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To cite this article: Sacha Amaruzaman, Beria Leimona, Meine van Noordwijk & Betha Lusiana (2017) Discourses on the performance gap of agriculture in a green economy: a Q-methodology study in Indonesia, International Journal of Biodiversity Science, Ecosystem Services & Management, 13:1, 233-247, DOI: [10.1080/21513732.2017.1331264](https://doi.org/10.1080/21513732.2017.1331264)

To link to this article: <http://dx.doi.org/10.1080/21513732.2017.1331264>



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Published online: 09 Jun 2017.



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Discourses on the performance gap of agriculture in a green economy: a Q-methodology study in Indonesia

Sacha Amaruzaman^a, Beria Leimona^a, Meine van Noordwijk^{a,b} and Betha Lusiana^a

^aWorld Agroforestry Centre, Bogor, Indonesia; ^bPlant Production Systems, Wageningen University and Research Centre, Wageningen, the Netherlands

ABSTRACT

Gaps exist between aspirations of 'green agriculture', which protects biodiversity and ecosystem services, and the reality on the ground. Using Q-methodology, we explored expert opinion in Indonesia on the contributing factors to the gaps. Q-methodology indicated three dominant discourses on 'green agriculture' and groups of experts who prioritize them: (1) endorers of regulations and innovations; (2) providers of resources for access to capital, technology and knowledge; and (3) proponents of green economy (GE) and land-use planning (LUP). Group 1 pointed out the importance of endorsing incentives to reduce the gap, while Group 2 reckoned that building smallholders' capacity and providing them with access to capital, technology, and knowledge are needed to green agricultural practices. Group 3 described the importance of integrating environmental value into the gross domestic product and earmarking sources derived from environmental levies for greening the agricultural sector. All discourses recognized the importance of scientific policy formulation. Groups 1 and 3 agreed that non-synchronization of LUP between national and local governments highly contributes to the gap. Groups 2 and 3 perceived that ecosystem services from the agricultural sector have not been sufficiently understood to promote green agricultural development. By simultaneously addressing the gaps on each level and understanding how each factor contributes to the gap, we propose a set of recommendations to improve the implementation of green agriculture in Indonesia by creating a platform that all three groups can recognize and support.

ARTICLE HISTORY

Received 11 April 2016
Accepted 11 May 2017

EDITED BY

Dagmar Mithöfer

KEYWORDS

Green agriculture; Indonesia; gaps; q-methodology; discourse

Introduction

Policy emerges in a complex process where opinions and concepts matter at least as much as objective evidence, if the latter exists at all (Laranja et al. 2008; Clark et al. 2011). Evidence is constructed and interpreted, often subjectively, by a small group of decision makers with their own limited perspective. Thus, evidence that speaks to some may lose its meaning when discourses diverge in the broader arena of development. Here, we comprehend discourse as a way of viewing and talking about a topic or issues (Barry & Proops 1999; Curry et al. 2013). Getting to know the diversity of opinions and discourses among key informants of a policy process is important to design communication strategies for stakeholders and helps to improve policy formulation (Leimona, Amaruzaman, et al. 2015) based on credible and legitimate research (Clark et al. 2011; Leimona, Lusiana et al. 2015). The ongoing discussion on greening Indonesia's agricultural sector is an example of examining different points of view or discourses.

'Green agriculture' can be interpreted as a way to achieve agricultural growth and economic development while preventing environmental and natural

resource degradation, reducing negative externalities, and using resources more efficiently (Hall & Dorai 2010; Blanford 2011; FAO 2011; Pešić 2012). The increasing global demand for sustainable products urged producer countries to 'green' their agricultural practices, such as by applying internationally verified standards and green commodity certifications. This trend is highly relevant for Indonesia, which counts among the five largest producers of globally traded palm oil, rubber, coffee, and cacao.

This trend – and the standards and certification themselves that allow commodity differentiation while also addressing social, environmental and economic concerns – is a part of a global policy issue–attention cycle (Mithöfer et al. 2017). The trend is contextual, depending on the maturity of each issue (environmental, social and economic) and governments' aspirations and application. Indonesia's agricultural policies have recognized 'green agriculture' as part of a national 'green growth' strategy to reduce the environmental footprint from agricultural practices and improve export opportunities. Partially owing to changes in government, influence from global sustainability initiatives and support from others, such as the private sector and NGOs, the Government of Indonesia has promoted an enabling

environment for sustainable agricultural practices that can be harmoniously aligned with economic growth. However, the aspirations often remain without action on the ground, thus creating gaps between words and deeds.

These gaps lead to pertinent issues of environmental threats and unsustainable practices in the country's agricultural sector. Partially supported by strong global demand, common adverse impact of agricultural practices includes expansion of agricultural land and conversion of forests that leads to a loss of ecosystem services and biodiversity, organic and inorganic pollution, excessive use of water resources, and loss of nutrients, mainly owing to poor site selection (Leimona, Amarusaman, et al. 2015). The performance gap indicates a failure to integrate agricultural development, biodiversity conservation, ecosystem service provisions, and socially responsible practices. Aligned with economic development, the number and interests of stakeholders in the agricultural sector vary widely and complicate efforts to reduce this gap. Expert opinion varies on the nature of this performance gap and what can be done to close it.

We investigated experts' perceptions of the major gaps in greening agricultural practices in Indonesia, based on their experience with Indonesia's five major commodities: cacao, coffee, palm oil, rubber, and rice. We used Q-methodology to answer the following questions: (1) What are the distinctive discourses on the performance gap in green agriculture implementation in Indonesia? (2) In what aspects are the discourses distinct? (3) In what aspects are the discourses overlapping and in agreement? and (4) How the discourses can be addressed to reduce the gap?

Revealing those discourses and recognizing in which area they are distinct or overlap would provide us better understanding of the factors that contribute to the gap between green agriculture aspirations (policy, regulation, and initiatives) and action on the ground. This is necessary information to inform policy and induce change aimed at reducing the performance gap on greening agriculture. Finally, as part of the special issue, 'Certifying Environmental Social Responsibility' (Mithöfer et al. 2017), this article contributes to identifying more specific policy performance gaps and providing direction to improve green agriculture implementation in Indonesia.

Methodology

Q-methodology

Q-methodology is a method that provides a systematic approach to structure various perspectives or subjective points of view on a particular issue. Using

Q-methodology, one can elicit a variety of accounts or discourses around a specific domain, theme, issue, or topic, and further analyse the degree of overlap, consensus and divergence, or disagreement between actors (van Exel & de Graaf 2005; Hermans et al. 2012). The main results of Q-methodology are: (1) cluster groups of opinions or discourses that are shared by participants with similar response patterns; (2) distinct statements, consisting of unique statements (i.e. 'highly agree' or 'highly disagree') that define key differences between those groups; and (3) consensus statements, in which participants from all groups share why they agree or disagree with the statement (Donner 2001). Thus, each group of opinions iterated from the analysis represents a different discourse or way of seeing the factors that contribute to the green agriculture gap in Indonesia.

Recently, the application of Q-methodology in the development sector is increasing, as it provides opportunity to systematically analyse the complex, multidimensional challenges and identify the shared perspectives of various stakeholders on development issues (Barry & Proops 1999; Donner 2001). Several studies have used Q-methodology to reveal and structure different perspectives of stakeholders on natural resource management, from the global and national scales (Dasgupta 2005; Curry et al. 2013; Nijnik et al. 2013, 2014) to the rural scale (Davies & Hodge 2007; Fairweather & Klonsky 2009; Hermans et al. 2012).

Research steps

The first stage was the development of the question and a set of statements (Q-samples). The main question was, 'What are the main factors or challenges that contribute most to the gap between green agriculture aspiration and its implementation in Indonesia?' Based on that question, we constructed a set of Q-samples that represented the complete range of opinions about the factors of the gap.

Initially, we investigated the potential gap factors through a literature review and interviews of key informants with expertise in observing and analysing national trends of agricultural policy and economics, and overcoming the challenges in applying more sustainable farming practices to production of Indonesia's five main export-oriented commodities: rice, rubber, coffee, cacao and palm oil. The initial statements were then presented to a wider group in a national consultation workshop, involving national and subnational government representatives. After the workshop, the statements were discussed in detail with the technical team of the green agriculture study (see Leimona, Amarusaman, et al. 2015). This resulted in 30 final statements used in Q-sorting.

The statements covered a number of aspects that supported the entire green agriculture implementation process, such as land-use planning (LUP), market-

based instruments, capacity building, smallholder access to capital, standards and regulations, the role of government and the private sector, monitoring and evaluation, and research and development. The technical team, which consisted of practitioners and researchers from an international NGO and agricultural commodity association, agreed that the 30 statements covered a wide range of aspects that contributed to the performance gap and they were sufficiently distinct to be sorted.

The second step was to select respondents, also known as the P-set. Q-methodology does not aim to generalize the perspective of broad populations, but rather to structure the pattern of opinions of specific groups on particular issues. Thus, data are not obtained from a large number of participants representative of a population, such as in a questionnaire or interview, but largely driven by the responses of participants based on their understanding and relevancy to the issues (Donner 2001; van Exel & de Graaf 2005; Davis & Michelle 2011). Purposively selected for diversity of opinion, participants were resource persons who we expected to represent different points of view or discourses on green agricultural practices in Indonesia.

In total, 22 green agriculture experts participated (Table 1). To broaden our perspective, selected participants were experts with experience in more than one agricultural sub-sector and with cross-sectoral knowledge related to green agricultural practices in Indonesia. We selected the participants from governmental, non-governmental, and research institutions, such as the National Planning Agency, the Ministry of Forestry, the Ministry of Environment,¹ the National Plantation Research Centre, the National Soil Research Centre, the World Agroforestry Centre, and Center for International Forestry Research. Participants ranged from mid-level positions with experience in the supervision of programmes and policy formulation to high-level positions with decision-making responsibility.

The third step was Q-sorting, in which the participants responded to the umbrella question by subjectively rank-ordering the 30 selected statements into a normal distribution matrix. The participants had to assign a value to each statement, based on their degree of agreement with the statement (Figure 1). In the matrix, -4 and -3 corresponded to disagreement (i.e. the factors that least contributed to the gap); -2 to +2 represented the statements that

Table 1. Participant characteristics.

Characteristic		# of Respondents
Gender	Female	9
	Male	13
Education	Master degree	14
	Doctoral (PhD)	8
Occupation	Government	16
	Non-government	4
	University/state-owned research centre	2
General Expertise	Agriculture	3
	Forestry	1
	Environmental management	18
Specific Expertise	Biophysical	4
	Economy	10
	Policy, institutional & social	8
Knowledge on green agriculture	Comprehensive, cross-sectoral, and multi-disciplinary	9
	Sectoral, GA-related	6
	General issue	7
Work proportion on research	< 30% of total working hours	7
	30–50% of total working hours	5
	50–80% of total working hours	6
	80–100% of total working hours	4

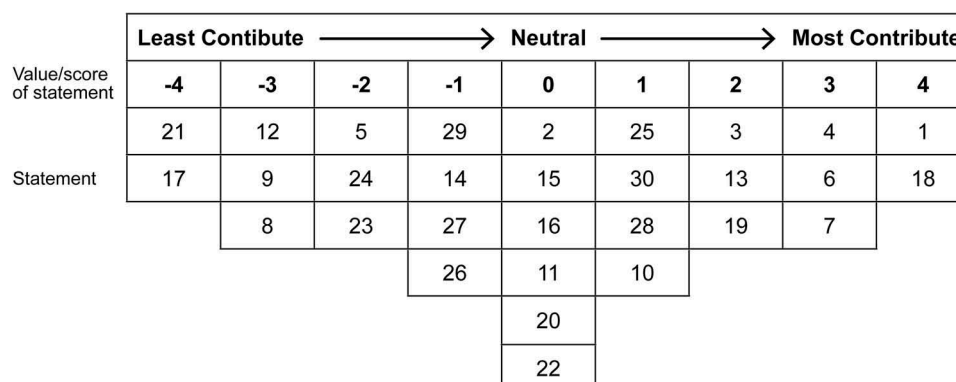


Figure 1. Illustration of a completed normal distribution of a Q-sort matrix.

the participants had relatively neutral opinions about; and +3 and +4 indicated complete agreement (i.e. factors that contributed most to the performance gap of green agriculture implementation). The completed Q-sorting resulted in an individual subjective pattern of opinions called Q-sort. One session of Q-sorting of the 30 statements took approximately 20–30 min, not including a short post-Q-sort discussion to gain more insights into the participants' Q-sort.

Data analysis

The fourth step was data analysis. All the data was analysed using a free software program for Q-methodology analysis called PQMethod.²

The first analysis in Q-methodology was to create the correlation matrix of Q-sorts in order to observe the degree of similarity between each individual Q-sort. The matrix was then factor-analysed to identify the number of similarities or dissimilarities between Q-sorts. Subsequently, significant factors were extracted and rotated using the principal component analysis and Varimax methods.

Participants who shared similar opinions or perspectives would be in the same factor or group (Davis & Michelle 2011). A factor loading was calculated for each Q-sort, showing how strongly a Q-sort can be associated within a factor. It is possible that one Q-sort would share a similarity with more than one factor, or would not share a similarity with any factor.

The factor analysis on Q-sort resulted in the factor scores and difference scores. Factor score is the normalized average score (Z-score) for each statement of the respondents that define the factor. The Z-score $\geq +1$ and ≤ -1 represented significant statements for the factor, and represented significant agreement and disagreement within the factor group. The rank of the Z-score in the factor score is translated into matrix elements ($-4, \dots, +3, +4$) as in a Q-sort matrix, called factor Q-sort value.

A 'difference score' is a statistically significant range of differences between a statement on two factors (van Exel & de Graaf 2005). A statement is defined as a distinguishing statement when the Z-score of a statement on two factors exceeds the difference score. A statement can be defined as a consensus statement when it does not distinguish the various factors at significant level.

Robustness test

To check the consistency of the generated discourses from Q-methodology, we used a jackknife resampling procedure (Miller 1974) as robustness test. The approach entailed performing Q-method analysis on resampled data sets, each leaving out one of the Q-sorts and

quantifying the association between factor loadings with respondents across $n-1$ runs. We thus had 22 additional data sets and classification results for each respondent in each case, with an approach similar to estimating PRESS statistics in regression analysis in order to find the most influential observation (Tarpey 2000).

Results

Table 2 shows that a reduction of the overall responses to three dimensions (factors), interpreted as the three main discourse types, retains 51% of the variation in the data set. The factor loading represents the correlation of Q-sort to the principle dimensions. Out of 22 Q-sorts, five Q-sorts remain without a significant loading (nos. 3, 15, 17, 18, and 20), which means that they did not belong to any specific discourse but shared aspects with opinions of all other experts.

Table 3 below summarizes the extracted values from the Q-sort for each discourse from the factor analysis. We enclose the rank of the statements based on the average score of participants in Appendix 1 to compare the results.

Based on the pattern of significant statements across all groups, we distinguished three main discourses on the gaps in green agriculture, with the following titles: (1) endorsers of regulations and innovations; (2) providers of resources, such as access to capital, technology, knowledge, and capacity building; and (3) Proponents of 'green economy' (GE) and 'LUP. Figure 2 summarizes the distribution of the most significant statements³ in each discourse based on Q-sort values. The lowest weighted statement across the three discourses was 'Several international environmental standards are not suitable for Indonesia', which reflects contextual challenges in the application of global commodity standards and certifications, such as the roundtable on sustainable palm-oil for palm oil, or rainforest alliance and UTZ standards for coffee and cacao certifications.

Discourse 1: endorsers of regulations and innovations

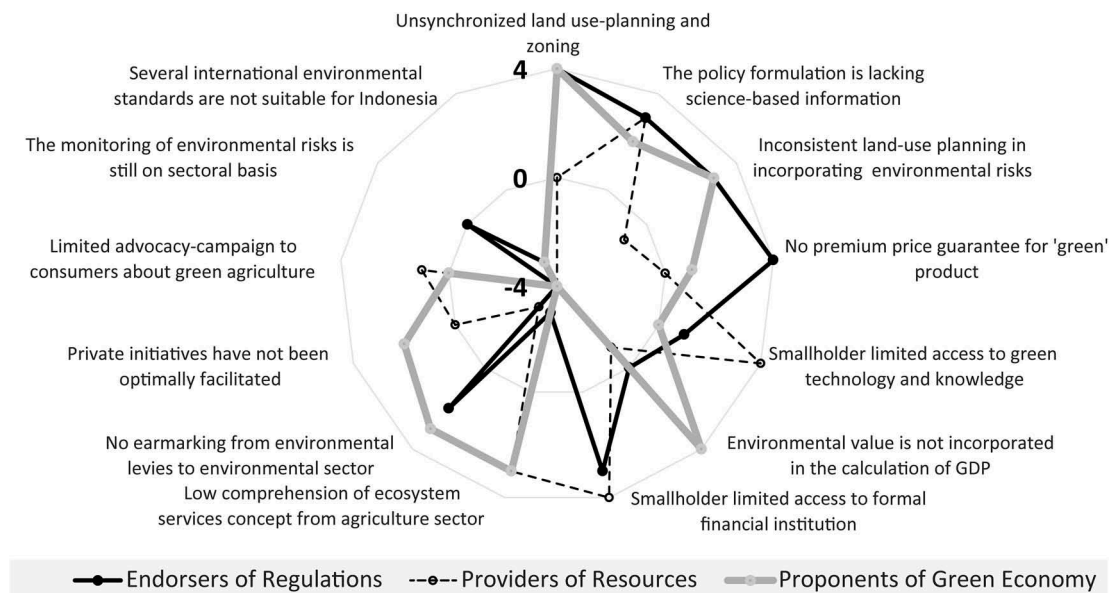
This group perceived that non-synchronized LUP and zoning at the national and subnational level (1)⁴ and the absence of premium-price guarantee regulations for the green product (4) were the major contributors to the performance gap in green

Table 2. Factor-loading matrix.

Q-sort	Factor loading		
	A	B	C
Participants loading onto factor (N)	9	5	4
% explored variables	22	15	14

Table 3. Factor Q-sort values for each statement on each factor.

Stat. no.	Statement	Discourses (factors)		
		A	B	C
18	No premium price guarantee for 'green' products, meaning no incentive for farmers	4	0	1
1	Unsynchronized land-use planning and zoning map at the national and subnational level	4	0	4
13	Smallholder farmers have limited access to formal financial institutions	3	4	-4
7	Agricultural policy formulation is lacking scientific information	3	3	2
2	Inconsistent and not comprehensive land-use planning and application at the subnational level in incorporating environmental risk and impact	3	-1	3
14	Financial institutions have not taken into account green agricultural practices as an instrument to access capital for smallholders	2	1	-3
10	Unavailability of comprehensive database and risk/impact monitoring system	2	-3	-1
4	Funds from environmental levies have not been earmarked for environmental sector, such as for environmental protection and rehabilitation	2	-3	3
19	Smallholder farmers have limited access to green agriculture technology and information	1	4	0
6	Government has not provided sufficient budget and adequate assistance/guidance for environmental conservation and preservation in the agricultural sector	1	2	2
16	Green certification costs are relatively expensive and not affordable for smallholder farmers	1	0	0
15	Green agricultural practices are relatively expensive and less profitable thus impede adoption by smallholder farmers	1	0	-3
26	Limited knowledge and skills to operate environmentally friendly technology in agriculture	0	2	-2
25	Green agriculture implementation in Indonesia has not been widely recognized as a 'best practice'	0	1	1
20	Extension programs aiming to increase farmers' awareness, knowledge and skills of green agricultural practices are not adequately functional	0	0	0
5	Environmental values have not been incorporated in the calculation of national and local GDP	0	-1	4
12	Agricultural business scale in Indonesia is not economically viable thus hindering the application of green agriculture	0	-2	-2
28	The monitoring of environmental impact and indicators is still carried out on a sectoral basis instead of cross-sectoral	0	-4	-4
23	Training and extension in environmental management in the agricultural sector is still limited	-1	3	1
22	Farmers do not have adequate knowledge and capacity to apply a green agriculture approach	-1	1	-2
17	Commodity certification schemes are not effective to overcome the environmental risks/impact	-1	-2	0
27	Lack of national standards to measure the progress or achievement of green agriculture	-1	-3	1
9	Policy and legislation to apply the green agriculture concept have not been available for all commodities	-2	2	-1
8	Robust data and information to measure the relationship between agricultural practices and their environmental risks/impact is still limited	-2	-1	-1
11	High level of technology has not been optimally applied to support green agriculture	-2	-1	0
24	The concept of ecosystem services in the agricultural sector has not been well-understood	-3	3	3
29	The national accreditation body of Indonesia has not properly incorporated environmental standards in agriculture	-3	-2	-1
30	Several international environmental standards are not suitable to be applied in Indonesia, considering local norms and conditions	-3	-4	-3
21	Consumers only receive limited advocacy and educational campaigns about green agriculture	-4	1	0
3	Private initiatives in preserving the environment have not been optimally facilitated by government	-4	0	2

**Figure 2.** Discourses' perspectives on the factors most contributing to the gap.

agriculture in Indonesia. Other significant factors were inconsistent and not comprehensive LUP in incorporating environmental risks and impact (2) and the agricultural policy formulation process that

was carried out without scientific support (7). Table 4 details the statements for this discourse, while the excerpt on the distinguishing statements is shown in Figure 3.⁵

Table 4. Significant factor scores for Discourse 1: endorers of regulations.

No.	Statements	Z-scores
Deemed to be important:		
1	Unsynchronized land-use planning and zoning map at the national and subnational level	1.871
18	No premium price guarantee for 'green' products, meaning no incentive for farmers	1.830
2	Inconsistent and not comprehensive land-use planning and application at subnational level in incorporating environmental risk and impact	1.667
7	Agricultural policy formulation is lacking scientific information	1.234
Deemed to be unimportant:		
24	The concept of ecosystem services in the agricultural sector has not been well-understood	-1.093
30	Several international environmental standards are not suitable to be applied in Indonesia, considering local norms and conditions	-1.148
29	The national accreditation body of Indonesia has not properly incorporated environmental standards in agriculture	-1.371
3	Private initiatives in preserving the environment have not been optimally facilitated by the government	-1.383
21	Consumers only receive limited advocacy and educational campaigns about green agriculture	-1.848

In Indonesia, unsynchronized LUP and zoning means overlap and conflict between national and subnational regulations. This often leads to problems for zoning enforcement, as conflicting regulations from different authorities apply to the same area (i.e. agriculture vs. protected land).

The absence of a premium-price guarantee for sustainable products provides no incentive for farmers to implement sustainable agriculture to improve their less sustainable practices. This group believed that the improvement of those aspects (LUP regulations, incentives, and scientific policy formulation) is crucial in closing the gap.

This group perceived that limited advocacy to consumers, suboptimal facilitation of private initiatives by the government, and the absence or incompatibility of international environmental standards to be applied in Indonesia were the least contributing factors to the gap. Post-Q-sort interviews revealed that this group argued that advocacy and facilitation to consumers would come from strengthened regulations on green agriculture. Furthermore, they thought

that the government had so far facilitated many private initiatives for environmental conservation and the application of international environmental standards in agriculture. However, they believed that those initiatives could not be widely upscaled or mainstreamed without strong support from the regulations and innovations in facilitating incentives for smallholders.

Discourse 2: providers of resources

Table 5 indicates that the providers of resources perceived that most of the gaps originated from the limitation of smallholder farmers⁶ to access information and technology (19), capital through formal financial institutions (13), and capacity building through training and extension on environmental management in the agricultural sector (23). Providers of resources were also concerned that the concept of ecosystem services for agriculture had not been understood by stakeholders (24). Providers of resources agreed that green agricultural policy should

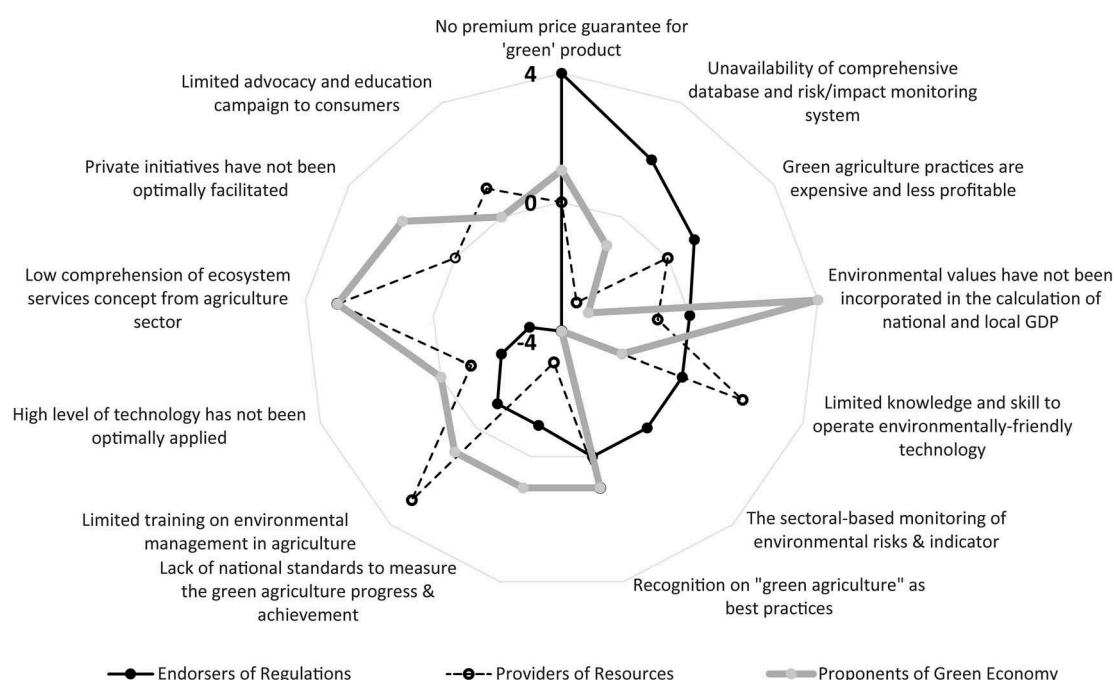
**Figure 3.** Distinguishing statements for Discourse 1: endorers of regulations.

Table 5. Significant factor scores for Discourse 2: providers of resources.

No.	Statement	Z-scores
Deemed to be important:		
19	Smallholder farmers have limited access to green agriculture technology and information	1.519
13	Smallholder farmers have limited access to formal financial institutions	1.408
23	Training and extension in environmental management in the agricultural sector is still limited	1.148
24	The concept of ecosystem services in the agricultural sector has not been well-understood	1.127
7	Agricultural policy formulation is lacking scientific information	1.075
9	Policy and legislation to apply the green agriculture concept have not been available for all commodities.	1.033
Deemed to be unimportant:		
12	Agricultural business scale in Indonesia is not economically viable thus hindering the application of green agriculture	-1.079
4	Funds from environmental levies have not been earmarked for the environmental sector, such as for environmental protection and rehabilitation	-1.080
10	Unavailability of comprehensive database and risk/impact monitoring system	-1.391
27	Lack of national standards to measure the progress or achievement of green agriculture	-1.490
28	The monitoring of environmental impact and indicators is still carried out on a sectoral basis instead of a cross-sectoral	-1.646
30	Several international environmental standards are not suitable to be applied in Indonesia, considering local norms and conditions	-2.285

be available for all commodities (9), and thought that the agricultural policy formulation process that was mostly carried out without scientific inputs (7) significantly contributed to the gap.

Group 2: providers of resources believed that providing smallholders with access to resources will significantly reduce the performance gap. The experts in this group felt that stakeholders in Indonesia have a poor understanding of the non-economic benefits of green agricultural practices, such as cultural and regulatory benefits. Beside the economic and livelihoods' aspect, the other potential ecosystem services, such as regulatory and cultural services, generated from agricultural practices had not been widely recognized by stakeholders in Indonesia. While the Indonesian agricultural sector consists of various popular global commodities, this group perceived that green agriculture policy was only applied to a limited number of commodities, particularly export-based ones, such as palm oil.

This group did not feel that improved compatibility with international environmental standards (30), monitoring and measurement systems for environmental risk (28 and 10), and improved national standards to measure progress in green agriculture (27) would reduce the gaps in the implementation of green agriculture. The providers of resources equally perceived that the earmarking of environmental funds (4) and the

improvement of green agricultural business feasibility (12) did not contribute to the bigger gaps between aspiration and practice.

Discourse 3: proponents of green economy and land-use planning

The proponents of GE and LUP highly perceived the inability to integrate environmental value into the gross domestic product (GDP) (5) and the absence of environmental-earmarking funds from environmental levies (4) as the major factors contributing to the performance gap. The integration of environmental value and earmarking of environmental funds could be done by considering the environmental aspect and integrating environmental indicators into the GDP. This group believed that integrating the environmental into the fiscal and financial aspects of development would increase agricultural sustainability, as this would embed the sustainability principle in all sectoral programmes and budgets, including agriculture. Table 6 elaborates the statements with significant factor scores for this discourse.

This group shared perspectives with the endorsers of regulations on the unsynchronized and inconsistent LUP and zoning to incorporate environmental risk and impact (1, 2) as the other significant contributors to the gap. Just like the providers of resources, this group

Table 6. Significant factor scores for Discourse 3: proponents of GE and LUP.

No.	Statement	Z-scores
Deemed to be important:		
5	Environmental values have not been incorporated in the calculation of national and local GDP	2.042
1	Unsynchronized land-use planning and zoning maps at the national and subnational level	1.902
2	Inconsistent and not comprehensive land-use planning and application at the subnational level in incorporating environmental risk and impact	1.675
24	The concept of ecosystem services in the agricultural sector has not been well-understood	1.298
4	Funds from environmental levies have not been earmarked for the environmental sector, such as for environmental protection and rehabilitation	1.173
Deemed to be unimportant:		
14	Financial institutions have not taken into account green agricultural practices as an instrument to access capital, particularly for smallholder farmers	-1.102
15	Green agricultural practices are relatively expensive and less profitable thus impede adoption by smallholder farmers	-1.659
13	Smallholder farmers have limited access to formal financial institutions	-1.711
28	The monitoring of environmental impact and indicators is still carried out on a sectoral basis instead of a cross-sectoral	-1.733

perceived that the concept of ecosystem services from agricultural practices has not been recognized and understood (24), thus maintaining the gap.

The proponents of GE and LUP disagreed that a lack of cross-sectoral monitoring of environmental impact (28) significantly contributed to the gap in green agriculture. The group perceived that environmental monitoring would automatically follow when the environmental aspect is integrated into budgeting. This group did not perceive that improving access of smallholders to formal financial institutions (13) as

well as reducing the cost of embracing green agriculture practices (15), and the integrating of green agricultural practices with agricultural financing for smallholders (14) would significantly reduce the gap.

Distinguishing and consensus statements for all discourses

From the distinguishing statements (Figures 3–5), we can observe how the discourses significantly differ on several points. What differentiates the endorsers

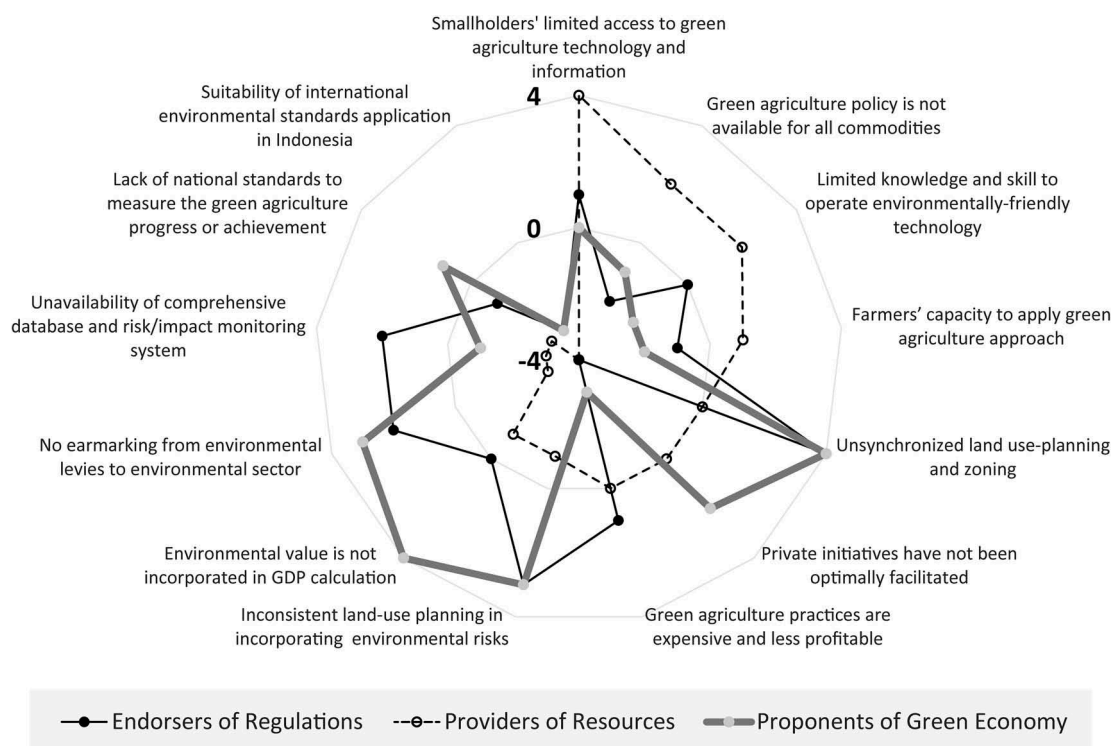


Figure 4. Distinguishing statements for Discourse 2: providers of resources.

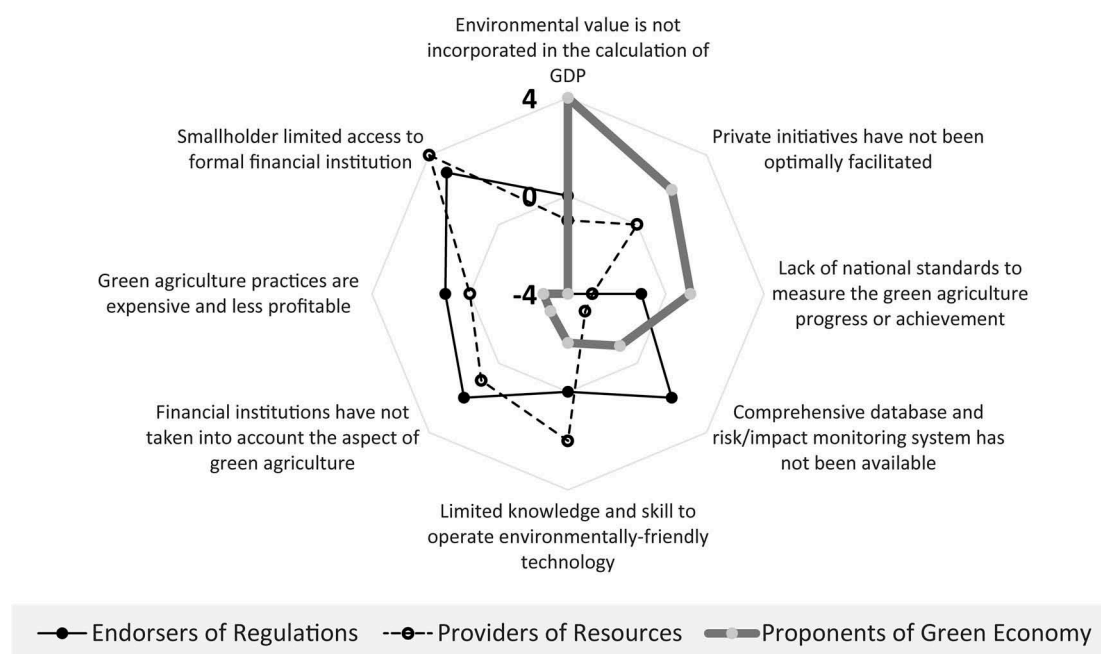


Figure 5. Distinguishing statements for Discourse 3: of green economy and land-use planning.

(Discourse 1) from the other discourses is that the former reckons the absence of incentive or premium price for green agricultural products (18) as a highly significant factor in the performance gap. Unlike the other groups, the endorsers also think that the unavailability of a database to monitor environmental risk (10) contributes to the gap, although not as significantly as the incentives.

Group 2, the providers of resources, separated itself from the others in its perceptions on smallholders' limited access to resources and their capacity to use environmentally friendly technology (19, 26, 22) as the influencing factors in the performance gap. This group did not consider the lack of national standards as a significant factor.

Only Discourse 3, the proponents of GE, described the importance of integrating environmental values into the GDP and earmarking funds from environmental levies for greening the agricultural sector. Another distinguishing perception for Group 3 was that it perceived that suboptimal government facilitation of private initiatives was one of the contributing factors.

For the consensus statements (Table 7), all discourses recognized the importance of scientific support in policy formulation (7), particularly, Discourse 1: endorsers of regulations and Discourse 2: providers of resources. Groups 1 and 3 shared a strong opinion that unsynchronized and inconsistent LUP among national and local governments were major contributors to the gap. Meanwhile, Groups 2 and 3 similarly perceived that ecosystem services from the agricultural sector had not been sufficiently understood to promote green agricultural development. All groups agreed that limitations of data and information were not major factors contributing to the gap nor did they reckon that ineffective eco-certification schemes contributed to the gap. They were not sure to what extent the affordability of commodity certification costs for smallholders influenced the gap.

The robustness of Q-method results

Table 8 presents the probability matrix of all discourses based on the reclassification of Q-sorts through the 22 jackknife resampling runs. The table shows that the probability of each discourse after reclassification is high, with the lowest probability of 86% for Discourse C.

When compared with the results from the original full data, Q-method analysis for this particular data set is robust with the lowest consistency of statement classification being 81% (Appendix 2). Our robustness test shows high consistency of Q-method results, which indicates that the cluster definitions were achieved with a relatively small number of respondents. The resulting classification was not dependent on any single respondent.

Discussion

Clark et al. (1997) and Posner et al. (2016) indicated the importance of accommodating multiple perspectives into the policy- and decision-making processes. Recognizing the common ground while accommodating the strong points of different discourses could be a challenge, as such innovation would require some adjustment and approval from stakeholders with various agendas involved in the process (Clark et al. 1997). Thus, we emphasize consensus in the experts' perspectives as options for aspirational priorities, while also acknowledging the significant factors in each discourse.

Discourse 1 and Discourse 3 present an urgency for decision makers to improve implementation of LUP policy synergized at the national and subnational levels. Dewi et al. (2011) highlighted the lack of integration of spatial planning, between governance scales as well as sectoral domains, as the main challenge to pursue the objectives of low-emission development in Indonesia. The argument is supported by Anderson et al. (2016), who recently

Table 7. Consensus statement on the discourses.

		Discourses					
		1		2		3	
		Q- SV	Z- SCR	Q- SV	Z- SCR	Q- SV	Z- SCR
No	Statement						
Deemed to be important:							
7*	Agricultural policy formulation is lacking scientific information	+3	1.23	+3	1.08	+2	0.72
6*	Government has not provided sufficient budget and adequate assistance/guidance for environmental conservation and preservation in the agricultural sector	+1	0.41	+2	0.86	+2	0.59
16	Green certification costs are relatively expensive and not affordable for smallholder farmers	+1	0.4	0	0.1	0	-0.21
Deemed to be unimportant:							
17*	Commodity certification schemes are not effective to overcome environmental risk/impact	-1	-0.66	-2	-0.88	0	-0.34
20	Extension programs aiming to increase farmers' awareness, knowledge and skills in green agricultural practices in Indonesia are not adequately functional	0	-0.29	0	0.28	0	-0.09
8*	Robust data and information on measurement of causal relationships between agricultural practices and their risk/impact on the environment are still limited	-2	-0.86	-1	-0.56	-1	-0.56

Non-significant at $P > 0/01$. Those flagged with an * are also non-significant at $P > 0/05$

presented a case study of how unsynchronized planning and policies between governance scales provide a major challenge to meet Indonesia's GE aspirations. To reduce the gap between policy and practice, targeting national and subnational decision makers to develop a system to synergize their policy is crucial to promote green agriculture.

Decision makers also need to focus on specific aspects of each discourse, where new approaches and ideas might be raised. Discourse 1 states incentives as one potential instrument to promote green agriculture, mainly targeting smallholders by providing premium prices for green products. In Indonesia, incentives through certification have been endorsed by non-governmental entities with varying results in implementation; while the focus of government is more on palm oil (Brandi et al. 2013; Winarni et al. 2014; Leimona, Amaruzaman, et al. 2015; Wijaya & Glasbergen 2016). The government needs to provide regulations and institutionalize the incentive process for all global commodities' value chains, from producers through to consumers, so that both smallholders and corporations are encouraged to green their agricultural practices. Incentives and support for private initiatives highlighted in the discourses represent new ideas for changing the practice of implementing public-private partnerships. Several policy studies argue that promoting new ideas or innovations requires legitimacy from influential stakeholders who have different interests (Laranja et al. 2008; Clark et al. 2011; Flanagan et al. 2011).

The perspectives from Discourse 2: providers of resources show the importance of improving smallholders' access to resources, such as to capacity building, green technology, and green finance. At the moment, access to these resources is minimal and/or is not available to smallholders and has been indicated as one of the gaps that need to be filled to green Indonesia's agriculture (Leimona, Amaruzaman, et al. 2015).

Discourse 3 suggests that the government needs to gradually develop a more comprehensive financing support system for green agriculture through the implementation of green GDP and earmarking of environmental levies. In late 2014, OJK, the Indonesian financial services regulator, published a Roadmap for Sustainable Finance in Indonesia, which

included agricultural commodities (OJK 2014; UNEP 2015). Considering the contribution of the agricultural sector to Indonesia's GDP, incorporating earmarked levies and green GDP accounting in the agricultural sector could enhance the achievement of this roadmap's objectives. Further, several national institutions, such as the Bureau of Statistics, Ministry of Forestry, and the former administration's Presidential Working Unit for Supervision and Management of Development (UKP4), have applied natural capital accounting to produce their own statistics and data (WAVES 2016). To support implementation of the national green development plan, these initiatives from different institutions need to be synergized.

Discourse 3 also suggests improvement of awareness of the importance of agricultural land in provision of ecosystem services. This idea has been supported by many scientists in Indonesia (Joshi et al. 2002; Verchot et al. 2007; Agus et al. 2013), however, the implementation of ecosystem services' policies is still focused on ecosystem services from protected, state forest land (Leimona, Amaruzaman, et al. 2015). To green the agricultural sector, the scope of ecosystem services' regulations must be broadened to include the services provided by agricultural land or productive landscapes (Swinton et al. 2007).

The parallel acknowledgement of policy and implementation in the three discourses would fit what Flanagan et al. (2011) suggested as a policy mix: an innovation of policy to deal with complex, multilevel and multi-stakeholders' policy spheres. Thus, accommodating the interaction of the three discourses with different actors at the different governance scales will better promote policy action for greening the agricultural sector.

The parallel operationalization of discourses can be done by providing each discourse with rationales, including the policy objective, level of intervention, target, and relevant policy instruments (Laranja et al. 2008). Using this rationale framework, we can operationalize the implementation of each discourse, decide under what circumstances they can be utilized, and when/where they overlap. The operationalization of Discourse 2, for instance, can be conducted by specifying the discourses' objective to strengthen smallholders' access to resources and technology, highlighting its main target of intervention for smallholders, detailing the rationale of how this discourse sees technology and financial capital as the means to promote green agriculture, and explaining that extension services and cooperatives can be used as instruments to provide smallholders with the resources to reach the objective.

The three discourses reflected interacting but separate issues in various stages of the 'green agriculture'

Table 8. Transition probability matrix for jackknife results.

Discourses		Classified based on n-1 observations			
		A	B	C	None
Classified based on n- observations	A	0.949	0.000	0.018	0.030
	B	0.010	0.981	0.010	0.000
	C	0.024	0.012	0.869	0.096
	None	0.105	0.124	0.114	0.667

issue–attention cycles as elaborated in Mithöfer et al. (2017), suggesting different types of solution. For instance, the integrated LUP issue in Discourses 1 and 3 became prominent when a moratorium on permits for forest conversion was implemented in Indonesia in mid-2011 under a Presidential Decree; scientists emphasized the urgency of gaining good-quality data in order to measure the baseline and impact of the moratorium (Dewi et al. 2011; Edwards & Laurance 2011; Agung et al. 2014). In this case, the Indonesian Government responded with the One Map policy and partial progress has been made targeting subnational governments (Fuad et al. 2016; Shahab 2016). Private sustainability initiatives in Indonesia started to emerge at the end of the 1990s through the organic movement, with the issues particularly raised by non-governmental entities then embraced by the government, particularly, first on palm oil certification and then gradually expanding to coffee and cacao (Leimona, Amaruzaman, et al. 2015; Wijaya & Glasbergen 2016). The most advanced stage of the issue–attention cycle would be the capacity building of smallholders that has become a long-term, nationwide, and institutionalized government programme. With the current progressive development of the concept and practices of green agriculture globally, government programs for farmers' extension needs reevaluation (Riyandoko et al. 2016).

In summary, the three discourse groups covered three primary dimensions of governance: incentives, regulation, and agreed norms of behaviour, informally described as 'carrots, sticks, and sermons', that deal with 'what pays', 'rights', and 'what is right' (Serbruyns & Luyssaert 2006; Bemelmans-Videc et al. 2011; van Noordwijk et al. 2012). The required clarity of regulations and the need for green agriculture to be profitable at the farm gate have clear proponents, but underpinning all is the need for a more shared sense of values of what is at stake in reconciling the need to invest in the natural and associated social and human capital of Indonesia, while benefitting from current and sustained future productivity.

Conclusion

Q-methodology indicated three discourses on the performance gap in greening agricultural practices in Indonesia: (1) endorsers of regulations and innovations; (2) providers of resources for access to capital, technology, and knowledge; and (3) proponents of GE and LUP. Instead of focusing on the contradictory points of view from the discourses, policymakers could focus on the points where discourses overlapped, and on the specific aspects in each discourse that can help reduce the gap at different scales. Providing rationales based on scientific information might help to operationalize each discourse. Efforts to close the gap can expect to garner strongest

support from stakeholders if they are built on the common ground between, and include the key aspects of each discourse. The policy issue–attention cycles of Indonesian green agriculture reflect interacting but separate issues as described by various discourses. Each discourse needs more contextual solutions depending on the maturity of its stage of issue–attention cycle. Thus, further study that focuses on the gaps at the different sub-sector (commodity) and governance scales of agricultural practices is needed to provide clearer ideas on greening the agricultural sector in Indonesia.

Notes

1. At the end of 2015, about a year after the survey concluded, President Joko Widodo's administration merged the Ministry of Environment and the Ministry of Forestry to address overlap and unsynchronized regulations that were also indicated in this study. We chose to keep the respondents' affiliations as they were at the time of the survey, as the merger had not become fully operational at the time of submission of this paper.
2. The PQMethod was developed by Peter Schmolck and John Atkinson. We used PQMethod version 2.33, downloaded on 14 April 2014 from <http://schmolck.userweb.mwn.de/qmethod/>
3. Statement with Z-score ≥ 1 , which is associated with the challenge or factor that contributes most to the gap in the implementation of green agriculture in Indonesia.
4. The number in brackets refers to the Q-sample statements in Table 3
5. The wordings on the figures were rephrased and shortened from the tables
6. Indonesia's agricultural producers are predominantly smallholder farmers who typically acquire a small piece of agricultural land (less than 2 ha per household), and have low access to capitals and technology. See Leimona, Amaruzaman, et al. (2015) for further details.

Acknowledgements

The study was carried out as part of the review, *Indonesia's 'Green Agriculture' Strategies and Policies: Closing the Gap between Aspirations and Applications*, by the World Agroforestry Centre. Thanks are due to all experts who contributed to the discussions and workshops for statement development and who participated in the Q-sorting. Special thanks to Fitria Yasmin for her excellent contribution in the early preparation of Q-sample statements and data entry.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

The CGIAR Research Program on Forests, Trees, and Agroforestry (FTA-3) supported the study in collaboration with the World Bank World Bank, Washington DC.

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Appendix

Appendix 1. Rank of statements based on the overall preferences of all participants

Rank	Stat. no	Statement	Mean*	Min score	Max score	Median
1	1	Unsynchronized land-use planning and zoning map at the national and subnational levels	+2.27	-3.00	+4.00	+3.00
2	2	Inconsistent and not comprehensive land-use planning and application at the subnational level in incorporating environmental risk and impact	+1.77	-2.00	+4.00	+1.50
3	18	No premium price guarantee for 'green' products, meaning no incentive for farmers	+1.64	-2.00	+4.00	+2.00
4	7	Agricultural policy formulation is lacking scientific information	+1.50	-2.00	+4.00	+1.50
5	6	Government has not provided sufficient budget and adequate assistance/guidance for environmental conservation and preservation in the agricultural sector	+1.45	-3.00	+4.00	+1.50
6	15	Environmental values have not been incorporated in the calculation of national and local GDP	+0.86	-3.00	+4.00	+1.00
7	14	Financial institutions have not taken into account green agricultural practices as an instrument to access capital for smallholders	+0.86	-4.00	+4.00	+0.50
8	4	Funds from environmental levies have not been earmarked for the environmental sector, such as for environmental protection and rehabilitation	+0.82	-4.00	+4.00	+1.00
9	13	Smallholder farmers have limited access to formal financial institutions	+0.64	-4.00	+4.00	+1.50
10	25	Green agriculture implementation in Indonesia has not been widely recognized as a 'best practice'	+0.64	-3.00	+4.00	0
11	19	Smallholder farmers have limited access to green agriculture technology and information	+0.50	-4.00	+3.00	0
12	15	Green agricultural practices are relatively expensive and less profitable thus impeding adoption by smallholder farmers	+0.36	-4.00	+4.00	+0.50
13	23	Training and extension in environmental management in the agricultural sector is still limited	+0.27	-3.00	+4.00	+0.50
14	24	The concept of ecosystem services in the agricultural sector has not been well-understood	+0.18	-3.00	+4.00	0
15	9	Policy and legislation to apply the green agriculture concept have not been available for all commodities	0	-4.00	+4.00	0
16	10	Comprehensive database and a risk/impact monitoring system has not been available	-0.05	-4.00	+4.00	+0.50
17	16	Green certification costs are relatively expensive and not affordable by smallholder farmers	-0.18	-4.00	3.00	0
18	20	Extension programs aiming to increase farmers' awareness, knowledge, and skills of green agricultural practices in Indonesia do not function adequately	-0.27	-3.00	2.00	0
19	26	Limited knowledge and skills to operate environmentally friendly technology in agriculture	-0.50	-4.00	3.00	-1.00
20	3	Private initiatives in preserving the environment have not been optimally facilitated by the government	-0.59	-4.00	3.00	-1.00
21	27	Lack of national standards to measure the progress or achievement of green agriculture	-0.73	-3.00	2.00	-1.00
22	8	Robust data and information to measure the relationship between agricultural practices and their environmental risk/impact is still limited	-0.86	-4.00	1.00	-0.50
23	22	Farmers do not have adequate knowledge and capacity to apply a green agriculture approach	-0.86	-4.00	3.00	-1.00
24	11	High level of technology has not been optimally applied to support green agriculture	-0.95	-4.00	3.00	-0.50
25	21	Consumers only receive limited advocacy and educational campaigns about green agriculture	-1.09	-4.00	4.00	-0.50
26	17	Commodity certification schemes are not effective to overcome environmental risk/impact	-1.14	-4.00	1.00	-1.00
27	12	Agricultural business scale in Indonesia is not economically viable thus hindering the application of green agriculture	-1.32	-4.00	+4.00	-1.50
28	28	The monitoring of environmental impact and indicators is still carried out on a sectoral basis instead of a cross-sectoral one	-1.50	-4.00	+4.00	-2.00
29	29	The national accreditation body of Indonesia has not properly incorporated environmental standards in agriculture	-1.64	-4.00	+2.00	-2.00
30	30	Several international environmental standards are not suitable to be applied in Indonesia, considering local norms and conditions	-2.09	-4.00	+1.00	-2.00

Appendix 2. Q-sorts with frequency of classification across three discourses resulting from n-1 runs of jackknife resampling

Q-sorts	Original full observation data	Associated discourse			
		Jackknife resampled with n-1 (%)			
		A	B	C	None
1	A	90.5	0	0	9.5
2	B	0	100	0	0
3	–	14.3	33.3	4.8	52.4
4	A	100	0	0	0
5	A	100	0	0	0
6	A	100	0	0	0
7	A	85.7	0	9.5	4.8
8	B	0	100	0	0
9	A	92.5	0	0	4.8
10	B	4.8	90.5	4.8	0
11	C	4.8	0	81	14.3
12	C	4.8	0	81	14.3
13	C	0	4.8	90.5	4.8
14	B	0	100	0	0
15	–	0	9.5	19	71.4
16	A	95.2	0	0	4.8
17	–	14.3	0	0	85.7
18	–	0	19	9.5	71.4
19	A	95.2	0	4.8	0
20	–	23.8	0	23.8	52.4
21	C	0	0	95.2	4.8
22	B	0	100	0	0