
Needs, Modes and Efficiency of Economic Organizations and Public Interventions in Agriculture

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Abstract: This paper incorporates interdisciplinary New Institutional Economics and suggests a framework for assessing needs and efficiency of economic organizations and public interventions in agriculture. Proposed new approach includes: studying farm and agrarian organizations as governing rather than production structure; assessment of comparative efficiency of alternative market, contract, internal, and hybrid modes of governance; analyzing level of transaction costs and their institutional, behavioral, dimensional, technological and natural factors; determination of effective horizontal and vertical boundaries of agrarian organizations; specification of economic role of government and needs for public interventions in agrarian sector; assessment of comparative efficiency of alternative forms of public involvement.

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1. Introduction

Assessment of agrarian organizations is among the most topical issues in last 25 years (Csáki, C. and Lerman; Harvey et al; Gortona and Davidova; Mathijs and Swinnen; Sporleder). Efficiency of farms is usually restricted to “productivity of resources” and comparisons are made for farms of different type, subsectors and countries independent to specific socio-economic environment. Public intervention is justified to correct “rare” cases of market deficiencies - tragedy of commons, externalities, disparities. Traditional approach do not answer the fundamental question: why there exist so many organizations of different type and size in a country, subsector etc. performing with variation in efficiency. Neither it is able to assess needs and forms for public intervention or explain numerous “public failures” in agriculture. This paper incorporates interdisciplinary New Institutional Economics (Coase; Furuboth and Richter; North; Williamson) into analysis of agrarian organizations, and suggests a framework for assessing needs and efficiency of economic organizations and public interventions in agriculture.

2. Understanding Agrarian Organizations

2.1 New approach

Traditional approach for evaluating economic organizations is based on assessment of productivity of employed recourses. Criteria for organizational efficiency is derived from equilibrium condition of economic system (marginal benefits equalized marginal costs). Agents’ activity is effectively governed by a single free-market mode. Organizations using recourses with different from marginal productivity are inefficient. Inefficiency of market/private modes is easily detected and corrected though government interventions. There is no reason for market, private or public failures.

Traditional approach does not answer the fundamental question: why there exist so many organizations with different productivity in agriculture. If efficiency of an organization is low, there will always be private or social mechanism (competition, public intervention) for reallocation of resources to effective application. What is more, traditional approach estimates different organizations

without answering the question: why there exists so big variety of agrarian organizations - one-person or group farms, cooperatives, firms of different kind, subsistent, small, large, integrated etc.

New Institutional Economics explains existence of diverse agrarian organizations with their governance and transaction costs economizing role (Bachev, 2004; Harvey et al.; Sporleder). Carrying out individuals exchanges (land and labor supply; marketing) is usually associated with significant transaction costs - for complying with institutional requirements; finding best prices/partners; contract negotiation, writing, and enforcement; disputing; adjustments with constant changes in conditions.

Division and specialization of labor, and related exchange and cooperation, open up enormous opportunities for increasing productivity and welfare. However, it is associated with additional (transaction) costs. High costs of outside exchange make it more profitable to carry out division and cooperation of labor (transaction) within organization (e.g.firm) instead across market – e.g. specialized livestock farm organizes internally crop production (hiring labor/farmland) because of significant costs/risks for market forage procurement. Internal management of transactions is also associated with costs (directing, stimulating and supervising hired labor; coordination partners activity) which restricts expansion of (internal) organization. Thus a transaction/activity is carried in organization if costs are lower than for governing the same transaction across market or in another organization (Coase, 1937).

Distribution of activities between different farms, agrarian organizations, and markets is determined by the comparative costs for using various arrangements as most efficient one(s) (minimizing internal and external transaction costs) tend to prevail. Ultimately, evolution/size of any free-choice organization is explained by transaction cost minimizing (rather than technological) reason (Williamson).

Thus, economic efficiency of agrarian organizations should take into account their capacity to minimize production costs and ability to economize on transaction costs. Both current costs for using organizations and the long-term costs for initiation, maintenance, modernization, and liquidation have to be accounted.

If execution of activity/exchange was not associated with transaction costs then organization mode would have no economic importance. Individuals would govern their relationships with same efficiency though free market (adapting to prices), private modes (contracts, firms), collective decision-making (cooperative, association), nationwide hierarchy (private or state company). Technological opportunities for economies of scale/scope (maximum productivity of resources, “internalization of externalities”) would be easily achieved (Coase, 1960). All information for effective optimization of resources, meeting demands, respecting rights would be costlessly available, and individuals would costlessly define, protect and exchange rights, and trade resources in mutual benefit until exhausting possibilities for increasing productivity (“Pareto efficiency”).

Often high transaction costs make it difficult or block otherwise efficient (mutually-beneficial) for all parties activity/exchange – e.g. despite pay-off on investments in agrarian research and innovation, market and private agents do not organize activity in sufficient scale because of high uncertainty and low market and private appropriability (Bachev and Labonne). Since carrying out activity is connected with transaction costs, the rational agent will chose and develop such modes for organization of activity/exchanges which maximize transacting benefits and minimize associated costs. Type of organization becomes crucial since various forms give unequal possibilities to explore technological opportunities, coordinate transactions, stimulate acceptable behavior of others, protect rights and investments from unwanted expropriation. In a long-run inefficient forms are abandoned and only effective modes for organization of agrarian activity/exchange dominate.

Transaction costs minimizing helps understand efficiency of agrarian organizations – economic boundaries of farms (“make of buy decision”; internal division, specialization and diversification); divers contractual arrangements and type coalitions (partnerships, firms, cooperatives); economic needs for cooperation with competitors (in inputs supply, marketing, lobbying) or vertical (downstream, upstream) counterparts; development of agrarian markets etc. Efficiency of particular

organization can hardly be assessed without analyzing efficiency of complementary and/or competing organization(s) – e.g. “high” efficiency of small-scale farms and producers (inputs supply, marketing) organizations cannot be properly evaluated without analyzing their complementarities; depending on public provision, support, preferences, market and private organizations would have dissimilar efficiency for agents, etc.

2.2 Factors for organizational choice

Different governance forms are alternative but not equal modes for organization - they have different advantages and disadvantages to coordinate, control, and stimulate transactions (Williamson).

Free market has big coordination and incentive advantages (“invisible market hand”, “power of competition”), and provides “unlimited” opportunities to benefit from specialization and exchange. However, market governance could be associated with high uncertainty, risk, and costs due to price instability, possibility for opportunism, and “missing market” situation.

Special contract form permits better coordination, intensification, and safeguard of activity. Nevertheless, it may require large costs for specification of contract provisions, adjustments, enforcement and disputing. Internal (ownership) organization allows greater flexibility and control on activity - direct coordination, adaptation, enforcement, and dispute-resolution by fiat. However, extension of internal mode beyond family or small-partnership boundaries may command significant costs for development (initiation, registration, restructuring), and current management (collective decision-making, control on coalition opportunism, supervision and motivation of hired labor).

In addition to costs, the choice of organization depends on:

(1) Personal characteristics of agents – preferences, ideology, knowledge, capability, risk-aversion, reputation, trust, power. For instance, in some cultures, cooperative is preferred mode of agrarian organization; good manager is able to design and control bigger organization governing more internal (labor) and outside (market, contract) transactions; risk-taking farmer prefers riskier but profitable forms (e.g. bank credit); when counterparts are family members or friends there is no need for complex organization (relations are “governed” by good will and mutual interests). Benefits for farmers could be: monetary or non-monetary income; profit; indirect revenue; pleasure of self-employment or family enterprise; enjoyment eco-activities; increased free time etc.

(2) Formal and informal institutions (“rules of the game”). Often governing choice is (pre)determined by institutional restrictions. For instance, corporate and cooperative organization of farming is often forbidden; market trade of labor, natural resources, certain outputs or inputs is illegitimate; private management of natural ecosystems is not allowed. Institutional environment considerably affects transaction costs – e.g. when public regulations, and laws and contract enforcement work well, preference is given to spotlight and classical (standard) contracts; when rights on resources are not well-defined and enforced, that lead to primitive subsistence farming, informal, personal and over-integrated forms, unsustainable organizations, undeveloped or missing markets.

(3) Natural and technological factors. In rare cases there is one possible form for governance – e.g. in Japanese dispersed paddy-agriculture water supply could not have been conducted by individual farmers (high-interdependency and non-reparability) and historically water-use organization developed as public projects (Mori); effective governance of eco-activities requires certain scale and collective actions at regional, national or transnational scale. Besides few examples in farming is difficult to find cases where governance form is unilaterally determined by natural or technological parameters. Technological development affects enormously structure and level of transaction costs – e.g. mechanization and standardization of operations and products increases manageability and leads to extension of activities under single management enlarging internal (labor division, specialization) and outside (market or contract procurement, trade, cooperation) transactions; progression in production, transportation, measurement, and ICTs allows intensification of transactions (easy assessment and traceability; on-line information, coordination, monitoring, detecting, advise; direct low-costs exchanges and collective actions at national and international scales; rapid problem

detection and government interventions; full-participation and control by individuals on public decision-making.

Each activity/transaction has different critical dimensions varying according to the specific institutional environment, agent's personal characteristics, macroeconomic conditions and policies, dominant technologies, and natural environment. There exists no single efficient (universal) form for organization of all activity in all possible settings. According to critical dimensions of activity and exchange agents use the most appropriate (effective) mode for governance. In any particular moment agrarian activities is carried (governed) through a variety of organizations: some by "invisible market-hand", others through special contract mode ("private order"), some in hierarchy (under "manager's hand"), others supported by a third-party (Government, international assistance), rests require mixed modes.

It must be abandoned "Nirvana approach" evaluating different forms as "good or bad" for their own or comparing with non-feasible (ideal, foreign) model. Evaluation is to find comparative advantages (for establishing, using, adaptation, intensification, coordination, stimulation, controlling, minimizing overall costs) of alternative and really possible modes in specific socio-economic, technological, and natural environment – e.g. in transitional conditions of undefined private rights on farmland, and high costs for protection and exchange, short-term lease and internal integration (semi)subsistence farming, production cooperation) were the most efficient forms for organization of land supply in Bulgaria and other East European countries (Bachev, 2010).

2.3 Public policy implications

Recognition of transaction costs has important policy implications related to economic needs and efficiency of public intervention in agriculture:

First, public (government) role is to establish organizations facilitating and intensifying market and private transactions and minimizing related costs – for identification, protection, and disputing rights; quality, labor, and eco-standards; supply of market infrastructure and information etc.

Second, when high level of costs for market and private transactions (preventing effective market and private forms) is observed then public is to intervene to make socially desirable activity and exchange possible or more efficient.

Third, different forms of public intervention (assistance, regulations, provision, partnership) are with unequal efficiency since they have different potential to deal with specific market and private failures, and command different (implementation, transaction) costs. Comparative efficiency of feasible forms of public intervention is to be assessed and most efficient one selected.

Forth, "market failure" does not imply public intervention since private and collective forms often effectively overcome market deficiency. When there is a situation of market and private failure there is a need for public intervention. However, public involvement in market and private activity is to be undertaken only if there is a net benefit compared to costs of intervention. Therefore, the choice is always between "imperfect social arrangements".

Finally, "public failure" is a feasible outcome and when there is a need for public intervention "induced" public organization is not always efficient (misuse of power, bad design, mismanagement).

3. Steps in Analysis of Agrarian Organizations

3.1 Basic unit of analysis

New approach turns individual transaction and transaction costs into a center of analysis. Following that line first, major type transactions in which agent managing agrarian activity (farmers, farm entrepreneurs) participates are to be determined (Figure 1).

Second, alternative and feasible forms for governing of agrarian transactions are to be identified.

Third, factors of transaction costs, and costs and benefits of alternative modes of governance are to be specified.

Forth, comparative efficiency of alternative modes is to be assessed, and effective boundaries of market and private organizations defined.

Fifth, cases of market and private failures and needs for public intervention are to be identified.

Six, alternative and feasible forms for public intervention in agrarian sector are to be identified.

Finally, comparative efficiency of alternative modes of public intervention is to be assessed, and the one(s) selected.

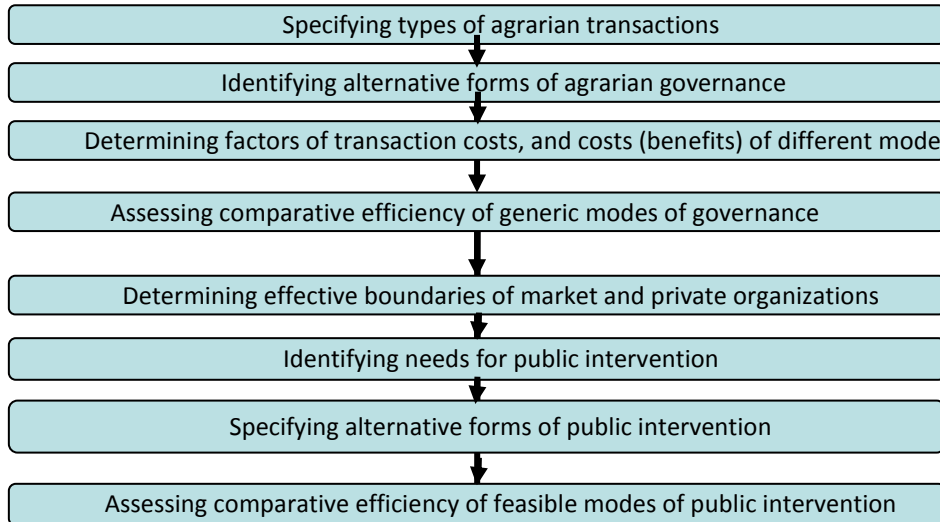


Figure 1 Steps in analysis of agrarian organizations

Major types of transactions in agriculture are associated with:

- labor supply,
- land and natural resources supply,
- service supply,
- inputs supply,
- knowledge supply,
- innovation supply,
- finance supply,
- insurance supply,
- marketing of services and products.

Additionally, farm entrepreneur takes part in collective actions for inducing public intervention in market and private sector.

Usually, every agrarian activity/exchange could be governed through variety of alternative forms. One extreme is when farm manager specializes in governing of market transactions (leasing-in farmland and long-term material assets, purchasing all services for cultivation and harvesting, buying short-term assets, selling entire product). Another extreme is a close internal organization such one-person or group subsistent farm (farmer(s) employ own resources and consume entire product). Between these two polls there is spectrum of feasible modes for governing agrarian activity/exchange – e.g. “cultivation of land by tractor” is governed as: farmer buys (unified ownership), rents (rent contract) or leases tractor (interlinked input/credit contract); farmer buys cultivation service from market (service contract); number of farmers buy tractor (joint ownership) and use it in group (producers cooperative) or individually; farmer joins cooperative providing cultivation services (non-for-profit organization); farmer leases-out land to tractor-owner and shares output (share-tenancy); farmer hires tractorist to work on farm (employment contract), and may sell-out cultivation service (profit-making organization); cultivation service to farms is subsidized by Government (trilateral mode), or provided by municipality or state company (public organization).

Identification of available forms for organizations of transactions in different countries, regions/ and subsectors is subject of special micro-economic study – e.g. Table 1 summarizes major forms in functional areas of Bulgarian farms.

Table 1 Forms of organizations for functional areas of Bulgarian farms

Functional areas	Alternative modes of organisation		
	Market	Special contract	Special organization
Supply of management	n.a.	Employment contract with guaranteed minimum salary and output-based bonuses	Cooperation Partnership
Supply of land and natural resources	Purchase Short-term lease	Long-term lease with fix rent Long-term lease with share rent Long-term lease with market rent	Cooperation Partnership
Labor supply	Daily hire Seasonal hire	Permanent labor contract with fix remuneration Permanent labor contract with result-based payment	Partnership Cooperation
Supply of short-term material assets	Purchase with a spotlight contract Standard contract	Long-term procurement contract Supply contract interlinked with crediting, service supply, and/or marketing of farm produce	Cooperation
Supply of long-term material assets	Purchase with a spotlight contract Standard contract	Long-term lease contract Contract for purchase interlinked with crediting (leasing) and/or services	Partnership Cooperation
Service supply	Purchase with a spotlight contract Standard contract	Long-term supply contract Supply contract interlinked with other services, products or crediting	Partnership Cooperation
Innovation and know-how supply	Purchase with spotlight contract Standard contract Free consultation in farm advisory system	Long-term supply contract Supply contract interlinked with supply of material assets and/or crediting	Cooperation
Financing	Bank loan Loan from individual agent Loan from private organization	Co-investment Crediting interlinked with supply of material assets and services Contract with public funding program	Partnership Cooperation
Insurance	Purchase of insurance Purchase of “assurance service”	Insurance contract interlinked with material assets Long-term insurance contract	Cooperation
Marketing of products and services	Retail sale Wholesale trade Standard contract	Long-term contract for marketing Marketing contract interlinked with crediting, supply of material assets and/or services	Partnership Cooperation

3.2 “Measurement” of transaction costs

One direction for evaluating agrarian organizations is direct comparison of costs for each transaction in different forms. Data for some transaction costs are found in traditional statistics and accountancy (e.g. management, marketing, and insurance costs). Other transaction costs are easily specified – e.g. costs for registrations, information, court-suits, guards etc. However, significant

portion of transaction costs is very difficult or impossible to determine – e.g. costs for finding best partners, negotiation, contract enforcement, organizational development, interlinked transacting, relations with bureaucracy; unrealized/failed deals. Often is complicated to separate transaction from production costs – e.g. during farming farmer supervises hired labor; transporting inputs negotiates output marketing etc. Approximate level of efforts and time devoted for governing different type transactions could be defined by farm managers.

Component comparison of transacting costs could not always give idea for efficiency of organizations. Often alternative form decreases some costs while increasing other type costs – e.g. replacement market with integral mode is associated with reduction of costs for information (overcoming market uncertainty), (re)negotiations along with changing conditions, and safeguarding from outside opportunism. However, it enlarges costs for organizational formation, decision-making, integral management, labor supervising and motivation. Furthermore, some transactions are governed not by “pure” but complex and interlinked modes – e.g. inputs supply in “package” with know-how, extension and/or service supply; joint supply of inputs and credit; crediting production against output marketing. Thus, it is important to take into consideration the overall costs for organization of different type’s transactions - farm’s external and internal transaction costs.

Another direction for evaluating efficiency is discrete structural analysis (Williamson). Assessment is made on comparative costs of alternative organizations instead on absolute level of transaction costs in different form, and determining organization with lowest costs for particular transaction/activity.

Initially critical factors of transactions in specific (market, institutional, natural etc.) environment are to be identified. They are responsible for variation of transacting costs and associated with:

- Agents behavioral characteristics - bounded rationality, opportunism, reputation, risk-taking, trust;
- Economic dimensions of transactions - frequency, uncertainty, assets specificity, appropriability¹.

Transaction costs have two behavioral origins: individual’s bounded rationality and opportunism (Williamson). Agents have no full information about system (prices, demands, opportunities, trends) since its collection and processing is very expensive or impossible (future events, intentions for cheating etc.). In order to optimize decision-making they have to spend costs for “increasing rationality” (data collection, analysis, training etc.).

Agents are also given to opportunism and if there is opportunity to get non-punishably extra-rent from exchange they likely do so. Opportunism can be: pre-contractual (“adverse selection”), when some partner uses “information asymmetry” to negotiate better contract terms; post-contractual (“moral hazard”), when some counterpart takes advantage of impossibility for full observation on activities (by partner or a third-party) or takes “legal advantages” of unpredicted changes in conditions (prices, regulations); “free-riding”, occurring in larger organizations (individual benefits are not-proportional to efforts, and everybody expects others to invest in organizational development benefiting from new organization (Olson). It is very costly or impossible to distinguish opportunistic from non-opportunistic behavior (bounded rationality). Agents have to protect transactions from hazard of opportunism through: ex-ante efforts to find reliable counterpart, and design efficient mode for partners’ commitments; and ex-post investments for overcoming (monitoring, controlling, stimulating cooperation) possible opportunism during contract-execution.

Transaction costs depend on critical dimensions of each transaction. When recurrence of transactions between same partners is high, both/all sides are interested in sustaining and minimizing costs of relations (avoiding opportunism, building reputation, setting incentive, adjustment, conflict-resolution mechanisms). Continuation of relations with a particular partner and designing special transacting mode has high economic value. Parties restrain for opportunism which detection is “punished” by turning to a competitor. Besides, costs for development of a special private mode for facilitating bilateral/multilateral exchange is effectively recovered by frequent exchange. For

¹ Williamson (1996) determined the first three, while Bachev and Labonne(2000) added the last one.

incidental transaction possibility for opportunism is great since cheating side cannot be easily punished (good reputation is not of value).

When uncertainty surrounding transactions increases, then costs for carrying and secure transactions go up (overcoming information deficiency, safeguarding risks). Bounded rationality is crucial and opportunism can emerge, and agents employ organization diminishing transaction uncertainty. Certain risks are diminished or eliminated by production management or market mode (e.g. insurance purchase). However, most transacting risk requires special private forms – e.g. trade with origins; guarantees; share-rent or output-based compensation; taking economic hostages; risk-pooling, inputs-supply, or marketing cooperative; complete integration.

Transaction costs are high when specific assets for relations with a particular partner are to be deployed. It is impossible to change partner (alternative assets usage) without big loss in value of the specific capital (if transactions fail to occur, prematurely terminated, or less-favorable terms are renegotiated in contract renewal time before the end of assets life-span). Relation specific (dependent) investments are "locked" in transactions with a particular buyer or seller (personality of counterpart matters), and cannot be recovered through "faceless" market trade. Dependant investment (assets) have to be safeguarded by a special form (long-term or tied-up contract, interlinks, hostage-taking, joint-investment, quasi or complete integration). Often, later is quite expensive, specific investment not made, and activity cannot take place or occurs without comparative advantages in respect to productivity. If symmetrical assets-dependency exists there are strong incentives in parties to elaborate special mode. Unilateral dependency forces the dependent side to protect investments against possible opportunism (behavioral uncertainty or certainty) through integrating transactions (unified organization, joint ownership, and cooperative) or safeguarding with interlinked contract, exchange of hostages, collective organization for price negotiation or lobbying for Government regulations.

Activity/transacting is particularly difficult when appropriability of rights on products or resources is low. "Natural" low appropriability has most of agrarian intellectual products (agro-market and meteorological information; new varieties, technologies, software) and all products and activities with significant (positive or negative) externalities. If appropriability is low possibility for unwanted market and/or private exchange is great, and costs for protection (safeguard, detection of cheating, disputing) of private rights and investments extremely high (bounded rationality). Costs and benefits are independent for individual participants and they over-produce (negative externalities) or under-organize activity (positive externalities) unless they are governed by efficient private or hybrid mode (voluntary initiatives, cooperation, alliances, long-term contract, trade-secrets, public order).

3.3 Principle modes for effective organization

Alternative organizations are to be evaluated according to potential to: minimize agents bounded rationality and transactions uncertainty; appropriation and protection of rights and private benefits and investment) from possible opportunism; recover long-term costs for organizational development through high transacting frequency; explore economy of scale/scope on specific capital.

Individual organizations have different advantages and disadvantages to maximize benefits and minimize costs of transactions with specific critical dimensions. Internal organization has advantage for governing transaction with high uncertainty and assets specificity/dependency, since it diminishes bounded rationality and protects investments from outside opportunism. Transactions with high certainty (bounded rationality is unimportant) and universal character of assets (opportunism cannot occur since partner can be changed without additional costs) can be carried across free market without encountering costs for special mode.

Private organization is effective for transactions with high recurrence between partners, since occasional or single transactions do not let recovering investment for special mode. Markets and private forms are appropriate for transactions with high appropriability, since they recover invested resources through exchange. For transaction with low appropriability private rights cannot be protected or are enforced with extreme costs. Such transactions could be effectively governed by hybrid (public-private, quasi-public) or entirely public forms.

According to combination of specific characteristics of each activity and transaction, there are different most effective form of organization for that particular activity (Figure 2 below).

Generic modes	Critical dimensions of transactions								
	Appropriability								
	High							Low	
	Assets Specificity								
	Low				High				
	Uncertainty								
	Low			High		Low		High	
	Frequency								
High	Low	High	Low	High	Low	High	Low		
Free market	☺	☺							
Special contract			☺			☺			
Internal organization					☺		☺		
Third-party involvement				☹				☹	
Public intervention									☹

Note: ☺ - most effective mode; ☹ - necessity for third party involvement

Source: Bachev(2009)

Figure 2 Principle modes for governing of agrarian transactions

Transactions with a good appropriability, high certainty, and universal character of investments are effectively carried across free-market through spotlight or classical contracts. Organization of transactions with a special form or within farm/firm only brings extra costs without any transacting benefits.

Recurrent transactions with low assets-specificity, and high uncertainty and appropriability, are effectively governed through a special contract. Relational (“neoclassical”) contract is applied when detailed transacting terms are unknown at outset (high uncertainty), and framework (mutual expectations) rather than obligations’ specification is practiced. Partners (self)restrict from opportunism, motivated to settle emerging difficulties and continue relations (situation of frequent bilateral trade). No significant risk is involved since investments are easily (costlessly) redeployed to other use or users (no assets-dependency).

Special contract forms are efficient for rare transactions with low uncertainty, high specificity and appropriability. Dependent investments are safeguarded through contract provisions since it is easy to define and enforce partners’ obligations in all contingencies (no uncertainty). Occasional character of transactions does not justify internalization within farm/firm.

Transactions with high frequency, uncertainty, assets-specificity/dependency, and appropriability, are organized within farm/firm (internal ownership) – e.g. managerial and technological knowledge is quite specific to farm, and its supply is governed through permanent labor contract and coupled with ownership rights; capital investments in land are made on owned or long-leased rather than seasonally-rented land (high site and product specificity); “critical” to farm material assets are internally organized (e.g. forage production for animals; important machineries; water supply for irrigated farming); universal capital is financed by market form (e.g. bank credit) while specific investments can only be internally funded (own financing, equity sell, joint-venture).

If specific and specialized capital cannot be effectively organized within farm (economy of scale/scope explored, funding made), then effective governing form outside farm-gates is to be used (group farming, joint-ownership, interlinks, cooperative, lobbying for public intervention).

When strong assets (capacity, technology, time of delivery, site, branding) inter-dependency with upstream or downstream partner exists, then it is easy to govern transactions through contract (mutual interests for cooperation and restriction of opportunism). For instance, effective supply and procurement contracts between farmers and processors are widely used in dairy, meat, vine, and organic industries.

Often farmers face unilateral dependency and need an effective ownership organization to protect interests. Costs for initiation and maintaining of such “collective organization” is great (big coalition number, different members interests, “free-riding” problem) and it is unsustainable or not evolve at all. That creates serious problems for efficiency and sustainability of individual farms - missing markets, monopoly or quasi-monopoly situation, impossibility to “induce” public intervention.

Serious transacting problems arise when condition of assets-specificity is combined with high uncertainty and low frequency. Elaboration of a special mode for private transacting is not justified, specific investments not made, and activity fails to occur at effective scale (“market and contract failure”). Similar difficulties are encountered for rare transacting associated with high uncertainty. In these cases, third-part (private, NGO, public) involvement in transactions is necessary (assistance, arbitration, regulation) in order to make them more efficient or possible. Development of organic farming and trade with origins are good examples – there is increasing consumer’s demand (price premium) for these products but it cannot be met unless effective trilateral governance (independent certification and control) is put in place.

When appropriability associated with transaction and activity is low, there is no pure market mode to protect and carry activity effectively. Transactions could only be governed by “good will”, or voluntary or charity actions of agents. Private modes are employed if high frequency and mutual assets-dependency exists – e.g. unwritten accords, interlinking, bilateral or collective agreements, close-membership cooperatives, professional codes, alliances, internal organization. Emerging of special large-members organizations for dealing with low appropriability (satisfying “social” demand) is very slow and expensive, and unlikely sustain in long-run (“free riding”). There is a need for third-party public intervention in order to make activity possible or more effective.

For example, supply of eco-goods by farmers could hardly be governed through private contracts with individual consumers (low appropriability, high uncertainty, rare character of transacting). Supply of eco-service is costly and unlikely be carried on voluntary basis. Farmers compensation by willing consumers through market is ineffective (high information asymmetry, massive enforcement costs). Third-party mode with direct public involvement makes transaction effective: on behalf of consumers State negotiates with farmers a contract for “eco-conservation/improvement service”, coordinates activities of agents, provides payments for farmers compensation, and controls contracts implementation.

3.4 Economic boundaries of agrarian organizations

Comparative analysis let define the effective boundaries of agrarian organizations (farms, contracts, and markets) and includes:

First, identification of feasible forms for each generic mode for specific country’s, subsectors’, agents’ conditions. Range of “internal organization” in agriculture comprises: one-person farm/firm, family farm/firm, group farm/firm, cooperative, corporation, public farm/firm, joint-venture. Forms of “free market” are: spot exchange on local or regional markets; classical contract, wholesale trade, direct sell on international markets. “Special contract form” includes: short-term, long-term, and relational contracts; interlinked organization; multilateral agreement.

Second, determination effective horizontal and vertical boundaries of individual forms based on potential to: overcome bounded rationality and transaction uncertainty, protect transactions and investments from opportunism, explore economy of scale/scope on specialized and specific capital, minimize production and transaction costs.

One-person farm/firm has zero internal transaction costs, but limited possibility for investment in specialized and specific capital. “Internal” opportunities for increasing productivity (investments,

economies of scale/scope) increases with extension of coalition members (group farm, partnership). Internal (ownership) organization allows greater flexibility and control on activity (direct coordination, adaptation, enforcement, dispute resolution by fiat). However, extension of that mode beyond family or small-partnership boundaries (allowing minimum technological and agronomic requirements; technological economies of scale/scope) may command significant costs for development (initiation, design, registration), and current management (collective decision-making, control on members opportunism, labor supervision and motivation).

Separation of ownership from management (cooperative, corporation, public farm/firm) gives enormous opportunities for growth in productivity and transacting efficiency (internal labor division and specialization; economies of scale and scope; innovation; diversification; risk-sharing; investing in product promotion, brands, relations with customers, counterparts, and authority. It could be connected with huge costs for decreasing information asymmetry between management and shareholders, decision-making, controlling opportunism, and adaptation. Cooperative and non-for-profit form also suffers from low capability for internal long-term investment due to non-for-profit goals and non-tradable shares (“horizon problem”).

Special contract combines greater “control” with possibility for exploring advantages of specialization. However, it could be connected with large costs for contract preparation and enforcement for complex occasional transactions with unilateral dependency.

Boundaries of agrarian markets extend with development of specialization, standardization of recourses, technologies and products, and institutional for protection of private rights. Nevertheless, market governance could be associated with high uncertainty, risk, and costs due to price instability, possibility for opportunism, (semi)monopoly or “missing market” situation.

Trade-offs between gain in productivity/benefits and gain in transacting costs of each mode is quite different in specific (institutional, economic, natural etc.) environment for agents with unlike characteristics, and activity/transactions with specific combination of critical dimensions. Therefore, individual organizations have quite different efficiency and boundaries – a part of transactions are effectively governed through free-market exchange, another part are organized through special contract mode(s), some are integrated, others protected through private organization(s) outside farm gates. It also becomes “logical” variations in investments’ profitability in agro-firm (a profit-making organization), and “pay-back” of expenditures/resources in cooperative (a member-oriented organization), public farm (a non-for-profit organization), subsistence farm (allowing productive use of “non-tradable” family labor and land).

4. Effective Forms for Public Intervention

4.1 Improving public organizations

Discrete structural analysis let specify existing and emerging deficiencies in organization of market and private transactions, and define needs for public intervention in agrarian sector (“economic role of government”).

In modern agriculture often there are public modes along with market and private organizations, and it could be a case of effective (perfect) governance. However, usually there are numerous socio-economic, environmental etc. challenges (problems, conflicts, risks) – a constant need for improving public organization.

Comparative analysis is to embrace public modes and include (Figure 3).

First, assessment on correspondence of public involvement to real needs of development (identified intervention needs in Figure 2). Analysis is to cover the entire governance system, and identify deficiencies (failures, risks) in market, private, and public organizations.

Second, identification alternative modes for public intervention able to correct existing or emerging market, private and public failures, assessing their comparative efficiency, and selecting the most efficient one(s).

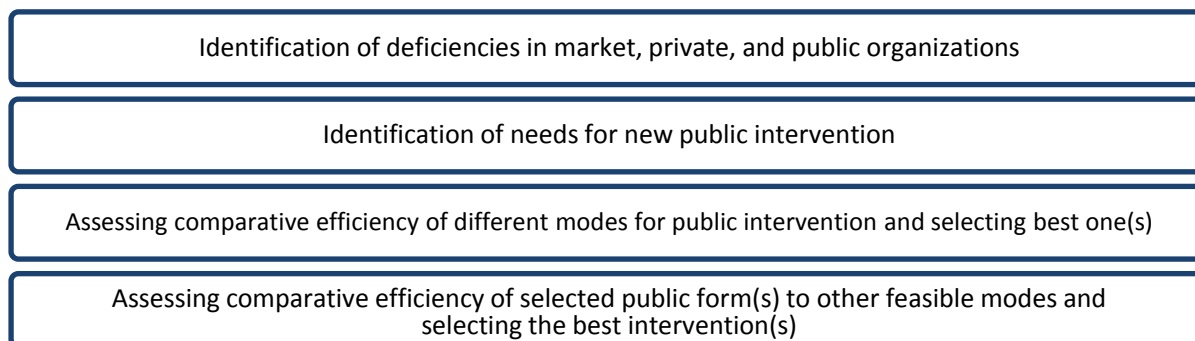


Figure 3 Steps in analysis and improvement of public organizations

Third, assessment on comparative efficiency of selected public form to other feasible modes of governance (partnership with private sector, fundamental property rights modernization, international cooperation). New public intervention is to be initiated only if there is a net benefit - effects are greater than additional individual and social costs.

Public intervention is necessary for transactions with: small appropriability; and high assets-specificity, uncertainty and low frequency. Here there is no pure market and private mode for effective organization (market, contract and private sector failures) and a third-part involvement (state, NGO, international) is necessary to make transactions more efficient or possible at all.

Depending on uncertainty, frequency, and necessity for specific investment of public involvement, there are different most effective forms (Table 2). Interventions with low uncertainty and assets-specificity require smaller public organization (regulatory modes; improvement of laws and contract enforcement). When uncertainty and assets-specificity increases a special contract mode is necessary - e.g. public contracts for provision of private services, public funding or subsidies of private activities, temporary labor contract for special public programs, leasing-out public assets for private management. When transactions are with high assets-specificity, uncertainty and frequency then internal mode and bigger public organization is needed - permanent public employment contracts, in-house integration of crucial assets in specialized state agency or company etc.

Table 2 Effective modes for public intervention in agrarian sector

<i>Level of Uncertainty, Frequency, and Assets specificity</i>				
<i>Low</i>	←-----→			<i>High</i>
New property rights and enforcements	New regulations	New taxes	New assistance and support	New public provision

It is essential to assess comparative efficiency of (technically, economically, politically) feasible and alternative forms. Additional benefits (goals to achieve, problems to overcome), costs, and modes for new intervention must be socially admissible and acceptable. If different forms permit achieving the same goals, then mode minimizing the total (implementing and transacting) costs is to be selected. Assessment is to comprise all costs – direct (tax payer, assistance agency) expenses, transacting costs of bureaucracy (for coordination, stimulation), costs for individuals’ participation and usage of public modes (for information, paper works, fees, bribes), costs for community control and reorganization of bureaucracy (modernization, liquidation), and (opportunity) costs of public inaction. Form having same or less costs as alternatives is to be chosen if provides more benefits or is more preferable. If one form provides more benefits at expense of more costs, then selection depends on whether additional costs are socially acceptable and feasible. If there is a single mode available for achieving certain goal(s) it would be introduced if (implementing and transacting) costs are socially admissible and feasible.

4.2 Public intervention in eco-activity

Market and private sector fail to organize effectively most eco-transactions and activity in agriculture (Bachev, 2010). There is a variety of possible modes for public intervention (Table 3).

Table 3 Effective modes for public intervention in agrarian eco-transactions*

New property rights	Regulations	Taxes	Assistance and support	Public provision
Rights for sustainable environment; Private rights on natural/biological/eco-resources; Private rights for (non)profit management of eco-resources; Tradable polluting quotas/permits; Private rights on intellectual agrarian property, origins, ecosystem services; Rights to issue eco-bonds/shares; Private liability for polluting.	Regulations for organic farming; Quotas for emissions, use of products/resources; Regulations for introduction of foreign species, GMC; Bans for activity/inputs/technologies; Norms for nutrition/pest management; Regulations for water protection against nitrates pollution; Regulations for biodiversity/landscape management; Regulations for trading protection of ecosystem services; Licensing for water/agro-system use; Quality/food safely standards; Standards for GAPs; Mandatory eco-training; Certifications/licensing; Compulsory eco-labeling; Designating eco-vulnerable/reserve zones; Set-aside measures; Inspections/fines/ceasing activities.	Tax rebates/exception/breaks; Eco-taxation on emissions/products; Levies on manure surplus; Tax/levies on farming/export for funding innovations; Waste tax.	Recommendation/information; Demonstration; Direct payments/grants for eco-actions of business/community organizations; Preferential credit; Public eco-contracts; State purchases (water/critical resources); Financial/price support for organic/eco-production/origins; Funding eco-management training; Assistance in farm/eco-associations; Collecting fees for eco-system service providers; Compensation for eco-damages	Research/development/extension; Agro-market/know-how information; Agro-meteorological forecasts; Sanitary/veterinary control, vaccination, prevention; Specialized public agency/company for important ecosystems; Land reclamation/rehabilitation of natural eco-systems; Pertaining “precaution principle” Eco-monitoring/foresight; Risk assessment

* Associated with agents’ eco-rights and eco-performance

Initially, existing and emerging problems in market and private transactions have to be specified. Appropriate public involvement is to create environment for: decreasing uncertainty surrounding market and private transactions, increasing intensity of exchange, protecting private rights and investments, making private investments less-dependent. For instance, State establishes and enforces quality and eco-standards for farm inputs and produces, certifies producers and natural resources users, regulates employment relations, transfers management rights to water associations, sets farm-gate prices.

Next, feasible modes for increasing appropriability have to be considered. Low appropriability is often caused by unspecified or badly-specified private rights. Sometimes, most effective intervention is to introduce and enforce new private rights. That is efficient when privatization is not associated with significant costs (low uncertainty, recurrence, specific investment). That intervention effectively transfers transactions into market and private governance, liberalizes market competition and induces private incentives and investments. For instance, tradable permits and quotas are used to control use of certain resources and pollution levels. They give flexibility allowing farmers to trade permits and meet own requirements and costs. That form is efficient when target must be met, and reduction is dictated through permits while trading allows cheapest compliance.

Sometimes, it is more efficient to put in place eco-regulations aiming changing farmers’ behavior and restricting eco-impacts. This mode is effective when general improvement of performance is desired but is impossible to dictate appropriate changes (in activities, technologies) for diverse operators and eco-conditions (high uncertainty and information asymmetry). When hazard level is high, outcome is certain and control is easy, and no flexibility exists (for timing or nature of required result), then bans and strict limits are used. Regulations impose uniform standards regardless of costs for compliance and adjustment, and give no incentives to over-perform.

Sometimes, using incentives and restrictions of tax system would be most effective. Different tax preferences are used to create favorable conditions for certain (sub)sectors, regions, organizations, population, and activities. Eco-taxation on emissions and products is applied to reduce use of harmful substances. It imposes same conditions for farmers using a particular input giving signals to take into account social “eco-costs”. Taxing is effective when there is close link between activity and eco-impact, and there is no immediate need to control pollution. However, appropriate tax level is required to stimulate desirable change in behavioral.

Sometimes, public assistance and support is the best mode. Financial support for eco-actions is commonly used instrument for improving farmers’ eco-performance. It is easy to justify public payments as “eco-service” payment. Nevertheless, share of farms covered by agri-environmental schemes is small (voluntary and self-selection character of the mode) excluding the most intensive and damaging farmers with highest eco-enhancement costs. Low-rate of farmers’ compliance is also a problem (high enforcement costs, harsher penalty intolerable). Besides, once payments are introduced it is politically difficult to be stopped when goals are achieved or there is funding difficulties. Withdraw of subsidies often lead to further eco-harm since it induces intensification or conventional farming.

Sometimes public information, recommendations, training are the most efficient, in other cases pure public organization (in-house production, provision).

Often there is necessity of combined intervention caused by: forms’ complementarities; restricted potential of the less-expensive modes; possibility for getting extra-benefits; problems specificity; activity’s critical dimensions; uncertainty associated with new forms’ impact; government capability to fund and implement different modes; policy doctrine etc.

Level of intervention (governance) depends on the kind of problem – some involvements are executed at local (ecosystem, community, regional) level, others require nationwide governance, others are to be initiated and coordinated internationally (needs for cooperation, exploration scale/scale economies, managing spill-overs, national or local government failures). Many problems and risks require multilevel governance with combined actions at various levels, diverse actors, and geographical scales.

Public (regulatory, inspecting, provision) modes must have special mechanisms for increasing competency (decrease bounded rationality, powerlessness) of bureaucrats, beneficiaries, interests-groups, and public, and restricting opportunism (interlinking, abuse of power) of public officers and stakeholders. It is made by training, introducing new assessment and communication technologies, increasing transparency (independent audit), and involving experts, beneficiaries, and interests groups in management at all levels. Moreover, “market like” mechanisms (auctions) in public projects design, selection and implementation significantly increase incentives and decrease costs.

Pure public organization should be used as last resort when other modes do not work (Williamson). “In-house” organization has higher costs for setting, running, controlling, and reorganization. Unlike market and private forms there is not automatic mechanism (such as competition) for sorting out less-effective modes. Public “decision-making” is required which is usually associated with high costs and time, and is influenced by strong private interests (lobbying groups, policy-makers and associates, bureaucrats) rather than efficiency. “Inefficiency by design” is widely practiced to secure (rent-taking) positions of certain interest groups, stakeholders, and bureaucrats. With development of institutional environment, and measurement and communication technologies, efficiency of pro-market (regulation, information, recommendation) and contract forms would get advantages over internal less-flexible arrangements.

Usually hybrid modes (public-private partnership) are more efficient given coordination, incentives, and control advantages. Involvement of farmers, farmers organizations and beneficiaries increases efficiency, decreases information asymmetry, restricts opportunisms, stimulates costs-sharing, and reduces management costs. For instance, hybrid mode is appropriate for carrying eco-preservation by farmers. That is determined by farmers’ information superiority, interlinks of activity with traditional food production (scope economies), assets-specificity to farm (competence, site-specificity of investments), spatial interdependency (needs for regional cooperation), and farmers origin of externalities. Enforcement of most animal-welfare and eco-standards is very difficult. Thus, supporting (assisting, training, funding) voluntary actions are more effective than mandatory public modes in terms of incentive, coordination, enforcement, and disputing costs.

If there is a strong need for public involvement but effective intervention is not introduced in a due time, agrarian “development” is substantially deformed. Thus public failure is also possible and often prevails. Comparative analysis let improve design of public organization. It also let predict likely new failures due to impossibility to mobilize political support and resources and/or ineffective implementation of otherwise “good” policies in the specific environment of particular country, region, or sub-sector. Since public failure is feasible its timely detection permits foreseeing persistence/rising of certain development problems, and informing (local and international) community about associated risks.

5. Conclusion

In economy "without institutions and transaction costs" there is no (need of theory of) agrarian organization. In real agrarian economy with diverse agents, institutions and transaction costs there is place for effective non-market modes of governance. It also becomes absurd widely used traditional approach (based on productivity and profitability) for assessing efficiency of agrarian organizations.

Suggested new framework helps better understand factors for organizational choice, efficiency and complementarities of governing structures, and needs and efficiency of public intervention. Agrarian sustainability is compromised when market and private sector fails, and no effective public intervention takes place - imperfect institutional structure is reformed, delayed or bad government interventions prevail, fruitless international assistance dominate, and needed global governance established.

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