

13. Governing the commons on an Aegean island: the management of water resources on Sifnos, Greece

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13.1 INTRODUCTION

Garrett Hardin's 1968 article in *Science* on the 'tragedy of the commons' (Hardin 1968) popularised how a scarce resource may be eventually depleted if it belongs to no one in particular ('a pasture open to all'). The over-exploitation of cod stocks in the North Atlantic from the mid-1950s, causing their virtual disappearance in the early 1990s, and the resulting death of the fishing industry which had sustained the livelihoods of the United States and Canadian fishing communities for 300 years, is merely one example. (See also Fehr and Leibbrandt 2011.)

The original response to the Tragedy of the Commons was to view it as a problem of poorly defined property rights (Coase 1960). When a resource is collectively owned, and access is unrestricted, individual users pursuing their short-term self-interest end up harming the community's long-term collective interest. By seeing the problem as stemming from the poor definition of property rights, two alternative solutions arose: (1) public ownership and regulation, whereby the government sets and enforces limits (via quotas, penalties, access rights, and so on); or (2) conversion to private property, that is, privatisation of the common resource, providing the incentive to the (single) owner to eliminate excess use in order to maximise profit. The two solutions can be shown to yield identical results in terms of the elimination of excess use, though of course they may differ greatly in terms of their distributional implications.

Elinor Ostrom's book *Governing the Commons: The Evolution of Institutions for Collective Action* (Ostrom 1990), which won her the 2009 Nobel Prize in Economics, established a third solution. Reviewing a great variety of historical examples, she demonstrated that small and stable communities have long been able to devise creative, effective and resilient local systems of rationing access

to scarce resources, drawing upon locally evolved norms of reciprocity and trustworthiness. In particular, Ostrom's analysis of the *huertas* (fertile irrigated areas) of Valencia, Murcia, Orihuela and Alicante, whose origin went back to the early 15th century, showed how local communities devised ingenious irrigation institutions for granting farmers access rights, and for enforcing the sustainable use of scarce water resources.

Our research showcases a little-known example of a locally devised system of equitable and sustainable access to scarce water resources in Poulati, an area on the Cycladic island of Sifnos, Greece. The system was established in the Byzantine era, was allowed to persist under both the Venetians (1207–1617) and the Ottomans (1617–1821), and is still practised today, albeit under constant threat from the growth of tourism. The system consists in a set of rules, formal and informal, rationing local farmers' access to water, regardless of the location of springs and cisterns, which often lie within the boundaries of private plots of land. This chapter, drawing on fieldwork, traces the past and present of the Poulati system, describes its workings, assesses its performance in the light of Elinor Ostrom's 'design principles of long-surviving, self-organized resource regimes' (Ostrom 2000), and concludes with a reflection on threats to the system's survival in a rapidly changing context.

13.2 THE AREA OF POULATI

Poulati is a valley with a partly dry riverbed situated on the eastern coast of Sifnos, a Greek island in the archipelago of the Cyclades, in the Aegean Sea. The island extends over an area of 74 km² and has a population of 2755 (EIStat 2022). Archaeological evidence points to a long history dating back to the Mycenaean era (1750 BC to 1050 BC). It features a strong local community: traditions are kept, dozens of winter feasts take place at churches on their saints' name-days, inhabitants like to meet and share stories. In recent decades, Sifnos has become a thriving tourist destination, receiving thousands of visitors every summer, including an international community who have made the island their second home.

Poulati takes its name from the monastery, built in 1872. Originally, the area was known as The Garden, although today most people refer to the whole area as Poulati. The terraces and fields irrigated by collectively managed water resources cover an area of approximately 15.5 hectares. The plots that are still cultivated, owned by a small number of persons, cover less than 6 per cent of the area in question, corresponding to approximately 1 hectare. Owing to geography, and small plot size, the kind of agriculture practised in Poulati is strictly non-mechanised. From above, the area looks like a green vein that descends to the sea between narrow and long terraces that cross it like ribbons in a stair-like fashion (Figure 13.1).



Source: DECA Architecture.

Figure 13.1 Poulati, Sifnos

There are nine known water springs running along the green vein of Poulati, their flow varying by the season and by the year. The altitude of the water springs ranges from sea level to 140 metres above it. Locals consider water to be a common good, no matter where the spring happens to be located, whether on private or public property.

The water from each spring is collected in stone tanks, built alongside the riverbed, each one a little lower than the next, using gravity to get water to run through small irrigation furrows. There are over 30 such stone tanks of various designs, ranging in size: ten or so are small troughs (*γούρνες*), sized about 3 m³ each; the remaining 21 are open-air cisterns of about 15–20 m³ each. Sifniots call them dumps or cesspools (*χαβούζες*), although the water collected is not as filthy as the word suggests.

In fact, some cisterns are very beautiful, with pillars once used to support vines that created natural shade, presumably to delay water evaporation. Most are stone-built, some V-shaped on one side like an arch. Some are whitewashed and look well kept, while others are dry and no longer in use. Their shape and position seem to be in harmony with the descending flow of the riverbed and the stair-like terraces. They are embedded into the hand-built environment of

dry stone walls (*ξερολιθιές*) and ribbon-shaped terraces supported by tall stone walls (Figure 13.2).

Some cisterns, known as communal, irrespective of whether they are located on public or private property, are more important than others: their water flows directly from a spring, and then on to other cisterns lying further down the slope. Of the 21 open-air cisterns, five are communal. Other cisterns, termed secondary, are typically smaller, fed with water from a communal one.



Source: DECA Architecture.

Figure 13.2 Poulati, Sifnos

The cisterns are connected through a web of century-old stone-built small irrigation furrows distributing water from the springs. These are still visible, though no longer in use, having been replaced by plastic water pipes; the abandoned furrows are now filled with earth and branches. Among those that are still in use, one can admire the efficiency and resilience of their stone construction. The locals call a water furrow *κουτέντο* (*kouténdo*), a word most likely deriving from the Latin *contentum*, past participle of *continēre* (meaning to contain, to preserve, to maintain).

Terraces are linked by stairs that allow one to climb up and down, revealing the need for regular movement, probably for cultivating and farming the small plots as effortlessly as possible, on an otherwise steep incline down the valley. Tall stone walls separate narrow terraces from one another. The area around the valley is U-shaped, opening down to the sea, with several footpaths circling it at different altitudes. Footpaths circle the terraces and allow for even more regular connection between different properties. Beautiful old wooden doors mark the entrances from footpaths to properties.

The built environment is remarkable for its efficiency and resilience. Over the centuries, these walls have been built and re-built numerous times in the same way, by hand, with techniques passed on from one generation to another. Every year, heavy rainfall or land erosion may destroy parts of the dry stone walls. When this happens, it is the top terrace landowner's responsibility to fix it. On public property, re-building a wall is a community activity. The highly sophisticated knowledge of hand-built dry stone walls is reflected on the richness of the vocabulary: locals use more than 30 different words for stone.

Infrastructure maintenance is necessary to keep the system running. Terraces were built to save every inch of soil from natural erosion and for creating vegetable plots; water furrows, stairs to move easily from one terrace to another, footpaths, gates and dry stone walls were all included in the maintenance responsibilities of the wider exchange system. In the steep Poulati valley, hand-built stone infrastructure amounts to a volume of 21 000 m³. (For a sense of scale, the marble used to build Rome's Colosseum is estimated at 100 000 m³.)

The area is divided into 34 properties irrigated by the valley. Properties follow the shape of the terraces: they look like long and narrow ribbons, with most of them, although not all, connecting to the valley. The owners fall into three groups: (1) absentee landlords, whose property is practically abandoned; (2) non-farmers, who use spring water for drinking and washing, not for farming the land; and (3) farmers, who irrigate their plots with spring water.

The largest part of the irrigated area belongs to one of six Sifniot families, owning the land for many generations (Georgoulis, Gozadinos, Baos, Vourdakis, Vernikos, Maridakis). Of the old local families, only two number at least one member who still farms the land in the traditional way.

Another four proprietors are 'foreign', brought in by members of these local families: two are Greek (Chatziyiannakis and Nahmias, who bought land in the area in the 1980s), one Dutch (Frank Greiner, whose brother Onno entered Poulati in the 1970s), and one British (Helen Fost, who joined in the 1990s). The four non-local proprietors own less than 2.0 hectares combined.

Of the 34 properties, six feature summer houses, five are still farmed, while the remaining 23 are abandoned-looking plots or olive groves. As explained later, unused water rights allocated to the abandoned plots are used by those

farming their plots as and when needed. In terms of size, 14 of the 34 properties are larger than the 0.4 hectare threshold, which qualifies them for a building permit (subject to certain further constraints). Of these 14, as mentioned above, summer houses already exist in six; most of the remaining eight seem eligible for obtaining a building permit. Of the 20 properties that are under 0.4 hectares, some feature stone shacks (*θημωνιές*), qualifying them for a maintenance permit, which raises their commercial value.

The next section mainly draws on our interviews with 13 landowners and six of their relatives, conducted between October 2021 and October 2022. (Our main informant, Thomas Gozadinos, a local landowner who was also a medical doctor, much respected by all in the island for his culture and kindness, sadly passed away at the age of 80 in June 2022.)

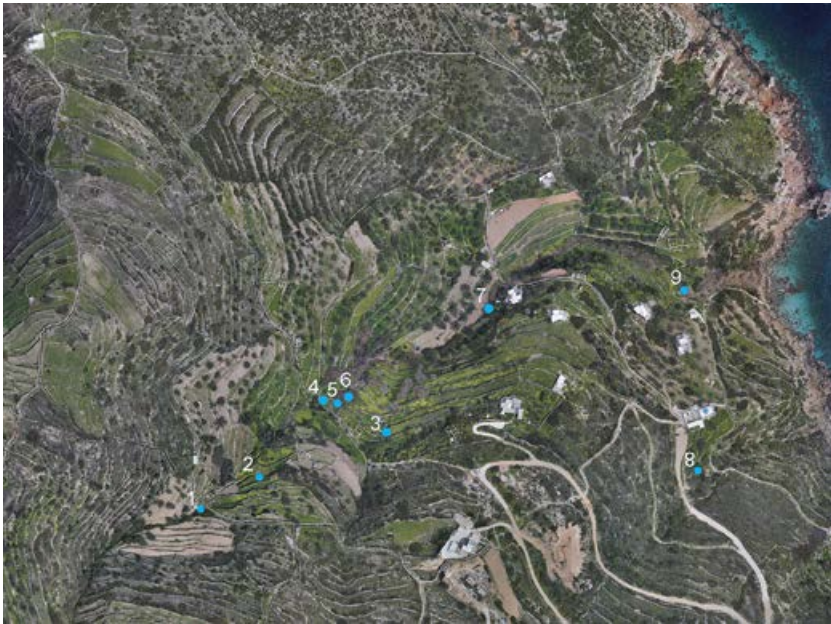
In addition to that, we have also inspected land sale contracts deposited with the local notary, often containing clauses on water rights. Moreover, we have parsed books and articles for information on the history of Poulati, often written by amateur historians with local roots.

Furthermore, we have been able to exploit the infrastructure analysis and drone photography carried out by DECA Architecture in the context of STARTS4Water, a collaborative project promoting sustainable water management in six countries, funded by the European Commission Directorate General for Communications, Networks, Content and Technology (DG-CONNECT). The goal of the project was to explore whether a joint approach of the digital with the arts could ‘help induce behavioural changes in our mind-sets, on a business’ and even ‘on a policy level’. The project was completed in October 2022, after an artwork depicting the Poulati area, and how the water system worked, was installed in the main island square for the duration of the summer season.

13.3 POULATI’S WATER-SHARING SYSTEM

How is water shared between landowners? Spring water runs to the plots lying below its outlet through a main open-air cistern that collects it and then distributes it in turn accordingly. We located five such cisterns (near springs 1, 3, 5, 6 and 7 in Figure 13.3), situated at nodal points. Most interviewees insisted that ‘no matter where a spring lies, public or private property, its water belongs to everyone’. Each landowner draws water by opening the outlet that leads to their own cistern for the agreed amount of time. The time each outlet remains open is measured in 12-hour spans. This water-time is referred to simply as ‘water’ (as in ‘x waters per week’).

Until the early 20th century, water-sharing agreements were unwritten, compliance based on trust. It was about then that water rights began to be spelled out in land sale contracts and inheritance deeds. In the words of Ioanna



Source: DECA Architecture.

Figure 13.3 Poulati, Sifnos

Theodorou (born Rafelletou), a landowner of a plot inherited from the Baos family, ‘the choice between written and unwritten is that properties that have a water spring or a collecting communal cistern do not need to mention water rights. It is the properties that draw water from them that have water rights spelled out in contracts’. For instance, Frantzeskos Kroustis, descendant of the Georgoulis family through his mother (married Krousti) owns the communal open-air cistern that fills up with water from the highest-lying spring, known as ‘The Red One’ (*του Κόκκινου*), marked 1 in Figure 13.3, in view of which his access rights are not mentioned in the contracts. Helen Fost, who finally bought land in the mid-2010s, reported that she made sure that ‘water rights written down in previous contracts, allowing for water twice a week from Kroustis’ communal cistern’, were included in her purchase contract. Access agreements are tied to the land irrigated by the springs (and cisterns), not to the owners who inherit water rights (and obligations) as properties change hands.

Water-sharing agreements specify not just the number of 12-hour spans, but also the day of the week. Water rights also include access to overflows and drain-offs (*στραγγίδια*), thus ensuring that ‘no water is ever lost’, as most interviewees stressed emphatically. These rights are not mentioned in the contracts:

they remain as oral agreements based on trust. This is the case of water flowing from the Red Spring through Kroustis's cistern to a plot owned by Frantzeskos Georgoulis, where the second spring, marked 2 in Figure 13.3, and a secondary cistern are also located.

Water rights are more formalised in the case of the communal cistern, filled by the fifth spring in altitude, marked 5 in Figure 13.3, also known as 'Flea' (or 'Vein'). The cistern is treated as communal, even though it is situated on private land. This cistern gives 14 waters to plots below, shared by five different families of landowners. Its flow is steadier and larger than others. The water rights to this cistern are mentioned on the contracts of the landowners involved.

A mix of written and unwritten arrangements applies to the cisterns just below the communal one, under the berry bushes, filled by a spring marked 6 in Figure 13.3. Two water cisterns, an open-air and a closed one, belong to Giorgis Gozadinos, son of Thomas. Water overflows are directed through a plastic water pipe to another cistern, two terraces below the water spring level, on a plot owned by Frank Greiner, the Dutch landowner. Frank's contract states that he has 'the right to receive water once a week from the neighbouring land ... now belonging to Giorgis Gozadinos'. The exact nature of the water right is not specified, though both parties accept that it amounts to one water (12-hour span) per week. The contract makes no mention of Frank's right to drain-offs from the closed cistern whenever there is extra water. Drain-off rights are all unwritten, based on trust between the two parties, built over decades since they first met back in the 1970s.

Long-established water access agreements, whether written or unwritten, are to some extent open-ended, in the sense of allowing a degree of flexibility, adaptation and improvisation. Overflows, mentioned above, when the season is unusually wet, are shared according to circumstances, based on secondary cisterns still in use. In a drought, plots that are still farmed are irrigated first. Water rights to plots that have been abandoned are tacitly appropriated by active farmers for the benefit of their own plots. The latter are conscious that by doing so they are breaking the unwritten agreement, and seem to be rather uncomfortable (and, at any rate, circumspect) about appropriating others' access rights.

Disputes arise when water rights and obligations are not respected. According to our main informant, when access to a spring was denied, the dispute was resolved by referring to the old oral agreement. For instance, the existence of a stone-built irrigation furrow between a spring on private land and a cistern on a neighbour's plot was used as evidence of the latter's right to water from the spring. Stone irrigation furrows channelling water from the springs, built over centuries, have been and still are used as evidence of rights and obligations under the sharing system, particularly informing which communal cistern fills

which secondary one. However, not everyone interpreted the arrangement as above. One of our informers (Ioanna Theodorou) argued that what was shared with others was only overflows, not the entire spring. Her diverging view is yet another demonstration of how fragile the old consensus might be in the face of changing conditions.

It is important to emphasise that farming in Poulati is a declining pursuit. In the 1980s, one could count more than 25 farmers tending their narrow plots. At the time of writing (September 2022), four of the six local farmers were over 75 years of age (Apostolos Georgoulis, Frantzeskos Georgoulis, Christos Georgoulis, Frantzeskos Kroustis). The other two, the brothers Kostas and Vaggelis Georgoulis, sons of Apostolos, are in their late forties. A newcomer, Dimitris, linked to one of the local families, is currently testing the commercial viability of caper cultivation. Others, though not active in farming, keep small vegetable plots as a hobby in the summer months.

Three issues seemed to worry those remaining in Poulati. For Frantzeskos and Christos, that their descendants have abandoned farming, without which the water infrastructure is difficult to maintain. For Zoi Gozadinou, an architect, that changes in land use often associated with tourist exploitation risked upsetting the landscape's fragile balance. For Ioanna and Kostas, that the recent (2015) cadastre has divided the plots, situating for instance the main old communal open-air cistern on private property, and separating it from the water spring feeding it. Even though they all adhered to the old water-sharing arrangements, they were suspicious that changes might undermine the understanding on which agreement rested.

We return to the future of farming in Poulati, and of the system of collectively managed water resources used to irrigate the area, in the closing section of this chapter. Before that, we turn to the question of how the Poulati system performs when assessed against Elinor Ostrom's 'design principles of long-surviving, self-organized resource regimes' (Ostrom 2000, 149–153).

13.4 DESIGN PRINCIPLES

Ten years after the publication of the *Governing the Commons* book that eventually won her the 2009 Nobel Prize in Economics, Elinor Ostrom – an untypical economist – was invited by the prestigious *Journal of Economic Perspectives*, one of the flagship publications of the American Economic Association, to write an article on 'Collective action and the evolution of social norms', where she identified 'the key factors that affect the likelihood of successful collective action', and explained 'how potential co-operators signal one another and design institutions that reinforce rather than destroy conditional cooperation' (Ostrom 2000, 138). In this section we explore how the Poulati system fits into Elinor Ostrom's scheme.

13.4.1 Setting the Boundaries

The presence of clear boundary rules is the first of Ostrom's eight 'design principles of long-surviving, self-organized resource regimes':

If a group of users can determine its own membership – including those who agree to use the resource according to their agreed-upon rules and excluding those who do not agree to these rules – the group has made an important first step toward the development of greater trust and reciprocity. Group boundaries are frequently marked by well-understood criteria, like everyone who lives in a particular community or has joined a specific local cooperative. Membership may also be marked by symbolic boundaries and involve complex rituals and beliefs that help solidify individual beliefs about the trustworthiness of others. (Ostrom 2000, 149)

Poulati is a close-knit community, occasionally opening to admit new members. The largest part of the irrigated area, 13.5 out of 15.5 hectares, is owned by the descendants of the six local families listed earlier. The four non-local proprietors – two Greek, one Dutch and one British – were brought in by Thomas Gozadinos (1942–2022), a medical doctor serving at a public hospital close to Athens, sometimes indirectly. As revealed in an interview, this was how Chatzigiannakis, also a medical doctor, a colleague and close friend of Thomas, came to the area: Gozadinos vouched for him with another landowner (Georgoulis), who in turn approached Chatzigiannakis with an offer for a piece of land nobody else knew was for sale. It was the same with Helen, who arrived in Poulati in the early 1990s, invited by Vicos Nahmias, the close friend of Thomas. It was only in 2016 that she was offered a plot for sale by the farmers. She reminisced: 'I realized they would rather give it to me than to someone they didn't know. But I consider the repeated obstacles for the buying and evaluating building possibilities as evidence that outsiders would never be truly accepted.'

In other words, buying land in Poulati resembles becoming a member of a club, whose new members must be sponsored by older established ones. It is worth noting that, as mentioned earlier, the combined area owned by new entrants (2.0 out of 15.5 hectares) remains altogether small.

13.4.2 Rationing Scarce Resources

In Ostrom's scheme, access rules are at the heart of sustainable and equitable resource regimes:

The second design principle is that the local rules-in-use restrict the amount, timing, and technology of harvesting the resource; allocate benefits proportional to required inputs; and are crafted to take local conditions into account. If a group of users is going to harvest from a resource over the long run, they must devise rules related to

how much, when, and how different products are to be harvested, and they need to assess the costs on users of operating a system. Well-tailored rules help to account for the perseverance of the resource itself. (Ostrom 2000, 149–150)

As mentioned earlier, water access in Poulati is based on written as well as unwritten arrangements. Clauses detailing access rules were found in the land sale contracts that we inspected. One contract explained that the plot of land purchased came with the right to use water four times a week (specifically: Tuesday, Wednesday, Saturday and Sunday) from a certain spring located outside its boundaries. Another stipulated that the buyer had the right to draw water from the seller's spring once a week. A third contract specified the spring from which the plot of land purchased could draw water, also once a week; and so on. Interestingly, the language used in contracts implies that it is the land that is invested with rights, not the persons who own it. This resonates with Ostrom's observation in her discussion of the Valencian *huerta* (well-demarcated irrigation area): 'In Valencia, the right to water inheres in the land itself' (Ostrom 1990, 71).

13.4.3 Setting (and Changing) Rules

The third design principle is that 'most of the individuals affected by a resource regime can participate in making and modifying their rules' (Ostrom 2000, 150). This is key to compliance: individuals are more willing to abide by the rules if they participated in their design (Bowles 1998).

How rules were originally set is lost in the mists of time. In a book published in the 1930s, its author, a local priest, ancestor of one of the current proprietors, described how the Orthodox monastery of the Virgin Mary of Poulati was built between 1865 and 1872. Water for the construction of the monastery was donated by plot owners. The author quoted a local builder explaining to him that 'Each proprietor had his day and his hours' for the use of water from a particular cistern; 'We planned how we should arrange it so that no one is wronged' (Vernikos 1933, 30). The author went on to narrate how 'The virgin Mary licked her finger and erased all our accounts written on stone tiles', meaning that local proprietors agreed to receive no payment for donating water used in building the church.

13.4.4 Monitoring Compliance

The fourth design principle is that 'most long-surviving resource regimes select their own monitors, who are accountable to the users or are users themselves and who keep an eye on resource conditions as well as on user behavior' (Ostrom 2000, 151).

From our interviews with two landowners who still farm the land in the traditional way (Christos Georgoulis, Frantzeskos Kroustis), it emerged that they acknowledge a third figure (Apostolos Georgoulis, Christos's older brother) as informal 'monitor', on the grounds that he is the holder of the historic memory of ancient rules. His son, Kostas Georgoulis, spoke affectionately of his father's 'imposing personality' that 'leaves little doubt on how water should be rightfully shared'.

As explained earlier, the distinction between communal and secondary open-air cisterns corresponds to a different status between those who distribute water from their own communal cistern to others, and those who receive it below in their collecting cisterns. Kostas Georgoulis, owner of the largest active communal cistern, explained that 'ownership of this large central cistern is separate from the land on which it is situated. I bought it to control the water and protect my neighbours' water-rights'. He is proud that he went out of his way in terms of time and expenses to preserve the built infrastructure. Trust between farmers has been built over a long period of cooperation (they often work together or share tasks), and is bolstered by family ties (they are often brothers, cousins or brothers-in-law).

13.4.5 Enforcing Sanctions

Ostrom's fifth design principle is the use of 'graduated sanctions that depend on the seriousness and context of the offense. By creating official positions for local monitors, a resource regime does not have to rely only on willing punishers to impose personal costs on those who break a rule' (Ostrom 2000, 151).

Although no such official position exists in Poulati, uncertainty about rules is resolved by recourse to the elderly unofficial 'monitor' (Apostolos Georgoulis). Our informants seemed genuinely surprised by our interest in how infringements are dealt with. ('Why should anyone cheat? It wouldn't do him any good.')

Once again, trust in a close-knit community is of crucial importance:

In contrast to the uncertainty caused by these environments, the populations in these locations have remained stable over long periods of time. Individuals have shared a past and expect to share a future. It is important for individuals to maintain their reputations as reliable members of the community. These individuals live side by side and farm the same plots year after year. They expect their children and their grandchildren to inherit their land. In other words, their discount rates are low. If costly investments in provision are made at one point in time, the proprietors – or their families – are likely to reap the benefits. Extensive norms have evolved in all of these settings that narrowly define 'proper' behaviour. Many of these norms make it feasible for individuals to live in close interdependence on many fronts without excessive conflict. Further, a reputation for keeping promises, honest dealings, and

reliability in one arena is a valuable asset. Prudent, long-term self-interest reinforces the acceptance of the norms of proper behavior. (Ostrom 1990, 88–89)

As mentioned earlier, past disputes were settled by reference to old oral agreements, supported by evidence of water rights as embedded in stone-built irrigation furrows from one plot to another. In other respects, compliance is voluntary. More recently, water rights to abandoned plots have been tacitly appropriated by active farmers to irrigate their own plots. This may be seen as a flexible adaptation of existing rules, although the slightly embarrassed attitude of the persons concerned suggests that perhaps they themselves may at least partly see it as an infringement.

Ostrom's theory of 'long-surviving, self-organized resource regimes' largely rests on the five design principles hitherto discussed. This is how she summarises their connection to each other, and their contribution to her general scheme:

When the users of a resource design their own rules (Design Principle 3) that are enforced by local users or accountable to them (Design Principle 4) using graduated sanctions (Design Principle 5) that define who has rights to withdraw from the resource (Design Principle 1) and that effectively assign costs proportionate to benefits (Design Principle 2), collective action and monitoring problems are solved in a reinforcing manner. (Ostrom 2000, 151)

In Ostrom's scheme, the next three design principles play a supporting role to the first five.

13.4.6 Resolving Conflict

'The operation of these principles is then bolstered by the sixth design principle', which concerns 'the importance of access to rapid, low-cost, local arenas to resolve conflict among users or between users and officials' (Ostrom 2000, 152).

A classic example of that would be the Tribunal de las Aguas, 'a water court that has for centuries met on Thursday mornings outside the Apostles' Door of the Cathedral of Valencia' to adjudicate on disputes between irrigators from the canals, assess damages, and establish fines in cases concerning access to the waters of the Turia River in the *huerta* near the city of Valencia (Ostrom 1990, 71–74).

No such institutions have emerged in Poulati, partly because its size is significantly smaller: Poulati is 1000 times smaller than the Valencian *huerta* (15.5 hectares compared to 16 000 hectares, respectively). Besides, most interviewees agreed that going to court over water right violations is unthinkable. It has never happened. Christos Georgoulis, who tends Frantzeskos Kroustis's

land, said laughingly: ‘I would just shout loudly to whoever takes our water, and may not serve him wine at the feast, but that would last a couple of days and then I’d forget about it.’ This example of informal conflict resolution shows that the existence of social bonds and exchange relationships within the community make formal procedures unnecessary.

13.4.7 Achieving Official Recognition

The seventh design principle is the ‘minimal recognition of the right to organize by a national or local government’, which affects the ‘capability of local users to develop an ever-more effective regime over time’ (Ostrom 2000, 152).

In the case of Poulati, historical research suggests that the local community may have been granted such recognition by the authorities during the period of Venetian domination (1207–1617):

For the resolution of conflict between Greeks, it seems likely that ... the dynast applied his ‘good judgement’ and the Law that had evolved locally before the conquest of the islands, which obviously contained elements of Byzantine Law. In the early 14th-century a Code of laws was established, similar to the one applied in Cyprus, but adapted to the customs of the Cycladic islands, called by local people ‘Customs’. Although a formal system of laws did exist, Greeks preferred to resolve their differences by appealing to the arbitration system based on the customary law which evolved before the Venetian conquest. (Symeonidis 1990, 136)

It is possible, therefore, that water rights in Poulati may have also been codified by the Venetian authorities in the 14th-century *Codex*. In modern times, local users have relied on a system of arrangements, written and unwritten, underpinned by contracts and memory respectively, without further official recognition.

13.4.8 Multi-Layer Governance

In some cases, ‘long-surviving, self-organized resource regimes’ feature a more complex governance structure:

When common pool resources are somewhat larger, an eighth design principle tends to characterize successful systems – the presence of governance activities organized in multiple layers of nested enterprises. The rules appropriate for allocating water among major branches of an irrigation system, for example, may not be appropriate for allocating water among farmers along a single distributory channel. Consequently, among long-enduring self-governed regimes, smaller-scale organizations tend to be nested in ever-larger organizations. It is not unusual to find a large, farmer-governed irrigation system, for example, with five layers of organization each with its own distinct set of rules. (Ostrom 2000, 152–153)

As pointed out earlier, Poulati is much too small for such multi-layer governance structures to emerge. It is certainly possible to envisage the area as being nested in a larger valley, where different rules may well apply. This broader question, however, lies beyond the scope of our research.

13.5 CONCLUSIONS

In the preceding pages we explored a locally devised system of equitable and sustainable access to scarce water resources in Poulati, an area on the Cycladic island of Sifnos, Greece, drawing on interviews with landowners, notary records and local histories. We showed that the set of rules for rationing water was already present in the early 14th-century, when the island was under Venetian domination. We finally traced the resilience of the Poulati system to its close fit with Elinor Ostrom's 'design principles of long-surviving, self-organized resource regimes'.

There is therefore little doubt that the Poulati system has a great past. The question is: does it have much of a future? We have already discussed how farming in the area is a declining pursuit, the number of active farmers dwindling, most of them well past retirement age, their children unwilling to follow on their footsteps.

The threats to the survival of Poulati, the quintessential fragile territory, although superficially diverse (ranging from unauthorised construction in the area to drilling for water from the same aquifer as the springs), can in fact be traced to the poorly regulated growth of tourism. Tourism has certainly brought prosperity to Sifnos, as to most other Greek islands, freeing its people from the hardship and toil facing older generations. According to recent estimates (Bürgisser and Di Carlo 2022), tourism accounted directly and indirectly for over 20 per cent of Greece's gross domestic product, and over 25 per cent of all employment in the country. At the same time, tourism acts as a 'resource curse' (Auty 1993), sucking up resources from competing uses. Why keep up subsistence farming in Poulati when more money can be more easily made selling goods or services to tourists?

The very essence of the 'resource curse' is that exploitation of the abundant resource (in this case) often works to the detriment of the long-term viability of the resource itself. Rampant tourist growth threatens not just the ancient set of rules for rationing water in Poulati, but all that made Sifnos (and the other Greek islands) attractive to visitors in the first place.

Conversely, a possible way forward for Poulati is to reconcile it with tourism, and in the process redefine tourism itself, making it compatible with respect for natural resources. Indeed, it is not hard to imagine a more sustainable tourism model, with fewer visitors staying in accommodation with a smaller environmental footprint. In such an alternative model, Poulati's

ancient system of equitable and sustainable access to water would be promoted as part of the island's heritage and unique contemporary appeal, adding value to tourism activities, with guided tours to the area for a restricted number of visitors, and with the 'kilometre zero' (Km0) organic tomatoes and other produce grown there brought to their table.

Our research, drawing on fieldwork conducted in the context of STARTS4Water, a collaborative European project, is part of an innovative effort to give the Poulati system a new lease of life, by mobilising artists, engaging the local community, raising awareness, and exploring alternative development paths that will secure its place in the island's future.

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