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Rural Village Water Resources Management Project Phase III

Cost Benefit Analysis of Water Supply Systems:
Multiple Use Water Systems, Private Taps and Public Taps

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Bashu Dev Pandey, Juho Haapala, Bishnu Pokharel

Contents

Executive summary 3
1. Introduction 4
1.1. Background 4
2. Methods 5
2.1. Selection of schemes 5
2.2. Data collection and analysis 7
3. Findings 8
3.1. What is the difference in cost and contribution in different schemes? (Q5) 8
3.2. What benefits there are in the different schemes? (Q6) 9
3.3. How did you utilise the time saved from fetching water in the different schemes? (Q7) 10
3.4. What are the benefits for women from the different schemes? (Q8) 10
3.5. What functionality & sustainability benefits the different schemes bring about? (Q9) 11
4. Limitations and reflections on findings 12
Annex: Questionnaire responses compiled 14
i. What is the difference in cost and contribution in different schemes? (Q5) 14
ii. What benefits/drawbacks there are in the different schemes? (Q6) 14
iii. How did you utilize the saved time from fetching water in the different schemes? (Q7) 16
iv. What are the benefits/drawbacks for women from the different schemes? (Q8) 16
v. What functionality & sustainability benefits/drawbacks the different schemes bring about? (Q9) 18

Executive summary

RVWRMP implements different types of water supply schemes. Whereas in the previous phases (since 2006) and in the beginning of the third phase (since 2016) the project has mainly implemented public tap stand based water supply systems, the emphasis has been shifting to private yard connections in the last years of implementation (2018 onwards). Private systems correspond with the Sustainable Development Goal 6.2 targets. The difference is that in the private connection schemes each household has their own water supply tap stand, whereas tap stands are shared among several (typically 2-4) households in the public system. Furthermore, RVWRMP implements Multiple Use Service (MUS) based water supply systems that have broader integrated water uses, such as irrigation, micro hydropower, or improved water mills connected to the water supply system. All types of systems integrate components such as home gardens for all, animal troughs, and utilization of overflow water, as well as a dedicated amount of water for additional household uses in the scheme designs. While the aim of all these systems is to provide efficient, effective, and smart use of water resources also beyond basic water supply, sanitation and hygiene purposes, there are differences in the costs and benefits acquired from the different schemes.

The objective of the study is thus to analyse the costs and benefits of different types of schemes within the following thematic areas: Costs and contributions (questionnaire question number 5); general benefits (Q6); utilization of time saved from water fetching (Q7); benefits for women (Q8); and benefits for scheme sustainability and functionality (Q9). The findings section elaborates the results within these areas.

The study identified some differences between the scheme types. Regarding personal hygiene and laundry, the private tap system increased the level of personal hygiene by allowing regular private bathing and laundry more than the public tap system did. Dignified menstrual management and sanitation can be managed better with private connections that allow families to manage their household water independent and regardless of community taboos. The private tap system reduced water fetching time even more effectively than the public tap system. The MUS scheme studied benefitted from revenue from its micro hydropower component (not implemented by RVWRMP), improving its sustainability and ability to cover the operation and maintenance costs. Overall, the study support the view that MUS and private taps convey more benefits than public taps do, while the costs are only insignificantly higher in these schemes.

All types of RVWRMP schemes provided capabilities and means of living and healthy life. The users get safe and sufficient drinking water. The livelihoods benefits included the possibility for home gardening and the related significant dietary benefits, income generation, reduced need to buy vegetables, and less work in water fetching and animal watering. The reported sanitation benefits included ease of household works, better personal hygiene, separated human waste from daily life, as well as improved hygienic behaviours. Time saved from water fetching is used for all types of regular activities, including household work, labour work, taking care of children and the elderly, sanitation and hygiene, livelihood activities, socializing, voluntary work and resting.

Women have gained improved possibilities to save individually and to get access to income and decision-making power in the family. Regarding menstruation, there is a clear change in perception about menstruation hygiene management (MHM) due to the project interventions; menstruating women can socialize and interact with others better than before, and the impact of menstrual taboos is decreased in women's lives. The related participatory activities produce a setting that empowers women and the other disadvantaged groups.

1. Introduction

1.1. Background

RVWRMP implements three different types of water supply schemes: Public tap, private tap, and multiple use water service (MUS) schemes. Public tap systems distribute water to public tap stands shared by several households, whereas the private tap system distributes water directly to individual households. The service levels are respectively referred to as basic and improved/advanced water supply service. Furthermore, the project supports MUS, combining drinking water, conventional/non-conventional irrigation, and Improved Water Mills (IWMs), and pico/micro hydropower in the same water distribution system.

The project requires a slightly bigger monetary contribution from the communities for the more advanced private tap systems and MUS, as well as requires the locals to dig their own private connections. All project's water supply systems, both public and private, have MUS element; runoff water or household washing water is used directly to home garden or by collecting the grey water in soil cement tanks for run off storage. Many water supply schemes also include animal troughs and use of overflow from water tanks for irrigation. The exact application depends on the local conditions and needs. All types of schemes involve an extensive package of workshops and trainings as well as institutional development and capacity building, and all the systems are planned and constructed through a participatory approach by the community people with project's technical support.

Basic service level was the standard of the project from 2006 till mid Phase III (2006-2018), with around 1200 public tap systems supported by the end of the project in 2022. The change occurred because of project's own policy to start promoting private tap systems in line with Sustainable Development Goal 6.2 that defines its targets in improved service level. Furthermore, after 2017, the Rural Municipalities' (RMs) policies in the WASH sector started supporting private connections. Water user's willingness to contribute more towards investment budgets also improved. Private tap systems were mainly constructed in the areas of high willingness towards private taps, whereas the public taps were still constructed in areas where the users preferred public tap systems. At present, the project has supported 15% multiple use schemes out of the total water supply schemes and 28% water supply schemes have private tap connection, while 72% schemes have public tap systems.

The project furthermore supports the development of Water Use Master Plans (WUMPs) at Municipal level. It is an entry point for holistic planning for the management, utilization and protection of the water resources in the project working core rural municipalities. The WUMP guides the equitable water use and sustainable utilization of water resources within the municipalities. It also ensures prioritization of water supply over irrigation, and links the community status and wishes with the municipal level.

The objective of the study is to analyse the costs and benefits of different types of schemes. The respective research question is the following:

RQ: What are the experienced costs and benefits of MUS / public tap / private tap systems for water users?

The question was analysed within the following thematic areas: Costs and contributions (questionnaire question number 5); general benefits (Q6); utilization of time saved from water fetching (Q7); benefits for women (Q8); and benefits for scheme sustainability and functionality (Q9). The findings section elaborates the results within these areas.

2. Methods

2.1. Selection of schemes

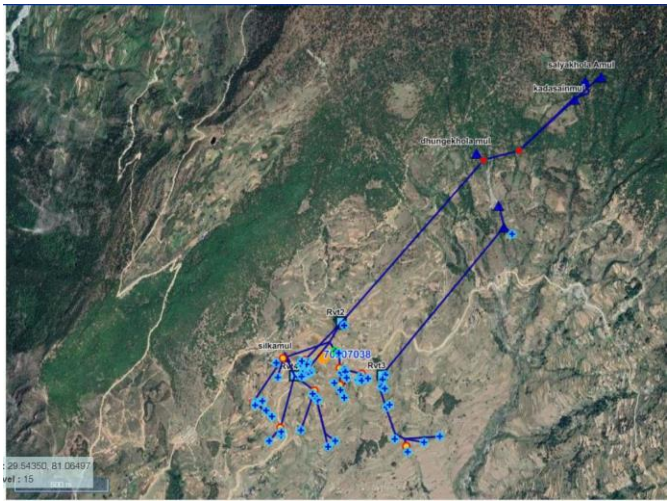
The study is based on an in-depth analysis of the experienced benefits of public tap, private tap, and MUS schemes for water users. The schemes were selected so that they were as similar as possible: They are located in a similar terrain and distances to sources in the same district and thus have been implemented by the same technical support unit team in all cases. They are of around the same size, and similar ethnic composition. All three schemes also provide water to one school. All the schemes have been completed rather recently in the latest years in the third phase. However, as will be recognized in the findings below, the slight differences in the scheme completion years ended up making comparisons between MUS and standalone schemes difficult as the benefits of the MUS were only becoming visible in the recently completed MUS scheme whereas the 2 and 4 years old standalone schemes had had more time to mature and show the benefits. Technical details of the schemes are available below:

Simsair DWSS (Thalara Rural Municipality- Bajhang) is a gravity water supply scheme completed in fiscal year 2074/75 (4 years before the study was conducted. The water supply scheme benefits a total of 70 HH (12 HH Dalit & 58 HH others) with a population of 425 (27 % Dalit & 73 % Other). The scheme also provides water to one school with 155 students (85 Boys & 70 Girls).

The actual total cost of the scheme is 2,824,861 NPR (GoN: 694,907 GoF/EU: 1,042,361 RM: 299,592 Users Cash: 34,000 Users in-kind: 754,000). The scheme has 13 public taps, one intake, two reservoir tanks, 1,200 metre distribution pipeline and 2,000 metre transmission pipeline.

The scheme is affiliated with a cooperative and the Operation and Maintenance (O&M) fund (58,630 NPR) is kept in the cooperative. The water tariff rate per month per HH is NPR 50. The scheme has trained two male Village Maintenance Workers (VMW).

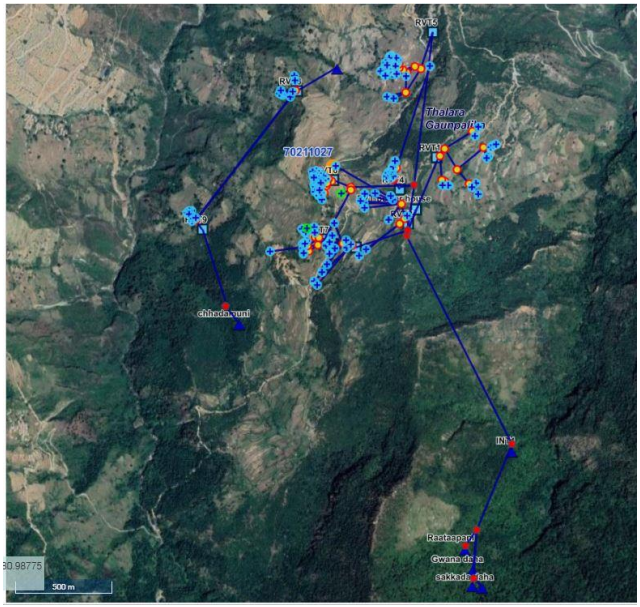
Silkakotsain Samdeu PS DWSS (Chhabis Pathibhera Rural Municipality, Bajhang) is a gravity-fed water supply scheme completed in fiscal year 2076/77 (2 years before this study was conducted). A total of 83 HH (12 HH Dalit & 71 HH Others) and a population of 644 (9% Dalit & 91% Others) benefit from the scheme. The scheme also provides water to one school with 90 students (43 Boys & 47 Girls).



The actual total cost of the scheme is 6,155,474 NPR (GoN: 1,542,996 GoF/EU: 1,548,178 RM: 1,517,540 Users Cash: 164,000 Users in-kind: 1,382,759). The scheme has additional costs for private tap connections, where the Users Cash payment amounted to 310,000.00, and in-Kind: 618,724.50. The scheme have 79 private taps, 4 public taps, 8 intakes, 5 reservoir tanks, 3505 m distribution pipeline and 4450 m transmission pipeline.

The scheme is not affiliated with a cooperative and the O&M fund (NPR. 150,000) is kept in the bank. The water tariff rate is NPR 100 per month per HH. The scheme has trained three male VMWs, who are all working.

Sakkada Bajha MUS scheme (Thalara Rural Municipality- Bajhang) is a gravity-fed MUS (water supply + non-conventional irrigation (NCI)) scheme completed in fiscal year 2077/78 (1 years before this study was conductedbefore). A total of 184 HH (42 HH Dalit & 142 HH Others) with a population of 1175 (21 % Dalit & 79% Others) benefit from water supply. The joint MUS (water supply +NCI) beneficiary HH are 120 (40 HH Dalit & 80 HH Others), serving a population of 642 (31 % Dalit & 69 % other). The scheme also provides water to one school with 180 students (89 Boys & 91 Girls).



The actual total cost of the scheme is 14,359,931 NPR (GoN: 3,384,379 GoF/EU: 3,522,517 RM: 3,733,936 Users Cash: 132,825 Users in-kind: 3,586,273). The scheme has an additional cost for private tap connection as Users Cash: 800,000 Users in-Kind: 1,714,021. The scheme has 162 private taps, three public taps, six intakes, nine reservoir tanks, 5,630 m distribution pipeline and 5,574 m transmission pipeline.

The scheme is affiliated with a cooperative and the O&M fund (NPR 407,885) is kept in the cooperative. A water tariff rate of NPR 100 per month per HH is collected.

2.2. Data collection and analysis

Data collection in the field was organized in December to January, 2021. Data was collected by the Technical Specialist and Water Resources Advisor of Bajhang, facilitated by field staff of Bajhang. It involved semi-structured interviews of families (maximum 10 per scheme/community; including a questionnaire and follow-up questions) and women's groups (1 in MUS and 1 in private tap community) were conducted during field study. The same questionnaire was asked in all types schemes. Data collection was done manually using checklist and taking notes on the field. The results vis-à-vis the research question were analysed manually by the Technical Specialist and reported in the findings. The field observations were reflected against general knowledge of the staff about implementation. Compiled raw responses from the questionnaire are available in the annex.

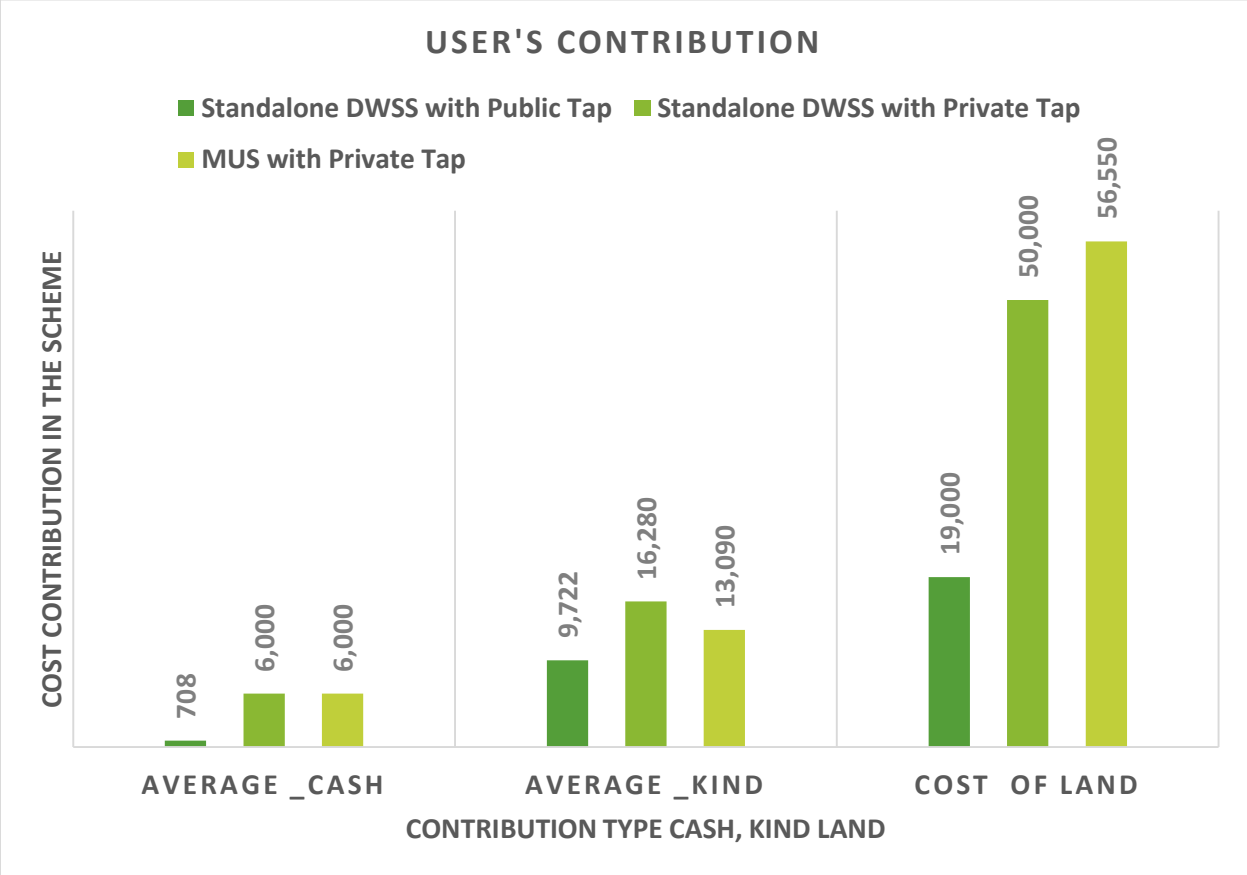
Survey questions (Q) 1-4 were designed to gather general information and scheme services respondents were asked survey questions (name of the scheme & RM, respondent names, numbers of family members, scheme information and services). Q5-9 studied the five themes of the analysis: costs and contributions (questionnaire question number 5); general benefits and drawbacks (Q6); utilization of time saved from water fetching (Q7); benefits and drawbacks for women (Q8); and benefits and drawbacks for scheme sustainability and functionality (Q9). The findings section elaborates the results within these areas.

General information of the selected schemes was available in the RVWRMP MIS system, such as technical details, beneficiary details, monetary details, users' committee details, and capacity building activities conducted.

3. Findings

3.1. What is the difference in cost and contribution in different schemes? (Q5)

The contribution of users in cash, kind and the cost of land used for the scheme during implementation in the different schemes is shown below. The compulsory cash contribution in both private and MUS schemes is NPR 6000,and is used to build the private tap stands and fittings with meters; whereas in the public tap schemes the compulsory contribution is 1% of the investment cost. The in-kind contribution is higher in the public tap systems, which may be due to having more distribution pipelines and fewer household beneficiaries, which are case specific reasons. Furthermore, the private connection schemes require more digging of trenches all the way to the house yards. MUS schemes require more infrastructure and digging pipes compared to a public tap system. Together, these differences in the scheme type explain the in-kind contribution pattern. The same reasons apply to land cost – the more infrastructure that has to be constructed, the more land it requires. Typically, only the structures that occupy farm land are compensated. Overall, the presented sums for land cost are however very small compared to the scheme cost or even individual household average contributions.



3.2. What benefits there are in the different schemes? (Q6)

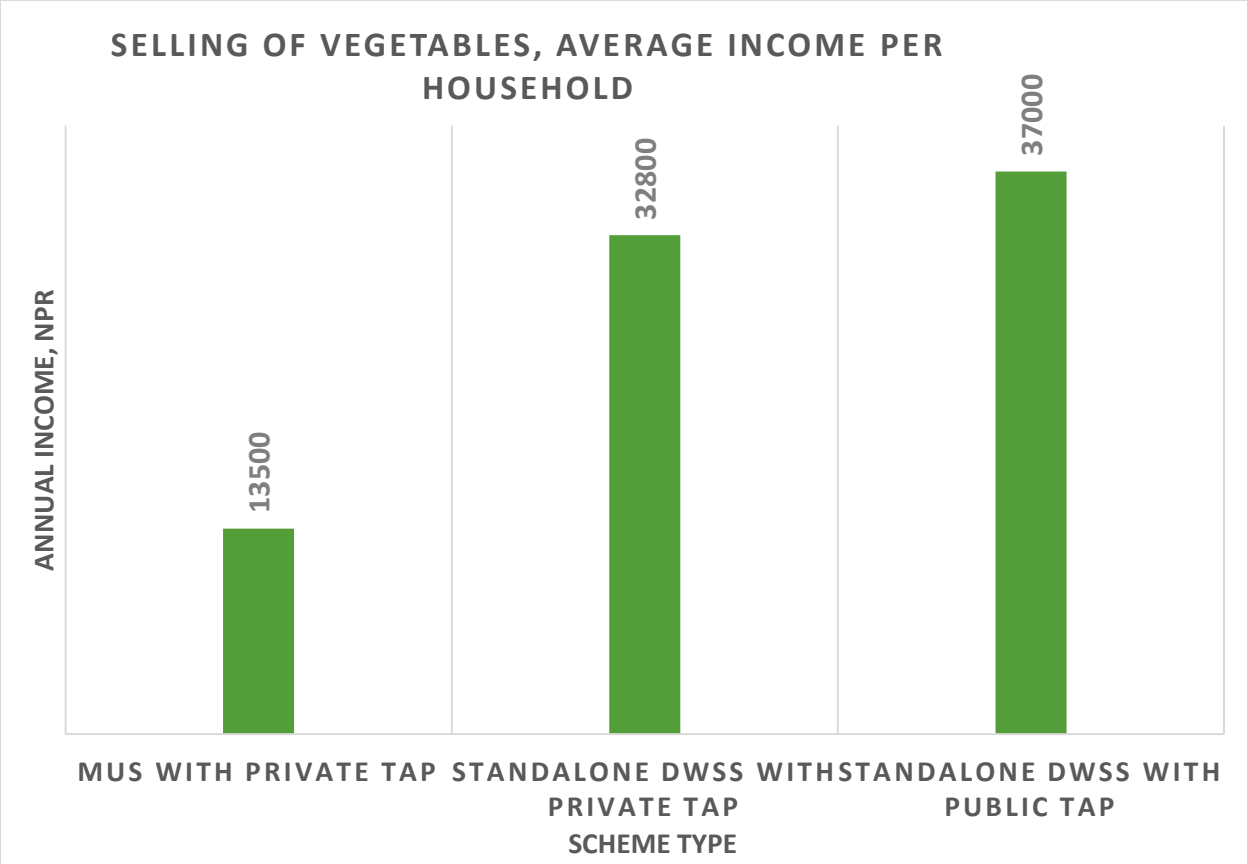
The benefits/drawbacks of different schemes were studied through different indicators like a) water security, safety and ease of collection; b) water supply (QARQ-related); c) Sanitation, hygiene and cleanliness related; d) basic subsistence, home gardening and nutrition related; e) advanced livelihoods, income generation and income from sales; and f) water: fetching, managing water before and after the scheme.

Common benefits to all types of schemes studied included the following:

a) Safe Drinking water, sufficient water, possibility for vegetable farming, less work with O&M of the scheme, time saving, easy access to water, more leisure time, animal watering easier now as it was difficult to bring water from the stream.
b) Adequate quantity of water, good access to water supply, reliable water (over full 12 month period), good quality of water, it does not cause diseases like diarrhoea. Cough, diarrhoeal diseases reduced
c) Cleaning house and yard regularly, dish drying rack, waste pit, access to toilet and use of it, regular washing of clothes and clean clothes (more than before), increased in sanitation, hygiene and cleanliness practice, increased hand washing practice with soap, and regular bathing.
d) It makes easy to grow/produce vegetables now, diversified vegetable consumption, hygienic food, better nutrition, increased food production/stock, changed dietary habits, health status improved, know how to eat vegetables and change habits, Home garden developed for fresh and off seasonal vegetables (bitter gourd, bottle gourd, cabbage, cauliflower, onion cabbage, broccoli, Swiss chard, cucumber, spinach (palungo)), where before we only grew potato.
e) Less food/vegetables/fruits bought from market, increased vegetables production & consumption, farming in poly houses, use of drip irrigation, increased cash crop production, wastewater/overflow water used for irrigation.

The differences between the benefits of the schemes were few:

a) Regarding personal hygiene and laundry, the private tap system increased the level of personal hygiene by allowing regular private bathing and laundry more than public tap system did. This can be complemented by the general observation that dignified menstrual management and sanitation can be managed better with private connections that allow families to manage their household water use regardless of community taboos.
f) Regarding time savings, the situation was fairly similar in the schemes, including hours of walking to the water source (2-4 hrs). The private tap system reduced the water fetching time to zero (yard connection), whereas the public tap system reduced it to 14 minutes back and forth.



3.3. How did you utilise the time saved from fetching water in the different schemes? (Q7)

The responses, similar at scheme level in all types of surveyed schemes, emphasized that the time is used for household work (cooking, washing clothes, carrying grass and wood, sewing, weaving); labour work (carpentry, farm work, firewood processing, pottery works, taking care of children, sanitation and hygiene, livestock related, productive work, taking care of elderly household members, livelihood activities (poly-house, home gardening, vegetable farming, irrigation), socializing and meeting people, voluntary work in community/village (FCHV), and resting.

3.4. What are the benefits for women from the different schemes? (Q8)

The benefits of different schemes were identified using different indicators: a) Changes in traditions, such as beliefs regarding menstruation/privacy/chhaupadi, b) Changes in menstrual hygiene practices; c) Changes in women's household work load; d) Changes in the status of economic independence of women; e) Changes in level of confidence of women in family; f) Changes in participation and position in the community, women's leadership and occupational status; and g) Changes in community recognition of women's status and issues.

The common benefits in different schemes included:

a) Increased awareness about GESI, no chhau huts, menstruating women can socialize and interact with others better than before, changed perception about MHM (within the HH), increased awareness about GESI (men and women are equal).
b) Regular washing/bathing, granted access to water (via pipe connection in tap, couldn't touch tap before), access to quality food during menstruation (sometimes kitchen entry prohibited still), use of sanitary pads (used old cloths earlier), improvement of sanitation and personal hygiene, awareness increased.
c) No need to carry water from far, vegetable production, home gardens, increased time used for cleaning toilet/clothes, also men do work that was previously considered mainly women's tasks eg. washing clothes+ watering veg+ animal watering.
d) Improved possibility to save individually, access to own income, improved possibility to buy items in the market individually, increased saving in groups/cooperatives/banks/microfinance, changed decision-making power of women in family (women can sell vegetables by own decision/own way and User Committee work), all family members have an account in a bank.
e) Access to cash increases confidence and self-dignity, participation in decision making ("wife is more active").
f) Time to participate in the community meetings, improved status of women in community, empowered to talk in the meeting, given role in community (Vice chair in scheme, VMW, FCHV, mother group), given role in UC.
g) Enhanced self-confidence, access to income, participation in decision making, self-income from vegetable production, participation in community groups/coops, women's dignity is realized in the community, women are supporting the community to improve sanitation & vegetable production by creating awareness, acceptance that women can make an income.

3.5. What functionality & sustainability benefits the different schemes bring about? (Q9)

The benefits/drawbacks of different schemes were studied via different indicators: a) what are the drawbacks and benefits of User Committee management and service provision? b) How does the water Tariff system function?

The common benefits to all types of schemes included:

a) Management mode is similar in all types of schemes and their functionality status resemble each other. The schemes have no significant management or service provision issues. This is expected, as the same staff and project implemented the schemes.
b) Water tariff system is the same and all schemes collect a water fee.

Differences were few:

a) MUS scheme receives additional income from electricity generation as they have a micro-hydro integrated to the system. In the future, it is likely that the MUS scheme produces also other livelihoods benefits but this could not be studied as the scheme was too new.

4. Limitations and reflections on findings

The respondents clearly focused on benefits rather than drawbacks. The original questionnaire included also drawbacks but the respondents did not report any scheme type-related drawbacks, but rather reported things that require further efforts, which were not, however, related to the particular scheme types. Therefore, the possible drawbacks are likely negligible for the users, or the informants did not understand the questions on drawbacks correctly. The drawbacks are therefore not considered in the findings.

The study could not identify many differences between the three types of schemes. There are many reasons for it, one being that the MUS scheme was only completed in one year ago, thus waiting for the livelihoods benefits to start yielding income and dietary benefits to the community. The MUS scheme therefore resembled more the standalone schemes than it should have been. Another reason is that the standalone schemes involve MUS components and related integrative thinking too – in practice all RVWRMP schemes are MUS. Both Standalone DWSS with either private or public tap system are providing service to community in water supply and waste water reuse and surplus water for irrigation. The differences between standalone WASH and MUS were therefore rather invisible in this study. The selection of the schemes thus did not succeed in the best possible way despite of the careful selection of similar schemes for the study.

The study could still identify some differences between the scheme types: The MUS scheme benefitted from revenue from its micro hydropower component (not implemented by RVWRMP), improving its sustainability and ability to cover the operation and maintenance costs. It also provides irrigation and IWM services that are missing from the other schemes, though their benefits did not show in the findings this time.

Regarding hygiene and saitation, the private tap system increased the level of personal hygiene by allowing regular private bathing and laundry more than public tap system did. This can be complemented by the general observation that dignified menstrual management and sanitation can be managed better with private connections that allow families manage their household water independent and regardless community taboos. Regarding time use, the private tap system reduced water fetching time even more effectively than the public tap system. This can be considered as a general rule. In overall, the study support the view that MUS and private taps convey more benefits than public taps do.

Average incomes from selling of vegetables was surprisingly higher in the public tap scheme than in the other two types. This was, however, because of the beneficiaries have been practicing vegetable production last four years while other two schemes have been recently completed and hence income generation activities have not yet properly yielded.

Common benefits and impacts were very clear. Regarding costs, the presented costs were rather small compared to the importance of the service, the acquired benefits, or the cost of the scheme construction. They can be considered very fair to the water users. Accounting for the land cost did not change the picture. Regarding benefits in general, the users get safe and sufficient drinking water. The livelihoods benefits included the possibility for home gardening and the related significant dietary benefits, income generation via poly-house farming, reduced need to buy vegetables from the market, and less work in water fetching and animal watering. The reported sanitation benefits included ease of household works, better personal hygiene and ease in household work, clean clothes, separated human waste from daily

life, as well as improved hygienic behaviours. The time saved from water fetching is used for all types of regular activities, including household work, labour work, taking care of children and the elderly, sanitation and hygiene, livelihood activities, socializing, voluntary work, and resting.

Women have gained improved possibilities to save individually and to get access to income. This translates to improved possibility to buy items in the market and increased savings. This changes the decision-making power of women in the family. The WASH sector positions held by women also provides chances for improving the status in the community, often triggering women to be more active in the municipality level and in the society in general. Finally, the participatory approaches used by the project lead to enhanced self-confidence of women. Regarding menstruation, there is a clear change in perception about MHM due to the project interventions; menstruating women can socialize and interact with others better than before, and the impact of menstrual taboos is decreased in women's lives; many of them can live almost normally during the period while others suffer from milder restrictions than before. Also access to menstrual pads has increased.

Interpreting the results regarding transformative change in people's lives, all types of RVWRMP schemes that have integrated MUS thinking and components provide the capabilities and means of living and healthy life. Even more importantly, the related participatory activities produce a setting that empowers women and the other disadvantaged groups, helping them to transform their lives by changing the informal rules of the community and family life, including abandoning the menstrual taboos, allowing access to income for women, giving them a possibility to live dignified lives as ever more appreciated and independent members of the surrounding society.

Annex: Questionnaire responses compiled

i. What is the difference in cost and contribution in different schemes? (Q5)

Cost contribution of users in cash, kind, cost of land used for scheme during implementation phase of the scheme was in the different schemes as shown below. The compulsory cash contribution in both private and MUS scheme is NPR 6000 that is used to build the private tap stands and fittings with meters, whereas in public tap scheme the compulsory contribution is 1% of the investment cost. Kind contribution is higher in public tap systems which may be due to more distribution pipelines and less household beneficiaries, which are case specific reasons. Furthermore, the private connection schemes require more digging of trenches all the way to the house yards, whereas MUS schemes require more infrastructure and digging pipes compared to a public tap system as well. Together, these differences in the scheme type explain the kind contribution pattern. The same reasons apply to land cost – the more infrastructure has to be constructed, the more land it requires. Typically, only the structures that occupy farm land are compensated. Overall, the presented sums for land cost are however very small compared to the scheme cost or even individual household average contributions.

ii. What benefits/drawbacks there are in the different schemes? (Q6)

The benefits/drawbacks of different schemes were asked through different indicators like a) Water security, safety, and ease related, b) water supply (QARQ) related, c) Sanitation, hygiene and cleanliness related, d) basic subsistence, home gardening and nutrition related, e) advanced livelihoods, income generation and income from sale and f) water: fetching, managing water before and after the scheme.

DWSS with public tap

Benefits:

a) Safe Drinking water, sufficient water, vegetable farming possibility, less work with O & M of the scheme, time saving, easy access to water, more leisure time, animal watering easier now as it was difficult to bring water from the stream.
b) Adequate quantity of water, good access to water supply, reliable water (12 months), good quality of water, it does not cause diseases like diarrhea.
c) Regular bathing, access to toilet and use of it, cleaning house and yard regularly, regular washing of clothes and wear clean cloths, hand washing practiced, dish dryer, waste pit. “We used to do before also, but now it made easy to do sanitation and cleanliness activities"
d) Started home gardening, hygienic food, better nutrition, increased food production/stock, changed dietary habits (Dalbhat only to plus vegetables). Fresh vegetables available at home for household consumption, we used to do before also, but now it is easy for vegetable farming. There was an irrigation canal before, but it was damaged by road construction, so this scheme helps to irrigate our vegetables.
e) Less food/vegetables/fruits bought from market, increased vegetables production and consumption, farming in poly houses, used drip irrigation, increased cash crops production, wastewater/overflow water used for irrigation.
f) Before 2hr 13 min, after 0 hr 14 min. Around 2 hr. saved time.

Drawbacks:

a) Sometimes turbid in monsoon, flood diversion work needs to construct in the intake.

b) Sometimes cuts in supply (2-3 times in a month, 20-25 days in a year service is interrupted) and it takes 1-2 days to maintain/continue the supply, over a 12 month period 10-15 times cuts in supply, and takes 1 to 2 days for maintenance
c) Sometimes we need to buy off seasonal vegetables from market.

DWSS with private tap

The benefits/drawbacks that users are getting from standalone DWSS with private tap system scheme are:

Benefits:

a) Safe drinking water, sufficient water, easy access to water, vegetable farming possibility, more leisure time, time saving (6 hr.), animal watering and have a time for animal keeping, less work with O & M of scheme.
b) Adequate quantity of water, good access to water supply, reliable water (12 months; no cuts in supply), good quality of water, it does not causes diseases like diarrhea and cough, diseases reduced
c) Cleaning house and yard regularly, dish dryer, waste pit, access to toilet and use of it, regular washing of clothes and clean cloths (More than before), increased in sanitation, hygiene and cleanliness practice, increased hand washing practice with soap, regular bathing (increased than outside bath far)
d) It makes easy to grow/produce vegetable now, diversified vegetable consumption, hygienic food, better nutrition, increased food production/stock, changed dietary habits, health status improved, know how to eat vegetables and change habits, Just started the HG for fresh and off seasonal vegetables available in the HG (Bitter Gourd, Bottle gourd, cabbage, cauliflower, onion Cabbage, Broccoli, Swiss chard, cucumber, Spanich (palungo)) where it was before only pidaloo, potato for vegetables that we used to grow.
e) For self-consumption in home only, increased cash crops production, increased vegetables production and consumption, less food bought from market, farming in poly houses, used drip irrigation, “Without husband able/can do alone poly house farming and irrigation within it", less food bought from market (Only bought potato).
f) Before 1 hr 59 min, now water supply tap at yard

Drawbacks:

a) Less water for irrigation, sprinkler not worked due less head, turbid water during monsoon.
b) Yet to install poly houses, not started yet IG activities, vegetables for 2-3 month in year need to buy from market.

MUS with private tap

Benefits:

a) Safe drinking water, sufficient water, time saving, vegetable farming possibility, easy access to water, less work with O & M of the scheme and more leisure time.
b) Adequate quantity of water, good access to water supply, reliable water (12 months; no cuts in supply), good quality of water, it does not cause diseases like diarrhea.
c) Cleaning house and yard regularly, regular washing of clothes and clean cloths, hand washing practiced, dish dryer, waste pit, regular bathing, access to toilet and use of it.

d) Started home gardening, diversified vegetable consumption, hygienic food, better nutrition, increased food production/stock, changed dietary habits.
e) Increased cash crops production, increased vegetables production and consumption, less food bought from market, farming in poly houses, used drip irrigation, self-consumption only.
f) Before 3 hr 37 min, now water supply tap at yard

Drawbacks:

a) Sometimes turbid water

iii. How did you utilize the saved time from fetching water in the different schemes? (Q7)

Standalone DWSS with public tap system scheme

Taking care of children, sanitation and hygiene, livestock related, paid jobs, taking care of elder, sanitation and hygiene, livelihood activities (Poly house, HG, vegetable care, irrigation), productive work, socializing, meeting people, voluntary work in community/village (FCHV), household work (cooking, washing clothes, grass, wood work), taking rest, voluntary work in community/village.

From standalone DWSS with private tap system scheme

Household work (weaving/tailoring), taking care of children, sanitation and hygiene, livelihood activities, productive work (tailoring) , socializing, meeting people, voluntary work in UC/cooperatives/community groups, meeting people (having leisure time), can go outing from village, work in farm, wood cutting, vegetable farming, paid jobs (Labour work, work in farm, But not saved, just hand to mouth only), paid jobs (Carpenter work, Wife is VMW and support her work also, Wood, Aggregate, sand porter, farming work)

MUS with private tap system scheme

Household work, taking care of children, sanitation and hygiene, livelihood activities, livestock related, productive work, paid jobs, voluntary work in community (Environment Sanitation, member secretary in Cooperatives), socializing, meeting people.

iv. What are the benefits/drawbacks for women from the different schemes? (Q8)

The benefits/drawbacks of different schemes were asked on different indicators like a) Changes in traditions? Like belief about menstruations/privacy/chhaupadi, b) Changes in menstrual hygiene practices, c) Changes in women's household workload d) Changes in the status of economic independence of women e) Changes in level of confidence of women in family f) Changes in participation and position in the community, women leadership and occupational status and g) Changes in community recognition of women's status and issue.

Standalone DWSS with public tap system scheme:

Benefits:

a) Increased awareness about GESI, no chhauhuts, changed perception about MHM, easy in sanitation, menstruating women can socialize and interact with others, mother group prepared locally and using pads.

b) Regular washing/bathing, use of menstrual pads, granted access to cooking, access to quality food during menstruation, use of menstrual pads, granted access to water (Can use tap self), access to quality food during menstruation (milk, curd), can sleep within same room during periods also.
c) Vegetable production, home garden, no need to carry water from far, increased time used for cleaning toilet/clothes, reduced water related workload, also men do work that was previously intended for mainly women e.g. washing clothes/sometimes, collect/bring water, Tap nearby yard.
d) Saving groups/cooperatives, access to own income, improved possibility to buy items in the market individually, changed decision -making power of women in family, improved possibility to save individually (Account opened in Bank), changes came but not only from this project interventions.
e) Access to cash helps confidence, home consultation, and self-dignity, participate in decision making.
f) Time to participate in the community meetings, given role in UC (Husband works as VMW, Secretary of mother groups), empowered to talk in the meeting (Can speak easily/confidently), improved status of women in community.
g) Participation in decision making, vegetable production and selling, self-income from vegetable production, enhanced self-confident, access to income, realized women's dignity in the community, acceptance that women can make income, participation in community groups/coops, (Vice Chair at women saving group).

Drawbacks:

a) No chhauhuts for Youth only, elders still do.
b) Increases the sanitation related work and garden (vegetable) work

Standalone DWSS with private tap system scheme:

Benefits:

a) No Chhauhuts, increased awareness about GESI, changed perception about MHM, Menstruating women can socialize and interact with others (Some easier than before), now we can bathand wash in home compound, we can do as we wish, no need to go to the stream, privacy maintained now during bathing washing, little changed (25%) perception about MHM.
b) Regular washing/bathing, access to quality food during menstruation, granted access to water (via pipe connection in tap, couldn't touch tap before), access to quality food during menstruation, use of menstrual pads (used cloths piece before), increased in sanitation and personal hygiene, awareness increased.
c) Reduced water related workload, tap at home yard, no need to carry water from far, vegetable production, home garden, Increased time used for cleaning toilet/clothes, also men do work that was previously intended for mainly women e.g. washing clothes+ watering veg+ animal watering).
d) Improved possibility to save individually, access to own income, improved possibility to buy items in the market individually, increase saving in groups/cooperatives/banks/microfinance, changed decision-making power of women in family (can sell veg by own decision/own way and UC work), all family members have account in bank, can buy anything needed own way.
e) Access to cash helps confidence, self-dignity, participate in decision making (Wife is more active), participate in decision making.
f) Time to participate in the community meetings, improved status of women in community, empowered to talk in the meeting, given role in UC (Vice chair in scheme, VMW, FCHV).

g) Enhanced self- confident, access to income, realized women's dignity in the community, acceptance that women can make income, able to make self-income from vegetable production, participation in community groups/coops, acceptance that women can make income, saved money, able to do Health insurance (GoN per family 350 scheme).

Drawbacks:

a) Same as before in belief about menstruations (some response): No change (milk curd) still not allowed, still we connect pipe to yard tap, increased water related workload

MUS with private tap system scheme:

Benefits:

a) No chhauhuts, menstruating women can socialize and interact with others, increased awareness about GESI (men and women are Equal), menstruating women can socialize and interact with others, changed perception about MHM (except kitchen entry), other than kitchen involved in all works/all places.
b) Regular washing/bathing, granted access to water, use of menstrual pads, access to quality food during mensuration.
c) Reduced water related workload, tap at home yard, no need to carry water from far, vegetable production, Home garden, Increased time used for cleaning toilet/clothes, also men do work that was previously intended for mainly women e.g. washing clothes.
d) Saving groups/cooperatives, access to own income, improved possibility to save individually, improved possibility to buy items in the market individually, changed decision-making power of women in family.
e) Access to cash helps confidence, self-dignity, participate in decision making, home consultation.
f) Time to participate in the community meetings, empowered to talk in the meeting, improved status of women in community, given role in UC (member).
g) Enhanced self-confident, access to income, participation in decision making, self-income from vegetable production, participation in community groups/coops, realized women's dignity in the community, doing / supporting community for sanitation & vegetable by creating awareness, acceptance that women can make income.

Drawbacks:

a) Still some restrictions on MHM e.g. Not allowed to do Kitchen work

v. What functionality & sustainability benefits/drawbacks the different schemes bring about? (Q9)

The benefits/drawbacks of different schemes were asked on different indicators like a) what are the drawbacks and benefits of User Committee managements and service provision? b) What about water Tariff system?

Standalone DWSS with public tap system:

Benefits:

a) Separate fund for O&M, Fund deposited in cooperative, community involved in O & M, UC is active: accounts and books kept, annual general meetings held, availability of VMW/operator, willingness to maintain the scheme, office established (Kept in VMW House), meetings as needed (Once in a month), maintenance on time (VMW heard users complain on time), VMW salary npr.1500 per month.
b) Water tariff collected, Willingness to pay water tariff, Users income from selling vegetables, waste/overflow water utilized, every month 8th date VWM collected the water tariff, by visiting in each HH.

Drawbacks: -

Standalone DWSS with private tap system scheme:

Benefits:

a) Meetings as needed (Once in a 2 month), UC is active: accounts and books kept, annual meetings held, maintenance on time, availability of VMW/operator, separate fund for O & M, fund deposited in cooperatives & Bank, community involved in O & M, transparent, financially clear up to completion of the scheme.
b) Willingness to pay water tariff, water tariff collected, UC gets additional income from external sources, VMW salary 5000, total water tariff 5700, saved around 700, which is in treasure hand/responsibility, water tariff paying monthly, collected by VMW.

Drawbacks:

a) Some beneficiary response from HH not known about the User Committee managements and service provision.

MUS with private tap system scheme:

Benefits:

a) Regular meetings held, office established, UC is active: accounts and books kept, annual meetings held, willingness to maintain the scheme, availability of VMW/operator, separate fund for O & M, fund deposited in cooperatives, community involved in O & M, regular meetings held (each 13th date of the month), maintenance on time (within 2-3 hr.).
b) Water tariff collected, Willingness to pay water tariff, UC gets additional income from external sources (late fee fine as 5 per month), based on meter, 100 minimum up to 5 unit and 5 per unit if exceeds.

Drawbacks:

a) Some beneficiary response from HH not known about the User Committee managements and service provision.