Whose limit? Water and democracy in a green Californian Desert

Birgit Müller[1]

Elise Boutié

École des Hautes Études en Sciences Sociales, France

Abstract

Groundwater governance in Cuyama Valley, California, unites the structural dilemmas of neoliberal environmental governance: a weak state, powerful corporations, a population called to participate but not to decide, and a limited vital resource. Creating institutions of self-governance in the conflictual domain of groundwater use draws local actors into the center of political struggles and strategies, as the State of California avoids governing or limiting groundwater use, purportedly for fear of getting embroiled in costly and lengthy lawsuits with private agroindustry. The SGMA process illustrates the power of property and money in the political game of sustainable resource governance, but it also confronts powerful actors with objectivizing satellite surveys, that point to absolute limits and challenge the growth myth. Institution-building for groundwater governance in Cuyama exposes the strategies of agricultural corporations towards local residents, highlighting the tensions inscribed in the very design of SGMA's polycentric governance structure, between the power to decide and the power to advise. Local residents have appropriated the language of science to contest strategies of denial by the agro-corporations, and to speak reason to unreasonable water users.

Key words: Groundwater, governance, moral economy, institution building, power, politics of time, timescapes, self-limitation, SGMA, corporate agriculture, denial

Résumé

La gouvernance des eaux souterraines dans la vallée de Cuyama, en Californie, réunit les dilemmes structurels de la gouvernance environnementale néolibérale : un État faible, des agro-entreprises puissantes, une population appelée à participer mais pas à décider, et une ressource vitale limitée. La création d'institutions d'auto-gouvernance pour la gestion des eaux souterraines met les acteurs locaux au centre des conflits et stratégies politiques, alors que l'État de Californie évite de gouverner ou de limiter l'utilisation des eaux souterraines, par crainte, semble-t-il, de s'engager dans des litiges longs et coûteux avec l'agro-industrie privée. L'implémentation de la SGMA met en évidence le poids de la propriété et de l'argent dans le jeu politique de la gouvernance durable des ressources, tout en confrontant les acteurs surpuissants à des suivis par satellites qui montrent objectivement les limites des ressources en eau et en réfutant le mythe de la croissance illimitée. Par ailleurs, la mise en place d'institutions expose les stratégies des agro-entreprises envers les résidents locaux, mettant en lumière les tensions inscrites dans la conception même de la gouvernance polycentrique de la SGMA, entre le pouvoir de décider et le pouvoir de conseiller. Les résidents locaux se défendent en s'appropriant le langage de la science pour contester les stratégies de déni des agro-entreprises et pour faire entendre raison aux utilisateurs déraisonnables de l'eau.

Mots clés: Eaux souterraines, gouvernance, économie morale, construction d'institutions, pouvoir, politiques du temps, paysages temporels, auto-limitation, SGMA, agro-entreprise, déni

---

[1] Prof. Birgit Müller, Laboratoire de l'Anthropologie politique (LAIOS), École des Hautes Études en Sciences Sociales, Paris, France. Email: birgit.muller@ehess.fr. Elise Boutié, PhD student, Laboratoire de l'Anthropologie politique, EHESS, France. Email: elise.boutie@ehess.fr. Acknowledgements: We would like to thank Tania Murray Li, Madeleine Fairbairn and the anonymous reviewers of the *Journal of Political Ecology* for their inspiring comments on the manuscript. We hope that this article will still be of use to the community of Quail Springs, to Robbie Jaffe and Steve Gliessman, and the residents of New Cuyama who shared their ideas and insights with us.

Resumen

La gobernanza de las aguas subterráneas en el Valle de Cuyama (California) conjuga los dilemas estructurales de la gobernanza medioambiental neoliberal: un Estado débil, agro-empresas poderosas, una población llamada a participar pero no a decidir, y un recurso vital limitado. La creación de instituciones de autogobierno en el conflictivo ámbito del uso de las aguas subterráneas sitúa a los actores locales en el centro de las luchas y estrategias políticas, ya que el Estado de California evita gobernar o limitar el uso de las aguas subterráneas, supuestamente por miedo a verse envuelto en costosos y largos litigios con la agroindustria privada. El proceso de la SGMA ilustra el poder de la propiedad y del dinero en el juego político de la gobernanza de los recursos sostenibles, pero también enfrenta a los poderosos actores con estudios satelitales objetivadores, que señalan los límites absolutos y desmienten el mito del crecimiento. La creación de instituciones para la gobernanza de las aguas subterráneas en Cuyama revela las estrategias de las empresas agrícolas frente a los residentes locales, poniendo de relieve las tensiones inscritas en el propio diseño de la estructura de gobernanza policéntrica de la SGMA, entre el poder de decidir y el poder de asesorar. Los residentes locales se han apropiado del lenguaje de la ciencia para refutar las estrategias de negación de las corporaciones agrícolas y para que se hable en voz de razón a los usuarios irracionales del agua.

Palabras clave: aguas subterráneas, gobernanza, economía moral, construcción de instituciones, poder, políticas del tiempo, paisajes temporales, autolimitación, SGMA, agricultura corporativa, negación

1. Introduction

Surrounded by steep bare slopes and dry canyons with juniper, sage-brush and *manzanita* brush, the flat valley bottom of Cuyama Valley, the driest place in coastal Central California, startled us with lush green. Gushing sprinklers turned in the hot midday sun. Here, eighty miles (129km) inland from the Pacific coast, grow the popular baby carrots[2] thanks to the incessant pumping of fossil waters from wells up to 1,000 feet (305m) deep. Only five inches (127mm) of rain on average fall annually on the valley floor. Two agricultural corporations — Grimmway and Bolthouse Farms — manage production, pump the water, hire migrant labor, and sell organic carrots to the major supermarket chains all over the US, Canada and internationally. In the western part of the Valley a third big corporate actor — the Harvard Management Company (HMC), an investment fund owned by Harvard University — began in 2014 to invest US$11 million in 8,700 acres (3,521 ha) of previously dry grazing land and planted grapevines on 850 acres (344 ha) irrigated from fourteen new wells (Burnes and Wang, 2018). As a consequence, aquifers currently become depleted at twice the renewal rate. Some 20,000 acre feet (24.7 million cubic meters) of water is the safe annual withdrawal; the Valley has a yearly overdraft of 11,000 to 40,000 acre feet (13.57- 49.34 million m^3 = 13.57 – 49.34 billion liters).[3] How to govern the scarce groundwater resource reasonably and equitably in the coming decades poses fundamental challenges for democracy, and produces tensions that becomes particularly obvious in Cuyama Valley.

Isolated in the middle of the desert, the largest section of the Cuyama basin belongs to the county of Santa Barbara, the richest county in California, the most prosperous state in the United States. In the valley, however, 19.6% of the Latino and 12% of the non-Latino residents live below the poverty line (Walsh, 2020: 2).[4] The 517 inhabitants of the unincorporated township New Cuyama cope with drawn-down wells polluted with arsenic, and dust storms when the surrounding carrot fields are fallowed. Up a side canyon in the North Eastern region of the Valley, a permaculture community cares for a spring and a one-foot (35 cm) wide brook, by protecting the bare sides of the flood bed with mats of woven willow branches. They help trees and bushes to re-establish on the side of the rivulet, their root systems acting like sponges holding the precious water. The catchment takes four to 10 gallons (45.5 liters) of water per minute from the stream to bring it down the canyon

[2] First introduced in 1989, these carrots are bred to be long and slender, then cut into 2-inch pieces and lathed to a uniform width.

[3] In the dry year 2018 groundwater pumping was 60,000 AF (74 million m^3) the reduction in storage was 39,400 AF (48,5 million m^3), while in the wet year 2019 groundwater pumping was 47,000 AF (58 million m^3) and the reduction in storage 11,100 AF (13,7 million m^3).

[4] Cuyama Valley officially has 732 inhabitants and a considerable number of undocumented/uncounted/unofficial residents (unofficially over 2,000 people). https://suburbanstats.org/population/california/how-many-people-live-in-new-cuyama

to a small settlement surrounded by vegetable gardens. Only a couple of miles apart, this contrast between water use and abuse is striking. Caring for a tiny spring appears futile when thousands of acre-feet (billions of liters) of groundwater are blown up in the air only a few miles away.

Figure 1: The lush green of the irrigated fields in Cuyama Valley is striking when seen from the heights of the Los Padres National Park. Image reproduced with permission from Birgit Müller

However, when Birgit Müller first visited in July 2016, there was hope. The Sustainable Groundwater Management Act (SGMA), passed in 2014, under the Democrat governor of California, Jerry Brown, had solicited local self-governance to halt the overuse of groundwater. Local agencies with authority over water could form a Groundwater Sustainability Agency (GSA) by July 1, 2017. These agencies had to establish a Sustainable Groundwater Management Plan (GSP) between users of the same water basin by January 31, 2020. To enter into force the plan had to be evaluated and accepted by the State Department of Water Resources.

Creating institutions self-governing groundwater poses a problem that Amartya Sen evoked in *The Idea of Justice*: how could voluntary good behavior be achieved by the users themselves, without compelling them through force (Sen, 2009: 76)? Rather than treating institutions themselves as manifestations of justice, Sen wants them to promote justice (Sen, 2009: 82). He affirms that it is not enough to hand over the task of justice to some social institutions and to establish legal rules (Sen, 2009: 83), but justice has to be realized in the lives and freedoms of the people involved. The most important criteria for making social rules and institutions appropriate for promoting justice, is to assess — no matter how appropriate the established organizations might be— whether "a big fish could still devour a small fish at will" (Sen, 2009: 20).

The procedural rules and laws in the SGMA do not explicitly promote environmental justice, and nor do they evoke California's human right to water law (AB 685) passed in 2012 (Dobbin, 2021: 5). The objective is to achieve sustainable water use. To phrase it in Sen's terms, to assure that the big fish do not empty the pond, where all the other fish want to live. The Act framed political objectives in terms of promoting voluntary commitments to use the limited water resource in a reasonable way (Grey 2015). With the SGMA, the Californian state attempted to incite excessive, mostly agricultural water users to voluntary plan for and govern

local self-limitation. Meanwhile SGMA was brandishing state rule as a last resort (Kiparsky *et al.* 2017), if reductions in groundwater use were not achieved (Milman *et al.* 2018: 472). The state also hoped to evade direct confrontation and lawsuits with excessive water users. The implementation of SGMA relied on the premise that it would ultimately be in the interest of all water-users to maintain the precious groundwater resource and adopt reasonable behavior in the use of the common good. It thus drew on Elinor Ostrom's conviction that, "successful community resource management is not only possible but commonplace." She claims that, "contrary to the presumption that only external coercion constrains individual selfish appetites, throughout history communities have used informal social controls, often complementing them through modest use of formal enforcement, to manage their water. (Ostrom *et al.*, 2003: 9) In Cuyama Valley, however, a community of water users did not exist prior to SGMA and thus had to be built for the purpose of implementing it.

How were three wealthy agro-corporations, the inhabitants of a poor unincorporated township and a few agroecologists going to constrain "individual selfish appetites"? Water in Cuyama Valley was an absolutely limited resource. The Valley was thus the perfect case for testing whether SGMA was an appropriate legal frame for achieving self-limitation. In contrast to other Californian valleys that also used surface water (Ostrom, 1990; Conrad *et al.* 2018: 48), Cuyama relied exclusively on groundwater and occasional rain for its agricultural activities (Kettmann 2014). Ostrom's idea of a tradable water rights system, that assumed districts could pay for replenishing the basins from other sources by levying substantial pump changes on all water extractors (Ostrom *et al.* 2003: 9; Langridge and Ansell 2018: 486), would not work in Cuyama. No pump charges, no matter how high, would replenish this basin. The groundwater extracted in the central part was more than 10,000 years old and emptied aquifers were collapsing — a situation money could not reverse. The need to physically limit groundwater extraction is particularly obvious. However, limits are not an objective property of nature to be deciphered by scientists, but a choice that confronts the social actors (Kallis 2019). The question is not, what are the natural limits to groundwater extraction, but *whose limits* are going to prevail in the SGMA governance process?

The integration of agricultural corporations into a process of local collective self-limitation touches a key problem of contemporary capitalism: according to what moral economy do individuals representing corporations act and decide? In previous fieldwork in a multinational corporation[5], Müller found that managers claimed to "take moral decisions" when they abstracted from the individual identities of their employees and silenced preferences for a specific production site. Instead, they felt they had to focus on making production the most cost-effective, no matter where, following the "objective" laws of the market (Müller 2007). The conception of the entrepreneur morally embedded in a local community (Smith 2001), had long been replaced by a widening gap between business corporations and local communities. Four processes have led to this development (Gonin, 2015: 225, 227).

(1) Larger enterprises are no longer undertakings of single people, but complex institutions which gained autonomous legal existence as corporations.
(2) Corporations are owned by large numbers of shareholders with an interest in short-term profit and a distance from daily business.
(3) Managers as organizational agents are bound by the profit maximization expectations of the shareholders, and struggle to integrate civic roles and duties in their practice.
(4) The local community is weakened, and represents a multitude of value systems of which none can claim universal authority.

Corporations whose economic logic is based on limitless growth, impose, when they extract, severe limits on the possibilities for local communities to assure the physical and economic well-being of their members. Also, because their existing infrastructural investment is expensive, corporations want to fully

[5] In the 1990s Müller followed the managers of a multinational corporation on what they considered a 'civilizing mission' into post-communist Eastern Europe.

depreciate it — extract to the maximum extent possible — before writing off the investment (Magdoff and Foster 2011: 53).

Political ecology emphasizes these contradictions, exploring macro politico-economic structures together with micro power exercised at multiple governance levels (Clement 2010: 3). Power is an enabling and constraining resource, inscribed in a field of possibilities (*dispositif*) (Foucault 2001: 1052), and it exists only in action. Coercive effects of power ("Power *over*") are always accompanied by enabling effects ("power *to*") (Kashwan *et al.* 2018: 5). SGMA is such a field of possibilities as it structures the (possible) actions of water users rather than constraining them through force (Foucault 2003: 138). Taking institution-building as a catalyst allows to highlight the power relationships in water governance, to uncover their points of application and the methods they use (Foucault 2001: 1044). The strategies of agricultural corporations confront those of local residents, highlighting the tensions inscribed in the very design of SGMA's polycentric governance structure (Morrison *et al*. 2019) between power to decide and power to advise.

Local control written into the law was the result of lobbying by agricultural interests – the Farm Bureau – who hoped to retain the power of agricultural capital over the management of groundwater. However, moving control to the local level set into motion multiple processes of political organizing and community-building in Cuyama Valley and beyond (Dobbin, 2021) that creatively challenged the limited scope of the Act. Before SGMA, institutions were few, and groundwater regulation was non-existent in the valley. Arguably their absence was a presence, as groundwater was in open access for those with land, and its overuse was a highly profitable secret. Making limits to extraction negotiable created frictions (Tsing 2004), "awkward, unequal, unstable, and creative qualities of interconnection across difference", and intense struggles. It brought into the open conflicting temporalities and opposing attitudes of greed and sobriety, and allowed for the confrontation of contrasting narratives about the future of the Valley in the public arena. For the first time, SGMA created a political space in Cuyama Valley where corporations were no longer perceived as invisible powers, but their managers[6] became "adversaries", whose values and strategies one can fight (Mouffe 2000:15).

Methods

Following the details of the planning process allowed us to assess the legal framework of SGMA and to understand how it empowered or restrained corporations and inhabitants to translate their visions for the future into water models, sustainability goals, measurable objectives, and minimum thresholds written into the plan. The way we accessed the SGMA process is in itself revealing. In 2016, friends inhabiting the Valley and participating in the Cuyama Valley Community Association invited Müller to use her professional skill as a political anthropologist to help them understand the intricacies of the SGMA legislation and to find out about the different interests and attitudes with respect to groundwater use among the actors in the Valley.[7] Their question of departure — how can the residents of Cuyama Valley use the legal frame of SGMA to realize reasonable groundwater governance in the Valley? — was not only a prelude to research, but an ever-present issue in the collection and interpretation of empirical data and in our scholarly pursuit of uncovering the strategies of building local institutions of groundwater governance (Low and Merry 2010: S207). We conducted interviews and observations in the Valley in 2016, 2017 and 2019, took notes during public meetings, talking to workers, growers and representatives of agricultural corporations identifying ourselves as anthropologists. We provided empirically grounded criticism of the institutional frame for participation in the public policy process of SGMA (Forman, 1993: 298). As European strangers in California, we offered our interlocutors a radically external perspective which sometimes unnerved them as naïve. Other times we touched a nerve when

[6] Few employees of Grimmway and Bolthouse were living in Cuyama.

[7] Birgit Müller at the time a visiting professor at Santa Cruz University had studied in the 1990s how environmental impact assessments sharpened and revived local democracy in the post-socialist Czech Republic. In 2016, witnessing the presidential election campaign, she became deeply curious about the functioning of (local) democracy in the US. She read up on environmental and water legislation in California, conducted a first set of interviews and wrote a twenty-page information sheet for the Cuyama Valley Community Association. The paper established trust with the local residents who welcomed her master student Élise Boutié a year later to carry out fieldwork about the on-going SGMA process.

we persistently challenged the assumption that property without residency should allow its owners to establish a claim to local decision making.

Fieldnotes are to the ethnographer what the particle detector is to the nuclear physicist, however in the compilation of these notes, the authors' point of view is always intricately interwoven. Critical self-reflection, which consists in pondering, what we do, when we do, what we do, accompanied the entire research process: from the formulation of the problem to the methodological choices, to the gathering of evidence, to the analysis of the results. As we did research together with people involved in a conflictual process, we fed back our findings to the residents who had invited us during the entire course of the research, and this was an integral part of the research process. We took sides in favor of the limitation of groundwater use, but we were rigorous about the use of potentially sensitive data collected in interviews or casual conversation, in particular when they came from employees of agricultural corporations. When we talked to them and when we participated in the meetings that were all open to the general public, we identified ourselves as anthropologists. In writing, we anonymized the names of corporate employees to protect them. The inhabitants of the Valley asked to be quoted with their real names. In the thousands of pages of technical information and official records of committee meetings made public online, of course, all the actors appear with their real names. For work with sources from the internet, the way in which documents are catalogued and for what purpose is critical. In the case we are analyzing, the sheer amount of data produced and published on the website of the Groundwater Sustainability Agency (GSA) of Cuyama Valley became an issue for the practice of democracy itself, as we will analyze later in the article.

***

In the second section we explore how silences and contradictions inherent in the Sustainable Groundwater Management Act (SGMA) created moral and ethical dilemmas. Omissions and silences in the law left conditions for decision-making and participation undefined, and established a tenuous frame for its implementation.

The time it will take to implement SGMA has an irreversible effect on the state of the aquifers in the Valley. The Valley is running out of water *and* time. The third section explores how SGMA's abstract scientific projections into the future as expressed in water models, sustainability goals, measurable objectives and minimum thresholds, encountered three conflicting temporal narratives for the future of the Valley: the story of extraction and quick money, the story of New Cuyama's lost Californian dream of modernity and the alternative narrative of restauration for future generations.

SGMA was an imperfect institution, that evoked the moral standard of protecting communities, and the environmental ethics of beneficial use, but it did not give the citizens the legislative tools to *impose* beneficial use. The fourth section looks at how the biggest water users could influence SGMA's local institutions building and how water consuming residents struggled to go beyond a purely advisory role.

As the agricultural corporations refused to acknowledge overdraft, and willfully pretended ignorance, the challenge for effective groundwater governance was thus not so much to achieve a shared understanding of the model, but to wage a successful struggle for limiting those who extracted the most. At issue was not knowledge, but power to achieve reasonable use. The fifth section explores how local residents appropriated the language of science to contest strategies of denial by the agro-corporations and speak reason to unreasonable water users.

Through participating in the drafting of the Plan, the corporations committed in principle to start reducing water use. Even if the process might actually work in the end to produce an outcome, the decisive question is how much time it will take. In the sixth section we examine how money is used to buy time for more extraction.

2. The reasonable use doctrine — a hundred years of good intentions

California does not have a permit process for the regulation of groundwater use in spite of the California Supreme Court decision in the 1903 Katz v. Walkinshaw case, that the "reasonable use" provision governing other types of water rights also applies to groundwater (Langridge 2016).[8] In 1928, California's government took action against wasteful water users by amending the State's constitution declaring that "the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented." The State did not, however, give itself the legal means to measure and regulate the volume of groundwater withdrawn. Owners of land overlying the aquifers continued to have unlimited access. For decades during California's periodic droughts, extraction was continually in excess of both managed and natural recharge. Levels declined with associated negative impacts on communities and on the long-term resilience of the basins. Impacts included saltwater intrusion, subsidence, reduced surface water flows, water quality degradation, increased extraction costs, the stranding of shallower wells, and permanent loss of storage.

In spite of these observable consequences, depletion was largely underestimated until data from satellites of the National Aeronautics and Space Administration (NASA) and the German Aerospace Centre Gravity Recovery and Climate Experiment (Grace) revealed that between 2003 and 2009 the aquifers for the Central Valley and its major mountain water source, the Sierra Nevada, had lost almost 26 million acre-feet (32 billion m^3) of water (WEF 2015: 3). The remote sensing technology brought visibility (Haraway 1988) and legibility (Scott 1998) to overuse and mismanagement. It was a way of "seeing everything from nowhere" (Haraway 1988) and invited an "administrative ordering of nature and society" (Scott 1998: 4) where disorder had become visible. "The visualizing tricks" of modern science and technologies work generally *for* those in power (Haraway 1988: 581-582). In this case, the external scientific measurements and surveillance worked *on* those with power. The technological innovation of aerial sensing of the gravity and mass of declining aquifers challenged the practices that made farming profitable in the Californian drylands. The view from the sky signaled that unlimited pumping of groundwater cannot be sustained; it urged limitation and called for the realization of the fundamental legal principle of "reasonable enjoyment of property". In the California State Legislature, it sparked debate about what degree of limitation on rights to extract groundwater constituted a form of "taking" property (Aistara 2018: 141). SGMA affirmed the premise: "Failure to manage groundwater to prevent long-term overdraft infringes on groundwater rights."[9] The Act summoned the state and water users to manage, and thus limit, groundwater use in order to protect those who had groundwater rights, from their own capitalist logic of extraction. The extractive logic compelled them to profit from their capital invested in land, deep wells and irrigation systems as fast as possible and to the maximum.

The Californian water tables were the last in the United States without a legal framework of regulation.[10] At the height of the drought of 2014, when permit requests for the drilling of wells had doubled from the preceding year, California passed finally three pieces of legislation, which together are known as the Sustainable Groundwater Management Act (SGMA). The two key principles of these new laws are:

(1) groundwater is best managed at the local level by local agencies, and
(2) only if a local agency fails to manage groundwater sustainably, *then* the state can intervene until the local agencies are able to properly manage groundwater.

Instead of directly regulating groundwater use, with SGMA the Californian state used audit on those with the power and resources inciting them to self-regulate. Where audit is applied, the state's overt concern is less to impose day-to-day direction than to help "(monitoring) people help (monitor) themselves" (Strathern 2000: 3-4).

[8] Prior to 1903, the English system of unregulated groundwater pumping had dominated.

[9] Sustainable Groundwater Management Act, and related provisions (as chaptered) Page i as effective January 1, 2019.

[10] Arizona, for instance, a desert state, already had its Groundwater Management Act in 1980.

The State Water Resources Control Board (SWRCB) established the priority level of each water basin, ranging from low, to medium, and high. The Cuyama Valley basin was classified as a high priority basin, because subsidence, the gradual downward settling of the ground's surface resulting from the collapse of emptied groundwater arteries, was occurring at several points in the Valley. A new institution, a local Groundwater Sustainability Agency (GSA) had to be created to draft a Groundwater Sustainability Plan (GSP) by January 31, 2020. It had to work together with town-sites, counties administrations, farmers, governmental agencies (both federal and state), and any users to implement the Plan and to eliminate six "undesirable results:

(1) depletion of supply, indicated by chronic lowering of groundwater levels;
(2) reduction of groundwater storage;
(3) seawater intrusion;
(4) degraded water quality;
(5) land subsidence that substantially interferes with surface land uses; and
(6) adverse impacts on the beneficial uses of interconnected surface water due to depletions."[11]

If an agency provided an inadequate plan or proved unable to come up with one, the basin would be classified as probationary, and the Californian Water Board would take over, until a plan was established and/or implemented that ensured sustainable management. Law AB 1739 of the Act allowed local agencies to fine users for the violation of any rule, ordinance, regulation or resolution pertaining to the Plan.[12] However, the Act did not give the local agency any power beyond fines, and did not allow it to revoke a water right (in accordance with Section 1200 of the Water Code). Thus, any Plan perceived to violate groundwater rights risked legal challenge (Moran and Cravens, 2015: 2).

The responsibility was thus with the local actors, summoned to organize themselves to establish and maintain sustainability of the resource. But who were the "local" actors? Section 10723.2. of Chapter 4 of the Act defined a wide array of actors from agricultural users to domestic well-owners, from California Native American tribes to military managers of federal lands, from disadvantaged communities to municipal well-operators. All these actors had ties with the locality, but their assessment of groundwater use and need differed, depending on their position, their situation, interests and values (Sen 2009: 160-161). According to SGMA all actors had to be consulted (CWC § 10723.2), but not all had to be included in the decision-making structures (Conrad *et al.,* 2018: 45). Theoretically, any local public agency with water or land use authority could become a Groundwater Sustainability Agency, and multi-agency GSAs could decide to include private associations and members of the general public as voting partners (Milman *et al.,* 2018: 467). By placing the users at the heart of the new institution, the law-makers tried to sidestep direct confrontation and potential lawsuits with owners asserting or suing for the enjoyment of their property. In the spirit of neoliberalism, law-makers seemed to assume that the non-interference of the State in local affairs would be welcomed by all users no matter their economic status and interest.

Akin to Elinor Ostrom's ideas on participatory water governance (Ostrom 1990), SGMA attempted to incite the different water users to voluntarily transform their open access regime into one managing a common-pool resource by (self-)limiting their use and abandoning the established doctrine of the free-for-all. Taking scientific criteria into consideration, the Groundwater Sustainability Agencies (GSA) had to determine the minimum threshold for groundwater extraction by majority decision. Before this lowest acceptable elevation of water was reached and "undesirable results" set in, they had to agree on restrictions in use and determine measurable objectives for eliminating overdraft.

How in the interest of coming generations, would they come to some common understanding independent of their particular interest and position? The process illuminates the liberal paradox of wanting to achieve the general interest by inciting social actors to confront their egoistic self-interests. The members of the

[11] Sustainable Groundwater Management Act of 2014, Chapter 4, Part 2.74, article 10723.2, section a, Part 2.74, Chapter 2, section 10721, section (w).

[12] Sustainable Groundwater Management Act of 2014, Chapter 9, article 10732,

GSA, county supervisors, public utility companies, water districts were to depart in their deliberations from position-relative assessments (Sen 2009: 160) and scientific criteria establishing "beneficial uses" of groundwater dependent ecosystems. These agencies were to work for the particularistic interests of their constituents in confrontation or coordination with other users who also wanted access to groundwater. The real issue was whether the government agencies would defend common and general interests, or whether they would comply with the interests of wealthy property owners with highly paid lawyers.

The question that remained unaddressed, were the conflicting time horizons that linked the different actors to the Valley and its inhabitants. The legislator envisioned a policy built over several decades, going beyond the political calendar and changing political mandates. Once the plan was established, the agency would file annual extraction reports, and levy fees to finance mandatory implementation. The law stipulated that it was not a "one size fits all" approach and that each basin was different (Water Education Foundation 2015). The guiding principle was sustainability. Paradoxically, however, a measure of sustainability, a temporal and physical baseline, was not clearly defined in the Act. The only criteria that had to be addressed were the six "undesirable results." Was the cut-off point the moment when overdraft began to occur, when the Act came into force, or when the plan would be put in place? SGMA specified that the Groundwater Sustainability Plan "*may*, but is not required to, address undesirable results that occurred before, and have not been corrected by, January 1, 2015" (SGMA 10727.2. b (4)). Most importantly the law "does not allow the disclosure of how much water an individual user *pumps*" (Water Education Foundation, 2015: 5). The Sustainability Agency could only measure *the level of groundwater* in the wells of the private owners *if* they granted access, and it could *not* measure *how many acre feet of water* they used unless the users agreed to have their pumping measured. Even more ambiguously, SGMA allowed for a "glide path" in use reductions. Over-drafted basins could be allowed to go further down until they gradually levelled off over a period of years to achieve "sustainability" by 2040.[13]

The silences and contradictions inherent in the law created moral and ethical dilemmas. How to oblige users to limit extraction, if property and water rights were explicitly excluded from the realm of the law, and water meters not obligatory? How to take decisions over use reduction locally, when the law did not specify which agencies or organizations were entitled to decide, and which were simply consulted? To achieve fair representation, SGMA needed to give voice, as much as practically feasible, to the full range of interests that would be affected by the decisions to be made, including interests not backed by money or power (Kiparsky *et al.*, 2017: 8). It was left to the discretion of local agencies which social categories were going to be considered stakeholders worthy of inclusion into decision making. Big and small users, carrot producers and domestic water consumers were not equal in front of the SGMA laws, and did not have the same power and financial means to get involved. To realize reasonable use of groundwater, "institutions have to be chosen not only in line with the nature of the society in question, but also co-dependently on the actual behavior patterns that can be expected" (Sen 2009: 69). It was decisive how groundwater governance institutions empowered or constrained the biggest water users.

The objective of sustainability remained an empty frame unless the local actors filled it with meaning, created their own institutions, and found their own practical solutions. The mechanism was in many respects similar to the 2015 Paris Climate Accord, where national governments were left to commit voluntarily to lower carbon dioxide emissions (Benabou, Moussu & Müller 2017). As the Convention of the Parties did not give itself the power to oblige member countries to comply to strict limits, or even to develop a transparent measure of carbon emissions, they were left to self-monitor and to self-report on the fulfilment of their stated plans. In SGMA the local actors could determine the speed and extent of their self-limitation provided they showed convincingly that they would be able to meet a sustainability goal by 2040 that they also had to define themselves. In contrast to the international climate deal, in the SGMA process there was an ultimate arbitrator. The California Department of Water Resources had to review and accept the Groundwater Sustainability Plan and confirm the limits set. During the next twenty years of authorized overuse, it would be crucial, in order to preserve the aquifer, how fast the plan was executed, and to what extent the users began to self-limit their extraction early on. Yet, as one of the Valley residents warned: "The concept of limits is Un-American."

[13] https://cuyamabasin.org/assets/pdf/FINAL_CBGSA-Newsletter-Edition-3-Nov2018.pdf

3. Time is of essence

Carrot producers, permaculturists and residents envisage/aspire to different water futures. Their logics of production clash. Their ways of being in the world, of connecting to the natural elements, of counting and calculating, of caring and repairing, of time horizons are incompatible. How they understand and manage social and environmental change is a question of the "politics of time", that aims at creating futures in the present—or at thwarting them (Becker, Brauner & Esposito, 2021). Depletion of aquifers "is a defining drama of our times. Within it, planetary crises of ecologies, democracy, and interpretation are condensed" (Bessire 2021). In this drama, timescapes (Adam, 1998) are not only lived in but are active counter-hegemonies, that can be mobilized for political action. In a recent special issue on time of the *Journal of Political Ecology,* the authors show that temporal strategies are used by differently situated actors to produce delay, engage in anticipatory action, or speed up the process of land and resource appropriation (Fent & Kojola, 2020).

In the Cuyama case, three dimensions of time play a fundamental role in how different social narratives of the past are told, and experiences reflected, as well as how individual and collective futures in the Valley are envisaged. Firstly, the time of politics matters in the processes of construction and implementation of public action. In the case of SGMA, the time it will take to implement it has an irreversible effect on the state of the aquifers in the Valley. The Valley is running out of water *and* time (Bohannan 2006). Secondly, the politics of time, this is the administration of time and temporalities, becomes an instrument for political action and inaction. For carrot producers with the short time horizon of making a maximum return on investment, for example, a dragged-out slow reduction process is preferable, while the residents living in the Valley have an interest in immediate urgent action against overdraft of the aquifer. Thirdly, when time is politicized, temporalities become a political problem which relates to how past and futures are told (Povinelli 2011). The temporal narratives thereby manifest themselves as political challenges (Kallis *et al.* 2006) of the ways in which different temporalities are enacted and contribute to reinforcing or destabilizing the asymmetries that structure the processes of water governance. Political actors use time as a resource to legitimize or delegitimize policies and politics, for instance, when carrot producers construct "residents" as existing outside of productive time as recipients of social assistance and in need of economic development, or when the Harvard investment fund boasts its first mover advantage of planting vineyards the year before the SGMA laws went into force (Fairbairn *et al.* 2021).

In SGMA, however, it is also the counting and abstracting of time that make its imprint on the process. SGMA's particular narrative expresses the future in water models, sustainability goals, measurable objectives and minimum thresholds. The material temporalities of groundwater, the history of depletion and the time it takes to replenish the aquifers are acknowledged in the ways in which deadlines for achieving sustainability are set. The SGMA narrative met with three older narratives in the Valley: first the story of colonization and extraction, second the story of New Cuyama's lost Californian dream of modernity and third the alternative narrative of restoration. Whether they expressed longtime attachment to place, care for bees, birds, springs and humans, or whether they were about production plans and profitability goals, all narratives had to be translated into the language of numbers and measures if they wanted to be heard by SGMA. The new narrative of SGMA thus created spaces of possibility and impossibility for conflicting temporalities, visions for the future and sensorial and emotional attachments to place.

Paying attention to conflicting narratives complements the spatial perspective of the "hydrosocial territory" — the imagined, planned or materialized space that defines processes of inclusion and exclusion, development and marginalization (Boelens *et al.*, 2016: 2). It allows to envisage the processes and strategies that transform the hydrosocial territory. The ways of imagining the future and telling the past, condition groundwater extraction and preservation.

The first narrative, which is dominant in Cuyama since white settlers occupied the Valley and expelled the native population, is about colonization and extraction. At the beginning of the 20th century Cuyama was "unexplored territory", considered hostile and hard to live in. Colonization began with domestication and "taming of the wilderness" rewarded by the Homestead Act. Since the 1940s, the Valley has attracted investors

looking for natural assets to be exploited. Among the first was the Richmond Oil Company. For US$100 per acre (0.4 ha) per month, the company rented land from the biggest landowner who continued to graze his livestock while oil was extracted more profitably from under the hooves of the cattle (Schmitt *et al*., 2002). By renting out access to the sub-surface, the landowners ensured cash inflow, but at the same time they participated in the devaluation of their own property. Indeed, ten years later once oil — a non-renewable natural resource — was extracted, the land lost its value. It was not so much the permanence of the land itself that gave the landowners a social and economic base, but the speculation with its limited subterranean riches.

Not only the landowners relied on the industrialists. Transformed into an oil field, the Valley needed manpower. Richmond Oil Company the main employer decided in 1952 to build a "company town", New Cuyama. The town-site was the only land the company owned, while it controlled and managed more than 10,000 acres (4,047 ha) of sub-surface. Ranchers, homesteaders and oil extractors were the local elite because all had been able to extract profits, income and returns from the land. The division between those who had nothing but their labor power and those who owned the land was felt all the more strongly, when in 1972 the main employer Richmond withdrew from the Valley. The local economy collapsed and with it the social aspirations of the former employees and the easy money for the landowners.

An extractive logic similar to the narrative of the oil era motivated the next investors, agricultural corporations that invested in the dry land of the Valley because California's jurisdiction imposed no restrictions on the use of groundwater (Boutié 2018). It was enough to drill a well and install a motor powerful enough to pump. "It's free water", the manager of Cuyama Ranch Grimmway explained. The cost of infrastructure was quickly amortized when thousands of acres were irrigated with this "free" resource. However, agroindustry, faced a similar predicament to the oil industry. It had a limited time horizon as it rested on the short-term overuse of an exhaustible and non-renewable resource. In 2020, Grimmway owned 11,000 acres (4452 ha) and produced organic carrots in rotation on less than half the land. Bolthouse Properties owned 20,000 acres (8000 ha) in the Valley and rented 4,000 acres (1600 ha) each year to Bolthouse Farms for carrots, 1,000 to 1,500 acres (400 to 600 ha) of which were organic. Since 2002, the proportion of organic carrots has increased each year.

Carrots are planted from December to March for harvest from May to July. During July to September a second crop of carrots is grown alternating with leafy greens, onions and potatoes ready for harvest from November to February. The extracted water, some of it fossil water, 10,000 to 25,000 years old, leaves deposits of heavy metals and salts on the soil, as a United States Geological Survey found.[14] One of Bolthouse's managers responsible for organic production denied depletion and explained reassuringly that the water table in the 1,000 feet (304m) deep wells could already be encountered at 350 to 400 feet (106 to 120m) depth. As water was a free resource, the profitability of their operation depended on the cost of extraction, that is on the cost of energy needed per gallon of water pumped (interview 2016). In contrast to the geological evidence of overdraft and to economic research that consistently showed that "open access almost always leads to destruction of any resource that is in great demand" (Ostrom 2003: 9), the manager argued that the largest growers, as self-interested water-utility maximizers, would naturally be the ones with the keenest interest in preserving groundwater, as it was the basis of their business (Interview 2016).

[14] [https://www.independent.com/news/2014/aug/21/cuyama-valley-drying/] (accessed 1 October 2019) and [http://projects.nytimes.com/toxic-waters/contaminants/ca/santa-barbara/ca4210009-cuyama-community-services-district] (accessed 1 October 2019)

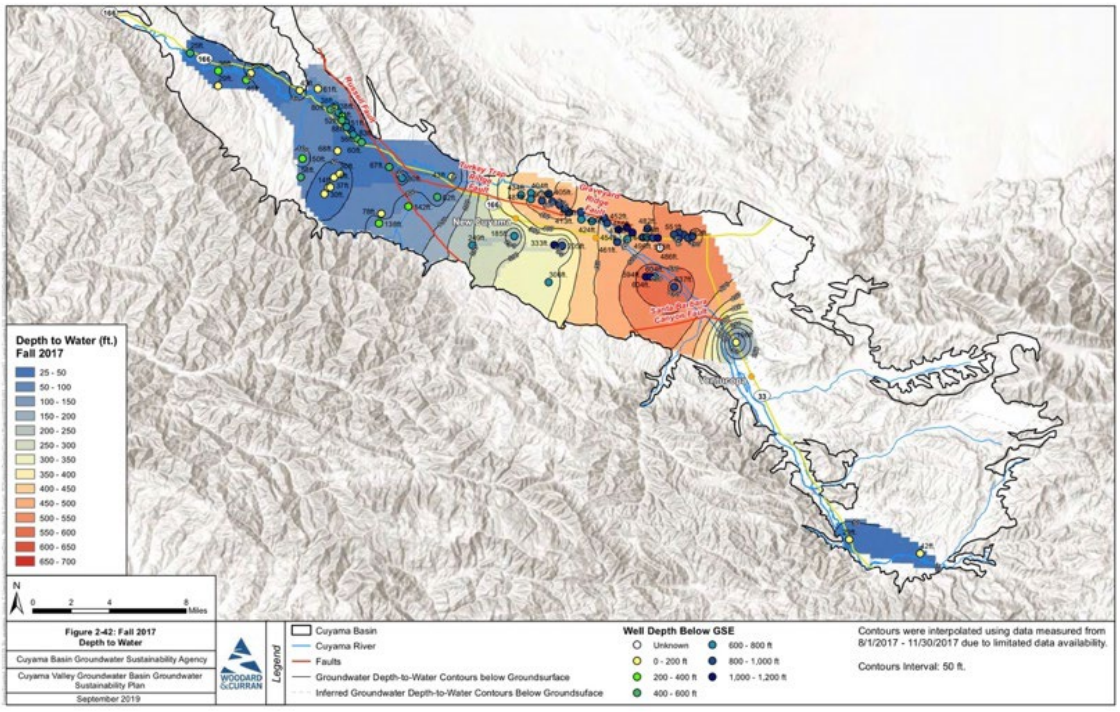

Figure 2: This Depth-to-Groundwater image shows a cone of depression over 600 feet (180m) deep where the main extraction in the center of the Valley takes place. Map obtained from the Groundwater Sustainability Plan, page 177.

"Why do you have to grow carrots in the desert?" we asked. He laughed and explained that growing carrots was risky and too much rain actually posed a problem. In wet climates there was more disease. In Cuyama, Bolthouse could grow carrots on a dependable basis all year round, as their customers wanted them to be fresh. Close enough to the coast and quite high in elevation, the Valley was ideal because the soil was sandy and it was cool in the evening. Over the relatively wet year of 2017[15], Bolthouse Farms showed negative results in their carrot farming business. As the short-term profitability did not meet expectations, the multinational food and snacks company Campbell Foods, that had bought Bolthouse Properties for 1.55 billion dollars in 2012, put it up for sale in 2019. Also the family-owned Grimmway corporation had a short-term time horizon. Their manager confirmed (interview 2017), that their plans to practice agriculture in Cuyama Valley did not exceed the next twenty years.

Nonetheless, the next investment project has already been put into place. In the western part of the Valley an investment fund owned by Harvard University began in 2014 to plant grapevines on 850 acres (344 ha) irrigated from fourteen new wells. Research conducted by Madeleine Fairbairn and her colleagues suggests that it was precisely the regulatory uncertainty of a newly established groundwater law, combined with the material uncertainty of subsurface structures and flows that attracted the investment. It provided an opening for well-endowed investors to actively enhance their farmland value "by wading into governance debates based on contested hydrogeological science" (Fairbairn *et al.* 2021).

[15] A 'water year' runs from 1 September to 31 August and is numbered after the ending year.

Figure 3. Irrigated field where organic carrots are grown. Image reproduced with permission from Birgit Müller.

In the second narrative of lost modernization, residents of the town-site still evoke an idealized New Cuyama in the 1960s: "a neat town-site; everyone had a nice lawn, the houses were all painted in nice colors with a nice car in front of them" (Boutié 2018). Houses and paved streets, trees and lawns, running water and electricity, a supermarket and hardware store, a steakhouse, church, and baseball field: all of this urban infrastructure was set up by the company. The company provided free water for its employees. In the middle of the desert, two hydraulic wells were drilled, a system of water treatment and distribution installed so that the company town did not have to rely on drinking water from the State of California.

Since Richmond left, the unincorporated town, with 220 houses and officially 517 inhabitants, — four streets running parallel to the highway and cut perpendicularly by three other streets — felt isolated, far from sites of government, and without official representation, exposed to the whims of surrounding agribusinesses. Richmond donated the two wells to the town-site to be administered by the Cuyama Community Services District (CCSD), struggling from then on to maintain the infrastructure as a public good. The amount of arsenic in the well water of the New Cuyama townsite is above the legal limit, the amount of lead above the health limit,[16] and the filtration system was broken at the time of our fieldwork. Some of the residents remained or settled in New Cuyama by default, because they were too poor to rent or buy housing elsewhere (Walsh 2020). Not all of them were able to pay for running water, and the costs for the wells were carried on fewer shoulders with bills rising to 180 $/month, ultimately cutting more and more residents off from the water delivery system.

[16] See http://projects.nytimes.com/toxic-waters/contaminants/ca/santa-barbara/ca4210009-cuyama-community-services-district] (accessed 1 October 2019). Arsenic concentrations exceeding the MCL (greater than 10 micrograms per liter (µg/L)) were found in 12 percent of groundwater quality samples and ranged from 0.51 to 67.1 µg/L. High concentrations of arsenic correlated with groundwater more than 25,000 old (Hanson *et al*. 2014).

The inhabitants of New Cuyama were clearly separate from the rest of the Valley: assembled on the small territory of the town site, each owning or renting only a house and yard. In the eyes of the landowners, they did not deserve to occupy the land they inhabited. A few of the decrepit houses of this company town were abandoned. Others had been renovated over the years by a population predominately from Latin America. Still, most of the land of the townsite and the businesses were owned by white Americans. The New Cuyama residents complained about the dust drifting in from fallowed fields mostly without cover crops or shelterbelts. When the pumps were switched off, the sandy soil started blowing without restraint, and when there was the occasional rainstorm, mud invaded the town. Before SGMA, however, the residents did not feel empowered to confront the growers on these issues.

In striking contrast to the short time prospect of extraction, a third narrative emphasizing a deep long-term engagement with the landscape of the Valley has emerged in the last twenty-five years. It came from the margins, from the Western hills, where two agroecologists Robbie J., and Steven G. trained their wine stocks to lengthen their roots and grow without irrigation, and from the canyon on the Eastern side of the Valley, where the permaculture community settled. Steve's and Robbie's vineyard was established in 1995 and they progressively added more vines and olive trees over the years, rounding out five acres (2 ha) of grapevines with a few rows of Spanish, Italian, and French olive trees nestled in between. For Steve the farm was "that place, where each time I place my hands in the soil, prune a vine, or harvest a bunch of grapes, I am nourished by the land, by family, and by community." For Robbie it was "a place of community", where friends and family gather to help with harvest and "enjoy the fruits of our labor together" (interview 2019). Steve and Robbie's community was from outside the Valley. Activists and academics interested in agroecology and enthusiastic about growing and preparing delicious food, came once or twice a year and helped them with harvest. Before the SGMA process they had had hardly any contact with the inhabitants of New Cuyama, nor had they ever visited the permaculture community.

The permaculture community emerged out of a wilderness awareness program for homeless kids from the coast. The founders had observed and become attached to the tiny springs that fed the canyon. They bought the land in 2004 with an interest free loan provided by an organic pistachio grower in the Valley (interview 2016). The permaculture method favors life in all forms and considers human settlement as a socio-ecological system designed to reduce and optimize the need for inputs, including water (Mollison 1988). Imitating the functioning of healthy ecosystems when designing human places of life permaculture wants to ensure the production and reproduction of an abundance of diverse and varied material and immaterial resources. (Centemeri 2018: 7). Inspired by the seventh-generation-principle of native American Nations, the founders of the community started out with a 200-year plan to restore the land and watershed, deliberately choosing a time span, that considered the impact of their decisions beyond an individual lifetime. Fourteen people lived permanently in the small earthen houses. They raised goats, chicken and rabbits and organized workshops on permaculture and earthen house construction. The food they produced covered an important part of the nourishment of the inhabitants and guests. Since the community took over, cattle that had destroyed much of the trees and compacted the soil through overgrazing was shut out. Springs started to flow where little by little, seedlings were nursed back to become shading trees, and fresh green emerged, where the water reached it. In 2020, the yearly average flow was about 40 gallons (182 liters) per minute during the day and 60 gallons (273 liters) per minute at night. Wildlife was flourishing with the increased water supply.

Rather than being in open confrontation, the people carrying the three divergent narratives largely ignored each other, before SGMA came along. The managers of the agro-corporations lived mostly on the coast, and only one manager, and a few foremen and valve operators inhabited the Valley. The workforce of migrant Latino workers was shipped in by a labor contractor from Bakersfield every day by bus. The agroecologists and the permaculture community on the margins were busy working on positive alternatives hoping to slowly develop potential for fundamental change. It was the view from the sky, the position-independent assessment (Sen 2009: 161) of the satellites signaling the end of groundwater, and the political promise of local self-government in SGMA, that brought them together. The necessity to reduce groundwater consumption became political, because there was no solution that would have satisfied all parties.

4. Groundwater institution building

SGMA set into motion a process of "commoning" (Centemeri 2018: 4) an action of "doing in common", to limit the extraction of groundwater. The institutional frame of SGMA opened up a field of political possibilities that were seized in their own way by people with different visions of the world and differing expectations. Rather than aiming for a common "alternative to commodification and capitalization guided by emancipation, social justice, and ecological sustainability" (Dobbin 2021) commoning in Cuyama Valley did not depart from common values, but created a conflictual political space through practices of debate and strategy-building.

Regarded as a historical milestone, SGMA sparked apprehension among the growers and high expectations among some politicians and administrators, and also among the Valley residents, permaculturists, ranchers and agroecologists. However, at first extraction increased. When the establishment of a Groundwater Sustainability Agency became imminent, corporations and individuals drilled wells as fast as possible to lay claim on groundwater before it was regulated.

When a county supervisor from Santa Barbara called a first consultative meeting in 2014 inviting inhabitants to get ready for the Valley's groundwater governance, they responded with enthusiasm. New Cuyama, an unincorporated townsite without elected representation, had felt the distance from government institutions, the lack of local administration and the precariousness of daily living conditions for a long time. At the first meeting, fifty people from the town, the hillsides and the canyons expressed concern about the high cost of water, the broken treatment plant for filtering out arsenic, and the defective community well. Voicing their concerns, they discovered that they were not alone in being unable to pay a water bill of more than US$150 a month.

After several monthly meetings, which the inhabitants fondly remember, the Cuyama Valley Community Association was founded to offer a forum to discuss the most urgent problems in the Valley. Anyone who was 18 years or older, lived in the Valley or owned property there, could become a member. Opening membership beyond the residents, however, meant also including the absentee landowners and managers of the carrot corporations. During the meetings gathering around a large rectangular table, the inhabitants on one side and the representatives of the firms on the other, were clearly separate from each other. Grimmway sent their public relations manager, who eagerly took on the role of explaining SGMA to the residents overwhelmed by its complexity. Soon residents shifted from the original enthusiasm to mistrust, which turned into outright hostility, when the manager of Grimmway silenced residents who asked probing questions about SGMA. Unable to find out, how they, as simple citizens, could play an active role, one of them self-critically remarked: "In hindsight I should have spent more time investigating SGMA myself. It is just such a lot of reading…." (interview 2017).

The impulse to include the absentee landowners ultimately weakened political potential. Without a strategic space of their own (de Certeau 1980), residents were easily intimidated: company men arrived with big folders, recorded conversations, whispered in each-others' ears and cut off critical voices. The locals felt "everything is settled behind closed doors" anyway. "Hidden transcripts" (Scott 1990), ideas and visions carefully kept below the radar, questioning the legitimacy of the corporations were circulating nevertheless: "The corporations insist that they care about the Valley while continuing to increase the pumping of water. Look at the green fields. They say: 'we are the stewards of the land' but at the same time they do not care at all." (Interview 2017) The legal status quo, that property rights over land give free access to water, was no longer accepted by all as a certainty. Brenton K. from the permaculture community saw a deep dilemma between rights and fairness, that they were confronted with:

> My greatest conflict in civic law is: how can you legislate morality and ethics? We have a law here that says: 'we give the future a potential'. That's an ethic, that's fair share! There is no law that says: 'this is how much we have to leave for future generations.' There is nothing like that. We have rights given to individuals, to corporations to get access to the things, they assume are theirs. We have no way of telling them: 'Well is that fair?' — They say: 'it is my right! It has nothing to do with fairness.' How does ethics or fairness enter into the control of this situation? (interview 2017)

SGMA was an imperfect institution, that evoked the moral standard of including communities and the environmental ethics of beneficial use, but it did not give the citizens the legislative tools to *impose* beneficial use. Brenton wondered, how fairness could be made to prevail over the right of unlimited access, how "a spirit and an ethic" could become present at the Groundwater Sustainability Agency (GSA)?

Apart from the Community Service District in charge of water treatment and distribution from the two town wells of New Cuyama, no public agency existed in the Valley that could have formed a Sustainability Agency. The Service District was a fragile institution managed by volunteers who had to cope with residents unable to pay their water bills. "We sell water", recapped Sue N., "rather than administering together a common good" (interview 2017). In the absence of a public agency capable of forming a GSA, it was thus up to the water agency of Santa Barbara county and the elected county supervisors from Ventura, Kern, and San Luis Obispo counties, that each administrated a section of Cuyama Valley, to create a multi-agency GSA. The four counties had different interests and orientations: the supervisor from Ventura county governed a protected area for conservation in the Valley, Kern county focused on promoting agriculture, Santa Barbara Water Agency had to maintain a balance between the inhabitants of New Cuyama and agricultural interests, while San Luis Obispo administrated a section of the north-western part of the basin where the large vineyard of the Harvard Investment Fund was developed.

To be represented on the GSA, the agricultural corporations endeavored to form an agency tailored to their interests — a California Water District without any of the functions that the California Water Code attributed to such an agency, i.e. to "acquire, plan, construct, maintain, improve, operate, and keep in repair the necessary works for the production, storage, transmission, and distribution of water for irrigation, domestic, industrial, and municipal purposes, and any drainage or reclamation works."[17] The manager of Grimmway, explained: "If we wouldn't have created this water district, we would have been dependent on the government. It's only damage control" (Interview 2017). The water district corresponded to what John Rawls called "a necessary public pretense." This façade of an agency pretended to act in the public interest without proposing "any general principles or standards for specifying fair terms of cooperation" (Rawls, 1993: 50). In spite of its spurious character, the Local Agency Formation Commission (LAFCO) of the county of Santa Barbara endorsed its formation with a six to one majority. A ballot among 117 landowners representing more than 60,000 acres (24,281 ha) of property authorized the formation of the water district with a 96 percent majority.[18] Residents complained publicly that its set-up was undemocratic as it would allow the landowners to continue their "strategies behind the scenes," and regretted: "The best approach or possible means of complying with the state's expectations and the integrity of the basin would have been to minimize the major landowners' discretionary power."[19] Instead, as on a board of shareholders, the biggest owners were given the greatest say, as decisions were by one vote per acre. Consequently, the interests of the smallholders carried no weight at the table and hardly any resident attended the meetings of the Water District. The Water District levied fees tailored to the amounts of irrigated acres. Owners of irrigated land paid 65 times more fees per acre than owners of non-irrigated land; and thus felt consequently more entitled. The Water District hired its own experts and paid a consulting firm to write a report shedding doubt on the United States Geological Survey claiming it had "overestimated rates of decline" (EKI 2017).

On June 30, 2017, one day before the cut-off date, the eleven-member GSA of Cuyama Valley was officially established. Five county representatives composed the GSA — two for Santa Barbara County and one for each other county — as well as the director of the Community Service District of New Cuyama and all five directors of the newly created Water District, who together were given three votes. Only one of the members of the GSA board actually lived in the Valley. The Water District designated a manager of Bolthouse as their

[17] Californian Water Code section 354

[18] Vote cast on the 28th of February 2017 https://ballotpedia.org/Cuyama_Basin_Water_District,_California,_Formation_Proposal,_Measure_A2017_(February_2017)

[19] New Cuyama resident John M. wrote in an emailed statement published in the *Santa Maria Sun* http://www.santamariasun.com/news/15093/lafco-approves-cuyama-water-basin-district-application/

candidate for president of the GSA and his bid was accepted by the majority of the other members. At a meeting of the Water District, the manager explained his strategy to his fellow growers: "To gain influence, since you're putting in the most money, it's up to you and you'd better nominate several people from the board for each of these [GSA] committees to make sure you're part of it." (fieldnotes 2017). A close friend of a manager of Grimmway was chosen from three candidates to be the administrative director of the GSA. The director had worked for many years for the Water Authority in Kern County where the wealthy Resnick family managed the controversial Kern Water Bank, a vast system of wells, pipelines and underground cisterns spread over 20,000 acres (8100 ha) hoarding and selling groundwater in the southern San Joaquin Valley. (Walsh 2019: 193).

The demand of the Cuyama Valley Community Association to get at least a non-voting seat on the GSA was rejected by the majority of GSA board members. Instead, the Cuyama residents, emboldened by the agroecologists Robbie J. and Steve G. and the permaculturist Brenton K. used a provision in SGMA to create a Standing Advisory Committee (SAC) officially under the discretion of the GSA and with the mandate to advise it. Sixteen candidates from within and outside the Valley applied, and seven were appointed by the GSA, among them an administrator working for the agricultural corporations. At last the public was allowed to take its ease to ask all those questions that had previously been rapidly glossed over at GSA meetings. The meetings often went on for several hours. The deliberations were not concluded with a vote, but with recommendations that were either unanimous or, if not, recorded dissenting opinions. At first, nobody from the large Spanish-speaking majority of Valley residents applied to participate. Later two Spanish speakers joined. Roughly 60 percent of the Valley population is Latino and 40 percent non-Latino (Walsh 2020: 3). Some were foremen or did service jobs for the growers and didn't want to antagonize their employers and customers. Others felt it was a conflict between white landowners and white environmentalists and not their battle to fight.

The Advisory Committee faced the daunting task of speaking reason to overwhelming well-organized economic power.[20] Residents had to confront three challenges: first, GSA institutions gave decision-making power to property owners and the main groundwater extractors, and only consultative status to residents. Second, all debate had to submit to the hegemony of scientific discourse. Third, the SGMA process was so expensive that the availability of and access to money risked being the factor determining its outcome.

5. Speaking reason to power

Hydrological models are tools of world-building that embed, enact and circumscribe subsurface politics (Kroepsch 2018: 43). Similar to the recurrent warnings of the Intergovernmental Panel on Climate Change (IPCC) that the limit of one-point-five-degree global warming should not be exceeded, the satellite view from the sky showed the absolute limit of groundwater, while a study of the basin from the United States Geological Survey (Hanson *et al*. 2014) showed the concrete local problem. In 2008, when the county of Santa Barbara had ordered the report to obtain scientific measurements of the condition of its groundwater resources and subsoils, Bolthouse and Grimmway had refused the USGS access to their wells, as did most big land and well-owners in the Valley at the time. The small owners, who had nothing to hide when it came to their water consumption, accepted that state agents came to check the condition of their wells. Despite the drilling of several test wells, the scientific work conducted over several years, the report of more than 100 pages and the conclusion in 2014 that the depletion of the water tables was linked to extractive industries including agriculture, the big growers refused to accept this report and called it at best exaggerated and alarmist, and at worst an outright lie. Their argument was simple and patently unreasonable as it did not rely on "informed scrutiny" (Sen 2009: 45), but precisely on their refusal to allow scientific scrutiny. They claimed: the USGS report was based only on certain wells, its findings thus did not concern the entire Valley and did not give an accurate account of the state of the groundwater table.

Elinor Ostrom had insisted that a shared understanding of the relevant groundwater system among its users was an essential starting point for its governance (Ostrom 1990). However, as the growers refused to cooperate, and willfully pretended ignorance, the challenge for effective groundwater governance was thus not

[20] http://cuyamabasin.org/assets/pdf/2018-06-28-SAC-Board-Packet.pdf

so much to achieve a shared understanding of the model, but to wage a successful struggle for limiting those who extracted the most. At issue was not knowledge, but power to achieve reasonable use.

The report also found elevated levels of arsenic in the groundwater pumped from deep wells in the Central Region of the Valley including the community wells of the townsite New Cuyama.[21] The carrot companies claimed ignorance about whether their carrots picked up the arsenic. Bolthouse's manager maintained that arsenic levels were arbitrary. In the old days, he told us, arsenic levels were 50 parts/billion; today this limit is tightened to 10 parts/billion (interview 2017). Carefully cultivated ignorance offered excuses for not pursuing the critical issue of water contamination where it would put into question fundamental investment choices and engrained practices.

From July of 2017 to December of 2019, leading up to the establishment of the Plan, a battle of numbers over levels of groundwater, extraction, minimal thresholds and measurable objectives was waged between the directors of the Water District and the citizens on the Advisory Committee, while the county supervisors were attempting to avoid conflict inside the GSA. Establishing the Plan was financed by a grant from the State of California to the GSA of over one million dollars, The GSA divided the Valley into various "threshold regions" and assigned to each a "measurable objective" (MO)—basically a goal groundwater level—as well as a "minimum threshold" (MT)—a floor below which groundwater levels should not fall because it would cause negative environmental consequences known in the SGMA as "undesirable results" (Fairbairn 2021).

The director of the Cuyama GSA explained: "if you think there are no undesirable results in the area, keep the Minimum Threshold low, if you think there are, keep it high." (Minutes of the GSA Meeting 29/11/2018). The Minimum Threshold became an object of subjective valuation rather than a scientific criteria. If members thought that continuing to extract large quantities did not lead to undesirable results *for their constituents*, then they should plan for drawing down the water-table even further and keep the threshold low, whereas if they were concerned about depletion, they should insist that water tables should not go down any further and keep the threshold high. The challenge was not only to access relevant information about the situation of the aquifers and be allowed to speak about particular interests and positions, but also whose interest counted and how the majority was constituted that should prevail.

The Standing Advisory Committee had access to all the technical information at the disposal of the GSA. Also, as Robbie J. phrased it: "we have voice, much more voice than I initially thought, but no decision-making power" (interview 2019). The committee organized workshops in English and Spanish to inform the official and undocumented Valley residents. The strategy of the growers to keep the groundwater problem and the extraction practices opaque, now had formidable challengers unafraid of lengthy debates. At the first public workshop on March 7, 2018 the questions from the audience were candid: "Aren't the solutions for the Cuyama Basin groundwater problem simply more rain and less use? What other options do we have?"[22] The Advisory Committee elected Brenton K. from the permaculture community as vice-chair, and Robbie J. the organic wine-grower as chair. In her youth, Robbie J. had been involved in the United Farm Workers (UFW) movement as a field organizer and boycott organizer for the state of Florida. Later she co-founded the Community Agroecology Network (CAN) with her husband. She explained: "I could not have been in the Valley with this going on and be a passive person. Being who I am I got involved" (Interview 2019).

Reviewing the drafts produced by consultants of the GSA, discussing minimal thresholds and measurable objectives for each region and every single well of the basin, was particularly overwhelming. In long protracted meetings each word was painstakingly analyzed. Technical arguments for including additional wells into the monitoring network had to be studied, data gaps in the draft of the Plan identified and advice transmitted to the GSA. The daunting tasks demanded staggering levels of goodwill and exertion (Holland *et al.,* 2015: 37). At each monthly meeting hundreds of pages of technical reports, minutes, legal texts, soil maps, and groundwater data were produced or simply slightly altered by the consulting firms and thus had to checked for changes. While the Water District paid hundreds of thousands of dollars for consultants, the Advisory Committee members had only their stubborn determination and diligence to rely on to make sense of the flood of data.

[21] Some of the groundwater in Cuyama Valley had according to the USGS report approximately 40 parts / billion.

[22] Cuyama Valley Groundwater Basin Groundwater Sustainability Plan Appendices, December 2019, page 76.

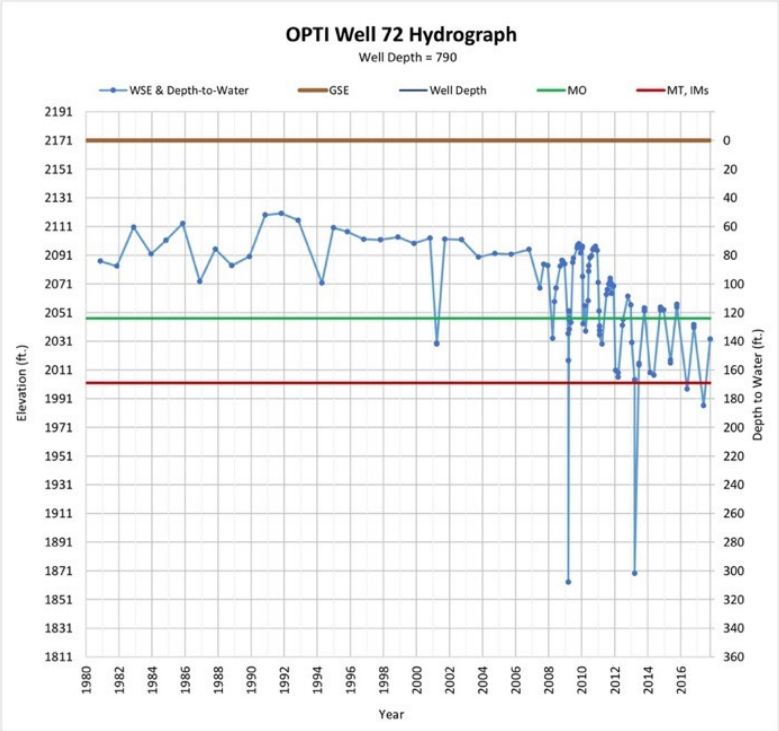

Figure 4: The fluctuations and steady decrease of the groundwater level in test well number 72, information provided on page 1022 of the annexes to the Groundwater Sustainability Plan. The red line represents the minimum threshold.

The minutes which we could consult online, kept track of how members of the Advisory Committee, in particular Robbie J. and Brenton K., felt compelled to translate practical concerns into technical language. Their critical narratives were forced into the hegemonic scientific jargon. To express that water from the deep wells in the Central Basin was toxic, contained arsenic and that irrigation had contaminated the soil, Brenton went on record with the almost unintelligible phrase: "The best available science suggests a causal nexus between SGMA related activities like groundwater extraction and the migrations of constituents into areas with lower pressure heads due to unsustainable extraction." He tried to convince the GSA members to make provisions for monitoring boron, arsenic and nitrites[23] along with age dating, as groundwater pumped from 1,000 feet (304 m) depths often contained these elements and evoked "the best available science" and not the health of residents and carrot consumers to make his point.

Not all the members of the Advisory Committee had the same way of seeing the problem. Devoted members sacrificed time, neglecting their own affairs. Their families felt that the engagement with SGMA became an obsession. Others wanted to find an equilibrium between economic and ecological concerns, or were worried about the value of their houses once groundwater was depleted, while a few were ready for a more radical confrontation with the growers. Over 48 percent of respondents in the Cuyama Valley census affirmed that they had attended a water meeting at least once (Walsh *et al.* 2020: 59). Oldtimers, newcomers, agricultural workers, pensioners, farmers: each saw their common problem through their own prism. In one of the meetings they mused self-reflexively that some wanted to be optimistic, because they had grown up in the Valley and wanted their children to live there, while others were ready to pack up and leave, if SGMA failed. The different

[23] The minutes of the meeting mention the necessity to measure the presence of nitrite but probably confused nitrite with nitrate, as nitrite is typically absent in groundwater, because it is rapidly converted to nitrate.

interests met inside the Advisory Committee and led to discussions, but not to disputes as the committee was not obliged to vote or come up with a common position. In their attempt to create community around technical documents and expert knowledge, the members began to cultivate a collective intelligence (Stengers, 2005) effectively aspiring to reclaim their different imaginings.

Figure 5: Freshly planted wine stock on the New Harvard Investment Project in the Western Part of the Valley. Image reproduced with permission from Birgit Müller

When they had to consider the measurable objectives and minimum thresholds for the previously untapped and unstudied North-Western Region of the basin, opinions diverged at a joint meeting of the GSA and Advisory Committee. Growers and landowners claimed "room to breathe" for the Harvard investment project.[24] In striking contrast to the language of numbers that Brenton had felt obliged to adopt, the growers allowed themselves to argue emotionally. Setting strict limits for the fourteen new wells drilled by the Harvard investment project would "punish" landowners in the area. Enthralled by the reigning mythology deeply embedded in the national consciousness, growth still seemed worth the price that must be paid for it. The growth imperative undermined a sense of place and continuity. Although the depleting aquifers revealed disagreeable truths pointing to the flawed basis of the growth myth (Speth, 2012: 182), the agroecologists were depicted as "blessed", as lucky to be able to pump the little water they needed in their dry farming from a shallow 20 foot (6m) deep well.

When the Groundwater Sustainability Plan was completed[25], it had reached a size comparable to an international trade agreement: 429 pages plus an additional 1,093 pages of annexes. It was presented at a joint GSA and Advisory Committee meeting on December 6, 2019 which was well attended. The atmosphere was tense and residents felt it to be disempowering. They described the managers as "self-contented white middle-aged men sure of their competence, power and entitlements. [….]" Their attitude was, "we have to have that meeting but we don't have to listen to your input and we are not going to listen to your input". (interview 2019). Outraged by an executive summary of the Plan, that minimized the problem of overdraft and proposed the odd solution of cloud seeding with silver iodide for rainfall enhancement, Brenton gave up talking in the language

[24] http://cuyamabasin.org/assets/pdf/2018-11-29-CBGSA-SAC-Minutes.pdf

[25] due to be submitted on the 1 January 2020

of SGMA and went on record saying: "With a problem of this magnitude, to underrepresent in this way is like putting lipstick on the backside of the pig."[26]

In the end, water quality, in particular arsenic, was not included in the Plan. It stated that the actions of the GSA could not reduce the arsenic levels in the old groundwater strata, thus measurement was unnecessary. Limiting the scope of the Plan to defining water levels without considering water quality will allow growers to continue irrigating organic and conventional crops with large quantities of fossil water potentially contaminated with arsenic and boron. In the final version the Western part of the basin still figured as "full" and as requiring further studies. Robbie was ignored, when she remarked, that in spite of exceptionally good rains their own and their neighbors' wells had been on a downward trend for the last two years, ever since the Harvard project in the Valley bottom had started pumping. The technician from the department of water resources in Santa Barbara had told her in private, that the level in test-wells had decreased by 80ft, (24m) and that he expected wells in the Western part of the basin to be dry in about seven years. Frustrated Robbie exclaimed:

> "I am generally an optimist. But I really feel, unless the state really does something to implement this, which historically the state has not done… The community just does not have any power… and no-one cares ….
>
> I much rather do what I have done my whole life, to work on positive projects that will move the Cuyama Valley in a way agriculture needs to move in the future…. doing the dry farming project, working with the permaculture community, working on creating alternative opportunities for people in the basin..." (interview 2019)

As a matter of fact, also her dry farmed vineyard and olive grove depended on a functioning well. Without groundwater her "positive project" did not stand a chance. Similar to climate change endangering all human life on earth, if "genuine human life" (Jonas, 1982) was to continue in the Valley, it was imperative to find a political solution and stop water depletion. However, the Plan remained hypothetical and concluded that "basin-wide groundwater pumping *may* have to be reduced by as much as 50 to 67 percent, with the major proportion or reduction required in the Central Management Area." The ultimate objective of use reduction remained vague. The plan established that after three years of further studies, a reduction by 5% should start in year 4 and by 2039 the basin should have reached sustainability. The ultimate technical evaluation remained with the Department of Water Resources, that had to decide within two years whether Cuyama's Groundwater Sustainability Plan should be implemented, revised or rejected.[27]

6. Buying time to extract

A common reproach made to polycentric systems of water governance is their cost. Due to the complexity of spatial patterning, multiple functional overlays, partial polity formation, and variable system coupling "the costs in time and money of collective action (consultation, reaching agreement, and enforcing such agreements) are high" (Morrison *et al.* 2017: 6). This argument does not envisage, that the excessive spending of money for expertise can become a power tool in itself inhibiting effective governance, adding useless expertise, complicating and slowing the process, and rendering less well-off groups illegitimate as they can't pay.

This is what happened in the Cuyama case. The Plan provided for levying a fee of US$19 per acre foot ($1233m^3$) of water. Paradoxically it did not oblige the growers to install water meters, and it continued to allow them to self-report. To monitor consumption, other methods had to be found, such as measuring the electricity

[26] 2019-11-12 Final Draft Cuyama Basin GSA GSP, Comments, p.121.

[25] By February 2025, if the DWR fails the plan and the basin has significant groundwater depletion, the basin will be under Probationary Status. It means the State Water Board will develop an Interim Plan (likely with pumping restrictions and metering requirements) until the basin is compliant and the extractors have to pay the associated fees determined by the State Water Board.

used by the well pumps, their capacity, and the time they ran. If this data was triangulated with satellite imagery measuring the greenness of the leaves of the crops with infrared, it was possible to calculate how much water was used by the crop. However, at a meeting in Kern County in 2017, Élise Boutié learned how the growers were able to cheat on the satellites, harvesting before their passage so as to have their fields recorded as unirrigated. To carry out all these elaborate measurements, implementation was projected to cost between US$800,000-1.3 million per year, plus project and management actions of an additional US$650,000 to US$3.7 million per year (GSP 2019: 420). This was a sum that smaller farmers using groundwater more sustainably were unwilling to contribute to. Byron A., apple grower and board member of the GSA complained:

> …we are getting a plan that opens up a growing, bottomless pit of spending that threatens us all…. I don't think it was the purpose of SGMA to force smaller, often undercapitalized, farming operations, like my own, to pay the price for the ungoverned externalities of large, highly capitalized operations that have been the principal drivers of the drawdown of our largest aquifer. (letter from Byron A. to the GSA chair 2019)

For the success of SGMA, distributional fairness throughout the policy process is critical (Hammond Wagner and Niles, 2020). Brenton saw the expensive monitoring plan as a deliberate strategy of the agro-corporations to make SGMA unpopular by laying an excessive financial burden on everybody:

> It is a strategy not only for their pocket book but for SGMA, because SGMA ought to be a great thing. But nobody has a good word about it. Everybody is blaming it, feels threatened by it, it is going to be painful … it is gonna cost jobs. It is going to close schools. It is bad, bad, bad, bad, bad…. Although it is f… great… (interview 2019)

Money was not used directly to buy political influence, but to make it impossibly expensive and protracted to set clear limits on water use. Money was buying time for more extraction, and this time was worth a lot of money. The growers purchased counter-expertise, requested further studies and required expensive measuring technology. What distinguished this type of plutocracy, this reign of money over politics, from corruption as the "violation of public trust" (Wedel, 2012: 489), was that the state itself had pushed decision-making to the private sector. Through the diffusion of authority from the state of California to "stakeholders" at the local level, the private entities holding the largest stake were legitimated to hold public office in the Water District and were allowed to take decisions in their own interest inside the GSA. The growers legitimated as public agents in the Water District, ignored the interests of the public: the state of California, the inhabitants of California today and in the future, and the water users living in the Valley. Obviously, the policy-makers themselves were culpable. None of the four counties responsible for the watershed wanted to carry out the Plan and administer its costly implementation. Instead, as a next step, the county supervisors on the GSA agreed to transfer the responsibility for executing the plan to the Water District thus to the growers themselves. The GSA would only monitor its implementation. As Robbie phrased it: "Even the counties are not there anymore. There is basically no enforcement. They definitely put the foxes in charge of the henhouse." (interview 2019)

In contrast, Brenton thought the transfer agreement might have positive aspects and if not, at least help to reveal the uselessness of the Water District:

> They have to perform and they don't get to say, what to perform. The GSA says: you have to perform. Because it is a contract and even though there is a delegation of some authority, the authority remains with the GSA. If it does not happen, the Water District has failed and the contract is annulled." (interview 2019)

Through participating in the drafting of the Plan, the growers committed in principle to start reducing water use. The process might actually work in the end to produce an outcome, if he counties and the state of California

can avoid costly adjudication procedures. Attuned to the mentality of "no limit" it might in the end install a limit. The question is how much time it will take. There is a risk, obviously, that the Water District will mis-report- or under-report water use. Also, as time is of essence, the danger is real that the whole process will drag out until the aquifers are irremediably depleted.

7. Conclusion

After millions of dollars spent and thousands of hours writing, reading and commenting on data, the outcome for the aquifers of Cuyama Valley is still uncertain. Will the citizens have the stamina to follow the process and supervise implementation? Brenton in any case has not given up:

> I still have the expectation that something good can come of SGMA. It can make a difference. I have no doubt they [the growers] will do everything they can to keep that from happening. So the hope is, that there will still be some of us around in ten to fifteen years to keep their feet to the fire. (Interview 2019)

Just a few months after the Groundwater Sustainability Plan was finally submitted, Harvard's Investment Fund was issued construction permits to drill three additional irrigation wells on their property (Fairbairn 2021). Neighboring farmers and the Cuyama community, on the other hand, resisted the attempt of the investment fund to build three "frost ponds" reservoirs of 49 acre feet (60,440 m^3), and incited the Santa Barbara County Board of Supervisors to advise Harvard[28] to conduct a full environmental impact assessment whose outcome is still uncertain. In November 2020, after all, the GSA directors voted to require meters on all wells in the Cuyama Basin by December 31, 2021 and to actually provide figures of their water consumption by January 1 2022.[29] On the basis of the data from 2022 a 5% reduction will have to be implemented in 2023. Brenton commented: "Without the data they cannot find the 'off' switch to the pumps they all turned on! Baby steps!" (Brenton 2021).

Three decisive institutional shortcomings in the legal frame of SGMA inhibited its effectiveness: the absence of a decision-making role for residents in the governance structure of the GSAs, the ambivalence of the definition of sustainability and the reluctance to impose the measuring of water use. What is more, for the Cuyama watershed, the Local Agency Formation Commission (LAFCO) of the county of Santa Barbara endorsed the formation of a water district organized like a shareholder company, allowing the big groundwater users to impose themselves on the GSA and to play for time.

Groundwater governance in Cuyama Valley unites in a nutshell the structural dilemmas of neoliberal environmental governance: a weak state, powerful corporations, a population called to participate but not to decide and a limited vital resource. The story of Cuyama Valley is emblematic for the shortcomings of SGMA processes all over California. It shows how citizens learned the language, mechanisms and ambiguities of water governance, and engaged with unreasonable corporate power. Also in other basins, final Groundwater Sustainability Plans have been overwhelmingly disappointing and their potential approval by the state would, in many ways, constitute a formalization of the existing status quo, enshrining inequitable groundwater access and management with newfound legitimacy. Determined state action and intervention is needed to avoid that the Plans become a "giant step backward for California's progress on the human right to water (AB 685)." (Dobbin 2021: 8,9) Community organizations from San Joaquin Valley, organized in the Groundwater Leadership Forum and funded by the California Water Foundation developed a Human Right to Drinking Water Scorecard[30] for reviewing the Plans for drinking water quality and availability. Appealing directly to the state, they submitted comment letters on draft Plans, often dozens of pages long and accompanied by exhibits and

---

[28] https://santamariatimes.com/news/local/santa-barbara-county-supervisors-decide-eir-needed-on-cuyama-valley-vineyard-ponds/article_139f8d09-4e2d-5645-a69e-a2c775f0b34b.html

[29] https://cuyamabasin.org/standing-advisory-committee. All extractors must start submitting data by January 1st 2022.

[30] https://leadershipcounsel.org *› uploads › 2020/05*

appendices. The Cuyama Advisory Committee did the same. In July 2021 the California Water Board came out in favor of the residents of Cuyama, and suggested that the GSA should monitor water quality and in particular arsenic. It also required to take the link between the declining water levels in the shallow wells and the deep drilling into account. The GSA has until July 2022 to respond to the request. This incited Bolthouse and Grimmway to attempt bypassing the SGMA process altogether and to initiate an adjudication process to establish rights to extract in the courts, rather than have water access and use be determined in a political process (Merritt 2021). If this adjudication process is accepted by the courts, it will again take time and lots of financial resources and if it is completed it might lock in water rights long into an increasingly drought-stressed future. The big fish continue to play for time in order to empty the pond, where all the other fish want to live.

There are, after all also positive effect of SGMA in Cuyama. The process brought the residents of the Valley together and incited them to reflect about what they considered just and fair; to discuss their modes of engagement, their commitments to the Valley landscape and people, and their temporal perspectives. To make their voice heard, let alone being listened to, however, required exceptional skill, knowledge, time and dedication. Enmeshed with an imperfect institution such as SGMA, the members of the Advisory Committee had no effective decision-making power and were limited to speaking reason to unreasonable corporate power. This is a paradox governing many environmental impact assessments (Müller/Kohutek, 2002). Corporations pay skilled experts to seed doubt while unpaid citizens have to acquire sophisticated skills to debunk their attempts. By confronting themselves with technical details, and daring to question highly paid consulting firms, members of the Advisory Committee became able to throw light on the strategies of the corporations. By constantly probing, questioning and supervising, the Advisory Committee effectively challenged attempts by the big water users to keep their practices invisible. As they discussed seemingly technical issues in public, groundwater thresholds and measurable objectives lost their gloss of neutrality and objectivity and revealed themselves as objects of controversy, tied to different temporalities, economic interests and political power.

Ignoring reason and rational arguments was the privilege of the powerful. Tellingly, when confronted with scientific measurements in public meetings, corporate managers resorted to emotional appeals, claimed to be (unjustly) "punished", without a "fair fighting chance" to realize all the potential profits on corporate investments. They did not engage with the needs and worldviews of the people living in the valley. Moral values were muted (Bird and Waters, 1989) when managers discussed their strategies to control water governance in the circle of the Water District.

The experience of Cuyama valley shows the fundamental absurdity of allowing the major water users and squanderers to restrict and self-limit groundwater use and allocation. Expensive auditing procedures did not make the foxes legally and financially responsible for what they continue to do to the henhouse.

In a changing climate with prolonged droughts, groundwater has to remain a common good. It cannot be legally enshrined as individual property controlled and hoarded by the few. The limits of use have to be decided democratically in a long-time perspective with future generations in mind and this not only on the local level. Then economic interests have to be constrained to comply with the legal frames that are democratically established. Importantly, the right of access to water has to evolve, adapting to changing climatic conditions, constantly open to be determined and restricted through democratic political processes.

Bibliography

Aistara, G. (2018). *Organic sovereignties: Struggles over farming in an age of free trade*. University of Washington Press.

Adam, B. (1998). *Timescapes of modernity: The environment and invisible hazards*. Routledge.

Becker, T., Brauner, C. & Esposito, F. (2021). *Chronopolitics: Time of politics, politics of time, politicized time.* Conference, German Historical Institute, London.

Benabou, S., Moussu, N. & Müller, B. (2017). The business voice at COP21: The quandaries of a global political ambition. In Aykut, S. C., Foyer, J. & Morena, E. (eds.) *Globalising the climate: COP21 and the climatisation of global debates*. Routledge.

Bessire, L. (2021). *Running out: In search of water on the High Plains*. Princeton University Press.

Bird, F. & Waters J. (1988). The moral muteness of managers. *California Management Review* 32(1): 73-88.

Boelens, R., Hoogesteger, J., Swyngedouw, E., Vos, J. & Wester, P, (2016). Hydrosocial territories: a political ecology perspective, *Water International*, 41(1) 1-14, https://doi.org/10.1080/02508060.2016.1134898

Bohannan, J. (2006). Running out of water–and time. *Science* 25 Aug, 313 (5790), 1085-1087.

Boutié, É. (2018). *Désert vert. Vivre dans un paysage de sécheresse. Usages, propriétés et défenses d'un écosystème fragile et violent*. Mémoire de Master en sciences sociales EHESS, Paris.

Burnes, E. W. & Wang, W. L. (2018). In Drought-Stricken Central California, Harvard hopes to turn water into wine. *The Harvard Crimson*, April 13, https://www.thecrimson.com/article/2018/4/13/water-harvard-vineyards/

Centemeri, L. (2018). Commons and the new environmentalism of everyday life. Alternative value practices and multispecies commoning in the permaculture movement. *Rassegna Italiana di Sociologia*, 64(2), 289-313.

Certeau, M. de. (1990). *L'Invention du quotidien, tome I, Arts de faire.* Gallimard.

Clement, F. (2010). Analysing decentralised natural resource governance: Proposition for a "politicised" institutional analysis and development framework. *Policy Sciences* 432, 129-156.

Conrad, E., Moran, T., DuPraw, M. E., Ceppos, D., Martinez, J. & Blomquist, W. (2018). Diverse stakeholders create collaborative, multilevel basin governance for groundwater sustainability. *California Agriculture* 72(1), 44-53. https://doi.org/10.3733/ca.2018a0002

Dobbin, K. B. (2021). Environmental justice organizing as commoning practice in groundwater reform: Linking movement and management in the quest for more just and sustainable rural futures. *Elementa: Science of the Anthropo*cene 9(1). https://doi.org/10.1525/elementa.2020.00173

EKI Environment and Water, Inc. (EKI). (2017). *Preliminary findings from review of the USGS Study of the Cuyama Valley Groundwater Basin*. Report. Burlingame, California. EKI.

Fairbairn, M., LaChance J., Teigen De Master K. & Ashwood L. (2021). In vino veritas, in aqua lucrum: Farmland investment, environmental uncertainty, and groundwater access in California's Cuyama Valley. *Agriculture and Human Values* 38, 285–299. https://doi.org/10.1007/s10460-020-10157-y

Fent A. & Kojola E. (2020). Political ecologies of time and temporality in resource extraction. *Journal of Political Ecology* 27: 819-829. https://doi.org/10.2458/v27i1.23252

Forman, S. (1993). *Diagnosing America: Anthropology and public engagement*. University of Michigan Press.

Foucault, M. (2001). Le sujet et le pouvoir. In M. Foucault, *Dits et écrits II* 1976-1988. Gallimard.

Foucault, M. (2003). Security, territory and population. P. Rabinow, P. & Rose, N. (eds.) *The essential Foucault: selections from essential works of Foucault 1954-1984*. The New Press.

Gonin, M. (2015). Adam Smith's contribution to business ethics, then and now. *Journal of Business Ethics*, June, 129(1): 221-236.

Grey, B. E. (2015). The Reasonable Use Doctrine in California water law and policy. In A. Lassiter (ed.), *Sustainable water: Challenges and solutions from California*. University of California Press.

Hammond Wagner, C. & Niles, M. (2020), What is fair in groundwater allocation? Distributive and procedural fairness perceptions of California's Sustainable Groundwater Management Act. *Society and Natural Resources* 33, 1508-1529.

Hanson, R.T., Flint, L.E., Faunt, C.C., Gibbs, D.R., & Schmid, W. (2014). *Hydrologic models and analysis of water availability in Cuyama Valley*, California: U.S Geological Survey Scientific Investigations Report 2014-5150. https://doi.org/10.3133/sir20145150

Haraway, D. (1988). Situated knowledges: The science question in feminism and the privilege of partial perspective. *Feminist Studies*, 14(3): 575-599.

Holland, D. D., Nonini, D. M., Lutz, C., Bartlett, L., Frederick-McGlathery, M., Guldbrandsen, T. C., & Murillo, E. G. (2007). *Local democracy under siege: Activism, public interests, and private politics.* New York University Press.

Jonas, H. (1982). *Das Prinzip Verantwortung*. Insel Verlag.

Kallis, G. (2019. *Limits: Why Malthus was wrong and why environmentalists should care.* Stanford University Press.

Kallis, G., Kiparsky, M., Milman, A. & Ray, I, (2006). Glossing over the complexity of water *Science* 5804: 1387-1388.

Kashwan, P., MacLean, L. M.& García-López, G. A. (2018). Rethinking power and institutions in the shadows of neoliberalism. *World Development* 120: 133-146 https://doi.org/10.1016/j.worlddev.2018.05.026

Kettmann, M. (2014). Cuyama Valley drying up: Study confirms groundwater being used faster than it recharges. *Santa Barbara Independent*. https://www.independent.com/news/2014/aug/21/cuyama-valley-drying/

Kiparsky, M., Milman A., Owen D. & Fisher A. T. (2017). The Importance of institutional design for distributed local-level governance of groundwater: The case of California's Sustainable Groundwater Management Act. *Water,* (10), 755; https://doi.org/10.3390/w9100755

Kroepsch, A. C. (2018, Groundwater modeling and governance: Contesting and building (sub)surface worlds in Colorado's Northern San Juan Basin. *Engaging Science, Technology, and Society* 4: 43-66. http://doi.org/10.17351/ests2018.208

Langridge, R., Brown, A., Rudestam, K. & Conrad, E. (2016 *An evaluation of California's adjudicated Groundwater Basins.* Report for the State Water Resources Control Board, http://www.waterboards.ca.gov/water_issues/programs/gmp/resources.shtml

Langridge, R. & Ansell, C. (2018). Comparative analysis of institutions to govern the groundwater commons in California. *Water Alternatives* 11(3): 481-510.

Low, S. M. & Merry, S. E. (2010). Engaged Anthropology: Diversity and Dilemmas. An Introduction to Supplement 2 *Current Anthropology* 51, Supplement 2, 203-226.

Magdoff, F. & Foster, J. B. (2011). *What every environmentalist needs to know about capitalism: a citizen's guide to capitalism and the environment*. Monthly Review Press.

Merritt, M. (2021). A snapshot of California's complex water policy through Cuyama Valley. *The Morning Brew*, https://www.morningbrew.com/daily/stories/2021/10/05/a-snapshot-of-california-s-complex-water-policy-through-cuyama-valley

Milman, A., Galindo, L., Blomquist, W. & Conrad, E. (2018). Establishment of agencies for local groundwater governance under California's Sustainable Groundwater Management Act. *Water Alternatives* 11(3): 458-480.

Mollison, B. (1988). *Permaculture – A designer's manual*, Tagari Publications.

Moran, T. & Cravens, A. (2015). California's Sustainable Groundwater Management Act of 2014: Recommendations for preventing and resolving groundwater conflicts. Stanford Woods Institute for the Environment.

Morrison, T.H., Adger, W.N., Brown, K., Lemos, M.C, Huitema, D., Phelps, J., Evans, L., Cohen, P., Song, A.M., Turner, R., Quinn, T. & Hughes, T.P. (2019). The black box of power in polycentric environmental governance. *Global Environmental Change*, *57*, [101934]. https://doi.org/10.1016/j.gloenvcha.2019.101934

Morrison, T., H., Adger, W. N., Brown, K., Lemos, M. C., Huitema D. & Hughes, T.P. (2017). Mitigation and adaptation in polycentric systems: sources of power in the pursuit of collective goals. *Climate Change* e479. http://doi.org/10.1002/wcc.479

Mouffe, C. (2000). Deliberative democracy or agonistic pluralism. *Political Science Series* 72, Institute for Advanced Studies, Vienna.

Müller, B. & Kohutek P. (2002). Engaging the new democracy: EIA procedures and institution building in the Czech Republic. *Focaal: European Journal of Anthropology* 40: 67-81.

Müller, B. (2007). *Disenchantment with market economics: East Germans and Western capitalism,* Berghahn.

Ostrom, E., Stern, P. C. & Dietz, T. (2003). Water rights in the commons, *Water Resources Impact*, 52, 9-12.

Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge University Press.

Povinelli, E. A. (2011). *Economies of abandonment: Social belonging and endurance in late liberalism,* Duke University Press.

Power, M. (1999. *The audit society: Rituals of verification*. Oxford University Press.

Rawls, J. (1993). *Political liberalism*. Columbia University Press.

Schmitt, R. J., Dugan, J. E., & Adamson, M. R. (2002). Industrial activity and its socioeconomic impacts: Oil and three coastal California Counties. MMS OCS Study 2002-049. Coastal Research Center, Marine Science Institute, University of California.

Scott, J. (1990). *Domination and the arts of resistance: Hidden transcripts*, Yale University Press.

Scott, J. (1998) *Seeing like a state: How certain schemes to improve the human condition have failed,* Yale University Press.

Sen, A. (2009). *The idea of justice.* Penguin.

Smith, A. (2001[1776]). *An inquiry into the nature and causes of the wealth of nations*. Project Gutenberg.

Speth, J. G. (2012). American passage: Towards a new economy and a new politics. *Ecological Economics* 84: 181–186.

Speth, J. G. (2012). America the possible: A manifesto, Part II, *Orion Magazine*, April 25.

Stengers, I. (2005). Le défi de la production de l'intelligence collective. *Multitudes* 20(1): 117-124.

Strathern, M. (2000). *Audit cultures: Anthropological studies in accountability, ethics and the academy.* Routledge.

Swyngedouw, E. (2005). Governance innovation and the citizen: The Janus face of governance-beyond-the-state. *Urban Studies* 42(11), 1991-2006.

Tsing, A. L. (2004). *Friction: an ethnography of global connection*. Princeton University Press.

Walsh, C. (2019). Water to wine: Industrial agriculture and groundwater regulation in California. In Gibson J. W. & Alexander, S. E. (eds.). *In defense of farmers: The future of agriculture in the shadow of corporate power.* University of Nebraska Press.

Walsh, C. (2020). *Cuyama Water Census Final Report*. U.C. Santa Barbara, Department of Anthropology.

Water Education Foundation (2015). *The 2014 sustainable groundwater management act: a handbook to understanding and implementing the law*. Water Education Foundation.

Wedel, J. R. (2012). Rethinking corruption in an age of ambiguity. *Annual Review of Law and Social Science* 8: 453-498. https://doi.org/10.1146/annurev.lawsocsci.093008.131558