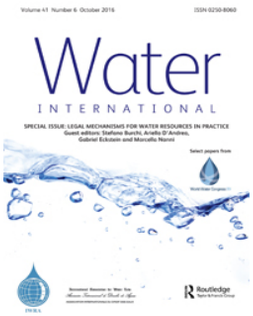

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Water governance reform in the context of inequality: securing rights or legitimizing dispossession?

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ABSTRACT

Secure and legally sanctioned access to water is gaining significance to farmers to cushion themselves against climate change and to participate in markets that are increasingly concerned with social and environmental responsibility. Nicaragua is among the countries which recently has introduced a new water rights regime as part of its water governance reform. The article analyzes the extent to which the reform has succeeded in providing water security for all. The article argues that due to selective and partial implementation, the water governance reform could lead to the concentration of enforceable water rights in the hands of the few.

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Water governance; legal reform; water rights; inequality; irrigation; Nicaragua

Introduction

Secure and legally sanctioned access to water is gaining significance to farmers at large, both to cushion themselves against the effects of climate change–related unpredictability of rainfall patterns (Organisation for Economic Co-operation and Development [OECD], 2014), and to market their products in domestic and international markets that are increasingly concerned with corporate and consumer social responsibility (Daniel & Sojamo, 2012; Mason, 2013).

Water governance, including a supportive legal and institutional framework, is increasingly seen as key to water security (Burchi, 2012; UN-Water, 2013). Hence, in recent decades a wave of water governance reforms has swept across the developing world (Aagaard & Ravnborg, 2006; Burchi, 2012; Jacobi et al., 2014; Ravnborg, 2015; van Koppen, 2007). Policies, laws and administrative guidelines have been proposed, challenged, fiercely contested (not least in many Latin American countries), re-conceptualized and approved, and are currently in the process of being implemented in numerous countries (Boelens et al., 2012; Burchi, 2012; De Vos, Boelens, & Bustamante, 2006; Ravnborg, 2015).

Common to this recent wave of water reform is the attempt to replace complex, often locally negotiated and overlapping sets of water rights (Bruns, Ringler, & Meinzen-Dick, 2005; Hodgson, 2004) with a single, unified legal framework for water allocation under public, i.e. government, control. The aim is to move decisions on water access and water allocation out of the realm of things that are negotiated locally into the

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realm of things that are negotiated and sanctioned through statutory institutions according to predefined social, environmental and economic criteria, e.g. expressed as a clear order of priority between different types of uses of water, as well as setting the conditions which should be met to enjoy continued water use rights (Ravnborg, 2015).

Nicaragua has recently reformed its legal and regulatory water governance framework. According to the General Law on National Water (Law 620), enacted in 2007, the objective of the water governance reform, of which the water law forms part, is to ensure "the sustainable and equitable use of water and the conservation of the country's water resources in terms of quantity as well as quality",[1] through the regulation of rights to access and use water resources.[2]

However, laws and regulations on paper and laws and regulations in practice are often two different things. Despite the often sound economic, social and environmental rationales underlying water governance reforms, in many cases translated into concrete legal and administrative provisions, their fulfilment is often hampered, particularly in developing countries, by being implemented in contexts characterized not only by insufficient administrative and regulatory capacity but also by significant inequality. As noted by the UNDP, this combination is a significant challenge because "the importance of power in shaping the outcomes from legislation [tends to be] inversely related to regulatory capacity", implying that "weak regulatory capacity increases the scope for exploitation of unequal relationships" (United Nations, 2006, p. 182). Thus, though probably unintended, there is a risk that under such conditions, rather than enhancing water security for all, water governance reform may introduce a new dimension of inequality, namely the dimension of legal water security for the benefit of a limited – and privileged – segment of the total population of water users.

Drawing on interviews and archival research conducted in Nicaragua before and after the approval of the new water law in 2007, this article examines the extent to which the implementation of the water governance reform, and particularly the new water rights regime regulating access to and use of water, has contributed to water security for different segments of irrigation farmers in the country. The article is organized into six sections. Following a presentation of the empirical material upon which the article is based, the third section provides an account of Nicaragua's new legal and institutional framework for water governance and the process of its coming into being. Focusing on irrigation, the fourth section examines achievements to date with respect to implementation of the new water rights regime, while the fifth analyzes the implication of these achievements with respect to water security among farmers and agricultural enterprises. The final section draws conclusions and discusses the implications for water governance reform implementation in contexts characterized by limited administrative and regulatory capacity.

Methods and materials

In addition to interviews, conducted over more than a decade, with key actors in water governance reform and its implementation at national, district and local levels, this article is based upon two data-sets. Ideally all administrative resolutions issued by the National Water Authority, e.g. with respect to applications for permission to develop and register water infrastructure as well as for water use rights, are published in the

national gazette at the cost of the applicant. Hence, the first data-set is constructed through a review of all issues of the Nicaraguan national gazette published from the establishment of the National Water Authority in 2010 up to 29 February 2016 to identify all published administrative resolutions related to it. The data-set consists of the administrative resolutions issued until the end of 2015,[3] and as a subset of these, all published administrative resolutions announcing concessions of water use rights for irrigation. This inventory was supplemented with periodic reviews of the National Public Registry of Water Rights and tabulated as a database.[4] A total of 433 administrative resolutions were identified, of which 252 announce concessions of water use rights, of which 120 are for irrigation. The second data-set is constructed as a subset of the Fourth National Agricultural Census data-set from 2011 (N = 262,546 farms – INIDE, 2011) containing those farms which according to the census employ some form of irrigation (n = 11,599 farms). This data-set provides a profile of the 11,599 farms which make use of water for irrigation and thus of the context in which the implementation of the water governance reform with respect to irrigation takes place.

Water governance reform in Nicaragua

The coming into being of Nicaragua's water law

It took almost a decade, gave rise to the formation of a widely anchored and highly effective civil society movement against the privatization of water and in defence of the right to water, and involved a number of competing draft law proposals before Nicaragua in 2007 passed its first General Water Law (Barrios and Wheelock, 2005; Gentes, 2011; Gómez, Ravnborg, & Rivas Hermann, 2007; Romano, 2012). The initial impetus for the legal reform process arose through the negotiations over a major loan from the Inter-American Development Bank to modernize Nicaragua's water and sanitation services in the aftermath of Hurricane Mitch, which had hit the country in late 1998 (Romano, 2012). Subsequently, legal water reform was made part of the conditions for the negotiation of the free trade agreement (CAFTA) between Central America and the United States. Strongly influenced by the neoliberal doctrine which still prevailed in the 1990s and into the first years of the new millennium, institutions like the World Bank and the Inter-American Development Bank actively advocated and supported countries to follow the example of Chile, which a decade earlier had passed a water law that turned water into a commodity to be allocated entirely through the market (Bauer, 2004). Nicaragua was one of the countries which experienced these pressures to privatize its water and sanitation services and enable market-based allocation of water rights. However, these efforts were everywhere met with resistance, if not from governments themselves, then from civil society. Thus, until now, no other country has gone as far as Chile in instituting free market–based allocation of water rights (Burchi, 2012), and even in Chile, the 1981 Water Code was subsequently reformed in an effort to regulate the market-based allocation of water rights (Bauer, 2008; Burchi, 2012; Ravnborg, 2015).

In Nicaragua, the first signs of resistance emerged in response to plans to privatize one of the country's major hydroelectric power plants. Neighbouring residents feared that this would lead to the privatization of the water feeding the plant (Romano, 2012).

Gradually, this initial resistance grew into a national movement consisting of a large number of grass-roots organizations as well as district governments opposing the privatization of water as a resource and the privatization of water supply and sanitation utilities, and defending water as a human right (Barrios and Wheelock, 2005; Romano, 2012). Coalitions were established, marches were organized, and alternative water law proposals were formulated and consulted on across the country. Supported by 29,000 signatures, the alternative water law developed by the Alliance against Water Privatization and for the Right to Water qualified to be presented for discussion at the National Assembly in 2004.[5] Thus, in 2007, when the National Assembly passed Nicaragua's water law, the Alliance could celebrate that the new law incorporated several of its demands. These included "water is a national patrimony",[6] "it is the duty of the state to prevent [water as a natural resource] becoming subject to any type of privatization",[7] and "the drinking water service will never become subject to any type of privatization, direct or indirect".[8]

Nicaragua's new water law

The objective of Nicaragua's water law is to establish the legal and institutional framework for the governance of the country's water resources – surface as well as groundwater – and thereby ensure "the sustainable and equitable use of water and the conservation of the country's water resources in terms of quantity and quality",[9] with the aim "to promote social and economic development".[10] The introduction of a water rights regime is at the core of Nicaragua's new legal and institutional water governance framework. In the context of hydrological units ranging from river basins through watersheds to catchments, this new water rights regime has as its objective "to ensure the control of the use of water from both a quantitative and a qualitative perspective, and enable the effective exercise of the rights of access to water".[11] Thus, according to the law, all water use, whether by individuals or by public or private legal persons such as water utilities and companies, has to be formally sanctioned through a concession, licence or authorization.[12] To regulate the allocation of rights to use or benefit from water resources[13] and thus to act as a custodian of Nicaragua's water resources, the water law establishes the National Water Authority as the executive body charged with the regulatory and technical responsibility for water governance in the country.[14] Moreover, the water law establishes the National Public Registry of Water Rights.[15] This registry is envisaged as separate from, yet administered by, the National Water Authority. The law requires that public access to the water rights registry be guaranteed.[16] The Nicaraguan water law thus enlists itself among the so-called 'modern' water laws which a whole range of countries have adopted in recent decades (Aagaard & Ravnborg, 2006; Burchi, 2012; Ravnborg, 2015; van Koppen, 2007).

To guide the National Water Authority in the allocation of water rights, the law establishes the order of priority between different types of water use to be followed in cases where demands for water exceed the resource available.[17] Water use for human (domestic) consumption, including for rural and urban water utilities, takes precedence over all other types of use. This and the explicit statement of the state's responsibility towards providing, facilitating and regulating the adequate supply of safe drinking water for the population bring the Nicaraguan water law in line with public demand for the recognition of water as a

human right, later declared a universal human right by the United Nations (2010). In order of priority, domestic consumption is followed by the use of water for agricultural, livestock and forestry production; for environmental purposes; for energy production intended to meet public needs; industrial purposes; tourism; navigation; etc.[18] Thus, rather than leaving the allocation of water rights to the market, as in the Chilean model initially advocated e.g. by the World Bank, Nicaragua opted to follow what senior officials referred to as a "Mexican model" (personal communication, Jaime Morales, leader of the Environmental Committee of the Nicaraguan Parliament, 30 August 2004), which retains significant public control over the allocation of water rights (Garduño, 2005; Wilder, 2008).

The new water rights regime

Nicaragua's new water rights regime distinguishes between three different types of use permits. With respect to irrigation, it defines two types, namely *concessions* and *authorizations*, both valid for between 5 and 30 years and both potentially subject to a water use fee, for which, however, the specific design and law are still pending. The third type of permit, the *licence*, is intended exclusively for public water utilities providing drinking water and involved in hydro-power generation. According to the law, users of water for irrigation of areas larger than 20 hectares need a *concession*, while users of water for small-scale irrigation, defined as irrigation of areas smaller than three hectares, need an *authorization*. Thus, though this is probably unintended, the law is silent with respect to how to formalize water use rights for irrigation of areas between 3 and 20 hectares. Nonetheless, this omission bears witness to the limited attention given during the legislative process to the context in which the new water rights regime was to be implemented, as well as to the implementation challenges that would ensue once the law was enacted. While concessions are to be issued by the National Water Authority, authorizations of water use in minor quantities for irrigation, but also for other purposes, may be granted by the district authorities, or in the autonomous regions by the regional councils, *provided* that a signed collaboration agreement exists between the district authority or regional council and the National Water Authority. However, apart from the issuing authority, no further differences are stipulated with respect to the legal requirements or provisions for concessions and authorizations. Thus, an application, whether for a concession or for an authorization,[19] should be accompanied by the legal identification of the applicant and the farm for which irrigation is solicited, the source and the quantity of water solicited, and, if deemed necessary, by an environmental impact study. In all cases, the water right, if granted, is conditioned on the commitment to comply with the Nicaraguan environmental law and regulations, e.g. with respect to use of pesticides or other contaminants. The decision on an application for a water rights concession[20] is to be communicated through an administrative resolution.[21]

Water governance reform implementation in Nicaragua

The case of water rights for irrigation

Although the law was passed in 2007, it was not until 2010 that the National Water Authority was formally established and became operational. This led to the elaboration

of a new water law regulation (Decree 44-2010),[22] and the preparation of a regulation which made the National Public Registry of Water Rights functional (Decree 33-2011). Hence, the first applications for water use rights concessions were received in 2010 and granted and made public in 2011, by means of an administrative resolution. As a legal practice, the National Water Authority introduced a standard clause in its administrative resolutions which conditions their validity upon their publication in two national newspapers, as well as in the national gazette, at the cost of the applicant. In a systematic review of the national gazette up to 29 February 2016 and the National Public Registry of Water Rights up to April 2015, we identified 433 administrative resolutions. Of these, 366 resolutions (85%) were published in the national gazette. According to the National Water Authority's own newsletter (Rubí, 2014), however, 800 concessions, licences and authorizations have been granted by the National Water Authority. This would imply that a significant share, i.e. more than half of these, have never been published.[23] A total of 252 of the administrative resolutions were concessions[24] of water rights, of which 120 were related to irrigation. Of these, 104 (87%) were published in the national gazette. A bit more than half of the 116 concessions for irrigation (65) were granted for the irrigation of sugar cane (Figure 1).

Besides building up the newly established National Water Authority, which today counts on a technical staff of between 15 and 20 persons, including lawyers and hydrologists, efforts have been devoted to developing the procedures and formats for handling and evaluating applications, and for issuing and registering the administrative resolutions. Today, these formats are in place and available from the National Water Authority's homepage.[25] Moreover, as part of the process of developing the institutional

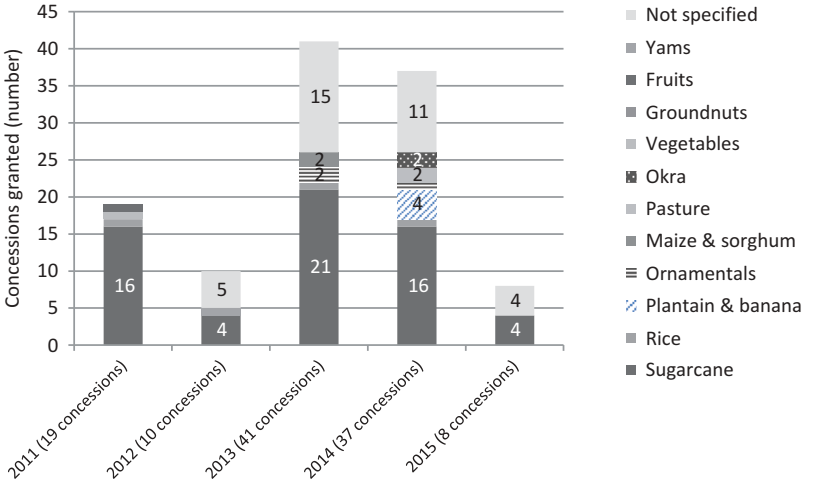

Figure 1. Irrigation concessions (115 total) granted by the National Water Authority, 2011–2015, by crop to be irrigated. Source: Own elaboration based on review of the national gazette, *La Gaceta – El diario oficial de Nicaragua* (August 2010 to 29 February 2016, available at http://www.lagaceta.gob.ni), and the National Public Registry of Water Rights.

Note. Whether the small number of water use rights concessions granted for irrigation in 2015 is due to a decline in 'demand' for such concessions or to failure on the part of the applicants to publish the administrative resolutions in the national gazette, is unfortunately unclear.

procedures, the National Water Authority has developed standard templates for the hydrological or hydro-geological studies[26] which are requested to accompany applications for water use concessions.[27] Of the 120 concessions granted for irrigation, 46 make reference to being supported by a hydrological or hydro-geological study. Meanwhile, no templates have been developed so far to respond to the legal requirement to consider the potential social impact of the solicited water use, including how to account for the actual use of the water solicited.[28] Mechanisms which could make up for this absence, such as seeking the endorsement of district or community authorities in the districts and communities where the water will be extracted and used, have only been applied sporadically. Thus, in Chichigalpa District, where some of Nicaragua's biggest sugar estates are located, district authority officials lamented the fact that the former practice of seeking their endorsement, e.g. before the development of new irrigation infrastructure, had been discontinued following the establishment of the National Water Authority. Instead, the sugar estate would now proceed directly to the National Water Authority to present their requests (personal communication, senior district officials, Chichigalpa, 21 January 2015). Of the 120 concessions granted for irrigation, 19 make reference to having obtained the endorsement from district authorities; none of them from Chichigalpa.

In addition to formally establishing the National Water Authority, the 2010 water law regulation (Decree 44-2010) introduced a new set of criteria for determining whether the right to use water for irrigation should be formalized through a concession or an authorization. Rather than considering the area under irrigation, which was the basis for the criterion stipulated in the water law, the new set of criteria is based on farm area, and on the destination of the produce. According to the 2010 regulation, a *concession* of water use for irrigation should be solicited from the National Water Authority when the farm where the irrigation will take place is larger than 70 hectares *or* when, irrespective of farm area, the produce is intended for the "industrial market" (*comercialización industrial*).[29] In cases where the farm in which the irrigation will take place is smaller than 70 hectares *and* where the produce is not intended for the "industrial market", water use should be formalized through an *authorization* solicited from the relevant district authority. Just like the concessions, these authorizations should subsequently be submitted to the National Water Authority for inclusion in the National Public Registry of Water Rights.[30] While thereby rectifying the ambiguity introduced by the water law with respect to how to formalize the use of water for irrigation of areas between 3 and 20 hectares, the 2010 regulation introduces a new source of ambiguity in that no definition of "industrial market" is provided. Nor is this a term or category commonly used, e.g. in national statistics.

Regardless of these legal-administrative changes in when an authorization as opposed to a concession should be solicited, limited progress has been made in institutionalizing the granting of water rights for the use of minor quantities of water by means of authorizations issued by district authorities. Much of this impasse is due to the legal and administrative ambiguity in the content and the conditions to be met to enable the National Water Authority to establish a cooperation agreement with a district authority or regional council. Neither the water law nor its regulation provide any guidance in this regard. Moreover, while recognizing the role many district authorities have played in regulating the use of water resources in order to provide

for the diverse needs of their citizens for domestic, productive and recreational purposes, staff of the National Water Authority also express reservations, both with respect to whether district authorities possess the necessary technical skills to authorize water use, and with respect to the administrative capacity of the National Water Authority itself to actually handle and honour cooperation agreements with Nicaragua's 153 district authorities and two regional councils. To compensate for at least part of this impasse, the National Water Authority established a territorial delegation in Estelí in 2013, intended to cater to the five northern departments of Estelí, Matagalpa, Jinotega, Madríz and Somoto. The delegation counts on two technical staff members. The main task of the delegation is to receive and examine applications and serve as the liaison to district authorities as well as to other national agencies. Thus, efforts have recently been made to develop cooperation agreements with district authorities, and by June 2015, draft cooperation agreements, e.g. with Estelí District, had been developed, and the hope was expressed that the agreement with Estelí District could be celebrated before the end of 2015 as the first cooperation agreement between the National Water Authority and a district authority. According to our information, however, no cooperation agreement had been signed by the end of 2015, and therefore no authorizations of the right to use water in minor quantities for irrigation had been issued. Thus, what may have been envisaged as a legal option to provide equal opportunities for formalizing water use rights for irrigation, irrespective of the scale of water use, namely the district authorizations, so far appears to be a legal cul-de-sac.

Implications for water security

The ambition presented in the water law was that all water use should be formalized, and thus sanctioned and secured through a formal water right, and that existing hydraulic infrastructure should be registered within half a year of the passing of the law (Law 620, Article 137). Given that resources (human as well as operational) did not match the passing of the law, and that only limited efforts were made to assess the actual magnitude of this ambition, in the case of irrigation to some extent explained by the lack of information on the number of farmers using irrigation,[31] this ambition appears to be a somewhat far-fetched dream. The experience of Mexico (Garduño, 2005), which was a source of inspiration for the Nicaraguan water law, would have suggested a much longer regularization period. On the other hand, although it is far from meeting the ambition stipulated in the law, progress has been made.

According to the criteria originally proposed in the water law, the legal obligation to formalize the right to use water for irrigation by means of a concession applies to owners of farms where the irrigated area is larger than 20 hectares. According to the data available from the Fourth National Agricultural Census (Table 1), this is the case at 381 farms out of the 11,599 farms which are reported to have some form of irrigation. In this context, the 120 concessions granted to date would have made up a considerable share, namely 31%. However, in the context of the new criteria introduced with the 2010 water law regulation, the achievement fades. Considering farm area, the first of these two criteria, the census identifies 1166 farms larger than 70 hectares, and reported to have some form of irrigation, and thus obliged to obtain a concession to formalize their right to use water for irrigation. This reduces the proportion of water right

Table 1. Profile of farms with irrigation according to irrigation type and type of legal water right requirement. Figures are number of farms.

	According to 2007 water law[b]			According to 2010 water law regulation			
	Requiring concession	Requiring authorization	*Requirement unknown*	Requiring concession	Requiring authorization	*Requirement unknown*	
Irrigation type[a]	Irrigated area >20 ha	Irrigated area = <3 ha	*Irrigated area > 3 ha and ≤ 20 ha*	Farm area > 70 ha	Farm area ≤ 70 ha and produce intended for own consumption	*Farm area ≤ 70 ha but significance of "industrial market" is unclear*[c]	Total
Gravity	260	3,773	*740*	622	1,286	*3,072*	4,980
Sprinkler	127	2,258	*368*	450	1,075	*2,512*	4,037
Drip	244	3,519	*706*	674	1,581	*3,519*	5,774
Manual	119	4,427	*428*	434	1,599	*3,011*	5,044
Other	9	183	*37*	26	84	*126*	236
All	381	8,700	*1180*	1166	3,522	*6,911*	11,599

Data source: Fourth National Agricultural Census (INIDE, 2011).

[a] Each farm with irrigation may have more than one type of irrigation system.

[b] The area under irrigation is unknown for 1338 of the 11,599 farms reported to have irrigation. Therefore, only 10,261 farms may be categorized with respect to water right type required by the 2007 water law.

[c] The census records whether the produce from a farm is primarily for own consumption or intended for the national market or for export. Assuming that farms smaller than 70 hectares and from which the produce is primarily for own consumption will be required to apply for an authorization rather than a concession, the degree of water right formalization achieved to date ranges between 1% and 10% in terms of number of farms.

formalization to 10%. Considering in addition the second criterion, whether the produce is intended for the "industrial market", the proportion may drop further – but by exactly how much is unknown, since we have no definition of "industrial market".

Yet, in the context of the amount of water estimated to be withdrawn annually for irrigation in Nicaragua, the degree of formalization of water use for irrigation achieved since the putting in place of the new water rights regime is significantly higher. Already by the end of 2011, water rights corresponding to 104 million m^3 annually were given in concession for irrigation, primarily for sugar cane, and entered in the National Public Registry of Water Rights. This corresponds to 9% of the total amount of water (1110 million m^3) estimated by FAO AQUASTAT to be withdrawn annually for irrigation (2011 data, http://www.fao.org/nr/water/aquastat/data/query/). To date, water rights for irrigation granted in concession correspond to 370 million m^3, or one-third of the amount estimated to be withdrawn annually for irrigation. In addition, as pointed out by Rubí and Murillo (2014) – both National Water Authority staff members – important insights with respect to the water resources and the uses they are put to are gained by the National Water Authority through the water rights allocation process itself.

The vast majority of the concessions of water rights for irrigation, namely 97 (81%) out of the 120 concessions to date for irrigation, have been granted to companies rather than to individual farmers. In most cases (87 of 97), these companies were represented by a lawyer during the application process. As already indicated, the sugar cane estates were the early movers with respect to formalizing their irrigation water use when this became possible in late 2010. As shown in Figure 1, sugar cane estates accounted for 16 of the 19 concessions of irrigation water rights granted in 2011. Although the sugar cane estates have now been joined by other types of agricultural companies, so that today the sugar cane sector accounts for 'only' 54% of the concessions for irrigation, it still accounts for most of water for which irrigation use rights have been granted.

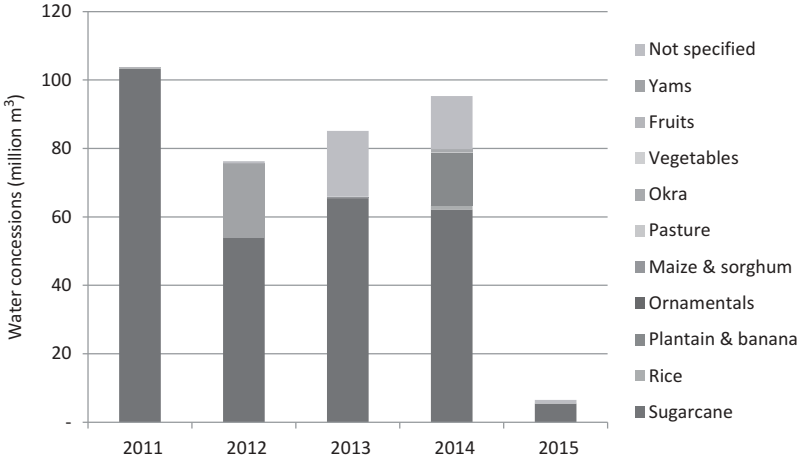

Figure 2. Water quantity conceded for irrigation by the National Water Authority, 2011–2015, by crop to be irrigated (115 concessions total). Source: Own elaboration based on review of the national gazette, *La Gaceta – El diario oficial de Nicaragua* (August 2010 to 29 February 2016, available at http://www.lagaceta.gob.ni), and the National Public Registry of Water Rights.

Note. Whether the small number of water use rights concessions granted for irrigation in 2015 is due to a decline in 'demand' for such concessions or to failure on the part of the applicants to publish the administrative resolutions in the national gazette, is unfortunately unclear.

Virtually all of the water given in concession for irrigation by the end of 2011 was for the irrigation of sugar cane, and combined for the period 2011–2015, 79% of the total volume of water for which irrigation water use rights had been conceded was conceded to sugar cane estates (Figure 2). In addition to a wish to comply with existing legislation, a strong incentive which allegedly has contributed to motivating the sugar cane estates to formalize existing or planned irrigation water use has been the requirement to document legal compliance, including with respect to water access, from financial institutions such as the International Finance Corporation (IFC, 2012) as well as increasingly also in commodity markets, including the biofuel market (Ponte & Daugbjerg, 2015), for which an increasing share of the sugar cane is destined (personal communication, National Water Authority officials, January 2014). This has repercussions for the standards which are gradually evolving, e.g. under the auspices of the UN Global Compact (e.g. the CEO Water Mandate[32]), within the World Economic Forum,[33] etc. (Daniel & Sojamo, 2012; Mason, 2013). Sugar cane is a commodity in expansion in Nicaragua from an annual production of 4.3 million tonnes in 2008 to 7.0 million tonnes in 2013 (FAOSTAT, http://faostat3.fao.org/). Part of this expansion has been financed by the IFC.[34] Moreover, sugar cane consumes large volumes of water. This has made the sugar cane sector particularly forthcoming with respect to soliciting the formalization of their water use and thus investing the resources necessary in terms of contracting the services of lawyers as well as of hydrologists to undertake the technical studies required to accompany the applications.

Although just starting to appear in the administrative resolutions published in the national gazette, tobacco enterprises have also begun to present their applications for irrigation water rights concessions. Whereas sugar cane is grown primarily in the plains

along the Pacific coast, tobacco is primarily grown on the river banks in between the hills of the northern part of the country. Formerly, tobacco was primarily grown by cooperatives and more recently also by small-scale farmers under sharecropping agreements with the cigar manufacturers (Gómez & Ravnborg, 2011). Lately, however, enterprises, including those of the cigar manufacturers themselves, also appear to be engaging directly in the growing of tobacco (personal communication, district environmental officer, Estelí District, 22 June 2015). As this is a high-end niche market, with the tobacco destined for the production of high-quality cigars for export, demands for legal compliance and meeting social and environmental standards are gradually transmitted through the value chain. As an example, Nicaragua now has one of the first producers of organic cigars (Savona, 2013). Thus, the recognition of the rapidly growing water demands[35] – and actual withdrawals – in the northern part of the country for the irrigation of tobacco, combined with the need of the tobacco industry to formalize their irrigation water rights, contributed to the decision of the National Water Authority to establish its first and to date only functioning territorial delegation in Estelí, in the northern part of the country. Again, though, the institutionalization of the water rights regime through the National Water Authority in the case of the northern part of the country, reinforced through the establishment of the territorial delegation, has come at the cost of the efforts formerly undertaken by several of the district authorities in the area to regulate the use of available water resources. Using the legal provisions of the district law to issue district by-laws to encourage the prudent use of water for irrigation during the critical dry-season months, district authorities in several of the northern districts have made considerable efforts to ensure that sufficient water is available for domestic uses as well as for livestock keepers, small-scale irrigation of food crops, etc. (Ravnborg & Gómez, 2015). With the establishment of the new water rights regime, and particularly in the absence of cooperation agreements with the National Water Authority, district authorities have become legally excluded from playing this role. This has created what several district environmental officers refer to as "a water governance vacuum", as no other institutional body has been able to effectively fill this role (Gómez & Ravnborg, 2011; Ravnborg & Gómez, 2015).

Moreover, the fact that the new water governance regime has been only partially implemented has introduced a new source of water insecurity for the many farmers to whom the option of formalizing their right to irrigation water through a district-issued authorization has so far been unavailable. According to the criteria in the water law, approximately 9000 farmers use minor quantities of water for irrigation (irrigating less than 3 ha) and should therefore be entitled to formalize their water right by means of a district-issued authorization (Table 1). The number of farmers for whom, according to the more recent (2010) water law regulation, a district-issued authorization would suffice, is less clear due to the ambiguity in the term "industrial market". Depending on how "industrial market" is defined, the estimated number of farmers for whom a district-issued authorization would suffice ranges from 3522 to more than 10,000 (Table 1). At any rate, in terms of irrigated area as well as volumes of water withdrawn, these farmers count for only a fraction of the irrigated area (10–20%, depending on the criterion used – Table 2). Moreover, due to their relying on irrigation techniques regarded as water saving (drip and manual irrigation) to a higher extent than farmers required to solicit a concession (Table 1), this fraction is likely to be even smaller.

Table 2. Profile of farms with irrigation according to irrigation type and type of legal water right requirement. Figures are area under irrigation (hectares).

	According to 2007 water law			According to 2010 water law regulation			
	Requiring concession	Requiring authorization	*Requirement unknown*	Requiring concession	Requiring authorization	*Requirement unknown*	
Irrigation type[a]	Irrigated area > 20 ha	Irrigated area ≤ 3 ha	*Irrigated area > 3 ha and ≤ 20 ha*	Farm area > 70 ha	Farm area ≤ 70 ha and produce intended for own consumption	*Farm area ≤ 70 ha but significance of "industrial market" is unclear*[b]	Total
Gravity[c]	38,646	3,753	*4,447*	46,531	1,428	*8,703*	56,663
Sprinkler[d]	21,540	1,987	*2,026*	24,504	605	*3,695*	28,804
Drip[e]	1,413	187	*198*	3,928	430	*1,276*	5,634
Manual[f]	512	1,518	*597*	629	595	*1,430*	2,654
Other[g]	1,190	147	*240*	5,302	108	*222*	5,632
All[h]	63,302	7,592	*7,507*	61,903	2,775	*13,723*	78,401

Own elaboration on the basis of the Fourth National Agricultural Census (INIDE, 2011).
[a] Each farm with irrigation may have more than one type of irrigation system.
[b] The census records whether the produce from a farm is primarily for own consumption or intended for the national market or for export. Assuming that farms smaller than 70 hectares and from which the produce is primarily for own consumption will be required to apply for an authorization rather than a concession, the degree of water right formalization achieved to date ranges between 1% and 10% in terms of number of farms.
[c] The area under gravity irrigation is unknown for 5 of the 4980 farms reported to have gravity irrigation.
[d] The area under sprinkler irrigation is unknown for 1272 of the 4037 farms reported to have sprinkler irrigation.
[e] The area under drip irrigation is unknown for 4190 of the 5774 farms reported to have drip irrigation.
[f] The area under manual irrigation is unknown for 2340 of the 5044 farms reported to have manual irrigation.
[g] The area under other type of irrigation is unknown for 5 of the 236 farms reported to have other type of irrigation.
[h] The area under irrigation is unknown for 1338 of the 11,599 farms reported to have irrigation.

Nevertheless, water security is no less important to small-scale irrigation farmers, in terms of providing security for investment, economic outcome, and gaining or maintaining access to increasingly demanding commodity markets, than it is to farmers required to apply for a concession. Accentuating this, in catchments where the two categories of farmers compete for access to the same water, their different situations with respect to water security, produced by the partial implementation of the new water rights regime, may actually put the continued access to water and associated economic opportunities at risk for those who cannot document their formally sanctioned right to water, thereby reinforcing existing inequalities.

Conclusion: the importance of implementation in securing rights or legitimizing dispossession

From the perspective of bringing irrigation water use under statutory jurisdiction, progress has been made as the implementation of the Nicaraguan water law gained pace following the establishment of the National Water Authority in 2010. With a relatively small staff and an even smaller operational budget, one-third of the volume of water which FAO estimates is withdrawn annually for irrigation in Nicaragua has been brought under statutory jurisdiction through the concession of water use rights. Yet, at the same time, precisely because of these budget constraints, which e.g. prevent the National Water Authority from undertaking independent technical studies and thereby make it rely on studies commissioned by the applicants, the National Water Authority has de facto become what could be described as a legalization service provider. Rather than being the *custodian* of Nicaragua's water resources, the regulatory role which the

water rights regime was intended to enable, the National Water Authority has primarily acted in response to water users wishing to formalize their water right.

Moreover, the apparent hesitation on the part of the National Water Authority to conclude and formalize cooperation agreements with district authorities has significantly hampered the accomplishment of the intention of the water governance reform to ensure "sustainable and equitable use" of Nicaragua's water resources. First of all, it has discouraged, if not put a halt to, previous efforts undertaken by district authorities to regulate water use, primarily in order to safeguard water security for domestic water users and thus uphold the order of priority among different types of water use as stipulated in the water law. As nobody has taken over this role, this has created in many districts a water governance vacuum.

Second, the partial implementation of the water rights regime envisaged in the water law means that while a limited number of farmers and companies have obtained legally sanctioned rights to a significant part of the water resources estimated to be used in Nicaragua every year for irrigation, the majority of Nicaragua's irrigated farms, namely those using only minor quantities of water, are left in a legal and administrative limbo. Up to now, they have been prevented from formalizing their current water use for irrigation through legally sanctioned water rights by means of what was initially envisaged as a more accessible, district-issued water use authorization process through their district authority. While at best these thousands of small-scale farmers are not hampered in their endeavour to supply their families as well as the national and international markets with anything from beans, fruits and vegetables to coffee and tobacco, at worst this failure to regularize the existing water use, particularly of small-scale farmers, may weaken their water security to the extent of putting at risk their continued access to water, as well as to economic opportunities in the growing number of markets concerned about social and environmental responsibility.

As competition for water intensifies, this new dimension of inequality, namely that of legal water security, produced through the very choices made during the process of implementing the water governance reform, may turn this legal water insecurity into actual dispossession of water access. Thus, independently of the water legislation as such, the very process through which any given water legislation is implemented is of crucial importance in shaping its wider societal outcomes.

Notes

1. This and subsequent quotes from the Nicaraguan water law (Law 620) are my own translations.
2. Law 620, Articles 1, 2 and 14c.
3. More administrative resolutions issued during 2015 may still appear in the national gazette, published from 1 March 2016 and onwards.
4. The last review of the National Public Registry of Water Rights was undertaken in April 2015.
5. http://www.simas.org.ni/noticias/28/2004-10-14-sociedad-civil-presenta-proyecto-de-la-ley-alternativo-de-agua/, last consulted 25 November 2015.
6. Law 620, Preamble, Article 3.
7. Law 620, Preamble.
8. Law 620, Article 4.

9. Law 620, Article 1.
10. Law 620, Preamble.
11. Law 620, Article 14.
12. Law 620, Article 41.
13. Law 620, Article 2.
14. Law 620, Articles 24–30. The 2010 regulation (Articles 13 and 17) states that the director of the National Water Authority has rank of minister.
15. Law 620, Articles 37–40.
16. Law 620, Article 40.
17. Law 620, Article 46.
18. Law 620, Article 46.
19. Law 620, Article 49.
20. The water law only specifies this as an obligation for the National Water Authority.
21. Law 620, Article 65; Decree 44-2010, Article 23.
22. Decree 44-2010 replaced the regulation elaborated shortly after the water law was passed in 2007 (Decree 106-2007).
23. It has not been possible to develop a comprehensive overview to document the number of administrative resolutions issued by the National Water Authority published in the two major Nicaraguan national newspapers, *El Nuevo Diario* and *La Prensa*. However, according to our archival reviews, at least 117 of the 433 administrative resolutions (27%) were published at least in one of them, while 3 resolutions were published in both. Thus, at least 98 of the administrative resolutions have been published both in the national gazette *and* in at least one of the national newspapers.
24. More concessions may have been granted but not published in the national gazette and/or registered in the National Public Registry of Water Rights prior to 17 August 2015, when the revisions of this article were concluded. The last consultation of the National Public Registry of Water Rights was made in April 2015.
25. www.ana.gob.ni.
26. http://ana.gob.ni/index.php/icons, last consulted 30 December 2015.
27. Neither the law nor its regulation strictly requires the application to be accompanied by the development of hydrological studies (in the case of surface water) or hydrogeological studies (in the case of groundwater). Rather, these studies are referred to as the basis for evaluating the application. In the practice which has evolved since 2011, the obligation to prepare the hydro(geo)logical studies rests with the applicant, who also contracts and pays for the study.
28. Law 620, Articles 46c and 49e.
29. Law 620, Article 71.
30. Ibid.
31. The 2001 National Agricultural Census available at the time of preparing and passing the law contained only limited information on the use of irrigation as compared to the 2011 National Agricultural Census.
32. http://ceowatermandate.org/.
33. https://www.weforum.org/projects/global-water-initiative/.
34. http://goo.gl/otlsqd.
35. According to the Nicaraguan Tobacco Association, Nicaragua had around 5000 hectares planted to tobacco in the beginning of 2015 (*La Prensa*, January 26, 2015; http://www.estanquers.cat/docs/1111.pdf).

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