Managing a common resource in agriculture: an overview of the French nested water allocation system

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Chapter 9

Managing a common resource in agriculture: an overview of the French nested water allocation system

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ABSTRACT

Water resources in France are the focus of much social and political attention with recurring conflicts between agriculture and environmental organisations. The last 30 years have seen a major transition from open to regulated access to water resources, which has required a deep transformation of the regulatory framework, the development of new planning procedures at different nested levels, the establishment of new organisations, the development of hydrological, hydrogeological and environmental knowledge and significant social change. Nowadays, the French allocation regime has distinct characteristics, giving priority in allocation to the environment and relying on permits that can be modified or cancelled by the State without compensation. A move towards co-management has nevertheless occurred where authorities, users and stakeholders jointly define allocation rules. Co-management is deployed at different nested levels, from river basin district to catchment level and agricultural user communities. In particular, the establishment of agricultural users' organisations (OUGCs) is an innovative attempt to organise reallocation without relying on market mechanisms. The French model still faces major challenges in the future, due to imperfect allocation institutions and increased scarcity and droughts driven by climate change which will further question allocations between water uses and the environment.

Keywords: Agro-food value chains, collective management, common pool resource, reallocations, water user organisations

9.1 INTRODUCTION

France is generally endowed with generous water resources and has not yet faced the extreme cases of water scarcity, droughts, and depletion of aquifers experienced in other countries. However, varying climates are present in the country, including a large Mediterranean ecoregion and dry summers across much of the country. With significant growth in water extractions in the second half of the 20th century, particularly from agriculture which represents 80% of net water use in the dry season, aquatic ecosystems and groundwater-dependent ecosystems have increasingly been impacted by abstraction pressures. In the future, France is likely to be exposed to longer and more severe droughts, as well as growing water scarcity in many regions. According to the study Explore 2070 (MEDD, 2015), average river flow could decline by 50 to 70% in most rivers by 2065, while groundwater recharge could reduce by 55%. In that context, current allocations will increasingly exceed future available water resources, worsening conflicts between agriculture, public water supply and the environment.

Prescriptions under three water laws (adopted in 1964, 1992 and 2006) provide French authorities with significant powers to regulate water use. Authorisations to withdraw water are made through a national permitting regime established in 1964 and, since 1992, users are required to meter their extractions and restrictions on water use applied during droughts. Another important feature of the French model formalised in the 2006 Water Law is its nested and user-based allocation system where users, under the supervision of the State, collectively negotiate who gets water, how much and when (for historical overviews, see Erdlenbruch *et al.* 2013; Rinaudo, 2020).

This chapter presents the legal and institutional framework regulating water allocation in France, including the changes made to the nature of water rights, and the system of collective licences controlling water use in agriculture. Additional operational dimensions of the allocation system are also presented, including approaches taken to define environmental limits and allocation caps, rules for allocating water between agricultural users and rules reducing those allocations to sustainable levels, and mechanisms for monitoring and enforcement. The interaction of the allocation regime with other existing instruments is also explored. The chapter concludes with the key features of the French approach and its overall performance.

9.2 LEGAL AND POLICY BACKGROUND

9.2.1 The nature of water rights

Although the main rivers have been under royal control since the middle ages, non-navigable rivers and 'closed' water (i.e. groundwater, ponds dug by the landowner, springs generating minor flows, and stored rain) were left to landowners' appropriation as long as the water stayed on their land. Access to those resources was progressively restricted, starting with the Civil Code of 1804 and culminating with the 1992 Water Law which stated, in its first article, that all surface water and groundwater is the 'common patrimony of the Nation'. As a result, France now recognises water as a common good, subject theoretically only to rights of use. This provides a strong legal basis for greater oversight by the State over water use (Conseil Etat, 2010), first through a nested system of water management planning instruments and second, through a comprehensive registration and permitting regime.

9.2.2 Water management planning instruments

The current French water allocation regime operates within a nested system of targets and rules, established from the European to the catchment and aquifer levels. Under the European Union Water Framework Directive (WFD), adopted in 2000, Member States were requested to achieve a set of ecological, chemical, and quantitative status conditions in all their surface water and groundwater bodies. To achieve these targets, River Basin Management Plans (RBMPs) are required to be adopted at river basin district levels, which, in mainland France, follow the boundaries of the surface hydrological basins of the six largest rivers.

The preparation of these six RBMPs (SDAGEs in French) is delegated to River Basin Committees (RBCs), representing state administration, regional and local governments, users and civil society. Water agencies support RBCs by preparing and implementing RBMPs and their associated programme of measures, in line with the strategy defined by the RBCs. They are also in charge of collecting and redistributing financial resources in the form of water extraction and pollution fees and subsidies to fund measures in the plans. However, they are not in charge of the operational management of water infrastructure, nor are they in charge of delivering permits to extract water. Water agencies are public administrations linked to the Ministry of Environment and Sustainable Development.

An additional planning level exists in France, at the sub-basin level, organised along hydrological boundaries such as catchments and regional aquifers. A local water commission (LWC) composed of local councils, state administration, and user and civil society representatives is in charge of developing the sub-basin plans (called SAGEs). They refine objectives, strategies and measures laid out in SDAGEs (Rinaudo *et al.*, 2020). As for SDAGEs, these plans are legally binding and the State must ensure coherence of other public policies with the requirements of the SAGE.

9.2.3 The permitting regime

In France, access to water is regulated by several permits: (i) an 'infrastructure' permit, for example for drilling a well, constructing a weir in the river or installing a pumping station; (ii) a pumping permit that defines the capacity of the extraction equipment; and (iii) an 'extraction' permit to withdraw specified quantities of water.

These permits are issued either through a registration process or an authorisation procedure depending on the pumping capacity of the installed equipment and its location inside or outside a 'restricted area'. Restricted areas are catchments that have an imbalance between supply and demand (in France, 'Zone de Répartition des Eaux', hereafter ZRE) (see Table 9.1). The difference between the registration and authorisation procedures only relates to administrative requirements (e.g. whether an environmental impact assessment should be provided with the application). Outside restricted areas, permits are very easy to obtain, provided the projected pumping capacity does not represent a threat to third parties or aquatic ecosystems. In restricted areas, an impact assessment study is required. In both cases, the State can refuse any application it deems incompatible with water management rules.

Pumping and extraction permits are required to be compatible with the SDAGE and SAGE, including specific pumping requirements based on their potential impacts on ecologically sensitive areas, drinking water protected areas, and restricted areas. Users are required to install meters and keep a record of their withdrawals. Permits specify not only a maximum permissible flow rate, but also an annual volume (sometimes expressed in monthly or seasonal time steps) that cannot be exceeded.

The extraction permit is simultaneously tied to the abstraction point and a user. Thus, it cannot be transferred to another abstraction point owned by the same user. The extraction permit can be transferred to a new user in the event of a change of ownership of the abstraction point. However, this is not automatic, and the State can oppose the transfer.

Although infrastructure and pumping permits have no validity limit, they can be modified or cancelled without compensation by the State if it is demonstrated that extraction causes significant

Table 9.1 Declaration and permitting requirements.

	Significance of extraction (volume based on pumping capacity use over one year)	Administrative procedure for pumping permit	Administrative procedure for abstraction permit
Outside water restriction areas (ZRE)	Annual extraction <1000 m^3/yr (domestic use)	Local council declaration	Not applicable
	Annual extraction between 1000 m^3/yr and 10,000 m^3/yr	Declaration to state	Not applicable
	Annual extraction between 10,000 m^3/yr and 200,000 m^3/yr	Declaration to state	Declaration to state
	Annual extraction >200,000 m^3/yr	Application for authorisation (state)	Application for authorisation (state)
In restricted areas ZRE	Pumping capacity exceeding 8 m^3/h	Same procedure as for outside the ZRE	Application for authorisation (state)

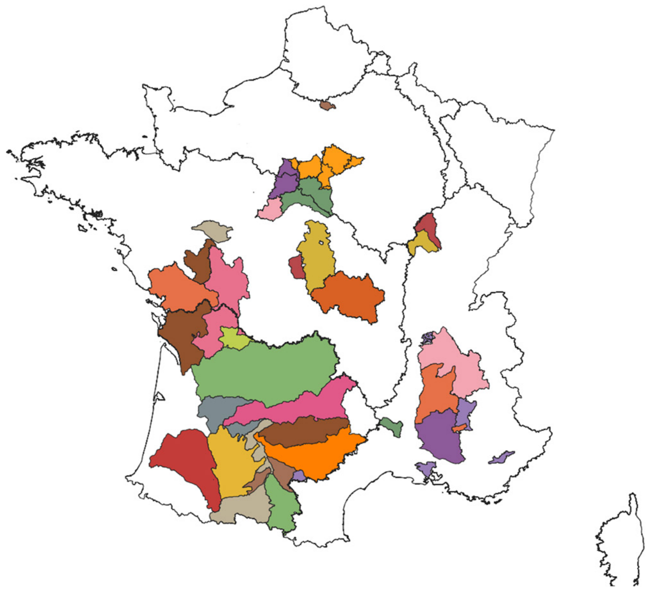

Figure 9.1 Map of river basins (black lines) and OUGCs (coloured units) in France. Data: DREAL in 2018.

environmental impact. Extraction permits are usually renewed annually through a very simple procedure, but the State keeps a possibility to reduce allocated volumes if needed.

Since the 2006 Water Law, a different procedure has applied to agricultural extraction permits withdrawing from 'restricted' catchments and aquifers (ZRE). In this case, all agricultural irrigation extractions (previously under individual extraction permits) are regrouped into a single collective permit valid for up to 15 years. The permit can be revised following revisions of the SDAGE or SAGE, where new hydro-climatic datasets, modelling updates, a better understanding of local conditions, or evolving climatic or socio-economic conditions require a change in the allocated volume.

The permit is issued to a 'Single Collective Management Organisation' ('Organisme Unique de Gestion Collective', hereafter OUGC) created for the purpose of allocating the bulk volume amongst its members (Lafitte *et al.*, 2006). There were 49 OUGCs across France in 2020 (Cinotti *et al.*, 2020, see Figure 9.1). The OUGC is a major institutional innovation established by the 2006 Water Law to facilitate the regulation of agricultural abstraction. The setting of the extraction cap in restricted areas is discussed in Section 9.4 and the functioning of the OUGC in Section 9.5.

9.3 ENVIRONMENTAL BOTTOM LINES

Broadly, three types of requirements have been established to ensure environmental protections for French rivers and aquifers:

- Minimum flows set below each major infrastructure impairing the natural flow of rivers or diverting water
- Target flows and target aquifer levels for major river nodes defined in SDAGEs or SAGEs, and aiming at meeting good quantitative, qualitative and ecological conditions
- Alert and emergency flows and aquifer levels set to restrict water use in the event of a drought

Each requirement is examined below.

9.3.1 Minimum flows

The regulatory framework requires the setting of minimum biological flows guaranteeing the life, reproduction and circulation of water species downstream of infrastructures affecting river flow. These minimum biological flows are servitudes on the operators of the infrastructures, and are gradually adopted as they only apply to new authorisations, renewal of existing authorisations, or existing ones upon request of the State. They are established based on studies focused on local hydrological statistics and considering the linkages between hydraulic and ecological conditions (RF, 2011). In all cases, minimum flows cannot be set below 1/10 of average natural annual flow, or 1/20 for rivers with an average natural annual flow above 80 m^3/s. The average flow rate should be based on all the years for which data are available, with a strict minimum of 5 years, and should recreate an estimated natural flow removing the impact of extraction, discharges and water transfers. The 1/20 also applies as a minimum servitude for infrastructure used to produce peak-time electric production.

9.3.2 Management targets

An additional set of river flow targets are established for major river nodes in SDAGEs and SAGEs. They represent objectives guiding operational management decisions. Called 'target low flows' (in French, 'Débit Objectif d'Etiage' or DOE), they represent the monthly average flow above which authorities consider that downstream water demand can be satisfied without impacting good ecological status under the WFD. Similar to minimum flows (see above), target low flows must be set so they guarantee the life, reproduction and circulation of water species. Target flows can vary between seasons.

Target low flows are set in a nested manner, at the most downstream point of each hydrological sub-unit of the river basin, that is individual catchments, sub-catchments and other management units. Target groundwater piezometric levels are also set for aquifers connected to surface water bodies, to avoid a drop in aquifer levels impairing the achievement of minimum biological flows. The flow targets are considered achieved if it is observed a posteriori that the lowest 10-days average flow (or aquifer level) was maintained above 80% of its value. Flow targets must be met on average 8 years out of every 10. These target low flows are used to calculate the sustainable extraction cap (see below).

9.3.3 Alert and crisis flows

In addition to minimum biological flows and target low flows, French water actors use 'alert' and 'crisis' flows (i.e. Débit d'Alerte and Débit de Crise) below which restrictions on water extractions and uses apply so that essential water uses and the environment are prioritised in the event of droughts:

- 'Alert' level is the average daily flow that indicates that water demand for all water uses downstream may not be met without impacting the aquatic environment. First restrictions on non-priority uses apply.
- 'Crisis' low flow is the average daily flow below which top-priority uses (e.g. essential drinking water provision for humans and animals, and good functioning of freshwater species) are endangered. Non-priority uses are not allowed for the extraction of water.

A 'vigilance' level is also set before the 'alert' level and a 'reinforced alert' level is set before the 'crisis' level in order to smooth the implementation of the alert level (some restrictions) to a crisis situation (full restrictions).

Specific restrictions on water uses apply at each level. An equivalent system based on groundwater levels applies to unconfined aquifers. These targets are set considering the interaction between surface and groundwater, based on studies conducted during the planning process (SDAGE or SAGE).

9.4 DEFINING THE ALLOCABLE RESOURCE POOL

Since the 2006 Water Act, Sustainable Extraction Limits (SELs) must be imposed in restricted catchments and aquifers (i.e. ZRE). SELs are defined in local management plans (SAGEs) by members of the Local Water Commission (Section 9.2.2), based on hydrological or hydrogeological studies. SEL studies are directed by a steering committee appointed by the LWC and include all stakeholders potentially affected by the SEL.

The SEL is legally defined as the volume of water that can be extracted without impairing the environmental objectives of the European Water Framework Directive, that is good ecological, chemical and quantitative status of water bodies. Operationally, the SEL is set to ensure that the low flow targets adopted in the basin plans (Section 9.3) can be met in 8 years out of 10. If the basin is fully allocated within the SEL, allocations will still need to be curtailed on average 2 years out of 10 (drought years). In other words, the SEL is the quantity of water that can be withdrawn with 80% reliability.

The SEL takes the form of a volumetric cap on the water that can be extracted annually from restricted catchments and aquifers, usually sub-divided seasonally (winter/summer), and sometimes monthly and even weekly during intensive use periods. The SEL is specified in volume for each management unit of a catchment and aquifer. Management units can be sub-catchments, parts of a sub-catchment or different aquifers (connected or not connected to surface water).

The SEL is based on an assessment of the catchment and aquifer water balance. Methodologies for assessing the SEL vary greatly, ranging from simple statistical analysis to sophisticated integrated surface-groundwater models. Reporting on an analysis of a sample of those studies, Arnaud (2020) warns that the setting of SELs in France is not always scientifically robust and that SELs have sometimes been overestimated due to various reasons, from insufficient knowledge to political pressure from water users. However, he shows that SELs have often been 10 to 20% below current water use levels, and up to 50% in some cases, posing major challenges to authorities charged with reducing allocations to water users.

Once the SEL is set, the LWC is in charge of allocating water to each main use of the sub-basin, and the OUGC is in charge of allocating water between individual agricultural users. The rules directing the sharing of the SEL are discussed in the next section.

9.5 ALLOCATION RULES

In catchments characterised by water scarcity, water is now allocated using a volumetric management approach, complemented by a system of use restrictions during drought years. These two allocation mechanisms, which were progressively implemented between 1992 and 2010, are presented below, followed by a specific focus on allocations for agriculture within the OUGC.

9.5.1 Volumetric allocations between sectors

Once the SEL is set, the State and stakeholders (in LWCs) negotiate over allocations between sectors (drinking water supply, industry, agriculture). In France, public water supply is given priority over other economic sectors and receives an allocation corresponding to the users' needs. These needs are estimated by taking into account performance standards in terms of water losses and efficiency. The remaining volume of water is shared between industry and agriculture. Industrial water use is usually given priority over agricultural water use, although it depends on the type of industry and the efficiency of use in each industry. Therefore, much of the reduction needed to balance supply and demand in any given catchment or aquifer is usually imposed on agricultural uses.

It is worth noting that, given the use priority system in place, high-priority users have little incentive to limit their claims and the room for negotiation with low-priority users might seem very limited. However, since stakeholders live in the same territory and may have other interests in common and other issues to negotiate, they may be open to compromise.

Once defined, the volumetric allocation granted to agriculture is provided as a bulk permit to the OUGC. According to the 2006 Water Law, the OUGC is responsible for allocating water between irrigators in their operating areas within the limit set by the bulk permit. The OUGC is charged with defining which irrigators are authorised to access water, how much and when.

9.5.2 Allocating and reallocating water in agriculture

The 2006 Water Laws leave considerable leeway to agricultural user organisations (OUGCs) to define their own internal allocation rules. OUGCs took advantage of this and crafted a variety of rules to allocate water between existing users and for including prospective irrigators (Rouillard & Rinaudo, 2020). They are examined in turn below.

9.5.2.1 Allocation between existing claimants

In most cases, OUGCs have used some form of grandfathering, allocating the bulk volume proportionally to past withdrawals (e.g. an average or maximum use over a reference period) or proportionally to the authorised flow rate specified in the original individual pumping permit (especially where accurate data on volumes extracted in previous years by each farmer were not available). This establishes a stable allocation for each irrigator, providing greater security for existing claimants and protecting the value of irrigated land.

However, this has resulted in many cases of overallocation, and OUGCs have had to find strategies to ramp down individual allocations to align with the SEL. To smoothen the process of reducing individual allocations, the first bulk permit usually allows the OUGC to allocate more water than their share of the SEL during the first years. The OUGC is then required to ramp down allocations to the SEL for agriculture over a period of generally 3 to 5 years.

Rouillard and Rinaudo (2020) observed three strategies for ramping down individual allocations so that cumulatively they do not exceed the SEL for agriculture after the permitted period:

- Application of the commonly known ‘use it or lose it’ approach, whereby an individual allocation is reduced if the reported withdrawals do not match the requested volume. Most OUGCs currently follow this approach despite its potential for disincentivising efficient water use.
- Application of a uniform reduction on all allocations, often with a lower ceiling to protect small allocations.
- Maintaining individual allocations at their initial levels and applying an annual reduction coefficient that reflects resource availability.

Overall, many OUGCs have so far managed to reduce allocations, but few have managed to significantly reduce water extractions. The ramp-down rules implemented mainly eliminated dormant allocations, that is volumes that were systematically allocated but generally not used.

Irrigators are not allowed to transfer volumes between themselves without authorisation from the OUGC. However, OUGCs have established procedures for temporarily reallocating water between users. During the irrigation season, when the OUGC realises one or several irrigators will not fully use their allocation, it may decide to transfer it to other users. This transfer is strictly managed by the OUGC, according to internal rules, in order to avoid the emergence of informal water markets. The internal rule can for instance state that unused volume will be reallocated in priority to cattle breeders or to small farmers. Such rules are approved by OUGC members during plenary assemblies.

9.5.2.2 Incorporating prospective claimants

Farmers who were not previously irrigating had very limited opportunities to access the resource, at least in the first years, as OUGCs have usually grandfathered historical uses. To address this issue, OUGCs have crafted very different rules:

- A first and common approach has been to systematically reject all new requests. In these cases, prospective irrigators can only obtain irrigation water by buying currently irrigated land and obtaining approval for the transfer of the allocation from the OUGC. No legal ground linking allocations with property rights exists in France. However, authorities and OUGCs have so far permitted their simultaneous transfer during land transactions.
- A second approach consists of partially satisfying all new requests, even in fully allocated catchments and aquifers, which implies a reduction of the share allocated to historical users.

- A third approach has been to build an allocation 'reserve' by retaining a share (up to 20%) of the allocation being transferred through land transactions. This reserve is progressively used to endow new irrigators to become permanent claimants.

To select amongst prospective users, OUGCs have developed a 'waiting list' where claimants are ranked according to various criteria which are OUGC specific. Priority can be given to young farmers, to those requesting small allocations (equity), to economically vulnerable farms (social objective), to those growing high-added-value crops or generating employment in the value chain (economic objective), or to efficient irrigation techniques or farmers with ecologically friendly practices (e.g. organic farming).

9.5.3 Drought restrictions

Drought restrictions apply when river flows and aquifer levels reach alert and crisis levels. In effect, drought restrictions are applied frequently in France due to stricter environmental requirements under the WFD, more frequent meteorological droughts and still widespread cases of fully and overallocated river and groundwater basins. Restrictions have been applied almost every year in certain western catchments.

Restrictions apply to users independently of prior appropriation – a notion which does not exist in the French legal framework. Instead, water uses are grouped into pre-defined priority classes: a higher class water use (including drinking water supply and cooling of nuclear power plants) prevails over environmental needs, which, in turn, prevail over sectoral needs such as agriculture or energy. The priority classes are enshrined in the 1992 Water Law.

As a general rule, the following restriction levels are progressively implemented when drought conditions are present:

- *Public water supply:* limitation (and ultimately prohibition) of watering gardens, lawns and green spaces, car washing, and pool filling
- *Agriculture:* prohibition to irrigate 1 day per week, several days per week or at certain times, and ultimately total ban of irrigation
- *Industry:* specific measures imposed on the most water-intensive units requiring a gradual reduction of activity

The State oversees the enforcement of restrictions, but stakeholders have the opportunity to negotiate the phasing of restrictions in Drought Management Committees (DMCs). DMCs are composed of the same actors as the LWCs (i.e. the State together with representatives of agriculture, industry, environment, fishing, and councils).

9.6 COMPLIANCE AND ENFORCEMENT

Despite the partial devolution of allocation responsibilities to LWCs and OUGCs, the State remains responsible for checking compliance of individual agricultural users with the requirements of their infrastructure and pumping permits as well as compliance with the individual allocation granted by OUGCs. OUGCs have a legal duty to collect information on water use from their members and to prepare an annual report comparing extracted volumes with allocations at individual levels – theoretically identifying offenders. However, they have no inspection powers to enter private properties and monitor volumetric meters, implying they have to rely on declarative data.

Notwithstanding this limitation, OUGCs have significantly improved the knowledge of extraction points and volumes withdrawn, which were historically poorly monitored by the State (Montginoul *et al.*, 2020). Farmers were indeed more willing to share information with an organisation that serves their interests and over which they have some control, than with a government agency they did not trust. This willingness increased as farmers realised that OUGCs were able to optimise water allocation, with obvious benefits for themselves, provided they had accurate information of extraction points and volumes.

The State also remains in charge of enforcing fines when individual irrigators do not comply with their allocation. However, some OUGCs implemented sanctions on farmers failing to report water use information since these prerogatives were clearly laid down as their responsibility in the 2006 Water Law. Others apply volumetric penalties (i.e. a reduction of next year's allocation) to farmers exceeding their annual allocation. OUGCs are likely to move in that direction in the coming years, progressively playing a greater role in enforcement and compliance, (see Cinotti *et al.* 2020), but this will require further legal clarification.

9.7 THE BROADER POLICY INSTRUMENT MIX

From the mid-1990s onwards, the progressive tightening of water allocation procedures has posed major challenges to public utilities, industries and farms, who had already invested significantly to achieve more efficient water use. Much of the challenge in reducing total allocations to SEL levels has so far lied with the agricultural sector as the current system prioritises drinking water, nuclear electricity production and industrial water needs. Several studies have highlighted that additional reductions of agricultural allocation, depending on how they are implemented, could significantly impact farm businesses and agro-food value chains (Danel, 2011; Lejars *et al.* 2012).

Remarkable progress has been achieved by the agricultural sector to adapt to the new constraints. For example, water productivity has increased by 30% on cereal crops in 20 years, thanks to reductions in water loss conveyance, improved irrigation piloting, genetic selection and better rotational choices. Farmers have also worked on increasing their security of supply by investing in small-scale reservoirs to store winter flows for use during the summer period, when most restrictions on direct pumping in rivers and shallow groundwater apply (Douez *et al.*, 2020).

Investments in water storage have proved particularly conflictual, leading to violent protests with environmental non-governmental organisations (NGOs) and, in many cases, ending in courts (Rouillard, 2020). To manage these conflicts, the State is currently establishing a new procedure (called Projet de Territoire de Gestion de l'Eau, i.e. PTGE) which brings together stakeholders to jointly define, through negotiation, the conditions for developing storage reservoirs. According to ministerial decrees (RF, 2015, 2019), the PTGE must aim for a balanced quantitative management of water resources, considering the impacts of climate change and taking into account the chemical and ecological status of water bodies, notably by promoting the development of agro-ecological systems and crop diversification to reduce pollution pressures.

The PTGE must also feature a variety of measures applied to all sectors (agriculture, drinking water, and industry) (Bisch *et al.*, 2018). For agriculture, measures should include not only increased water use efficiency and infrastructure modernisation, but also changes in crop production and rotation to reduce water demand and the development of agro-food value chains that incentivise the right production patterns according to local water resources. Overall water savings should take priority before water storage, transfers or reuse are considered. Where water storage is built, it should be in line with and contribute to broader rural development goals.

9.8 CONCLUSION

The development of the French water allocation regime described in this chapter has taken more than three decades. Transitioning out of open access to regulated water use has required a deep transformation of the regulatory framework, the development of new planning procedures at different nested levels, the establishment of new organisations, the development of hydrological, hydrogeological and environmental knowledge and significant social change.

In comparison to allocation policies deployed in other countries, the French approach presents the following specific features:

- The environment is clearly given first priority in allocation: water that can be allocated to consumptive use corresponds to resources available after environmental flows are met. SELs are, at least in theory, set solely based on ecological considerations, without accounting for social and economic dimensions.
- It relies on a system of permits that can be modified or cancelled by the State without compensation. Furthermore, these permits cannot be exchanged directly by individual users.
- The allocation regime relies on a co-management system, where the State and representative of users jointly define the rules, based on partial negotiation. Co-management is deployed at different nested levels, from river basin district to catchment level and agricultural user communities. The authority over allocation is hence shared by many actors at different governance levels, matching the definition of a polycentric model.
- The establishment of agricultural users organisations (OUGCs) is an innovative attempt to organise reallocation without relying on market mechanisms. It aims to reconcile economic efficiency, social justice and environmental sustainability, while favouring the development of solutions adapted to local conditions – hence more likely to be accepted and enforced.

The economic and social impact of this ongoing reform remains difficult to assess, considering the little temporal hindsight we have and the lack of data. A number of factors could turn the reform away from success:

- In some basins, there might be strong resistance to implementing reallocation rules within OUGCs, in particular where historical users endowed with large individual allocations control OUGC boards. There, grandfathering might become the rule and water reallocation be entirely linked to land transactions, water use rights being de facto sold with the land.
- More generally, providing OUGCs considerable leeway to develop allocation rules also creates a risk that influential farmers serving at the board could favour their own interests. There is a need for higher authorities to establish appropriate safeguards to keep rent-seeking behaviours under control.
- Collective management of water allocation can only be successful if users clearly see this approach as beneficial. OUGCs will thus need to develop a range of services, along with allocation, that can compensate for the losses incurred by some users.
- The distribution of enforcement responsibilities needs to be clarified between the State and OUGC, so that the latter can progressively play a greater role in monitoring, controlling and sanctioning. This also requires a shift in technology, with systematic use of telemetry (e.g. smart meters), remote sensing and other ICTs (smartphone applications, etc.).

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