RESEARCH ARTICLE

What explains collective action: The impact of social capital, incentive structures and economic benefits

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Abstract

This study focuses in testing the power of reciprocity and leadership as collective action incentive structures and cooperation economic benefits in explaining collective action initiation in the context of a post-communist transition economy. The paper is based on a structured survey targeting Albanian export-oriented farmers. Different from most previous studies, this paper uses both regression analysis and machine learning procedure which is better suited for analysing non-linear relationships. The empirical findings are at odds with common sense that non-cooperation is the dominant strategy, because the presence of tolerant reciprocators and leadership resources provide promising incentive structures for collective action development.

KEYWORDS
Albania, collective action, collective action benefits, incentive structures, leadership, power, reciprocity

1 | INTRODUCTION

Following the regime change from a planned to a market economy in the early 1990s, agricultural production in Albania was and is still characterized by a small farm structure; more than 4/5 of all farms are considered smallholders, owning less than 2 ha of land spread over a fragmented landscape of small plots. These farmers face several

challenges, such as a lack of mechanization and modern equipment; unclear property rights; and poor access to finance, technology, services and markets (FAO, 2020). Thus, smallholder farms typically deal with multiple constraints impeding them from taking full advantage of market opportunities. This situation would, in theory, imply an urgent need for collective action (a process where more than one individual is required to contribute to an effort in order to achieve an outcome; Ostrom, 2010) to deal with typical market failures and high transaction costs that smallholders are confronted with.

However, the cooperation among farmers in Albania is critically underdeveloped (FAO, 2020; Sokoli et al., 2021) even compared to new EU member states with a communist legacy (Gijselinckx & Bussels, 2014). Collective action is strongly correlated or conditioned by trust—various studies show that there has been growing distrust during transition to a market economy, which has negatively affected collective action not only in the case of the agriculture sector but also in other areas such as natural resource management as well as rotating savings and credit schemes which were far more common during communism (Imami et al., 2020; Kokthi et al., 2021a, 2021b; Rama, 2016). Similar challenges have been found also in other Western Balkan countries, such as North Macedonia, where farmers, especially small ones, are found to be significantly less likely to join community organizations (Gorton et al., 2009). It is worth noting that in terms of the magnitude of (forced) cooperation whereby farmers lost rights to farm private plots (Cungu & Swinnen, 1999; Pata & Osmani, 1994; Skreli, 1994), command and control by the communist government, and lack of democratic governance, Albania may be considered as a unique case, representing one of the harshest versions of a centrally planned economy (Skreli, 1994; Zhllima et al., 2021) leading to a reduction of already limited social capital. The Albanian case appears to strongly differ to some other former communist countries which combined different degrees of central planning with some space for market mechanisms and democratic governance. In the case of Hungary, for example, this combination led to a higher level of trust among cooperative members and cooperative leaders (Hurrelmann et al., 2006). Furthermore, a planned economy combined with forced cooperativization in Albania resulted in the impoverishment of cooperative members. In this context, since the early transition from a planned to a market economy, the typical Albanian farmer moved to other extreme by opting for a very individualistic stance. Common sense suggests that the Albanian case is similar to the classic collective action social dilemma which leads to no cooperation as unique equilibrium.

One way to deal with such social dilemma would be to transform the social dilemma game—rather than trying to solve the dilemma as it appears, it may be easier to work with transformed dilemma (Kollock, 1998). The transformed social dilemma we propose may be summarized as follows: (1) our studied subjects are not all rational egoists; instead, they are subjects with heterogeneous preferences: there are rational egoists but also reciprocans (with varying degrees of tolerance); (2) they do not use a 'tit-for-tat' strategy[1]—a strategy use in dyadic isolated prisoners dilemma (PD) game—but a 'out-for-tat' strategy[2]—used in a network PD game; (3) there is a portion of subjects who are trustful and have a willingness to forgive, to give a partner who defects in the first round a second chance (Hayashi, 1993; Hayashi & Yamagishi, 1998); (4) there are sufficient leadership resources which can be trusted to deal with designing and implementing a system of incentives (reward and punishment) and thereby solving the second order collective action problem.[3] Our proposed model is also consistent with Ostrom and Ahn (2009) who posit that the social capital approach takes these (omitted) factors (trust and norms of reciprocity, networks and forms of civic engagement) seriously as causes of behaviour and collective social outcomes. The social capital approach does this in ways that are consistent with neoclassical economics and rational choice approaches.

Based on this proposed model, the objective of this research is to test the impact of heterogeneous preferences on collective action in a post-communist country context. In this paper we test the impact of (1) reciprocity disposition (social preference)[4]; (2) leadership; and (3) cooperation economic benefits (payoff: economic preference) on farmers willingness to cooperate.

While the impact of reciprocity, including reciprocity disposition, on cooperative behaviour has been extensively researched in experimental settings, the impact of reciprocity on cooperative behaviour in a field context is more limited. Frey and Torgler (2007) analysed the impact of reciprocity on public good provision using the example of paying taxes in a cross country context. They found that the extent to which others also contribute, triggers more or less

cooperation and systematically influences the willingness to contribute. Pesämaa et al. (2013) examined, in a US field context, the roles of trust and reciprocity as precursors to commitment, as well as ultimate guarantors of inter-firm co-operation in a small-business co-operative environment. Perugini et al. (2003) have developed a measure for reciprocity distinguishing among positive, negative reciprocity and beliefs in reciprocity. In the Albanian context, Kokthi et al. (2021b) proposed a model including cognitive (interpersonal trust, reciprocity, and sharing) and structural social capital to understand collective action in the context of geographical indications. The authors report no significant relations between reciprocity and willingness to cooperate. *The main research contribution of this paper consists of testing reciprocity disposition and leadership as incentive structures on farmers willingness to cooperate in a country context where non-cooperation seems to be the dominant strategy*. To account for both linear and nonlinear relationships, the study applies a combination of linear regression and machine learning procedures.

The paper is based on a survey which targets two export-oriented sectors: greenhouse vegetables (mainly tomatoes) and watermelon. These are among the main Albanian agriculture export products (e.g., tomato is the first one), characterized by significant trade surplus. The growth of these sectors is largely export driven (AGT-DSA, 2021). While the domestic market has been the main market for local production, the share of production directed for export has increased significantly for both products—thus, exporting is and will remain the main driver of growth. The rest of the paper is structured as follows. The second section depicts the research context, followed by the theoretical background and literature review, the fourth section explains the methods and procedures, while the fifth section presents the empirical research findings, and the final section provides conclusions.

2 | RESEARCH CONTEXT

The study focuses on Albania, a post-communist emerging economy. Following WWII, Albania embraced a planned communist economy. During the communist era, the cooperative system played a central role in the Albania's agricultural and economic structure. Private land ownership was abolished and agricultural land was consolidated into state-managed cooperatives and state-owned farms. The government-controlled production targets, resource allocation, and distribution, hindered market dynamics, and innovation, while productivity was low and declining resulting in food shortages, which was common among co-operative members who were poorly paid (King & Vullnetari, 2016). Despite these challenges, the cooperative system remained dominant until the fall of communism in the early 1990s, when Albania shifted to a more market-oriented agricultural system with private land ownership and individual farming enterprises.

Albanian cooperation during the communist era was characterized by extreme collectivization, insufficient economic and sociological considerations of cooperative consolidation, and complete control of the cooperatives by the communist government (Skreli, 1994). Cooperatives and state-owned enterprises used to cover 98% of agricultural land unlike other Central and Eastern European countries where a significant private sector coexisted with collectivized/state sectors, although some of them had embraced the planned economy long before Albania (Dickinson, 1960). Initially established at the village level, cooperatives consolidated to encompass multiple villages, ranging from 4 to 10 villages. Most importantly, the cooperatives were essentially part of the state-owned sector, with government-appointed cooperative heads and leaving little space for democratic governance. Government decisions dictated production, sales, and prices, focusing on self-sufficiency, particularly wheat (as the main staple food) self-sufficiency. Low food prices supported the urban working class, while cooperatives were obliged to sell to government stores, allowing the government to extract substantial added value at the cost of poorer rural/agriculture communities. Therefore, relative poverty and state cooperatives underperformance generated a strong rejection of cooperatives in rural areas (Kokthi et al., 2021b).

The agricultural cooperatives system was part of a larger sophisticated system comprised of a number of 'mass organisations' such as democratic front organizations, womens' organizations, youth organizations, professional

unions, and most importantly party organizations. This system, closely supervised by secret police, was designed to ensure complete control over people's decisions. During the communist period, which was probably the most repressive regime in the entire communist world of Eastern Europe, Albanians had few alternatives to ensure their survival and to isolate themselves against an oppressive dictatorship than to rely more and more on their informal relations/networks, personal favours, the particularized trust between them to protect themselves from intrusive and exploitative organizations (of the party-state regime and its transmission belts: mass organizations) as well as to guarantee survival in such an environment (Sqapi, 2021). Ideological mobilization by the party-state drove individuals to seek refuge in private and unofficial networks (Rose, 1998).

The command-and-control system in the Albanian cooperative system, marked by government dictatorship and control, hindered meaningful participation in decision-making and nurtured the emergence of the 'dark side' of social capital, where members prioritize particularistic norms and values over universalistic ones (Sqapi, 2021). This command-and-control system promoted selfishness and individualism as a counter-reaction (Kokthi et al., 2021b).

In 1991, Albania initiated a significant agrarian reform that distinguished it from other Central and Eastern European (CEE) and Baltic countries. While some countries chose to return collective farmland to previous owners, Albania took a different approach by distributing all collective and state-owned farmland among the rural population. This reform led to the creation of over 400 thousand small farms. Albania's agrarian restructuring was more radical and resulted in the highest de-collectivization index among CEE countries. Consequently, the majority of land in Albania was cultivated by small individual farms, in contrast to other CEE countries where large-scale cooperatives and other agricultural entities occupied a significant portion of the land (Cungu & Swinnen, 1999).

Current farmer's economic environment is characterized by both governance and market failures. Farmers lack decent access to information, knowledge and skills, finance, and fair access to markets. On the other hand, value chain governance is weakly developed (FAO, 2020).

During Albania's transition to a market economy, characterized by inefficient and politicized government organizations, individuals relied on informal networks and personal connections to protect themselves and their families. Presently, Albanian society exhibits a social structure defined by particularistic and clientelist tendencies, influenced by materialistic values and survival instincts. As explained by Sqapi (2021), norms of mutual obligation, personal favours, and particularized trust have played a significant role, resulting in the adoption of dark forms of social capital to achieve personal goals. Notably, concepts such as 'the friend' signify close associations with influential individuals for personal advantage, while 'the coffee' represents informal gatherings used to address issues or accomplish tasks through personal networks. Additionally, 'the envelope' symbolizes the act of bribing officials to bypass regulations or engage in unlawful activities. The analysis presented aligns with the findings of Paldam and Svendsen (2000), who discovered that communist states, much like other dictatorships, have diminished social capital. This is evident from the low levels observed in transition economies of Eastern and Central Europe, as well as in Latin American countries. The communist system relied on informal networks, commonly known as grey/black networks, for its functioning. Although these networks were subject to control measures, they were tolerated. The authors argue that the transition that took place in 1989/90 resulted in a transformation of these previously essential networks into sources of negative social capital. Furthermore, the reduction in control systems during the transition allowed these networks to thrive.

Zhllima et al. (2023) provide an interesting analysis of the evolution of civic participation and leadership in Albania and Kosovo, specifically focusing on village leaders (known as 'kryeplak' in Albanian) and councils of elders. The study highlights that the role of village leaders and councils of elders has been crucial during periods of weak central and local governance. However, their influence has diminished in times of strong politicization and an increasingly patronizing central government, both historically during the communist era and in the present. This imbalance has hindered the establishment of proper community representation and accountability mechanisms.

3 | LITERATURE REVIEW AND STUDY HYPOTHESIS

The theoretical framework underpinning the present study derives from the second generation of collective action theories. This theoretical perspective posits that society is comprised of multiple types of individuals, each possessing varying dispositions towards cooperation. It acknowledges the presence of reciprocating individuals which leads to the emergence of multiple equilibriums within societal interactions. Notably, this framework incorporates the pivotal concepts of trust and institutions as fundamental incentive structures in fostering the evolution of grassroots collective action, as articulated by Ostrom and Ahn (2009). The second generation theory of collective action may be considered as the generalized case (including also first generation theory of collective action theory) because it considers that there are not only rational egoists but multiple types of individuals including co-operators beside free riders, with most individuals inclined to reciprocate—a strategy that lead to multiple equilibriums, and finally, bottom-up collective action also being possible in the presence of incentive structures. Table 1 summarizes the second and the first generation of collective action theories.

Ostrom (2010) in the work of many theorists, posits that one can explain behaviour in social dilemmas better if one assumes that bounded rational individuals enter situations with an initial probability of using reciprocity. Kahan (2003) synthetizing the former research on human behaviour in collective action dilemmas proposes an alternative theory to conventional collective action theory, coined 'strong reciprocity theory'. In collective action settings, individuals adopt not a materially calculating posture, but rather a richer, more emotionally nuanced reciprocal one. When they perceive that the others are behaving cooperatively, individuals are moved by honour, altruism, and like dispositions to contribute to public goods even without the inducement of material incentives. When, in contrast, they perceive that the others are shirking or otherwise taking advantage of them, individuals are moved by resentment and pride to retaliate.

In terms of preferences, a relatively small fraction of the population consists of committed free-riders and another small fraction of dedicated co-operators. But most individuals are reciprocators who cooperate conditionally on the willingness of others to contribute—some reciprocators are relatively intolerant and others are relatively tolerant, and a great many more—call them neutral reciprocators—fall somewhere in between. Intolerant reciprocators bolt as soon as they observe anyone else free riding. Tolerant reciprocators continue to contribute even in the face of what they see as a relatively modest degree of defection (Figure A1: Heterogeneity of collective action disposition; Kahan, 2003). Building on Hayashi (1993) and Hayashi and Yamagishi (1998) experimental research has

TABLE 1 First generation and second generation of collective action theories – a comparative view.

Category	Second generation of collective action theories	First generation of collective action theories
Agents	The theory acknowledges the existence of multiple types of individuals as a core principle of modelling	The core of first generation theories is an image of atomized, selfish, and fully rational individuals.
Preferences	Distribution of disposition to cooperate across population	Individual disposition to free ride is uniform
Equilibrium	Contribution if people believe others are inclined to contribute, but free-riding if they believe that others are inclined to free-ride (reciprocation with varying degrees of tolerance). This leads to multiple equilibria	Free-riding as the dominant strategy for every individual leading to non-cooperation—unique equilibrium
Incentive structures	Trust—if individuals can be made to believe that others will contribute, they can be induced to contribute in turn—and institutions represent critical incentive structures	Rewards (incentives) or punishments by and external authority to bring the individual interests into alignment with their collective ones in

Source: Author elaboration based on Ostrom and Ahn (2009) and Kahan (2003).

modelled the collective action outcomes as a function of subjects using the 'out-for-tat' instead of a 'tit-for-tat' strategy, we hypothesize that the presence of tolerant reciprocators or of subjects with a degree of forgiveness increase the probability of collective action. For a better understanding of 'out-for-tat strategy', refer to A1. Reciprocans strategies—'tit-for-tat' versus 'out-for-tat' with forgiveness.

H1. The more tolerant the reciprocating individuals, the higher their willingness to cooperate.

Free riding, benefiting without contributing to producing a collective good, is called the first order collective action problem (Olson, 1965). A large amount of theoretical and experimental work has been devoted to understanding the mechanisms that enable humans to solve collective action problem. These mechanisms include reciprocity (Fehr & Fischbacher, 2002), punitive sanctions (Boyd & Richerson, 1992; Fehr & Gächter, 2002; Yamagishi, 1986) and private incentives (Oliver, 1980; Rand et al., 2009) among others. Glowacki and von Rueden (2015) argue that the fundamental way societies do this is through leadership. Leadership can influence collective action and cooperation by passively or actively motivating group members by means of persuasive reasoning or coercion, framed in situational or institutional contexts and that is achieved due to past actions or ascribed based on kinship or social identity (Ibid). Leadership is a key determinant of collective action either directly or indirectly through formation of social capital (D'Silva & Pai, 2003). The contribution of leadership in collective action is, however, not straightforward. In many post-socialist countries, leadership has often been characterized by elite capture, abuse of power and lack of legitimacy that has led to lack of trust and consequently undermined collective action and cooperation (Theesfeld, 2004). They are inherited from the past communist legacy, where the organization of communities into cooperatives and the forcing of people into 'voluntary' work made people feel exploited by the communist regime (De Waal, 2005), and were enhanced by rent-seeking behaviour during the transition period (Stahl, 2010; Theesfeld, 2008, 2011). Polish case supports that dealing with negative communist legacy has been in the first place the task of trustworthy and skilful leadership (Hagedorn, 2014). On the other hand, leadership resources are related to culture and history, especially concerning the power distance dimension. Albania is a hierarchical society with a high-power distance culture, and consequently, a lower level of communication and knowledge exchange prevail within the organization (Vladi et al., 2022). The former research findings highlight the significant role of leadership in fostering cooperation, underscoring that the perception of positive leadership can enhance individuals' willingness to cooperate, despite challenges posed by historical and cultural factors in various societies, including post-socialist countries and those characterized by high power distance cultures.

H2. The perception of the presence of positive leadership increases individuals' willingness to cooperate.

The impact of reciprocity on cooperation is higher in the presence of leadership. According to Krishna (2001), social capital holds communities together, but what motivates them to play an active role in collective action may require the input of a 'mediating agency'. This mediating agency, a particular individual, has the role of translating the potential for collective action that is created by the presence of social capital into actual action - i.e. in the 'agency view' social capital provides the 'glue' but the mediating agency provides the 'gear'. Leaders guide members in the establishment of goals, logistics of coordination, monitoring of effort, dispute resolution, or reward and punishment (Glowacki & von Rueden, 2015). By doing so, leaders strengthen positive reciprocity and tolerance in reciprocity because of their increased belief that the other will contribute. The positive and effective role of leadership has been found also in experimental settings, dealing with coordination problems. For instance, Sahin et al. (2015) compared two types of leaders (leading-by-example and leading-by-suggestion) in two different game constructs, linear public game (Isaac & Walker, 1988), in which the dominant strategy is free-riding, and weakest link coordination game (Van Huyck et al., 1990), in which the optimal strategy of any player depends on the others' actions, basically reflecting reciprocity dynamics. Results in the weakest link game reveal strong coordination failure in the absence of

leadership, while both leadership types, leading-by-example and leading-by-suggestion, reduced the coordination problem (Sahin et al., 2015).

> **H3.** The association between reciprocity and willingness to cooperate is higher in the presence of leadership.

Ostrom (2009) developed the diagnostic framework for analysing determinants of collective action for common pool resource types of goods by organizing the relevant concepts in a nested, multitier framework. The importance of the resource to users (ibid) is a key determinant of cooperation for the management of common pool resources. Markelova and Mwangi (2010) posit that the lessons from previous research regarding success or failure of groups organized for the purpose of resource management can be applied to the study of collective action in other development domains. Möllers et al. (2018), using the Theory of Planned Behaviour to explain vegetable farmers' intention to participate in collective action (farmers groups) found a positive relationship between projected outcome from participation in collective action and intention to cooperate. Also Skreli et al. (2017) in studying the attitude of Albanian farmers of medicinal and aromatic plants towards collective action found a positive relationship between perceived benefits and participation in farmers groups.

While there are several studies that have found a positive relationship between the underlying dimensions of economic importance of cooperation services and willingness to cooperate in some contexts (Fischer & Qaim, 2012; Möllers et al., 2018), other studies have found that the social dimension can override the economic dimension in subsistence farming (Morrow et al., 2017).

> **H4.** The higher the cooperation benefits, the higher the willingness to cooperate.

The theoretical argument of market failure to countervail market power is also considered relevant to understand the farmer(s)–buyer(s) relationships and the need for collective action. As Abate (2018) posits, agricultural markets are characterized by pervasive market imperfections, and farmers are confronted with information asymmetries, abuse of market power and opportunistic behaviour by their trading partners. In such types of markets, contractual partners have little to lose by acting opportunistically. Hence, farmers look for alternatives to individual market arrangements, including undertaking collective action. Banaszak (2008) analysing the determinants of producers' groups success in Poland argues that competition exerted by other intermediaries (suppliers and buyers behave rather fairly) in the provision of services that may be provided by the group as well might decrease the likelihood of success for producer groups by making the cooperation services less important to farmers. On the other hand, when the market fails to offer product and services at fair prices due to large power asymmetry between trading parties, the exploited party will look for alternative ways, including collective action.

> **H5.** The higher the buyers' power over price and payments, the higher the willingness to cooperate.

While cooperation may enable many benefits, one major driver behind cooperation for small farmers is improving market access and positioning. Xhoxhi et al. (2018) and Xhoxhi et al. (2022) point out that buyers' engagement in quality control results in better market access or targeting of more attractive markets, which in turn pays off both for the buyer and supplying farmers. Whereas small farmers who do not face buyers' control over quality may be in weaker position to meet market demand, and as such, may feel under higher pressure to cooperate with each-other to overcome such difficulties. The buyers' role in terms of guiding the kind of product to be produced, production and post-harvest practices, and preparation of the product for the target markets strengthen the relationships between supplying farmers and buyers of their product deterring farmers from joint economic activity projects.

> **H6.** The higher the buyers' power over quality results in lower willingness to cooperate.

4 | METHODS AND PROCEDURES

4.1 | Data

The study is based on a structured farm survey, exploring aspects related to cooperation determinants. The questionnaire was based on an extensive literature review and 35 semi-structured in-depth interviews conducted with agrifood value chain actors and experts and three focus group discussions—the findings were useful in the process of designing and fine-tuning the farm survey questionnaire.

The survey questionnaire was initially tested in the field and further improved. The survey was carried out during 2016 in Central Albania, the area where both greenhouse tomato and watermelon production are concentrated.

The research sample included 462 farmers out of whom 221 (48%) were watermelon farmers and 241 (52%) were greenhouse farmers (see Table 2) with a response rate of 95%. The participants were selected randomly from the main greenhouse and watermelon production areas/villages. Stratification based on a number of criteria preceded the selection of villages (Primary Sampling Unit) and the random route method was used to select farmers. Table 2 summarizes the sample respondents' characteristics.

4.2 | Development of measures

Table 3 summarizes the measurement process by discussing the concepts, operational definitions and variables.

The individual items used in confirmatory factor analysis (CFA) to measure the latent variables represented in Table 3 are presented in Table A1.

To measure the latent variables of the study, namely, Willingness to cooperate, Leadership, Cooperation benefits, Services provided by other market actors, Competition at intermediary level and Buyers' power, CFA was employed. The measurement scales for each of the latent variables resulted from a combination of literature review and qualitative semi-structured in-depth interviews with value chain actors and experts to ensure that the item scales were representative of each variable domain, thereby, providing evidence for construct content validity.

TABLE 2 Sample description.

Variables	Mean	Std.Dev
Binary variables		
Sector (1 is watermelon)	48%	
Farmers agricultural education (1 received training)	21%	
Exit-Option (1 farming not main activity)	8%	
Ratio variable		
Farmers Age (years)	45.19	12.67
Farmers Education (years)	9.98	2.31
Farmer Experience (years)	10.62	7.32
Farm Members over 18 years old	3.90	1.37
Area under the main product (0.1 ha)	7.50	9.41

Note: $N = 462$. For the binary variables the estimate in the mean column shows the share of the sample that have received agriculture training; do not have farming as main business activity; cultivate watermelon (the rest 52% cultivate tomatoes in greenhouse); Area under the main product refers to the surface area cultivated with the main product expressed in dynyms which is 0.1 ha.

Before continuing with the estimation and hypothesis testing, it is imperative to establish the reliability and validity of the latent variable. The first step in the development of measures with adequate psychometric properties is to evaluate their reliability (i.e., the items used to operationalize the constructs of interest measured correspondingly). Therefore, composite reliability (CR) was estimated to assess construct's reliability. According to Nunnally (1981) the minimum acceptable value for CR is 0.70. The results in Table 4 show that besides the variables Services provided by other market actors and Competition at intermediary level, the other variables have a CR greater than the suggested threshold value of 0.7.

Besides reliability, each construct should be valid. A valid construct should fulfil two main conditions: convergent validity (i.e., items loading mainly on the factor they are intended to measure) and discriminant validity (i.e., the resulting factors should be unique and uncorrelated with the others) (Bagozzi et al., 1991). In order to fulfil these conditions, all variables with multi-item scales were subjected to CFA. The factor loadings generated from CFA are shown in Table A2. Details about the model's goodness of fit are shown in Table A2 and the threshold values presented in this table are the ones suggested by Hu and Bentler (1999). As the results of Table A2 show, the measurement model appears to have a good level of goodness of fit.

Tables 4 and 5 show the results related to the reliability and validity of the measured constructs. Regarding the convergent validity condition, CR and AVE (Average Variance Extracted) are two measures that provide evidence of this. According to Malhotra and Dash (2011) AVE is much more conservative than CR. The suggested threshold value for AVE is 0.5 (Hair et al., 2006). In Table 4, only the AVE values of Services provided by other market actors and Competition at intermediary level are below the threshold value of 0.5. In regard to discriminant validity Hair et al. (2006) suggest two threshold values to establish discriminant validity: 1. AVE > MSV; 2. Square root of AVE greater than inter-construct correlations. Based on the results of Tables 4 and 5, all threshold values suggested by Hair et al. (2006) are achieved. Thus, it can be concluded that except for the constructs of Service provided by other market actors and Competition at intermediary level all other constructs fulfil the conditions of convergent and discriminant validity. In this context, these variables are not considered in the subsequent analysis.

4.3 | Model

The multiple linear regression procedure with OLS estimation is employed to test the study hypotheses. To get more reliable results, robust standard errors to heteroskedasticity are calculated and presented in Table 6. The model was also checked for the presence of outliers and influential cases, which do not appear to be an issue. Moreover, multicollinearity is not problematic since all variance inflation factor (VIF values are below five). The empirical model may be represented as follows:

$$Y = a + \sum_{i=1}^{13} b_i * X_i + \varepsilon$$

where Y_i = Willingness to cooperate, X_i explanatory variables affecting willingness to cooperate and b_i a vector of regression coefficients.

To further validate the results, machine learning (i.e., random forest) is used to model the factors affecting the farmers' willingness to cooperate, which is a more robust algorithm than OLS especially for detecting nonlinear relationships. The results of the random forest are presented in Appendix A3. Machine learning results and the focus of the analysis is twofold; firstly, it calculates the importance of the variable using the permutations-based importance method developed by Fisher et al. (2019), which measures how much a model's performance changes if the effect of a selected explanatory variable, or a group of variables, is removed; secondly, Partial Dependence Plots (PDP) are used to show how the model, on average, changes with changes in selected variables by using the accumulated local

TABLE 3 Summary of research concepts, operational definitions and variables.

Concept		Variable name	Operational definition	Variable type and attributes	References	Symbol
Dependent variable						
Willingness to cooperate		Willingness to Cooperate	Willingness to cooperate	Ratio (latent variable CFA)[a]	Sokoli et al. (2021)	Y
Independent variables						
Social preferences	Reciprocity	Reciprocity	Farmers tolerance with respect to contribution for a jointly provided service	1—stop contribution when only one farmer stops contributing; 2—when 5 farmers stop; 3—when 10 farmers stop and 4—when 15 farmers stop contributing	Author developed measure, based on Kahan (2003)	X_1
Leadership	Leadership	Leadership	Perception on positive available leadership in community	Ratio (latent variable CFA)	Sokoli et al. (2021)	X_2
Economic preferences	Economic benefits of collective action	Cooperative benefits	Economic benefits due to joint input purchase and product marketing	Ratio (latent variable CFA)	Skreli et al. (2017)	X_3
	Benefits/costs related to Buyers' power over farmers	Buyers' power over price and payments	Buyers' power over price and payments and over quality farmers' integration into value chains	Ratio (latent variable CFA)	Xhoxhi et al. (2014, 2018)	X_4
		Buyer power over quality (Buyers' V.C. integration Role)		Ratio (second order latent variable CFA)	Xhoxhi et al. (2014, 2018)	X_5
Control variables	Farm size	Area under the main product	Area cultivated with the main product	Ratio (standardized variable)	Author developed measure	X_6
	Farming experience	Farmer Experience	Years in business	Ratio		X_7
	Exit option	Exit-Option	Farming not the main activity	Dummy: $1 =$ Farming not the main business; $0 =$ farming the main business	Kola et al. (2014)	X_8

TABLE 3 (Continued)

Concept	Operational definition	Variable name	Variable type and attributes	References	Symbol
Sector	Sectors analysed	Sector	Dummy		X_9
Labour availability	Number of family members over 18	Farm_Memb18+	Ratio		X_{10}
Age	Years old	Farmers Age	Ratio		X_{11}
Education	Education level in years	Farmers_ Education	Ratio		X_{12}
	Agricultural education	Farmers_Agric_ education	Dummy: 1 = having agricultural education; 0 = not having agricultural education		X_{13}

aRefer to Table A1 for the items used to calculate all latent variables

TABLE 4 Validity and reliability.

	CR	AVE	MSV	MaxR(H)
Willingness to cooperate	0.906	0.659	0.518	0.911
Leadership	0.864	0.683	0.276	0.901
Cooperative benefits	0.907	0.710	0.518	0.908
Buyers' Power Over Price &Payments	0.757	0.515	0.274	0.795
Services provided by other market actors	0.640	0.379	0.082	0.674
Competition at intermediary level	0.524	0.282	0.049	0.585
Buyers' Power Over Quality (buyers' V.C. integrative role)	0.742	0.611	0.274	0.948

Note: CR—Composite reliability; AVE—Average variance extracted; MSV—Maximum Shared Variance; MaxR(H)—Maximum Reliability.

effects (ALE) method (Apley & Zhu, 2020). Here, the PDP shows the average relation between the particular variables and farmers' willingness to cooperate.

5 | RESULTS

The results of the hypotheses testing using multiple linear regression with robust standard errors, presented in Table 6, are organized in two groups of hypotheses: (1) social preferences and (2) economic preferences.

Social preferences hypotheses. Hypothesis 1, the more tolerant the reciprocating individuals, the higher their willingness to cooperate is retained. Thus, all the higher reciprocity categories when compared to the base category show that those farmers that are more tolerant (i.e., give a second chance to those who fail to cooperate at the first round) are associated with a higher willingness to cooperate (Reciprocity 2: $b = 0.195$; Sig. <0.1; Reciprocity 3: $b = 0.477$; Sig < 0.01 and Reciprocity 4: $b = 0.544$; Sig < 0.01). In addition, the partial dependence plot generated from the random forest algorithm in Figure A3 shows that the willingness to cooperate is much higher for highly tolerant reciprocators. Table 7 summarizes the distribution of respondents by the degree of tolerance in reciprocity.

Leadership. Hypothesis 2: the presence of leadership increases individuals' willingness to cooperate is accepted ($b = 0.203$; Sig < 0.1). The perception of the presence of trusted and experienced people who can take over the tasks of setting goals and designing and implementing coordination, reward and punishment tasks positively affects farmers' willingness to cooperate. Perception on leadership availability ranks the second most important determinant of willingness to cooperate (Refer to Appendix A4). Furthermore, the partial dependence plot also shows a clear and strong relationship between willingness to cooperate and leadership.

Interaction. Hypothesis 3: The impact of reciprocity tolerance on cooperation is higher in the presence of leadership is not supported (Table 6). However, one may consider that the direction of association is as hypothesized and, more importantly, in Appendix A3. (Feature importance) show that the moderation effect of reciprocity-leadership on willingness to cooperate is very important for most tolerant reciprocators (Reciprocity4-Leadership interaction ranks 3rd in terms of feature importance).

Economic preferences hypothesis. Hypothesis 4, the higher the benefits from cooperation the higher the willingness to cooperate cannot be rejected ($b = 0.698$; Sig. < 0.01). Perceived benefits from the lower cost of joint input procurement and/or better prices from joint product marketing and lower transaction costs positively affect farmers' willingness to cooperate. Feature importance (see Figure A2) and partial dependence plots (Figure A3) supports the notion that the benefits from cooperation represent the most important determinant of cooperation.

Hypothesis 5, the higher a buyers' power over price and payments, the higher the willingness to cooperate is rejected ($b = 0.078$; Sig. > 0.1). However, the direction of the association is in the same line as the hypothesized one

TABLE 5 Factor correlation matrix with square root of the AVE on the diagonal.

	Willingness to cooperate	Leadership	Cooperative benefits	Buyer power_over price & payments	Services provided by other market actors	Intermediary_ competition	Buyer Power over quality
Willingness to cooperate	0.812						
Leadership	0.525***	0.826					
Cooperative benefits	0.720***	0.360***	0.842				
Buyer power_over price and payments	0.086	−0.047	0.237***	0.718			
Services provided by other market actors	0.021	0.037	0.055	0.286***	0.615		
Intermediary_ competition	0.01	0.047	0.158*	0.222**	0.053	0.531	
Buyer power over quality	0.073	0.042	0.286***	0.523***	0.239**	0.102	0.781

TABLE 6 Results of hypothesis testing.

	Variables	Estimate	Se
Social preference	Reciprocity2	0.195*	0.108
	Reciprocity3	0.477***	0.104
	Reciprocity4	0.544***	0.102
Leadership	Leadership	0.203*	0.052
	I (Reciprocity_2 * Leadership)	0.129	0.085
Interaction	I (Reciprocity_3 * Leadership)	0.035	0.075
	I (Reciprocity_4 * Leadership)	0.084	0.071
Economic preferences	Cooperative benefits	0.698***	0.041
	Buyers' Power Over Price and Payments	0.078	0.048
	Buyers' Power Over Quality (Buyers' V.C. integrative role)	−0.923***	0.165
Control variables	Area_main_prod	0.001	0.005
	Farmers_Experience	−0.006	0.005
	Exit_option	−0.021	0.100
	Sector	−0.09	0.070
	Family_members+18	−0.012	0.021
	Farmers_Age	0.002	0.002
	Farmers_Education_years	−0.01	0.015
	Farmers_Agric_education	0.001	0.081
	Constant	−0.099	0.223

Note: Dependent variable—Willingness to Cooperate; *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$; $N = 462$; adjusted $R^2 = 0.722$.

TABLE 7 Distribution of sample subjects according to tolerance in reciprocity.

Reciprocity (stop contribution when...)	Freq	%
1—Only one farmer stops contributing	117	25.3%
2—When 5 farmers stop contributing	96	20.8%
3—When 10 farmers stop contributing	78	16.9%
4—When 15 farmers stop contributing	171	37.0%

Source: Survey data.

(the higher the buyers power the higher the willingness to cooperate). Moreover, Appendix A4 (Feature importance) inform that buyer power over price and payments ranks sixth among the determinants of willingness to cooperate.

Hypothesis 6, The higher a buyers' power over quality, enabling better market access, results in a lower willingness to cooperate is sustained ($b = -0.923$; Sig. < 0.01). The buyers' role to integrate suppliers into the international value chain ranks fifth in terms of feature importance (Appendix A3). The partial dependence plot shows a clear inverse relationship between Buyers Power Over Quality (buyers' V.C. integrative role) and Willingness to cooperate.

Control variables. The control variables, namely size of the area cultivated with the main product, Farmer Experience, Exit options, Sector, Family members above 18, Farmers Age, Farmer Education, Farmer Agriculture education appear to be statistically insignificant.

6 | DISCUSSION OF THE RESULTS

The assumption made that studied subjects show heterogeneous preferences are valid. This is consistent with second generation theories of collective action (Ostrom & Ahn, 2009). What is surprising however is the right skewed distribution of subjects by reciprocity dispositions—there is a higher proportion of tolerant reciprocators than intolerant ones (Table 7). This shows that even in an individualistic post-communist context there may be enough tolerant reciprocators who may lead to different results than those predicted by classical collective action social dilemma. This also supports our transformed dilemma.

The current study finds that willingness to cooperate is impacted by both social and economic variables, namely reciprocity disposition (Social variable), Leadership and interaction between Reciprocity and Leadership, and Cooperative benefits, Buyers' Power Over Price & Payments, Buyers' Power Over Quality (economic variables).

The positive impact of reciprocity disposition on willingness to cooperate is consistent with the existing body of experimental research literature (Hayashi, 1993) and propositions made by Fehr and Fischbacher (2002), Kahan (2003) and Kollock (1998). But as posited by Kahan (2003), individuals are unlikely to fully over-come collective-action problems through reciprocity dynamics alone.

No matter how cooperative the behaviour of others, the committed free riders will always free ride if they can get away with it (Kahan, 2003), hence the need for a mechanism to deal with coordination and incentive structures thereby solving the second order collective action problem. The positive impact of leadership on farmers' willingness to cooperate is in line with findings from Glowacki and von Rueden (2015) who posit that leaders are intrumental to collective action success through motivation, persuasion and even coercing. Futher, the higher impact of reciprocity on the perceived presence of leadership shows that the impact of tolerant reciprocators on willingness to cooperate show all their potential in the presence of leadership.

On the other hand, the study results show that economic factors are also important in explaining collective action. This is in line with second generation of collective action theory which considers that both 'homos reciprocans' and 'homos economicus' exists (Fehr & Gächter, 1998), and Ostrom and Ahn (2009) who do not exclude economic motives associated with collective action.

The above evidence shows support for the transformed social dilemma we presented in the Introduction, and that even in individualistic societies, there might be contexts where there are enough tolerant reciprocators who forgive non cooperators up to a certain point (Hayashi, 1993), and perceived leadership to deal with the incentive structure. Under these circumstances and provided that enough subjects are aware on cooperation benefits, collective action is possible.

7 | CONCLUSIONS

The research contributes to the existing literature on the impact of social preferences and more specifically on the impact of reciprocity disposition and leadership as incentive structures in explaining collective action in the context of a post-communist country which has undergone the harshest form of a communist cooperative system and where non-cooperation seems to be a dominant strategy. Additionally, the results support external validity of the impact of reciprocity generated in laboratory settings. Our study finds that both sociological and economic factors affect willingness to cooperate. Dealing with only one side of human nature is not sufficient to understand the human behaviour with respect to participating in collective action. Hence, a multidisciplinary approach should be considered by researchers, policy makers and development agencies.

The research findings have important policy recommendations. Collective action supporting policies should consider very carefully the contexts where collective action takes place. This study identifies the critical factors to consider at the local/space level which are: (i) the presence of a critical number of tolerant reciprocators and

available leadership, and (ii) benefits coming from collective action which should be worth being engaged in a very complex cooperation project.

Reciprocity attitude tends to explain collective action. This is a very interesting finding with instrumental policy implications. First, every project aiming at supporting collective action should pay special attention to choosing the right people from the beginning – if the game starts positively as a cooperation game it will most probably trigger a chain of reciprocations; second, it is also critical to punish the 'bad guys'—intolerant reciprocators will defect first, followed by neutral reciprocators and tolerant reciprocators. As highlighted by Fehr and Fischbacher (2002), 'If people believe that the other cooperate to a large extent, cooperation will be higher compared to a situation where they believe that the other do not cooperate'. The targeted selective punishment of dedicated free riders (rather than punishment or/and reward of everyone) as posited by (Olson, 1965) works, in sum, because it simultaneously coerces dedicated free riders, calms unforgiving reciprocators, and avoids confusing or demoralizing neutral and forgiving reciprocators (Kahan, 2003). This creates an environment of trust as opposed to permanent external incentives and punishment.

The impact of leadership is critical for stating and sustaining collective action. Though study findings show the presence of leadership resources, their skills and leadership style are significantly important for members' commitment to the group's success. However, as suggested by Hejkrlik et al. (2021) given the challenges collective action faces, it is necessary to focus on the progressive professionalization and capacity building of leaders while maintaining a transformational leadership style.

Buyers' power may affect cooperation in two different ways: buyers' power over prices and payment favours cooperation in order to achieve market countervailing power. On the other hand, buyers' power over product quality has the opposite effect—when farmers follow buyers' instructions and control over product quality, they have better market access and therefore they are less economically motivated to self-organize. Actually, there is a competition in vegetable farmers' access to markets (particularly the export market) individually by establishing close relationships with reliable wholesalers (field interviews).

Although farmers may be less motivated to cooperate when the buyer provides satisfactory market guidance and access, cooperation may still prove useful both to them and even the buyer. There is evidence that buyers such as 'Value chain leaders'/exporters in export oriented value chains prefer to work with groups of farmers (and even support them) rather than with individual farmers to improve standards—standards awareness and enforcement tends to be more effective through farmers groups, utilizing peer pressure, while group certification is more affordable than individual certification in the case of smallholders (Imami et al., 2021). The relationships between farmers and buyers/traders with respect to quality standards and the ways it affects cooperation in different sectors remains an issue for further investigation.

This study differs from the previous studies also regarding the methodological approach. The analysis applies a machine learning analysis (in addition to logistic regression) which is much more robust in the identification of non-linear relationships compared to traditional statistical approaches, and as such can be replicated also to other studies on collective action.

The study's limitation stems from the fact that the survey was conducted in 2016. Therefore, caution is warranted when extrapolating the findings to the present context. Nevertheless, these findings continue to hold relevance for understanding farmers' behaviour and their attitudes towards collective action. Constructs such as willingness to cooperate, reciprocity disposition, and the influence of buying power over farmers are less susceptible to the passage of time. Despite growing support for investments and heightened awareness of food safety and quality standards among value chain leaders contributing to sector development, persistent challenges related to value chain development, coordination and farmer behaviour, including collective action, persist (AGT-DSA, 2021; FAO, 2020; Imami et al., 2021).

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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ENDNOTES

[1] Tit-for-tat strategy: cooperates on the first interaction and thereafter simply does whatever its partner did on the previous round (Axelrod, 1984).

[2] Out-for-tat strategy: cooperate with a partner until the partner defects and deserts the partner and turns to someone else as soon as the partner defects (Hayashi & Yamagishi, 1998).

[3] While the first order collective action problem is free riding, the second order collective action problem is related to developing mechanisms to deal with design and implementation of incentive structures, namely rewards and punishments. Trusted leadership is one of the most important ways to deal with second order collective action problems.

[4] In this study, we treat reciprocity as social preference based (Fehr & Fischbacher, 2002, p.2): 'A particularly important type of social preference is the preference for reciprocity or reciprocal fairness', and as a personal trait (Kollock, 1998), as intrinsic value, internal parameter (Ostrom & Ahn, 2009) which is 'not driven by the expectation of future benefits' (Fehr & Fischbacher, 2002, p.2), coined as 'reciprocity disposition' (Kahan, 2003, p.78).

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ANNEXES A

A1 | Reciprocans strategies—'tit-for-tat' versus 'out-for-tat' with forgiveness

Ostrom and Ahn (2009)	Ostrom and Ahn (2009) (Hayashi, 1993; Hayashi & Yamagishi, 1998)
1. Identify co-players 2. Assessment if they are conditional cooperators 3. Decision to cooperate initially 4. Refusal to cooperate with those who do not reciprocate 5. Punishment of those who betray trust	1. Identify co-players 2. Assessment if they are conditional cooperators 3. Decision to cooperate initially 4. Some degree of forgiveness for those who do not reciprocate initially and then refusal to cooperate in the second round 5. Punishment of those who betray trust

A2 | Heterogeneity of collective action disposition
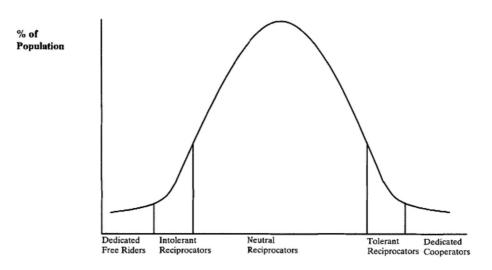

FIGURE A1 Heterogeneity of collective action disposition. *Source*: Kahan (2003).

A3 | Confirmatory factor analysis

TABLE A1 Confirmatory factor analysis—factor loadings.

Variables	Factor	Loading
How much influence does your main buyer have on the decision-making of what fertilizer to use?	Buyers Power Over Quality (buyers' V.C. integrative role)—1 (Xhoxhi et al., 2014; Xhoxhi et al., 2018)	0.641
How much influence does your main buyer have on the decision-making of what pesticides/herbicides to use?		0.787
How much influence does your main buyer have on the decision-making of what variety to produce?		0.557
How much influence does your main buyer have on the way the product will be harvested?	Buyers Power Over Quality (buyers' V.C. integrative role)—2 (Xhoxhi et al., 2014; Xhoxhi et al., 2018)	0.784
How much influence does your main buyer have on the way the product will be delivered to the buyer?		0.550
How much influence does your main buyer have on the time when the product will be delivered to the buyer?		0.760
How much influence does your main buyer have on the total amount to be paid?	Buyers' power over price & payments (Xhoxhi et al., 2014; Xhoxhi et al., 2018)	0.830
How much influence does your main buyer have on the conditions regarding the payment (e.g., how long the payment can be delayed or how the payment will be made) (e.g., with instalments or all in one)?		0.739
How much influence does your main buyer have on the product selling price?		0.558
Securing inputs and selling products in a group would reduce negotiation costs	Cooperative benefits (Skreli et al., 2017)	0.855
If we come together, we can reduce the amount of post-harvest losses.		0.845
If we cooperate, we can sell the product at a higher price than what we are currently selling		0.843
If we cooperate, we can buy inputs (seeds/seedlings, chemical fertilizers, pesticides and herbicides, advice on technology) at lower cost		0.826
In my village/neighbourhood it is difficult to trust someone to run a group; everyone looks at his own interest (Reversed)	Leadership (Sokoli et al., 2021)	0.858
In my village/neighbourhood, I know respectable people whom I trust and who can run one group of farmers		0.919
In my village/neighbourhood, I know educated young people whom I trust and who can lead a group of farmers		0.685
Agricultural inputs (seeds/seedlings, chemical fertilizers, pesticides and herbicides) are available from traders at good prices. (Reversed)	Services offered (author developed measure)	0.745
Input dealers offer price discounts to regular customers (Reversed)		0.506
Agricultural inputs (seeds/seedlings, chemical fertilizers, pesticides and herbicides) are available from traders at good quality. (Reversed)		0.570
I am ready to become a member of any group or agricultural cooperative	Willingness to cooperate (Sokoli et al., 2021)	0.845

TABLE A1 (Continued)

Variables	Factor	Loading
I am not ready to cooperate with other farmers (it is easier to solve farming problems individually using personal connections) (Reversed)		0.784
I am ready to pay my share to set up a group to buy inputs and sell the produce together		0.864
I am willing to contribute as part of a group to buy together and use agricultural machinery (tractor and agricultural aggregates, means of transport, etc.)		0.796
I am willing to contribute as part of a group for the payment of an agricultural specialist (for plant protection or for agricultural technology)		0.764
There are few buyers where I can sell my production	Intermediary competition (Xhoxhi et al., 2014)	0.705
The main product market is controlled by a small number of large buyers		0.440
Competition at the level of buyers is small		0.395
Second-order latent factor		
Buyers Power Over Quality (buyers' V.C. integrative role)—1	Buyers Power Over Quality (buyers' V.C. integrative role)	0.973
Buyers Power Over Quality (buyers' V.C. integrative role)—2		0.523

Note: Maximum Likelihood estimation is used.

TABLE A2 Measurement model goodness of fit.

Measure	Threshold	Model Values
Chi-square/df	<3	2.17
CFI	>0.95 great; >0.90 moderate	0.943
SRMR	<0.09	0.046
RMSEA	<0.05 good, 0.05–0.10 moderate	0.050
PCLOSE	>0.05	0.459

Note: Chi-square/df is the chi-square value of the model divided by model degrees of freedom; CFI—Comparative Fit Index; AGFI-SRMR—standardized root-mean-square residual; RMSEA—the root-mean-square error of approximation; PCLOSE—tests the null hypothesis that the population RMSEA is no greater than 0.05.
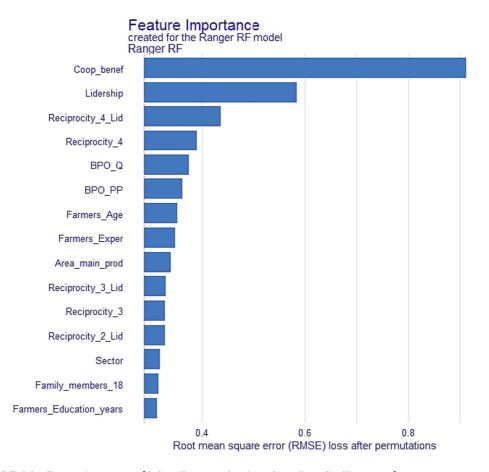
A4 | Machine learning results

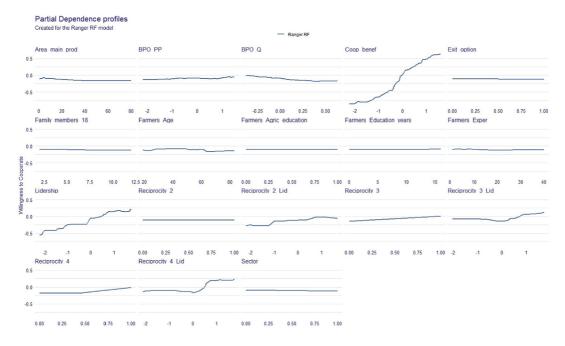**FIGURE A2** Feature importance. [Colour figure can be viewed at wileyonlinelibrary.com]

FIGURE A3 Partial dependence profile. [Colour figure can be viewed at wileyonlinelibrary.com]