Improving the quality of environmental impact assessment reports: effectiveness of alternatives analysis and public involvement in JICA supported projects

13 June, 2017

Tetsuya Kamijo

JICA Rsearch Institute, Tokyo, Japan

Background 1

Effective Environmental Impact Assessment (EIA) system consists of three major dimensions:

1. adequate institutional arrangement for EIA;

2. the quality of EIA reports; and

3. implementation of mitigation measures

   (Ortolano et al. 1987; Sadler 1996; and Momtaz and Kabir 2013).

Background 2

* EIA regulations have been established in developing countries but the weak enforcement is a major problem and the deficiencies in the quality of EIA reports are identified (Lohani et al. 1997; World Bank 2006).

* A lack of EIA expertise and related information are major constraints in developing countries (Momtaz and Kabir 2013). Proposed solutions remain general.

Background 3

* The JICA applies guidelines for environmental and social considerations in 2004 and supports the preparation of EIA reports when assists official development assistance (ODA) projects.

* Improving the quality of EIA reports under constraint of developing countries is one of the priority issues for JICA.

Objective of the study

The study aims:

1. to find key factors and clarify a mechanism on the quality of JICA EIA reports;

2. to explore key factors and their linkage in depth; and

3. to propose countermeasures for improving the quality of EIA reports under constraint of developing countries.

Scope of the study

The scope is:

1. to review the quality of JICA EIA reports;

2. to evaluate an introduction effect of JICA guidelines of 2004;

3. to analyze the review data and find key factors and a mechanism on the quality of EIA reports; and

4. to propose countermeasures for improving the quality of EIA reports.

Literature review 1

* There are many researches of reviewing the quality of EIA reports (Wood et al. 1996; Lee 2000; Cashmore et al. 2002; Canelas et al. 2005; Tzomis 2007; Sandham and Pretorius 2008; Badr et al. 2011; Momtaz and Kabir 2013; Sandham et al. 2013).

* Many constraints on quality of EIA reports in developing countries were identified. However, little is known about the countermeasures for improving the quality.

Literature review 2

* Alternatives analysis and public involvement are central part of EIA process but their implementation is limited (Abaza et al. 2004; Ahmmed and Harvey 2004; World Bank 2006; Clausen et al. 2011; Glasson et al. 2012; Betey and Godfred 2013; Geneletti 2014).

* They seem to be key factors for improving the quality but there is very few evidence to their effectiveness on the quality.

Problems identified

1. The EIA regulations in developing countries are well established but the practice has many shortcomings.

2. The quality of EIA reports is insufficient but the concrete countermeasures are not presented.

3. Alternatives analysis and public involvement could be key factors but there is very few evidence.

Data and methods 1

* Selection of sample: 120 JICA EIA reports – 10 per year for the years between 2001 and 2012- randomly selected to see change before and after the JICA guidelines of 2004.

* Conducting a review: the quality review based on the Lee-Colley review package (Lee et al. 1999).

Data and methods 2

* Statistical test: A difference between groups tested to distinguish whether it is an effect of a factor or merely a coincidence.

* Structural equation modeling (SEM): A path analysis with SEM to obtain a causal model between the overall quality and key variables

Data and methods 3

Quality review of 120 JICA EIA reports

Statistical test of review data

SEM to obtain a causal model

The Lee-Colley review package

Review areas and review categories

1 Description of the development, the local environment and the baseline conditions
   1.1 Description of the development
   1.2 Site description
   1.3 Wastes
   1.4 Environment description
   1.5 Baseline conditions
2 Identification and evaluation of key impacts
   2.1 Definition of impacts
   2.2 Identification of impacts
   2.3 Scoping
   2.4 Prediction of impact magnitude
   2.5 Assessment of impacts significance
3 Alternatives and mitigation
   3.1 Alternatives
   3.2 Scope and effectiveness of mitigation measures
   3.3 Commitment to mitigation
4 Communication of results
   4.1 Layout
   4.2 Presentation
   4.3 Emphasis
   4.4 Non-technical summary

Source : Lee et al. 1999.

Assessment symbols

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.

Result of quality review

Summary of category grades		A	B	C	D	E	F	N	%A-C	% D-F
1.1	Description of the development	0	24	85	11	0	0	0	91%	9%
1.2	Site description	0	22	81	16	0	0	1	86%	13%
1.4	Environmental description	1	23	51	39	6	0	0	63%	38%
1.5	Baseline conditions	2	17	35	32	33	1	0	45%	55%
2.1	Definition of impacts	0	11	34	48	24	3	0	38%	63%
2.2	Identification of impacts	0	9	32	60	16	3	0	34%	66%
2.3	Scoping	3	15	28	45	24	5	0	38%	62%
2.4	Prediction of impact magnitude	1	13	21	37	37	11	0	29%	71%
2.5	Assessment of impacts significance	0	12	20	37	39	11	1	27%	73%
3.1	Alternatives	4	20	20	30	31	14	1	37%	63%
3.2	Scope and effectiveness of mitigation measures	1	16	15	51	30	7	0	27%	73%
3.3	Commitment to mitigation	0	12	30	36	31	6	5	35%	61%
4.1	Layout	1	16	40	52	11	0	0	48%	53%
4.2	Presentation	1	16	34	55	14	0	0	43%	58%
4.3	Emphasis	0	13	31	53	21	2	0	37%	63%
4.4	Non-technical summary	1	12	36	53	16	2	0	41%	59%
Summary of review area grades										
1	Description of the development and the environment	1	21	53	44	1	0	0	63%	38%
2	Identification and evaluation of key impacts	0	10	26	55	26	3	0	30%	70%
3	Alternatives and mitigation	2	18	16	47	32	5	0	30%	70%
4	Communication of results	1	15	33	59	12	0	0	41%	59%
	Overall quality	0	17	25	63	15	0	0	35%	65%

Quality and periods of four-year intervals (*n*=120)

* Statistical test by two-sided Spearman's correlation coefficient by rank test. The *p*-value was .047*.

Period	A	B	C	D	E	F	Total
2001-2004	0	0	9	26	5	0	40
2005-2008	0	7	8	21	4	0	40
2009-2012	0	10	8	16	6	0	40
Total	0	17	25	63	15	0	120

Quality and sectors (*n*=120)

* Statistical test by upper-sided Kruskal-Wallis test. The *p*-value was .54.

Sector	A	B	C	D	E	F	Total
Transportation	0	10	7	25	5	0	47
Regional development	0	2	4	10	5	0	21
Power	0	4	4	11	0	0	19
Water resource	0	0	5	11	1	0	17
Pollution control	0	1	2	6	2	0	11
Agriculture	0	0	3	0	2	0	5
Total	0	17	25	63	15	0	120

t-values of review categories
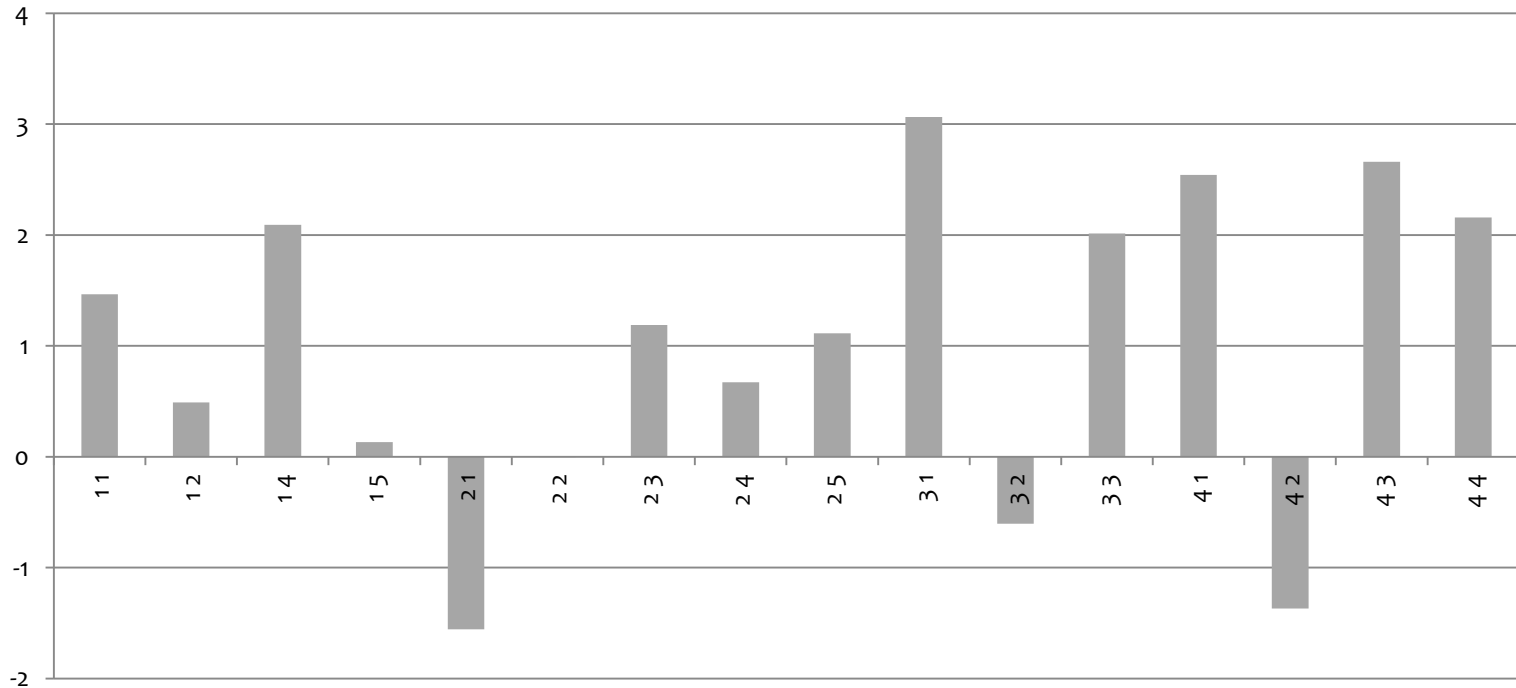
Alternatives analysis and public involvement (*n*=120)

* Statistical test by upper-sided Kruskal-Wallis test. The *p*-value was .000**.

Groups	A	B	C	D	E	F	Total
Both processes	0	17	15	15	2	0	49
Alternatives analysis process only	0	0	4	19	4	0	27
Public involvement process only	0	0	1	7	2	0	10
Neither process	0	0	5	22	7	0	34
Total	0	17	25	63	15	0	120

Quality by public involvement

* Statistical test by two-sided Spearman's correlation coefficient by rank test. The *p*-value was .000** and .998.

Groups	A	B	C	D	E	F	Total
In the case of the presence of alternatives analysis (*n* =76)							
PI0	0	0	4	19	4	0	27
PI1	0	2	2	10	1	0	15
PI2	0	9	9	4	0	0	22
PI3	0	6	4	1	1	0	12
Total	0	17	19	34	6	0	76
In the case of the absence of alternatives analysis (*n* =44)							
PI0	0	0	5	22	7	0	34
PI1	0	0	0	4	2	0	6
PI2	0	0	1	2	0	0	3
PI3	0	0	0	1	0	0	1
Total	0	0	6	29	9	0	44

Number of alternatives and criteria by public involvement stages

* Turkey-Krammer test (n=76, significant at *p<.05; **p<.01)

Groups	Mean	Standard deviation	n	PI1	PI2	PI3
Public involvement stages and number of alternatives						
PI0	3.7	1.7	27	1.2483	1.0525	1.1864
PI1	4.4	3.0	15		0.2978	0.0248
PI2	4.2	3.0	22			0.3047
PI3	4.4	2.1	12			
Public involvement stages and number of evaluation criteria						
PI0	3.8	4.5	27	0.8324	1.3649	3.6952
PI1	4.8	2.8	15		0.3702	2.6180
PI2	5.3	4.5	22			2.4800
PI3	8.7	9.7	12			

Causal model with path coefficients
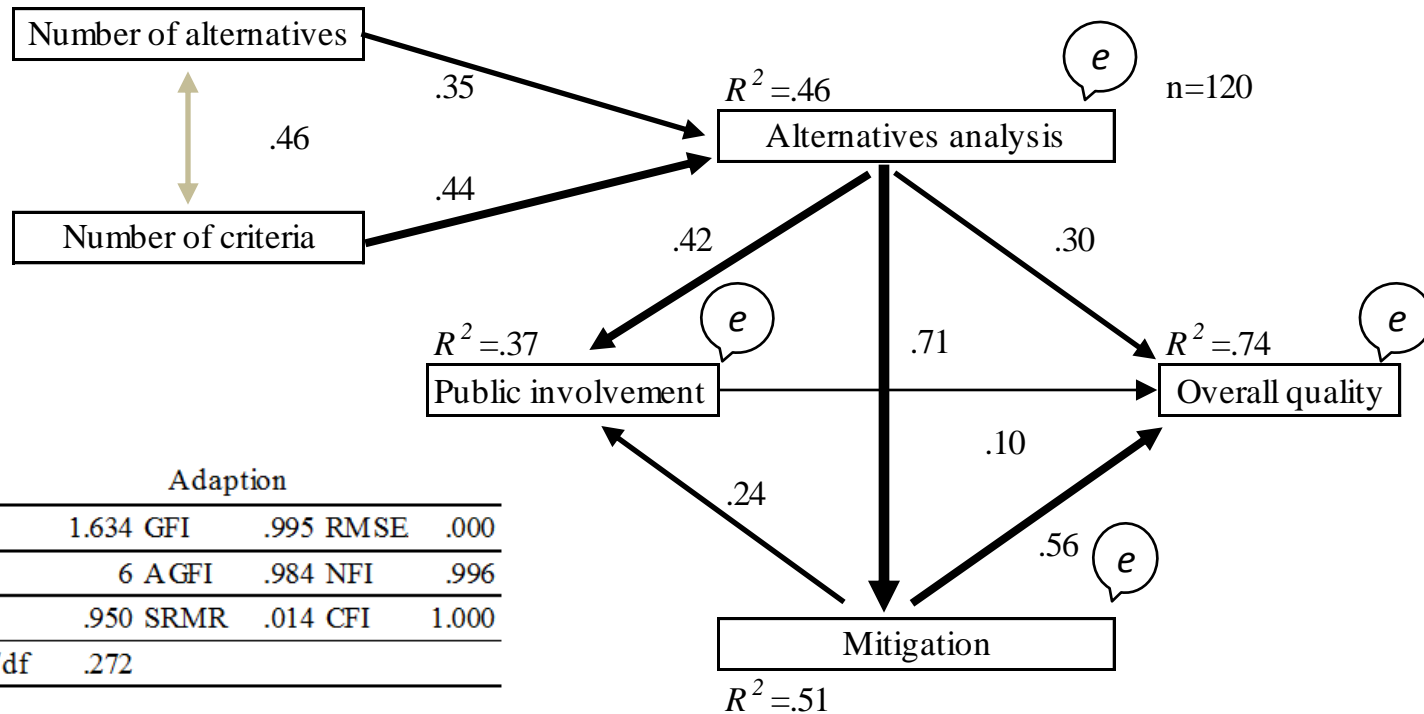
Total effect of alternatives analysis: .76=.30+.42×.10+.71×.56+.71×.24×.10
Total effect of public involvement: .10

Conclusions

1. Effectiveness of alternatives analysis with a wide range of criteria and two-time public involvement at the scoping and draft reporting stages;

2. Specific guidelines: five alternatives and more than six evaluation criteria;

3. Clear evidence of discussion of alternatives as heart of EIA report; and

4. Need to analyze the real discussion of alternatives based on case studies.

Impact Assessment and Project Appraisal

IAIA
International Association
for Impact Assessment

Taylor & Francis
Taylor & Francis Group

Improving the quality of environmental impacts assessment reports: effectiveness of alternatives analysis and public involvement in JICA supported projects

Tetsuya Kamijo[a] and Guangwei Huang[b]

[a]JICA Research Institute, Japan International Cooperation Agency, Tokyo, Japan; [b]Graduate School of Global Environmental Studies, Sophia University, Tokyo, Japan

ABSTRACT

This study examined the key factors for improving the quality of environmental impact assessment reports through statistical tests and path analysis. The Lee-Colley review package was used to review the quality of the samples of 120 reports prepared by the Japan International Cooperation Agency dating from 2001 to 2012. The result of the study showed that alternatives analysis and public involvement could be key factors for improving the quality of reports. When the number of public involvement stages went up, the number of evaluation criteria for alternatives analysis showed an increasing trend and the quality of the reports improved. Finally, the study pointed out the effectiveness of alternatives analysis with a wide range of evaluation criteria and public involvement for improving the quality of reports. Further research is needed to explore alternatives analysis and public involvement in more depth as well as to improve the effectiveness of their linkage via more case studies.

http://www.tandfonline.com/doi/full/10.1080/14615517.2016.1176402

Thank you for your attention

Contact: Kamijo.Tetsuya@jica.go.jp