Sustaining participation in irrigation systems of Ethiopia: what have we learned about water user associations?

Mastewal Yami

International Water Management Institute (IWMI), P. O. Box 5689, Addis Ababa, Ethiopia
E-mail: mastewalyami@yahoo.com

Abstract

Community participation, defined as engaging users of schemes in the decision-making processes for the planning and implementation of irrigation projects, is critical for the sustainability of irrigation schemes. This study was carried out in three regional states of Ethiopia to investigate the contribution of water user associations (WUAs) to sustaining participation in irrigation projects. The paper demonstrates that the poor understanding of community participation and institutional development by project staff in donor-supported irrigation projects results in the poor performance of WUAs in enhancing participation in irrigation systems. The interventions of external bodies in setting up the WUA by-laws and in determining the responsibilities of users and WUA committees contributed to the low level of participation. The transfer of schemes to WUAs without building WUA committees’ abilities in operation and maintenance constrained their ability to sustainably manage irrigation schemes. The WUA committees are male-dominated and the views of women are hardly represented in the decision making. Therefore, establishing WUA committees that reflect the interests and inputs of scheme users is crucial to achieve fair decision making. Local authorities and non-governmental organizations could do more to change perceptions and behaviour to reflect the importance of gender equity in sustaining the positive outcomes of irrigation at household and community levels.

Keywords: Agricultural water management; Ethiopia; Gender equity; Livelihoods; Sustainability; Water governance; WUAs

Introduction

The importance of Small Scale Irrigation (SSI) for reducing food insecurity and rural poverty, and improving the incomes of rural households in developing countries has received considerable attention in the past decades (Bhattarai et al., 2002; Hussain & Hanjra, 2004). Peter (2011) demonstrated that irrigation schemes increased food security and income generation at the household level in Swaziland. Janaiah et al. (2000) also found that the incidence, depth and severity of rural poverty were lower in...
irrigated areas than in rain-fed areas in Chhattisgarh, India. Bacha et al. (2011) reported similar results in which SSI reduced rural poverty in the Ambo district, Ethiopia. Other evidence also shows that SSI in Ethiopia contributes more to the income and livelihoods of smallholder households when compared to rain-fed farming (Hagos et al., 2009; Tilahun et al., 2011). Accordingly, Agricultural Development Led Industrialization (ADLI), the country’s development strategy, poverty reduction papers, and the recent Five Year Growth and Transformation Plan (GTP) have emphasized the relevance of SSI in addressing rural poverty, improving food security and enhancing the livelihood outcomes of smallholder farmers (Yami & Snyder, 2012). The growing interest in enhancing rural livelihoods through improving agricultural water management has led to an increase in investment in SSI development by donors, and governmental and non-governmental organizations (NGOs).

In irrigation schemes, participation is crucial in addressing poor management of the irrigation infrastructure by farmers, and enabling the establishment and enforcement of by-laws that regulate the use of irrigation water and reduce conflicts over water among users. Participation has an important role in enhancing gender equity in benefit sharing from irrigation schemes, and developing a feeling of ownership of the irrigation scheme by the community (Van Vuren et al., 2005). However, poor community participation and problems of ownership of irrigation projects have characterized the management of irrigation schemes in the past decades (Scott & Banister, 2008). For instance, Bruns (1993) indicated that participation in irrigation systems in south-east Asia was limited by the lack of appropriate designs, the difficulty of incorporating cost-sharing requirements into projects, and a lack of policies that give farmers incentives to maintain schemes.

The government of Ethiopia and development partners such as the International Fund for Agricultural Development (IFAD) acknowledged the importance of the participation of users for the sustainable management of SSI schemes (IFAD, 2005); and there is a growing body of literature on these experiences. However, the literature on SSI schemes in Ethiopia has focused on the impact of SSI on water use efficiency, crop production (Van Halsema et al., 2011), and income and livelihoods (Bacha et al., 2011; Deneke et al., 2011). Evidence is lacking regarding the influence of water user associations (WUAs) on the participation of users in the management, operation and maintenance of SSI schemes; users’ involvement in the decision-making processes in SSI management; and gender equity. This information is, however, critical for devising mechanisms that strengthen the contribution of WUAs in sustaining community participation in irrigation schemes.

The present study was carried out on irrigation systems in the Amhara, Tigray, and Southern Nations Nationalities and People’s (SNNP) regional states of Ethiopia. The objectives were to: (1) examine the role of WUAs in improving users’ participation in planning, designing, implementing, monitoring and evaluation of SSI schemes at the local level, (2) analyze the influence of WUAs on gender equity in irrigation projects, and (3) assess ways of strengthening WUAs’ contributions to enhancing community participation in irrigation systems. The data come from five SSI schemes under the Participatory Small Scale Irrigation Development Program (PASIDP), a programme funded by IFAD, the government and the local communities. PASIDP focuses on drought-prone, food-insecure areas with high population pressure. The programme aims at improving the livelihoods of food-insecure and poor farmers in rural areas. SSI development, agricultural development and institutional development are the three components in PASIDP.

The next section presents the notions of WUAs and participation followed by a detailed description of the methodology used in the study. Then a section follows on the analysis of the historical development of SSI and WUAs, how WUAs influence gender equity and community participation, and puts forward ways of strengthening WUAs’ contributions to sustain participation in irrigation schemes. The last
section draws conclusions on the main findings of the study and presents the implications of the findings to improve farmers’ involvement in the decision-making processes of SSI development.

WUAs and community participation in SSI systems

Discourse on participation assumes that the proper involvement of beneficiaries in the supply and management of resources is relevant for ensuring the sustainability of development interventions. Thus participatory approaches are said to facilitate greater efficiency and effectiveness of development interventions, and enable democratic decision-making processes (Hickey & Mohan, 2005). The discourse of participation is influenced by the theory of New Institutionalism, which suggests that institutions help to formalize mutual expectations of cooperative behaviour, allow the exercise of sanctions for non-cooperation and thereby reduce the costs of individual transactions (Cleaver, 1999). Ostrom et al. (1994, 2005) use the Institutional Analysis and Development (IAD) framework to analyze participation in the decision-making arena of the management of natural resources. The framework has become an important approach in understanding institutional settings in land and water management in the context of developing and developed countries. For instance, Shivakoti (2003) used the framework to analyze the diversity of governance systems of irrigation in Asia.

Since the 1970s, governments and several agencies including the United Nations have promoted participatory approaches with little or no critical reflection on the drawbacks (Oakley, 1995). The agencies have high expectations of participatory approaches in bringing empowerment to the local community. Yet the effectiveness of participatory approaches to bring meaningful social change is constrained by the difficulty of addressing power and politics (Cooke & Kothari, 2001). Importantly, the way participatory approaches are used in development interventions and the lack of understanding of power distribution among different actors and local institutional arrangements have reduced the effectiveness of the approach in planning and implementing projects. Thus far, most development agencies agree that some form of participation is important for making development relevant, sustainable and empowering (Hickey & Mohan, 2005), but few are able to attain this goal in practice.

In the past decades, more funds and resources have been devoted to developing irrigation infrastructure than to social infrastructure, mainly due to the assumptions of donors and governments that farmers will use the scheme once it is built for them (Brown, 2011; Tilahun et al., 2011). Such assumptions and the top-down approaches used in implementing irrigation schemes result in inadequate involvement of the local community in decision making and have led to the collapse of irrigation schemes and a waste of financial resources in countries such as Ethiopia (Aberra, 2004; Habtu & Yoshinobu, 2006), Malawi (Joseph, 2009; Veldwisch et al., 2009) and elsewhere. Such failures have led governments and donors to give more consideration to the importance of sustaining participation in irrigation schemes (IFAD, 2005). For that reason, the development of physical infrastructures together with social infrastructures has become relevant for interventions in SSI (Ostrom et al., 2011). Although there is more rhetoric on participation, there is not much progress in the actual investment and implementation of SSI projects (IFAD, 2005). Additionally, the high cost of operation and maintenance of irrigation schemes in a centralized system, the failing financial viability of schemes and deteriorating infrastructure have led to the need for effective models to manage irrigation schemes (Vermillion, 1997; Kujinga, 2002). WUAs were established to reduce costs for government and improve service delivery and efficiency. For instance, development agencies, including the IFAD and the World Bank, have supported and promoted the establishment of WUAs with the goal of enhancing
ownership of irrigation projects by the local community and sustaining operation and maintenance by users themselves (World Bank, 2004; IFAD, 2005; Wang et al., 2010).

WUAs are expected to promote the participation of users in the planning and implementation of schemes and address the lack of ownership of SSI schemes by taking over the responsibilities of scheme management (Uphoff, 1988; Meinzen-Dick & Bakker, 1999; IFAD, 2005; Abdullaev et al., 2010). WUAs are considered important links between external actors and the local communities in SSI projects in Ethiopia. Often, the external actors assume that WUAs enable participation by shaping the behaviour of local communities and making decisions towards sustainable, user-managed irrigation schemes (Backeberg, 2006; Wang et al., 2006; Birendra et al., 2011). For that reason, external actors use WUAs to introduce concepts and approaches of participation and water management issues (Garande & Dagg, 2005; Brown, 2011). Studies reveal that WUAs were established by water users themselves in several parts of the country to manage traditional irrigation schemes (Deneke et al., 2011; Tilahun et al., 2011).

In many developing countries, participation in irrigation schemes mainly means WUAs that execute management tasks in schemes (Mostert, 2006). Kahimba & Niboye (2008) in Tanzania & Khasankhanna (2005) in Uzbekistan reported that WUAs were successful in managing irrigation schemes. Van Halsema et al. (2011) also observed positive outcomes of WUAs in managing the Haleku scheme in the central rift valley of Ethiopia, under conditions of abundant water availability, fewer conflicts over water use and minimal incentives for enforcing by-laws. Similarly, transferring the management of irrigation schemes to farmers and accompanying the transfer with physical rehabilitation of schemes in Sri Lanka have brought some marginal improvements in agricultural production (Samad & Vermillion, 1999). In contrast, poor achievements were reported for WUAs in countries in Asia (Chandran et al., 2001; Abdullaev et al., 2010) and Africa (Brown, 2011) due to the top-down approaches used in implementing WUAs and too much or too little state intervention. For instance, Mollinga et al. (2007) found that the takeover of the WUA leadership by a rural elite and the link between the WUA leadership and party politics in Andhra Pradesh, India resulted in a technically improved irrigation system but poor participation of users in WUA decision making. Such cases imply that biophysical and socio-cultural factors have an influence on the performance of WUAs.

Evidence shows that factors including cohesiveness, common interest, the collective efforts of water users, effective leadership of WUA committees, legal support, and financial viability of WUAs are important in determining the capacity of WUAs to involve users of schemes in the planning and management of these schemes (Swain & Das, 2008; Abdullaev et al., 2010; Mishra et al., 2011). The build-up of WUAs in a pragmatic and socially embedded process instead of imposing cooperative WUAs could work better in managing irrigation schemes. For instance, Habtu & Yoshinobu (2006) indicated that managing traditional schemes with village by-laws enforced by water distributors contributed to the persistence of the Betmera–Hewane traditional irrigation scheme that has existed in Tigray since 500 BC; while many newly introduced SSI schemes in the same area failed due to poor community participation. Additionally, the lack of a clear-cut distinction between the roles of agricultural cooperatives and WUAs creates confusion in the governance of irrigation schemes in Ethiopia (Yami & Snyder, 2012). While the establishment and operation of agricultural cooperatives in Ethiopia in the socialist regime were state-driven and had involuntary membership, there is a renewed interest in cooperatives in the current government (Getnet & Anullo, 2012). Thus cooperatives are encouraged to play important roles in promoting agricultural development in Ethiopia, such as in providing farmers with access to farm inputs. The government often considers cooperatives as an articulation of community voice (Spielman et al., 2009).
On one side, cooperatives operate as implementing agencies for development projects prioritized by the government, including the development of SSI, although they are public institutions. On the other side, there are WUAs established by the community to govern traditional schemes or established by irrigation projects to play key roles in the management, operation and maintenance of schemes once the schemes are handed over to the community. The WUAs do not have formal status in the local governance and have to be registered as cooperative WUAs to have legal status. In this case, the governance structure gives legitimacy only to WUAs registered as cooperatives (cooperative WUAs) and WUAs have to fulfil the criteria for the establishment of cooperatives. Often conflicts arise in conditions where there are WUAs operating in irrigation schemes but where they are not registered as cooperatives. The distinction between WUAs and cooperatives fades away since in most cases the WUAs are registered as cooperatives to ensure their legal status regardless of why they were initially established. The voluntary establishment of cooperative WUAs has compromised their ability to enforce rules to manage irrigation schemes.

In the present study, the elements of New Institutionalism, including creating a suitable environment for joint decision making, acknowledging local knowledge of resource management, and enabling the exclusion of non-users of communal resources at low cost for users, are used to examine the relevance of WUAs in facilitating participation in irrigation schemes. The paper argues that the way different actors understand the meaning of participation and how it can be achieved influences the impacts of WUAs in enabling the participation of smallholder farmers in SSI projects and enhancing gender equity in irrigation schemes, and thereby the sustainability of SSI projects.

### Methodology

This study was conducted in five villages: Mesanu and Chelekot in Tigray, Kuhar Michael and Angot in Amhara, and Suka in SNNP regional states, Ethiopia (Table 1, Figure 1). In all sites, social capital is

<table>
<thead>
<tr>
<th>Variables</th>
<th>Tigray sites</th>
<th>Amhara sites</th>
<th>SNNPR site</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mesanu</td>
<td>Chelekot</td>
<td>Kuhar Michael</td>
</tr>
<tr>
<td>Geographical location</td>
<td>Northern</td>
<td></td>
<td>North western</td>
</tr>
<tr>
<td>Altitude (m above sea level)</td>
<td>2021</td>
<td>2025</td>
<td>1795</td>
</tr>
<tr>
<td>District town (DT)</td>
<td>Wukro</td>
<td>Kuiha</td>
<td>Wereta</td>
</tr>
<tr>
<td>Distance from DT (km)</td>
<td>15</td>
<td>30**</td>
<td>10</td>
</tr>
<tr>
<td>Average rainfall (mm yr⁻¹)*</td>
<td>545</td>
<td>541</td>
<td>1306</td>
</tr>
<tr>
<td>Major land uses***</td>
<td>EX, CL</td>
<td>EX, CL</td>
<td>CL, WL, GL</td>
</tr>
<tr>
<td>Dominant ethnic group</td>
<td>Tigrean</td>
<td>Tigrean</td>
<td>Amhara</td>
</tr>
<tr>
<td>Total number of households (HHs)</td>
<td>90</td>
<td>235</td>
<td>107</td>
</tr>
<tr>
<td>Male-headed HHs (No.)</td>
<td>64</td>
<td>199</td>
<td>97</td>
</tr>
<tr>
<td>Female-headed HHs (No.)</td>
<td>26</td>
<td>36</td>
<td>10</td>
</tr>
</tbody>
</table>

*The average rainfall is for the years from 2004 to 2009, and data on rainfall were collected from the Ethiopian Meteorological Service Agency in 2011.

**Chelekot is closer to Mekele, the regional capital (17 km), than to Kuiha, the district town.

***CL, WL, GL, EX, and PF are crop lands, private wood lots, grazing lands, exclosures, and protected forests, respectively.

Source: Yami & Snyder (2012).
built on religion, family lineages and neighbourhoods. Most importantly, informal social institutions including ‘Mahber’ (religious festivals), ‘Eqib’ (rotational savings) and ‘Idir’ (burial institutions and social safety nets) are the basis for socializing events and serve as platforms for communication, information sharing and conflict resolution (Yami & Snyder, 2012).

Farmers pursue mixed crop–livestock farming and use oxen to till their farm plots. Farming is carried out on small farm plots (average 0.5ha per household) for both subsistence and market sales. In most cases, animal husbandry supplements crop production. The amount and availability of rainfall, agro-climate and soil fertility influence agricultural productivity and thus livelihoods. In the Tigray and Amhara sites, farmers produce wheat, barley and teff on rain-fed farm plots, and maize, vegetables and fruit on irrigated fields. In the SNNPR site, farmers cultivate maize and root crops such as sweet potatoes. The choice of crop production is related to food preferences for specific staple foods and also on rainfall availability (Yami & Snyder, 2012).

Data were collected from April to December 2011 in the five villages using in-depth interviews, focus group discussions and field surveys, and some of the study sites were revisited in May 2012. For
in-depth interviews, 50 participants were chosen using purposeful sampling. Participants included farmers, government officials, local authorities, irrigation experts at regional and wereda\textsuperscript{1} levels, and development agents (extension officers) of the government at kebeles\textsuperscript{2}. For field surveys, 102 participants were selected using stratified random sampling from a list of dwellers who were users of irrigation schemes (Table 2). In the surveys and interviews, semi-structured questionnaires with open-ended and closed questions were used. Interviews were conducted in Amharic and with the help of translators, depending on the local language spoken in the study sites (Yami & Snyder, 2012). Participants were asked questions about the historical context of irrigation practices, the establishment and functioning of WUAs, their understanding of participation in irrigation, their perceptions of the outcomes of irrigation on their livelihoods, the influence of WUAs on gender equity, and possible ways of enhancing participation in irrigation projects. Other questions concerning demographic, socio-cultural and political factors that influence the establishment, functioning, and outcomes of WUAs in irrigation projects were also asked. Observations of WUA meetings in Amhara and Tigray were also made in May 2012 to understand how participation is perceived by different actors and how it is done on the ground. Secondary data on socio-economic settings were extracted from the literature and local organizations including the Office of Agriculture and Rural Development (OARD). Qualitative data analysis and descriptive statistics were used to analyze and interpret the data.

Table 2. Characteristics of survey participants in the studied villages.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Tigray sites</th>
<th>Amhara sites</th>
<th>SNNPR site</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mesanu</td>
<td>Cheleko</td>
<td>Kuhar Michael</td>
</tr>
<tr>
<td>Average family size (No.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Male HHs</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>• Female HHs</td>
<td>5</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Family members working in irrigation (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Male HHs</td>
<td>39.2</td>
<td>35.2</td>
<td>48.4</td>
</tr>
<tr>
<td>• Female HHs</td>
<td>33.5</td>
<td>46.0</td>
<td>47.3</td>
</tr>
<tr>
<td>Membership of WUA (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Male HHs</td>
<td>45.0</td>
<td>64.0</td>
<td>60.0</td>
</tr>
<tr>
<td>• Female HHs</td>
<td>45.0</td>
<td>67.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Average plots in the upstream (No.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Male HHs</td>
<td>2.1</td>
<td>1.3</td>
<td>1.4</td>
</tr>
<tr>
<td>• Female HHs</td>
<td>2.2</td>
<td>1.0</td>
<td>1.1</td>
</tr>
<tr>
<td>Average plots in the downstream (No.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Male HHs</td>
<td>2.0</td>
<td>1.5</td>
<td>1.6</td>
</tr>
<tr>
<td>• Female HHs</td>
<td>1.2</td>
<td>1.0</td>
<td>1.3</td>
</tr>
</tbody>
</table>

\textsuperscript{1} Wereda is a government administrative unit comprising a number (approximately 20) of villages. Wereda is often described as synonymous with district.

\textsuperscript{2} Kebele (tabia in Tigray) refers to the lowest government administrative unit.
Results and discussion

Historical context of irrigation activities

Participants recalled that traditional irrigation was started in response to insufficient rainfall availability and food insecurity problems in all the study sites. Then, the traditional irrigation schemes were upgraded to ‘modern’ river-diversion schemes with the support of IFAD and the government. The definitions given to ‘modern SSI’ by farmers, extension personnel and SSI project implementers translate to the construction of schemes by external bodies (government or NGOs) and include concrete river-diversion structures, lined canals, introduced water-lifting devices and the use of farm inputs. The ‘traditional SSI’ is defined as an SSI system developed by farmers and one that has diversion structures and canals made from locally available materials such as soil and stones and a farming system with low use of farm inputs and low or no use of modern technologies. In all the study sites, farmers used to irrigate their plots by diverting rivers using wood, stones and soils to cope with drought and seasonal food insecurity, then the PASIDP upgraded the traditional schemes by constructing concrete river-diversion structures and lined canals. In Kuhar Michael, the initiative of traditional irrigation by diverting the Guanta river was started in 1989 by the then head of wereda OARD. The head convinced farmers of the importance of irrigation for increasing production, and farmers contributed labour and locally available materials during construction. The wereda OARD uses agricultural cooperatives for sale and distribution of farm inputs so that the price will be consistent and to meet seed demands in an organized manner.

In Angot, a few farmers started traditional SSI in 1977 by diverting the Shini river. The Commission for Sustainable Agriculture and Environmental Rehabilitation for Amhara Region (COSERAR) came to the Kebele in 1994 and convinced farmers that ‘modern’ SSI was more beneficial than traditional SSI because the scheme would not be destroyed by flooding and would also prevent wastage of water to seepage. A WUA committee in Angot highlighted that farmers were suspicious of the new idea and believed it could be a trick to take their land and rights over the traditional scheme if the government were to invest in the construction of the ‘modern’ scheme. The wereda OARD and wereda administration convinced the farmers to learn from the experiences of Bure wereda in Amhara region. They provided training on how to use the SSI, how many times to crop per year, and what to produce towards generating better incomes. Construction took four years in total. However, villagers complained to the OARD. They believed the construction was poor, because the narrow width of the canals makes cleaning difficult. The development agent in Angot explained that construction was interrupted due to the disagreement between the villagers and COSERAR. Then, the problem was solved by contracting the construction to the Water Works Construction Enterprise (WWCE). The quality of design and construction was better accepted by the community and the scheme has been functional since 2009 (Interviews, April 2011).

In Mesanu, traditional SSI was used in the tabia for more than 100 years, in which the Birki river was diverted. Only those with rist rights had access to the SSI during the Haile Selassie regime. Since the Derg, all farmers who have land in the command area can access the SSI scheme. The traditional

---

3 Rist system refers to one of the oldest and most common forms of usufruct tenures in which land was held by a descent or village group whose members had equal-use rights to the land. In some localities, there was periodic reallocation of holdings in the rist system. In rist, individuals had only use rights over their land holdings, which they could not transfer to others by sale. Village chiefs, who were usually appointed by the district’s governors, administered the rist land rights. These hereditary rights were subject to payment of taxes and provision of other services to the local administration or gult (Hoben, 1973; Rahmato, 2009).
scheme was upgraded to a ‘modern’ river-diversion scheme in 2001 by IFAD, the government and villagers. Villagers contributed labour and local materials during construction and the wereda OARD handed over the scheme to the local community through the kebele administration (Interview with WUA in Mesanu, May 2011).

Traditional irrigation was practised in Chelekot for several decades by diverting the Gereb Kokhi river using stones and soils. The main challenges with the traditional SSI scheme were flooding, siltation in canals, frequent need to rebuild/maintain the canals, wastage of water, collapse of the earthen canal and high labour demands for cleaning (Focus group discussion in Chelekot, May 2011). In response, the villagers demanded ‘modern’ river diversions from the government. The traditional scheme was upgraded to a ‘modern’ irrigation scheme in 2005.

In Suka, traditional irrigation was started to provide water for the seedling nursery of agricultural cooperatives in the Derg regime. Meanwhile, drought in 1984 and 1987 prompted farmers to use the traditional SSI to produce sweet potatoes. After that, the OARD taught farmers to produce maize, onions and other vegetables. Farmers grew cassava and sweet potatoes, which improved the nutritional levels of households. The traditional scheme was upgraded to a ‘modern’ river diversion in 2003.

**Perceptions on livelihood outcomes of irrigation projects**

The livelihood outcomes of irrigation had similarities across all the study sites (Figure 2(a)–2(c)). The frequently mentioned outcomes by participants were improved nutrition, ability to afford clothing and medical care, increase in income and food security of households, and increase in market participation. Improving nutrition and medical care from the sale of the harvest were more important than investing in farm inputs and technologies that increase agricultural production. Increasing the workload of women was the only negative outcome of irrigation mentioned by participants. Female participants mentioned the increased workload as a negative outcome less frequently than the male participants mainly due to the consideration of cooking food either for family or for those working on irrigable plots as their regular task. Considerable numbers of family members (ranging from 33.5% to 60.9%) are also working in the irrigation schemes (Table 2). The perceived outcomes are in line with the main goals of the irrigation projects in enhancing food security and increasing the income from irrigable plots. Likewise, Dillon (2011) indicated that SSI projects in northern Mali improved household food consumption, agricultural production and nutrition, and reinforced informal sharing within villages with low agricultural potential.

**Evolution and functioning of WUAs in irrigation schemes**

The evolution of WUAs in the study sites reveals that traditional irrigation practices, the political context of the villages and the interests of external actors have influenced the set-up of WUAs. Historically, villagers and the local administration established village by-laws to govern the traditional irrigation schemes in all sites. The village by-laws include rules to access the scheme, protect the infrastructure from destruction and clean the canals, as well as monetary sanctions for violating the rules. In all the study sites, village by-laws were agreed on by the villagers verbally and were not in a written form. Then the local administration facilitated villagers to assign ‘water fathers’ and, in some cases, guards to enforce the village by-laws in the irrigation system. Participants indicated that the village by-laws contributed to defining users, defining boundaries, resolving conflicts, economic water use, equitable access among users, preventing degradation of water resources, and mobilizing collective action for operation.
Fig. 2. Perceptions of outcomes of irrigation projects in Tigray (a), Amhara (b) and SNNPR (c) sites.
and maintenance of the irrigation schemes. For instance, sixteen users are allocated watering turns for eight days at a time and other users are allocated turns over the following weeks in the SNNPR site. In the traditional system, the Hatsa Shuma (meaning ‘water fathers’) decide the duration and frequency of watering for each user based on the types of crops or vegetables a user grows. Turns for watering onions are from early morning to 8 a.m. Then turns are given to those watering different crops or vegetables from 8 a.m. to 4 a.m. the next day. If someone steals someone else’s watering turn, the fine will be 15–30 ETB. The fine for missing one day of canal cleaning is five ETB. The village by-laws in the SNNPR site allocate watering turns and ensure maintenance of canals with the deterrent of fines. However, the watering schedule, which is based on types of crops, might face challenges due to the increasing demand for onions in the local market. Participants perceived that the introduction of ‘modern’ schemes has degraded the traditional system of managing schemes using village by-laws in the SNNPR site. The perception arose from the increasing use of cooperative by-laws over village by-laws in managing SSI schemes.

In the Tigray sites, the traditional water distribution system and the WUA leadership through Meaja, Abo Gereb and Abo May committees persist regardless of the new institutional arrangements introduced by PASIDP and the cooperative agency. The newly established WUA cooperatives, led by WUA committees, are functioning in the schemes in parallel to the traditional system. Meajas are committees that work on establishing watering turns. Abo Gerebs are committees responsible for controlling water use and resolving conflicts for a specified part of the scheme. Abo Gerebs are established later in the irrigation season and serve for one irrigation season. Abo Mays resolve conflicts and allocate water fairly and they also control whether users in the whole command area are following watering turns properly. Unlike Abo Gerebs, Abo Mays work for several irrigation seasons (Focus group discussion in Chelekot, May 2011). Unlike the other study sites, the traditional system of governance of irrigation in the Tigray sites continues to govern the ‘modern’ irrigation schemes. The persistence of the governance system in the Tigray sites arose from the positive experiences of farmers in keeping the traditional Baito system of politico-administrative governance, which characterize local empowerment at the lowest local authority. Participants agreed that the Tabia administration has the strongest influence in the management of schemes due to the political power and formal status of the institution creating enabling conditions for rule enforcement (Figure 3).

Fig. 3. Diagram of the institutional arrangement of SSI management in Chelekot (illustrated by participants of focus group discussions, thicker size of lines between boxes implies stronger linkage).

---

4 The average exchange rate in 2011 was 1 Ethiopian birr = 0.057 USD.
5 Baito refers to a system of political leadership and administration at Tabia or Wereda level (Milas & Latif, 2000).
The case of WUAs in the Amhara sites reveals the influence of the political context on agricultural cooperatives. Such influence was common across sites that were considered to have good potential for production across the country during the Derg regime. For instance, in Kuhar Michael, the Jigna agricultural cooperatives were established in 1976 prior to irrigation practices in the village and following the Derg regime’s proclamation, which stated that farmers should be involved in collectivization. However, the cooperatives in the Derg regime did not focus on irrigation.

Later, irrigation became an important component of the farming system in the village. Farmers worked on seed multiplication in 1994 and shared the benefits among themselves. Farmers’ negative experiences on collectivization, which was facilitated by the agricultural cooperatives in the Derg regime, created challenges including low level of membership for the establishment of WUAs in 2002.

With the introduction of ‘modern schemes’, the water fathers are replaced by the WUA leadership, which is governed by five to thirteen committees including chairperson, cashier and supervisor in the Amhara and SNNPR sites. The WUA leadership is expected to abide by the rules and regulations of the cooperative agency. In the Tigray sites, the WUA committees function as the lowest level of formal institutions to govern the irrigation schemes and administer WUA membership fees, while the traditional governance systems are used to manage the water distribution and mobilize labour for operation and maintenance of the scheme. The cooperative agency treats the establishment of WUAs in similar ways as those for cooperatives, which work in facilitating the supply of farm inputs to members and assist farmers in searching for markets to sell crops. In most of the sites, the WUA membership levels are high, particularly for male farmers, compared to the number of users of the schemes. The decrease in size of the actual irrigable area due to the collapse of canals and shortage of water explains the outnumbering by WUA members compared to actual users (Table 3).

The cooperative agency is responsible for organizing farmers and facilitating the legal status of the farmers’ associations. With regard to irrigation, WUAs can get their legal status by being registered as WUA cooperatives, and the registration process is similar to that of agricultural cooperatives. The arrangement of formalizing WUAs as cooperatives could emerge from the assumption that organizing farmers at the grass-roots level facilitates collective action and strengthens the institutions by providing legal status for rule enforcement. Establishing WUAs with strong formal by-laws using the set-up of cooperatives could be important in collecting service fees and encouraging savings. However, it

<table>
<thead>
<tr>
<th>Evaluation/functioning criteria</th>
<th>Tigray sites</th>
<th>Amhara sites</th>
<th>SNNPR site</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mesanu</td>
<td>Chelekt</td>
<td>Kuhar Michael</td>
</tr>
<tr>
<td>Level of membership compared to users (%)</td>
<td>204.4</td>
<td>44.7</td>
<td>74.8</td>
</tr>
<tr>
<td>Preventing wastage of water in irrigation</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Preventing any violations regarding cropping pattern</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Preventing any illegal practices in the scheme</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Fair allocation of water for irrigation</td>
<td>Poor</td>
<td>Good</td>
<td>Poor</td>
</tr>
<tr>
<td>Performance of WUA committees (good = 1, poor = 0)</td>
<td>0.5</td>
<td>0.6</td>
<td>0.5</td>
</tr>
<tr>
<td>Enforcement of village by-laws (good = 1, poor = 0)</td>
<td>0.7</td>
<td>0.5</td>
<td>0.9</td>
</tr>
</tbody>
</table>

√ shows that the WUAs fulfil the evaluation criteria while X shows that the WUAs do not fulfil the criteria. Average values of ratings by survey participants were taken to assess performance.
lacks the mechanisms to address the heterogeneity among water users and casts doubts on its inclusiveness, because residence in the *kebele* and having plots in the command area are the criteria for WUA membership. The criteria could deprive poor and landless members of the community from benefiting from the WUA membership of irrigation projects.

In addition, participants highlighted that the cooperative agency designed the rules and regulations of the WUAs without the involvement of WUA members. The top-down approach used by the cooperative agency in devising the formal WUA by-laws reduces the common understanding of by-laws by users of schemes and weakens rule enforcement. The interference of external authorities in by-law establishment increases insecurity among WUA members about their access to the irrigation schemes in the long run since they have no way of knowing if the rules are changed without their consent. In such cases, the WUAs face challenges to ensure rule enforcement and collective action to manage the schemes as reflected in Table 3. Similarly, Regmi (2008) pointed out that farmers in Nepal are less likely to organize in a WUA for the long term if they lack a common, shared understanding of the costs and benefits of engaging in a collective action.

Both male-headed and female-headed households in the study sites rated the performance of WUA committees as average, and enforcement of village by-laws as good (Table 3). The respondents in the SNNPR site rated fairness of water allocation as ‘poor’, although they gave the highest score for the performance of WUA committees and the enforcement of village by-laws compared to the other sites. This deviation could emanate from the consideration of allocating more watering turns to users who planted onions and other vegetables than to users who produce other crops as being unfair by most of the respondents. WUAs did not influence access to irrigation because all villagers with irrigable plots in the command area have access to the irrigation scheme regardless of their membership of WUAs. The WUA committees also function in preventing wastage of water and illegal practices in the scheme. Efficient use of water is expected to enhance crop production and WUAs worked well in this regard. However, respondents pointed out that the WUA committees did not work on cropping pattern issues and that the committees also did not have good performance in fair allocation of water, with the exception of Angot and Chelekot. In Angot, the close distance of the scheme to the nearest market could increase the value of irrigable crops and encourage users to become more involved in the follow-up of water allocation procedures and evaluate the performance of WUA committees frequently. The perception of fairness in water allocation in Chelekot is due to the good availability of water for irrigation in the village.

The importance of WUAs in conflict resolution was mentioned less frequently (Figure 4(a)–4(c)). Users depend on the *water fathers* and village elders, who might be members of WUAs or not, when conflicts arise because the cost of conflict resolution is lower in terms of time and flexibility in the traditional mechanisms of conflict resolution than the formal WUA system. The *water fathers* and village elders are usually available to mediate in conflicts. The fact that they live in the same village as users of schemes also enables quick decision making. In contrast, Lecoutere (2011) observed a positive influence of WUAs in resolving conflicts that arise from competition for water resources in irrigation schemes in Tanzania.

Some cases revealed that the effectiveness of WUAs in fair water allocation and conflict resolution is also influenced by the level of trust of users in the WUA committees. For instance, in Kuhar Michael, participants frequently mentioned that they have lost their trust in WUA committees because WUA committees are corrupt in giving more watering turns to their relatives, in-laws and neighbours.

Such bias in rule enforcement was a general problem facing the WUAs in some of the study sites. The presence of several informal social and religious institutions such as *Idir* and *Mahber* might indicate the
Fig. 4. Perceptions of the respondents on performance of WUAs in managing SSI in Tigray (a), Amhara (b), and SNNPR (c) sites. The number of replies could be lower than, equal to, or greater than the number of participants because participants mentioned none, one, or more than one importance.
presence of high social capital among villagers. While social capital was useful in mobilizing villagers to set common goals and take actions to improve management of irrigation schemes, often high social capital might not provide the accountability, transparency and equity that the government and IFAD intend to achieve in irrigation schemes. Deneke et al. (2011) also found that the distribution of power among villagers and bribery influenced the water allocation in Kuhar Michael. Bedeke (2011) found similar results in irrigation systems in East Hararghe, Ethiopia in which the corrupt and rent-seeking behaviour of WUA committees lowered users’ contributions for maintenance of irrigation schemes. Komakech et al. (2012) observed that water allocation by WUA committees favours farmers with larger land endowments, with many family members, and with good communication skills over other farmers in irrigation schemes in the Makanya catchment in Tanzania. Such cases demonstrate the challenges in trying to use either traditional institutions or introduced ones to achieve equity and transparency goals, which are not necessarily shared by those with the most power locally.

Most of the respondents believe that involving WUAs in the study and design of schemes is important to develop ownership of the schemes, to create off-farm employment during construction, and to give farmers a chance to contribute their local knowledge on irrigation practices. However, none of the WUAs in the study sites took part in the design and construction of irrigation schemes, although the PASIDP design indicates WUAs should be involved in the planning and implementation of schemes. This case indicates that the designs of the PASIDP and reality may not be consistent. The OARD and contractors handed over the schemes to the local communities through the WUA committees after completion of construction. The external actors transferred the management of schemes to WUA committees without ensuring the abilities of the committees on operation and maintenance, and the necessary financial and administrative skills. Such a transfer weakened the management of the schemes and resulted in negative outcomes, including poor operation and maintenance of the irrigation scheme.

Furthermore, strengthening the capacity of WUAs is critical for the sustainability of irrigation projects, as the capacity of WUAs determines water use efficiency in the scheme, the level to which the concerns of both the upstream and the downstream users are addressed, and the participation of men and women in decision making. Lack of evaluation of performance of WUA committees could lower their leadership quality in enforcement of by-laws and mobilization of the users in labour and financial contributions. This in turn influences the sustainability of the SSI across the study sites. The findings indicate that sustainability and achieving higher levels of performance in irrigation schemes are constrained, among other things, by the weakness in how the users are involved and facilitated to participate and accept ownership. Huamanchumo et al. (2008) also indicated that a transfer of irrigation management responsibilities to WUAs in Peru, accompanied by changes in leadership, administrative, and technical personnel, has led to a deterioration of the irrigation infrastructure and a lowering of agricultural production.

Influence of WUAs on gender equity in irrigation projects

In all the sites, all WUA committee members are men, and there are no women on any of the committees. Both male-headed and female-headed households perceived that men perform well as WUA committees. Further, male-headed and female-headed households questioned whether women are capable of undertaking the leadership responsibilities and enforcing village by-laws (Figure 4(a)–4(c)). Respondents highlighted that domestic workloads of women increased with the development of ‘modern’
irrigation because they have to cook for the people working on irrigable plots in addition to other domestic activities, and this limited their participation in WUA committees.

Villagers also believe that women are less assertive than men. For instance, female participants of a focus group discussion in Chelekot mentioned that: ‘Women are shy to express themselves and to take responsibilities, such as punishing users that violate rules and giving lessons on irrigation management in public.’

Most of the male and female respondents agreed that women are too weak to be on WUA committees and be involved in decision making. Men dominate the institutions through which decisions such as the establishment of village by-laws, mobilization for operation and maintenance of the irrigation scheme, and ways of water allocation among users are made. This male dominance in WUA membership and WUA committees excludes women from negotiating in decision making on how to use an irrigation scheme, allocate watering turns among users, maintain canals, and conserve soil and water resources in the watershed. This situation also deprives women of information on cropping patterns and marketing. In addition, the lack of incentives for women to be on WUA committees and the fact that men use informal get-togethers to discuss issues in managing irrigation schemes have lowered women’s interest in working on WUA committees (Focus group discussion of women, Amhara sites, May 2011). This is unfortunate, however, in that high participation of women in WUA leadership could have enhanced inclusiveness in decision making and enabled women in the WUA committees to liaise between the WUA leadership and other women (Van Koppen et al., 2001).

Furthermore, it was observed in two WUA meetings on irrigation schemes in Amhara that some women are less interested in attending WUA meetings mainly because they are not given the chance to forward their ideas by the chairmen. Women believe that no one listens to what they have to say. Women’s physical presence at WUA meetings does not ensure their involvement in decision making. Female participants in focus group discussions also underlined that their involvement in domestic work, the lack of incentives to be on WUA committees, the difficulty for married women to get their husbands’ permission to speak in public, and the less attention given by the public to points that women make in WUA meetings, constrained their participation in decision making in irrigation schemes. In cases in which women face some troubles in the irrigation scheme, they ask their husbands or male relatives to explain the problem in WUA meetings. The belief of villagers that men are responsible for making decisions regarding
irrigation schemes has limited women’s representation in WUA committees and women’s involvement in WUA decision making. Such beliefs and practices favour decision making by men over women. The participation of women in WUAs is very limited, despite women’s active participation in irrigation activities following high levels of migration of men to other areas (Figure 5). Udas & Zwarteveen (2005) in Nepal and Gunchinmaa et al. (2011) in Uzbekistan also found that prevailing notions about how men and women should behave influenced how users of schemes interpret and value participation in the WUAs in irrigation schemes.

By and large, the lower place given to women in decision-making processes has hindered the benefits of having women on WUA committees to achieve gender equity, empowering women, and also in filling the gap in incorporating the needs and priorities of women in irrigation which might be similar to or different from those of men. This gap in balancing the decision-making power of men and women demands an intervention of local authorities and local NGOs in changing behaviour on gender equity towards sustaining the positive outcomes of irrigation for livelihoods at household and community levels.

**WUAs’ influence on community participation in irrigation projects**

The way actors in irrigation schemes understand participation influenced the performance of WUAs in sustaining participation in irrigation schemes. Farmers’ perceptions of participation refer to collective action for maintaining the irrigation infrastructure, controlling water distribution, and using water in irrigation canals for multiple uses in addition to irrigating their fields. Looking at participation from the angle of using and maintaining the irrigation scheme was a dominant view of both male-headed and female-headed households (Figure 6(a)–6(c)). The responses of both male-headed and female-headed households frequently refer to the meaning of participation, which is the labour contribution for construction and maintenance of schemes. Contributing labour for canal cleaning and soil and water conservation works in the irrigation scheme (Figure 7), using water from canals for bathing and washing clothes, and using water from canals for livestock were the most important ways of participating in irrigation schemes for farmers. Most of the respondents reported that they have participated in training about irrigation practices, although the frequency was higher for male-headed households.

Respondents in all study sites consider decision making as a task of the WUA committees and do not consider themselves as being responsible for the decision-making process. Factors including poor understanding of the decision-making aspects of participation by project implementers and the intervention of external bodies in determining the set-up of WUA by-laws constrained the contributions of WUAs in promoting participation. The lack of clarity on the responsibilities of WUAs vis-à-vis cooperatives in rule enforcement also limits ways of involving users in the decision-making process, for instance, the cooperatives play little role in conflict resolution.

The meaning of participation for the experts of OARD and WUA committees was different from male and female farmers’ perceptions of participation in irrigation schemes. The perception of participation by the experts of OARD and WUA committees refers to attaining the following: (1) more than 50% of the community become members/beneficiaries of a project; (2) farmers’ interests are incorporated into project plans, although farmers had poor involvement in most of the SSI projects studied; (3) free and transparent discussion/consultation between beneficiaries and the project implementers exists; and (4) representatives of farmers are involved before and after the implementation of the irrigation project.
While the perceptions in some way include farmers’ involvement in decision making, the actual implementation of participation does not make allowance for farmers to make major decisions on irrigation schemes. The way extension personnel work to achieve participation demonstrates top-down approaches of the agricultural extension system.

The indicators used by OARD experts and WUA committees to assess participation in irrigation schemes, although their explanations had slight differences, shared similar notions. The experts use
the number of beneficiaries of the project and the level of adoption of an introduced irrigation technology or improved seed variety by farmers as evidence of participation. The indicators used by the WUA committees include the level of WUA membership compared to the total number of users, the number of users that attend WUA meetings, and the number of users that contribute labour and local materials for construction and maintenance. Additionally, the amount of contributed fees and income from selling onion seeds are used to assess participation in Amhara sites.

The acceptance of the WUA committees’ decision making by users of schemes on issues of collective action for operation and maintenance was important in influencing how farmers participate in irrigation schemes. For instance, users could express their reaction to the lack of transparency in how service fees are used and the poor attention given to their opinions and concerns from the onset of irrigation projects by refusing to contribute labour for canal cleaning. At this point, one can argue that the indicators used in assessing participation should be beyond figures and should include an assessment of whether WUA members take part in the decision-making processes or not, and of what incentives are expected by WUA members for active involvement in the decision-making arena.

In line with the findings of the present study, a study in India (Bassi et al., 2010) indicated that the goal of achieving participation in irrigation systems through WUAs was constrained by the interest of communities to get services from the WUAs, such as water allocation, rather than getting involved in the decision-making processes of WUAs. In addition, Garande & Dagg (2005) elaborated that a failure to integrate the community or inform the community in a formal manner about the project and consult them regarding key project issues constrained the involvement of users in decision making in an irrigation scheme in Chile. Such cases reveal that communicating with the community and building common understanding of the goals and implementation of the irrigation project from the onset of irrigation schemes enable the active involvement of the local community.

**Recommendations for strengthening WUAs towards sustaining community participation**

The study reveals that practical means for improving participation, for instance, developing separate by-laws for WUA establishment instead of imposing the by-laws of cooperatives on WUAs, are needed for the successful management of schemes. This measure would be useful in enhancing accountability in decision making and addressing the trade-offs in rule enforcement. The OARD and users of schemes
could take part in devising the by-laws for WUA formation and functioning. Such institutional measures are important to address the ‘one size fits all’ approach used by the cooperative agency and incorporate the requirements of irrigation in the by-laws. Government authorities should revisit the legal status of WUAs to enforce by-laws and provide legitimacy to WUAs by distinguishing them from cooperatives. For instance, providing legal status to WUAs, accompanied by the authority for enforcing rules on users of schemes, has resulted in successful organization and management of WUAs and the sustainability of irrigation institutions in Thailand (Teamsuwan & Satoh, 2009). There is a need for distinguishing the mandates between cooperatives and WUAs for fee collection and input supply. WUAs should be allowed to mobilize financial resources from their members and cover their own demands for supply of farm inputs without interfering with the profit-making target of cooperatives with input supply.

In addition, experimenting with ways to include women’s perspectives and views in WUA decision making and designing methods beyond setting targets for membership in WUAs or WUA committees are crucial. For instance, women’s interest groups could be formed within WUAs to enable them to present their views with greater security and by-laws could be designed whereby consultation with these women’s sub-groups becomes a stipulation for any decision making for the WUA. Greater economic empowerment has been shown to increase women’s confidence to participate in wider decision-making bodies. Thus devoting funds to capacity building of women in input use, agricultural and financial planning and marketing skills, in particular in female-headed households, could improve women’s involvement in decision making.

Checking whether the WUA committees represent the heterogeneity among users of schemes and defining roles and responsibilities of WUA committees lessen the dilemmas on accountability issues. Accountability in the WUA system can be improved by preparing platforms for following up the enforcement of by-laws and evaluating the performance of WUA committees by the WUA members on a regular basis, and clarifying the goals of the WUAs such as good documentation of crop production and financial records. Improving WUAs to be more inclusive and communicative is crucial in sustaining the participation of users. Devising incentive mechanisms for WUAs, for instance, through training opportunities and farmer-to-farmer experience-sharing visits, could be crucial. Besides, since agricultural cooperatives do not provide services to fulfil the demands of irrigation, strengthening the WUAs to work in seed multiplication and supply to users of the scheme improves their financial capacity and increases the market participation with the production of crops and vegetables according to demand in the market. In this way, the WUAs can increase their acceptance by the community, improve community participation in irrigation systems, and sustain the positive outcomes of irrigation schemes to livelihoods.

Furthermore, increasing WUA membership levels of men and women through devising social and economic incentives for membership is important. High membership levels in WUAs could develop the financial and administrative capacities of WUAs. Additionally, the involvement of users of schemes in deciding the amount of service fees by themselves, instead of the imposition of decisions by external authorities, and in preparing plans on how to use the financial resources is crucial. By doing so, members are more involved in the WUA, and the financial administration of the WUA becomes transparent. Involving users in preparing plans for operation and maintenance is appropriate. Implementing the plans could increase the timely maintenance of schemes and avoid negligence in waiting for external support for scheme maintenance, which is often unreliable, irregular, and not at the right time. Similarly, Shioda & Onimaru (2007) emphasized that adjusting water allocation procedures according to the requirements of users and developing the water allocation, and operation and maintenance plans, with involvement of WUA committees and users of the schemes are important in enhancing participation in irrigation schemes.
Conclusions

Ensuring community participation has been a challenge to the management of irrigation projects in Ethiopia. This article contributes to the knowledge and practice for strengthening WUAs to sustain participation in irrigation projects by drawing evidence from IFAD-supported irrigation schemes on the ways in which irrigation practices and WUAs evolved, gender issues in managing irrigation schemes, and the perceptions of participation by different actors. The article demonstrates that the poor understanding of community participation and institutional development by project staff results in the poor performance of WUAs in enhancing participation in irrigation systems in Ethiopia.

Irrigation has improved the food security status of households, income generation, and overall well-being of the community. Yet, the interference of the cooperative agency in imposing cooperative by-laws on WUAs, the top-down approaches used in developing the by-laws, and the poor understanding of decision-making aspects of participation by different actors have constrained community participation. The little attention given to inputs from the community in building the lowest level of institutions in irrigation schemes have lowered the acceptability and effectiveness of WUAs and the formal by-laws by the users. The findings indicate that the OARD and local government should assess the felt need and interest in irrigation of the local community. Besides, women were underrepresented in the WUAs, the importance of their input in improving the decision-making process in WUAs was underrated, and the decision-making process lacked inclusiveness in representation and platforms used for discussing irrigation management issues. Therefore, policy and legal reforms for distinguishing the establishment of WUAs from cooperatives, training local officials and engineers in working with communities, and using specially trained institutional organizers as facilitators in community engagement are crucial. There is a need to revisit the establishment of WUAs, the by-law set-up process, and the transparency and accountability of the governance structure. Development practitioners such as local NGOs have crucial roles to play in raising awareness of the importance of gender issues in irrigation at household and community levels. The project implementers also need to work towards taking the perspectives of participation from those of using the irrigation scheme and contributing labour and local materials for maintenance to a level of a user-managed irrigation scheme with active influence of the users of the schemes in the decision-making process.

Acknowledgements

I would like to thank Katherine Snyder, Doug Merrey and Nicole Lefore for their useful insights and comments on the earlier versions of this article. I am grateful to Yenenesh Abebe for mapping the study sites.

References


Received 9 February 2013; accepted in revised form 9 June 2013. Available online 12 July 2013