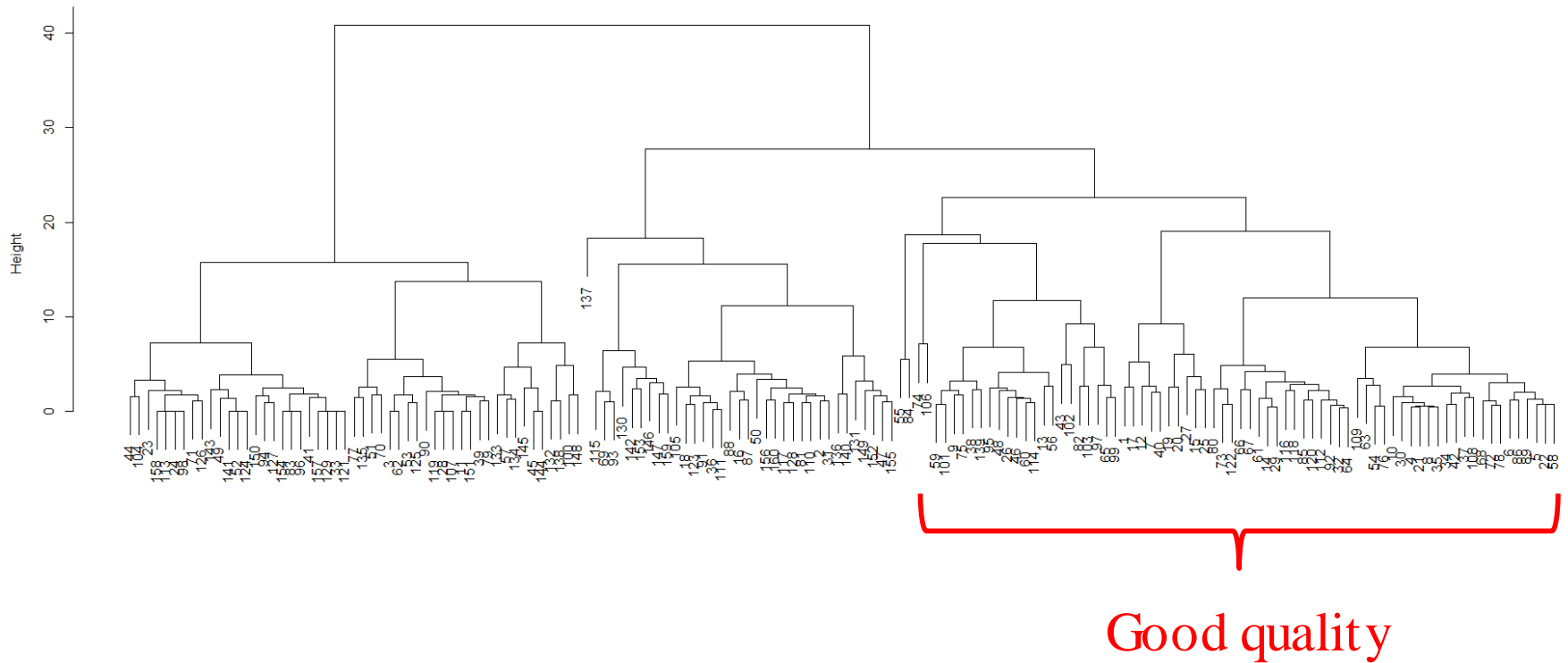
Data for cluster analysis and decision tree analysis

No.	Level	Alt	PI	No. Alt	No. Crt	No. PI	Area 1 grade	Area 2 grade	Area 3 grade	Area 4 grade	Overall quality
1	EIA	yes	yes	16	7	2	B	C	B	B	B
2	IEE	yes	yes	3	7	1	C	D	D	C	C
3	EIA	yes	no	2	0	0	D	D	D	D	D
4	IEE	yes	no	3	13	0	D	D	D	D	D
5	EIA	no	no	0	0	0	C	D	D	D	D

Note: Alt: alternatives, PI: public involvement, Crt: criteria

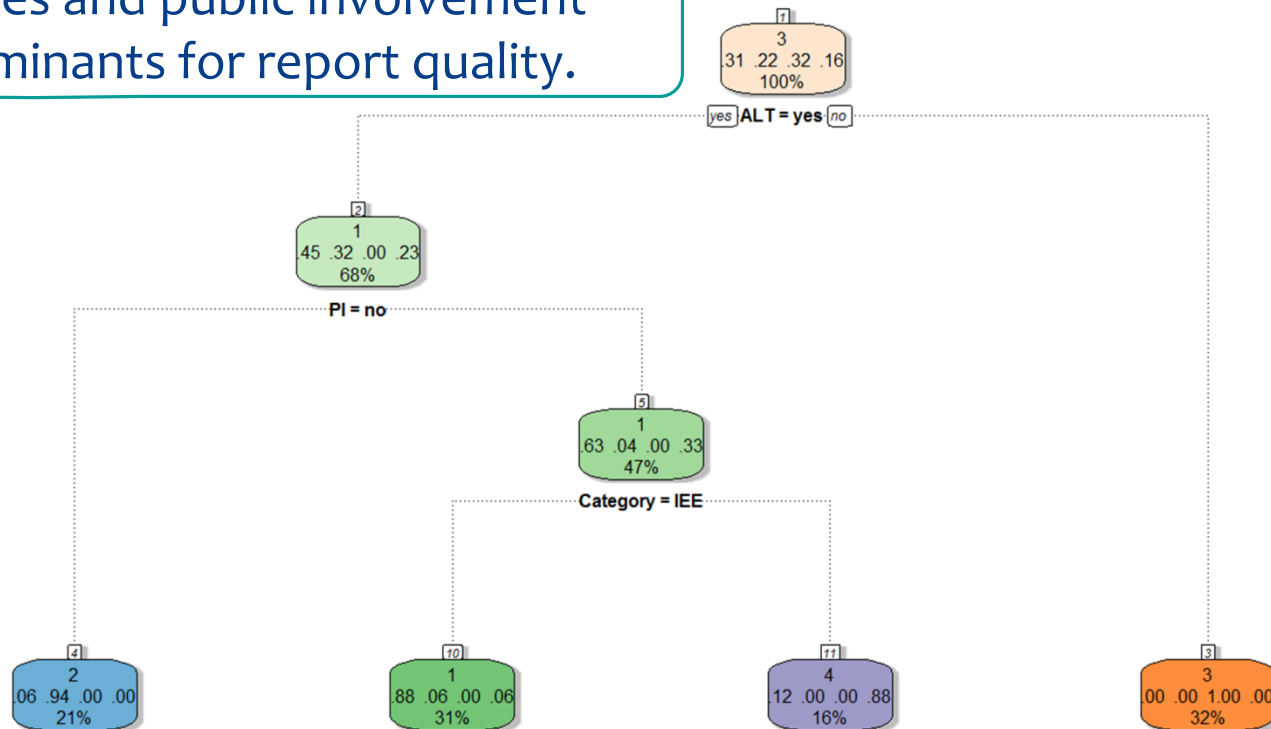
Qualitative variables like EIA or IEE, and yes or no, were converted into dummy variables. Ordinal scales from A to F were converted to rank scores like 6, 5, 4, 3, 2, and 1.

Cluster dendrogram (n=160)



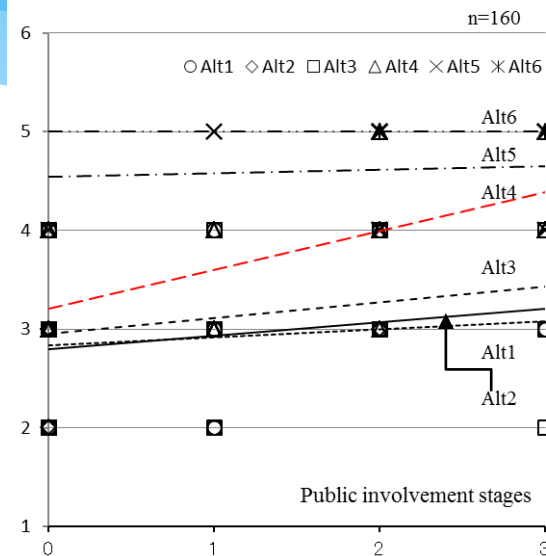
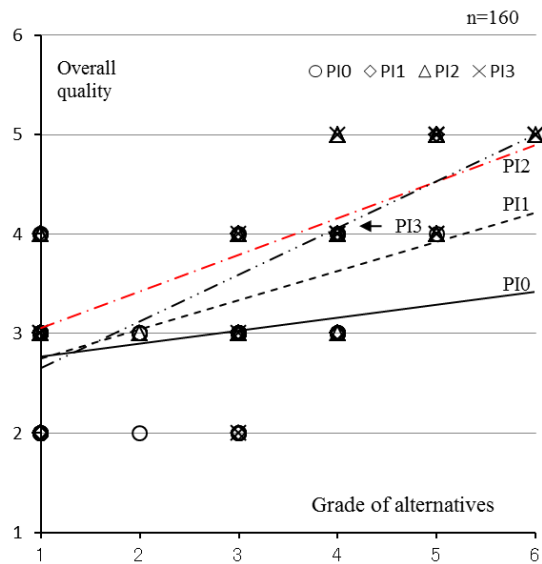
Decision tree of four clusters (n=160)

Alternatives and public involvement are determinants for report quality.



Good quality

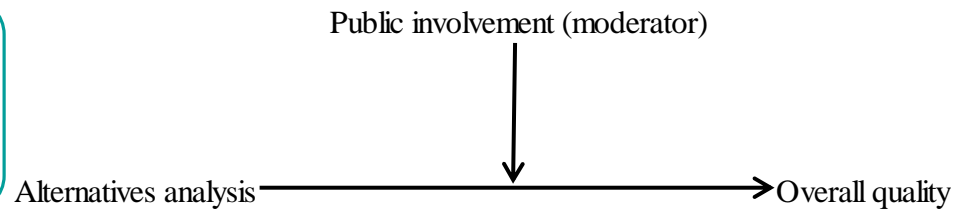
Interaction effect between alternatives and public involvement



$$Y = 2.273 + 0.276 x_1 + 0.248 x_2 + 0.092 (x_1 \times x_2), R^2 = 0.54, **p < .001$$

Regression coefficient of interaction : $**p = .004$ Interaction effect is significant.

Public involvement would moderate the effect of alternatives to the overall report quality.



Conclusions

1. Alternatives analysis and public involvement are the determinants of JICA EIA report quality;
2. The public involvement would moderate the effect of alternatives to the report quality; and
3. The grade C (just satisfactory) of alternatives and two times of public involvement could be the guidance for satisfactory EIA reports.

Environmental justice

1. The public involvement promotes environmental justice and improves the EIA quality; and
2. This study justifies the effect of public involvement to improve the quality of EIA reports based on data analysis.

Thank you for your attention.

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