

# Farmer groups as a device to ensure the provision of agri-environmental services in the Netherlands: a procurement perspective

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## **Abstract**

In 2016 the Dutch government decided to fully switch to a farmer collectives agri-environmental service provision system. The focus is therewith on creating good habitat conditions for rare species (territorial based) instead of commitments on farm level. The paper describes and analyses the organisational framework and links it to the Dutch tradition of environmental cooperatives. Issues of collective action, transaction costs, information problems, effectiveness, accountability, and procurement efficiency are analysed in a qualitative way. It is concluded that the Dutch model is promising, although not without risks.

Keywords: agri-environmental services, collectives, transaction costs, procurement

JEL code: Q13, Q15, Q18

## **1. Introduction**

Since the introduction of the second pillar of the EU's common agricultural policy (CAP) (as part of the Agenda 2000 policy reform), the EU's rural development (RDP) policy aims to strengthen the sustainability and greening of agriculture, by providing payment schemes which actively promote the provision of green services. A main policy instrument are the agri-environmental schemes (AES) that are offered to farmers and which pays them a compensation in return for having them providing certain environmental management services or taking measures that contribute to the realization of pre-defined policy objectives regarding biodiversity and landscape preservation. AES measures are part of the EU's rural development policy (2<sup>nd</sup> pillar of the CAP) and the annual EU-28 spending on AES-measures amounts about 3 billion euro (due to co-financing obligations the total expenditure about €5.5 billion, an amount comparable to the USDA's expenditure on conservation programs).

Several studies question the ecological, costs effectiveness and design of the schemes currently applied (Klein and Sutherland, 2003, Slangen et al, 2008a, Klein, 2011, ECA, 2011). The mixed effects found indicate that the overtime increasing efforts have not been sufficient to halt the decline in biodiversity (e.g. Fisher et al, 2011). Moreover, evidence shows that by being arbitrary with respect to location and conditions where AES-schemes are adopted (e.g. the voluntary participation) the ecological effectiveness can become poor.

In 2010 about 14 thousand Dutch farmers (20%) participated in AES schemes and the total area under management amounted to more than 143,000 ha (share about 8% of total agricultural land) (Agrimatie; Melman et al., 2016). In 2012 they brought about 60 thousand hectare into the AES-scheme, which represents about 5% of the agricultural area (EU-27 average in 2009 was 21%; Eurostat, 2012). Since 1999 the degree of participation declined. Moreover, it became more and more clear that a decline in farm land biodiversity could only be reversed through cross-farm approaches. This especially applied to the Dutch situation, whereas farmland birds and ecological corridors are important conservation targets (Terwan, 2016). Up till 2016 the Dutch government procures agri-environmental services by contracting individual farmers, which is the classical model in the EU. Since 2016 onward the Dutch government only procures agri-environmental services by contracting with groups of farmers, organized as farmer

collectives (MEA, 2013). It hopes that by following a farmer collective (FC) approach rather than individual farmer (IF) approach it might on the one hand improve the performance of the policy while, on the other hand, it may lead to a reduction in costs for the government (Mulders, 2018). The Netherlands is the first, and so far only, EU Member State following such an FC approach, although also several other member states have examples of farmer collaboration groups (Westerink et al, 2017).

In its November 2017 Communication about the Future of Food and Farming, the European Commission proposes to have a more flexible approach to AES service provision, which makes it more interesting to learn from the Dutch FC pilot-example, even though a full impact evaluation of it is not yet available.

The aim of this paper is twofold. First, it describes the specifics of the Dutch farmer group approach. Second, it analyses a number of procurement aspects of contracting AES service provision via farmer collectives.

The remainder of this paper is organised as follows. Section 2 provides a description of the Dutch farmer group approach, how this is structured, the organisational requirements it should satisfy, the role of different actors and institutions, etc. It also links this description of the FC approach with the past IF *cum* environmental cooperatives-approach, which is the EU's current classical approach. In the following sections key issues associated with efficient procurement in collective agri-environmental contracting are discussed, exploiting insights from the literature on public and private procurement (e.g. Latacz-Lohmann et al, 1997; 2007; 2009). From this literature it turns out that there are several factors that are crucial in determining the properties of the final outcome. These factors are:

- A characterization of the basic parameters defining the procurement setting (e.g. monopsony-buyer situation) (section 3);
- Contract specification by the buyer and the specifics of the contracting due to the peculiarities of the public good or green service to be contracted (section 4), including:
  - Contract incompleteness
  - Contract type and reward structure
- Frequency of (re)contracting and expected design-changes after the contract is signed (section 5).

Section 6 closes with a number of concluding remarks.

## **2. Farmer collective action and the provision of agri-environmental services**

The Dutch agri-environmental policy started in the seventies of the last century with a policy paper on the linkage between farming and nature and landscape management (Rijksoverheid, 1975). Schemes were introduced that enabled farmers to protect agricultural landscapes and at the same time to provide farmers with a reasonable income. The reference for the compensation was the farm income in comparable areas without agri-environmental restrictions (see Polman, 2002 and Polman, 2009). At the end of the 1980s, the basis switched to income forgone calculated using extra labour input and cost for agri-environmental management. There was also a movement from relatively simple agreements, requiring relatively few and minor adjustment of farming practices, to packages having more severe impacts. From 2000 onwards, the Dutch policy has been aligned with the European agri-environmental policies (Regulation EU 1257/99). In 2007, provinces became the contracting partner for farmers implying delegation of public governance from the state to the regions.

### *The IF and ANV environmental cooperatives*

The Netherlands has a tradition in farmer groups as the first farmer group-approaches to agri-environmental management in the Netherlands were already established in the early 1990s. The number of farmer groups or cooperatives (hereafter labelled by the Dutch acronym ANV) grew steadily to about 150 in 2005. The majority of the ANVs had been established in the period 1995-2005. The average number of members of the ANVs has grown as well in this period. The area covered by ANVs ranges from a few 100 hectares to more than 15.000 hectares. Most groups have been operating for more than 15 years. When they get older and more mature their yearly growth in numbers of participants decreases. The ANVs can be quite heterogeneous, as they differ in size and type of activities. This can partly be explained by the physical environment in which they are operating, which ranges from large scale grassland areas oriented on meadow birds, arable areas with field margins to relative small areas with a

focus on the management of landscape elements. Other explanations are cultural and presence and availability of leadership (e.g. Polman, 2002). The attitude of farmers towards cooperation and responding to new challenges appeared to differ for different regions. The organisations also differ with respect to the ways in which they carry out agri-environmental management. Some of the groups entirely rely on volunteers for their activities, whereas others do also employ staff for coordination, administrative tasks and support on ecological knowledge. Many of these groups support their participants in applying for individual agreements. A large number is also involved in collective agreements with regional/local authorities.

The governance arrangements of these organisations have developed in different ways, partly as a response to the pressure felt to show credible commitment for nature management (Polman, 2002). Taking initiatives to set up farmers groups to manage wildlife and landscape shows that many farmers are concerned about their farming environment. The local focus, the bottom-up approach, the participating farmer involvement and a lean organisation are important elements of their sustainable success. Even though they had no formal contracting role, many of ANVs contributed to the impact of the AES policy by facilitating the learning process within their group (e.g. by organising and/or participating in courses on wildlife and landscape management), and saving on transaction costs (e.g. by taking over paper work from farmers). They were involved in monitoring efforts that went beyond direct legal requirements, and occasionally introduced result based payments alongside the traditional effort-based compensation schemes.

#### *Farmer collectives (FCs)*

The latest CAP reform (CAP towards 2020) for the first time allowed member states to organize schemes via collective agreements with groups of farmers from 2014 and onwards (see Regulation EU, No 1305/2013). The Dutch government, which had lobbied in Brussels for having this option, would like to introduce a new approach to agri-environmental service delivery, that would focus on creating good habitat conditions for rare species (territorial based) rather than on commitments made at farm level. Moreover, it would like to enhance effectiveness and improve efficiency. As regards the policy monitoring and evaluation one wanted a stronger focus on goals rather than on efforts or made commitments. Further on, it was felt that knowledge skills could be improved and that better use could be made of local skills and energy. Finally, one would be better able to respond to the dynamics of nature, by introducing flexibility to adjust measure intensity and allocation to this dynamics if this would be better for goal-achievement (Terwan et al, 2016; Mulders, 2018). Following the CAP reform, the Dutch government decided that they will only contract farmer groups or collectives rather than individual farmers for the provisioning of agri-environmental services. No limits are imposed to the size of the farmer groups. The schemes remain voluntary and go beyond the relevant mandatory standards. The FCs are newly formed bodies, which act as applicants for AES schemes and are the final and only beneficiary. In places where there were already ANVs, they often initiated the new FCs, while in other areas also farmer unions took initiative to form FCs (Kuindersma, 2017). FCs have legal power and are the main responsible for a proper implementation of AES-measures. In some areas the former ANVs still exist, although their role changed, while in other regions they merged into farmers collectives. Collectives that emerged from ANVs had to determine their role with respect to the new collective (Dik, 2016). This could lead to some of the tasks of the ANVs being transferred to the FC, while others remained with the ANV<sup>1</sup>. Important to note is that tasks relating to agricultural nature management had to be transferred to the collective. Some ANVs were dissolved.

The number of FCs differs by province, e.g in Flevoland, Limburg, Zeeland and Drenthe there is one group for the whole province, whereas in other provinces there are up to 8 groups (South-Holland). The areas covered by the FCs range from 16.000 ha to about 160.000 ha., of which only a limited part is designated for agri-environmental management. There are currently 40 FCs, involving more than 6,300 farmers, and a managed area of 68 thousand hectares of land (BIJ12, 2016). The number of participating farmers is lower than the number of farmers that have been participating in the past (e.g. in 2007 still more than 15 thousand farmers participated (Agrimatie)). Even though the FCs cover a larger area than the ANVs in the past, the number of managed hectares is substantially lower than in the

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<sup>1</sup> The exact status and task of the old ANVs in the new framework is not yet clear. Their formal role is limited (they can themselves become a member of the farmer group and get some delegated tasks from the farmer group organisation). Their informal role is that they are active counterparts for the Dutch Ministry in the development and design stage of the new framework.

past (decrease since 2010 ranges from 37-54% depending on its measurement (Melman et al., 2016)). It is difficult to draw clear conclusions from these observations however, as in the past there was IF contracting outside ANVs and the number of farmers is steadily declining over time. The decline in managed hectares could indicate a more targeted and discriminatory approach and can well lead to a more effective service delivery per contracted hectare than under the IF-system.

In 2016, the total budget for agricultural nature management was 44.5 million euros (approximately €650/ha)<sup>2</sup>. The size of the farmer collectives (average approximately 150 farmer-members/collective) and the number of farmer groups per province depends on regional circumstances, including the past history with respect to the ANVs and preferences of policy makers<sup>3</sup>. The implementation costs for the government have been estimated to be approximately 7.1 million euro, of which about 40% was used as a compensation for the efforts made by the FCs (Dieleman et al, 2013; BIJ12, 2016). This is equivalent with an implementation cost of about €175,000 per FC, or €100/ha of managed area. In order to be recognized as such, FCs need to be a certified legal entity (screening). The certification involves administrative (organisational competences) and financial checks of candidate FCs by the government.

The FCs play an intermediary role in between the (regional) governments and farmers. In the Netherlands it are the (12) provinces which are responsible for the AES localized demand articulation, whereas the national government define the national targets and provides a broad menu of possible conservation activities and payments (all listed in the Annex of the Dutch RDP). The provinces are to a large extent autonomous in the way they implement the policy. They can, for example, add regionally important species to target species list provided by the national government. For this purpose the different provinces developed integral regional plans, Provincial Nature Conservation Plans (PNCs), which cover their (full) territory and take into account all national and international legal obligations The Netherlands has. In particular the Birds and Habitats Directive plays a key role here. The measures that are requested will mostly on species preservation outside the National Ecological Network (NEN) and Natura 2000 area, with the aim to complement and provide additional support to preservation measures already taken in these nature-designated areas.

In response to the provincial requests, the FCs offer a package bid, consisting of a mix of agri-environmental measures as well as a multiannual plan expressing a longer term vision regarding the management of natural resources and biodiversity conservation strategy<sup>4</sup>. The offer includes a total area per habitat and a set of measures for maintaining and reinforcing these habitats (article 3.2 of SVNL, 2017). The selected bids are usually subject to a process of further adjustment via a process of bargaining (Terwan et al, 2017). In this process the FC has at the same time to assure that its bid to the province matches with the activities the farmers are able and prepared to deliver. The FCs do this by subcontracting individual farmers or land managers for different activities in such a way that it ensures the agreement or collective bid it made with the authorities is satisfied. This includes regional targeting and fine-tuning in which the expected effectiveness of allocating certain measures to certain areas is usually accounted for. As argued in the literature (e.g. Westerink et al, 2017), FCs as vehicles pursuing a landscape approach to AES provision could be instrumental in improving the performance level. In that respect also other supportive activities of FCs, such as knowledge dissemination, facilitating learning from good practices and coordination and integration of activities, are important.

Alongside the collective contract (6 year application), FCs have to develop annual management plans, in which it not only selects the appropriate conservation targets and activities (according to the contract), but also defines the ecological preconditions and guidelines for participants. In this process it consults farmers as well as conservation organisations and discusses preferences, options and possibilities. At the same time, FCs are assumed to provide ecological guidance for proper measure implementation and actively acquire desired contracts and refusing applications that do not fit in the overall plan. This is done by field coordinators that pay visits to the farmers that are carrying out the agreed conservation measures, and advise them. Part of the activities of FCs is to annually report and actively inform their members as well as the wider public about the well-being of the target species (Terwan et al, 2016). This

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<sup>2</sup> In 2017 the Netherlands shifted 20 million euro from Pillar 1 of the CAP to Pillar II, with the aim to further strengthen AES provision and accommodate the signals of increase in farmer interest.

<sup>3</sup> Individual farmers that want to participate in agri-environmental service provision can only do so by becoming a member of a farmer group.

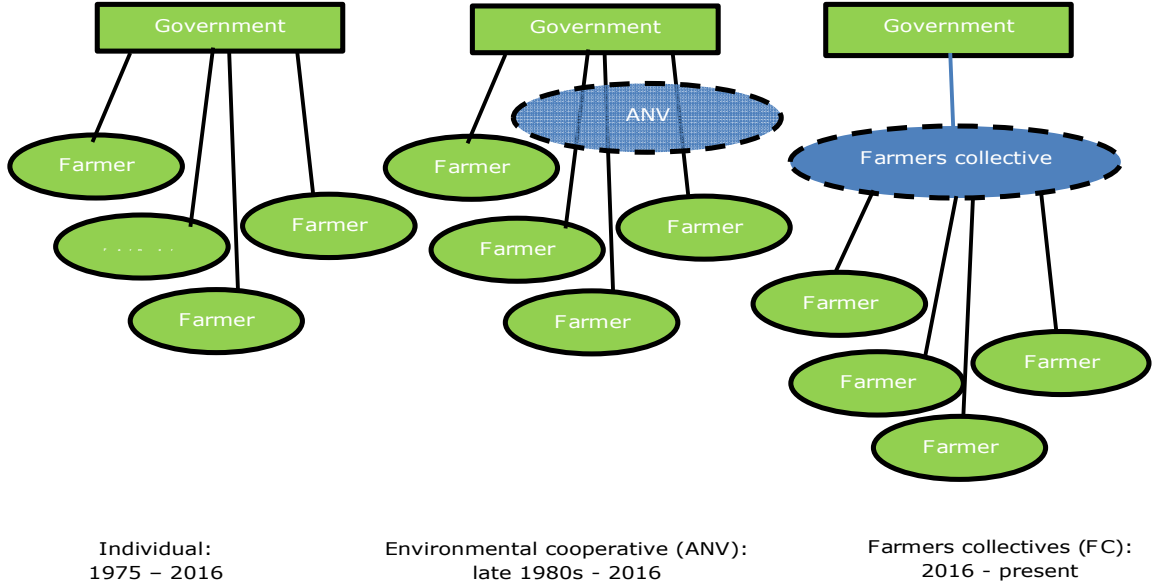
<sup>4</sup> Initially measures will only contain agri-environmental measures. At a later stage also measures coming from other backgrounds (e.g. water bodies, tourism-organisations) might be integrated.

not only creates transparency about the effectiveness of sending public money, but also contributes to induce social pressure to apply measures, select locations, and cover functions (e.g. shelter places, nest places, foraging areas) in such a way that they contribute to support the FCs performance.

FCs are responsible for doing controls and check. The FC is also responsible for sanctions in case individual farmers are detected to be non-compliant with respect to the FC-farmer subcontracting agreement. The FC claims the payment from the national and EU authorities and makes payments to farmers in accordance to the agreed subcontracts that have been made. As private organisations, FCs have the autonomy to develop their own service reward rules and could apply some kind of price discrimination with respect to low and high costs suppliers. Potentially, such redistribution could lead to a higher service level and a higher number of farmers participating (not further explored in this paper) that would have been the case under the traditional system.

Payments are granted annually to the FCs to compensate farmers "for all or part of the additional costs and income foregone resulting from the commitments made". Additional payments are possible to cover implementation and transaction costs (up to 20 % of the premium paid for individual famers and up to 30% for groups of farmers and other land managers). Though a start-up phase may involve additional costs, the transaction costs have been indicated by several FCs to be a major concern (Secretary of State of Economic Affairs, 2016). Although a good evaluation procedure is welcome to determine what is reasonable, the private transaction costs should be recognized as being a 'productive input' (Jongeneel et al, 2016). As FCs often employ paid staff and are in need to do so to satisfy organisation requirements (professionalism) that is asked for, they are likely to have a minimum of fixed costs. A way to reduce transaction costs as a share of the volume of transactions made could be to increase scale and exploit economies of size.

Figure 1 summarizes the evolution of agri-environmental management in the Netherlands. It started with contracts between individual farmers and the government (see left side of Figure 1). Then in the nineties of last century ANV type associations took the role of intermediary organisation in many regions. Since 2016 the contractual relation is between farmer collectives and provincial governments.



**Figure 1** Evolution of Dutch agri-environmental management model

**3. Basic features of Dutch farmer group contracting**

As is known from auction theory the most significant problems in auctions and auction design are probably those related to how to discourage collusive, predatory and entry-deterring behaviour as they affect the chances to achieve a competitive and efficient outcome. The key issue here is how to ensure a

sufficiently competitive procurement process (Klemperer, 2004, 29). Agri-environmental collective contract procurement in the Dutch agri-environmental policy approach has two economic basic features: First, the government, more precisely the provinces, are the major buyers and have monopsony power (reverse auction). They can use this power to structure to a large extent what happens at the supply side. As was described before they do impose requirements on the organisational structure of the farmer groups, which the farmer groups need to satisfy before being qualified as an acceptable potential contract partner. Second, the government or provinces has to make choices in what to buy (deliveries contract), whom to buy from (choice of contractor or farmer group), and how to buy (choice of contract type).

The buyers (provinces) appear to play a very decisive role. This is illustrated by the steps the provinces have taken to develop procedures, define requirements and make formats and templates for the contractors, therewith to a large extent determining their room for manoeuvre. As such in reality the process is rather top down, probably more so than Figure 1 might suggest. The degree of competition seems to be limited, because the capacity building activity among farmers and their associations also functions as a pre-selection of contract partners, which will limit competition at the suppliers' side. This issue will be further explored below, when also other aspects are brought into the discussion.

As regards the competition between the FCs as suppliers of AES services the spatial character of AES contracting should be acknowledged. By allowing only groups of farmer to offer bids, the number of competitors for a provincial 'tender' will depend on the number of farmer groups that can be formed, which in turn depends on the minimum specified for the number of farmers that should be at least included in a group, as well as by the farm scale (in terms of hectares of land) in relation to the total area in a region<sup>5</sup>. In particular, when a policy objective of the buyer is to get a balanced participation of suppliers or of farmers over its territory or farmers in a specific zone, this will limit the number of suppliers and increase the likelihood of strategic and collusive behaviour among suppliers in normal auctions (cf. the large demand relative to supply-argument made in Hellerstein et al, 2015). Following a non-auction awarding procedure, in which the buyer pre-selects a number of reputable suppliers (e.g. making use of the social capital of ANVs with a proven track record from the past), shares information with (potential) FCs, and provides funding for organisational capacity building for at least a limited number of most promising groups of farmers, that are evaluated to be potential reliable suppliers, can then in the end generate a more competitive outcome (see Tadelis, 2012).

#### **4. Contract specification**

##### *Incompleteness*

Collective agri-environmental contracts define a 6 years results-oriented obligation to realise specific habitats on a specified land area (Terwan et al., 2016). An important characteristic of these contracts is their inherent incompleteness. Relative to the FC approach, collective contracts are more incomplete in the sense that many details about the activities are not known to the procuring institution. In the old individual system character and location of conservation activities used to be fixed for six years. The scheme's flexibility in terms of the design and location of conservation activities is much more flexible than under the old IC-approach system. In the collective contracts a provision has been included which allows the FCs to adjust activities until 14 days the activity will take place (see Terwan et al., 2016). This has to be notified to the contracting province, which will then assure that the payments made will be adjusted to the change in deliveries. Due to an especially developed ICT structure, linking FCs and the Paying Agency, this has been made also administratively feasible. FCs as well as subcontracted farmers have to make investments that are specific to the relationship (cf. Polman, 2002; Steele 2008). At the level of the FC this implies investments necessary to become a certified professional conservation organisation (see Terwan et al., 2016), the generation of the social capital (including trust), and the investments made in creating a detailed proposal. But it is not only this, also efforts need to be made with respect to establishing well-functioning FC-farmer member-relationships. Because of the fear of hold up and policy uncertainty, farmer groups may have a tendency to underinvest, unless the policy maker

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<sup>5</sup> In the Netherlands no clear choices have been made about this, but different provinces seem to follow different strategies. This makes it difficult to evaluate the degree of competitiveness.

convincingly signals to be committed to support agricultural conservation efforts in the context of an underspecified over-arching agreement with the farmer groups (Steele, 2008).

Entering into an incomplete contract implies that the contracting farmer group-partner imposes a hazard on itself. Both the farmer group and the provincial authorities face risks when contracting. Given the contract incompleteness and the complexity of the services to be contracted (e.g. their impact or the effective constraints they generate to farmers being subject stochastic conditions such as variations in weather), there might arise a need for ex-post contract adaptation during the contractual relation. As is known from the procurement literature (see for example Steele, 2008 and Tadelis, 2012) both the buyers and sellers will then share uncertainty about many important contract design changes than will, or are very likely to occur after a contract is signed.

#### *Contract type and reward procedures*

Defining a collective agri-environmental contract not only requires a detailed and as complete as possible specification of the obligations and deliverables a contractor has to fulfil, but also to specify a reward procedure. Here several options are possible, with the three options that frequently are observed in the literature being a fixed-price contract, a cost-plus contract and a unit-price contract<sup>6</sup>. As has been proved by Bajari and Tadelis (2001) and Tadelis (2012) in case of relative simple projects, which are likely to have relatively complete contract specifications, fix price procurement may be most efficient. A competitive auction will in that case induce suppliers to compete their surplus away and the buyer will procure the design at the lowest price. Fixed price contracts provide an incentive to reduce production costs, but hamper efficient adaptation. With complexity and contract incompleteness increasing (and as a result adaptations of contracts more likely occurring). contrary to the conventional wisdom, both another type of contract (a cost plus contract) and another allocation mode (bargaining with a reputable and qualified buyer) are likely to be optimal. Procuring "cost plus" contracts via an auction can create severe problems with adverse selection, creating a risk that the "wrong" suppliers (highest cost, least able) will win the contract (see Tadelis, 2012, 300 for a detailed argument). It is acknowledged that negotiated contracts may be less effective in selecting the lowest bidder than open auctions or tendering systems. But such negotiated contracts can economize on ex-post transaction costs resulting from frequent adaptations of the contract. The cost savings involved with this may outweigh the gains of competitive bidding. Whether this will be actually the case for agri-environmental management needs further empirical evidence, but an empirical assessment of Bajari et al (2014) of data on 819 completed public highway construction contracts showed that the adaptation cost associated with incomplete contracts can be substantial, and maybe even more important than the standard sources of (asymmetric) private information and moral hazard mentioned to explain departure from efficiency in procurement.

The new Dutch FC-approach system is clearly a single buyer procurement setting. However, as regards the bidding process there is a special posted price-feature phenomenon, which imposes a tight restriction to agri-environmental public sector procurement (see details below). As such the new Dutch procurement system can be characterized as unit price auction rather than as a discriminate price auction. An important institutional aspect is the use of the so-called Catalogue Green and Blue Services (CGBS) which offers building blocks for composing agri-environmental measures for individual farmers. This catalogue provides a pre-fixed unit price fixation for different agri-environmental measures and services, with the calculated compensation based on the estimated costs for providing these services by an "average" supplier (being an individual farmer rather than a farmer group)<sup>7</sup>. More specifically, the compensation for the different measures is based on the income forgone-principle, which compensates farmers for their efforts (costs) as well as for the revenues forgone associated with these actions. The measures included in the Catalogue are not only described in detail with respect to implied requirements

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<sup>6</sup> A fixed price contract specifies a fixed price the contractor agrees to accept in return for keeping the obligations and delivering the services as specified in the contract. In a cost-plus contract the contractor is reimbursed for the costs (labour, material, forgone revenues) she makes with an additional stipulated fee. Hence the costs of any adaptations are automatically compensated for by the conditions that are already specified in the original contract. A unit price contract can be interpreted to be a hybrid form of the previous ones.

<sup>7</sup> Rather than specifying a unique unit-price, the Catalogue specifies maximum payments by measure that fit within the regulation on State Aid in the European Union, where some kind of regional differentiation is taken into account and is agreed with by the EU Commission. The latest update of the Catalogue with the EU Commission dates from 2010 (see <http://www.portaalnatuurenlanschap.nl/themas/catalogus-groenblauwe-diensten/overzicht/> for further details).

on farmer behaviour and specifying the set of actions farmers have to undertake, but are also notified to and confirmed by the EU Commission (European Commission, 19-II-2007, C(2007) 586). Following this standard has as an advantage for The Netherlands is that it by doing so can prove its accountability and defend oneself for example against accusations of overcompensation of (individual) farmers. The Catalogue not only provides an overview of measures farmers can take on their farms, but also including information on the maximum payments for these measures that fit within the regulation on State Aid in the European Union. The budget per habitat paid to the FCs is based on the average payments per hectare for the different activities (Terwan et al., 2016). Note that the payment-system that the government applies leaves it open how the FCs will decide to internally schedule the activities and payments.

The catalogue offers a toolbox or menu not only for pooling measures into packages that will be part of the contracts provinces will make with farmer groups, but also help to price them. Since both the buyers (provinces) and suppliers (farmers and their organisations such as the ANVs) are familiar with the Catalogue both sides can save on transaction costs when using this toolbox, rather than inventing the wheel anew. However, a drawback is that following this posted-unit pricing-rule will not provide any guarantee to the policy maker that it will achieve its policy objective with respect to the level of service provision (as define in the regional provincial plans). For that to achieve one should allow the farmer groups to specify an endogenous price as part of their bid. Following this pricing rule allows the policy maker to calculate a fixed price for a farmer group package-contract and then create a take it or leave it exchange rather than a sealed bid unit price auction.

## **5. Frequency of (re-)contracting**

As regards the frequency of contracting, annual contracting rather than making a contract covering a multi-annual period can be beneficial for both parties since a higher contracting frequency reduces the time gap between unit commitment and delivery period for suppliers and therefore their risk of marketing their asset in a suboptimal way. Following the analysis initiated by Williamson, Slangen et al (2008b, 178-186) argue that when longer term commitments are involved (i.e. a collective contract with a 6 year duration) relational aspects in transactions become increasingly important and a market type allocation is often not leading to the best allocative outcome. Moreover, increasing the contracting frequency allows the buyer to arrange adjustments and utilize learning and information revealing effects in new contracts, thereby reducing the costs associated with ex-post haggling and frictions (Hellerstein et al, 2015). It should be noted that such ex-post frictions cannot only lead to direct costs, but also to indirect costs, in terms of uncertainty for the farm businesses and a deterioration of the social (trust) capital and perceived fairness. The benefits of higher frequency procurement need to be weighed against the additional transaction costs associated with more frequent procurement. As far as increasing the frequency may foster collusion between suppliers and by that reducing the efficiency of the outcome this should be also taken into account (Latacz-Lohman and Silizzi, 2007). It may also induce risk-averse behavior, leading to lower results as the government or farmers may opt not to continue.

In the Dutch system there is an institutionalized arrangement that the provinces and FCs meet twice a year to evaluate and (if necessary) to adjust the agri-environmental management (Terwan et al., 2016). Moreover, many FCs create buffers and a reserve fund for the annual payments for activities. They do this to on the one hand anticipate mistakes or fields of farmers dropping out. On the other hand, it offers them a way to adjust the FC-farmer contracts to changing circumstances, which could negative affect achieving the goals specified in the contract. Using slightly lower payments than the maxima allowed by the scheme offers the FCs the opportunity to create some financial buffer.

## **6. Conclusions**

Table 1 summarizes the pros and cons of the farmer collective and individual farmer-approaches, following the key aspects as these are discussed in the previous text (including basic features, contract specification, and frequency of re-contracting).



**Table 1** Qualitative assessment of the pros and cons of the farmer collective (FC)-approach to agri-environmental contracting (using the individual farmer contracting approach (IF) as a benchmark)

Issue	FC-approach	IF-approach
Basic features	Contract with farmer collective; screening of farmer groups; package bids; complex package contracts	Contract with individual farmer; relatively simple contracts; voluntary farmer collaboration via ANVs
Contract specification: incompleteness	Incomplete contract with a composite of activities; build in flexibilities (provide annual management plans, real time notification Paying Agency of changes in activities up till 14 calendar days before the activity is undertaken); contract duration 6 years;	Simple contracts with single activity; duration 6 years; posted-price (CBGS)
Contract specification: reward structure	Average payment per hectare of habitat preservation; posted-price feature (CBGS-based) at aggregate level being satisfied, but allowing flexibility with respect to FC's payments to farmers; allowance for a 20% transaction cost mark-up	Simple contracts with single activity; posted-price (CBGS)
Frequency of re-contracting	Re-contracting after 6 years, but in meantime yearly adjustments possible and real time notification option.	No re-contracting possible; farmer exist when contract expires, but can re-apply

Source: based on the previous analysis

Based on the previous analysis some concluding observations from our analysis can be made:

- The switch from an IF approach to a FC-approach requires a large initial effort of both the government as well as the private sectors. As such the swift to an effective FC system is costly both in terms of time and money. However, when the transition is made, the transaction costs of the public sector are likely to be substantially lower relative to an IF-approach.
- The gain in transaction costs achieved at the public side is going together with an increase of transaction costs on the private side. It is unclear to what extent the decline and increase in public and private transaction costs balance each other. For the new FCs, transaction costs (administration) are often still an issue of major concern and also from a procurement perspective they may need further analysis.
- The FC approach to agri-environmental service delivery contracting offers potential benefits and flexibilities that go beyond those realized by the previous IF approach. Providing an offer/bid requires the FC to make a convincing plan, including a longer term vision regarding the management of natural resources and biodiversity conservation, where different stakeholders and NGO's (bringing in different knowledge) can be involved. Moreover, FCs have an obligation to annually report about their activities and the well-being of target species, which makes failures to perform easily visible. All this contributes to landscape approach and coordination of activities helping to overcome the lack of regional coordination, which in the literature has been identified as an important factor of the poor performance of AES measures.
- Issues of contract incompleteness, the creation of a custom made product, the spatial aspect and the implications this has for organizing a competitive bidding process (for a specific area and in addition to there being a monopoly buyer there can be a monopoly supplier), as well as the lack of time to specify detailed contracts can be a legitimate factor to rely on a procurement systems characterised by a bargaining/negotiation approach with reputable suppliers, rather than sticking to a competitive auction approach with several suppliers. In contrast which what might be suggested by the conventional wisdom in the standard auctioning literature, such a bargaining approach can lead to an optimal outcome.
- The strategy followed by the Dutch policy maker to rely on the Catalogue of Green and Blue Services and make sure that maxima are introduced with respect to the payment for specified

activities is likely to contribute to reduce public as well as private transaction costs that might be associated by designing new collective contract in a fully open way. Moreover, it contributes to cope with the EU's accountability requirements.

- Since the (provincial) government is a monopsony buyer in its territory it can potentially use its buying power to determine to a large extent the conditions under which agri-environmental services will be delivered. When a system of FCs covering a large part of the countryside is in place the entry of new FCs can become complicated, even though the entry and access of farmers may be more flexible. Learning then becomes important to ensure quality enhancement and dynamic efficiency gains.

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