

Farmers' characteristics as determinants of collective action: the case of Greenhouse Producers in Albania

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Jel Classification: D23, D71, O13

1. Introduction

Albanian agriculture is dominated by very small farms. According to the Ministry of Agriculture, Food and Consumer Protection (MAFCP, 2012), in 2011 the average farm size in the whole country was 1.26 ha, in the range between 0.7 ha and 1.7 ha; farm size has grown very slowly from 1.04 ha in 2000. Additionally, land fragmentation represents a major problem.

Skreli and McCalla (2013) suggest that the small farm size and land fragmentation are among the main factors at the origin of the structural problem resulting in low competitiveness of the agricultural sector in Albania. Under such circumstances, farmers encounter many difficulties in improving technology at farm level, acquiring suitable inputs at a fair price, dealing with product marketing in terms of quality standards, reliable quantity, and timeliness and coping with competition from input suppliers and traders. Albania has therefore an import dependent trade model with an export-import ratio of 1:1.67. In 2012 Albania's agricultural imports amounted to \$875 million and agricul-

Abstract

The present study investigates the determinants of collective action in a strategic and fast growing sector - greenhouse vegetables in Albania – looking at the impact of individual farmers' characteristics on their likelihood of cooperating, using a logistic regression model. A Thurnstone scale was constructed to measure the likelihood that farmers will cooperate and a composite index was designed and applied to measure the farmers' stock of social capital. Results show that social capital, human capital, leadership and the problems farmers face in terms of input supply are important determinants of collective action. The results are of both theoretical and practical importance. Theoretically, this study suggests that social capital, human capital, leadership and economic environment characteristics are important determinants of collective action in post-communist transition country agriculture. Practically, the results can provide support to government agencies concerning three issues: (i) better targeting the potential farmers' groups, (ii) improving preconditions for collective action through an increase in the stock of social capital to assist the farmers in their "first collective action experience", and (iii) designing and implementing capacity-building and leadership programmes.

Keywords: collective action, producer organizations, greenhouse vegetables, Albania.

Résumé

L'objectif de cette étude est d'explorer les déterminants de l'action collective dans un secteur stratégique et en croissance rapide – les légumes sous serre en Albanie – en évaluant, à l'aide d'un modèle de régression logistique, l'influence des caractéristiques individuelles des exploitants agricoles sur la probabilité de coopération. Nous avons développé une échelle de Thurnstone pour mesurer la probabilité de coopération des exploitants et nous avons mis au point et appliqué un indicateur composite pour mesurer le stock de capital social des producteurs. Les résultats montrent que le capital social, le capital humain, le leadership et les problèmes auxquels les producteurs se trouvent confrontés en termes de fourniture des intrants sont autant de déterminants de l'action collective. Les résultats sont significatifs sur le plan théorique et pratique. D'un point de vue théorique, ils amènent à conclure que le capital social, humain, le leadership et les caractéristiques de l'environnement économique sont des déterminants importants de l'action collective dans l'agriculture d'un pays en transition postcommuniste. D'un point de vue pratique, ils peuvent apporter des éléments de réponse aux instances gouvernementales à trois différents niveaux : en permettant de mieux cibler les groupes potentiels d'exploitants, en mettant en clair les conditions pour une action collective à travers l'augmentation du stock de capital social pour soutenir les exploitants dans "leur première expérience d'action collective", et en indiquant la nécessité d'élaborer et réaliser des programmes de développement des compétences et de leadership.

Mots-clés: action collective, organisations de producteur, légumes sous serre, Albanie.

tural exports amounted to \$74 million (MAFCP, 2013).

Given the small farm size and land fragmentation as well as the slow trend in terms of farm size increase and land consolidation, it becomes clear that cooperation among farmers represents an important alternative to deal with the structural problem affecting Albanian Agriculture. The MoAFCP clearly recognizes the need for cooperation by supporting the establishment of Producer Organizations (MAFCP, 2013). Having said that, in Albania the collective action at input supply and marketing level remains critically under-developed. The limited number of groups in existence in the recent past is rather donor project induced – all groups have stopped their activity once the projects have ended.

Greenhouse vegetable production is becoming an important economic activity for Albanian agriculture. The area covered

by greenhouse vegetables has more than doubled, shifting from 462 ha to 940 ha between 2000 and 2002. At present, there are 5,708 farms cultivating greenhouse vegetables with a total production of 79 thousand tons, or 9% of total vegetable production (MOAFCP, 2013). The impact of the sub-sector in terms of economic development is, however, much higher than its weight in production. Greenhouse

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vegetable production has a clear export potential unlike the production of open field vegetables which is mainly intended for self-consumption and, at best, for the domestic market. The export of vegetables represented mainly by vegetables grown in greenhouses has increased 9 times as much between 2001 and 2011 (UN ComTrade, 2013). Recognizing the sector potential, vegetable production, including vegetables grown in the greenhouse, is one of the four priority sectors of the new Programme for Rural Development in Albania (MAFCP, 2011).

Research on the determinants of collective action is quite extensive. In his seminal work “The logic of collective action: Public Goods and the Theory of Groups” Olson (1965) opens the debate on determinants of collective action, focusing mainly on public goods type of product. Ostrom (2010), synthesizing her previous work, puts forward a *theory* about determinants of collective action, distinguishing between structural and core variables, some of which are related to non-repeated situations, and others to repeated situations. The determinants of collective action have been thoroughly investigated with a special focus on common property type of goods (Bardhan, 1993; White and Runge, 1994; Baland and Platteau, 1997; Johnson, 2000; McCarthy *et al.*, 2002; Meinzen-Dick *et al.*, 2002; Ostrom, 2003; Kurosaki, 2006; Ostrom and Ahn, 2007). The units of analysis used in all the above cases are the groups rather than the individual players.

The research on collective action determinants in post-communist transition countries is rather limited. Banaszak (2008) investigates the determinants of successful cooperation in agricultural markets using the Polish producer groups as unit of analysis. Theesfeld (2001) examines the factors explaining opportunistic behaviour with regard to irrigation systems in Bulgaria, focusing on trust between community members and effective institutional settings.

Skreli (1994) and Musabelliu and Skreli (1997) consider the determinants of collective action in Albania without statistically testing the significance of determinants-variables.

The present study *will explore the determinants of collective action at the level of individual players in a strategic and fast growing sector - greenhouse vegetables in Albania*. The choice of investigating the individual player level is justified on the grounds that collective action in the Albanian agricultural sector is critically underdeveloped. Leonetti (2009), laconically summarizing the underdevelopment of collective action in Albania, hyperbolized this concept stating that “the discussion we have right now in Albania is to find out whether there is just one group of farmers or zero groups of farmers”.

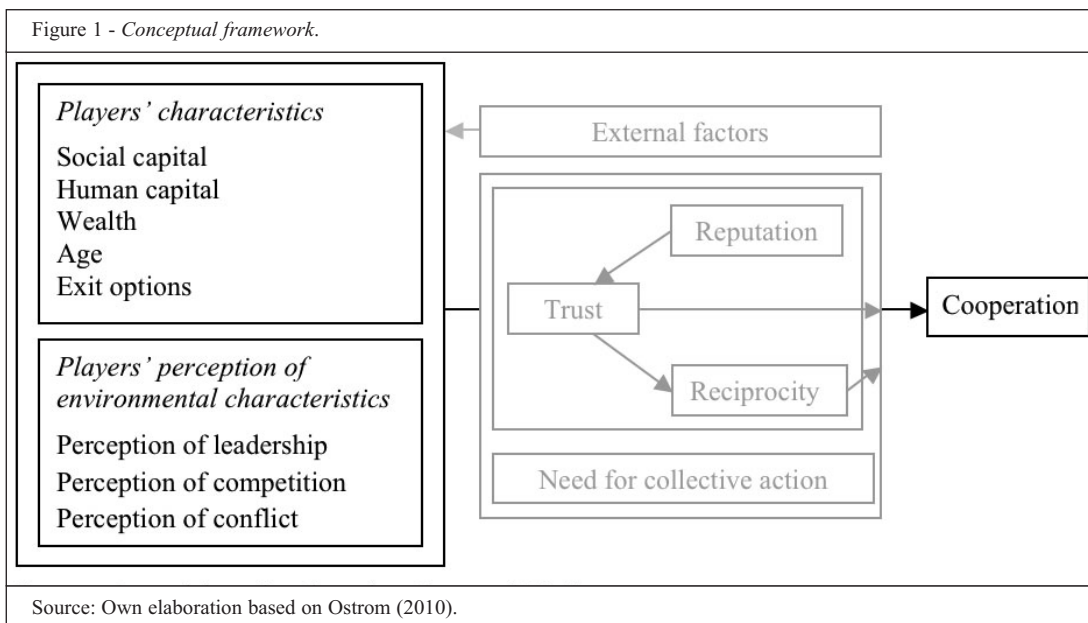
This study also brings a contribution in terms of methodology, more precisely as regards the measurement of two important concepts i.e. attitude towards collective action and social capital. A Thurnstone scale has been developed to measure attitude towards collective action, and a composite indicator has been designed and applied to measure social capital, using inputs from Krishna (2004) and World Bank Social Capital Tool (World Bank, 2013).

2. Conceptual framework and study hypothesis

The following conceptual framework has been developed based on previous research on determinants of collective action at the level of individual *players* and on the experience gained by the authors concerning collective action in Albania.

In her influential paper “Analysis of collective action”, Ostrom (2010), synthesizing former theoretical and empirical research, classifies the determinants of collective action into two main groups, structural variables and core variables. Structural variables are associated with non-repeated as well as repeated situations, such as the number of participants involved, the type of product, the heterogeneity of participants and face-to-face communication (non-repeated situations), information about past actions, the way individuals are linked, and freedom to enter or exit (repeated situations). Core variables affecting collective action are reputation, trust, and reciprocity. Ostrom posits a causal relationship: structural variables influence core variables and the latter affect collective action outcomes.

The following conceptual framework (Figure 1) is based on Ostrom



(2010), who focused on the relationship between structural variable and collective action outcomes, but also on other empirical works (with special reference to discussion on hypothesis) addressing structural variables other than those mentioned by Ostrom, mainly in terms of *players'* perception of environmental characteristics.

Figure 1 clearly indicates that external factors - in meso and macro environment, including markets, infrastructures, formal and informal rules and institutions, and policies - affect individual *players'* characteristics and their perception of the environment (structural variables). Several factors (social capital, age, perception of leadership, perception of conflicts) affect reputation, trust among *players*, and reciprocity and others (human capital, wealth, exit options, and perception of competition) affect the need for cooperation to deal with environmental problems. The chain of results starts from external factors in *players'* characteristics and their perception, goes through reputation, trust and reciprocity and need for cooperation which, in turn, affect individual *players'* likelihood of cooperating.

Based on the conceptual framework developed, the predictors assumed to have an impact on collective action groups suggest two sets of hypotheses, (1) *players' characteristics hypothesis*, and (2) *players' perception of environmental characteristics hypothesis*.

1. *Players' characteristics hypothesis*

H1.a: Social capital hypothesis. The stock of social capital – regarded as the *players'* former participation in networks, formal and informal organizations or their experiences in informal collective action processes – is expected to positively affect the likelihood of collective action. It is argued that *players'* participation in recent collective action has helped *players* to build trust among them and it has taught them about the benefits of collective action and its feasibility. There is a broad consensus among researchers that social capital has a positive impact on collective action. Ostrom (2007) posits that various forms of social capital contribute to successful collective action, almost always by enhancing trust among the actors. In other words, trust is the core link between social capital and collective action. Several other studies (White and Runge, 1994; Meinzen-Dick *et al.*, 2002; Banzak 2008) support that social capital is a strong predictor of collective action. Bardhan (1993) indicates that in a world where we cannot often predict each other's reactions, norms which form slowly from previous actions provide much-needed rules of thumb that lend a degree of inflexibility and commitment laying the foundations of our binding agreements.

H1.b: Education hypothesis. Education level is expected to positively affect the likelihood of collective action emergence. Education level or specific training in cooperative organizations in a democratic system is expected to make people more aware of benefits associated with cooperation and institutional arrangement to deal with collective action problems, including free riding. McCarthy *et al.* (2002) hy-

pothesized that education favours the cooperative activity by increasing individuals' capacity to acquire information and transform such information into practical knowledge.

H1.c: Wealth hypothesis. The relationship between wealth and collective action is expected to be positive - larger farmers are expected to be more inclined to cooperation. Greenhouse vegetable production is, as a rule, a commercial activity. As farm size increases - still under small farms assumption, farmers become more aware of efficiency gains and therefore of the benefit they can get from economy of scale offered by cooperation. However, from a theoretical point of view, there is still much debate about the impact of *wealth* on cooperation. With increasing wealth, the relative importance of potential benefits from cooperation has decreased and as a result, the potential for participation could decline (White and Runge, 1994). On the other hand, a subset of members may now find that undertaking certain activities is in their best interest (Olson, 1965; Baland and Platteau, 1997). Additionally, wealthier members may find that assuming leadership and benefactor roles within a community is in their own interest (Wade, 1988).

H1.d: Age hypothesis. Age is expected to affect collective action likelihood negatively - farmers are expected to cooperate less at older ages. This is due not only to the fact that older people are more risk averse than younger people (White and Runge, 1994) but also to the fact that older people in Albania have experienced the "dark side" of the communist system cooperation. Instead of positive social capital, they have inherited "negative" social capital.

H1.e: Exit options hypothesis. Exit options considered to be available opportunities to have an off-farm income earning activity reduces the likelihood of collective action. This is because "exit option reduces the effectiveness of social norms" or because the "game becomes more uncertain" leading to opportunism (Bardhan, 1993), but also because exit options support the idea that farming is not the most important activity; it is not salient – salience indicating the importance that people invest in new institutions. Wade (1988) suggested that salience—the extent to which resource users depend upon a resource or activity for their livelihood—is an important condition which facilitates collective action in a common pool resource. Dietz *et al* (2003) argued that salience is a major condition for collective action. They argue that the resource or activity must be salient enough to the users that they are willing to invest time and energy to create new institutions.

2. *Players' perception of environmental characteristics hypothesis*

H2.a: Leadership hypothesis. The farmers' perception of the presence of leadership is hypothesized to improve the chances for collective action. Banaszak (2008), summarizing relevant studies on the role of leadership in cooperation – departing from a game theory perspective — states that "in coordination games, leaders emerge in order to e-

conomise on choosing one of multiple equilibria. Furthermore, in social dilemma games, the institution of leadership increases individual contribution levels by setting an example for other players and changing the payoff structure by introducing sanctions for free-riding.” It is assumed that in Albanian rural areas there are now “trustful people” who are also able to “introduce sanctions on free-riders” and, when farmers perceive that, cooperation likelihood increases.

H2.b: Competition hypothesis. The stronger the competition for cooperative project by other businesses — inputs are available at a fair price and farm produce is purchased at a fair price — the lower the chances for collective action. Banaszak (2008) argues that competition exerted by other intermediaries might increase the likelihood of deviation from group rules expressed through sales outside, and thus decrease the likelihood of achieving success for producer groups. A volatile environment may raise the attractiveness of a short-run gain of defection in relation to the obedience to the long-run implicit contract (Hendrikse, 2007). In such a condition defection of one group member might also result in a cascade of defections by others, since everyone else sees less value in the initial choice.

H2.c: Perceived conflicts hypothesis. Perceived conflicts by individual farmers are expected to affect their attitude towards collective action as well — higher perceived conflicts are hypothesized to lead to lower likelihood of engaging in a collective action. Intra village conflicts may impede collective action. As Bardhan (1993) argues, in environments where conflicts are more common, internalization of cooperative norms is more difficult. In a conflicting environment, the degree of confidence or trust that individuals have in the likelihood that others will play their part in a cooperative agreement may be low, as in the Seabright (1990) model which predicts that the “degree of community” lending viability to conditional cooperation in the evolutionary models may be missing.

3. Methods and procedures

The discussion on the empirical model to be used in this study is preceded by an introduction to translating collec-

tive action determinants (concepts) into variables and the way the latter have been measured.

3.1. Definition of variables

Likelihood of cooperating is measured by a dummy variable, *LikelyCoop*. The variable takes the value 1 for “Cooperate” and 0 for “Does not cooperate.” The dummy variable was constructed following the development of a Thurnstone scale which was administered to farmers. Kola *et al.* (2012) developed a Thurnstone scaling approach to measure Albanian apple farmers’ likelihood of cooperating, based on an equal interval method proposed by Thurnstone (1928). The scaling was modified to fit the greenhouse farmers’ likelihood of cooperating. The main steps to performing the measurement involved developing the focus, generating potential scale items, rating the scale items, computing scale score values for each item, selecting the final scale items and administering the scale to 200 greenhouse farmers in the most productive vegetable area in Albania. A dummy variable was constructed based on a Thurnstone scale, assigning 1 to individual farmers with averages above the general average and 0 to individual farmers with averages below the general average. Constructing a dummy variable based on a Thurnstone scale represents an important improvement in terms of construct validity because farmers’ likelihood of cooperating was measured by “speaking to the farmers in their own language”.

Social capital is measured by a scale variable, *SocCap*, which is a composite indicator taking into account former farmers’ participation in formal/informal collective action and their degree of participation. The measurement of social capital was carried out by capitalizing on Narayan and Pritchett (1999), Krishna (2004), World Bank (2013). Narayan and Pritchett (1999) measured social capital by households’ participation in rural groups, groups’ characteristics and their trust in these groups. Krishna (2004) used participation in formal/informal activities as a proxy for measuring social capital, and the World Bank (2013) The Social capital/Household questionnaire measures the social capital by participation in formal and informal groups. Our measurement of social capital goes a step further by combining the frequency of participation in formal groups and informal collective action activities and the degree of participation. The respondents’ answers are assigned a value of “1” for participation in each informal/formal activity and 1 to 4 for the degree of participation; the degree of participation in collective action ranges from 1 to 4: 1=not active, 2=somewhat active, 3=very active, 4=leader. Eighteen formal groups and six informal activities involving collective action were included in the questionnaire. As specified earlier, the stock of social capital for each respondent combines the frequency of participation and the degree of participation. For instance, if someone is participating very actively in a parents’ committee and actively in irrigation canal maintenance, their stock of social capital is $5=(1*3+1*2)$; 1 stands for participation and 3 and 2 stand

Table 1 - Concepts and variables.

Concept	Variables	Symbols
	Dependent variable	
Likelihood of cooperating	<i>LikelyCoop</i>	Y
<i>Farmers’ characteristics</i>	Independent variables	
Social capital	<i>SocCap</i>	X_1
Wealth	<i>FarmSize</i>	X_2
Exit options	<i>MainJob</i>	X_3
Human capital: Education	<i>Education</i>	X_4
Human capital: Training	<i>Training</i>	X_5
Age	<i>Age</i>	X_6
<i>Farmers’ perception of environmental characteristics</i>		
Perceived leadership	<i>Leadership</i>	Z_1
Perceived competition	<i>ProbInp</i>	Z_2
Perceived conflicts	<i>Conflict</i>	Z_3

for the degree of participation in the respective collective action.

Wealth is measured by the variable *FarmSize* expressed in terms of area under greenhouse vegetable production.

Human capital: education level is measured by the variable *Education* which is an ordinal variable taking the value of 1 for non completed elementary school, 2 for completed elementary school (4 years), 3 for completed junior high school, 4 for non-completed high school, 5 for completed high school, 6 for non-completed professional school, 7 for completed professional school, 8 for non-completed university, 9 for completed university.

Human capital: training is measured by the variable *Training*. This is a dummy variable which is scored 1 if respondents 'have received special training in agricultural cooperation' and 0 if respondents 'have not received any special training in agricultural cooperation.'

Age is measured by the variable *Age* which is a scale variable expressed in terms of number of years.

Perceived leadership is measured by the variable *Leadership* which is a dummy variable scored 1 in case the farmer perceives the presence of leadership in his close community and 0 in case he perceives the lack of leadership.

Perceived competition is measured by the variable *ProbInp* (problems related to input supply availability and input price – the higher the gravity problem, the lower the competition by other businesses) – which is an ordinal variable taking the following values: 1 for 'No problem at all' (very strong competition by alternative service providers), 2 for 'No problem', 3 for 'Neutral', 4 for 'It is a problem', and 5 for 'It is a big problem' (no competition at all by service providers).

Perceived conflicts is measured by the variable *Conflict* which is an ordinal variable taking the value -2 for (in our village there are) 'Much more conflicts than in other villages' -1 for 'More conflicts than in other villages', 0 for 'Neutral', 1 for 'Less conflicts than in other villages', 2 and 'Much less conflicts than in other villages'

3.2. Sampling Unit of analysis

Farmer is the unit of analysis in our study. Farmers' objective characteristics (age, education, farm size, employment, former engagement in collective action) and their perception of economic environment characteristics were combined to understand farmers' inclination towards collective action. Studying the groups of farmers proved to be unrealistic, given that their number is limited in Albanian agriculture.

Data collection instrument

Data come from a survey designed and implemented for the purpose of this study. The survey instrument was designed to collect the information needed to test the hypothesis put forward in terms of players' characteristics and players' perception of environmental characteristics. The

relevant information to be collected through surveys includes: (i) demographics (age, gender, education, special training in collective action, and employment), (ii) land resources and production of greenhouse vegetables, (iii) market for greenhouse vegetables, (iv) problems related to the economic environment (market information, input and output markets structure, market infrastructure, irrigation, agricultural machinery), (v) attitude towards collective action, (vi) participation in organizations and processes involving collective action, (vii) costs and benefits of engaging in collective action, (viii) perception of leadership presence, and (ix) conflicts and conflict resolution mechanisms.

Sample design

A sample size of 200 interviews was considered to be sufficient to provide a precision level of 7% and a confidence level of 95% (Israel, 2012). Improving the precision level by only 2% would have required doubling the sample size. The survey was conducted in two major greenhouse production areas in Albania, namely Fier and Berat in central Albania. The farmers within the investigated areas were selected randomly.

3.3. Empirical model

Binary logistic regression model was used to estimate the impact of farmers' characteristics and farmers' perception of the likelihood of engaging in collective action¹.

The model has the following form:

$$\ln\left(\frac{P_i}{1-P_i}\right) = a + b_i x_i + c_i z_i + e \quad (1)$$

Where P_i the probability that the person i takes part in collective action; $1-P_i$ the probability that the person i does not take part in collective action; a , a constant; x_i , z_i the variables standing for the characteristics of individual players and the players' perception of the environment respectively; and b_i , c_i the vectors of the parameters to be estimated.

The odds ratio is determined by the equation below:

$$\frac{P}{1-P} = e^{a+b_i x_i + c_i z_i} \quad (2)$$

The odds ratio, in the case at hand, should be interpreted as follows: one unit change – say – in the stock of social capital increases by e^{bl} the ratio of probability that the farmer participates versus the probability that the farmer does not participate in collective action.

Binary logistic regression model is preferred to linear probability model, binomial or multinomial. The later regression models assume that marginal effect of independent variables on the dependent variable is constant for different levels of independent variables. While we do not have an

¹ Three econometric models, namely linear probability regression model, logistic regression model, and Probit regression model has been used to test the hypothesis. The three models generate similar results.

indication that this is the case, logistic regression comes as a solution because it does not make this assumption. In terms of marginal effects, we may say that linear regression model is only a special case of logistic model. Hence, specialized literature suggests using non-linear models rather than linear ones. Furthermore, linear models may lead to probability results above one and below 0 (in case of binary dependent variable) and beyond the highest or lowest attribute of Likert scale. The specialized techniques to solve this problem are available but discussion becomes then too sophisticated. Finally, linear probability model does not meet several theoretical conditions, including normality and error term homoscedasticity.

4. Results and discussion

Fifty percent of participants in the survey have a stock of social capital between 3 and 10, with a median of 7 and an average of 7.47 (Table 2). The figures may be interpreted in different ways representing a combination of participation in collective action organizations or processes and degrees of participation (refer to Definition of variables; Social capital). The minimum of social capital stock is 0 – for non-participating farmers – and the maximum stock of social capital is 18 for very participative farmers.

Table 2 - Variables descriptive statistics².

	Mean	Median	Minimum	Maximum	Percentile 25	Percentile 75
SocCap	7.47	7.00	.00	18.00	3.00	10.00
Education		6	3	9	3	6
Training		1	0	1	0	1
FarmSize	1686	1500	400	7000	1000	2000
Age	51	52	25	70	47	55
Lider		1	0	1	0	1
Conflict		1	-1	2	0	1
ProbInp		4	3	5	4	4

Participants in the survey have completed at least junior high school (assigned 3 in the survey) and their level of education ranges from junior high school to university (assigned 9 in the survey) with a medium of 6. Fifty percent of the participants in the survey have an education level between junior high school and professional school (non-completed). According to the statistics from MAFCP (2012), 64% of the farmers in the study area have completed elementary and junior high school, 33% have completed high school and only 3% have completed university.

FarmSize for the farmers represented in the survey is rather small, ranging from 400 m² to 7000 m². The average farm size is 1686 m², and 50% of the farms are between 1000 and 2000 m². According to the statistics from MAFCP

(2012), the average farm size for the area under investigation is 1631 m² which is quite close to the survey average farm size.

Average age for the interviewed farmers is 51 years, and the age ranges between 25 and 70. Fifty percent of the farmers represented in the survey are aged between 47 and 55 years.

Based on Logistic regression results (Table 3), five variables are found to be statistically significant, four of them affecting the farmers' likelihood of collective action positively and one affecting it negatively.

Table 3 - Logistic regression model results.

Independent variables	B	S.E.	Wald	df	Sig.	Exp(B)
SocCap	.219	.052	17.864	1	.000	1.245***
Education	.134	.133	1.013	1	.314	1.143
Training	1.431	.462	9.607	1	.002	4.183**
Age	-.052	.026	3.926	1	.048	.949**
FarmSize	.000	.000	.041	1	.839	1.000
Lider	1.427	.433	10.859	1	.001	4.166***
Conflict	-.177	.239	.551	1	.458	.838
ProbInp	.832	.421	3.902	1	.048	2.298**
Constant	-5.329	2.392	4.963	1	.026	.005

*** Significant at 99% **significant at 95

Social capital, training, leadership and problems farmers face in terms of input supply have a positive impact on farmers' likelihood to engage in collective action as shown by the parameter estimate signs (B column, and Exp (B) column, Table 3). This is in conformity with the way these factors have been hypothesized in this study. Age affects collective action negatively. The remaining variables discussed in Table 3 are found to be statistically insignificant.

Social capital is an important determinant of collective action for greenhouse farmers in Albania. The odds ratio for *SocCap* of 1.245 (Exp (B) column, Table 3) shows that one additional unit of social capital leads to an increase of 1.245 times in the ratio between the probability that a farmer cooperates versus the probability that a farmer does not cooperate, or the probability ratio – farmer cooperates versus farmer does not cooperate – increases by about 7 times if a farmer has formerly participated, say, very actively in 2 informal activities and in 1 formal organization involving collective action³. The *SocCap* variable interval is between 0 and 18 units (Table 2).

Human capital, mainly special training in cooperation, also positively affects collective action. The odds ratio for *Training* of 4.183 shows that if one has participated in special training sessions on cooperation (cooperation benefits, rules and regulations), one has the chance to cooperate 4 times more than not to cooperate.

Leadership, measured as farmers' perception of the availability of a leader in farmers' community, has a clear strong impact on undertaking collective action by greenhouse farmers in Albania. The odds ratio for *Leader* of 4.166

² Exit option, measured by *MainJob* variable, was not included in the analysis because farming is the main job for all respondents. Therefore, the variable has no impact on farmers' likelihood of cooperating.

³ $e^b=1.245$. If $x=9$ ($2*3+1*3$), then $(e^b)^x=(1.245)^9=7$

shows that farmers are more than 4 times more likely to cooperate than not to cooperate if they perceive that there is a leader in their community. This does not come as a surprise. The leadership is a scarce resource in Albanian farmers' community. Field evidence suggests that the relationship between success and failure in cooperative projects is closely related to the leadership resource.

Competition in cooperative project by other businesses including input suppliers, measured by *ProbInp*, has a significant inverse impact on farmers' likelihood to cooperate. The odds ratio for *ProbInp* of 2.298 shows that farmers are 2.3 times more likely to cooperate than not to cooperate for one higher level of input supply problem gravity. Simply put, they are prone to cooperate more when they face more problems in terms of input supply or when the competition by other businesses is low.

Age affects likelihood of undertaking collective action negatively. This is in conformity with our hypothesis. One may support that older people are more risk averse. Additionally, the legacy of almost 50 years of coerced cooperation during the communist regime still impacts the Albanian farmer's attitude towards collective action.

Three important variables are found to be statistically insignificant: they are wealth, education and conflict. Wealth, measured by *FarmSize*, is found to be statistically insignificant. The variability of farm size is relatively small – 50% of farmers have between 0.1 and 0.2 ha with a median of 0.15 ha. The low variability of farms size does not allow for observing a clear farmer's attitude either for or against collective action. The statistical insignificance of *Education* and *Conflict* needs more in-depth quantitative and qualitative analysis to have a greater understanding.

5. Conclusions

The objectives of the study were to assess the impact of farmers' individual and environmental characteristics on their likelihood of cooperating. Results show that social capital, human capital (training), leadership and the problems farmers face in terms of input supply are important determinants of collective action. Research findings are in line with the way they have been hypothesized and in conformity with previous studies. Skreli *et al.* (2011) found that social capital and leadership have a strong positive impact on cooperation among farmers in the case of apple producers in Albania. Several studies (Meinzen-Dick *et al.*, 2002; Kurosaki, 2006; Banaszak, 2008; Skreli *et al.*, 2011) demonstrated a positive significant impact of leadership on collective action.

Age affects negatively likelihood of collective action. White and Runge (1994) have also found a statistically significant correlation between age and participation in collective management of watershed in Haiti – young farmers are found to be more prone to cooperation. Farm size and conflicts are found to be statistically insignificant.

The results of this study on leadership and social capital may be generalized to the horticulture sector – both fruit

and vegetables – in Albania, based on results repeatability. Skreli *et al.* (2010), studying the impact of collective action determinants for apple fruits in Albania, found that social capital and leadership are statistically significant determinants of collective action for the apple sector.

The results are of both theoretical and practical importance. Theoretically, the study shows that social capital, human capital (special training in cooperation), and leadership are important determinants of collective action in post-communist transition country agriculture. Practically this study indicates that improving preconditions for collective action in post-communist transition country agriculture is critically important for collective action to “take off”. The following may be considered in this regard: (i) increase the stock of social capital by supporting farmers to develop their small cooperative projects in order to develop trust and reciprocity. However the support should be well designed to prevent failure; (ii) design capacity building programmes for farmers in terms of cooperation benefits and the cooperative management; (iii) promote and support leadership by developing leadership programmes and assist farmers in implementing democratic procedures when electing cooperative leaders. The findings are also instructive for both government and development agencies in terms of targeting groups of young farmers – versus old farmers – in an area where input supply and marketing related businesses are less developed.

The statistical insignificance of education and conflict should be reconsidered in future studies on determinants of collective action.

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