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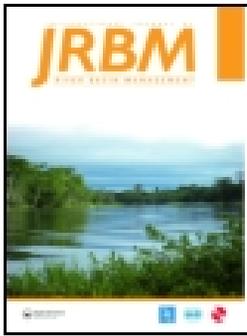
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RESEARCH PAPER



Water institutions in the Awash basin of Ethiopia: the discrepancies between rhetoric and realities

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ABSTRACT

This paper strived to describe the features of water institutions in the Awash basin from a historical perspective based on reviews of water laws, policies, and administrative documents, as well as interviews with water actors using snowball techniques. The result revealed that institutions had rapidly been changing but not coherently built. The most centralized duties and powers of institutions, coupled with financial and technical limitations created difficulty in enforcing the laws. The policy was comprehensive and inculcated the principles of Integrated Water Resource Management. Yet, it did not properly cascade down to the lower level as it was fundamentally top-down. Several stakeholders were not involved in the policy-making process. Water institutions were overwhelmingly more rhetoric than action oriented. Customary water institutions were undermined. Therefore, critical steps need to be taken towards enforcing formal water institution, recognizing the role of customary practices, and involving the key stakeholders, and building the capacity of actors to minimize water insecurity in the basin.

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Awash basin; administration; Ethiopia; institution; laws; policy; water insecurity

1. Introduction

The Awash basin is the first basin¹ in which modern agriculture was introduced as early as the 1950s. It is the most highly utilized basin in Ethiopia (Abraha 2006, Berhe *et al.* 2013). The Awash Valley Authority (AVA), established by Notice No. 299 in 1962, was the first institution responsible for water infrastructures constructing, allocating, collecting water fees, and administering (Imperial Government of Ethiopia (IGE) 1962). The management of Awash River basin has passed at least through three socio-political reforms. The first reform started with the establishment of commercial farms followed by the formation of the AVA with the motive to modernize agriculture. In this era, the basin had attracted several large-scale national and foreign firms such as Italian AIE (*Agricoltura Industriale del Etiopia*), Dutch HVA (*Handels Vereniging Amsterdam*), British Mitchell Cotts, Israeli, etc. However, the endeavours were never sustained and coordinated partly because there was not any policy and legal framework governing water use, allocation, access, and distribution at the time.

The second institutional reform corresponded with the downfall of Imperial Government of Ethiopia. The institutional reforms began with the nationalization and expropriation of all previously established large-scale and commercial farms. The reforms had put all resources including water entirely under the full control of the state (Provisional Military Administration Council (PMAC) 1978). The water was also reallocated to state farms to produce cotton, crops, fruits, and vegetables. This was also the time when institutional changes had occurred at the national level in general and Awash River basin in particular. The new institutional arrangements aimed to facilitate the transformation of agricultural and agro-industrial activities in the Awash valley into state enterprises. However, they encroached the local

communities and denied the development of private sectors (Said 1994).

The third episode of institutional change started with the re-crafting of the Federal Constitution in 1995. This was followed by other various proclamations and policies such as proclamations to establish the Awash Basin Water Resources Administration Agency in 1998; Water Works Design and Supervision Enterprise in 1998, and the Ethiopian Water Resource Management Policy (EWRMP) in 1999. Ethiopia had had water resources management policy for the first time in its history. It is serving as a guiding framework for all water-related strategies, programmes, and projects. Its major objective is to instigate Integrated Water Resource Management (IWRM) in a river basin context. The current strategy is mixed.

On the one hand, the current government is providing strong institutional backing for both private and state farms. It has also massive plans to ensure safe water for domestic purposes, to promote irrigated agriculture, watershed management, and conservation. On the other hand, the presence and dominance of the central government in water resources development and allocation are mainly focused on large-scale infrastructures such as dams and estates. The involvement of pertinent stakeholders including local community has received little attention. The problems of resource use, administration, regulation, and control are still prevalent. The water scarcity and stress are perpetuated. The major drought and flood highly hit the basin.

Despite these facts, the institutional analysis of river basins in Ethiopia in general and the *Awash* River basin (hereafter AwRB) in particular is thin. Admittedly, most of the studies conducted in this area focused on transboundary river basins such as the Nile (Gizaw 2004, Arsano 2007, Wondwossen

2008, Rahman 2012) and Omo (Carr 2017). This was mainly inspired by their geopolitical nature, and it was a complete disregard to the institutional aspects of domestic basins such as Awash. As such, the functionality of national and local laws, policies, and strategies on trans-in-boundary basins received little attention. A few studies (Flintan and Tamrat 2002, Taddese *et al.* 2005, FAO 2013) attempted to understand the overarching issues of the Awash basin. Still, they were neither systematically addressed nor sufficiently researched. With the desire to systematically understand and characterize the nature of water institutions in the AwRB, the paper intends to fill the gaps drawing on historical and political contexts. It attempts to understand the characteristics of water institutions, and how they affected water resources management.

The remaining part of the paper is organized as follows. The second part highlights the theoretical framework employed to underpin the analysis. The third part presents the methodology used to collect and analyse data. The fourth section provides the key findings. It outlines an overview of historical and political contexts. It reviews the Ethiopian water laws, policies, and administrations, as well as sheds light on the existing power hierarchies and conflicts in the basin. The final part concludes the key findings and suggests policy ideas relevant to the basin.

2. Conceptual framework

The present paper is an attempt to contribute to the discrepancies between the macro-level rhetoric of laws, policy, and decision-making and grassroots level realities of water institutions. Thus, we need to put water institutions in theoretical perspectives. Broadly, institutions comprise a wide range of issues such as organizations, policies, politics, laws, regulations, and incentives depending on the purpose we defined for. In this study, water institution is understood as an interaction of water law, policy, and administration of the formal and informal at macro and micro levels (Saleth and Dinar 2004). They decomposed water institutions into three components. The first is water law, which constitutes the general legal treatment

of water resources, water rights including customary rights, conflict resolution, legal accountability, participation, the tendency of decentralization, as well as integration. The second is water policy that treats water resource as economic and social good including pricing and cost recovery, water allocation, and policies of involvement of all category of water use (from domestic to productive) and users (ranging from local to private sector) consistent with functional water laws, as well as harmony with other sectorial economic policies. The third is water administrative organizations at various scales, which comprises spatial organizations, human resources and implementation capacity, budget adequacy, water tariff and fee systems, administrative accountability, information access, and technology application.

The above three components of water institution concur with Ostrom's (1990, 2011) common pool resources governance system. She explained that the 'rule of law' is the general legal framework taken from constitutional-choice rules. The water policy coincides with the collective-choice rules that may be adopted authoritatively to device their operational-choice rules. It is administrative mechanisms that help the rules interpreted to actions. In this study, water laws and regulations have a constitutional foundation. Water policy, often aligned with the water laws, is a political process to provide directions for the entire water resource management. In this sense, the water administrations are organizations that are tailored to particular procedures and operational rules to implement water laws and policies within a given institutional framework. Thus, they are interactively linked to one another. While water law empowers water policy, water policy provides a political economy framework for water law. The two determines how organizations operate and the capacity of the water administration to implement the legal and policy provisions at the basin level (Figure 1). This paper hypothesized that water institutions in the basin are characterized by poor institutional arrangement and pervasive coordination failures that risk water security. It is mainly due to either lack of proper institution or inability to implement the water resource laws and policies.

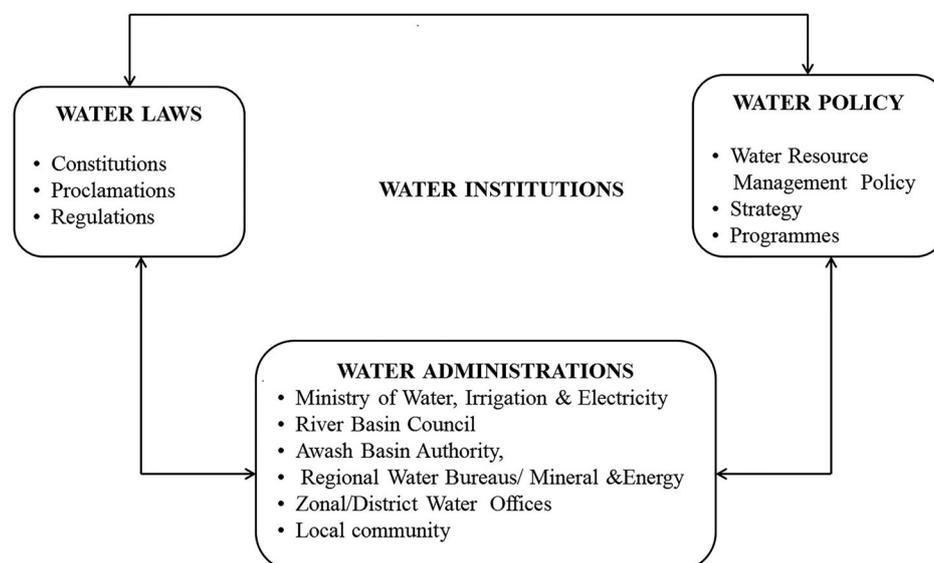


Figure 1. Conceptual relationships of water institutions. Source: Elaborated based on Saleth and Dinar (2004).

3. Methods and approaches

3.1. The Awash River basin: an overview

This study was conducted in the AwRB of Ethiopia. It is situated between latitudes 7°53'N and 12°N and longitudes of 37°57'E and 43°25'E (Berhe *et al.* 2013). The basin constitutes the central and northern part of the Rift Valley and is bounded to the west, southeast, and south by the Blue Nile, the Rift Valley lakes, and Wabi Shebele basins, respectively (Abraha 2006) (see Figure 2). The basin covers a total area of 110,000 km² with a length of 1200 km. Based on Central Statistical Agency projection (2013), it is a home for about 18.3 million dwellers. It terminates within the national boundary in the salty Lake Abbe bordering Djibouti (FAO 2013). More than 70% of the country's large-scale irrigated agriculture is located along the Awash River (Achamyeh 2003) and some 77.4% irrigable land was irrigated in 2012 (FAO 2013). Several other projects are under government-planned irrigation development programmes.

3.2. Research process

The study followed the qualitative approach. It involves the analysis of water policy, proclamations, regulations, and administration. The data were collected between October 2015 and January 2016 at multiple scales. About 50 questionnaires were sent to pertinent experts and professionals from public and private water sectors, academia, donors and NGOs, and other volunteer professionals. In order to obtain relevant respondents the snowball sampling technique was applied. Nevertheless, out of 50 questionnaires sent to the respondents, only 15 were appropriately completed and returned. The questionnaire aimed to assess the

appropriateness and effectiveness of the existing institutional framework in the AwRB. In addition, 29 key informants (experts, managers, community elders, water users associations (WUAs), officials, and consultants) were consulted in-depth. The purpose was to obtain detail information on nature of water institutions in this particular basin. In order to manage the process of data collection, semi-structured checklists were used.

Furthermore, documents and archives from water laws, water policy, and water administrations were reviewed and crosschecked with interviews. The documents and archives from *water laws* included Awash Valley Authority establishment Notice No. 299/1962, National Water Resources Commission (NWRC) order No. 75/1971, Agrarian Reform Proclamation No. 31/1975, Proclamation No. 142/1978 for the Establishment of the State Farms Development Authority, Water Resources Utilisation Proclamation No. 92/1994, the Constitution of the Federal Democratic Republic of Ethiopia Proclamation No. 1/1995, Ethiopian Water Resources Management Proclamation No. 197/2000, Ethiopian Water Resources Management Council of Ministers Regulation No. 115/2005, Awash Basin Water Resources Administration Agency Establishment Proclamation No. 129/1998, Environmental Impact Assessment Proclamation No. 299/2002, Environmental Pollution Control Proclamation No. 300/2002, River Basin Councils and Authorities Proclamation No. 534/2007, Council of Ministers Regulation No. 156/2008, and others. *Water policy-related documents* included: Imperial Government of Ethiopia the First Five-Year Plan (1957–1961), the Second Five-Year Plan (1962–1967), the Third Five-Year Plan (1968–1973), the EWRMP (1999), National Water Sector Strategy (WSS) (2001), Water Sector Development Program (WSDP) (2002), Investment Policy

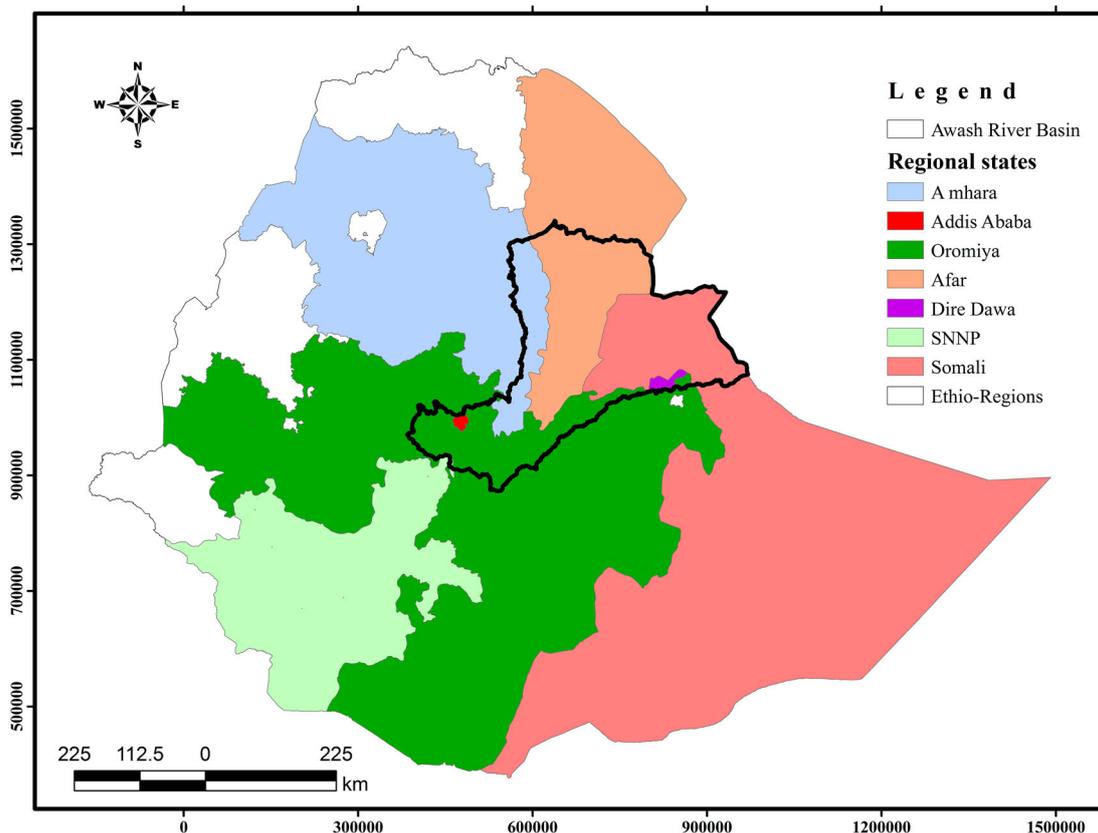


Figure 2. Regional Administrations in Awash River basin. Source: Own processing.

(varies), Universal Access Plan (UAP) (2011–2015), and others. Water *resources administration* related pieces of evidence were collected and collated from representatives of Ministry of Water, Irrigation and Electricity, Regional Bureaus of water resource, Agriculture and Natural Resources, Irrigation Development Agency, Zonal Water Resource and Agricultural Offices, District Agricultural, Water Resource, and Irrigation Development Offices in Oromia, Afar, and Amhara, Awash River Basin Authority (AwBA), and local communities, as well as WUAs.

Moreover, archives, reports, project documents, and gray literature were consulted. The data were carefully summarized, crosschecked, analysed, and narrated where appropriate employing content and context analyses.

4. Findings and discussions

4.1. An institutional scenery in the Awash basin

Some people believe that water is the gift of God. Some say it is the property of the society. Some still say it is a public resource [good]. I say water is the property of the powerful man. (Haji Fentale Hawas, Age 82)

The first modern irrigated agricultural development in the basin was undertaken by a Frenchman called Saboret who grew cotton and banana near *Awara Melka* in 1905. Later, it was owned by an Italian national until it was nationalized in 1975 when it became part of the *Awara Melka State Farm* (Malifu 2006). The first hydropower plant was built on the *Akaki River*, one of the tributaries of the *Awash River*, by Emperor Menelik II in 1912 on the *Awash River*. The purpose was to electrify his palace and a group of small factories in Addis Ababa (Carr 2017). In 1929, Emperor Hailesillassie established *Ras Teferi's farm* that extended over 80 km at *Errer*. The farm was managed by an Italian citizen, Angelo Pastorelli, and irrigated citrus fruits, coffee trees, and grapes were harvested. The products were directly sent to Djibouti and Addis Ababa via railway (Malifu 2006). In 1932, the first dam, *Abba Samuel*, which is about 30 km from Addis Ababa was constructed on the *Akaki River* with the aim of providing hydroelectric power to metropolitan areas. The development in the basin continued even during the Italian occupation (1936–1941). *Agricoltura Industriale del Etiopia*, an Italian company, started sugarcane plantation on about 1600 ha. After Italian expulsion from the country, a Greek, *Lazarides*, had taken over until the Dutch HVA acquired the farm in 1951. In 1954, the farm was christened to be *Wonji Shewa* sugar plantation.

The growing enthusiasm for the development of the basin motivated the Imperial Government of Ethiopia to request United Nation Development Programme Special Fund (UNDPSPF) to appraise the land and water resource of the valley for further development. UNDPSPF came up with some policy measures including the need for institutional setting to control, use, and charge water. Moreover, as a part of First Five-Year Development Plan of the Emperor (1957–1961), the assessment prioritized to work on the forms and procedures of agricultural development, concessions, settlements, and other matters with the *Awash valley dwellers* (IGE 1971).

In 1960, the *Koka dam* was completed by a Norwegian company called *Norconsult* in the downstream of the dam, the commercial large-scale farms such as the Dutch HVA company for

sugar and the British firm *Mitchell Cotts* for cotton were interested to start farming (see Flintan and Tamrat 2002, Clapham 2006). *Wonji Shewa* and *Metahara Sugar Factories* started operation in 1968. A year later, in 1969, the *Awash National Park*, which covers 803–830 km² area, was gazetted by Notice No. 54. However, the park had already expropriated the land and established in 1966. The inauguration of the park had displaced *Kereyu* and *Afar Pastoralists* from key grazing areas, which are still claimed by the local community. Some important timelines in the basin are outlined in Table 1.

By 1970, several farms were already operating around *Amibera*, *Tendaho*, *Abadir*, *Nura Era*, *Melka Sedi*, etc. These developments consistently denied the pastoralists access to critical water points in the *Awash riverbank*. The then planners deliberately made the basin level water management institutions support capitalist enterprises. One of such motives was the establishment of centralized Water Resources Department in 1956. In 1962, the Ethiopian experts visited and emulated valley development approach from the USA's iconic *Tennessee Valley Authority (TVA)* and founded *AVA*. This was followed by the establishment of the *National Water Resource Commission (NWRC)* in 1971 to harness water resources development in the valley.

Overwhelmingly, during the Imperial regime (1929–1974) water resource was associated with landlordism. During this regime, the landlords grabbed the fertile and suitable lands originally under the control of the traditional chiefs and local clans in the *Afar* and *Kereyu* as the quest for water in the basin has heighten. Discussion with local elders proved that there was no consensus on the water allocation and

Table 1. Milestones of major institutional developments in the Basin.

Year	Major development undertaken
1912	The construction of first hydropower plan on the <i>Akaki River</i>
1932	Construction of <i>Abba Samuel dam</i>
1954	<i>Wonji sugar plantation</i> was established
1956	Water Resources Department was established at National level
1957	First Five-Year Development Plan (1957–1961) launched
1960	<i>Koka dam</i> was commissioned and started operation 1961
1961	British firm, <i>Michell Cotts</i> started operation in <i>Tendaho</i>
1962	<i>Awash Valley Authority (AVA)</i> was established
1968	<i>Wonji Shoa</i> and <i>Metahara Sugar Factory</i> was established
1969	<i>Awash National Park</i> Gazetted
1971	<i>National Water Resource Commission</i> Established
1974	<i>Dergue</i> seized the power
1975	Agrarian Reform Proclamation No. 31/1975 nationalized all farms
1977	The Valleys Agricultural Development Authority (VADA) was established
1978	State Farms Development Authority proclaimed
1981	<i>National Water Resource Commission</i> reorganized
1987	<i>Ethiopian Valleys Development Studies Authority (EVDSA)</i> was created
1991	<i>Ethiopian Peoples Revolutionary Democratic Front (EPRDF)</i> formed
1994	Water Resources Utilization Proclamation
1993	Ethiopia was restructured into 9 regional states and 2 city administrations; Ministry of Natural Resource and Environmental Protection established
1995	New Constitution ratified; MoWR was instituted
1998	<i>Awash Basin Water Resources Administration Agency</i> ; Water Works Design and Supervision Enterprise Regulation were established
1999	<i>Ethiopian Water Resource Management Policy</i> was promulgated
2001	<i>Ethiopian Water Resources Management Proclamation</i> was decreed
2002	Investment Proclamation; Water Resources Development Fund and Administration; <i>Ethiopian Water Sector Strategy</i>
2005	<i>Ethiopian Water Resources Management Regulation</i>
2007	<i>Basin Councils and Authorities (Proclamation No. 534/2007)</i> issued
2008	<i>River and Awash Basin High Councils and Authorities</i> decreed
2009	<i>Irrigation Development Investment Incentives</i>
2010	MoWR renamed as Ministry of Water and Energy (MoWE)
2011	The <i>Awash Basin Authority</i> was restructured with new mandates
2013	MoWE changed to Ministry of Water, Irrigation, and Energy (MoWIE)
2015	MoWIE became Ministry of Water, Irrigation, and Electricity (MoWIE)

Source: Own synthesis.

land appropriations with the state and large-scale farmers due to power asymmetry and divergence of interests. An elderly person succinctly puts how power matters to access water and land in the 1960s as follows:

The introduction of all these farms was forceful with little concern and no consensus. We were evicted from key grazing zones. For example, when we lost both Metehara for sugarcane plantations and Awash National Park area for Imperial's aesthetic value, we protested and in conflict with the state. The response was neither negotiation nor compensation. Instead, military force was used and armed conflict was ensued. We were further evicted. As a result, we often fought with our neighbouring clans to access water and pasture almost every year.

It is plausible to deduce that water allocation has been in favour of the interest of the state and the elite at the ignorance of the riparian. It mainly geared natural resource management policy to the private and state large-scale farms, which possessed strong institutional backing from the central government at the expense of local community.

In 1974, the socialist regime (1974–1991) seized power with *coup d'état*. It ended the landlordism flourished during the Imperial era through radical land reform² in favour of the state and peasants. All private farms and plantations in the basin were expropriated and nationalized, reorganized, and re-established under the new institutional arrangement. The PMAC had issued Proclamation No.142/1978 for the establishment of the State Farms Development Authority to coordinate and administer the large-scale state farms (1978). Almost all these farms were in the AwRB. Nevertheless, the farms were not efficient under new institutional settings. As a result, some of the irrigation schemes were abandoned due to siltation and poor management. One of the experienced consultants regarding institutional issues in the basin vividly explained that the situation of water management was totally wasteful. He substantiated that

Since 1962 there were several large-scale farms attracted by the basin's suitability for irrigation. During the socialist regime all lands, including commercial farms, were nationalized in the Upper, Middle, and Lower sub-basins. They became state farms. The water use of these farms had been inefficient. The trend continued even after privatization of some of these farms because there were no strict rules governing them. The farms had only taken into account the output not the input- water and land quality. Sadly, there was also no vibrant, functional, and responsible body regulating the water use system. As a result, thousands of hectares were abandoned. The reclamation of some of this land had incurred huge costs.

The socialist regime was overthrown in 1991, since then, the coalition of political parties, the EPRDF, has ruled the country for the last 26 years. It is striving to support the expansion of agro-industries and plantations in the basin, and to this end several institutions were restructured. The new constitution, policy, and administration were introduced. Moreover, decentralization policy and institutional reforms were initiated since the 1990s. One of such reforms was to put water resources institutions in place as we shall see in the subsequent sections of this paper.

The current government has been expanding state-owned large sugarcane plantations such as Wonji, Methahara, Kesem, and Tendaho to meet the growing need of sugar, as well as to generate income. It has been privatizing some state farms in the basin. The political doctrine of 'democratic developmental state' has encouraged the expansion of several irrigated large-scale cotton, floriculture, horticulture, cereal

farms, and industries. As a result, water resource competition, scarcity, and misuse are growing. The rivers and basin environments are polluted. The water flow is diminishing. Water distributions and allocations of water resources for various purposes remain unregulated. Gradually, water resource is deteriorating that the basin is not in a position to provide sufficient water on a sustainable basis.

In summary, the institutional settings in the past had commonality in terms of centralizing water resource management similar to the observation of Keeley and Scoones (2000). These institutions were affiliated to particular political ideology. The development projects had undermined the livelihood of the local community due to underdevelopment of water institutions in the basin. The development projects so far implemented were highly contested socio-politically and environmentally (Flintan and Tamrat 2002). Institutional changes were overwhelmingly discontinuous. Such institutional arrangement has been perpetuating water scarcity and stress, droughts, and flood incidences.

4.2. Water laws: constitutions, proclamations, and regulations

This section reviews the water-related laws since the 1960s and identifies the gaps in terms of ensuring water security with a particular focus on the basin.

The 1960 Ethiopian Civil Code: It comprised a riparian right doctrine whereby a landowner whose land was crossed or bordered by flowing water had the right to use water. This law provisioned the ownership and use of water for different activities such as domestic, irrigation, hydropower, and industrial uses. The civil code was meant for allocating water under circumstances where potential disputes might arise between upstream and downstream users. Such a doctrine was inadequate as the demand for water for various purposes increased. As a result, later on, it was replaced by the government authorities responsible for water resources management to plan and allocate its uses (Tamrat 2004).

Water Resources Utilisation Proclamation No.92/1994: The first formal water law was officially promulgated in 1994 by Transitional Government of Ethiopia (TGE) under Water Resources Utilisation Proclamation No. 92/1994. The proclamation emphasized water use permit. It mainly focused on the permit system for water utilization. The proclamation aimed to benefit investors and developers. It did not have any provision for IWRM. The presences and roles of multi-stakeholders were unrecognized. Consequently, this proclamation was never implemented due to its inherent weakness in addressing fundamental issues regarding the country's water resources management. For example, it did not take into account a river basin as the appropriate planning unit. It also lacked institutional backing to implement and reinforce the law. Thus, the decree of the proclamation was 'to put the cart before the horse'. As such, the law was not put into practice and later on repealed by Proclamation No. 197/2000.

The 1995 Constitution: In 1995 the new Federal Democratic Republic of Ethiopia's (FDRE) Constitution was decreed. It has been serving as the general political, social, economic, legal, and policy framework of all sectors (FDRE 1995). Article 40(3)³ of the constitution stated that all natural resources, including water, are 'a common property of the Nations, Nationalities, and Peoples of Ethiopia'. It guaranteed

the right to water resource for the citizen. Furthermore, Article 44(1) declares that ‘all persons have the right to a clean and healthy environment’. It seems to guarantee water security for all citizens. Some experts justified that the major reason to keep water under public control is equity. Others insisted that such a property right regime facilitates land and water grabbing for the state own particular priority (see Behnke and Kerven 2011, Bues and Theesfeld 2012) that water uses can be abused. In general, the constitution has recognized the right of people to sufficient quantity, quality, and access to water on a sustainable basis yet translating it into reality is problematic.

Ethiopian Water Resources Management (EWRM) Proclamation No. 197/2000: This proclamation was decreed to translate water resources development, protection, and utilization of Ethiopia to the highest social and economic benefit (FDRE 2000). It echoes that all water resources of the country are the public resources. And thus the proclamation emphasizes that the management of the water resources is based on a permit system. Article 7(1) of the proclamation reveals that the foremost priority of water use is domestic use (drinking, cooking, sanitation, or other domestic purposes) over and above any other water uses. It retains most powers and duties of planning, management, utilization, and protection of water resources to the Ministry of Water Resource (now MoWIE) with the little tendency of decentralizing. However, the Ministry can delegate its powers and duties such as water dispute settlements, inventory of water resources and registry of actions, permits and professional licences, water service fees and charges, and water bank protection and prevention of harmful effects to an appropriate body such as basin authorities or regional states for the sake of efficient execution of its duties. Moreover, the proclamation encourages the establishment of WUAs to utilize water for productive uses based on their initiation and the will of the users. Hitherto, the proclamation has been used as a legal framework for over-all resources management in Ethiopia.

Ethiopian Water Resources Management Regulation No. 115/2005: After five years of silence on how to implement EWRM Proclamation, the Council of Ministers issued the regulation with the objective of providing detailed provisions for the effective implementation of Proclamation 197/2000, which left many of its general provisions to be elaborated by further regulations. The regulation has detailed the permit systems, water quality control, water users’ cooperative societies, fees and charges, dispute settlement, and other miscellaneous provisions (FDRE 2005b). For example, the utilization of water resources that causes a negative impact on the environment that failed to meet the provisions of Environmental Impact Assessment (EIA) Proclamation No. 299/2002 and Pollution Control Proclamation No. 300/2002 could lead to the termination of water use permits. The regulation listed down 21 types of permit fees yet it did not outline any fee for water use charges or release of waste into water resources. Superficially, the regulation is committed to environmental goals.

The regulation still maintains the status quo of the Ministry with key roles and responsibilities. For example, the Ministry organizes and registers water users’ cooperatives for medium- or large-scale irrigations. Regional state or a city administration organ is responsible for small-scale irrigations, but the information should be transmitted to the Ministry. Similarly, the Ministry is accountable for arbitrating

water conflicts if they may arise. Sadly, grassroots level customary institutions and organizations are side-lined. These institutions are believed to better understand where real contestations are *in situ* without necessarily being intervened by the highest government organs. In addition to grassroots level, also called informal institutions, arrangements are more accessible than the formal legal system. Table 2 succinctly summarizes major water laws relevant to the Awash

Table 2. Water law, purposes, and limitations from the perspective of Awash basin.

Water law	Purpose and nature	Main limitations as seen by authors
1960 Civil Code of Ethiopia	Premised on the riparian rights doctrine	It could serve to settle disputes might arise between upstream and downstream users but difficult to implement
Agrarian Reform Proclamation No. 31/1975	Redefined property rights and access to land; gave the state as the trustee of the people	Rights holders had only use rights of the land and water they had accessed. The private sector was denied
Water Resources Utilization Proclamation No. 92/1994	Focused on the permit system for water utilization	Side-lined the presence and role of multi-stakeholders; accorded primacy to investors and developers and thus not implemented
The 1995 Constitution	Provided broad framework that water is a state property and provision of clean and healthy environment for all	Basin organization was not recognized; customary water institutions were bypassed; blurred the roles of the federal and regional governments in the basin
Water Resource Administration Agency proclamation No. 129/1998	Meant to coordinate, administer, allocate, and regulate the utilization of surface water resources of the Awash basin	Headquartered at Amibara; no clear budget sources; limited human capacity; the agency has not survived and re-established and restructured
Ethiopian Water Resources Management Proclamation No. 197/2000	Aimed to put the water resources of Ethiopia to the highest social and economic benefits for its people through appropriate protection and due management; introduced RBOs and IWRM approaches	The Ministry centralized major responsibilities though it can delegate to region or a basin authority; permit systems (pollution control) standards are vague; ignored customary water institutions
Ethiopian Water Resources Management Regulation No. 115/2005	Detailed the implementation of the Proclamation No. 197/2005 such as the permit systems, water quality control, water users’ cooperative societies, fees and charges, dispute settlement, and other miscellaneous provisions	Delayed for 5 years between the publicizing of the Proclamation and Regulation; centralized key powers and duties such as permit system and conflict arbitrations or conflict resolutions
River Basin Councils and Authorities proclamation No. 534/2007	Need for technical support to the Basin Higher Council (BHC) and MoWIE on dispute settlement, allocation and use of water resources in the basin; promoted IWRM through river basin authorities	Overlapping roles and responsibilities with regional states, AwBA, the MoWIE, and BHCA, which may cause controversy; fragmentation of responsibilities and inadequate coordination with water-related sectors

Source: Own synthesis.

River basin in Ethiopia along with their purposes and limitations.

River Basin High Councils and Authorities (BHCA) Proclamation No. 534/2007: The proclamation is meant to implement IWRM through the river basin planning approach. It is hoped to serve towards the effective, efficient, and sustainable management of water resources. The proclamation recognizes 12 river basins of Ethiopia including AwRB. The BHCA has the highest power and duties serving as the secretariat of the basin authority. The law has transferred some of the powers of the MoWIE to the basin authorities and regional states on the intention that the later could implement IWRM more effectively. Yet, it is vague whether the BHCA will be the highest decision-making body for the river basins because it is not functional.

4.2.1. Customary water by-laws

Customary institutions are essential when considering water as common goods or public goods (Rahmato 2007). Since unmemorable time, they have been engaged in water resource use, allocation, distribution, regulations, and conflict resolutions. Nevertheless, the formal water institutions have not recognized them. For instance, Bruns and Meinzen-Dick (2005) believe that the inclusion of customary institutions in the modern constitution enables the public officials to manage public affairs through understanding the value systems that govern the indigenous politico-social institutions. It is, thus, evident that there are realities of water right-related convergences between customary and modern water institutions for sustainable water resource management. The customary institutions have an immense role in water resource management and are proven to be resilient. They govern grassroots level working rules and regulations. The typical examples are the *Konfi* system of *Borena Oromo* (Tache and Irwin 2003), which have been managing water resources under both surfeit and scarcity. Such practices are not recognized as a key institutional arrangement for water resource management by formal institutions in the basin.

We came across that there are both collective and group rights over water use. WUAs are a group ownership mainly for irrigation purpose and hence recognized by water laws. Still, an individual can store/harvest water and own water resources for any kind of use. In the basin, local level conflicts over water allocation and use are prevalent, which are often settled by clan elders. Such institutional arrangements facilitate amicable access to water and grazing areas. Furthermore, the perception of the experts showed that roles of customary institutions are numerous. These institutions uniquely involve the local community, resolve water-related conflict, mediate equitable resource access, and empower women and disadvantaged groups. In addition, when the formal water resources policy fails to function to meet the interest of the voiceless, customary institutional arrangements have magnificent roles at the grassroots level. Field evidence reveals that the tradition of consulting these institutions as pertinent stakeholder remains weak. As a result, ground-level implementation of the formal water institutions is challenging. The aspirations to instigate IWRM in the basin without the premise of local participation are unlikely that top-down institutional crafting is unsustainable and would shortly obsolete. The formal arrangements may exist on the paper can but be never implemented on the ground. They are particularly ineffective to resolve escalating conflicts

among the plantation farms, pastoralists, as well as small-scale commercial farms during the water scarce season. Therefore, a systematic means to address the source of conflict require recognizing customary institutions.

We believe that any water institutional crafting should unleash the potential of customary institutions. The typical example in the particular basin is the *Mallaqa Bishaanii* (water budgeter) in the Fentalle area which manages from water acquiring to utilization (Table 3). Similarly, *Yewuha Abbat* (Father of water) in the Amhara region of north Shewa can be cited as successful customary water resources managers. It is an elected committee which is responsible for community-based small-scale irrigation schemes water resources distribution/allocation. This committee is an informal arrangement. However, some *Yewuha Abbats* have evolved into formal WUAs. Both of them determine the irrigation interval, rotation, timing, and resolve conflicts among users. The committee has governing by-laws. Their decisions are respected. The major criteria for water allocation are usually based on the size of land. When the water supply decreases in the dry season, usually between April and May, *Yewuha Abbat* is responsible for water reallocation depending on the available water to avoid conflicts.

It is possible to harmonize customary water institutions with the formal water law. However, the institution should be demand-derived rather than induced externally. The formal institutional arrangement can provide the legal and capacity backing while customary institutions play critical roles in water allocation, distribution, conflict resolution, and policy implementation at the local level. By and large, the recognition of customary institutions is very useful for effective water resource management. Furthermore, the stake of the local community could complement the effort to establish IWRM activities at the basin scale.

4.2.2. Gaps in water laws

The overall evaluation of the experts revealed that water laws are centralized. In addition, the legal provision underestimated the role of customary institutions and the participation of the local community in water resources development and

Table 3. An illustration of customary water institution in the Awash River basin.

A committee drawn from the local elders called *Maallaqa Bishaanii* is responsible for day-to-day water access of all people. It is quite similar to WUAs. *Maallaqa Bishaanii* is responsible for day-to-day water allocation, distribution, conflict management, and determining priority for the users. It has equivocal on decision-making and administers all aspects of water access. This is the mechanism that helps the community to secure water event under scarcity. The *Maallaqa Bishaanii* checks to the extent possible that every drop of water is properly managed. It is accepted by all members of the community and democratically elected members. The committee is unidentified. It can be toppled when it misbehaves, for example, biases and impartially in water allocation and distribution committed. The *Maallaqa Bishaanii* allocated water equitably irrespective of economic, social, and gender disparities. The allocation is solely based on the wisdom and observation of the *Maallaqa Bishaanii* and crop water demand. Besides, it has a responsibility to negotiate with large-scale plantations over water access in case water access is blocked. Representing the need of the community, such arrangement addresses the problem of water to the district and the factory. Such traditional water allocation mechanism has a long history in *Hararghe*- an adjacent Zone. The *Maallaqa Bishaanii* is not paid formal salary but it collects fines from violators of rules and regulations. This money can be used for the operating expenses of the *Maallaqa Bishaanii* upon the decision of the local elders. The members enjoy the privilege to serve their society not the payment. *Maallaqa Bishaanii* is transparent and accountable to local community not to the local government. However, it works with all walk of stakeholders including government, sugarcane plantations, and households.

Source: Own data.

management. In fact, the impact of previous and existing water laws in addressing efficient and equitable water use in the basin is questionable. Some key informants questioned whether the law itself should be revised or not. On the one hand, there are several issues that the existing laws do not address such as the role of customary right, conflict resolution in trans-regional context, EIA and reviews, permit systems, among others. On the other hand, the proclamations and regulations are sporadically implemented and reinforced by the AwRBA as River Basin Organization (RBOs). Hitherto, the permit system does not establish the water fee and use charges. Finally, water laws have lacunae in addressing emerging contexts such as climate changes, urbanization, population, and economic growths.

4.3. Water policy, strategy, and programmes

4.3.1. Ethiopian water resource management policy

In 1999, Ethiopia has devised water policy for the first time to promote the socio-economic development of the country. It ostensibly urged to resolve the overarching problems of water insecurity across the country. The policy came up with the overall goal of enhancing and promoting all national efforts towards efficient, equitable, and optimum utilization of available water resources of the country for the significant socio-economic development on a sustainable basis (MoWR 1999). The policy encourages step-by-step institutional crafting following the principles of IWRM. It advocates the river basin as a unit of planning. Its content is superficially quite comprehensive. It introduced RBOs as the fundamental planning unit for entire water resources management. The principle of water resource development, use, and allocation is mainly centred on the permit system. All uses require licencing from relevant government authority on the belief that the permit-oriented water management could create fair distribution and sustainable use.

The policy-making process was criticized for centralizing most powers and duties regarding water resources management. It also provided little space for the involvement of 'external body' such as donors, private sectors, Civil Society Organizations (CSOs), NGOs, as well as the local community in the process. The policy recognized that these stakeholders have practical roles in water supply and sanitations (WATSANs), small-scale irrigation development, organize, and train WUAs at the community level. They also provide technical and financial supports to the water sector. Notwithstanding, at the time of policy drafting, these stakeholders were not part of the policy advocacy or had no space to generate policy ideas. The Ethiopian policy-makers were not comfortable to the involvement of these stakeholders in the policy-making process. They rather argued that policy-making is the question of ownership albeit, all owners must not be involved. Regarding the involvement of NGOs, CSOs, and donor agencies, they qualify their justifications by stating that 'the policy was meant for Ethiopia and thus the Ethiopian citizenry need to be consulted primarily' with the presumption that the NGOs and donors are *external bodies*.

Above and beyond, the policy provided a framework to implement water resources management and development for river basin management as a whole. It calls for 'appropriate institutional framework from the national to the regional and lowest administrative levels in accordance with the evolving forms of decentralised management' (MoWR 1999).

Similarly, there are sector-specific policies and strategies, which are consistent with the specific water policy as described in Table 4. Yet, the policy alone could not guarantee water security unless it is usable and implementable on the ground. What most matters is the involvement of pertinent stakeholder, ownership, and efficient institutions to translate the policy statements into action.

4.3.2. Water sector strategy and programmes

The policy was followed by National WSS in 2001 in order to implement and cascade down the policy intents into strategic directions. Consistent with the policy, WSS was a road map for IWRM. It took into account basin, sub-basin, inter-basin transfer, and other possible hydrological boundaries (MoWR 2001a). Water harvesting and watershed management practices were treated as a key instrument to achieve water security, which was barely emphasized in the policy. It also gave utmost water allocation priority to WATSAN and water for livestock. Waters for irrigation, hydropower, and environmental water flow have given secondary importance.

In order to translate WSS into programmatic context, WSDP was designed in 2002. The programme was formulated for a 15-year period with three major priority areas: water supply and sewage (2002–2006), irrigation and drainage (2007–2011), and hydropower development (2012–2016) (MoWR 2002). Similar to water laws, the policy, as well as the strategy, the programme stressed the basin as a planning unit for the development and management of water resources. The programme was also harmonized with the Millennium Development Goals (MDGs) related to water, which aimed to halve the proportion of people without sustainable access to safe drinking water by 2015. Moreover,

Table 4. Water-related policies, focus area, and their limitations.

Related policies, strategies, and plans	Focus area	Main limitations regarding water as seen by the authors
The sustainable development and poverty reduction programme (2000–2005) (MoFED, 2002)	Support water harvesting and small-scale irrigation and focus on increased water resource utilization to achieve food security; promote decentralization of service provision	Quite ambitious but did not ensure stakeholders' participation and strengthen partnerships; water committees, water boards, and WUAs, professional and civic associations established but not sustained
Plan for accelerated and sustainable development to end poverty (2005–2010) (MoFED, 2006; 2010)	Centered on WATSAN, as well as irrigation as a means to achieve water security	Dysfunctional water schemes were 20%; rush to achieve food security but limited investment in small-scale irrigation
Growth and transformation plan (GTP) – I (2010–2015) (MoFED, 2010)	Develop irrigation agriculture; intensify the use of water and watershed management; increase overall potable water coverage	Ambitious nature and controversy of data and indicator; insufficient capacity building for local community and lowest echelon of government structures
GTP-II (2015–2020) (NPC) (2015)	Increase WATSAN, irrigation development; it sets new standard regarding water supply	The issue of implementing IWRM is overarching

Source: Own synthesis.

the programme emphasized the creation of an appropriate legal and regulatory framework to enforce the policy and strategy, establishing seven basin authorities, reorganize the MoWR, and strengthening of regional institutions for sustainable water resources management. Nevertheless, the programme has achieved little regarding institutional reorganization and capacity building as an enabling environment. For example, of the seven river basin authorities planned to be established, only the Abbay Basin Authority, the Awash Basin Authority, and the Rift Valley Lakes Authority were realized.

4.3.3. Gaps in the policy, strategy, and programmes

A dynamic and functional basin institution needs a decentralized and active management, administration, and involvement at all levels because the basin is a political unit as much as a natural unit (Warner *et al.* 2008). The policy insisted that the hydrological unit is a prerequisite for IWRM; however, it is not welcomed by regions. As such, IWRM is not implemented nearly for two decades in the basin context. The policy did not clearly address different interest groups for judicious water allocation. At the grass-roots level, the involvement of relevant stakeholders was found to be minimal. At the higher decision-making level, AwBA attempted to bring together the stakeholders. Yet, it is far from creating coordination and networking. The authority reasoned out financial and human resource constraints for the shortcomings. Based on field observations, in a nutshell, all issues of water resources allocation, distribution, use, and regulation are not properly shaped to fit efficient, equitable, and ultimately holistic and integrated basin management. Consequently, the policy, strategy, and programmes area are more of rhetoric than action in the context of this basin.

4.4. Water administration

4.4.1. The imperial period (1929–1974)

Historically, the administration of water resources in Ethiopia in general and in the AwRB, in particular, was haphazard and uncoordinated. Several line ministries and government bodies were involved but never integrated or harmonized their plans and implementations. In order to alleviate this problem, AVA, the first water resource administrative body, established under the IGE general notice No. 299 on 23 January 1962, to (1) administer water use and water rights; (2) coordinate the activities of all government organs; (3) construct and administer dams and canals; (4) allocate water for irrigation and other purposes; and (5) fix and collect fees for the use of water and other facilities in the Awash Valley (IGE 1962).

The prime aim was to support import substitution industrialization through increasing production and expanding agro-processing. The water and land rights were basically guaranteed bundles of the right to the landlords and developers. They can appropriate, own, transfer, or use water to the best of their interests and priorities. Such administrative mechanisms dispossessed the pastoralists and ago-pastoralists from wet and dry season grazing lands. These lands were traditional water points with appropriate moisture, which are suitable for cultivation. An informant noted that the claims over these lands are still surfacing in the community. For instance, the conflicts

that often erupt among the pastoralists on access to pasture and water, particularly during the dry season are traced back to such historical antecedence. Another key informant added the pastoralist who often moves seasonally to escape from malaria infestation was confined to high malaria-sensitive areas. The introduction of such an estate has also brought schistosomiasis (Taddese *et al.* 2005) and other water-related diseases.

Generally, the AVA as a basin institution failed to coordinate different entities who were interested in water resources management. For example, Ministries of Agriculture, Health, Interior (municipalities), Foreign Affairs, Public Works and Water Resources, Transport and Communication, Ethiopian Light and Power Authority, and Addis Ababa Water and Sewerage Authority have had some sort of stake in the water resource issues but never acted in coordination.

On 27 October 1971, IGE issued Order No. 75/1971 to establish NWRC under the Ministry of Public Works and Water Resource. The overall mission was to improve water administration. One of the roles of the commission was to create coordination among different policies, plans, and activities of pertinent stakeholders. It aimed to regulate water use; to review plans and activities and keep them up-to-date regarding water resource; and to ensure that the various development programmes are in line with the overall country's socio-economic development and changes. Moreover, the NWRC was expected to operate water resource development, allocation, licencing, collecting water rates, and authorizing construction of water laws in accordance with the law (IGE 1971).

The commission came up with the idea of Water Districts and the creation of Water Authorities to administer and plan water resource. The creation of such institutions was expected to move water administration from complete centralization to at least a semi-decentralization stage. It was also hoped to strengthen and expand basin planning principles based on hydrological boundaries and thus a basin authority approach similar to AVA. The commission recognized coordination problems among government institutions and the keen need of RBOs for water administration. However, because of the inadequacy of financial resources, the problem of organizational and institutional settings, the lack of commitment to accept nationally devised public institute coupled with the downfall of the IGE by the 1974 revolution, NWRC has realized little. Later on, NWRC was demolished.

Over the period, water resource administration assumed the feudalist ideology of the Imperial regime. The regime has instigated the capitalist system and put institutions to fit the interest of capitalists. Most farms in the basin were owned by elite Ethiopian entrepreneurs, members of the royal family, and commercial irrigation schemes run by foreign businessmen (Said 1998). The water administration was geared to these interest groups. It neither meant for sustainable water resources development and management nor any concern for the majority of the poor pastoralist and peasantry.

4.4.2. The socialist regime (1974–1991)

The 1974 revolutionary decree came up with the socialist ideology of nationalization of private property, land reforms, and private property appropriation in favour of state under the Agrarian Reform Proclamation No. 31/1975. In 1975 Ethiopian Water Resource Development Authority

(WRDA) came to existence under the auspice of the Ministry of Mines, Energy, and Water Resources with three agencies under its umbrella, that is, Land and Water Studies Agency, Rural Water Development Agency, and Urban Water and Sewerage Agency (Gizaw 2004). The new institutional arrangements were meant to serve the socialist ideology. They intended to facilitate the transformation of agricultural and agro-industrial activities in the Awash valley. The institutions subsequently reorganized into state-run enterprises and expansion of state farms throughout the country.

The socialist regime accused peasant agriculture and pastoralists as the reason for food shortage. Instead, the government planned state farm development. In pursuant, Valley Agricultural Development Authority (VADA) was formed. The AVA retained its responsibilities to manage the Valley until 1977 when the Awash Valley Development Agency (AVDA) was established by proclamation No. 118/1977. VADA and AVDA were merged into NWRC under WRDA. VADA has given the power and duties to coordinate, regulate, and supervise the development and utilization of land and water resources of the basin for agricultural development. It has similar powers and duties as AVA except its jurisdiction was limited to water resources. AVA's responsibilities include all resources and its authority covered the whole country. In order to avoid institutional conflict between AVA and VADA, AVDA was formed. The AVDA's power had diminished as compared to that AVA had enjoyed though all assets and facilities owned by AVA were transferred to AVDA. The AVDA was periodically reported to the VADA on the development of the basin (Gizaw 2004).

On 7 November 1981, the socialist regime reorganized the water sector administration and created a new NWRC. The reorganization dissolved AVA and created new four departments. Namely: WRDA, Ethiopian Water Works Construction Authority (EWWCA), Water Supply and Sewerage Authority (WSSA), and National Meteorological Service (NMS). The NWRC was accountable to the office of Prime Ministries (MoWR 2001b). WRDA has engulfed AVA and stood as the semi-autonomous authority under the supervisory authority of the NWRC. Its major responsibilities were to conduct studies concerning water resources utilization, administration, regulation, protection, and allocation of the nation's domestic water resources were conformable to the government policy and plan. The AVA was put under the jurisdiction of WRDA to manage, administer, and development of the basin. It was unfortunate that WRDA achieved little of its roles and responsibilities owing to financial constraints and lacunae of qualified professionals.

The eagerness for efficient utilization of the basin was so heightened that the government of Ethiopia decreed proclamation No. 318/1987 on 25 July 1987 to establish a new institution called Ethiopian Valleys Development Studies Authority (EVDSA) with four key purposes. Some of them were similar to what had been given to AVA and WRDA. In short, it is *an old wine in new bottle*. The roles of EVDSA were to: (1) undertake studies; (2) plan valleys (including Awash) based on the studies and researches; (3) conduct studies and researches for the protection of the environment; and (4) conduct studies and research pertaining to transboundary rivers. One of the administrative challenges of EVDSA was to achieve desirable coordination for proper water resource allocation, particularly the development of irrigation and other uses (PMAC 1987). Nevertheless, several

mandates of the EVDSA had no institutional backing and failed to coordinate among key stakeholders. Several proposed professions were unstaffed including the Deputy General Manager. Much of the plans were not realized.

In sum, the socialist regime's water administrations have favoured the state farms and institutions. The water administration had also operational difficulties. There were resistances and conflicts between the local community and the farms. The sense of ownership was not built especially with the local chiefs and the central government. Sadly, the farms were inefficient compared to pastoralism. The state farms incurred huge costs. For example, Said (1994) calculated that in the 1980s the pastoral system yielded USD 33.14/ha/year net revenue compared to the loss of USD119.81 irrigated cotton production. The state subsidizes USD 53 for each quintal of lint cotton produced. In addition, the farms have been blamed for the negative externalities such as the disruption of socio-cultural life, increased vulnerability to drought and famine, salinization of soil, negative side effects of the agrochemicals used, and for other impacts on the environment.

4.4.3. The current regime (1991 to present)

EPRDF seized power overthrowing the socialist regime in May 1991. The new institutional arrangement dissolved NWRC in 1991. It also demolished the authorities under the umbrella of NWRC except for EWWCA and EVDSA. The Ministry of Natural Resources & Environmental Protection was established in 1993 under Proclamation No. 52/1993. EWWCA and EVDSA were made accountable to the Ministry.

In 1995, under the political and administrative restructuring of the country, as well as the new constitution, the MoWR was established in August 1995 by Proclamation No. 4/95 as a federal institution. It issued water resource management policy, proclamations, and regulations for best use of the country's water resources. The proclamation 471/2005 defined the powers and duties of the Executive Organs of the state (FDRE 2005a). The powers and duties of the MoWR include to undertake basin studies and determine the country's ground and surface water resources potential; to determine equitable allocation and utilization of water bodies; to undertake studies and negotiations of trans-in-boundary and trans-boundary water bodies; to promote the expansion of medium and large-scale irrigation dams; to issue permits and regulate the construction and operation of water works; and to administer dams and hydraulic structures, among others.

The new political order has called for the devolution and decentralization of water resource institutions. To this end, Water, Minerals, and Energy or Water Resources Development Bureaus were established at the regional level. Likewise, Water Resources Offices were structured at zonal and district government structures. However, the Ministry held a special responsibility for water resources development and river basin planning. Thus, all water resources management including basins, development, and capacity building is under the Ministry with some scopes of delegating the basin level water administration to the Basin Authority or the regions. The decentralization policy which began in 1995 was so apparent that it could not determine the optimum utilization and allocation of the water resources in river basin context. It was also not sufficiently cascaded down to appropriate levels. The key powers such as water

resources administration, permit system, and capacity building were centralized. The Ministry carried out several master plans and project studies and came up with useful data for basin planning and development.

One of the determinations to administer the Awash River basin was started with the establishment of the Water Resources Administration Agency under Proclamation No. 129/1998 on 10 November 1998. The proclamation aimed to coordinate, administer, allocate, and regulate the utilization of surface water resources of the Awash basin. It was an autonomous public agency having its own legal personality and accountable to the MoWR. The agency was given a dozen of powers and duties to exercise its overall managerial and monitoring activities in the entire basin (FDRE 1998). The roles given to the agency are almost similar to its predecessor, AVA, with more challenges of dealing with regionalization and growing water stress and scarcity. The agency was headquartered at *Amibera*. Its mandate did not include the whereabouts of groundwater similar to previous administrative arrangements. It has no clear budget sources on the assumption that the agency generates its own income from water charges and service fees collection, as well as donors and NGOs. However, the agency suffered both financial, human capacity, and structural limitations that it revoked in 2008 by Council of Minister's Regulation No. 156/2008.

In 2008, the AwBA was re-established by the Council of Ministers Regulation No. 156/2008 with administrative and regulatory roles. It has also been given small operational mandates such as the maintenance of primary irrigation canals. The Authority was restructured according to its new mandates in 2011. It has now a budgetary allocation from the government to pay employee salaries of more than 700 workers governed by the civil service law. The Authority has the vision to see a model river basin in which comprehensive and IWRM would be ensured. Its mission is to ensure a sustainable, comprehensive, and integrated water resources system through planning, studying, and researching with the participation of stakeholders. The Authority has set values geared towards IWRM.

The Awash Basin High Council and Authority of Council of Ministers Regulation No. 156/2008 was decreed. It was based on the Proclamation No. 534/2007. The AwBA has given powers and duties of planning, administering, coordinating, and managing water resources through initiating policy measures, undertaking activities, projects, and interventions, issuing permits, information management, developing and using a river basin model, giving advice and technical support to BHCA, setting up a forum for effective networking among stakeholders, and collecting water charges from users (FDRE 2007). However, AwBA is complaining that given the powers and duties, the budget allocated by the government is too scanty to carry out administrative activities and regulatory roles. To date, the Authority only administers and issues water permits. It collects water charges only from large-scale irrigation schemes found along the main Awash River. The collection of water use fees and charges are based on the volume extracted (or demanded) by the respective irrigation schemes. The collection of this fee is based on guesswork due to lack of automatic recorders/metering. The Authority is striving to put in place IWRM in the basin. Yet, the challenges of water insecurity remain. Some of them rolled back from previous regimes and others are emerging.

4.5. Power hierarchy and conflicts

The constitution of the country is considered as 'grand law' of all laws as it guides the entire policies. It bestowed powers and functions for the federal government and regional states to administer and implement water and other natural resources. The federal government has a responsibility of formulating and implementing the country's policies, strategies, and plans. It develops, administers, and regulates the waterways. Likewise, the regional state has the powers and functions 'to formulate and execute economic, social and development policies, strategies and plans of the state and to administer land and other natural resources in accordance with federal laws' Article 52(2) (FDRE 1995). Basically, the roles and responsibilities of both federal and regional governments are similar with some degree of power asymmetry. The federal government has given extended power to determine and administer the utilization of the waters or rivers and lakes shared by two or more regions. This legal framework puts the AwRB under the federal government yet the constitution did not indicate that RBOs could be established.

More than a dozen of powers and duties were conferred to the basin authorities by BHCA. In return, the basin authorities are expected to provide technical support to the BHCA. The MoWIE is responsible for dispute settlement, allocation, and use of water resources in the basin. The BHCA settles conflicts that might be aroused between regions and coordinated among the key stakeholders. Precisely, the key powers and authorities to implement the water laws in the basins are limited to BHCA and the MoWIE. One of the limitations of the water laws is the lack of delineating the powers and authorities of the river basin authority and the regional states. The other pitfalls are the ambiguity of hierarchy of water use permit that the MoWIE, regional states, and AwRBA are issuing. The permit system is contentious with regard to the mandates given to the basin authority vis-à-vis regional states.

Apparently, the point of controversy between the regional and federal governments is rooted in the interpretation of the constitution and the water policy. Regional states believe that the powers and duties of the basin authority are unconstitutional because they conflict with the powers and duties given to the regional states as stated in the Article 52 of the constitution of the country. An interview with an official from Oromia Water, Mines, and Energy Bureau is an illustration of the conflicting powers and duties operationally between the two institutions:

The Awash basin authority is not practical from a regional point of view whatever powers and duties were given to it. I am curious that the implementation of the duties and powers could raise conflict between the region and AwRBA because there are no clearly defined boundaries of power and duties over water resource governance between the two organs. As the demand and interest on the basin increased and priorities unmatched, the confusion is already emerging. The interest and operational plans may also overlap and/or in conflict. For example, the region has been providing permits for all water uses in the Awash tributaries except on the main Awash river. The region is not accepting the basin based administration of the water resources in the Awash River to allocate water. The coordination and cooperation among the region, the Ministry, and BHCA remain vague.

Leaving this as it is, water institutions have some sort of intra-governmental responsibilities that could be helpful for a domestic river like Awash. At the national level, MoWIE

Basin Directorate is in charge of the overall water resources management such as surface water, groundwater, recycled water, environmental, and water resources quality. Nonetheless, the Ministry can delegate responsibilities to the Regions and River Basin Authority. As a transitional echelon, the Zonal government has a limited role on groundwater, surface, or recycled waters. Moreover, the engagements of zonal offices are very limited regarding water pollution and quality control. The district and Kebele levels government structures have the power to manage surface water, groundwater, environmental management, and water quality control. In reality, they lacked financial and human resource capacity to realize it. It seems that the responsibilities are concentrated and centralized at the higher government structures with few devolution of power.

In this paper, we attempted to understand the level of participation, accountability, and responsibility, as well as conflicts of power among water institutions at various levels. It is intended to shed light on how they actually perform from viewpoints of water experts and local communities. The accountability of executives and officials to the state and to the people is an important aspect of water institutions. It mitigates 'wrong or non-implementation' of the water laws, policies, and strategies (Saleth 2004). It also resolves conflict at least at the macro level. The experts reported that there is no legal provision for ensuring accountability of officials, water suppliers, and users such as indemnity clauses in the water laws or penalty provisions. The accountability of water resources is perceived as a mere administrative procedure to govern the staffs and to provide services to the clients.

The AwBA need to be accountable at least to large-scale farms and projects. The regional, zonal, and district levels water, irrigation, and agricultural offices are accountable to rural water supplies, and agricultural water needs. In the case for urban water supplies and industries, municipalities are accountable. Regarding the accountability of the local community, the regulations are users oriented and decentralized through WUAs. The WUAs are accountable to the district government with the overall goal of liaising the local water users and the district water desk including policy implementations. Moreover, WUAs and the WATSAN committee at the community level play magnificent roles in water resource management. Most WUAs are evolved from customary practices; however, most of them are fragmented. They are administered based on the cooperative act of the country (Proclamation No. 147/1998), which may not be practical from the point of view of water resources management. Hence, water use and allocation involve multi-stakeholders with heterogeneous priorities and interests. Under such circumstances, the bargaining power of the poor and the voiceless is limited. For example, most WUAs could not negotiate with large-scale commercial farms or state projects or enterprises in the upstream of the basin due to power asymmetry and divergence of interests. In addition, the sugarcane plantations, hydropower, urban water reservoirs, industries, as well as fruit and vegetable farms are the state's top priority than local users. In the negotiation process, the local community is the loser as the state farms are public enterprises and the private sectors are the important allies of the state.

Both the WUAs and customary institutions have a strong sense of accountability to local people with a various degree.

Overall, the experts rated that the level of accountability of water policy-maker, allocators, regulators, and users is not effective. The accountability of the officials remains vague for water sources, use groups, and users' categories. Thus, interviews with water users and administrators revealed that there is no clear boundary between the state and the people concerning the accountability of water resources management.

The other operationally important provision is the responsibility of water institutions. The current conjecture and confusion regarding the responsibility for water resources is the underlying factor for the perpetuation of conflicts related to water and land resources in the basin today (Rahmato 2007). There are two sorts of responsibilities in the Awash basin. The first is the responsibilities among different Regions in the basin or interregional responsibilities. The second one is intraregional responsibilities, which attempt to define the roles and linkages of districts within a given region. The surface and ground waters, environmental issues, water quality, as well as pollution control are the responsibility of the national government to ensure interregional coordination (Table 5). Superficially, the federal and regional government took the prime lead for the governance of groundwater in this basin. Yet, groundwater governance is either neglected or ambiguous. The urgency and attention are centred on the surface water. It seems that the existing division of legal responsibility is not in favour of integrated management of water planning and development. Particularly, the issues of groundwater, water quality, and pollution control have no legally conceivable property rights. Laws and policies regarding pollution permits such as the EIA Proclamation No. 299/2002, Environmental Pollution Control Proclamation No. 300/2002, Solid Waste Management Proclamation No. 513/2007, and environmental standard guidelines are in place but not properly enforced. As a result, interviews confirmed that the overall legal provisions in protecting groundwater, as well as water quality are either ineffective or environmental law and regulation is unenforced.

In the process of institutional change and instability, power and legitimacy may move hierarchically but it has to allow for participation of relevant actors because participation is a *sine qua non* for sustainable resources management and boost ownership (Matti *et al.* 2017). Participation is seen in terms of engagement in water resources development, distribution, and management. The perception of water resources experts showed that the effectiveness of participation of various stakeholders varies in the water sector (Table 6). Compared to local user groups, the participation of large-scale farmers is low in water resource development, planning, and financing. The latter has, however, better execution and distribution of irrigation and domestic water uses. This is not surprising as the distributional systems favour large-scale farmers (Bues and Theesfeld 2012). The

Table 5. Intra-governmental responsibility in water laws and policy (+ – responsible 0 – not clear).

Govt. level	Surface water	Groundwater	Recycled water	Environment	Water quality
National	+	+	+	+	+
Regional	+	+	+	+	+
Zonal	0	0	0	+	+
District	+	+	+	+	+
Local	0	0	0	+	0

Source: Own data.

Table 6. Perception on the level of participations of stakeholders in water resource development, distribution, and management in the basin.

Use category	Resource development			Distribution	Management
	Planning	Finance	Execution		
Irrigation					
Local user groups	High	Very high	Very low	Low	Medium
Large-scale farmers	Very low	Very low	Medium	High	Very high
Donors	Low	Very low	Medium	High	Very high
Domestic use					
Local user groups	High	Very high	High	Low	Medium
Large-scale farmers	Very low	Low	Medium	High	Very high
Donors	Very low	Low	Medium	High	Very high

Source: Own data.

large-scale farmers have little tendency to invest in water infrastructure and technology development despite their demand for water being high because the farms operate on large tracts of lands and employ significantly more labourers compared to small-scale farmers.

The power and influence of the federal government are tremendously high followed by regional governments to allocate and control irrigation and industrial use of water. The roles and influences of the Awash Basin Authority are minimal and limited to collect a fee for irrigation maintenance from a few large-scale farms. The local and district government actors have a strong influence on the domestic water management. Since the power and influence of customary institutions are not properly accepted by the formal water institutions, the customary institutions, in turn, are sceptical towards the dominance of formal institutions. The local community contended that the state control of water resources merely contributed to social equity. Instead, it created water 'capitalism'. The community further argued that putting both groundwater and surface water equally under the common property is not fair. Such a mechanism favours powerful stakeholders as they have the capacity to exploit water resources to the best of their interests and priorities better than the poor local community.

In sum, it is worth note to outline some key points. First, one of the overarching issues that received little attention in the basin for the last three regimes was groundwater administrations. The 1999 Water Resource Management Policy treated the surface water and groundwater alike. Despite these facts, groundwater administration is very poor because the linkage between land and surface water is insufficiently addressed. Consistently, the institutional arrangements failed to govern the agricultural intensification activities that accumulated soil chemicals and created waterlogging problems. Studies depicted that the increased pesticide use increased toxic substances in the water (Molle and Hoanh 2011, Giordano *et al.* 2012). Agrochemicals caused high levels of nitrates in the water and created anaerobic conditions through the decay of organic substances. In addition, most irrigation schemes in the basin have very poor saline drainage. Hence, waterlogged conditions increase the salinity of groundwater in the flat topography of the basin. The intrusions of saline into freshwater systems have already affected the quality and accessibility of water for all purposes. In the Rift Valley area of the basin, the natural fluoride contamination is another health-related risk. Consequently, the potential of groundwater resource was not unleashed. A study revealed

that 35% of groundwater does not meet the quality for drinking water use and irrigation agriculture in the basin (REACH 2015). Thus, proper institutional means are required to administer and make use of groundwater resources in the basin.

Second, there is a historical bias against pastoralists, agropastoralists, and the peasantry. This affected the ownership and sustainability of development programmes in the basin. Water institutions did not consider and make local communities and other stakeholders as part of the development process through provisioning resource access and use. These programmes and projects did not understand the situation of the local people similar to the findings of other studies (Malifu 2006, Behnke and 2011, Bossio *et al.* 2012).

Third, the basin has limited skilled manpower and data management for effective resource allocation. It is rather skewed towards infrastructure development than institutional development. As a result, institutional aspects were underinvested and/or underestimated. Studies suggested that it is important to balance the 'hard option' – the infrastructure such as dams, water supply and irrigation development schemes, and 'soft option' – decentralization of facilities, efficient technologies, flexible public and private institutions, and human capital development (Gleick 2003). In addition, given the scanty understanding and limited knowledge of basin's ground and surface water resources, water allocation, and distribution of water resources were neither efficient nor equitable. Interview with various water experts reveals that water resources may not keep up with a burst of the population, urbanization, and economic growth in the basin. These potentially change the lifestyle of citizens towards more water-demanding unless proactive water institutions are in place. Fourth, the water institutions provided the highest precedence to domestic water use and irrigation development. Industrial uses and non-consumptive uses and misuses were not taken into account.

Finally, the implementation and enforcement of laws and policy with efficient water bureaucracy were too weak to negotiate among different water resources user groups. The local community could not negotiate with large-scale commercial farms and state enterprises due to power asymmetry and diversities of interest. The powerful actors such as foreign and domestic investors received special incentives such as finance, water, and land access under the federal auspices. Systematically, the local communities are excluded from fair and equitable access to riparian water points and grazing areas. Thus, it is plausible to say that regimes have been making sure that the benefit accrued to large-scale commercial and plantations farms never be compromised.

5. Conclusions and implications

The paper tried to understand water institutions that emerged since the 1960s in the Awash Basin of Ethiopia. It was observed that several laws were enacted, policies formulated, and administrative mechanisms organized yet a proper implementation and enforcement remain questionable. The water institutions were characterized by gradual development but highly changing. The changes were not consistent and unable to build strong and dynamic basin level institution. The new institutional arrangements were not drawing lessons from the old one which seems to be in contrast with Saleth and Dinar's (2004) view, who believe that effective water

institutional building is a 'gradual process' but it has to be as consistent as possible. This has created instability, discontinuity, and inherent coordination failure in the basin. It is attributed to turbulent political ideologies, which come up with various power relationships. In effect, at the basin level, water managements were not well governed with efficient water bureaucracy and the rule of the law. The basin administration faced financial constraints, lacked competent and qualified professionals, political interferences from above, and weak intersectoral coordination.

Furthermore, the water institutions were centralized key duties and powers. It is quite evident from the foregoing discussions that many of the laws, policies, and organizational settings passed at the higher levels were not cascaded down to the lower levels. The District, Kebele, and community levels institutions were not aware of the whereabouts, as well as the mandate of the AwBA, for instance. In addition, the formal water institutions misread customary institutions – traditions, customs, and norms that have had a prominent role for centuries. Such centralization of key powers allowed institutional settings to favour large-scale commercial farms and state enterprises that worked against smallholders and pastoralists. Although there are endeavours to restructure water institutions in the basin, they have not helped much to achieve administrative and managerial efficiency and hence unable to institute IWRM nor competent RBOs.

Therefore, it is the duty of the state to enforce water laws, implement the policy, cascade down the guidelines, and procedures to the lowest administrative echelons. In addition, the state has to strengthen coordination mechanisms among pertinent actors to overcome the failure of water institutions (Molle 2004). Such involvement of stakeholders helps to shift the centralized government to the governance of water resources (Rogers and Hall 2003, Boelens 2008). Furthermore, the process of institutional reform should take into account the past lessons and project the future development trajectories (Mollinga *et al.* 2008). In the AwRB, the role and responsibilities of water institutions at Federal, Regional, and Basin Authority must be clarified to overcome institutional failures. In tandem, capacity building (human, financial, and institutional) is an issue of greatest importance for the implementation of water laws, policies, and administrative procedures. Most importantly, the formal water institutions need to recognize the role of customary institutions and must inculcate as a part and parcel of water bureaucracy. Awareness creation at all levels through planned workshops and mass media could also be a feasible strategy to overcome gaps in understanding among key stakeholders and institutions in the basin.

Finally, this study attempts to shed light on the features of institutional settings in the AwRB of Ethiopia to demonstrate the discrepancies between various efforts and realities on the ground. It, however, barely provides exhaustive roles of key stakeholders and interest groups. It is also not in position to analyse existing institution and proposes alternative options to attain water security in the basin. Therefore, further in-depth studies that address these gaps are required.

Geolocation information

This study was undertaken in the Awash basin. It is located between latitudes 7°53'N and 12°N and longitudes of 37°57'E and 43°25'E in Central Ethiopia.

Notes

1. According to Proclamation No. 534/2007 (FDRE 2007), the basin is defined as a geographical area, described by the watershed limits of water system including surface and underground water flowing into a common terminus and includes main basins and their sub-basin of Ethiopia.
2. The core of the reform was to serve as public trustee. It abolished all existing customary and formal rights to land and water. Ownership of these resources is vested in the state. The state has the power to redefine property rights and access to land (Rahmato 2007).
3. The number outside and inside the bracket represents Article and Sub-article of the particular law, for example, 40(3) here represents Article 40 of Sub-article 3 of the FDRE Constitution.

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References

- Abraha, A.A., 2006. *Flood modeling and forecasting for Awash River basin in Ethiopia*. Delft: UNESCO-IHE Institute for Water Education.
- Achamyeleh, K., 2003. *Ethiopia: integrated flood management. WMO/GWP Associated Programme on Flood Management*, 1–5. [online]. Available from: http://www.apf.info/pdf/case_studies/cs_ethiopia/pdf [Accessed 16 December 2016].
- Arsano, Y., 2007. *Ethiopia and the Nile dilemmas of national and regional hydro-politics*. Zurich: Center for Security Studies, Swiss Federal Institute of Technology.
- Behnke, R. and Kerven, C., 2011. Replacing pastoralism with irrigated agriculture in the Awash Valley, North-Eastern Ethiopia: counting the costs future of pastoralism. *Paper presented at the International Conference on Future of Pastoralism*, 21–23 March 2011, The Institute of Development Studies, University of Sussex and the Feinstein International Centre of Tufts University. 40.
- Berhe, F., *et al.*, 2013. Catena MODSIM-based water allocation modeling of Awash River Basin, Ethiopia. *Catena*, 109 (2013), 118–128. doi.org/10.1016/j.catena.2013.04.007
- Boelens, R., 2008. Water rights arenas in the Andes: upscaling networks to strengthen local water control. *Water Alternatives*, 1 (1), 48–65.
- Bossio, D., *et al.*, 2012. Water implications of foreign direct investment in Ethiopia's agricultural sector. *Water Alternatives*, 5 (2), 223–242.
- Bruns, B.R. and Meinzen-Dick, R., 2005. Frameworks for water rights: an overview of institutional options. In: R. M.-D. Bryan Randolph Bruns, Claudia Ringler, eds. *Water rights reform: lessons for institutional design*. Washington, DC: International Food Policy Research Institute, 3–25.
- Bues, A. and Theesfeld, I., 2012. Water grabbing and the role of power: shifting water governance in the light of agricultural foreign direct investment. *Water Alternatives*, 5 (2), 266–283.

- Carr, C.J., 2017. *River Basin development and human rights in Eastern Africa – a policy crossroads*. Switzerland: Springer International.
- Central Statistical Agency, 2013. *Population projection of Ethiopia for all regions. At Wereda level from 2014 – 2017*. Addis Ababa, Ethiopia: FDRE.
- Clapham, C., 2006. Ethiopian development: the politics of emulation. *Commonwealth & Comparative Politics*, 44 (1), 108–118.
- FAO, 2013. *Coping with water scarcity, the role of agriculture: developing a water audit for Awash River Basin*. A Synthesis report. Addis Ababa, Ethiopia.
- FDRE, 1995. *Constitution of the federal democratic republic of Ethiopia. proclamation no. 1/1995*. Federal Negarit Gazeta, 1–38.
- FDRE, 1998. *Awash Basin water resources administration agency establishment proclamation no. 129/1998*. Federal Negarit Gazeta, 856–859.
- FDRE, 2000. *Ethiopian water resources management proclamation no: 197/2000*. Federal Negarit Gazeta, 1250–1260.
- FDRE, 2005a. *Definitions of powers and duties of the executive organs of the federal democratic Republic of Ethiopia No.471/2005*. Federal Negarit Gazeta.
- FDRE, 2005b. *Ethiopian water resources management council of ministers regulation no. 115/2005*. Federal Negarit Gazeta, 3057–3068.
- FDRE, 2007. *River Basin councils and authorities proclamation no.534/2007*. Federal Negarit Gazeta, 3655–3665.
- Flintan, F. and Tamrat, I., 2002. Spilling blood over water? The case of Ethiopia. In: K. Sturman and J. Lind, eds. *Scarcity and surfeit: the ecology of Africa's conflicts*. Pretoria, South Africa: The Institute for Security Studies, 243–320.
- Giordano, M., et al., 2012. *Water for wealth and food security: supporting farmer-driven investments in agricultural water management*. Synthesis report of the AgWater Solutions Project M. Giordano et al., eds., Sri Lanka: International Water Management Institute (IWMI).
- Gizaw, T., 2004. *Institutional set up studies of the Ethiopian Nile (Abbay) Basin project: River Basin institutions – the Ethiopian experience*. Addis Ababa, Ethiopia: BRL Ingénierie/DHV/T&A.
- Gleick, P.H.P.H., 2003. Global freshwater resources: soft-path solutions for the 21st century. *Science* [online], 302 (2003), 1524–1528. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/14645837>.
- Imperial Government Ethiopia (IGE), 1962. General notice no. 299/1962. Negarit Gazeta.
- Imperial Government of Ethiopia (IGE), 1971. *Awash valley development (1966–1971)*, Addis Ababa, Ethiopia.
- Keeley, J. and Scoones, I., 2000. Knowledge, power and politics: the environmental policy-making process in Ethiopia. *The Journal of Modern African Studies*, 38 (1), 89–100.
- Malifu, E., 2006. *The environmental consequences of dependent development in the upper Awash valley and the predicaments of the Kereyu*. Addis Ababa, Ethiopia: Addis Ababa University.
- Matti, S., Lundmark, C., and Ek, K., 2017. Managing participation: prospects for learning and legitimacy-creation in Swedish water management. *Water Policy* [online], 19 (2017), 99–114. Available from: <http://wp.iwaponline.com/cgi/doi/10.2166/wp.2016.023>.
- Ministry of Water Resource (MoWR), 1999. *Ethiopian water resources management policy*. Addis Ababa: FDRE.
- Molle, F., 2004. Defining water rights: by prescription or negotiation? *Water Policy*, 6 (2004), 207–227.
- Molle, F. and Hoanh, C.T., 2011. Implementing integrated river basin management in the Red River Basin, Vietnam: a solution looking for a problem? *Water Policy*, 13 (4), 518–534.
- Mollinga, P.P., Saravanan, V.S., and Wester, P., 2008. Water, politics and development: framing a political sociology of water resources management. *Water Alternatives* [online], 1 (1), 7–23. Available from: www.wateralternatives.org.
- MoWR, 2001a. *Ethiopian water sector strategy*. Addis Ababa, Ethiopia: MoWR.
- MoWR, 2001b. *Implementation strategy for river basin integrated development master plan*. Addis Ababa, Ethiopia: MoWR.
- MoWR, 2002. *Water sector development programme: main report volume I*. Addis Ababa, Ethiopia: MoWR.
- Ostrom, E., 1990. *Governing the commons: the evolution of institutions for collective*. Cambridge: Cambridge University Press.
- Ostrom, E., 2011. Background on the institutional analysis and development framework. *Policy Studies Journal*, 39 (1), 7–27.
- Provisional Military Administration Council (PMAC), 1978. *State farms development authority proclamation No. 142 of 197*. Negarit Gazeta, 37 (10), 4–8.
- Provisional Military Administration Council (PMAC), 1987. *Proclamation No. 318/1987*. Negarit Gazeta.
- Rahman, M.A., 2012. Water security: Ethiopia – Egypt transboundary challenges over the Nile river basin. *Journal of Asian and African Studies*, 48 (1), 35–46.
- Rahmato, D., 2007. *Customs in conflict: land tenure issues among pastoralists in Ethiopia*. Addis Ababa: Forum for Social Studies.
- REACH, 2015. *Country Diagnostic Report*, Ethiopia. Oxford, UK: University of Oxford. Available from: www.reachwater.org.uk
- Rogers, B.P. and Hall, A.W., 2003. *Effective water governance*. Stockholm: Technical Committee (TEC).
- Said, A., 1994. *Pastoralism and the state policies in mid- Awash valley: the case of the Afar, Ethiopia*, African Arid Lands Working Paper Series No. 1/94, Uppsala, Sweden.
- Said, A., 1998. Afar ethnicity in Ethiopian politics. In: M. A. Salih and J. Markakis, eds. *Ethnicity and the state in Eastern Africa*. Uppsala: Nordiska Afrikainstitutet, pp. 108–114.
- Saleth, R.M., 2004. *Strategic analysis of water institutions in India: application of a new research paradigm*. Research Report 79. International Water Management Institute. Research Report 79 Colombo, Sri Lanka.
- Saleth, R.M. and Dinar, A., 2004. *The institutional economics of water: a cross-country analysis of institutions and performance* [online]. Washington, DC: World Bank/Edward Elgar. Available from: <http://www.amazon.com/dp/1843767775>.
- Tache, B. and Irwin, B., 2003. *Traditional institutions, multiple stakeholders and modern perspectives in common properties: accompanying change within Borana pastoral systems*. Securing the Commons, Working Paper No. 4: IIED, 51.
- Taddese, G., Sonder, K., and Peden, D., 2005. *The water of the Awash River basin a future challenge to Ethiopia* [online]. Available from: <http://www.iwmi.cgiar.org/assessment/files/pdf/publications/WorkingPapers/WaterofAw> [Accessed November 11, 2014].
- Tamrat, I., 2004. Overview and assessment of the legal framework for water resources management in Ethiopia: institutional studies working paper for discussion of the Ethiopian Nile (Abbay) Basin Project, MoWR. Addis Ababa, Ethiopia.
- Warner, J., Wester, P., and Bolding, A., 2008. Going with the flow: river basins as the natural units for water management? *Water Policy*, 10 (Supplement 2), 121–138.
- Wondwossen, T., 2008. T.B. Transboundary water cooperation in Africa: the case of the Nile Basin initiative. *Turkish Journal of International Relations*, 7 (4), 34–49.