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INTEREST-BALANCED AGRICULTURAL POLICY-MAKING: KEY PARTICIPATIVE AND COLLABORATIVE CAPACITIES IN THE OPINION OF NGOS' EXPERTS

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ABSTRACT. Stakeholder participation in the process of agricultural policy-making is a way to express public interest and thus to better ensure sustainability of the sector as well as of a country. In agriculture, variety of stakeholders and their organizations is huge, and their power and ability to protect common interests are uneven. Studies on interest management note that contradictions between interest-based actors could be solved most effectively through their collaboration. Thus, the article aims to identify key capacities of agricultural organizations to fulfil their members' interests at the level of agricultural policy. With this aim, interviews with the leaders of agricultural NGOs were carried out. Opinions of experts were elicited using the 10-point Likert scale. The LiT method of grades' transformation given in the Likert scale to weights was proposed and used. The resulting weights revealed the significance of each question. As the result, shared resources, stakeholders' motivation and commitment, teamwork and synergy between intersectorial actors was found as the main collaborative capacities while influence-making, and the ability to act according to regulations and procedures has been estimated as a highly important participative capacity for agricultural NGOs.

Keywords: participative and collaborative capacities, stakeholder involvement, policy-making, inter-sectorial interaction, interest management, LiT method, NGOs, agriculture, Lithuania

Introduction

The issue of stakeholders' involvement in the process of policy decision-making is relevant in most sectors of public interest, e.g. in healthcare (Harris et al., 2016), education (Vargas et al., 2019), social protection (Wang & Ma, 2017; Revilla & der Valk, 2016), environment (Linke & Jentoft, 2016; Lacroix & Megdal, 2016; Garard & Kowarsch, 2017) as

well as in business because stakeholder participation is vital for ensuring the quality of a product or a service (Purvis et al., 2015; Green & Hunton-Clarke, 2003; Osey-Kojo & Andrews, 2016; Loi, 2016; Morgan et al., 2019). However, there are a few differences in agriculture due to a couple of reasons. Firstly, the sector of agriculture performs the function of providing food products. In addition, the society cares more and more about consuming healthy food (Krarup et al., 2008; Wezemaël et al., 2014). Therefore, the society is a key stakeholder of this sector due to the permanent need for food and growing requirements to its quality. Secondly, there is always a state-level policy of financially supporting agriculture. Agriculture and food sector are state-supported in the majority of countries of the world (Bilan et al., 2016; Gorb, 2017; Nagyová et al., 2016; Poór et al., 2017). For example, the European Union has dedicated 28.5 percent of all EU budget expenses to agriculture (Massot, 2018). The agriculture policy of the United States also includes support (Agriculture Improvement Act, 2018), for instance, in 2018, the US President signed the \$867 billion Farm Bill into law.

Due to uniqueness of agriculture (Ferto, 2018; Hlouskova et al., 2018; Polakovic et al., 2018), the variety of its stakeholders is huge and their influence and the ability to protect their interests are uneven. The contradictions caused are solved through the mechanisms of stakeholder inclusion and participation in policy-making (Wesselink et al., 2011, p. 295; Halpin, 2017; Pedrosa et al., 2019). There are attempts to establish stakeholder participation principal legally. For example, the EU Rural development programme distinguishes the priority of social inclusion (European Commission, 2016). Unfortunately, the researchers notice that stakeholder involvement and participation is a multidimensional problem, the essential aspect of which is insufficient stakeholders' role and activity in practice.

In publications, insufficient stakeholders' participation is explained at public policy, organization management and individual levels. Public policy investigations mostly discuss the questions of stakeholder legitimacy and institutionalization of participation (Linke et al., 2011; Arras & Braun, 2018; Wijaya et al., 2018; Reed, 2008; Prager & Freese, 2009), research at organizational level examines the ability to structure and manage stakeholders' participation (Arras et al., 2018; Sisto et al., 2018) while stakeholders' motivation is analysed at the individual level (Purvis et al., 2015; Kuliešis & Pareigienė, 2010; Falconer, 2000; Žiliukaitė, 2012). Here, the concept of participative governance can be taken on as it combines topics of different levels in itself (Krom, 2017; Newig et al., 2017), although the question on stakeholders' participative capacities in the context of their rank relevance remains unanswered. Based on the aforementioned issues and research relevance, the article is aiming to identify the capacities of agricultural NGOs needed for implementation of their members' interests in agricultural policy.

With this aim, structured interviews with the leaders of agricultural NGOs were carried out. Opinions of experts were elicited using the 10-point Likert scale. The novel LiT method of transformation of the grades given in the Likert scale to weights was proposed for use. The resulting weights reveal the significance of each question. Anova test estimating differences of opinions among the groups of experts was performed. The weights of questions' significance were constructed. For qualitative evaluation of the means of the elicited responses within each group and within the whole group of experts, confidence intervals around the means were constructed.

The case of Lithuania was chosen for analysis with a certain purpose in mind. In Lithuania, the ratio of big and small farms is very inconsistent on the state level while our earlier research has shown that the activity of small and big farmers in interest-based organizations differs significantly (Raišienė et al., 2018).

The article consists of four sections. The first section highlights different shapes of stakeholder involvement and inclusion into the process of policy-making and analyses the

problems related to stakeholder participative capacities. The second part briefly presents the structure of farming and other agricultural NGOs in Lithuania. In the third section, the research methodology is detailed. The fourth section discusses the research results. At the end of the article, the research conclusions and insights are presented which call to further discussion of the NGOs' participation capabilities.

1. Literature review

1.1. Key aspects of stakeholder involvement and inclusion into policy-making

In terms of stakeholders in agricultural sector, it should be emphasized that landowners are the most important agents of change who put forward the agricultural goals for politicians and directly or indirectly point out the required measures and programmes.

According to researchers, the stakeholder inclusion in policy making is the hidden ingredient which influences the efficiency of policy (Harris et al., 2016). However, individual stakeholders cannot participate in policy making processes except through special means like referendum. Thus, stakeholder participation in and with formal bodies is a way to express and protect public interest. Here, organizations of common interests can help in transition towards participatory society (Revilla et al., 2016), and members of those organizations play an essential role in the process.

Research show that stakeholders' attitude to activities in organizations of common interests affects their participative behaviour and activity (Falconer et al., 2000; Wilson, 1997). It seems that to solve the problem, a non-financial motive should be found which would more stakeholders to participate. However, in this aspect, activity of participation in policy making does not always depend on the motivation of individuals. The capabilities of organizations they are represented by are significant as well. Scientists highlight that organizations of common interests are sometimes unable to make interventions into policy making due to a lack of skills or time to coordinate a significant involvement (Harris et al., 2016). Due to this reason, stakeholder activity and adequate participation is highly dependent on public government decisions which create conditions for interest-based organizations to become involved in policy decision-making processes. In other words, since stakeholder organizations do not have enough intangible resources, they are supported by public government institutions whose duty is to protect the public interest.

Considering the ration of stakeholder self-involvement and inclusion by decision of governmental bodies, a question on the function could be raised: what is the task of stakeholders in policy making? Answering this question could be difficult due to cohesion between content and form of the issue. On the one hand, stakeholder inclusion in political processes in practice is formally regulated, i. e. the participation of representatives of the society or sector is provided with a specific form: consulting and discussion medium, council of representatives etc. On the other hand, strictly defined forms of participation put collaboration into frames which limit the opportunities to reach a result of interaction between stakeholders and governmental bodies that differs from the usual one.

One of the first to emphasize the problem of stakeholder participation was Arnstein (1969). She proposed the ladder of citizen participation model which distinguished in three levels of inclusion. These levels were defined as non-participation, tokenism and citizen power:

- Nonparticipation characterizes in one-sided information flow. Stakeholders do not make any input to the policy decision-making although various committees of representatives are established. Communication serves for the purpose of public relations.

- Tokenism is characterized by bidirectional communication. However, the stakeholders' opinion has no real significance to political decisions. Even when discussions are held, the stakeholders "participate in participation" rather than actually consult the decision makers (Arnstein, 1969, p. 220). Recent studies have also confirmed that consultations only ensure transparency of the policy (Arras et al., 2018).
- Citizen power level is the one, where stakeholders and government share power and possibility to influence policy decisions.

Later research, e. g. Green et al. (2003), Reed (2008), Prager (2009), Newig et al. (2017), Bruns (2003), Basco-Carrera et al. (2017), are generally based on Arnstein's model and define three types of stakeholder participation: informative, consultative and decisional. Informing, consulting and inclusion medium is arranged for stakeholders by government in practice as well. In other words, governmental bodies greatly influence the role, contribution and effect of stakeholders in processes of decision-making. In regard with this issue of stakeholder self-involvement and inclusion ratio rises again.

Individual stakeholders (farmers, foresters, local residents etc.) rally and cooperate seeking for their interests to be considered in policy making. Meanwhile, governmental bodies and other actors with decision power coordinate the process rather than collaborate (Prager, 2015; Basco-Carrera et al., 2017). Due to collaboration and coordination requiring different actions, it poses new challenges for stakeholder participation. The main challenges are i) dilemmas between private and public benefit, ii) difficulties in choosing the right structure of organizational interaction and iii) a need for special conditions for mutual trust and social capital in organizations and networks to grow. It can be seen that government organizations and researchers have different opinions to the participative government practice. The researchers notice that stakeholder participation in general is insufficient for their needs and ideas to reflect in political decisions (Linke et al., 2016). However, policy makers are more optimistic. For example, Boulton, Lockett, & Seymour (2013) that in most cases, coordination is enough and there is no genuine need for intensive collaboration. On the other hand, it is recommended to provide organizations with guidance on organizational structure, process management, member training and other aspects of development of inter-institutional collaboration.

Generally, for stakeholder organizations to get involved in policy-making processes, support from governmental bodies is necessary as stakeholders face a variety of obstacles acting independently: from lack of resources, lack of inter-organizational management skills and capabilities to insufficient motivation.

As a consequence, policy makers have all opportunities and power to specify on what level stakeholder organizations can be involved. In this case, stakeholders' capacities question, or rather stakeholder organizations' ability to have real influence on decisions arises anew and can be asked as follows: what participative and collaborative capacities are the most important for stakeholders in seeking to adequately protect common interests in process of policy-making. In order to answer this question, stakeholder capacities stated in literature and attitudes of farmers themselves need to be compared.

1.2. Capacities for stakeholder participation in policy-making

As it has been noted, the stakeholders are not organized in the early stages of participation, i. e. informative and consultative stages. Despite being active, they are separate members of different groups of society that lack abilities and formal opportunities to involve initiatives. However, as Connor (1988) states, participation of organizations does not improve how members of society are represented but rather put forward leaders whose influence in political decision making is often substantially significant. Logically, skills of organizational

interest management, recruitment and collaboration cause the rise of these organizational leaders and through them – realization of interests of groups in the organization in policy making.

Grindle & Hilderbrand (1995) discovered that effective public sector performance relies significantly on good management practices and effective communication networks. In terms of performance effectiveness, these factors are even more important than regulations and rules. [39]. In parallel, picking out stakeholder involvement in decision making as a part of the public sector performance it could be stated that the effectiveness of collaboration between policy makers and stakeholders depends on their networking, communication and other necessary capabilities. A capability can be defined as capability to perform the specific assigned task effectively and efficiently on a continuous basis (Waheed, 1999, p.915). Capabilities need to be considered with an appreciation of the dynamics and inter-relationships among various issues and actors in different dimensions (Bolger, 2000, p.3). Following this attitude, individuals are inseparable from the environment in which they act. In other words, individuals (in this case, farmers) are social and organizational actors. Thus, capacity changes on an individual level mean changes in a broader framework (Bolger J., 2000). As Lavergne & Saxby (2001) emphasize, capability development is about human development and change and about power and interest within communities, organizations and society (Lavergne et al., 2001). Therefore, capability of the group refers to competence to undertake responsibilities assign to them, while in huge organizational forms collective capabilities provide an opportunity for organizations and institutions to create public value (Analoui & Danquah, 2017, p.38).

The literature on stakeholder capacity considers some capacities as essential. These are capacities that allow social entities to use their potential on the highest possible level. Understandably, due to influence and power, the potential differs between governments, non-state actors and local stakeholders (Lavergne et al., 2001). It is important to take into consideration and define missing capacities while developing existing necessary ones.

It should be noted that participative and collaborative capacities in literature are most often examined in the context of institutional development. The discussion usually evolves starting with individual factors and ending with organizational group and interinstitutional network interaction issues. It should also be emphasized that in terms of content, publications tend to overlap stakeholder participation capacities with inter-sectorial and inter-organizational collaboration characteristics. Notable examples are: mutual trust; tendency to participate and willingness to collaborate; open dialog capability; intensive transparent communication horizontally and vertically; commitment; inclusiveness; regulations and procedures; influence and power relations; engagement; balance in interest representation; shared motivation and other groups (Fung, 2006; Morgan, 2008; Bitzer, 2012; Baimyrzaeva, 2012; Prager, 2015; Linke & Jentoft, 2016; Newig et al., 2017; Arras & Braun, 2018; Newig et al., 2018). These characteristics, abilities and factors are examined in order to determine how to better include stakeholder organizations in making decisions valuable to a wide range of stakeholders and society and how to better interact with these organizations in a complex network. Based on this goal and abovementioned publications, in addition to our earlier research (Raišienė & Baranauskaitė, 2018), we grouped stakeholders' inter-sectorial capacities into two groups:

A. Participative capacities: 1) influence capability; 2) decision power; 3) capability to enable specific regulations and procedures; 4) involvement capability; and 5) interest representation capability;

B. Collaborative capacities: 1) development of mutual trust; 2) inter-sectorial and inter-organizational communication; 3) teamwork; 4) motivation and commitment; 5) synergy; 6) shared resources; 7) willingness to collaborate.

In our research, these stakeholders' inter-sectorial interaction capacities are grouped and titled as QP (Participative capacities) and QC (Collaborative capacities) (Table 1).

Table 1. Stakeholders' inter-sectorial interaction capacities

QP	Participative capacities	QC	Collaborative capacities
QP.1.	Influence	QC.1.	Development of mutual trust
QP.2.	Decision power	QC.2.	Inter-sectorial and inter-organizational communication
QP.3.	Regulations and procedures	QC.3.	Teamworking
QP.4.	Involvement	QC.4.	Motivation and commitment
QP.5.	Interest representation	QC.5.	Synergy
		QC.6.	Shared resources
		QC.7.	Willingness to collaborate

2. METHODOLOGY

2.1. *The context: agricultural organizations of common interests in Lithuania*

We have chosen non-governmental organizations (NGOs) to research participative and collaborative capacities of the agrarian stakeholders as NGOs are established on the basis of common interests of a particular social group (e.g. Skouloudis et al., 2013) and thus fulfil the aim of our study. According research of Prager et al. (2009), „representatives of agricultural associations have frequent contacts with the relevant ministry departments and thus form the agricultural policy network”.

The forms of NGOs can be diverse: associations, unions, societies, communities, etc. Due to its specificity, i. e. performance on a voluntary and non-profit basis, NGOs face significant resource challenges over a longer period of time. It can be seen when analysis organizational life-span, e.g. according to the data of the Lithuanian Department of Statistics, in 2018 only 37.4% of 19262 registered associations were active in Lithuania (Official Statistics Portal, 2019), and only 1% of all Lithuanian NGOs operated in the agricultural sector. There were 78 NGOs in total.

According to the legal-organizational form, agricultural NGOs are distributed as follows: associations set up 71.8%, unions and societies – 11.5%, other NGOs (charity, support organizations, etc.) – 16.7%. As can be seen, associations dominate in the agricultural sector. They are also the most abundant of their members compared to other agricultural organizations acting on the basis of common interests. More than half of the associations do not have personnel.

By territorial distribution, local–regional NGOs account for 19.2%, other organizations operate throughout Lithuania. Some organizations belong to international networks of agricultural organizations.

Based on the nature of activities, agricultural non-governmental organizations can be divided into five dominant groups:

- General farmers' NGOs. They make up 30.8% of all NGOs operating in the Lithuanian agricultural sector. This group includes NGOs such as farmers' associations, farm associations, organic farming associations;
- Livestock subsector's NGOs. Their activities concern the raising of livestock and animals (cattle, pigs, sheep, horses, birds, fur animals, etc.) and production of their

products (milk, eggs). This group accounts for 26.9% of all NGOs in the agricultural sector;

- Fisheries subsector's NGOs. This group includes 16.7% of all agricultural NGOs;
- Crop subsector's NGOs. This group consists of NGOs of cereals, berries, vegetables, greenhouses, grapes, hops and other plants growers and accounts for 11.5% of all NGOs in the agricultural sector;
- Other NGOs. This group includes individual organizations without a common focus. These include forests, land reclamation, tourism, etc. NGOs. This group accounts for 14.1% of all NGOs in the agricultural sector.

Regarding the size of NGOs, there is no consensus either in literature or among professionals. Researchers group organizations in different ways depending on the research objectives (e. g. Farhad & Akram, 2012; Kim, 1997). In implementing our research, we divided the Lithuanian agricultural sector's NGOs into three groups. A group of large NGOs includes organizations with more than 500 members, a group of medium NGOs consists of 50–500 members and a group of small NGOs has up to 50 members. On the basis of such grouping, large agricultural NGOs accounted for 12.8% of all active organizations, medium NGOs – 34.6%, and small – 52.6%. As can be seen, the number of organizations in the groups is rather uneven. Unfortunately, we have not been able to distinguish at least a significant part of the medium organizations (e. g. groups of 50–250 and 250–500 members) due to a very small number of associations with a membership of between 250 and 500. Such organizations make up 3.8% of the total NVOs. NGOs distributions by type of activity and size of organization are presented in Figure 1.

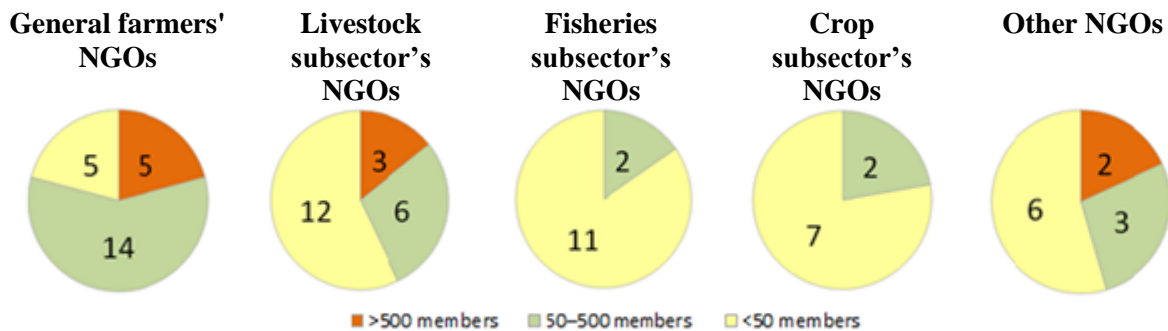


Figure 1. Distribution of NGOs in the Lithuanian agricultural sector by type of activity and size of organization

2.2. Materials and methods

In order to identify the most important capacities of stakeholder involvement and participation in the shaping of agricultural policy, an empirical research was carried out by expert interview. The research was carried out in Lithuania in July 2018 – March 2019.

The first step was to collect general statistical information on all NGOs operating in Lithuania and NGOs in the agricultural sector (for a brief overview see chapter 2.1). Then the NGOs were grouped by the number of members and by the area of activity (Figure 1).

Based on the theoretical analysis, in a third research stage was designed a questionnaire consisting of 2 groups of statements. The statements in the A group (QP) are intended to assess factors that characterize participation capacities while the statements in the B group (QC) - collaboration capacities (Table 1).

The questionnaire also included questions about the number of NGOs members and the activity of NGOs members.

Our research population was all 78 NGOs operating in the agricultural sector. In order to identify the most important capacities of stakeholder involvement and participation in the shaping of agricultural policy, an empirical research was carried out by expert interview, which is suitable for this purpose according Flick (2014). Experts were selected from agricultural sectors NGOs top managers, having experience as leaders more than 5 years, representing all 5 groups by type of activity and all 3 groups by size of organization. 15 experts were selected and agreed to participate in the survey. The NGOs that was represented by the experts participated in the survey were divided into three groups (Table 2):

- The first group includes large NGOs, with more than 500 members (20% of the organizations surveyed);
- The second group comprises medium NGOs, with a number of members ranging from 50 to 500 (40% of the organizations surveyed);
- The third group consists of small NGOs, with less than 50 members (40% of the organizations surveyed).

Table 2. Breakdown of expert NGOs by size (number of members)

Group of experts	Group 1	Group 2	Group 3
Size of NVOs	Large	Medium	Small
Number of members	>500	50–500	<50
Share (N; %)	N=3; 20%	N=6; 40%	N=6; 40%

Thus, our survey experts reasonably well reflect the proportion compared to the total distribution of Lithuanian agricultural NGOs by size of organization.

2.3. Quantitative analysis

For the analysis of survey results, firstly, the 10-point Likert scale was chosen for eliciting opinions of members of organizations (Likert, 1932) using linguistic descriptions of perception of intensity supplied with descriptions of each level of intensity. Likert scale was chosen in order to facilitate the process by making adequate perception of the scale by experts. Such qualities as “opportunity”, “intensity of cooperation”, “power of influence”, “level of confidence”, “effectiveness of communication”, etc. have only qualitative measurement; intensities of senses are difficult to be transformed into the quantitative terms directly by experts. In addition, measures of intensity of involvement, punctuality is also gauged using the same scale as above in the absence of statistical data of the exact participation of the members.

Likert scale uses qualitative variables and thus does not allow using quantitative weighing. There are various methods of transformation of linguistic variables into quantitative variables available in the literature. For example, search in the most popular Scienedirect scientific database using two key words “Likert” and “fuzzy” retrieved 2064 results. Methods with use of fuzzy numbers imply the fuzzification step in the model of eliciting weights (Dahooie et al. 2018; Vongalo, 2017), which require a good initial knowledge of the fuzzy theory by experts. Attempts to elicit weights using a discrete scale and probability were made in Podvezko & Podvezko (2015). In the latter case a good understanding of the theory of probability and statistics is required from experts. In all other cases a more transparent and simple methodology of transformation of the linguistic variables into quantitative variables should be used. The proposed Likert Transformation (LiT) method implies assigning a number that reflects magnitude of intensity to each point of the scale used. In our case for the

transformation of the 10-point Likert scale to the set of the real numbers the following correspondence of magnitudes is used (Podvezko et al., 2015; Li, 2013) (Table 3).

Table 3. Breakdown of expert NGOs by size (number of members)

Grade	1	2	3	4	5	6	7	8	9	10
Corresponding Magnitude	0%	11.11%	22.22%	33.33%	44.44%	55.55%	66.66%	77.77%	88.88%	100%

Variables of responses are transformed to quantitative variables as follows. Transformed grades obtained from the elicited responses G_{ij} (Table 2) given in Likert scale using the following formula (1):

$$\tilde{G}_{ij} = 100 \cdot (10 - G_{ij})/9, \quad (1)$$

where $i=1,2,\dots,12$ is the index for questions while $j=1,2,\dots,15$ is the index representing each expert.

Keeping in mind that there were a small number of responses, namely 15, such statistical tests had to be chosen that incorporate the number of degrees of freedom in corresponding distributions for making statistical tests. The F -distribution, used in Anova test, similarly as the t -distribution, has the prominence in cases of dealing with small samples. Reliability of the resulting tests increases further knowing that the sample of responses represents organizations and, consequently, can be treated as the set of means of responses of members of each organization.

An Anova test is performed in order to find out if the differences between the means of the evaluation grades by the three groups are statistically inconsiderable and the corresponding null hypothesis H_0 was formulated. Rejection of such a hypothesis would statistically confirm the alternative H_1 hypothesis that the means of the grades by the three groups are statistically different. The level of the statistical significance of 5% was chosen. The corresponding value of the F -test is obtained and compared with the critical value F_{crit} for 5% level of significance.

In case the means of the grades by the three groups are statistically similar weights of significance of questions are calculated. The weights of significance of questions are constructed using the following normalization formula (2):

$$\omega_i^l = 100 * \frac{\tilde{G}_{ij}}{\sum_{j=1}^S \tilde{G}_{ij}}, \quad (2)$$

where $i=1,2,\dots,S$ is the index denoting questions; $S \in \{5, 7\}$ depending on the number of questions in the group of questions l ; and l is the index that denotes the group of questions P or C. The resulting weights are depicted on diagrams in order to provide a graphical decision-making tool explaining magnitudes of influences of questions.

Responses to each question are tested in each group as well as in the whole set of responses using one-sided t -distribution threshold. From the responses to each question the standard deviation s is estimated and corresponding standard deviations of means are found. Such standard deviations of the distribution of the mean in each group of experts are denoted as follows: σ_3^i for the Group 1 of 3 and σ_6^i for the Groups 2 and 3 of 6, as well as σ_{15}^i for the whole set of experts. They are found by dividing s by the square root of 3, 6, or 15 correspondingly. The estimations are further adjusted because the population of experts in Lithuania is finite.

Confidence intervals around the average of answers in each group are estimated in order to obtain qualitative estimations of responses, in broad extreme terms, such as “there is a lack

of influence” or “there is a positive influence”. We note that negative answers range from 1 to 4 in our Likert scale, while positive answers range from 5 to 10, therefore the arithmetical threshold that discerns negative answers from positive is 4.5. We will choose the one-sided threshold of significance. In such cases when the mean of the answers in the group is below 4.5 we will extend the confidence interval to the right-hand, positive, side. And vice-versa, in the cases when the mean of the answers in the group appears to be above 4.5 we will extend the confidence interval to the left-hand, negative, side. Rejection of the following hypotheses:

H_0^N : the mean of the responses within the group is different from negative;

H_0^P : the mean of the responses within the group is different from positive;

will be made in the case if the confidence interval overlaps with the answers that contradict the qualitative judgement stemming from the mean, in other words, in cases when the confidence interval contains 4.5.

3. Results and discussion

3.1. Transformation of the grades given in the Likert scale to weights

Variables elicited from the experts in the form of the Likert scale were transformed to quantitative variables using formula (1) and are presented in Table 4.

Table 4. Transformed grades of experts \tilde{G}_{ij} from Likert scale to real numbers, %

Statement	NGOs*														
	Group 1			Group 2						Group 3					
	L1	L2	L3	M1	M2	M3	M4	M5	M6	S1	S2	S3	S4	S5	S6
QP.1.	33.3	44.4	100	88.9	88.9	88.9	66.7	44.4	33.3	44.4	77.8	88.9	88.9	77.8	22.2
QP.2.	33.3	33.3	33.3	22.2	77.8	55.6	55.6	33.3	0	33.3	77.8	44.4	44.4	44.4	33.3
QP.3.	11.1	22.2	77.8	11.1	44.4	77.8	33.3	11.1	11.1	33.3	77.8	66.7	11.1	77.8	77.8
QP.4.	11.1	22.2	22.2	77.8	100	11.1	11.1	0	0	22.2	77.8	77.8	0	11.1	100
QP.5.	0	22.2	0	77.8	88.9	11.1	22.2	33.3	0	33.3	77.8	88.9	22.2	44.4	22.2
QC.1.	11.1	11.1	22.2	22.2	22.2	11.1	22.2	0	0	22.2	100	11.1	22.2	33.3	0
QC.2.	33.3	11.1	22.2	44.4	22.2	11.1	33.3	44.4	11.1	33.3	77.8	22.2	22.2	33.3	33.3
QC.3.	33.3	33.3	33.3	33.3	22.2	44.4	33.3	33.3	44.4	33.3	77.8	77.8	22.2	55.6	44.4
QC.4.	33.3	33.3	33.3	22.2	44.4	33.3	55.6	33.3	44.4	33.3	77.8	77.8	33.3	44.4	44.4
QC.5.	33.3	22.2	33.3	33.3	33.3	33.3	55.6	44.4	44.4	33.3	77.8	33.3	33.3	44.4	44.4
QC.6.	33.3	33.3	33.3	55.6	66.7	88.9	66.7	44.4	44.4	33.3	77.8	77.8	11.1	66.7	55.6
QC.7.	33.3	33.3	0	33.3	44.4	11.1	55.6	33.3	44.4	33.3	77.8	44.4	55.6	44.4	55.6

* Represented by the experts NGOs are grouped by size and coded as follows: L - large-sized NGOs, M- middle-sized NGOs, S - small-sized NGOs.

As differences between the means of the grades G_{ij} within the three groups appeared to be statistically inconsiderable after performing Anova test (see section “Anova-verification of the means of evaluation grades of values of each criterion elicited from different groups of experts”), the weights of significance of questions were constructed using the normalization formula (2). Resulting weights of significance ω_i of each criterion in each group of experts and final weights, averages among the groups, was calculated (Tables 5 and 6) (Burinskiene et al. 2017; Palevicius et al. 2018).

Table 5. Weights of significance ω_i of statements *QP* within each group of experts, %

Statement	Group 1	Group 2	Group 3	Final
QP.1.	38.1	32.2	25	31.8
QP.2.	21.4	19.1	17.4	19.3
QP.3.	23.8	14.8	21.5	20
QP.4.	11.9	15.7	18.1	15.2
QP.5.	4.76	18.3	18.1	13.7

Table 6. Weights of significance ω_i of statements *QC* within each group of experts, %

Statement	Group 1	Group 2	Group 3	Final
QC.1.	7.84	5.11	9.77	7.57
QC.2.	11.8	10.9	11.5	11.4
QC.3.	17.6	13.9	16.1	15.9
QC.4.	17.6	15.3	16.1	16.4
QC.5.	15.7	16.1	13.8	15.2
QC.6.	17.6	24.1	16.7	19.5
QC.7.	11.8	14.6	16.1	14.2

It could be observed that the largest discrepancies among the resulting weights are related to such questions, where *p*-values of the Anova test of differences of means of evaluations are the smallest (Table 5).

In the group of questions *QP* the most important with weights above average (20%) appear to be QP.1. with the weight 31.8%; and QP.3 with the weight 20% while in the second group of questions *C* the most important with weights above average (14.29%) appear to be QC.6. with the weight 19.5%; QC.4 with the weight 16.4%, QC.3 with the weight 15.9%, and QC.5 with the weight 15.2. The two remaining questions QC.1 and QC.2 in the second group *QC* appear to be particularly unimportant (Tables 6 and 7).

3.2. Anova-verification of the means of evaluation grades of values of each criterion elicited from different groups of experts

Verification of the null hypothesis H_0 of differences of means of grades of evaluation elicited from the three groups of experts was undertaken using Anova test. Values G_{ij} of grades elicited from the experts were used as follows: three values from three experts in the first group; six values from six experts in the second group; and six values from six experts in the third group. Test results of the test by each criterion are presented in Table 7.

The results show that we cannot statistically reject the H_0 hypothesis as values of the *F* test are smaller than the corresponding threshold F_{crit} . for 5% level of significance and (2,12) degrees of freedom. Such a conclusion is also evident from large *p*-values, larger than 0.05, in all the cases. Therefore, it is safe to conclude (with at least 95% degree of probability or higher) that averages of responses in the groups did not considerably vary. Such a conclusion could be made because the analysis of variance in responses of the three groups did not show statistically significant differences between the means of the groups. We note that the value of the *F*-test in the case of question QC.5. was very close to the critical one not because the means appeared to be considerably different, but because variances of responses appeared to be smaller.

Table 7. Results of Anova test of differences of means of evaluations among the groups

Question	Result			
	<i>F</i>	<i>F_{crit}</i>	<i>p-value</i>	<i>d.f.</i>
QP.1.	0.11	3.89	0.89	2, 12
QP.2.	0.39	3.89	0.68	2, 12
QP.3.	1.27	3.89	0.32	2, 12
QP.4.	0.6	3.89	0.57	2, 12
QP.5.	1.84	3.89	0.2	2, 12
QC.1.	1	3.89	0.4	2, 12
QC.2.	0.85	3.89	0.45	2, 12
QC.3.	2.18	3.89	0.16	2, 12
QC.4.	1.81	3.89	0.21	2, 12
QC.5.	1.35	3.89	0.3	2, 12
QC.6.	1.87	3.89	0.2	2, 12
QC.7.	3.63	3.89	0.06	2, 12

3.3. Testing thresholds of significance of responses

Responses to each question were tested in each group as well as in the whole set of responses using one-sided *t*-distribution threshold. From the responses to each question (Table 2) standard deviation *s* was estimated based on the set of 15 responses. Consequently, corresponding standard deviations of means are found. Such standard deviations of the distribution of the mean in each group of respondents are denoted as follows: σ_3^i for the Group 1 of 3 and σ_6^i for the Group 2 and Group 3 of 6, as well as σ_{15}^i for the whole set of responders. They are found by dividing *s* by the square root of 3, 6, or 15 correspondingly. The estimations were further adjusted because the population of responders in Lithuania is finite and consists of 78 organizations by multiplication of each standard deviation by the finite population adjustment factor $\sqrt{1 - n/78}$, where *n* in this particular case indicates the number of responders in each group, $n \in \{3; 6; 15\}$. Adjusted standard deviations of the means of responses are denoted as $\tilde{\sigma}_3$, $\tilde{\sigma}_6$, and $\tilde{\sigma}_{15}$, correspondingly (Table 8).

As the choice of the threshold of statistical significance is rather liberal and depends on the essence of the research the 10% threshold of significance was chosen. The one-sided 10% threshold of significance for the *t*-distribution for this group (with 2 d.f.) is 1.89; for the second and third groups, which contain six responders, the 1-sided 10% threshold of significance (with 5 d.f.) is 1.48; for the whole set of 15 responders, the 1-sided 10% threshold of significance (with 14 d.f.) is 1.35. Multiplication of such thresholds with corresponding standard deviations will yield the length of the confidence interval for each criterion *i* and each group h_3^i , h_6^i , and h_{15}^i (Table 8).

The same lengths are denoted with the positive or negative signs in Tables 9–11 depending where the mean of responses appears to be in respect to 4.5. Because of the little number of experts in the Group 1 confidence intervals appeared to be too large for making any judgment. For the second, third groups and the group with the total number of experts we employ the following reasoning. In the case 4.5 belongs to the confidence interval, no judgement based on the statistical test can be made. Otherwise, it is possible to make a qualitative conclusion, whether an opinion of the group is positive or negative on a certain question, because the whole confidence interval then belongs either to the positive or negative range of grades in terms of our Likert scale.

Table 8. Results of Anova test of differences of means of evaluations among the groups

Question	Group									
	s	σ_3^i	$\tilde{\sigma}_3^i$	σ_6^i	$\tilde{\sigma}_6^i$	σ_{15}^i	$\tilde{\sigma}_{15}^i$	h_3^i	h_6^i	h_{15}^i
QP.1.	2.344	1.353	1.380	0.957	0.919	0.605	0.673	2.608	1.360	0.997
QP.2.	1.792	1.034	1.055	0.731	0.702	0.463	0.515	1.994	1.039	0.762
QP.3.	2.669	1.541	1.571	1.090	1.047	0.689	0.767	2.969	1.550	1.135
QP.4.	3.432	1.982	2.021	1.401	1.346	0.886	0.986	3.820	1.992	1.459
QP.5.	2.890	1.669	1.702	1.180	1.134	0.746	0.830	3.217	1.678	1.229
QC.1.	2.167	1.251	1.276	0.885	0.850	0.559	0.623	2.412	1.258	0.921
QC.2.	1.534	0.886	0.903	0.626	0.601	0.396	0.441	1.707	0.889	0.652
QC.3.	1.534	0.886	0.903	0.626	0.601	0.396	0.441	1.707	0.889	0.652
QC.4.	1.457	0.841	0.858	0.595	0.572	0.376	0.419	1.622	0.847	0.620
QC.5.	1.183	0.683	0.697	0.483	0.464	0.306	0.340	1.317	0.687	0.503
QC.6.	1.944	1.123	1.145	0.794	0.763	0.502	0.559	2.164	1.129	0.827
QC.7.	1.682	0.971	0.990	0.687	0.660	0.434	0.483	1.871	0.977	0.715

Table 9. Statistical judgement of responses in the experts' Group 2

Question	Average grade	h_6^i	Confidence interval	Qualitative estimation
QP.1.	7.2	-1.36	(5.8; 7.2)	positive
QP.2.	4.7	-1.04	(3.6; 4.7)	no judgement
QP.3.	3.8	1.55	(3.8; 5.4)	no judgement
QP.4.	4.0	1.99	(4.0; 6.0)	no judgement
QP.5.	4.5	1.68	(4.5; 6.2)	no judgement
QC.1.	2.2	1.26	(2.2; 3.4)	Negative
QC.2.	3.5	0.89	(3.5; 4.4)	Negative
QC.3.	4.2	0.89	(4.2; 5.1)	no judgement
QC.4.	4.5	0.85	(4.5; 5.3)	no judgement
QC.5.	4.7	-0.69	(4.0; 4.7)	no judgement
QC.6.	6.5	-1.13	(5.4; 6.5)	Positive
QC.7.	4.3	0.98	(4.3; 5.3)	no judgement

Table 10. Statistical judgement of responses in the experts' Group 3

Question	Average grade	h_6^i	Confidence interval	Qualitative estimation
QP.1.	7.0	1.36	(5.6; 7.0)	Positive
QP.2.	5.2	1.04	(4.1; 5.2)	no judgement
QP.3.	6.2	1.55	(4.6; 6.2)	Positive
QP.4.	5.3	1.99	(3.3; 5.3)	no judgement
QP.5.	5.3	1.68	(3.7; 5.3)	no judgement
QC.1.	3.8	-1.26	(3.8; 5.1)	no judgement
QC.2.	4.3	-0.89	(4.3; 5.2)	no judgement
QC.3.	5.7	0.89	(4.8; 5.7)	Positive
QC.4.	5.7	0.85	(4.8; 5.7)	Positive
QC.5.	5.0	0.69	(4.3; 5.0)	no judgement
QC.6.	5.8	1.13	(4.7; 5.8)	Positive
QC.7.	5.7	0.98	(4.7; 5.7)	Positive

Table 11. Statistical judgement of responses in the whole set of experts

Question	Average grade	h_6^i	Confidence interval	Qualitative estimation
QP.1.	6.9	0.997	5.9; 6.9	Positive
QP.2.	4.7	0.762	4.0; 4.7	no judgement
QP.3.	4.9	1.135	3.7; 4.9	no judgement
QP.4.	4.3	-1.459	4.3; 5.7	no judgement
QP.5.	4.3	-1.229	4.3; 5.5	no judgement
QC.1.	2.9	-0.921	2.9; 3.8	Negative
QC.2.	3.7	-0.652	3.7; 4.4	Negative
QC.3.	4.7	0.652	4.1; 4.7	no judgement
QC.4.	4.9	0.62	4.2; 4.9	no judgement
QC.5.	4.6	0.503	4.1; 4.6	no judgement
QC.6.	5.7	0.827	4.9; 5.7	Positive
QC.7.	4.6	0.715	3.9; 4.6	no judgement

The Groups 2 and 3, as well as the whole group of 15 experts agreed that the questions QP.1. and QC.6. have a significantly positive influence. The Group 3 has a specific opinion that questions QP.3., QC.3., QC.4., and QC.7. have a significantly positive influence, while the result is not so evident in other two groups as well as in the whole group of experts. Significantly negative opinions of the Group 2 on questions QC.1. and QC.2. affected the opinion of the whole group of experts on the same two questions. Concerning the remaining questions, opinions were close to the middle and a statistically significant conclusion about where the opinions are positive or negative cannot be made based on the confidence interval obtained.

4. Conclusion

A novel LiT method which allows to transform grades of evaluation provided in the Likert scale to weights of criteria was proposed and used. Thus, weights of importance of questions in groups QP and QC were obtained and analysed. The most significant weights were discerned. In the first group of questions QP the most important with weights above average (20%) appear to be QP.1. with the weight 31.8%; and QP.3 with the weight 20% while in the second group of questions QC the most important with weights above average (14.29%) appear to be QC.6. with the weight 19.5%; QC.4 with the weight 16.4%, QC.3 with the weight 15.9%, and QC.5 with the weight 15.2%.

Anova test of differences between the means of the grades within the three groups of experts was performed. The differences appeared to be statistically inconsiderable. For the qualitative evaluation of the means of the elicited responses within each group and within the whole group of experts, confidence intervals around the means were constructed. The Group 2 (middle-sized NGOs) and Group 3 (small-sized NGOs), as well as the whole group of 15 experts agreed that the questions QP.1. and QC.6. have a significantly positive influence. Also, the Group 3 stated a specific opinion that questions QP.3., QC.3., QC.4., and QC.7. have a significantly positive influence on NGOs inter-sectorial participative and collaborative potential, while the result is not so evident in other two groups as well as in the whole group of experts. Significantly negative opinions of the Group 2 on questions QC.1. and QC.2. affected the opinion of the whole group of experts on the same two questions.

Summarizing, some particular agricultural stakeholder NGOs' capacities of collaboration and participation obtained as more significant than others. In our research, shared resources, stakeholders' motivation and commitment, teamworking, and synergy between inter-

sectorial actors was found as a key for agricultural organizations of common interests to better involve to and participate in the process of policy-making. Also, stakeholders' capacity of influence-making and ability to act accordingly with specific regulations and procedures has been estimated as highly important.

Surprisingly, collaborative capacities of inter-sectorial and inter-organizational communication and development of mutual trust was rated low by middle-sized NGOs as well as undervalued by experts of other groups, and this result contradicts the prevailing opinion in literature on inter-sectorial collaboration that mentioned issues are of two essentials for productive interaction between actors. There is a need to explore the issue to find out if such result is fortuity or sign of the changes in inter-sectorial collaboration practice.

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