International Journal of the Commons
Vol. 10, no 2 2016, pp. 1172–1201
Publisher: Uopen Journals
URL:http://www.thecommonsjournal.org
DOI: 10.18352/ijc.688

ISSN: 1875-0281

Facilitating bricolage through more organic institutional designs? The case of water users' associations in rural Nepal

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Abstract: This study scrutinizes the institutional realities of water project implementation in remote, rural Nepal. It demonstrates that both sound institutional design and local bricolage capabilities are required for sustainable operation and maintenance of local institutions in the challenging operational environment. Institutional bricolage processes are best facilitated through providing locally legitimate, inspiring spaces to local agencies for continued learning, adaptation, and innovation. However, the apparent institutional designs do not explicitly facilitate such bricolage processes. We therefore outline more organic institutional design that accounts for and addresses the interlaced institutional design

and bricolage processes in development intervention contexts for advancing more sustainable natural resources management.

Keywords: Development project implementation, institutional bricolage, institutional design principles, Nepal, organic design, Water Users Associations

Acknowledgement: We are grateful for the participation of the WUSCs and the personnel of RVWRMP; and *'Maa-ja vesitekniikan tuki ry'* for funding the research.

1. Introduction

'Getting institutions right' is commonly recognised to be critical basis for governing, planning, and furthering sustainable natural resources management and collective action. This recognition stems from extensive studies on local natural resources management amenable to adequate *institutional design*. Institutions that have been able to sustain the effective management of natural resources are arguably characterized by certain types of institutional design principles (Gutu et al. 2014). By such principles, we mean the provision of adequate institutional "conditions that are central to the functioning of robust and enduring institutions for common property resource management" (see also Blaikie 2006; Cox et al. 2010; Cleaver 2012, 10). The best known of such characterizations is provided by Elinor Ostrom's (1990) eight principles of 'institutional strengthening': well-defined boundaries; match between appropriation and provision rules and local customs; collective-choice arrangements; monitoring; graduated sanctions; conflict-resolution; recognition of rights; and nested enterprises.

The value of adequate institutional design for sustainability applies to natural resources management projects as well. Development interventions are required to produce generic design guidelines for institutional development that are applicable within particular project contexts (Rusca et al. 2015). For instance, rural development project designs have evolved over decades from top-down infrastructure provision to more and more participatory, community-based approaches with an emphasis on local livelihoods development, micro-financing, and social funds (De Haan 2009), producing more and more effective designs for local natural resources management. Development agencies also have a tendency to employ such designs that are associated with contemporary development discourses, such as participation and social inclusion (Rusca et al. 2015). In other words, these intervention designs not only must work locally, but also must be aligned with the policies and strategies of host nations and influential international donors (Hänninen 2014; Rusca and Schwartz 2014; Rusca et al. 2015).

In operation, development intervention designs encounter various local, context-specific, socially embedded institutions (Cleaver 2007, 2012; Jones 2015; Rusca et al. 2015). This encounter produces a prominent gap between

institutional designs and reality (Cleaver 2002; Gutu et al. 2014). The local reality is increasingly studied in academic research by the *institutional bricolage* approach[1] (Cleaver 2000, 2002, 2012; Cleaver and de Koning 2015). These bricolage processes become exposed when new institutional designs are introduced to local, customary institutions in development intervention contexts (Gutu et al. 2014). Institutional bricolage describes the way that institutions emerge in practice as a combination of socially embedded practices and formal structures (Cleaver 2012; Jones 2015). It stresses social contexts and dynamics, such as power relations and individual agencies, in the formulation and enforcement of institutional rules (Gutu et al. 2014). It is through bricolage processes that established institutions become socially embedded and historically moulded (Cleaver 2012). As such, bricolage is considered as an inevitable, natural process of the institutional reality.

Bricolage is a critical institutionalist viewpoint that emerged partly as a critique of the alleged lack of deeper understanding about social, dynamic institutional realities within previous institutional approaches (Cleaver 1999, 2005, 2012; Blaikie 2006; Cox et al. 2010; Hall et al. 2014; Cleaver and de Koning 2015). The drawback of critical approaches is that they propose fewer valuable guidelines for natural resources management than the institutional design principles (Cleaver 2012; Cleaver and de Koning 2015). The approaches reflect different views on the role and nature of institutions in general (Gutu et al. 2014). Institutional designs have been developed for advancing the management of natural resources through generalizable means, whereas the inspiration of the bricolage approach stems from the understanding of the complex, fuzzy, socially construed institutional reality. Notably, both approaches are potentially valuable for furthering institutional sustainability.

Many scholars have stressed the value of facilitating bricolage in addition to institutional design guidelines for furthering sustainability (Cleaver 2002; Komakech and Van der Zaag 2011; Merrey and Cook 2012; Ingram et al. 2015). However, none of the studies actually demonstrate specific ways in which this type of facilitation could be done locally in practice. We therefore analyse and specify possibilities to better incorporate bricolage potentials within institutional designs. This is done through a case study on water users' institutions established by a water project in rural Nepal. The prominence of the study stems from the search to advance the potentials of both institutional design and bricolage processes for the purpose of furthering institutional sustainability.

[1] Cleaver (2012) describes the concept as "*a process in which people consciously and non-consciously draw on existing social formulae (…) to patch or piece together institutions in response to changing situations. These institutions are neither completely new nor completely traditional but rather a dynamic hybrid combining elements of 'modern', 'traditional' and the 'formal' and 'informal'. The institutions produced through bricolage are inevitably uneven in functioning and impact, and are often fussy assemblages of meaningful practices, which overlap and serve multiple purposes.*" (Cleaver 2012, 45.)

The first aim of the study is to explore the ways in which a water project design and institutional bricolage phenomena are manifested together within the operations of local water users' institutions, established by the water project. The study secondly ponders the ways in which the inevitable institutional bricolage processes could be better accounted through more 'organic' designs for advancing sustainable natural resources management. The focus of the study is on institutional functionality and sustainability.

2. Methods

2.1. Case study background

Nepal is a society with 83% of the population living in rural areas (Central Bureau of Statistics 2012). The Government of Nepal has set a target of achieving universal coverage of basic water supply and sanitation services for its citizens by 2017. The estimated country-wide water supply coverage in Nepal is 83.6% (Ministry of Urban Development 2014). Many of the remaining unserved pockets are located in the most remote, water-scarce, and poor regions of the rural areas. These regions suffer from various development challenges, including under-nourishment and extreme poverty. The problems can be alleviated by furthering sustainable water resources management and water infrastructure development. Such activities contribute to the basic prerequisites of a good life, such as land cultivation and home gardening possibilities, the reduction of water-fetching time and illnesses brought on by open defecation, and possibilities for enhancing personal health and hygiene. However, the lack of long-term sustainability remains a prominent challenge for water sector stakeholders (see Bhandari and Grant 2007; Ministry of Urban Development 2014). Institutional functionality and sustainability in the water sector remains challenging, as only about one fourth of the water supply schemes are fully functional (Ministry of Urban Development 2014).

Our target development intervention, the Rural Village Water Resources Management Project (RVWRMP), is a bilateral development cooperation project supported by the government of Nepal (GoN) and the government of Finland. RVWRMP attempts to tackle the challenges described earlier in the most remote, water scarce, food insecure, poor villages in the Far and Mid West Development Regions of Nepal (Figure 1). Operating since 2006, the project defines its scope as broadly defined water resources development. This includes local water supply, sanitation, hygiene, micro-hydropower and community-managed irrigation systems development, combined with livelihoods development, institutional capacity building and micro-finance (RVWRMP 2011; Rautanen et al. 2014). These developments are generally realised through establishing and training community-managed Water Users' and Sanitation Committees (WUSCs) for water scheme planning, implementation and management. Our case study focuses on WUSCs in rural Nepal.

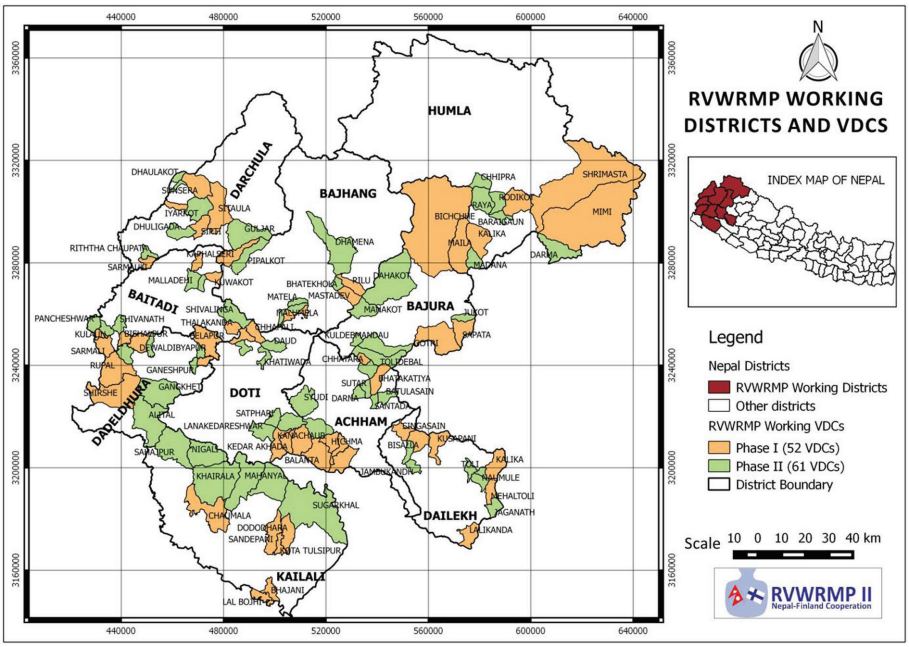


Figure 1: Map of Nepal and the project districts. (Provided with the permission of RVWRMP).

2.2. Analytical framework and scope of study

The theoretical lens is focused on the exogenous institutional water project design and chiefly local, endogenous bricolage processes. The *institutional design* is represented by government policies, project strategies, and operational guidelines. Bricolage is represented by the local arrangements that reform the original institutional design, draw on the project modalities to create new or adapted arrangements, meet encountered challenges, and improvise operations (Figure 2).

The focus of the study is on institutional functionality and sustainability aspects. We understand functionality to mean the capacity of the WUSCs to successfully provide reliable services by performing day-to-day operations and maintenance, to solve unexpected challenges, as well as to adapt to changes in the operational environment and invest in long-term sustainability. We examine the functionality aspects of the WUSCs as they are most essential for the long-term sustainability of water resources management. We hence understand sustainability as the long-term systemic consistency and resilience, and the potential for persistent institutional development and adaptation. We nevertheless highlight that evaluating the current functionality or sustainability status of the WUSCs as such is not the purpose of our analysis.

We acknowledge that bricolage is not necessarily only endogenous; there are bricolage phenomena also within the project design. However, the research

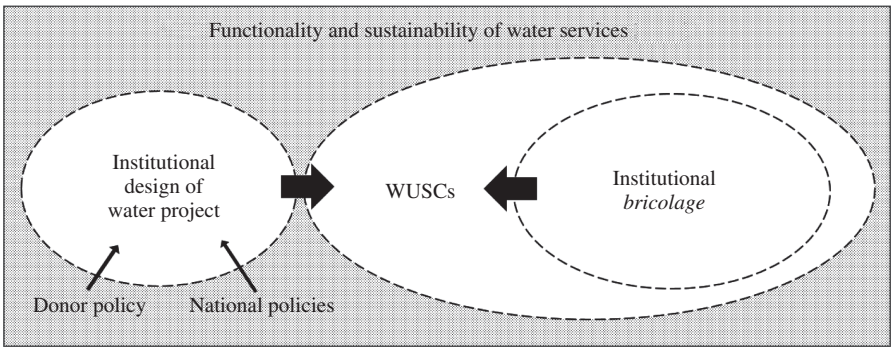


Figure 2: Analytical framework.

regards only the processes of the local water resources institutions; the bricolage occurrences of the project are out of the scope of this study. The project design is reflected only insofar as it influences the institutional settings and development at the local level.

We also highlight that we reflect our findings only in relation to institutional functionality and sustainability. We do not editorialise the importance of the sustainability aspect in relation to other socially fundamental questions, such as that of cultural preservation or the legitimacy of development interventions in general. One possible interpretation to that discussion in our case study context has been provided by Haapala and White (2015).

2.3. Selection of localities

The case study regards three RVWRMP districts of Far West Nepal, namely Dadeldhura, Bajura, and Achham. The studied WUSCs are selected from potential sites that are likely to represent the majority in the mid-hills – rather than in the plains (Terai) or high mountains (the conditions of both of which differ greatly from the hills).

The three case study districts were selected for two reasons that enabled us to study both the institutional project design and local bricolage processes. First, the target WUSCs are located in most remote, rural Nepal. That provides a case where the governmental influence is weak and geographical, social, natural and operational settings remain challenging for development projects. We therefore consider that the lack of external sustenance in the case study locality leaves relatively abundant room for local bricolage occurrences to be studied. This view is also supported by the studies by Ingram et al. (2015) and Funder and Marani (2015).

Second, the target WUSCs are relatively recently established, and they are undergoing a transition period from externally supported to feasible, self-standing institutions. The transition period is a vulnerable phase for community institutions

in Nepal, demonstrated in a study by Adhikari and Goldey (2010, 192) on 129 Nepalese Community Based Organizations (CBOs). The transition phase hence enables us to study the ways in which the institutional design established by the project dissolves into local social and institutional settings.

2.4. Case study design and data collection

Descriptive case study design (Yin 2013) is applied to the investigation of the WUSCs. The operation of WUSCs in Far West Nepal is deemed a *single-case* (Yin 2013). Our qualitative data collection regards seventeen in-depth WUSC interactions and related observation walks at the schemes. The studied WUSCs form seventeen *embedded units of analysis* (Yin 2013), which enable replication and comparison of the findings between the WUSCs. All but one of our target WUSCs are established during Phase I of the project (2006–2010); and one during Phase II (2011–2016).

Triangulation is used to reduce the potential biases and cross-check our results and interpretations: We compare the audio-recorded WUSC interactions against a dozen project personnel interviews, a workshop with project personnel on the bricolage processes in the project operations, three audio-recorded project specialist interviews on related special issues (namely cooperatives, the post-construction strategy of the established WUSCs, and community livelihoods development), one cooperative interview (in Dadeldhura District), unpublished project documents, and our field observations and earlier experiences in the field. Therefore, the results are an outcome from a dialogue between different stakeholders and sources of information. According to the project experts and our experiences, the results of the study reflect the typical situation of the project operations in Far West Nepal, pertaining to hundreds of schemes and water users' institutions. We therefore consider that our findings reflect the typical situation in the case study regions.

We acknowledge that potential challenges to the reliability and validity of this particular study can lie in the potential bias of the interpreters, as well as in the possible lack of trust between the researchers and the villagers. The use of project staff as interpreters and the presence of an external, foreign researcher clearly has a potential to influence the outcomes of the data collection. The answers, usually given by the most dominant members of the WUSC most probably reflected well the actual hierarchy and decision-making authority within the WUSCs, but we might have missed diversity of opinion for the same reason. Nevertheless, we believe that the translation was accurate and consider that the interviewed key-informants spoke openly.

3. Results

The results are presented in two sections. The first section reviews the water project design principles and the space left for local bricolage processes within them. The second section focuses on findings from the field, emphasising the institu-

tional realities of the WUSC operation from the interlaced institutional design and bricolage perspectives. Our interpretations of the given examples are reflected further in the discussion section. The results provide a factual, demonstrative basis for the discussion, which elaborates the ways in which bricolage processes could be facilitated for improving sustainability by more 'organic' institutional designs. A more detailed description of the characteristics of the WUSCs is available in the appendix.

3.1. Review of project design on WUSCs and space for bricolage processes

The stated project design principles of RVWRMP strive for good governance. This includes working from within local governance structures; avoiding parallel, project-specific structures; transparency; community management and participation; and human rights, gender equality and social inclusion (HRBA & GESI) (see RVWRMP II and RWSSP-WN 2015). The stated purpose of RVWRMP emphasises the achievement of improved well-being and reduced poverty in the project villages (RVWRMP 2011, 28). The project is embedded into the lowest tiers of the local government, operating under the Ministry for Federal Affairs and Local Government. The institutional arrangements at the community level are aligned with the Nepalese institutional structures described in the Local Self Governance Act 2055 (GoN 1999). WUSCs are defined as users' groups in the Local Self Governance Act 2068 and they are registered under the Water Resources Act, establishing their right to their water source and making the WUSC a legal entity. WUSCs have a formal status within the governmental administration, and a budget of their own. They are formed by the local water users (comprised of local beneficiary households), who are also expected to contribute to both their scheme construction and its maintenance later on. WUSCs thus represent community-managed institutional arrangements. Practically all the schemes are gravity-fed piped water supply systems in the case study area.

The project operates through establishing and training WUSCs for community-managed water schemes. The task of WUSCs is first to plan and implement, and then to lead the operation and maintenance of individual water supply schemes at the local level. The posts were distributed as equally as possible to both sexes and ideally represent all social groups. WUSCs should prepare a constitution, establish a bank account, prepare an action plan, and follow good management practices, specified in the Step-by-Step and Post-Construction Guidelines of the project (RVWRMP 2012a).

For the first time in the Far West, water users formed WUSCs that lead the planning, implementation, and operation and maintenance at an individual water scheme level, and had a budget of their own (rather than being planned and constructed by the district prior to handover). The premise was that the principles of good governance, including financial transparency and accountability can best be realised by bringing the scheme budgets and related decisions down to the lowest appropriate levels. The main institutional design arrangements of the project

WUSCs are categorized in accordance with Ostrom's (1990) eight institutional design principles in Table 1.

Remarkably, we found no explicit procedures in the formal project design that would have clearly supported or enhanced institutional bricolage occurrences. On the other hand, we found no explicit barriers in the project design that would have prevented local bricolage activities as such. The focus of the project on community management, participation, and social inclusion may potentially support bricolage activities and processes, though the project did not provide any explicit advice or guideline for such support. The WUSC post-construction guidelines (RVWRMP 2012a) was the most notable document that had the potential for supporting self-initiative operation modes as it was used for the preparation of the WUSCs for independent operation and maintenance by project phase out.

3.2. Project design meets local bricolage

The first, fairly general example on the institutional realities of the WUSC emphasises the unequal distribution of power and responsibilities within the WUSC by gender and social status, despite efforts by the project (see #3 in Table 1). All the interviewed chairpersons and the Village Maintenance Workers (VMWs; a trained person responsible for day-to-day maintenance of a water scheme) were men, reflecting the typical situation in the Far West. Men usually held many of the other most important positions in the WUSCs, though treasurers are usually women (as of 2015, project data showed that only 34% of WUSC leadership positions are held by women). From earlier experiences and the project staff, we recognise that this unequal distribution of power within the WUSC is common in the study area, due to both the local social traditions limiting women's roles, and to the limited literacy of women – a very practical barrier to holding office. One of the interviewed WUSCs [scheme number XVI, see Appendix] operated mainly under the supervision of one of the leading men of the VDC. The female treasurer did not even know about deposits in their bank account since the influential male leader was responsible for all such things.

The second example concerns maintenance (#4 in Table 1; #10 in Table B in Appendix). The project design requires that all WUSCs need to train, appoint and employ at least one VMW. As a result, VMW salaries have become the most prominent – and quite often the only (see Table A in the Appendix) – running expenditure for the WUSCs. Hence, they might try to reduce the costs by various bricolage developments, such as the following: One interviewed WUSC [XI] requested the trained VMW to attend only when needed with an on-the-spot payment instead of regular maintenance work and salary. Day-to-day scheme inspections would be done by the users themselves. This adaptation possibly posed a risk to the operation and maintenance, but it also reduced the running expenditures significantly, offering a feasible solution to the community. From our experiences and from the experiences of the project personnel, we understand that many other WUSCs have decided on similar arrangements in rural Nepal.

Table 1: Implementation of institutional design principles within project operations.

Design principle	Implementation in practices of WUSCs	Difficulties sometimes encountered
1. Well-defined boundaries	Institutional: WUSC responsible for managing the infrastructure Users/beneficiaries: Water fee payers Physical: Scheme infrastructure and immediate watershed above the water source Users groups operational and legal boundaries defined in the local self-governance act	Sometimes, due to water scarcity, water is taken from a neighbouring Village Development Committee (VDC) – this carries some risk for continuing supply
2. Match between appropriation and provision rules and local customs	WUSC Statute: defined rules, regulations, shared costs WUSC registration under Water Act: establishing rights to water and responsibilities (water source). Women's meeting held to decide tap locations.	Potential conflict as traditionally community members consider water to be free. Risk of elites taking water for production and depriving some households
3. Collective-choice arrangements	Election of WUSC members from the water users; familiarity and continuous interactions between water users and WUSC members; transparency principle in operation and maintenance and management	Risks of elite capture, exclusion of disadvantaged groups/women
4. Monitoring	Participatory systematic monitoring embedded into the Step-By-Step approach. Public hearings and mass meetings are an aspect of the monitoring practice stipulated in the project guidelines. Transparency and accountability principles of the project. Operational scheme monitoring: VMW Responsibility: WUSC	Requires initial facilitation by project and regular collection of adequate water tariff to pay VMW. Water tariff set often too low to pay for continuing maintenance
5. Graduated sanctions	WUSC Statute: rules and regulations Follow-up with sanctions by WUSC	Sometimes not written down. Sanctions may not be well understood or may be applied unfairly.
6. Conflict-resolution	WUSC Statute, Water Safety Plan Public audits and public hearings, transparency, accountability as established during the planning and implementation phase through Step-by-Step approach	Requires initial support from project. Risk of corruption leading to conflict.
7. Recognition of rights	Legal status (Local Self Governance Act 2055; 2068; Water Act)	Registration must be renewed
8. Nested enterprises	Supportive roles of VDCs, V-WASH-CCs, DDCs, District WASH Coordination Committees and line agencies.	Sometimes limited support available (e.g. VDC Secretaries overloaded)

Note: Village Development Committees (VDCs) constitute the lowest tier of the governance hierarchy. District Development Committees (DDCs) are the second lowest tier of the governance, comprised of multiple VDCs. The project works with VDC-wide Village Water, Sanitation, and Hygiene Coordination Committees (V-WASH-CC). The VDC WASH Coordination Committees (V-WASH-CCs) in the RVWRMP area cover all water resources management issues, livelihoods and micro-finance. The establishment and role of V-WASH-CCs is defined in the Nepal National Sanitation and Hygiene Master Plan (GoN 2010). The role of District WASH Coordination Committees D-WASH-CCs corresponds at District level with the role of V-WASH-CCs. VMW; village maintenance worker is a trained person, responsible for day-to-day maintenance of a water scheme.

The third example regards WUSC statutes – a written memo on regulations for the WUSC management, required from the WUSCs by the project (see #2 and #5 in Table 1; and #2 in Table B in Appendix). Eight interviewed WUSCs [I, III, V, IX, XII, XV, XVI, XVII] had not prepared complete WUSC Statutes as required. However, the interviews revealed that the local scheme users clearly had a good mutual understanding about the rules and regulations under the WUSC Statute. This understanding legitimated the rules and regulations in the community without an itemised Statute. The understanding was based on their local conventions and hence they simply did not see a reason to write down the Statute. In one instance, the interviewed WUSC [XVI] members had prepared the required Statute on paper, but they argued that "these rules and regulations are prepared and passed by the WUSC and users but it is not again opened and seen and followed."[2] Hence, this bricolage application was clearly legitimate in the community, maintained the local customs and case-to-case flexibility, but it also left more space for potential quarrels and conflicts.

The fourth example regards external support. Many WUSCs expected either donor-based or governmental support for large scheme repairs and projected renovations[3] (#4 and #8 in Table B in Appendix). These expectations confronted the intended WUSC design promoted by the project. The project design emphasised community ownership and independent operation and maintenance. Six of the WUSCs [IV, V, VI, XII, XIV, XVII] expected mostly external support, with only minor contributions from the water users. A project specialist described the situation in some less remote areas: "They [WUSC members] think like 'if this project will go, the next project will come'. […] I feel that sometimes even to eat you might need some donor, you know. That kind of scenario is being developed in the community. So, aid dependency is that aid is restricting individuals from knowing their capacity."[4] Due to the strong presence of external donors in some of the more accessible areas of rural Far West Nepal, this certainly rational donor-preference actually prevented the WUSCs from truly taking the projected responsibility of the scheme. This was obviously against the community-ownership based design of the project, but still an accepted custom among the communities.

The last example considers financial management and institutionalisation. WUSCs encounter many financial management problems and competency issues

[2] Quote from the treasurer of the WUSC.

[3] This type of thinking is typical and even more evident in less remote parts of Nepal where the presence of donors is stronger. For more about donors and policies in the rural water sector, see Hänninen 2014.

[4] Most of the WUSCs in the Far West do not suffer from this type of overly strong presence of donors and continuous flows of external resources. The problem arises in certain localities that are more easily accessible due to the proximity of the Tarai terrain and paved roads, and that are better off than average WUSCs in the remote countryside.

that can be managed by official cooperatives.[5] However, not all the remote study areas have well-functioning cooperatives operating. While the project has supported cooperative development in some VDCs, only two cooperatives were established in the VDCs where the interviewed WUSCs were located. Instead, the WUSCs had established analogous community organisations that would act in practice as cooperative-like microcredit groups, without legal registration and statutes. Establishment of these groups requires considerable self-initiative from the WUSCs.

Five of the interviewed WUSCs [VIII, XI, XII, XV, XVI] intended to further develop community-level cooperatives or Community Organisations.[6] Furthermore, three WUSCs [XII, XIV, XVII] had addressed their poor accessibility to markets and banks by investing their water fee payments themselves as micro-loans in the home village. "It [the borrowed money] is circulating in their village and they get interest and they also circulate that much money in their village […]. They use their money for goat farming, chicken farming, and other livelihood purposes and return it back to the users' committee."[7] It is notable that some WUSCs received up to 24% annual interest from the micro-credit business whereas some others did not charge any interest[8] (see Table A in Appendix).

Wherever the WUSCs were not capable of creating alternative institutional solutions to the encountered economic and capability problems, the general financial management and the collection of water fees tended to remain unsatisfactory. For example a majority of the interviewed WUSCs [I, II, III, V, VI, VII, X, XIII, XVII] were content to stay without interest for at least part of their deposited savings, without considering the formation of cooperative-like institutions or offering micro-credit by themselves.[9] Even in some communities with successful cooperatives operating nearby, project staff had noted that some WUSCs still are reluctant to bank with the cooperative. Historical distrust of cooperatives leads the community to prefer to keep their accounts in the bank, even though they do not receive interest.

[5] Cooperatives potentially contribute to water scheme management in multiple ways. By centralising monetary matters to local cooperatives, WUSCs achieve a larger deposit base, allowing the creation and sustenance of large VDC-wide multi-purpose accounts and enabling more reliable interest rates. These benefits produce a monetary buffer for the villagers and enable the achievement of accumulative value of savings. Furthermore, cooperatives also enable the engagement of more professional financial personnel. For more about cooperatives in Nepal, see Simkhada 2013.

[6] A Community Organisation is not business-oriented like a cooperative, but rather a small revolving fund with very small sums of money. Community Organisations can be quite organised, maintain accounts and apply 'group control' for those who do not pay back their loan. However, cooperatives are registered and official, while Community Organisations are not.

[7] Quote from the chairperson of the WUSC number XIII.

[8] This most probably reflects the variability of the business opportunities and management skills of the WUSCs.

[9] This obviously risked the WUSC functionality as the annual inflation has fluctuated around 9% (World Bank 2015) over the recent years and the value of savings without interest decreased accordingly.

4. Discussion

4.1. Reflections on results

In this section, we interpret the examples given in the results (Section 3.2). First, we discuss examples 1–3 that demonstrated the ways in which project designs encountered the local conventions and bricolage occurrences often in rather contradictory manner. The evident moulding of the project design to local settings could be construed as an indication of institutional adaptation or as a return to earlier local behaviours. Morris et al. (2013) found comparable results regarding the community operation of water users' associations in rural Tanzania, where the water resources management moved away from designed arrangements towards local learning forums, initiated by civil society organisations.

In our study context, we experience such contradictory encounters between the institutional design and the local settings as a case of elite capture – the powerful, higher caste men of the village continue to control business in many cases, despite the water project attempts to design more equitable systems. The same issue was recently addressed by Adhikari and Goldey (2009); Rusca et al. (2015); and Rusca and Schwartz (2014), who raised concerns on how institutional designs that aim for participatory approaches are too easily taken over by local elites, transforming them into disempowering forms of participation that reproduce local inequalities. In our study, such modes of management had a clear degrading impact to the overall access to water; and in that sense to the overall accruing benefits. In this sense, inequality, functionality, and sustainability are interlinked.

Such elite capture certainly reduces the equity and equality of the WUSC management but the opinions on the impacts on sustainability vary in the review literature. According to several studies, elite capture reduces institutional functionality (Prokopy 2005; FCG International Ltd. 2013; Walters and Javernick-Will 2015). Then again, it is obvious that some actors naturally possess more authoritative resources than the others; bricolage is hence an authoritative process by nature (Franks et al. 2013; Gutu et al. 2014; Rusca and Schwartz 2014; Rusca et al. 2015). This unequally distributed authority may also prove necessary for the efficiency and functioning of institutions (Rusca and Schwartz 2014). Our results reminded that one cannot declare the institutional adaptation in favour of local customs either as 'positive' or 'negative' in terms of functionality and equity without a careful insight into the reality of the scheme management in each separate situation.

The presence of external support, discussed in the fourth example, may reduce the need to deploy local capabilities. This obviously poses a risk to long-term scheme functionality. Ideally, projects would therefore need to be able to promote either external support or facilitate endogenous bricolage behaviours depending on the estimated effects on the WUSC operation, vis-à-vis project objectives. This requirement obviously poses a challenge to projects in practice, as the project personnel would need expressly good knowledge of the WUSC capacities and local social dynamics. This, again, raises the question whether certain desirable types

of bricolage can be facilitated (e.g. Merrey and Cook 2012), discussed further in the next section.

Another related question regards the sustainability of the WUSCs in the future, once the project support is no longer present. White et al. (2015) studied the 496 rural community managed drinking water and sanitation schemes (30–250 beneficiary households per scheme) supported by RVWRMP (2006–2014). The observed results (91.5% fully functional, 8.3% partially functional and 0.2% schemes closed due to natural disasters and social conflicts) compared very favourably to the systems implemented by the government of similar age, which had much less hands-on technical support and resources for follow-up. This result supports the awareness that well-designed institutions produce a good baseline for the development of local water resources management. However, the development could ideally be further reinforced by facilitated bricolage processes that would obviate the donor-preference and increase the endurance of WUSCs through adaptation over time.

The last example of the results surveyed ways in which the WUSCs meet their various financial management problems in the challenging operational environment. The bricolage capabilities seemed to be essential especially in the most challenging, remote, and poor operational environments where governmental and other institutional support remained weak. Bricolage seems to potentially generate institutional endurance through increased adaptation capacity over time (Cleaver and de Koning 2015). Similarly, Funder and Marani (2015) and Ingram et al. (2015) saw bricolage activities as a strategic response to weak or complex administration and governance in their case studies. Sehring (2009) observed that formal state or donor organisations become undermined by informal institutions in Central Asia. Verzijl and Dominiquez (2015) found in the Peruvian Andes that an adaptive, polymorphic institution was regarded as the most enduring type of water-user association. In our case, the self-initiated actions provided solutions to the financial and other problems, as well. Careful consideration is therefore required on finding functional and equitable ways in which to support the inevitable bricolage processes especially in challenging operational environments.

In general, externally driven project designs are overlaid with the need to apply certain generic institutional designs to local levels (Rusca and Schwartz 2014; Haapala and White 2015; Rusca et al. 2015). This generates a growing concern with identifying simultaneously locally acceptable, and sustainable institutional arrangements (Booth 2012; Cleaver and de Koning 2015; Jones 2015). In Far West Nepal, this concern has been studied by Haapala and White (2015), for instance. Externally planned models, however, often collide with the traditions, values, and social hierarchies of the community. In our case study, such generic models involved gender equality and social inclusion strategies, human rights-based approach, principles of good governance, and environmental protection efforts. The reality is that project funding cannot be supplied by the donor and partner government unless these principles are respected in the project design. We believe that a design that would more explicitly acknowledge bricolage processes

would help to alleviate that contradiction. This type of design is further discussed in the next section.

4.2. Towards more organic institutional designs

The research revealed that the generic water project design and local institutional bricolage arrangements were profoundly interlaced in the field. Both sound institutional design and bricolage capabilities are required to successfully maintain the functionality of the water user institutions and water schemes in the challenging operational environments. Yet, the formal project design identified no explicit bricolage processes. It therefore seems that there is a risk that the customary institutional design overlooks the potentials of the local bricolage processes.

We demonstrated the ways in which bricolage arrangements pose problems and offer solutions to institutional functionality and sustainability. First, we observed that the challenge with bricolage arrangements was that such occurrences frequently remained either 'bad ideas' or 'bad executions' for institutional functionality or equity. The examples regarding different forms of elite capture demonstrated this drawback in the results, as discussed in the previous section. On the other hand, in many challenging situations bricolage arrangements offered the only potential way to further sustainable institutional operations. Such arrangements were demonstrated in the last example regarding self-initiated financial management efforts of the WUSCs.

We ponder in this section the ways in which these challenges can be overcome and the unused potentials better employed for the benefit of institutional sustainability. We demonstrate that there are several means for facilitating bricolage potentials within the institutional design. This does not mean forgetting the value of the well-established institutional design guidelines. It rather means creating an explicitly specified space for facilitated bricolage occurrences.

4.2.1. Organic design

It is evident from the above that bricolage 'just occurs'. We, however, acknowledge that such processes do not occur in isolation but in a certain operative environment. Therefore, it is possible to modify that space by careful facilitation or 'triggering' so that the bricolage occurrences are more likely to lead to more and more sustainable operation modes. This idea characterises our concept of 'organic' institutional design that merges the best of institutional design principles and the possibility for facilitating bricolage, as specified below.

The possibility for facilitating bricolage has been broadly acknowledged in academic research. For instance, Merrey and Cook (2012) stress the need for better understanding of the social and institutional realities: "Fostering bricolage processes involves negotiating and facilitating local change agents' creative processes, not imposing new 'best practice' techniques. […] with a deeper understanding of the institutional landscape and social processes, researchers and politicians can support people to improve their livelihoods and well-being." (Merrey and

Cook 2012, 15–16). Similarly, Shah (2007) stresses the importance of the facilitation of bricolage processes at local levels to strengthen adaptive capacity, rather than attempting to impose new institutional arrangements and water management practices. Cleaver (2002) likewise stresses the importance of facilitating or allowing bricolage by arguing that development interventions "should be based on socially informed analysis of the content and effects of institutional arrangements, rather than their form alone" (Cleaver 2002, 11). There are also other related institutional concepts, such as institutional crafting (Bromley 2012; Thiel et al. 2015), that likewise emphasise the process nature of institutional reality.

This brings us to the question of how then this bricolage content could be articulated and its potential realised in the best way. We contribute to that discussion by explaining more in detail the ways in which bricolage could be more explicitly linked with project and other institutional designs in practice by their more 'organic' application. To illustrate the idea, we allegorically apply Stokes' (1997) "quadrant model of scientific research" diagram.[10] Our compliant matrix (Figure 3) combines the purpose of institutional design (for ensuring sustainable natural resources management) with the inspiration of the bricolage approach (which is to understand the socially construed institutional reality).

The depictions above suggest that these approaches reflect rather different views on the role and ontological nature of institutions (see also Gutu et al. 2014). Institutional design emphasises improved management through solution-oriented, positive, rational formalisations of 'good' governance and management, and institutional crafting. The bricolage viewpoint highlights enhanced institutional understanding and parity with the reality through accounting social embeddedness, piecing together practices, and critical decomposition of formulations (see Cleaver 2012, 10–16).

We stress that both of them are potentially valuable to sustainability – each through its own way, stemming from their foundational characteristics. The solution-oriented, rational principles and institutional crafting can be successfully merged with the critical parity with reality that accounts for the social settings and pieced-together practices. The solution-orientation in combination with the understanding about the underlying bricolage reveals a space for further development of management principles and practices that support bricolage processes. Both types of contributions are therefore necessary for furthering institutional sustainability. Despite their ontological differences, we address them together to combine their potential contributions to sustainability. The integrating approach is here referred as *organic institutional design*.

Organic design enables the generation of facilitated spaces for the bricolage occurrences. The facilitated spaces are to provide locally legitimate and broadly

[10] Stoke's matrix involved "Edison" as the representative of pure applied research (research inspired by considerations of use); "Bohr" as the representative of pure basic research (research inspired by quest for fundamental understanding); and "Pasteur" as the representative of use-inspired basic research (merging the two other inspirations).

Conducts driven by...		...advancing of sustainable natural resources management?	
		Less	More
...quest for understanding social institutional realities?	Less		Institutional design
	More	Institutional *bricolage*	Organic institutional design

Figure 3: Linking institutional design and bricolage.

inspiring room to local agencies. These spaces are gradually adjusted by continuous institutional learning towards sustainability. The very objective of organic design is therefore to address the evident risks and drawbacks of bricolage occurrences by creating directive facilitated spaces for such occurrences. One option is the gradual shift towards allowing such bricolage arrangements where those concerned have adopted the best practices and skills learned while starting with institutional design.

4.2.2. Explicit articulation of existing operations in terms of facilitating bricolage

Characterizing the concept of organic design, we firstly recognise that bricolage cannot be overtly planned or designed as it 'just occurs' within the existing, suitable space considering the local resources and the actual operational environment. We still consider, following for instance Merrey and Cook (2012), that it can be facilitated by creating such spaces for the bricolage occurrences in which they head towards increasing institutional sustainability. We see that the right type of space for bricolage processes can be furthered in several ways within the design by converting it to more 'organic' enterprise.

Facilitating bricolage does not necessarily require new institutional arrangements but rather redirecting the operations of the development intervention to explicitly facilitate bricolage. There is no doubt that the project design guidelines unwittingly contain characteristics that encourage sustainable bricolage occurrences. Such characteristics, also evident in the design of RVWRMP, comprise investments to the 'software' side of the intervention: institutional capacity building, provision of various trainings, promotion of certain behaviour changes, and strategies for gender equality and social inclusion. The Step-By-Step approach of RVWRMP, for instance, has the potential to be developed into this direction,

allowing bricolage to develop as WUSCs move ahead, step-by-step (see the project's Step By Step and Post Construction Manuals; RVWRMP 2012a, b). The post-construction phase guideline could be fully revised from this point of view, assuming that by the time the scheme has been completed, the WUSC has developed the capacity, skills and experience, together with confidence, to make new decisions with regards to O&M in the spirit of bricolage.

The challenge that we find here is that these designs are often not articulated explicitly in terms of the purpose of facilitating bricolage. The potency of such facilitation is thus left underrecognized and undervalued in the project designs from explicit point of view. We see that explicit application of organic design would expose these potentials to project operations, monitoring and documentation. This would enable further facilitation of the potentials of bricolage arrangements following the received feedback.

4.2.3. Providing locally legitimate and broadly inspiring spaces to local agencies

Besides the existing processes, also the endogenous behaviours and agencies would be potentially redirected for furthering sustainability. The means for such redirections are inevitably context specific and they often occur through local changes in social behaviour. In our case study context, Haapala and White (2015) conducted a study on the features that enabled or disabled domestic water use behaviour changes promoted by RVWRMP. They found that individual incentives, as well as the operating space allowed by the community, drove the behaviour changes. Local traditions often restricted the promoted behaviour changes. It was also more likely that behaviour changes would be accepted if they were relevant to both men and women, as they attained broader social coverage (Haapala and White 2015).

We consider that this study would offer a means for facilitating bricolage institutional changes in our project context and beyond, as well. Following Haapala and White (2015), the created space for institutional bricolage could be facilitated so that it inspires the local agencies broadly enough to further and maintain the sustainability. In order to ensure this, the provided bricolage space must also become locally legitimate over time.

This does not mean that the implemented changes would necessarily have a good social fit at the start. Rather, the promoted changes would need to contain the seeds for broader approval over time. Such seeds would include clear mutual benefits, improved social equity, transparency, democratic institutions, and local capabilities, depending on the case. As discussed above, many of such practices are already in place within institutional designs, though not necessarily explicitly expressed in relation to facilitating bricolage arrangements. Gerwel-Jensen et al. (2015) note the necessary steps by a community of preference (motivation), intention, choice of methods, use and maintenance, to be able to 'trigger' a sustainable change of behaviour. This reflects the importance of bricolage alongside institutional design.

Creating spaces for local agencies has linkages to capacity development as well. As noted by Rautanen (2016), ensuring sustainable water and sanitation ser-

vices requires integrated, multi-level 'capacity for development'. This is enabled by creating spaces for continued learning, adaptation, and innovation for institutional sustainability in volatile and unpredictable operational environments, such as that of rural Nepal (Rautanen 2016). Presence of facilitators in the field, that encourage and trigger changes to enhance sustainability, seems crucial for the creation of such facilitated spaces at various levels (Rautanen 2016). Development interventions that apply organic design in their operations would prove most suitable to such a role.

One way to translate this into practice is by starting with the institutional design that builds both capacity and confidence of WUSCs. They then 'graduate' into bricolage space, ideally carrying on with those legitimate practices that the WUSC itself has found useful and that the beneficiaries at large accept. For instance, WUSCs first develop capacity and real life experience in transparent financial management by collecting water tariffs and then exposing the use of the funds to the wider community through public audits. These events have the potential to trigger a positive response from the beneficiary population, encouraging the WUSC to carry on this practice also without the project's specific encouragement. WUSCs adapt the event to fit into their own operational environment, and hence enter from strict formal institutional design (of how to do a public audit) into bricolage by applying locally available resources and issues, making the event meaningful and legitimate to their context. The 'triggering' effect can be both ways, making WUSC members feel motivated at an individual level to stay as members, and encouraging the beneficiaries to support the WUSC, in terms of willingness to contribute to the WUSC for operation and maintenance.

This is also means that there is a research need to look at ways in which to articulate the bricolage processes beyond operative levels, at the policy and other formal levels, given that the policy environment should allow certain space for local adaptation. Rautanen (2016) also highlights the importance of capacity development at multiple levels (from individual to institutional and more generic levels of enabling environment) and triggering changes over time. Local capacity development is particularly important in relatively poor countries, where the local informal level provides the basis for daily economic activities but the formal level remains relatively weak and ineffective, being unable to implement policies at local levels (Merrey and Cook 2012). An organic design that promotes facilitated spaces for bricolage to be accounted in design and policies at multiple levels would play a role in triggering institutional changes for advancing sustainability over time.

5. Conclusion

Our case study demonstrated the institutional realities of a water project and water user associations in remote, rural Nepal. The research revealed that the generic water project design and local bricolage processes regarding local distribution of power and responsibilities, expected external support, the seminal application

of various project modalities, and financial management issues were profoundly interlaced in the field. Yet, the formal project design identified no explicit bricolage processes nor modalities to address them. It therefore seemed that the customary institutional design overlooked the potentials of the local bricolage occurrences.

We demonstrated the ways in which bricolage arrangements pose problems and offer solutions to institutional functionality and sustainability. First, we observed that the challenge with the bricolage arrangements was that such occurrences frequently remained either 'bad ideas' or 'bad executions' for institutional functionality or equity. The examples regarding different forms of elite capture demonstrated this drawback. On the other hand, in many challenging situations bricolage arrangements offered the only potential way to further sustainable institutional operations especially in the most difficult operational environments. The self-initiated financial management modes demonstrated such solutions. As a result, we argue that both sound institutional design and bricolage capabilities are required to successfully maintain the functionality of the water user institutions and water schemes in the challenging operational environments.

This brings us to the question of how then the bricolage could be facilitated, its potential drawbacks to sustainability evaded, and its potential for improved sustainability realised along with institutional designs. To address these issues, we argue for more 'organic' institutional designs: The first challenge of the apparent institutional designs is that they are often not explicitly articulated on behalf of triggering bricolage processes for sustainability. The potency is thus left under recognized and undervalued in the project designs, though the existing modalities software operations would support such facilitation. We see that the realisation of the potentials of facilitated bricolage processes would require more explicit application that would expose these potentials to the operational practices, monitoring and documentation. One proposal would be to explicitly plan for bricolage, by starting with a clear institutional design and then gradually allowing and even encouraging bricolage by the post-construction phase, while project staff are still involved and can provide guidance for sustainability.

Second, we see that more organic designs would generate facilitated spaces for institutional bricolage processes through providing, over time, locally legitimate and broadly inspiring spaces to local agencies for furthering sustainable activities. Developing and strengthening the capacity of critical institutions is an important element of the space within which the bricolage eventually occurs. We also stress the need to articulate the potential to facilitate bricolage processes beyond the operative levels, at the policy and other formal levels, given that the policy environment should allow certain amount of local adaptation. These suggestions are particularly important in the localities where informal, local institutions provide the basis for daily activities, but where the influence and support from formal institutions of governance remain relatively ineffective.

Literature cited

Adhikari, K. P. and P. Goldey. 2010. Social Capital and its "Downside": The impact on Sustainability of Induced Community-Based Organizations in Nepal. *World Development* 38(2):184–194. http://dx.doi.org/10.1016/j.worlddev.2009.10.012.

Bhandari, B. and M. Grant. 2007. User Satisfaction and Sustainability of Drinking Water Schemes in Rural Communities of Nepal. *Sustainability: Science, Practice, & Policy* 3(1):12–20.

Blaikie, P. 2006. Is Small Really Beautiful? Community-Based Natural Resource Management in Malawi and Botswana. *World Development* 34(11):1942–1957. http://dx.doi.org/10.1016/j.worlddev.2005.11.023.

Booth, D. 2012. *Development as a Collective Action Problem: Addressing the Real challenge of African Governance,* Africa Power and Politics Programme, Synthesis Report. London: Overseas Development Institute. http://r4d.dfid.gov.uk/Output/191460/ [11 November 2015].

Bromley, D.W. 2012. Environmental Governance as Stochastic Belief Updating: Crafting Rules to Live by. *Ecology and Society* 17(3):14.

Central Bureau of Statistics. 2012. *National Population and Housing Census 2011 (Village Development Committee/Municipality)*. Kathmandu, Nepal: Government of Nepal, National Planning Commission Secretariat.

Cox, M., G. Arnold, and T. S. Villamayor. 2010. A Review of Design Principles of Community-Based Natural Resource Management. *Ecology and Society* 15(4):38–60. Available at: http://www.ecologyandsociety.org/vol15/iss4/art38/ [11 November 2015].

Cleaver, F. 1999. Paradoxes of Participation: Questioning Participatory Approaches to Development. *Journal of International Development* 1999(11):597–612. http://dx.doi.org/10.1002/(SICI)1099-1328(199906)11:4<597::AID-JID610>3.0.CO;2-Q.

Cleaver, F. 2000. Moral Ecological Rationality, Institutions and the Management of Common Property Resources. *Development and Change* 31(2):361–383. http://dx.doi.org/10.1111/1467-7660.00158.

Cleaver, F. 2002. Reinventing Institutions: Bricolage and the Social Embeddedness of Natural Resource Management. *The European Journal of Development Research* 14(2):11–30. http://dx.doi.org/10.1080/714000425.

Cleaver, F. 2005. The Inequality of Social Capital and the Reproduction of Chronic Poverty. *World Development* 33(6):893–906. http://dx.doi.org/10.1016/j.worlddev.2004.09.015.

Cleaver, F. 2007. Understanding Agency in Collective Action. *Journal of Human Development* 8(2):222–224. http://dx.doi.org/10.1080/14649880701371067.

Cleaver, F. 2012. *Development Through Bricolage: Rethinking Institutions for Natural Resources Management.* London and New York: Routledge.

Cleaver, F. and J. de Koning. 2015. Furthering Critical Institutionalism. *International Journal of the Commons* 9(1):1–18. Uopen Journals. doi: http://doi.org/10.18352/ijc.605.

De Haan, A. 2009. *How the Aid Industry Works. An Introduction to International Development.* CO, USA: Kumarian Press.

FCG International Ltd. 2013. Nepal Rural Water Supply and Sanitation Sector Study – Modalities of Service Delivery, their Features and Options to Efficiently Increase Access and Sustainability, July 2013 (Working Report for Publication by the World Bank).

Franks, T., F. Cleaver, F. Magange, and K. Hall. 2013. Water Governance and Livelihoods: Outcomes for Smallholders on the Usangu Plains, Tanzania. *Water Resources and Rural Development* 1–2(2013):1–16. http://dx.doi.org/10.1016/j.wrr.2013.07.001.

Funder, M. and M. Marani. 2015. Local Bureaucrats as Bricoleurs. The Everyday Implementation Practices of County Environment Officers in Rural Kenya. *International Journal of the Commons* 9(1):87–106. http://dx.doi.org/10.18352/ijc.526.

Gerwel-Jensen, L., S. L. Rautanen, and P. White. 2015. Strengthening Behaviour Change Communication in Western Nepal: How Can We Do Better? *Waterlines* 34(4):330–346. http://dx.doi.org/10.3362/1756-3488.2015.030.

GoN (Government of Nepal). 1999. *Local Self-Governance Act, 2055*. http://faolex.fao.org/docs/pdf/nep74262.pdf [11 November 2015].

GoN (Government of Nepal). 2010. *Nepal National Sanitation and Hygiene Master Plan.* Steering Committee for National Sanitation Action. Kathmandu.

Gutu, T., S. Wong, and W. Kinati. 2014. Institutional Bricolage as a New Perspective to Analyse Institutions of Communal Irrigation: Implications Towards Meeting the Water Needs of the Poor Communities in Rural Ethiopia. *Pinnacle Agricultural Research & Management* 2014:14, Article ID: parm_115.

Haapala, J. and P. White. 2015. Why Do Some Behaviours Change More Easily Than Others? Water Use Behaviour Interventions in Rural Nepal. *Waterlines* 34(4):347–364. http://dx.doi.org/10.3362/1756-3488.2015.031.

Hall, K., F. Cleaver, T. Franks, and F. Maganga. 2014. Capturing Critical Institutionalism: A Synthesis of Key Themes and Debates. *European Journal of Development Research* 26(1):71–86. http://dx.doi.org/10.1057/ejdr.2013.48.

Hänninen, E. 2014. *Legitimating Aid: Donors and Policy Making in the Rural Water Supply and Sanitation Sector in Nepal*. [Academic Dissertation]. Publications of the Department of Political and Economic Studies 14(2014). University of Helsinki, Helsinki: Unigrafia. ISSN 2243-3635 (Print); ISSN 2243-3643 (Online); ISBN 978-952-10-9112-4 (PDF).

Ingram, V., M. Ros-Tonen, and T. Dietz. 2015. A Fine Mess: Bricolaged Forest Governance in Cameroon. *International Journal of the Commons* 9(1):41–64. http://dx.doi.org/10.18352/ijc.516.

Jones, S. D. 2015. Bridging Political Economy Analysis and Critical Institutionalism: An Approach to Help Analyse Institutional Change for Rural Water Services. *International Journal of the Commons* 9(1):65–86. http://dx.doi.org/10.18352/ijc.520.

Komakech, H. C. and P. van der Zaag. 2011. Understanding the Emergence and Functioning of River Committees in a Catchment of the Pangani Basin, Tanzania. *Water Alternatives* 4(2):197–222.

Merrey, D. J. and S. Cook. 2012. Fostering Institutional Creativity at Multiple Levels: Towards Facilitated Institutional Bricolage. *Water Alternatives* 5(1):1–19.

Ministry of Urban Development. 2014. *Nationwide Coverage and Functionality Status of Water Supply and Sanitation in Nepal*. Available at: http://www.moud.gov.np/downloads/Water_and_sanitation_Status_NMIP_Report_2014.pdf [10 March 2016].

Morris, M., C. Chonya, E. Koopmanschap, O. Zakariah, R. Llewellyn-Smith, and R. Absalom. 2013. Collective Learning in Search of Improved Institutional Effectiveness, Paper given at Capturing Critical Institutionalism workshop, King's College London. April 18–19.

Ostrom, E. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action.* New York: Cambridge University Press. http://dx.doi.org/10.1017/CBO9780511807763.

Prokopy, L. 2005. The Relationship between Participation and Project Outcomes: Evidence from Rural Water Supply Projects in India. *World Development*, 33(11):1801–1819. http://dx.doi.org/10.1016/j.worlddev.2005.07.002.

Rautanen, S.-L. 2016. *Access to Water? Dynamic Capacity Change for Sustainable Rural Water and Sanitation Services for All.* [Academic Dissertation]. Tampere, Finland: Tampere University of Technology. Publication 1373. ISBN: 978-952-15-3707-3. ISSN: 1459-2045. https://tutcris.tut.fi/portal/files/5091905/Rautanen_1373.pdf [4th April 2016].

Rautanen, S.-L., B. van Koppen, and N. Wagle. 2014. Community-Driven Multiple Use Water Services: Lessons Learned by the Rural Village Water Resources Management Project in Nepal. *Water Alternatives* 7(1):160–177.

Rusca, M. and K. Schwartz. 2014. 'Going with the Grain': Accommodating Local Institutions in Water Governance. *Current Opinion in Environmental Sustainability* 11:34–38. doi: http://dx.doi.org/10.1016/j.cosust.2014.09.010.

Rusca, M., K. Schwartz, L. Hadzovic, and R. Ahlers. 2015. Adapting Generic Models through Bricolage: Elite Capture of Water Users Associations in Peri-urban Lilongwe. *European Journal of Development Research advance* 27:777–792. http://dx.doi.org/10.1057/ejdr.2014.58.

RVWRMP (Rural Village Water Resources Management Project). 2011. Project Document. http://www.rvwrmp.org.np/rvwrmp-documents.html [11 November 2015].

RVWRMP (Rural Village Water Resources Management Project). 2012a. Post-Construction Guidelines. July 2012. http://www.rvwrmp.org.np/rvwrmp-documents.html [11 November 2015].

RVWRMP (Rural Village Water Resources Management Project). 2012b. Step By Step Manual. March 2012. http://rvwrmp.org.np/step-by-step.html [2 April 2016].

RVWRMP II and RWSSP-WN II (Rural Village Water Resources Management Project Phase II and Rural Water Supply and Sanitation Project in Western Nepal Phase II). 2015. HRBA & GESI Strategy & Action Plan – Operationalizing Human Rights Based Approach (HRBA) and Gender Equality & Social Inclusion (GESI) Principles in the Water Sector. (In cooperation with Rural Water Supply and Sanitation Project in Western Nepal Phase II). January 1, 2015, Pokhara, Nepal. Available at: http://www.rvwrmp.org.np/rvwrmp-documents.html [11 November 2015].

Sehring, J. 2009. Path Dependencies and Institutional Bricolage in Post-Soviet Water Governance. *Water Alternatives* 2(1):61–81.

Shah, T. 2007. Issues in Reforming Informal Water Economies of Low-Income Countries: Examples from India and Elsewhere. In *Community-Based Water Law and Water Resource Management Reform in Developing Countries*, eds. B. Van Koppen, M. Giordano, and J. Butterworth, 65–96, Chapter 5. Wallingford, UK: CABI.

Simkhada, R. N. 2013. Problems and Prospects of the Cooperative Sector in Nepal for Promoting Financial Inclusion. *Enterprise Development and Microfinance* 24(2):146–159. http://dx.doi.org/10.3362/1755-1986.2013.014.

Stokes, D. E. 1997. *Pasteur's Quadrant: Basic Science and Technical Innovation*. Washington, DC: Brookings Institution Press.

Thiel, A., F. Mukhtarov, and D. Zikos. 2015. Crafting or Designing? Science and Politics for Purposeful Institutional Change in Social–Ecological Systems. *Environmental Science & Policy* 53:81–86. http://dx.doi.org/10.1016/j.envsci.2015.07.018.

Verzijl, A. and C. Dominguez. 2015. The Powers of Water Use Associations: on Multiplicity, Fluidity and Durability in the Peruvian Andes. *International Journal of the Commons* 9(1):107–128. http://dx.doi.org/10.18352/ijc.537.

Walters, J. P. and A. N. Javernick-Will. 2015. Long-Term Functionality of Rural Water Services in Developing Countries: A System Dynamics Approach to Understanding the Dynamic Interaction of Factors. *Environmental Science and Technology* 49:5035–5043. http://dx.doi.org/10.1021/es505975h.

White, P., I. R. Badu, and P. Shrestha. 2015. Achieving Sustainable Water Supply Through Better Institutions, Design Innovations and Water Safety Plans – The Experience from far West Nepal. *Journal of Water, Sanitation and Hygiene for Development* 5(4):625–631. http://dx.doi.org/10.2166/washdev.2015.002.

World Bank. 2015. World Development Indicators: Inflation, Consumer Prices (annual %). http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG/countries/NP?display=graph [11 November 2015].

Yin, R. K. 2013. *Case Study Research: Design and Methods*. Thousand Oaks, CA, USA: Sage Publications.

APPENDIX: WUSC descriptions

Table A: Characteristics of scrutinised WUSCs.

Scheme number	Interviewees	Water tariff	Collected water tariff, total	VMW salary	Regularly deposited savings	Savings, total	Source-wise saving/ credit interest rates	Average distance to village market	Distance from village market to district HQ	Date of interview	District	Scheme age in years	Number of households	Estimated population	Number of water supply taps
I	Chair, treasurer, 1 beneficiary	20 NPR/ hh/m	180 NPR/m	90 NPR/m	10 NPR/ hh/m	Bank: NPR 5000, coop.: NPR 7000	Coop.: 10%, bank: 0%	1 h	0.5 h	8.3.2014	Dadeldhura	1.5	9	60	2
II	Chair, secretary, 2MCs	50 NPR/ hh/m	1500 NPR/m	1000 NPR/m	200 NPR/m	NPR 5000	0%	15 min	0.5 h	8.3.2014	Dadeldhura	1.5	30	150	8
III	3 MCs	20 NPR/ hh/m	1440 NPR/m	1080 NPR/m	360 NPR/m	NPR about 3000	0%	1 h	0.5 h	8.3.2014	Dadeldhura	0.5	72	420	6
IV	Chair	60 NPR/ tap/m	600 NPR/m	500 NPR/m	100 NPR/m	NPR 25,000	–	0–1 h	1 h	24.2.2014	Dadeldhura	6	29	170	10
V	Chair, secretary, treasurer, 2MCs, 10 beneficiaries	80 NPR/ tap/m	1680 NPR/m	1680 NPR/m	0 NPR/m	Bank: NPR 5000, coop.: NPR 15,500	Coop.: 10%, bank: 0%	0–1 h	1 h	26.2.2014	Dadeldhura	6	163	980	25
VI	Chair, 1 MC, about 20 beneficiaries	75 NPR/ tap/m	375 NPR/m	500 NPR/m (paid mostly in kind)	0 NPR/m	NPR 5000	0%	3–5 h	1 h	25.2.2014	Dadeldhura	6	17	100	5

Table A (Continued)

Scheme number	Interviewees	Water tariff	Collected water tariff, total	VMW salary	Regularly deposited savings	Savings, total	Source-wise saving/ credit interest rates	Average distance to village market	Distance from village market to district HQ	Date of interview	District	Scheme age in years	Number of households	Estimated population	Number of water supply taps
VII	Chair, secretary, treasurer, 8 MCs	50 NPR/ hh/m	5150 NPR/m	Planned salary in kind	50 NPR/ hh/m	NPR 16,00	0%	5 h	3–4 h	2.3.2014	Bajura	0 (implementation phase)	103	560	16
VIII	Chair, secretary, treasurer, 3 beneficiaries	To be decided	To be decided	To be decided	Planned 20 NPR/ hh/m to a coop.	NPR 42,000	0%	3–4 h	3–4 h	2.3.2014	Bajura	0 (implementation phase)	64	335	21
IX	Chair, secretary, 1 beneficiary	5 NPR/ hh/m	430 NPR/m	160 kg/a cereals	430 NPR/m	NPR 25,000	Micro-loans: 24%	3–4 h	3–4 h	2.3.2014	Bajura	2 (rehabilitation project)	86	500	17
X	VMW, vice chair, 1 beneficiary	20 NPR/ hh/m	800 NPR/m	200 kg/a cereals	800 NPR/m	NPR 24,000 of which NPR 20,000 invested as micro-loans	Bank: 0%, micro-loans: 12%	3–4 h	3–4 h	3.3.2014	Bajura	3	40	300	13

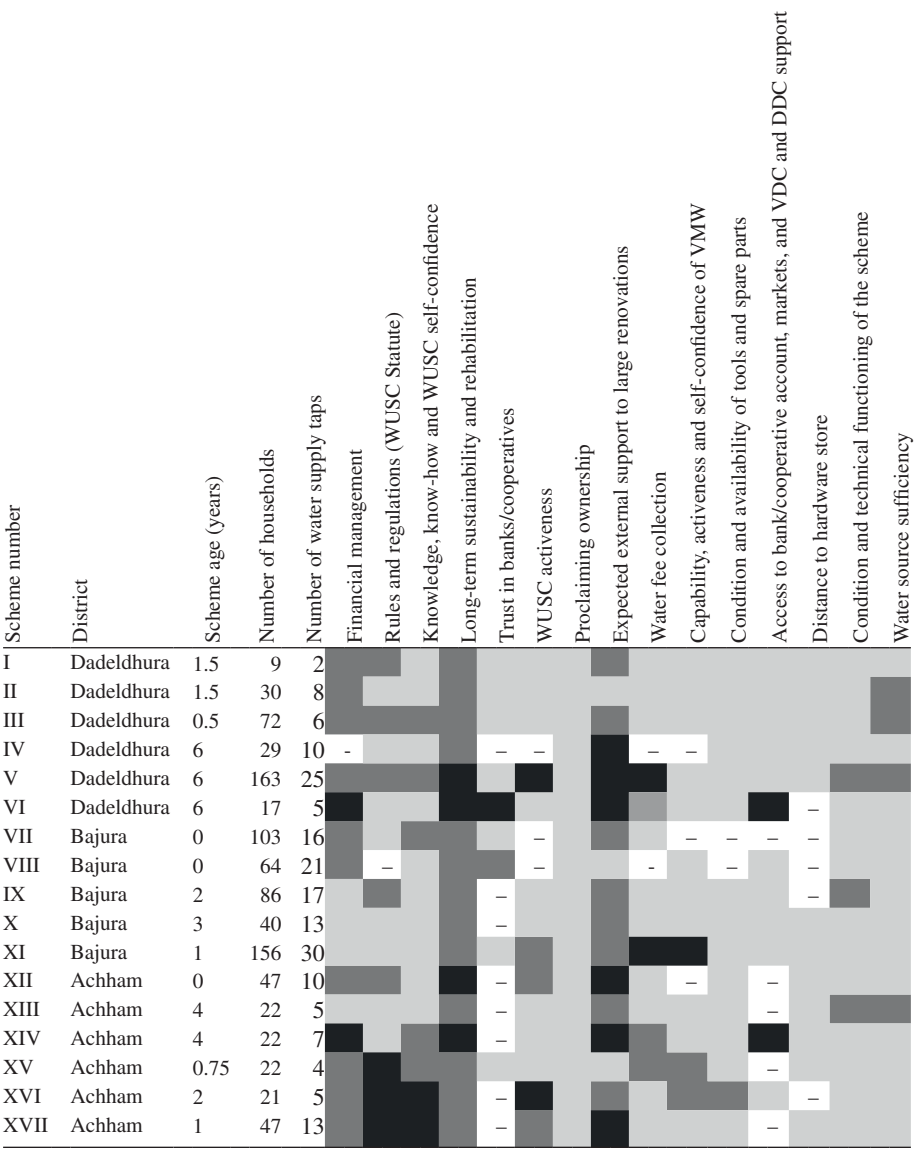
Table A (Continued)

Scheme number	Interviewees	Water tariff	Collected water tariff, total	VMW salary	Regularly deposited savings	Savings, total	Source-wise saving/ credit interest rates	Average distance to village market	Distance from village market to district HQ	Date of interview	District	Scheme age in years	Number of households	Estimated population	Number of water supply taps
XI	Chair, secretary	0 NPR/ hh/m	0 NPR/m	No full-time VMW, tax 250 NPR/d	3900 NPR/m general, 780 NPR/m water	NPR 54,000 in bank, NPR 10,000 in coop., NPR 39,000 loans	Bank: 0%, coop.: 10%, micro-loans: 24%	3–4 h	3–4 h	3.3.2014	Bajura	1	156	880	30
XII	Chair, 5 beneficiaries	20 NPR/ hh/m	470 NPR/m	Planned 10 NPR/ hh/m	470 NPR/m	NPR 27,000	0% (cash savings, no bank account)	3 h	1 d	11.3.2014	Achham	0 (just completed)	47	139	10
XIII	Chair, VMW	50 NPR/ hh/m	1100 NPR/m	20 kg/a cereals	1100 NPR/m	NPR 7000 cash, NPR 5000 in bank	micro-loans: 24%, bank: 0%	3 h	1 d	11.3.2014	Achham	4	22	130	5
XIV	VMW	10 NPR/ hh/m	220 NPR/m	300 kg/a cereals	0 NPR/m	NPR 5000 in bank	–	1 h	1 d	12.3.2014	Achham	4	22	130	7
XV	Chair, treasurer	20 NPR/ hh/m	440 NPR/m	440 NPR/m	0 NPR/m	NPR 5000 in bank	3–4%	1 h	1 d	13.3.2014	Achham	0.75	22	144	4

Table A (Continued)

Scheme number	Interviewees	Water tariff	Collected water tariff, total	VMW salary	Regularly deposited savings	Savings, total	Source-wise saving/ credit interest rates	Average distance to village market	Distance from village market to district HQ	Date of interview	District	Scheme age in years	Number of households	Estimated population	Number of water supply taps
XVI	Treasurer, 1 beneficiary	5 NPR/ hh/m+ 4 kg/a cereals	105 NPR/ m+84 kg/a cereals	84 kg/a cereals	105 NPR/a invested as micro-loans	Exact sum not known	Bank: 3-5%, micro-loans: 0%, planned 12%.	1 h	1 d	13.3.2014	Achham	2	21	93	5
XVII	Chair	10 NPR/ hh/ m+4 kg/ hh/a cereals	470 NPR/m	188 kg/a cereals	470 NPR/m	NPR 39,000 in bank	0%	3 h	1 d	14.3.2014	Achham	1	47	250	13

Table B: Status of scrutinized WUSCs.



Coding: lighter colour indicates better performance in accordance with the institutional design of the project. White boxes with a dash indicate categories which remained undiscussed in the interviews. More specific details on the schemes (I–XVII) are presented in Table A. Specific evaluation criteria to each evaluation category (1–15) are presented in Table C.

Table C: Evaluation criteria for Table B.

Category	Light grey	Grey	Dark grey
1	Well managed, adequate accumulating savings, good knowledge on economics	No accumulating savings or no interest, inadequate knowledge on economics	No accumulating savings and no interest, or no savings at all, inadequate knowledge on economics
2	Written, sufficient rules and regulations exist	Some written rules and regulations exist or comprehensive understanding exists	No written rules and regulations, no comprehensive understanding
3	Adequate knowledge on the following: VDC/DDC water funds, V/D-wash-CC, sustainability of the water fee, role of the water project. WUSC self-confident.	Some of the mentioned issues known, some not known	Few of the former issues known or clear lack of self-confidence
4	Clear saving target exists and preservation of long-term sustainability discussed.	No saving target but discussions, intentions and actions to save a reasonable sum observed	No target, no discussions, no reasonable savings
5	Full trust	Trust exists in theory but not necessarily in practice	No trust, bad experiences in the past
6	Active WUSC: R&R, Water Safety Plan, meetings arranged, no feeling of heavy workload within the WUSC	Some day-to-day tasks done, some not done properly	No Water Safety Plan or Statute, no regular WUSC meetings held
7	Ownership proclaimed	Ownership remained unclear	No ownership proclaimed when asked directly
8	Primarily users' own contribution, only kind governmental support expected, no donor support expected	Primarily users' own contribution but also major external support expected	Minor users' contribution, mostly external support expected
9	Water fee is reasonable, no proclaims	Water fee covers the running costs only	Water fee is not adequate for VMW salary and running costs
10	VMW works well, no complaints, monitoring, day-to-day works done	Lack of clarity in the fulfilment of VMW responsibilities	Serious lack of clarity in the fulfilment of VMW responsibilities
11	Tools and spare parts available	Unclear whether tools and spare parts are easily available	No tools and spare parts available
12	WUSC does not regard accessibility problematic	Accessibility status remained unclear	Accessibility challenging and no actions made to overcome the problem
13	No problems found	Accessibility remained unclear	Distance considered problematic
14	No problems found	Minor issues in scheme condition, only minor harm to scheme operation and maintenance	Major errors and unfixed problems
15	Water supply sufficient all the time, throughout the year	Water supply insufficient at times in certain conditions	Water supply inadequate all the time in all conditions