Changing lives through IFAD water investments

A gender perspective

Cover:

Gambia

December 2015

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Preface

Poverty is a multidimensional reality characterized by many interrelated components, one of which is the extent to which people are able to make choices about how they wish to use their free time. However, this choice can only be exercised if free time exists. Often, members of rural households are engaged in time-consuming drudgery work that leaves them little time for other endeavors, including income-generating activities, which could help them improve their livelihoods. Searching for and collecting water is one activity that contributes to the perpetuation of time poverty in rural communities. This is especially true for female household members because women are responsible for fetching water in most rural societies.

This study was designed to obtain evidence about how much time households gain when water-related projects are introduced into a community under IFAD-funded or cofinanced projects. If adequate time could be saved, all things being equal, men and, particularly, women could have more time to engage in their chosen activities, which would contribute to the reduction of time poverty. Men and women would also be able to engage in income-generating activities, which would benefit the whole family and contribute to the reduction of income poverty.

This study was conducted in the context of IFAD's core mandate of improving rural food security and nutrition and enabling rural women and men to overcome poverty. It was also guided by IFAD's Gender Equality and Women's Empowerment Policy, which aims to deepen the impact and strengthen the sustainability of IFAD-supported development initiatives, increase IFAD's impact on gender equality and strengthen women's empowerment in poor rural areas.

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Acknowledgements

This study was undertaken by Gadzeni Mulenga and the report prepared with inputs from Jeanette Cooke. Technical guidance was provided by Audrey Nepveu de Villemarceau and Clare Bishop-Sambrook.

Gratitude goes to Joyce Magala Mpalanyi, Sabin Bieri, Louisa Gosling and Barbara Van Koppen for their contribution to the development of the contextual framework and literature review.

Appreciation also goes to all the individuals, organizations and institutions that facilitated and conducted the data collection process, including: Moses Abukari, Abdullah Al-Dukail, Abla Benhammouche, Nigel Brett, Miki Foday Jawla, Modou Gassama, Roberto Haudry De Soucy, Dickxie Kampani, Lawrence Kasinga, Mohamed Khalilur Rahman, Alessandro Marini, Meera Mishra, Maija Peltola, Rocio Del Pilar Chirinos, Mohapatra Pravanjan, Thomas Rath, Lamin AD Sanyang, Pasco Jose M. Sialer, Rexy Tolani, Leon Williams and Omer Zafar.

Sincere thanks also go to Charlotte Goemans and Tumukunde Myers Murumu for their contribution to data entry.

Acronyms

DLSP	District Livelihoods Support Programme (Uganda)
DTW	deep tube well
HH	household
MIDPCR	Market Infrastructure Development Project in Charland Regions (Bangladesh)
OTELP	Orissa Tribal Empowerment and Livelihoods Programme (India)
Sierra Sur	Market Strengthening and Livelihood Diversification in the Southern Highlands Project (Peru)
UNDP	United Nations Development Programme


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Abstract

The following study was designed by IFAD in order to contribute to the knowledge about the relationship between gender, water investment and time saving. It is also intended to contribute to gender mainstreaming in IFAD's water projects. The focus of the study is to see how much time women and men gain when they have improved access to sources of water and to establish what individuals, particularly women, do with the time they save by not having to walk long distances in search of water. The study further aims to discover to what extent the projects/investments contribute to reducing drudgery and to achieving equitable workloads between men and women.

The survey targeted ongoing projects from the five regions in which IFAD operates that were either in their second phase or a mature stage of operation. In each project, one community was covered and 24 households were targeted. The survey successfully covered seven communities and 140 households and was mainly conducted through project officers facilitated by country programme managers or country programme officers.

The study found that women have saved just under two hours a day, on average, in both the wet and dry seasons since the water investments. This proves the value of such investments in freeing up women's time and energy for other activities. Other household members who support water collection efforts have also benefited from time savings, albeit to a lesser extent.

Furthermore, it was inferred that the impact of the water investments has supported the drive for equitable workloads between men and women. With markedly less daily drudgery in water collection activities and reported improvements in health and nutrition, women, female youths and girls are in a better position to take up new opportunities and change their lives. Most notably, however, the time savings enjoyed by women have enabled them to undertake more productive tasks. Not only can this improve a household's potential food and nutrition security, it can also increase women's confidence and economic potential and thus their bargaining position in married man-headed households and/or in the community. These may also be important steps towards bringing about more equitable workloads.

Several issues emerged regarding the relationship between gender, water investments and time saving that require further investigation and possible action. On a positive note, many women reported using some of the time saved to rest and socialize, suggesting that their workloads may not be too restrictive, at least since the water investments. Some women chose to collect more water rather than the same volume and save time. In such cases, women's workloads can actually increase, but it seems that the benefits (e.g. improved personal hygiene, better nutrition, increased incomes) outweigh the costs.

Relationships between household income group or headship and water collection habits and time use are highly context-specific. Nonetheless, it is important to understand them in order to ensure equitable access to water for all. Looking ahead, longer-term investment in rural water supplies is required to further reduce water-collection demands on women and to continue to promote equitable workloads between men and women.


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Background

Advocacy on the gender dimension of water collection continues to gain momentum. Improved water services in rural communities reduce the amount of time that households spend fetching water and allow collectors to engage in productive activities and other personal development activities. However, in most developing communities, water collection is still one of the most laborious and time-consuming tasks, especially for female household members. Water collection contributes to time poverty within households, which in turn contributes to the perpetuation of rural poverty.

One of the objectives of the International Fund for Agricultural Development (IFAD) is to help communities overcome time poverty through the promotion of labour-saving technologies such as water infrastructure and services. IFAD also understands the gender impact that is associated with poverty-reducing investments such as water infrastructure. The support that IFAD gives directly or in partnership towards investments in domestic and productive water sources are thus, in part, intended to contribute to the release of rural communities from time poverty and gender disparities.[1]

In line with this, the Policy and Technical Advisory Division water and gender desks have been collaborating to increase knowledge about the relationship between gender and water investments and to improve the mainstreaming of gender in the water project cycle. Part of this collaboration focuses on "the gender dimension of time saving" in rural water supply, multiple uses of water services and affordable labour-saving technologies. It is in this context that the study at hand has been designed.

The aim of this study is twofold. First, it is intended to contribute to knowledge on the relationship between gender and domestic, productive, multiple use and labour-saving water investment. Second, it aims to contribute to gender mainstreaming in the water project cycle, including baseline studies, results-based country strategic opportunities programmes, implementation support, reviews and evaluations within IFAD's operations.

The specific objectives of the study are to develop data/information on how investments in water supply, multiple uses of water services and affordable labour-saving technologies can:

- release time from laborious and repetitive tasks for rural households;
- facilitate greater sharing of roles and responsibilities between women and men; and
- provide opportunities for using the time saved in other activities, especially productive/economic activities.

This report is organized in eight sections, starting with this one which highlights the genesis of the study. This is followed by the context, which presents a global perspective on water collection and water investments and how they impact on time use in rural communities. Thereafter, the rationale highlights the pros and cons of water projects in the context of time saving and use and presents the justification for the study. Based on the context and rationale, the fourth section develops and illustrates the conceptual framework of the study and the research questions. This is followed by a description of the methodology employed. The sixth section presents the data analysis, the seventh details the key findings and the last section offers conclusions.

1 See IFAD Policy on Gender Equality and Women's Empowerment (http://www.ifad.org/operations/policy/policydocs.htm).

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Context

Water collection and time poverty

Time poverty is seen as "the burden of competing claims on individuals which reduces their ability to make unconstrained choices on how they allocate their time".[2] Time poverty has been shown to deplete well-being by, for example, restricting a person's freedom of choice to engage in leisure activities. It is also said to reduce human capital and productive/economic work because some activities require a minimum amount of time to be sufficiently productive (e.g. engaging in the sale of agricultural products may be profitable only if enough time is available to travel between the home and marketplace). Similarly, formal wage employment may require a fixed schedule and/or the commitment of a minimum number of daily or weekly hours for a particular activity. Time poverty also traps the poor in a circle of poverty because it keeps them involved in drudgery work that is time-intensive and leads to the need to make trade-offs among various tasks, which, in turn, leads to low productivity.[3] In this sense, the availability, amount and predictability of discretionary time may affect individuals' capacity to take on specific types of activities.[4]

Water collection processes typically contribute to time poverty. If technology could make available some less time-consuming options for collecting water, the time burden of households could be reduced. Options could include, for example, bringing water closer to households by using a borehole or introducing more advanced technologies such as piped water, multiple water-use approaches, irrigation equipment or special water containers.

Water collection and time use in rural communities

An overall review of household water resources and rural productivity in sub-Saharan Africa in the 1990s found that the average time for water collection ranged from 17 to 103 minutes per carrier per day,[5] averaging about 60 minutes per carrier per day.[6] More recent data reveal similar situations; according to the United Nations (2010), only 54 per cent of households in sub-Saharan Africa are within 15 minutes walking distance of a source of drinking water. The time needed to go to the source of drinking water, get water and return home is, on average, 36 minutes in rural areas and 25 minutes in urban areas. The proportion of rural households within 15 minutes of a source of drinking water is as low as 25 per cent or less in Burkina Faso, Burundi, Democratic Republic of the Congo and Mozambique, 15 per cent in Somalia and Uganda and 8 per cent in Eritrea. In other regions of the world, the proportion of households within 15 minutes walking distance of the closest water source is higher (i.e. Asia is at 84 per cent, Latin America and the Caribbean is at 90 per cent, and Eastern Europe is at 97 per cent).[7]

2 Mark Blackden and Quentin Woden. 2005. *Gender, time use and poverty in sub-Saharan Africa*. Washington D.C.: World Bank.

3 This situation may force households to adopt drastic survival strategies such as child labour.

4 World Bank. 2012. Memorandum to the Executive Directors, World Development Report, Gender Equality and Development, pp. 5.25-5.28.

5 Some isolated cases revealed that carriers spent as little as 7 minutes or as many as 264 minutes per day.

6 Sydney Rosen and Jeffrey R. Vincent. 1999. *Household Water Resources and Rural Productivity in Sub-Saharan Africa: A Review of the Evidence*. pp. 29-31.

7 United Nations. 2010. *The World's Women 2010: Trends and Statistics*. New York: Department of Economic and Social Affairs.

Many rural people also face severe constraints in accessing clean and adequate water for productive uses such as agriculture and agroprocessing[8] Supply is still inadequate because of insufficient access to technologies (e.g. irrigation or water harvesting equipment).

The time and effort that households spend collecting water may also be influenced by seasonal variations in water availability. In dry seasons, communities may have to walk further to find water. For example, in Malawi, there are large variations in the amount of time allocated for water collection based on seasonal factors.[9] In Kenya, water collection requires about four hours in the dry season and two hours in the wet season.[10]

A gender perspective of water collection

The time burden of collecting water particularly affects women and girls because they are the primary users, providers and managers of water, especially for domestic purposes.[11] The United Nations report, *The World's Women: Trends and Statistics*, highlights that in 38 of 48 countries studied, a greater percentage of households relied on an adult woman (i.e. 15 years of age or over) for water collection than relied on an adult man for this task. This is the case in both rural and urban areas in most sub-Saharan African countries and in rural areas of some Asian countries. In sub-Saharan Africa, on average, an adult woman takes on the duty of fetching water in 63 per cent of rural households and 29 per cent of urban households. By comparison, an adult man has this responsibility in 11 per cent of rural households and 10 per cent of urban households (e.g. in Malawi, women spend four to five times longer than men on water collection).[12] In rural Asia, women are responsible for fetching water for 30 per cent of water-collecting households and men for 13 per cent. In contrast, in rural and urban areas of Latin America and the Caribbean, men are more often responsible for water collection.

Girls under 15 years of age are also more likely than boys of the same age to be in charge of water collection. In sub-Saharan Africa, girls serve 7 per cent of households, while boys serve 3 per cent. The percentage of households in which girls fetch water is much higher in some parts of the region (e.g. Cameroon, Ghana, Sierra Leone and Uganda – where a girl collects water in more than 10 per cent of the households). In rural Benin, girls between 6 and 14 years of age spend an average of one hour a day collecting water compared with 25 minutes spent by their brothers.[13] In urban areas, the situation is more balanced: girls serve 4 per cent of households and boys serve 3 per cent. In rural areas in Asia, girls and boys collect water for about 2 per cent of households.[14] The United Nations Development Programme (UNDP) estimates that women from sub-Saharan Africa collectively spend 40 billion hours per year collecting water.[15]

These gender disparities lead to differences in the discretionary time available to men and women, which in turn affects the capacity of women and men to engage in non-survival activities, including market-oriented activities such as wage employment.[16]

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8 Data on the status of water for productive uses in developing regions are scarce.

9 UNDESA (http://www.un.org/waterforlifedecade/gender.shtml).

10 United Nations, 2000.

11 United Nations. 2010. *The World's Women 2010: Trends and Statistics*. New York: Department of Economic and Social Affairs. p. 143.

12 United Nations. 2010. *The World's Women 2010: Trends and Statistics*. New York: Department of Economic and Social Affairs. p. 143. It must be noted that more than one trip per day may be needed to cover the household needs, thus the indicated times may not be expended in one trip.

13 UNDESA (http://www.un.org/waterforlifedecade/gender.shtml).

14 United Nations. 2010. *The World's Women 2010: Trends and Statistics*. New York: Department of Economic and Social Affairs. p. 143. The percentages shown refer to the situation where a child is the main person collecting water; the proportion of households where children are involved to some degree in water collection is undoubtedly much higher.

15 United Nations Development Programme. 2006. *Human Development Report*, p. 47.

16 World Bank. 2011. *Memorandum to the Executive Directors, World Development Report, Gender Equality and Development.* pp. 5.25-5.28.

Reducing the burden of water collection

If an individual is able to change the allocation of his or her time during the day, that person may be able to secure more time for discretionary activities.[17] Improved water supply and technologies have been shown to positively impact school attendance, encourage market work[18] and reduce workloads for women. In Morocco, for instance, a World Bank rural water supply and sanitation project aimed to reduce the burden of girls who had been traditionally involved in fetching water in order to improve their school attendance. In this project, the time spent collecting water by women and girls was reduced by 50 to 90 per cent, and girls' school attendance increased by 20 per cent in four years, partly because the girls spent less time fetching water.

Similarly, the advancement of plastic jerry cans in the western province of Zambia in the mid-1980s illustrates how improved technologies can reduce drudgery and bring about gender balance in workloads. The containers were designed with handles for easy transportation, and they could be stacked on carts or perched on bicycles. Previously, water was collected in open bowls carried on people's heads, and this seemed undignified to men. With the development of the improved plastic jerry cans, more men began to fetch water. The change in container types also led to a reduction in the number of trips needed to provide the required quantities of water for the household.[19]

Practical Action reports that the introduction of multiple-use water technologies in the mountains of Nepal[20] provided clean domestic water for the rural poor while expanding their access to irrigation water. The technology is also connected to an income-generating activity for women. It therefore reduces the labour required for water collection, improves sanitation and hygiene for participating households, and helps women play a larger role in the household decision-making process because of their increased income.[21]

The IFAD gender and water perspective

IFAD's primary investments are in agriculture,[22] thus most of its projects with water activities deal with crop production (irrigation 64 per cent, rainfed 54 per cent), livestock (60 per cent) and inland fisheries (21 per cent). However, IFAD projects do not focus simply on agricultural production, but on people-centred rural development. Within IFAD's demand-driven approach, poor rural people define their own needs. As a result, 56 per cent of projects include activities for domestic water supply.[23]

Building on the work carried out between 2007 and 2010 by the IFAD water desk – which confirmed that over 60 per cent of IFAD-supported projects and programmes included interventions in water, beyond irrigation only – the Swiss Agency for Development and Cooperation provided financial and technical support to the Policy and Technical Advisory Division for improving projects in the water management and irrigation sector, with the aim of strengthening knowledge management and building awareness of successful experiences in this sector.

17 Hames. 2004. In: *Gender Relations and Access To Water; What We Want to Know about Social Relations and Women.* p. 19.

18 See N. Ilahi and F. Grimard. 2000. Public Infrastructure and Private Costs: Water Supply and Time Allocation of Women in Rural Pakistan. *Economic Development and Cultural Change* 49:1, pp. 45-75. (Only abstract and citations are available; looking for other options to access it apart from purchasing a copy.)

19 S. Sutton. 2001. *Water in the House – Women's Work, People and Systems for Water, Sanitation and Health.* 27th WEDC Conference.

20 See http://practicalaction.org/multi-user-water-systems.

21 See http://uk.ideorg.org/OurTechnologies/MultipleUseWaterSystems.aspx.

22 IFAD's goal is to empower poor rural women and men in developing countries to achieve higher incomes and improved food security.

23 See http://www.ifad.org/english/water/innowat/factsheets/investments.htm.

Furthermore, IFAD recognizes the linkages between poverty and gender issues and places great importance on women's empowerment as a means to reduce poverty and food insecurity. This is reflected in the IFAD Strategic Framework 2011-2015, which highlights gender concerns as central to enabling poor people living in rural areas to overcome poverty, and the new Gender Policy. In particular, Strategic Objective 3 of the Gender Policy aims to "achieve a more equitable balance in workloads and in the sharing of economic and social benefits between men and women".[24]

24 IFAD Policy on Gender Equality and Women's Empowerment.


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Study rationale

Some researchers argue that certain activities, such as fetching water, are part of a socialization practice that gives women the opportunity to get together "in a moment of independence and freedom". This may be a culturally sensitive issue, and shall be given careful consideration.[25]

Nonetheless, this study is founded on the following premises. First, it tries to emphasize the economic relevance of extending the choices that both women and men can have by simply providing them with basic infrastructure – in this case, water infrastructure. The hours saved by not having to "look for" water – which is not an income-generating task – could be used more efficiently if women and men were able to engage in other productive activities, such as paid work, and improve their living conditions.[26]

Second, development means expanding the freedoms that people enjoy,[27] be it for leisure, personal development or economic gains. Men and women must both have the opportunity to allocate their time in a way that fits them best and enhances their well-being.[28]

Moreover, a need has been identified recently for a data collection process that is gender-sensitive because this improves transparency and targeting.[29] Existing time-use surveys disseminate disaggregated results by gender, but other demographic or socio-economic factors, such as what this study tries to illustrate, have not been systematically considered.[30]

In addition, more accurate data are still needed on access to water, by distance and by the time needed to collect water to meet daily basic needs.[31] When available, further information from time-use surveys can show the proportion of women and men actually involved in water collection, how much time they spend doing this activity, and how the gender-specific time burden is associated with other factors such as age, employment or economic status.[32] So far, only a small number of countries from the less-developed regions – on-site drinking water is most lacking – have this data.[33] Furthermore, and partly as a consequence of the above, the application of a time lens to understand poverty and to inform poverty-reduction strategies has yet to be mainstreamed in most poverty analyses or strategies.[34]

25 Joana Costa, Degol Hailu, Elydia Silva and Raquel Tsukada. 2009. *The Implications of Water and Electricity Supply for the Time Allocation of Women in Rural Ghana*. International Centre for Inclusive Growth, UNDP, Working Paper Number 59, p. 22.

26 IFAD Policy on Gender Equality and Women's Empowerment.

27 Ibid., p. 22.

28 The definition of poverty has evolved significantly. Today it is seen as "multidimensional, encompassing both income/consumption and other dimensions relating to human development outcomes, insecurity, vulnerability, powerlessness and exclusion." Aslihan Kes and Hema Swaminthan. 2006. *Gender and Time Use in Sub-Saharan Africa*. In line with this, a view has emerged for the need to include a time lens to these dimensions – i.e. "time poverty". See Blackden and Wodon, 2006; Kes and Swaminathan, 2006; Charmes, 2006; Hirway 2006.

29 It allows for tracking differences between girls and boys, and women and men at the national level because limited data on time use are available which offer only a crude measure of women's burden in this area. Ministry of Women and Child Development, India. Report of the International Seminar on Towards Mainstreaming Time Use Surveys in National Statistical Systems in India, p. 145. 24-25 May 2007. Supported by UNDP and the World Bank.

30 United Nations. 2010. *The World's Women 2010: Trends and Statistics*. New York: Department of Economic and Social Affairs.

31 Some of the reasons for lack of data include broad social/cultural and institutional obstacles; lack of institutional commitment/accountability; data collection and methodology; and problems characteristic of the water and sanitation sectors. United Nations Department for Economic and Social Affairs and United Nations Water Decade Programme on Capacity Development. 2008. *Gender-disaggregated Data on Water and Sanitation: Expert Group Meeting Report* (http://www.unwater.org/downloads/EGM_report.pdf).

32 Ibid.

33 United Nations. 2010. *The World's Women 2010: Trends and Statistics*. New York: Department of Economic and Social Affairs. p. 144.

It must, however, be understood that providing or improving rural water supply services does not automatically have a positive impact on livelihoods.[35] This depends on the kind of technology that is introduced and for what purposes[36] and how much time is released.[37] It may also depend on the priorities and needs that households have for the time that is made available.[38] Therefore, in order to determine the opportunity cost of the time that a household spends securing water for domestic use, we must know both the amount of time that is spent and the value that is placed on that time. Because communities differ widely in the amount of time spent in collecting water, any estimate of the amount of time that could be saved by providing a new water source in a particular locality should be based on data from that area.[39]

34 Mark Blackden and Quentin Woden. 2005. *Gender Time Use and Poverty in Sub-Saharan Africa*. Washington D.C.: World Bank,

35 Sydney Rosen and Jeffrey R. Vincent. 1999. *Household Water Resources and Rural Productivity in Sub-Saharan Africa: A Review of the Evidence*. pp. 29-31.

36 IFAD. 2007. Securing Water for Improved Rural Livelihoods: The Multiple-use System Approach. p. 6.

37 Shibesh Chandra Regmi and Ben Fawcett, in C. Sweetman, Ed. 2001. *Men's Roles, Gender Relations, and Sustainability in Water Supplies: Some Lessons from Nepal, Men's Involvement in Gender and Development Policy and Practice: Beyond Rhetoric*. Oxfam Working Papers. Oxfam, Oxford. p. 2.

38 ADB – Independent Evaluation: Impact of Rural Water Supply and Sanitation in Punjab, Pakistan. Learning Curves, July 2010; Sydney Rosen and Jeffrey R. Vincent. 1999. *Household Water Resources and Rural Productivity in Sub-Saharan Africa: A Review of the Evidence*. pp. 27-28.

39 Sydney Rosen and Jeffrey R. Vincent. 1999. *Household Water Resources and Rural Productivity in Sub-Saharan Africa: A Review of the Evidence*. p. 17.


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Conceptual framework

The choice to engage in a particular activity depends on, among other things, the time available to an individual. Priority is understandably given to survival needs, which generally fall within the domestic subgroup of non-income-generating activities, as illustrated in Figure 1. Only after these needs have been met can one dedicate time to secondary activities, which fall within income-generating activities as well as within the personal and community categories of activities. We consider these to be productive activities because they consist of events that contribute to the enhancement and development of the individual and consequently the household. If someone were able to spend less time on lengthy "domestic" chores, including water collection, he or she would have more available time that could be invested in productive activities.

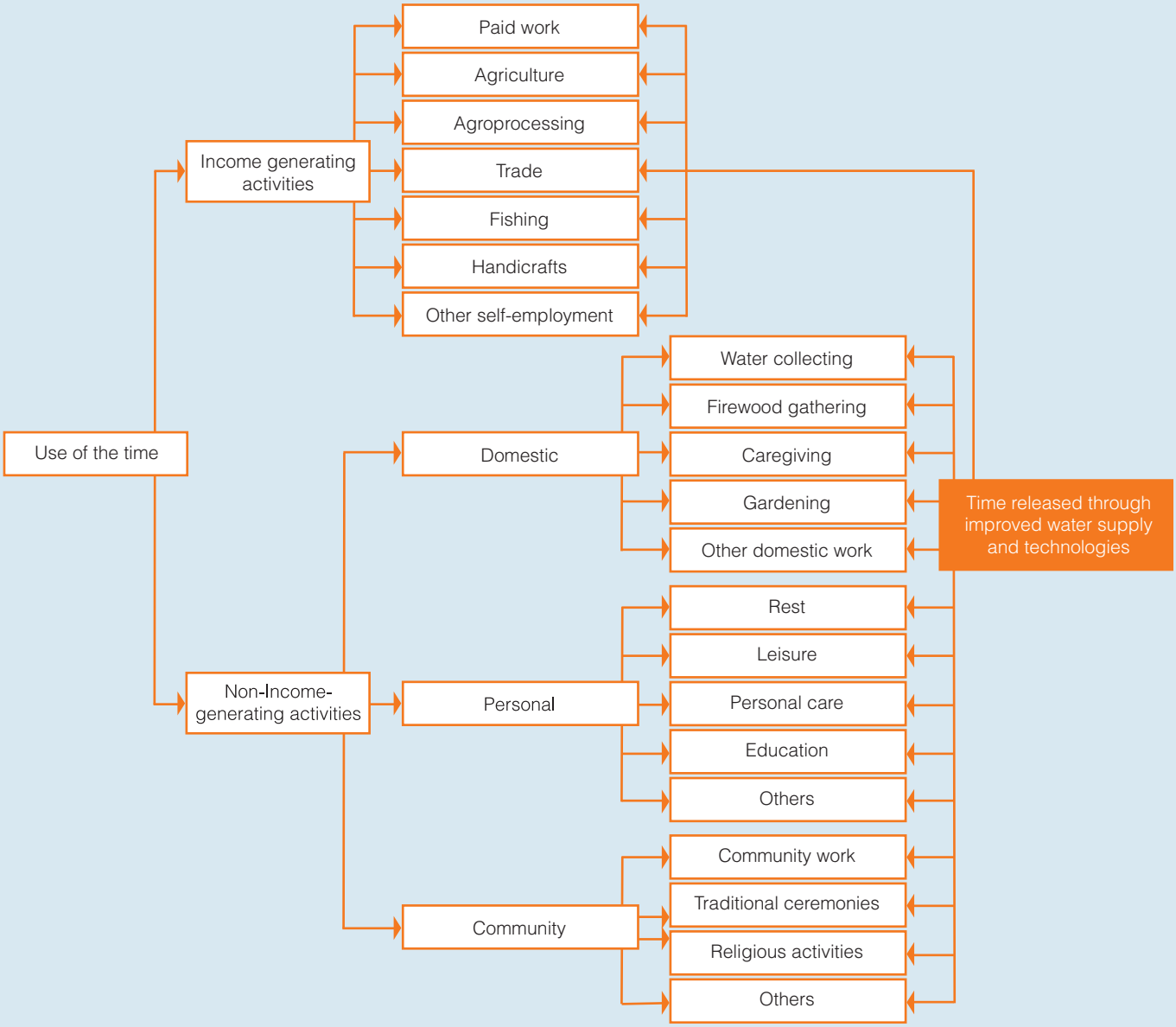
Figure 1 generally illustrates the daily activities of a rural household member, taking water collection into consideration.

An individual may be able to derive greater benefits from a set amount of time if he or she were able to reallocate how that time was used. One way to achieve this is to invest in domestic and multiple-use water sources and affordable labour-saving technologies. These investments can reduce the amount of time that households spend on water collection and thus give water collectors an opportunity to engage in income-generating and other productive activities. This would, in turn, reduce time poverty and gender disparities in rural households and communities. To illustrate this concept, we endeavour to answer the following questions:

- How much time do water investments release for rural communities (i.e. adults, youths and children)?
- How do community members, especially women, use this time?
- How much of this time goes into productive or economic activities?
- Does this process help to bring about gender balance, and to what extent?
- Are the above patterns affected by income group or by the gender of the household head?

FIGURE 1

Rural households, time use and the role of water collection



Rural communities have competing needs for their time

Method

Initial research

The study process began by establishing the general perspectives and concepts surrounding water fetching in relation to gender and time use. An extensive literature review was conducted of similar previous studies and of gender issues, water and time poverty in the context of rural development. In addition, professionals and groups in the fields of gender and water were consulted. Early contacts identified additional subject-matter experts. This was helpful in establishing the context and developing the rationale and concepts for the study.

Survey tools

In order to identify the data required for the analysis and to establish a comprehensive set of questions for the survey, time-use data sets from various countries and associated methods and tools were reviewed. A set of survey tools was designed consisting of a summary description of the study, survey instructions, and a pair of questionnaires to be administered at the community and household levels (see Annex 1). The tools were designed to gather information on the time spent fetching water for all types of uses.

Sample and sampling procedure

The sampling procedure was designed to capture results and impact, and therefore projects that were almost completed or in their second phase of implementation were targeted. The sample selection was done as follows: using the existing "Analysis of IFAD Water Portfolios"[40] for each country, a database was created, which was used to identify and select projects with at least two of the following uses: domestic, irrigation, livestock and industry. Design reports, supervision reports and midterm reviews were examined in order to verify and understand the context of the selected programmes/projects.

The survey was conducted in two phases. First, a pilot survey covering 45 households was conducted, and then that was scaled up into a larger survey covering more households and communities. Countries included in the pilot were The Gambia, India, Malawi, Peru and Yemen. Countries covered under the main survey were Bangladesh, Malawi, Peru and Uganda.

The data were collected through project officers at both community and household levels using a set of survey tools, which included a summary of the study, survey instructions and two types of questionnaires – one to be used at the community level and another at the household level (see Annex 1).

Data collection

Data were gathered, as summarized below:

At the community level, the interviewer identified some key informants (i.e. community representatives and/or existing committees and grass-roots organizations) who either provided or helped the interviewer develop a map or sketch showing the location of all water points.

The process of identifying target households was also done at this stage with the help of key informants as follows: the community was stratified into three wealth groups (i.e. high, middle and low) and three household types (i.e. woman-headed households, married man-headed households and single man-headed households). A minimum of 18 households were to be covered, as shown in Figure 2.

40 Each country was previously assessed to see what kind of water investments it had.

FIGURE 2
Sample composition per community

	High income	Middle income	Low income
Woman-headed households	2	2	2
Married man-headed households	2	2	2
Single man-headed households	2	2	2

An additional six households were to be selected as convenient from the field situation. This resulted in a total of 24 households per community and their location in relation to the water source indicated on the map.

At the household level, the questionnaire was targeted to the mother of the household, except in the single man-headed households. Question 8 was targeted to each household member individually in order to capture the different views between sexes and across ages.

The questionnaires were distributed by email and were received back by email, by post or in person.

Data entry and analysis plan

A household questionnaire analysis plan was drawn up to develop a data sheet in EpiData 3.0, a data entry programme. This is free software that can be downloaded from the Internet, and is used to enter data that can be subsequently exported to other programmes for analysis. Once entered, the data were exported to Excel to perform the analysis. The Excel file therefore holds the raw data and data analysis for reference and eventual future use.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Data analysis

The survey targeted 15 projects – three from each of the five geographical regions in which IFAD operates – and a total of 360 households. The response rate was more than one third, consisting of 140 households, as shown in Table 1.

A variety of water investments have been made across the sample communities. Some were funded directly by IFAD, others by a third party either as part of, or outside of, an IFAD-supported project. The following provides an overview of the analysis and findings by country. Detailed analysis and data tables are available on request.

TABLE 1
Survey response rate by country and community

Country and region	Programme/ project name	Location	Sample communities	No. of households
PERU Latin America and the Caribbean	Market Strengthening and Livelihood Diversification in the Southern Highlands Project	Arequipa region	Lari	24
INDIA Asia and the Pacific	Orissa Tribal Empowerment and Livelihoods Programme	Odisha region, East India	Jabang (Kalahandi)	17
BANGLADESH Asia and the Pacific	Market Infrastructure Development Project in Charland Regions	Patuakhali district	Bakla Tater Kathi	24
YEMEN Near East and North Africa	Al-Dhala Community Resource Management Project	Al-Dhala Governorate	Various communities in the districts of Jihaf, Al-Azarek, Qataba, Al-Shuaib, Dali	31
THE GAMBIA West and Central Africa	Sustainable Land Management Project/Participatory Integrated Watershed Management Project	Kinga district, Lower River Region	Kainga Mandina	24
		Jarra Central District, Lower River Region	Badume Koto	
MALAWI East and Southern Africa	Irrigation, Rural Livelihoods and Agricultural Development Project	Northern Malawi	Chapumbwa	7
UGANDA East and Southern Africa	District Livelihoods Support Programme	Kuenjojo Nyantungo district in western Uganda	Rwemiyongo	13
Total	7			140

Peru

Sample: A total of 24 household questionnaires were completed in the Lari community in the Arequipa region, an area participating in the IFAD-supported Market Strengthening and Livelihood Diversification in the Southern Highlands Project (Sierra Sur, 2005-2013).

Water sources and investments:
Investments in water supply systems were comprised of:

- private taps, funded and managed by the municipality between 1997 and 2002; and
- improved cement-lined irrigation canals, funded by the IFAD-supported Sierra Sur between 2009 and 2012.

Before water investments
Fourteen households used private taps, 12 used the surface sources, 10 used the public tap, 7 used unprotected wells, 7 used household-based rainwater harvesting systems, 8 used irrigation canals and 3 used irrigation sprinklers.

After water investments
Twenty-four households used private taps, 15 used surface sources, 7 used household-based rainwater harvesting systems, 13 used irrigation canals and 3 used irrigation sprinklers.

Interpretation of results

How much time is released and for whom?
People from 21 households reported saving time on water collection activities since the water investments.

Women have saved the most time, with an average saving of 2 hours and 20 minutes in the wet season and 1 hour in the dry season. They now spend, on average, approximately 45 minutes in the wet and dry season collecting water each day. Women were, and remain, the main collectors of water for domestic purposes.

Before the investments, they collected domestic water from the public tap (ten women), private taps (six women), through rainwater harvesting systems (one woman) and from surface sources (two women). After investments, when all 24 households in the sample had access to private taps, 17 women collected from private taps and 1 woman collected from a household rainwater harvesting system. In addition to domestic water collection, women from five woman-headed households also collected water from the unprotected well, irrigation canals and surface sources for watering crops, both before and after the investments.

Households without private taps reported significantly larger average time savings (approximately 1 hour and 30 minutes) than those who already had them (approximately 30 minutes). In fact, it is not clear why the 14 households that already had private taps still reported time savings. Perhaps since the most recent investment, the water service is better managed, more reliable and supplies more water, so real time savings have been achieved.

Despite the fact that the number of men who use the irrigation canals in the dry season increased from 8 to 14, men also reported significant time savings overall, with an average of 1 hour and 30 minutes in the wet season and 1 hour in the dry season. Men now spend an hour or slightly less, on average, on water collection per day in the wet and dry seasons. The majority of the 14 men who reported "collecting" water do so from the irrigation canals and surface sources for the productive purposes of watering crops and rearing domestic livestock. In the six single man-headed households, the men or male youths also collect domestic water from the private taps. The overall decrease in time spent per day on water-related activities seems to be as a result of the faster, more efficient on-site cement-lined canals as well as the accessibility of domestic water in the households.

In general, the only youths who collect water are those who either live on their own (from three households) or live with just one parent (three households). They all collect water for domestic purposes, and one male youth who lives on his own also uses the irrigation canals. A few male youths report small time savings in domestic water collection of 10 to 15 minutes a day. A few female youths report slightly higher time savings in domestic water collection of over 30 minutes a day in the wet and dry seasons.

Interestingly, the average time spent on water-related tasks per day is higher for men than for women and for male youths than for female youths. However, the women and men generally undertake distinctly different water-related tasks (i.e. women collect water for domestic purposes and men for productive ones).

How are the time savings used and by whom? Are productive activities undertaken?
Of the 21 households that reported saving time, 18 used the time for activities that generate an income, and four of these households explicitly referred to having increased their income as a result.

Women mainly use the time saved to help their husbands on the farm and rear livestock. Notably, women and female youths from married man-headed households did not report doing productive activities independently of their family farms. Very few women mention doing more housework. Men mainly use the saved time on productive activities, principally on the farm and rearing livestock, and then on "other" income-generating work such as welding. One woman and one man from different households reported having more time to teach. The few youths that collect water have used the saved time to help their father or mother on the farm and with livestock or to do "other" work and study.

The three households that reported saving time on water collection but which did not use the time for food production or income-generating activities reported spending the time with their families. It is not clear whether this was due to necessity or choice. The three households that saw no change to their water collection habits and times since the investments reported that nothing had changed since they all had private taps beforehand, and two had access to the irrigation canals as well.

Are there any relationships between household type and water collection and time use?
Eleven out of the 14 households that had private taps before the investments were low income. Six out of the seven households that used irrigation canals before the investments were low income. All seven households with rainwater harvesting systems were low income, and all three households that used irrigation sprinklers were low income. No relationship was observed between household type and households that do not access productive water sources (e.g. irrigation infrastructure and/or surface sources). Among the six households that did not report using irrigation infrastructure but relied on surface sources for watering crops and livestock, three were middle income, three were high income and four were headed by married men. Despite the fact that 58 per cent of the sample was low-income households, it can be inferred that there is no negative discrimination against low-income households regarding access to domestic and productive water sources.

The three households that reported saving time on water collection but which did not use this time on income-generating activities were low income.

India

Sample: A total of 17 household questionnaires were completed in the Jabang community in the Kalahandi, Odisha region, an area participating in the IFAD-supported Orissa Tribal Empowerment and Livelihoods Programme (OTELP, 2003-2015).

Water sources and investments:
Investments in water supply systems were comprised of:

- a dam, funded by the Integrated Tribal Development Agency and Th. Rampur in 1995;
- irrigation canals, funded by Panchayat Samiti and Th. Rampur in 2005;
- a gravity flow water supply scheme with distribution to household taps, funded by the IFAD-supported OTELP in 2008/2009 and managed by a water committee; and
- irrigation pipes, funded by the IFAD-supported OTELP in 2010/2011 and managed by the village development committee.

Before water investments
Seventeen households used surface sources, 10 used the unprotected spring, 8 used the borehole, 1 used the protected spring and 2 used the irrigation canals.

After water investments
Fifteen households used the private taps fed by the gravity flow scheme, 11 used the surface sources, 1 used the unprotected spring, 1 used the protected spring, 1 used the borehole, 6 used the irrigation canals and 2 used the irrigation pipes.

Only two respondents to the household questionnaires appear to have had access to OTELP-funded irrigation infrastructure, and six households had access to the otherwise-funded irrigation canals. Very little mention was made of changes to household activities with regards to irrigation infrastructure, and no advantages or disadvantages were given. Henceforth, reference to the "water investments" only refers to the gravity flow water supply scheme.

Interpretation of results

How much time is released and for whom?
Following the construction of the gravity flow water supply scheme, the average total time spent on water collection per person per day for all domestic needs (i.e. drinking, cooking, cleaning and bathing) decreased significantly for 15 out of 17 households. The decrease was from approximately 1 hour and 10 minutes to 25 minutes in the wet season and from roughly 1 hour and 35 minutes to 45 minutes in the dry season. This time was saved because domestic water was available in homes or neighbouring households, which greatly reduced the distance needed to travel to fetch water.

Women are the principal water collectors and, as such, were the main beneficiaries from the 15 households who experienced a decrease in the time needed to fetch domestic water. The women saved an average of 1 hour and 35 minutes in the wet season and 2 hours and 15 minutes in the dry season.

Because half of the responsibility for collecting water was and is shared with other household members, men, youths and children also benefited from the water investments. They now mainly collect water from the household tap rather than assisting the women who collect bathing water from the dam and pond. As a result, the average total time spent on water collection per person per day (wet season/dry season) decreased for five men by 29/41 minutes, four female children by 26/43 minutes, four male children by 25/41 minutes, four male youths by 31/24 minutes and two female youths by 50/44 minutes.

The two households that do not have access to the gravity flow water scheme continue to use either the protected spring or borehole and the dam and pond. The water collectors – a woman, a male youth and children in one of the households and the man and grandmother in the other – have seen no change in their water collection habits and continue to spend roughly 1 hour on water collection per person per day in the wet season and 1 hour and 45 minutes in the dry season.[41]

41 The average time savings quoted in the previous paragraph are significantly lower than in the second paragraph because they concern water collection times for women as well as other family members (men, female and male youth, female and male children, and "others") who did not spend long collecting water both before and after the investments. Meanwhile the women who used to collect from distant sources now have water available from private taps nearby resulting in large time savings.

How are the time savings used and by whom? Are productive activities undertaken?
The 15 households that realized time savings reported using it for productive and domestic/family-related activities.
Women from 13 households reported using time saved for one or more productive activities, namely collecting non-timber forest products, collecting and processing mangoes and attending self-help group meetings.
A few women mentioned farming and wage labour. Other activities listed by these women included rice processing (presumably for own consumption), spending more time with the family, and performing other domestic tasks such as collecting firewood, preparing food and caring for other family members.

The handful of men who collected domestic water beforehand reported using the extra time for farming, wage labour, petty business, relaxation and the domestic tasks of collecting firewood and caring for children. One male youth reported using the time saved for vegetable cultivation and wage labour. Three female youths reported more time for study, personal care, domestic tasks and relaxation/leisure.

Four households gave reasons for not undertaking productive activities. These were: (i) old age and limited time (reported by two low-income households with only one woman over 60 years old in each); and (ii) no time saved because they had no access to the gravity flow water supply scheme.

Are there any relationships between household type and water collection and time use?

By observation, it is noted that:

- four out of five households with no direct access to the gravity flow water scheme are low income, but respondents' completed questionnaires offer no explanation as to why this is the case; and
- five out of seven households with access to irrigation infrastructure (i.e. pipes and canals) are married man-headed households.

Bangladesh

Sample: A total of 24 household questionnaires were completed in the village of Bakla Tater Kathi in the Patuakhali district, an area participating in the IFAD-supported Market Infrastructure Development Project in Charland Regions (MIDPCR, 2006-2013). Analysis of the sample was undertaken in-country by the IFAD-supported MIDPCR project management unit from the local government engineering department, and a comprehensive report (*Identifying Time Savings Through Water Investments*) was compiled of all the results. A summary of its findings is presented below, and the full report is available on request.

Water sources and investments: Investments in water supply systems (1980-2011) were comprised of:

- eighteen deep tube wells (DTWs) offering a perennial drinking water supply, funded by the Relief Department, Education Department, Department of Public Health Engineering, DANIDA (Danish International Development Agency), Stichting Land Ontwikkelings Project Bangladesh (SLOPB, an international NGO), an individual and the community;
- new and improved big ponds and small ditches;
- an embankment in which village households are now located, built by the Water Development Board; and
- access roads.

Before water investments (1970 to 1980)
There were 2 DTWs, 1 river, 2 canals, 50 small ponds and 5 large ponds in the wet season and 18 small ponds and 3 big ponds in the dry season, used for domestic and productive purposes.

After water investments (2012)
There are 20 DTWs used for drinking water, 1 river, 120 small ponds and 40 big ponds

in the wet season and 40 small ponds and 7 big ponds in the dry season, used for other domestic purposes as well as for aquaculture, domestic livestock-rearing and backyard gardening.

Interpretation of results

How much time is released and for whom?
Women, female youths and girls were and are responsible for collecting water for domestic and small productive purposes.

With 18 more DTWs in the village, these wells are much closer to households now (within 200 metres) than before (from 200 to over 400 metres). Therefore, water collection times have decreased in the wet season – with an average savings of around 30 minutes a day – so that water collectors now spend an average of 50 minutes a day fetching water from the closest deep tube well (DTW). In the dry season, they have not saved any time and spend the same average of 1 hour and 10 minutes on water collection from the DTW; however, they collect, on average, 13 more litres per person per day. That said, some high-income households also pay for a maid servant to collect water, so the women, female youths and girls are less burdened with the responsibility.

Water collection times from the much more numerous big and small ponds have also decreased because there are ponds much closer to households now (less than 150 metres in the wet season and from 150 to over 400 metres in the dry season) than before (from 200 to over 500 metres in the wet season and from 300 to over 500 metres in the dry season). In the wet season, from 12 to 28 minutes are spent for each round trip to collect water compared with from 58 to 115 minutes before. In the dry season, from 32 to 80 minutes are spent on each round trip compared with from 80 to 118 minutes before.

Distances and times vary greatly between the wet and dry seasons because of the excess of surface water during the summer monsoon period (from June to October) compared with the relative water scarcity towards the end of the dry season (April and May). With lower groundwater levels, reportedly 65 per cent of the ponds run dry, leaving no alternative but to walk further to find a suitable pond or use the river. Young girls were observed making numerous trips to ponds every day.

Water collection times to and from the river have decreased for several reasons. Households are now located inside the embankment from 200 metres instead of from 300 metres to the river, which requires a 1-hour round trip, saving 20 minutes compared with before. Households do not have to use the river water for domestic purposes as much as before because there are so many more DTWs and ponds. The river water is used for bathing, cooking and cleaning by fewer than 10 per cent of households in the wet season and probably more households than that in the dry season (data not available).

How are the time savings used and by whom? Are productive activities undertaken?
Women use the time saved for productive and domestic activities. It is estimated that 30 per cent of the time saved is used for productive activities, such as domestic livestock-rearing, farming, backyard gardening, fish drying, net-making and repairing and aquaculture. Since the investments, water from the ponds can be used for some of these activities. After the investments and in the wet season, the average quantity of water from DTWs and ponds is 23 litres per person per day (l/p/d) in low- and middle-income households and 28 l/p/d in high-income households. With these quantities of water, these activities would seem possible across all households, with the greatest potential in high-income households.

Another 16 per cent of women's time saved is used for domestic activities, like child-rearing and housework. The remaining 54 per cent is said to be used for resting, leisure and socializing. The full report documents the case of Rahima Begum,

a widow and breadwinner from Patuakhali, who described the economic benefits of having water close to home: "In the past, I used to devote three hours a day to fetching water. Since 1995 when the water point was built, life has somehow become easy. I now have more time, and can do other activities like basket-weaving and making household utensils. I now save a minimum of Tk 5,500-6,680 (US$70-86) each year."

Female youths use the time saved to assist their mothers in domestic work as well as make and repair nets and rear goats. Young girls use the time to go to school and study. In addition, more teachers have accepted positions at local schools where there are three on-site DTWs.

Are there any relationships between household type and water collection and time use?
Household size and economic status were found to be positively related. That is, the lower the income group, the lower the average household size (i.e. number of members). Conversely, the lower the income group, the higher the percentage of female members and children under 5 in the household.

Higher-income households are located closer to well-managed and functioning DTWs and ponds. They have a lower cost of water, safer water and greater use of paid maid servants to collect water. This lowers the burden on a household's women and girls, and more collection trips are made per day to collect a greater volume of water for domestic and small productive activities. Meanwhile, average water collection times per household per day from different water sources are either the same or slightly lower for lower-income households because they travel longer distances but make fewer round trips and collect less water. The benefits are skewed in favour of higher-income households in part because 16 of the DTWs are owned and located in the homesteads of high- and middle-income families.

Yemen

Sample: A total of 31 household questionnaires were completed across various districts in Al Dhala Governorate, an area participating in the IFAD-supported Al-Dhala Community Resources Management Project (ADCRMP, 2007-2015).

Water sources and investments: Investments in water supply systems were comprised of:

- household-based rainwater harvesting systems, funded by ADCRMP in 2009-2010; and
- a small dam, funded through public works in 2004-2005.

Henceforth, reference to the "water investments" only refers to the household-based rainwater harvesting systems.

Before water investments
Twenty households used unprotected wells, 13 used the vendor/tanker truck, 11 used the surface sources, 8 used the protected well, 4 used the gravity flow water scheme and 2 used the borehole.

After water investments
Thirty-one households use the household-based rainwater harvesting systems, 21 used the unprotected well, 11 used the surface sources, 8 used the vendor/tanker truck, 5 used the protected well, 3 used the gravity flow water scheme and 2 used the borehole.

Interpretation of results

How much time is released and for whom?
Following the investment of rainwater harvesting systems, the average total time spent on water collection for domestic and productive needs decreased significantly for women and female youths (who are mainly responsible for water collection) and for a few male youths and children who fetch water.

Women from 26 households experienced average time savings per day of approximately 1 hour and 15 minutes in the wet season and

2 hours and 45 minutes in the dry season. They now spend, on average, approximately 2 hours and 30 minutes in the wet and dry season on domestic and productive water collection. Female youths from 16 households reported average time savings of approximately 1 hour and 45 minutes in the wet season and 2 hours and 15 minutes in the dry season. They now spend, on average, approximately 3 hours and 15 minutes in the wet season and 3 hours and 45 minutes in the dry season on domestic and productive water collection per day.

Two male youths who collect water in the dry season from the unprotected well and surface sources saved an average of 1 hour and 30 minutes, but they can still spend almost 4 hours a day fetching water in the dry season. Three female children reported average savings of 3 hours in the wet season and almost 1 hour in the dry season; they now spend roughly 1 hour and 30 minutes in the wet season and just over 30 minutes on domestic water collection in the dry season. Two male children also reported savings of over 2 hours in the wet season and 1 hour in the dry season; they now spend just 30 minutes a day on domestic water collection.

Twenty-three households in the wet season and all 31 households in the dry season used the household rainwater harvesting systems for domestic water. The time savings described above show that significantly less time was spent collecting domestic water from the distant water sources previously relied upon. Three households also now use water from the rainwater harvesting systems for domestic livestock-rearing. In the wet season, the average number of trips per household per day has decreased from four to three to the unprotected well and from four to two to surface sources, and the number of households using the protected well has fallen from eight to five. In the dry season, the average number of trips per household per day to the unprotected well has decreased from three to two, and the average number of litres taken per trip decreased from 52 to 45. Five fewer households need to use the vendor/tanker truck, and those that still do take fewer litres each time, on average (i.e. from 280 to 135 litres).

However, women and female youths still have to walk up to 2 km to these other sources a couple of times each day to fetch water for productive purposes and some remaining domestic chores. Water for domestic livestock-rearing is taken from the unprotected well by 18 households and from the surface sources by 15 households. Four households water their backyard food crops using the unprotected well, and another four use surface sources.

How are the time savings used and by whom? Are productive activities undertaken?
Most women use the time saved for both productive and domestic activities. Sixteen tend to domestic livestock, six engage in farming (i.e. assisting husbands in crop production and post-harvest processing), one tends to backyard gardening, one tends to bee-keeping, five take up learning and training in life skills and income-generating activities, seven explicitly refer to attending literacy classes, four teach children, and three undertake handicrafts such as sewing and making ornaments, clothes and school bags. Importantly, a handful of women report being able to buy livestock (i.e. 10 goats; 5 sheep; 10 sheep; 10 sheep; 15 sheep; 1 cow).

Fourteen women use the time to look after their families (i.e. children, elderly people and husbands), and 11 carry out housework, including collecting firewood. Eight women report resting and/or watching television.

Similarly, female youths use the saved time for productive activities, namely rearing livestock, producing handicrafts, learning and training, and attending literacy classes, school and study. They also help their mothers look after the family and carry out housework. Four female youths reported being able to attend social events and three reported resting and/or watching television.

Seven households reported that seven women and three female youths

have not saved time in the wet season and therefore cannot undertake more productive activities. Although no explanation was given, it may be because in six of these households, the rainwater harvesting system is only used to draw water in the dry season, and so they are still required to collect domestic water from distant sources in the wet season. Another household uses the rainwater harvesting system in both the wet and dry season, but still collects the same quantity of water from the unprotected well; it seems that they choose to collect more water for domestic and productive purposes rather than save time.

Are there any relationships between household type and water collection and time use?
Analysis is not possible because data on household type are missing for eleven households. Since the water investments, there has been, on average, a slight decrease in the volume of water drawn per household per day (from 257 to 247 l/hh/d in the wet season and from 265 to 247 l/hh/d in the dry season). However, there is a large amount of variation in the quantities drawn by households before and after the investments, lessening the significance of looking at average values. Furthermore, the questionnaires made no reference to a decrease in water volume since the investments, so it is difficult to examine the issue further. What is apparent is that there was and is greater potential in some households than in others to use water for small-scale productive activities.

The Gambia

Sample: A survey was conducted on a sample of 24 households from the communities of Kainga Mandina and Bandume Koto in the Lower River Region, which are participating in the IFAD-supported Participatory Integrated Watershed Management Project (2006-2014).

Water sources and investments: investments in water supply systems were comprised of:

- a hand pump for the protected well in Bandume Koto, funded by WaterAid in 1982;
- a hand pump for the protected well in Kainga Mandina, funded by ActionAid in 1990; and
- annual maintenance on the unprotected wells by the local communities.

There was one protected well that provided potable water and at least two unprotected wells for each community (as shown on the maps of water point locations in the communities in the report "Detailed Data Analysis by Country Sample", available upon request). References to the "water investments" below refer to the hand pumps (because of their significance in bringing about behaviour change) and not the frequent maintenance of the unprotected wells.

Before water investments
Twenty-four households used the unprotected wells, four used rainwater harvesting systems and two used surface water sources.

After water investments
Twenty-one households used both the protected well and the unprotected wells, the same four households used rainwater harvesting systems and the same two households used surface water sources.

Interpretation of results

How much time is released and for whom?
Women were and are primarily responsible for water collection, and female youths provide additional support in approximately half of the sample households. A very small number of other family members offer support as well.

Five women reported spending less time collecting water after the water investments, although the amount of time saved was

unclear from the data. However, for most women and female youths, the time spent collecting water has either slightly increased or imperceptibly changed compared with before the investments, and the women and female youths seem to continue to spend between four and five hours a day on the task. Analysis suggests that this is because households want and are able to collect more water, and because there are increased waiting times at the protected well:

- The total average quantity of water collected from all water sources per household per day has increased by 32 litres (from 255 to 287 litres) in the wet season and 52 litres (from 245 to 297 litres) in the dry season. The demand for more collected water per day could have come from the householders themselves or from development interventions (e.g. the promotion of hygiene education so that people want to use more water for personal and domestic hygiene; the promotion of small-scale productive activities; and/or the use of improved water containers and means of transport to hold and haul a larger volume of water).
- In both the wet and dry season, everyone who collects water uses both types of wells. In other words, none of the households arrange for only certain members to go to the different wells.
- At the protected well, water is drawn by a hand pump, so only one person can use it at a time. At the unprotected wells, several people can draw water at the same time using their own ropes and buckets. Use of the protected well has led to long queues and increased waiting times, which affect women and female youths the most since they are the principal water fetchers. Average waiting times during the wet/dry seasons are 14/17 minutes at the unprotected wells, which are less than the waiting times of 24/19 minutes at the protected well.

How are the time savings used and by whom? Are productive activities undertaken?

The five women who reported saving time used that time to cook, farm, make soap and work in their backyard gardens. Slightly more households use the water collected from both types of wells for watering food crops (from 10 to 13 households), watering cash crops (from 1 to 3 households) and for rearing domestic livestock (from 10 to 14 households).

People who have neither saved time nor undertaken income-generating activities offer the following reasons:

- more water is collected, so more time is spent on water collection;
- more water is used for vegetable gardening and livestock-rearing (which could result in improved household food and nutrition security and/or increased income); and
- there are queues at the protected well.

The average quantity of water collected per person per day (31 and 38 litres in the wet and dry seasons, respectively) would suggest that for most households there is adequate water for drinking, good personal hygiene and domestic chores, as well as small-scale productive activities like watering food crops (e.g. backyard gardens).[42] Analysis of data on how households use the water from the unprotected and protected wells, however, suggests that it is simply used for basic domestic chores, although, as mentioned above, slightly more households also use the water for small-scale productive activities. This interpretation is limited by not knowing the quantities of water used for each type of activity.

Are there any relationships between household type and water collection and time use?

42 Minimum drinking water and hygiene needs are estimated at 20 litres per person per day. (UNICEF and WHO. 2011. *Drinking Water: Equity, Safety and Sustainability*).

There were no clearly observable trends found between household type (e.g. income group and headship) and selected variables and results considered pertinent to this sample (i.e. household size; distance travelled to the protected well in the dry season; waiting time at the unprotected well in the dry season before investments; waiting time at the protected well in the dry season after the investments; households where female youths collect; households where rainwater harvesting systems are used; households where mothers saved time on water collection after investments; and households where water is used for small-scale productive activities).

Malawi

Sample: Seven households were surveyed from Chapumbwa village in northern Malawi, which is participating in the IFAD-supported Irrigation, Rural Livelihoods and Agricultural Development Project (2006-2014). Six households are headed by married men and of those, two are in the high-income bracket and four are in the middle-income bracket. The income group of the woman-headed household was not given. The average household size is five people, with a range of two to eight members.

Water sources and investments: investments in water supply systems were comprised of:

- a public tap in 2010, funded by the Malawian Government and managed by a tap committee;
- a borehole in 2010, funded by the Malawian Government and managed by a borehole committee;
- rehabilitation of protected and unprotected wells by the local community, managed by a committee; and
- rehabilitation of irrigation canals in 2010/2011, funded by IFAD and the World Bank and managed by a Water User Association.

Before water investments
Households used one or more of the following water sources: an unprotected well; a protected well; household rainwater harvesting systems; surface water sources; and irrigation canals.

After water investments
Households used one or more of the following water sources: the public tap; a borehole; the rehabilitated protected and unprotected wells; household rainwater harvesting systems; surface water sources; and the rehabilitated irrigation canals.

Since there have been various water investments in recent years, the respondents of the household questionnaires held different perceptions as to what constituted "before" and "after". Results could not therefore be aggregated and were instead considered on a house by house basis.

Interpretation of results

How much time is released and for whom?
Four households report that time has been saved in collecting water since the water investments because of closer water points or shorter waiting times and fewer collection trips each day. For two of the households, the distance travelled to reach the new water source has decreased significantly, from 200 to 20 metres to the borehole and from 3 km to 10 metres to the public tap. This saves the woman in one household up to 2 hours a day, and the woman, male youth and male child in the other household up to 3.5 hours a day. During the wet season, the woman and female child in a third household reportedly spend 6 hours less each day collecting water from the borehole and rainwater harvesting system than from the protected well, with shorter waiting times (from 30 to 5 minutes) and fewer collection trips each day (from 20 to the protected well to 2 to the borehole). The dramatic decrease in trips per day is because of rainwater harvested at home and zero "trips" reported because of the source's proximity to the household. In the dry season, overall water

collection times are unchanged because the protected well and borehole are used, while the rainwater harvesting system is not.

Three other households did not save any time as a result of either:

- no change in water collection patterns;
- a longer distance to travel to the new public tap (500 metres instead of 250 metres to the unprotected well) and the use of two (instead of one) water sources; or
- spending more time irrigating crops with the rehabilitated irrigation system, rather than relying on rainfed agriculture.

How are the time savings used and by whom? Are productive activities undertaken?
In two households, the women use the time saved to work in their backyard gardens and sell their produce in the market to increase household income. The woman and man in another household use the time to farm, and the man also undertakes paid work. Women in two households use the time to carry out domestic chores. The female child in one household uses the extra time to study, while the male youth and male child in another household use it to farm and study.

In the woman-headed household, more time is spent on irrigation, but this has had the positive effect of increasing production and income.

Are there any relationships between household type and water collection and time use?
There were no clearly observable trends between household type (e.g. income group and headship) and selected variables and results considered pertinent to this sample.

Uganda

Sample: A total of 13 household questionnaires were completed in Rwemiyongo community in Kuenjojo Nyantungo district, an area participating in the IFAD-supported District Livelihoods Support Programme (DLSP, 2007-2014). The sample covered six woman-headed households, four married man-headed households and three single man-headed households, and four high-income, three middle-income and six low-income households.

Water sources and investments:
Investments in water supply systems were comprised of:

- a protected well, funded by the Joint Effort to Save the Environment NGO in 2002, which was non-operational at the time of the survey in 2012; and
- a gravity flow scheme with a public tap, funded by the IFAD-supported DLSP in 2011.

Reference to the "water investment" henceforth refers to the DLSP-funded gravity slow scheme with public tap.

Before water investments
Seven households used the protected wells, six used the household-based rainwater harvesting systems, three used the unprotected wells and three used the surface sources.

After water investments
Thirteen households used the public tap, six used the household-based rainwater harvesting systems and one used a vendor/tanker truck.

Interpretation of results

How much time is released and for whom?
Twelve out of 13 households have saved time because of the water investment. They have seen a decrease in the average time spent collecting water per household per day of 2 hours in the wet season and 1 hour and 45 minutes in the dry season. Households now spend, on average, 1 hour and 30 minutes (ranging from 15 minutes to 3 hours and 10 minutes) in the wet season and 1 hour and 40 minutes (ranging from 10 minutes to 4 hours) in the dry season on water collection per day. The decreased time spent on water collection seems to result

from a mixture of the shorter distance to the public tap (400 metres closer on average), a decrease in time spent going to and from the source and improved accessibility.

Because there is a relatively even distribution of water collection responsibility among family members, both before and after the water investment, a varied group of people have saved time collecting water: women from nine households, men from five households, female youths from four households, male youths from four households and children from two households.

How are the time savings used and by whom? Are productive activities undertaken?
The 12 households that report saving time use it for productive and domestic/family-related activities. Most women and men reported spending more time on the farm and in their backyard gardens (many households cited the successful planting and cultivation of coffee and bananas), raising small and large livestock, attending meetings and undertaking income-generating activities such as wage labour and basket-making (by women in two households). Two women also spend more time going to the market to sell produce. All women, men and female youths who collect water also take the opportunity to rest.

The main difference between how men and women use the saved time is that women undertake more domestic activities, such as preparing food, cooking, cleaning, and caring for and helping family members (although men and youths also undertake these activities in single-male households). Most youths who collect water use the time saved for homework, and fewer numbers use it for a wide range of activities including resting, school, leisure, working on the farm or in the backyard garden, rearing livestock, wage labour (males only), domestic cleaning and caring for family members.

The one household that has not saved time explained that waiting times at the public tap compared with the unprotected well have increased from 2 minutes to 20 and 30 minutes, and the number of trips per day have increased from 2 to 3 and 3 to 4, in the wet and dry seasons respectively.

Are there any relationships between household type and water collection and time use?
At a 5 per cent level of significance, there is a correlation between who heads up a household and the number of people who collect water per household. Single man-headed households have only one person collecting water, while woman-headed households and married man-headed households have two or three people. There were no more clearly observable trends nor statistically significant relationships (at the 5 per cent level of significance) found between household type (e.g. income group and headship) and selected variables and results considered pertinent to this sample (i.e. distance travelled to the public tap in the dry season, time saved on water collection per day in the dry season and households where rainwater harvesting systems are used).

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Key findings[43]

Water source investments

The survey of 140 households in seven projects identified 14 water source investments, of various types, which have led to significant changes in household water collection habits and times.

Investments directly influencing *domestic* water collection included the rehabilitation or construction of the following types of water sources:

- piped water supply schemes with distribution to private taps (Peru, India);
- piped water supply schemes with distribution to public taps (Malawi, Uganda);
- boreholes/DTWs (Malawi, Bangladesh);
- protected wells with hand pumps (The Gambia, Malawi);
- household-based rainwater harvesting systems (Yemen); and
- ponds (Bangladesh).

Investments directly influencing *productive* water collection, for purposes such as irrigation, aquaculture, livestock-rearing and backyard gardening, included the rehabilitation or construction of:

- irrigation canals (Peru, India, Malawi);
- irrigation pipes (India); and
- ponds (Bangladesh).

It is important to bear in mind, however, that many of the investments directly influencing domestic water collection also had an impact on the water supply and time available for small-scale productive tasks, reflecting the multiple use of water by rural households from one or more sources.

IFAD-supported projects financed the development of 6 out of 14 of the water source investments identified in the survey. On eight occasions, funding came from the community, private individuals/organizations, the municipality, government or development agencies. The IFAD-supported projects funded: three productive water investments in irrigation canals in Peru and Malawi and irrigation pipes in India; three domestic water investments in piped water supply schemes with distribution to private taps in India; public taps in Uganda; and household-based rainwater harvesting systems in Yemen.

Responses from the household and community questionnaires focused on the type and impact of domestic rather than small or large-scale productive water investments. It is not clear why this occurred, particularly considering that the majority of respondents were men, while women are responsible for domestic water collection and use. Nevertheless, for future surveys, adjustments to the questionnaire are proposed to augment the quality and quantity of responses (see Annex 3).

A comparison of the water sources used before investments to those used afterwards shows that many projects have built upon existing technologies or introduced a new, more complex technology (e.g. from water piped to public taps to water piped to private taps in Peru or from unprotected wells to protected wells in The Gambia). In this way, a step change is avoided and technological advancement develops in line with individual/community financial, operational and management capacities necessary for sustainable water service.

43 The "Summary table of results" in Annex 2 enables a comparison "at a glance" of the main findings from all seven samples. General limitations to the data analysis are available in Annex 3 to help inform related work in the future.

Time savings

In five out of the seven samples, nearly all the households benefited from lengthy time savings in water collection. In the remaining two samples from The Gambia and Malawi, 5 out of 24 and 4 out of 7 households reported saving time, respectively.

Across all samples, women are the main water collectors and have saved an average of two hours a day in the wet and dry seasons since the water investments. Although the time saved varies within and between samples, it can be inferred that, on average, the potential of water investments to reduce women's drudgery is very high because they free up valuable time and energy for productive, personal development and community-related activities, as well as leisure.

The support received by women from other household members in some samples also means that they have benefited from time saved as well, although to a lesser degree. See the "Summary Table of Results" in Annex 2 for detailed figures.

The principal reason for the time saved is that the new or improved water sources have been located either:

- much closer to households (e.g. boreholes, DTWs, public taps, ponds); or
- inside the homestead or household (e.g. household-based rainwater harvesting systems, private taps).

The distances travelled to and from water sources have thus decreased, thereby reducing the length of time spent on water collection round trips. In some cases, this has also led to the need for fewer collection trips because more water can be collected and carried per trip or because no trips are needed as water is available in the household. When there are more water sources available, waiting times to draw water can also decrease – although in The Gambia, it was learned that waiting times can increase even when using an improved water source like a protected well and hand pump, rather than an (open) unprotected well, because only one person can draw water at a time. In such situations, more improved water sources or a hand pump with a faster discharge rate are required (assuming that funding and safe water yields are assured).

Another reason that time can be saved when collecting water is improved physical accessibility (e.g. when the public taps in Uganda and improved ponds in Bangladesh could be accessed over easier terrain). Cement aprons around water points fitted with effective drainage channels also help to improve accessibility by ridding the vicinity of mud and flies. In Peru, men saved time when irrigating their crops because faster and more efficient irrigation canals had been rehabilitated and lined with cement.

Interestingly, most households in the samples from Bangladesh and The Gambia (in the dry season) and a household in Malawi after the water investments collected more water for domestic and small-scale productive purposes, in order to enjoy the ensuing benefits, rather than collecting the same volume to save time (see *Impact on water quantity below*). Meanwhile, in Bangladesh, time savings are only achieved in the wet season because in the dry season, lower groundwater levels mean longer round trips to suitable surface sources and more water has to be collected from DTWs. Time savings follow a similar pattern in Malawi because water supplies are depleted in the dry season from household-based rainwater harvesting systems, forcing people to use communal water sources.

Water investments and promoting equitable workloads between the sexes

Impact on health

The water investments have clearly had a positive impact on family health and well-being and subsequently women's workloads. In all countries studied except Peru, improved access to safe drinking water was cited as an advantage of the water investments. Respondents in Bangladesh explicitly reported reduced morbidity in skin complaints, reduced morbidity and mortality

from diarrhoeal diseases in children, fewer post-natal infections and improved reproductive health for women. Women, female youths and female children also reported less mental stress and physical fatigue in Bangladesh and Yemen thanks to the reduced burden of water collection, including safer water source access points and paths. Consequently, women's role of caring for the sick and taking them for medical treatment is likely to have been reduced, as well as medical bills. Overall, households report less drudgery and improved health and nutrition which is an important basis on which women, female youths and girls can start to change their lives and take up new opportunities.

In Bangladesh, The Gambia, Malawi and Uganda, the improved quality of drinking water results from the rehabilitated or new protected water sources, rather than from actual investment in water treatment processes. In Yemen, households have switched from filtering drinking water from the unprotected and protected wells, the vendor/tanker truck and surface sources with gauze and cloth to using ceramic filters on drinking water from their rainwater harvesting systems. It is not clear from the data whether the change in treatment method results from project interventions or other factors. Investments in piped water supplies in India and Peru included centralized treatment processes. Interestingly, the basic level of treatment used in India of only sedimentation has been better received than the more sophisticated chlorine disinfection treatment in Peru, where the majority of households claim there is too much chlorine in their water.

Impact on distribution of water collection responsibility among household members

Since the water investments, slight changes have occurred in the distribution of water collection responsibility among household members in The Gambia and Malawi. In The Gambia, there were more youths collecting water in the wet season, increasing from 38 to 48 per cent of the responsibility. This change was potentially driven by the opportunity to collect more water and undertake more small-scale productive activities. In Malawi, a man and male youth from separate households started to help the women and female children to collect water after the borehole investment, which significantly decreased collection times because of the closer water source and shorter waiting times. In such cases, women either share or have a reduced water burden that can release their valuable time for other activities. Technologies that bring water into homesteads and households, such as household-based rainwater harvesting systems and piped water supplies to private taps, help to promote the sharing of water collection responsibility among household members (with the exception of Yemen).

Meanwhile, the distribution of water collection responsibility did not change in the other five sample countries. Women, followed by female youths and sometimes female children, continued to bear the burden of water collection for domestic needs and often small-scale productive purposes. The exception was Uganda, where there is a relatively even distribution of responsibility among household members, both before and after investment: 32-36 per cent women, 20 per cent men, 20 per cent female youths, 20 per cent male youths and 2-8 per cent children.[44]

Impact on daily activities

Women from all seven samples have used the time saved from water collection for a variety of productive tasks, principally family farming (e.g. crop production and processing and small livestock production), as well as backyard gardening, wage labour, selling goods in local markets and participating in self-help group meetings. Women from Uganda and Yemen reported spending time on handicrafts, while only women from Yemen reported attending training sessions (in life skills, literacy and income-generating activities).

44 In part, this is because men undertake all domestic chores in three single man-headed households and women do so in six woman-headed households, and also because of significant support from male and female youths.

The potential benefits of women undertaking more productive tasks include improved household food and nutrition security as well as increased confidence and economic potential for women. This can improve women's bargaining position in married man-headed households and/or in the community, which are important steps towards bringing about equitable workloads. The degree to which discriminatory gender roles can be challenged and women can gain economic independence may be limited when women's additional productive work still takes place on the husbands' farms, as noted in Peru.

Female youths also reported more time for productive activities, and female youths and/or children across all samples use the saved time for school and study, which could advance their education and subsequent opportunities.

Men from India, Malawi, Peru and Uganda also reported saving time from water collection and using it for the productive tasks of family farming, wage labour and income-generating activities.

Notably, only women and female youths (from five samples) reported using the time saved for domestic chores, with the exception of single man-headed households and in India, where five out of nine men from married man-headed households collect firewood and perform child care.[45] Interestingly, in Bangladesh, Uganda and Yemen, women reported using some of the time saved to rest, relax, socialize and for leisure, suggesting that their workloads had reached a balance, at least following the water investments.

In India and Peru, several low-income households reported saving time on water collection but not using the time to undertake productive activities. Instead, in Peru, the time is spent with their families, but it is not clear whether this is because of necessity or choice. In India, the reasons given are the old age of the single women occupants and a perceived insufficient amount of time saved. In such cases, it would be interesting to further clarify why productive activities are not undertaken in low-income households and, if appropriate, provide training or other means for them to do so. Regardless of the reason, the burden of work had been reduced.

Impact on water quantity

As mentioned above, households in the samples from Bangladesh (in the dry season), The Gambia and a household in Malawi have collected more water for domestic and productive purposes since the water investments. It appears that they have chosen to enjoy the ensuing benefits from more water, rather than collect the same volume and save time. In such cases, women's workloads can actually increase, but it seems that the benefits (e.g. improved personal hygiene, better nutrition, increased incomes) outweigh the costs. The demand for a higher volume of water collected per day could have come from the householders themselves or from development interventions (e.g. hygiene education/promotion so people want to use more water for personal and domestic hygiene; the promotion of small-scale productive activities; and/or the use of improved water containers and means of transport to carry a higher volume of water).

Although water quantity data are incomplete, it can be inferred from the quantitative and qualitative data that the average quantity of water drawn since the water investments has not increased in India, Peru, Uganda or Yemen. Here, the objective for the piped water supplies and household-based rainwater harvesting systems appears to have been to improve access to a safe water supply. In the sample from Uganda, the slight decrease in average water quantity per person per day of 1 litre in the wet season and 2 litres in the dry season could be because households now have to pay for the higher quality water from the public tap compared to the previously used communal water sources.

45 It is not known to what degree the men used to carry out these tasks, so it is not possible to attribute this "culture" of domestic support to the water investments.

Missing data on water quantity from rainwater harvesting systems may also affect the results. The most important objective – be it improved water quality, closer access to water or greater availability of water – or indeed the order of priority of all these objectives, is context-specific. In theory, enabling the accomplishment of all three objectives seems ideal, but that may not be necessary or, more likely, it may not be feasible or sustainable.

In the samples from Bangladesh, The Gambia and Uganda, where the average quantity of water collected varies from 15 to 38 litres per person per day, women report using some of the water collected for small-scale productive activities; however, the practice is limited to some rather than all households. This could be because of the significant variation in the water quantity collected per person per day between households in any one sample, suggesting there is much greater potential for some rather than others to use the water for productive activities. It would be interesting to learn why this is the case in order to enable all households to collect water for small-scale productive purposes to increase household nutrition, food security and women's economic potential. For instance, in Bangladesh, it is understood that high-income households collect more water than middle- and low-income households because the DTWs and ponds are owned by them and/or located in their homesteads and because maid servants can be employed to collect the water.

Sustainability of water services

In order to sustain any positive steps towards reduced drudgery for women and more equitable workloads between men and women, new or improved water infrastructure and services need to be effectively managed and financially viable in the long term. In view of this, a few issues were raised in the sample communities that require further investigation and possible action:

- inadequate cleaning and maintenance in Malawi and Uganda;
- chlorine overdosing, scarcer water and population growth in Peru;
- fewer opportunities for social networking and communicating with other women because there is less need to travel distances to fetch water, leading to fewer exchanges of gifts and local produce (e.g. cereals, dairy and vegetables), less access to news and less recognition of local events.

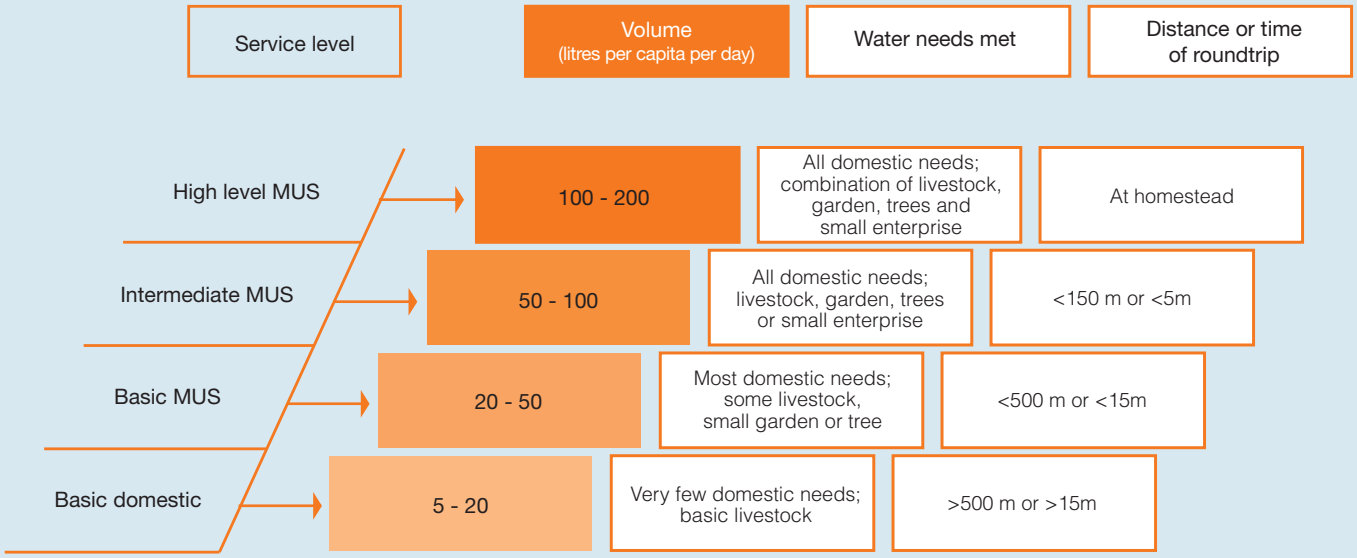
In Yemen, facilitating alternative opportunities for social networking and exchanging gifts alongside the water investment would uphold women's social and economic opportunities, supporting the drive for equitable workloads.

Replication and scaling up

In many of the sample communities, daily water collection still represents a lengthy and tiring task, with high opportunity costs of lost productive time and poor health. For example, across India, Yemen, Malawi, Peru and Uganda, women still spend, on average, 1 hour 30 minutes fetching water every day. Looking at the sample communities in Yemen and The Gambia, daily water collection can take women 2 to 3 hours and 4 to 5 hours, respectively.

Despite great advances made over the last 30 years in the sample community in Bangladesh, women and girls, mainly from low-income households who still rely on secondary or tertiary water sources, can still spend 2 hours two to three times each day collecting domestic water. Children are also reported to still suffer from diarrhoeal diseases, albeit to a lesser extent, due to the continued use of polluted surface sources, which negatively impacts upon their mental and physical capabilities in the long term. Furthermore, water supplies for small-scale productive activities managed by women, such as fruit and vegetable production and domestic livestock rearing, are said to have been largely overlooked by development schemes.

FIGURE 3
Multiple-use water services ladder[48]



Further reductions to the burden of domestic water collection on women, female youths and girls are therefore required, and women need access to water for small- and/or large-scale productive purposes as well.

Understanding the multiple livelihood strategies and the corresponding water needs of household members should be the basis when planning for water service provision.[46] A minimum of 20 litres per person per day is required for basic domestic use, including at least 3 litres of safe water per person per day for drinking purposes. On this basis, different incremental investments are then possible to increase the water supply to or near households, so as to move to "higher service levels" up the water ladder, and eventually fully meet productive water needs as well (Figure 3).[47]

IFAD can support longer-term investments in the rural water supply sector by funding programmes directly, finding co-financiers and technical specialists to support implementation and/or advocating at the local and national policy levels.

46 For more information, visit http://www.musgroup.net.

47 Marieke Adank, et al. 2012. *Guidelines for Planning and Providing Multiple-use Water Services*.

48 Barbara van Koppen, et al. 2009. *Climbing the Water Ladder: Multiple-use Water Services for Poverty Reduction.*

Relationships between household type and water collection and time use

With the exception of Bangladesh, few relationships were found between the household income group or headship and water collection habits and time use. No headline conclusions can be drawn from the results, except that any such relationships are clearly context-specific and cannot be assumed across countries or even communities. For example, in the sample community in Peru, positive discrimination in terms of water access appears to exist for low-income households, whereas in India, four out of five of the households with no direct access to private taps fed by the piped water supply scheme are low income.

In Bangladesh, high-income households have clearly benefited disproportionally more from the water investments in DTWs and ponds than middle- and low-income households. This is reportedly because the water sources are owned by high-income households and/or located in their homesteads. This highlights the importance of ownership arrangements and the location of water sources to enable equitable access to water for all.

Conclusions

Across all samples, women have saved just under two hours a day, on average, in the wet and dry seasons since the water investments. Average water collection times have decreased from three and a half hours to one and a half hours every day.[49] Such a significant daily time saving highlights both the burden of water collection drudgery on women prior to water investments as well as the value of these investments in freeing up women's time and energy for productive, personal development, community and/or leisure activities.

Other household members – mainly female youths, children and men – have also benefited from time savings from the water investments, albeit to a lesser extent. Important variations exist between households and communities in the amount and type of support women receive from other household members. As such, generalizations cannot be made during project design about who holds water collection responsibility.

The principal reason for the time saved is that the new or improved water sources have been located either much closer to households or actually inside the homestead or household, thereby reducing the length of time spent on water collection round trips.

From the results, it can be inferred that the impact of the water investments has supported the drive for equitable workloads between men and women. With markedly less daily drudgery in water collection and the reported improvements in health and nutrition, women, female youths and girls are in a better position to take up new opportunities and change their lives. Following the water investments, some women also share more of the responsibility for water collection with other members of the family, thereby lightening their daily load.

Most notably, however, across all seven samples, the time savings enjoyed by women have enabled them to undertake more of the same, or more varied, productive tasks – from farming to making handicrafts for sale to attending self-help group meetings and literacy classes. Not only can this improve a household's food and nutrition security potential, it can also increase women's confidence and economic potential, and hence their bargaining position in married man-headed households and/or in the community; these are important steps towards bringing about equitable workloads. Similarly, female youths have been able to spend more time on productive activities, and female youths and/or children across all samples use the saved time for school and study – essential steps for educational advancement and opening up farm and non-farm employment opportunities.

In a few cases, women did not used the time saved to undertake productive activities. Clarification is therefore needed as to why this is so – particularly given that they are from the low-income bracket – and, if appropriate, whether remedial interventions can be made. Women and female youths from married man-headed households reported using some of the time saved to carry out other domestic chores. More positively, however, a significant proportion of women in Bangladesh, Uganda and Yemen reported using some of the time saved to improve their quality of life through relaxation and leisure.

In some cases, the water investments have led to more water being collected for domestic and productive purposes.

49 Excluding data from Bangladesh and The Gambia because of missing data.

It appears households have chosen to enjoy the ensuing benefits from more water, rather than collect the same volume and save time. In such cases, women's workloads can actually increase, but it seems the benefits (e.g. improved personal hygiene, better nutrition, increased incomes) are deemed to outweigh the costs.

Only some households in the sample use the water for small-scale productive activities. No doubt this is partly due to the significant variation in the water quantity collected per person per day among households in any one sample. It would be interesting to delve further to learn why this is the case.

Relationships between household income group or headship and water collection habits and time use are clearly context-specific and cannot be assumed across countries or even communities. Few relationships were found, perhaps in part because of the small size of each sample. However, results from the sample from Bangladesh illustrate how strong the relationships can indeed be when they exist, and therefore it is important to understand them to ensure equitable access to water for all.

Notwithstanding the great advances made in reducing the drudgery of daily water collection in the sample communities, many women and other household members can still spend, on average, one and a half hours fetching water every day. In order to challenge gender roles and bring about equitable workloads between genders, longer-term investment is required in rural water supply in line with multiple water needs, including improving access to, and control of, water for women to use for small- and/or large-scale productive purposes. IFAD can support this by funding programmes directly, finding cofinanciers and technical specialists to support implementation, and/or by advocating at the local and national policy levels.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Annex 1
Community and Household Questionnaires

IFAD
Investing in rural people

SURVEY

A GENDER ANALYSIS OF CHANGES IN TIME USE ASSOCIATED WITH WATER INVESTMENTS

GUIDELINES FOR THE INTERVIEWER

1. Objective of the survey

The following survey has been designed by IFAD to gather data for a study that it is undertaking, called "Identifying Time Saving through Water Investments". Through this study, IFAD wishes to have evidence on how water investments, which are funded by the organization, affect men and women in rural households. The focus of this study is to see how much time men and women gain when they have improved water sources. It also intends to assess what people do with the time that they have gained – especially women because they are the main collectors of domestic water. Finally, it tries to establish if the water investments help to bring about equitable amounts of work between men and women. The findings will help to improve water programmes/projects of IFAD and its partners.

2. Data collection process

The survey covers fifteen projects, three from each of the five geographical regions in which IFAD is operating and 24 households will be interviewed under each project. It will be conducted through project officers and will target ongoing projects. However, in order to capture results and impact, only projects towards the end of their life or in their second phase of operation are considered. Information will be obtained at both the community and household levels, and the survey is expected to last about two days per community.

2.1. Community level

At the community level, the interviewer will:

(i) **Acquire a map or sketch showing the location of all water points:** An existing map or sketch in some cases may be readily available within the community from a water association or other grass-roots organization, a health institution or local authority, etc. If a map is not available, the interviewer will create one with the help of a few key informants.

(ii) **Establish a list of water sources:** A comprehensive list of existing water sources will show what interventions – if any – have been made to each source, the date of intervention, the responsible organization and any associated management arrangements.

(iii) **Identification of households:** Households will be identified with the help of the key informants (i.e. community representatives and/or existing committees and grass-roots organizations). The community will be stratified into three wealth groups: **high, middle and low** from categories. Thereafter, three household types will be selected from each of the categories, i.e.: **(a) woman-headed households; (b) married man-headed households; and (c) single man-headed households**.

Minimum coverage of the chosen sample of households: 18, as presented in the table, then choosing the remaining 6 households to be interviewed as convenient from the field situation.

	High income	Middle income	Low income
Woman-headed households	2	2	2
Married man-headed households	2	2	2
Single man-headed households	2	2	2

A total of 24 households will be targeted per community, and their location in relation to the water source should be indicated on the map.

2.2. Household level

At the household level, the questionnaire will be used to guide the discussion with the "mother" of the household, unless in the case of the single man-headed household. The interview is expected to last about 30 minutes.

Questions 3, 4, 5 and 6 refer, in particular, to the various uses of water. We thank you in advance to take care that the responses cover the following activities: drinking, cooking, cleaning, bathing, watering food or cash crops (backyard gardening or irrigation), domestic or commercial livestock-rearing, agroprocessing, handicrafts production, resale/vending, use in small businesses (specify type of business), ceremonial purposes, others.
Question number 8 in the questionnaire, however, must be completed by each household member individually in order to capture the various views between sexes and across ages.

- **Where possible, avoid the use of acronyms, as they may be difficult to understand for someone outside of the area.**

IFAD
Investing in rural people

PART A: COMMUNITY QUESTIONNAIRE

IDENTIFYING TIME SAVING THROUGH WATER INVESTMENTS: A GENDER PERSPECTIVE

Information to key informants at the community level

The following survey has been designed by IFAD to gather data for a study that it is undertaking called "Identifying Time Saving through Water Investments:
A Gender Perspective". Through this study, IFAD wishes to have evidence on how water investments, which are funded by the organization, affect men and women in rural households. The focus of this study is to see how much time men and women gain when they have improved water sources. It also intends to assess what people do with the time that they have gained – especially women because they are the main collectors of domestic water. Finally, it tries to establish if the water investments help to bring about equitable amounts of work between men and women.
The findings will help to improve water programmes/projects of IFAD and its partners.

Name of interviewer: _____

Day Month Year: |__|__| |__|__| |__|__|__|__|

Country: _____

Zone: _____

Region: _____

Name of community: _____

Project name: _____

Names of key informants: _____

_____

_____

Among the key informants, indicate the number of men _____

and the number of women _____

WATER SOURCES AND USE

This section gathers information about the various sources of water available for household's use, and also gathers information on how these sources are being used from the overall community point of view. This section, finally, captures the types of water source improvements that have been made by various actors and the date of intervention.
Indicate the duration of the wet and dry seasons in the spaces provided below
(e.g. November to March)

Wet season_____

and dry season_____

What are the main sources of water for domestic, livestock, crop and productive uses in the community for the wet season and for the dry season

Type of water source	Indicate the season in which the water source is used.		Indicate if the source is a new development/construction or if it has been improved or rehabilitated, by whom and when.			
	Wet	Dry	Type of development/ improvement	Date of development/ improvement	Cost (in US$) of construction/ improvement	Actor(s) or partners involved
Private tap						
Public tap						
Boreholes						
Vender, tanker truck						
Gravity flow scheme						
Rainwater/roof catchment						
Protected well/ spring						
Unprotected well/spring						
River, stream, lake, pond, dam						
Irrigation canals						
Irrigation pipes/ sprinklers						
Other (specify)						

*In the household questionnaire, focus on the water sources that have led to a change in the time spent on water collection (i.e. increase or decrease in the amount of time that household members spend on collecting water).

	Has the improvement resulted in any changes in time spent on water collection? If not, explain why.	Is there any cost associated to the water collection process? If so, how much per container or litre or per trip (if it is labour cost) or others? (In US$ and/or time)	Are there any management arrangements for the water source? If yes, specify.

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PART B: HOUSEHOLD QUESTIONNAIRE

IDENTIFYING TIME SAVING THROUGH WATER INVESTMENTS: A GENDER PERSPECTIVE

Information to be given to the interviewee

The following survey has been designed by IFAD to gather data for a study that it is undertaking called "Identifying Time Saving through Water Investments:
A Gender Perspective". Through this study, IFAD wishes to have evidence on how water investments, which are funded by the organization, affect men and women in rural households. The focus of this study is to see how much time men and women gain when they have improved water sources. It also intends to assess what people do with the time that they have gained – especially women because they are the main collectors of domestic water. Finally, it tries to establish if the water investments help to bring about equitable amounts of work between men and women. The findings will help to improve water programmes/projects of IFAD and its partners.

Please remember that your participation is voluntary.
All your responses will be confidential.
Is anything unclear? Would you like to ask me something?
Are you willing to participate in the survey?

Name of interviewer: _____

Day Month Year: l__l__l l__l__l l__l__l__l__l

Country:

_____

Zone: _____

Region: _____

Name of community:

_____

Project name: _____

Household survey number: l__l__l__l__l

Type of household: ☐ High-income ☐ Middle-income ☐ Low-income

and,

☐ Woman headed ☐ Single man headed ☐ Married man headed

Name of interviewee: _____

Age: _____ Sex: _____

Relationship to household head: _____

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SECTION 1: HOUSEHOLD DEMOGRAPHICS

This first section gathers information about the household.

Question 1: What is the composition of your household and what do they do for a living?

**Briefly describe each member/age group and specify occupation, e.g. schooling, employment, care giving, etc.*

Household member	Sex		Age	*Describe the general occupations of household members (usually more than one major occupation).
	Male	Female		
Mother				
Father				
Youths (15 to 24 years)				
Children (below 15 years)				
Other people in the household				

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SECTION 2: WATER COLLECTION AND TIME USE

This first section gathers information about the household.

A. Present water collection situation of the household (AFTER the investment in water)

Question 2: What are the sources of water your household uses for domestic, livestock, crop and productive activities?

Household member	What type of water sources do you currently use during the wet and dry seasons? (Tick)	
	Wet	Dry
Private tap		
Public tap		
Boreholes		
Vendor, tanker truck		
Gravity flow scheme		
Rainwater/roof catchment		
Protected well/spring		
Unprotected well/spring		
River, stream, lake, pond, dam		
Irrigation canals		
Irrigation sprinklers		
Other (specify)		

	What type of water sources were you using during the wet and dry seasons before the present water investment(s)? (Tick)	
	Wet	Dry

Question 3: What is the present situation regarding water collection in your household during the **WET** season?
Notes to the interviewer: Refer to the table of question 2 to inform the relevant water sources identified. Also include water used for agriculture (crop, livestock).

What type of water sources do you use during the wet season?	***Who collects water from each source?**	**How long does it take to collect water from this source? (In km, minutes)**			
		**Distance to water source in km and mode of transport	Travel time to water source in minutes	Travel time from water source in minutes	Waiting time at water source in minutes
Private tap					
Public tap					
Boreholes					
Vendor, tanker truck					
Gravity flow scheme					
Rainwater/roof catchment					
Protected well/ spring					
Unprotected well/spring					
River, stream, lake, pond, dam					
Irrigation canals					
Irrigation sprinklers/pipes					
Other (specify)					

* **Who collects the water =** mother, father, youths, children or others (and if male or female); **cost of water =** per trip/container/litre.
** **Distance and transportation mode =** e.g. 5 km by foot, animal-drawn wheelbarrow, bicycle, motorbike, motor vehicle, other uses.
*** **Uses of water =** drinking, cooking, cleaning, bathing, watering food or cash crops (backyard gardening or irrigation), domestic or commercial livestock-rearing, agroprocessing, handicrafts production, resale/vending, use in small businesses (specify type of business), ceremonial purposes, others.

			Quantity of water collected per trip in litres	Total amount of water collected per day	***How do you use the water collected from each of the selected sources?	Do you purify the water from these sources? If so, how and how long does it take?
	No. of trips per day	Total time spent on water collection per day in minutes				

Question 4: What is the present situation regarding water collection in your household in the **DRY** season? Refer to the table of question 2 to inform the relevant water sources identified; include water used for agriculture (crop, livestock).

Dry season (indicate the dry season period, e.g. June to October)					
What type of water sources do you use during the dry season?	**Who collects water from each source?**	**How long does it take to collect water from this source? (In km, minutes)**			
		Distance to water source (in km) and mode of transport	Travel time to water source in minutes	Travel time from water source in minutes	Waiting time at water source in minutes
Private tap					
Public tap					
Boreholes					
Vendor, tanker truck					
Gravity flow scheme					
Rainwater/roof catchment					
Protected well/ spring					
Unprotected well/spring					
River, stream, lake, pond, dam					
Irrigation canals					
Irrigation sprinklers/pipes					
Other (specify)					

B. Quick description of the water investment(s)/project(s) that happened and the date

	No. of trips per day	Total time spent on water collection per day in minutes	Quantity of water collected per trip (in litres)	Total amount of water collected per day	How do you use the water collected from each of the selected sources?	Do you purify the water from these sources? If so, how and how long does it take?

C. Previous water collection situation of the household (BEFORE investments in water)

Question 5: What was the situation in the household regarding water collection during the wet season **before** the current water investments?

Notes to the interviewer: Refer to the table of question 2 to inform the relevant water sources identified. Also include water used for agriculture (crop, livestock).

Wet season					
What type of water sources were you using in the wet season before the present water investment(s)?	**Who used to collect water from each source?**	**How long did it take to collect water from this source?**			
		Distance to water source in km and mode of transport	Travel time to water source in minutes	Travel time from water source in minutes	Waiting time at water source in minutes
Private tap					
Public tap					
Boreholes					
Vendor, tanker truck					
Gravity flow scheme					
Rainwater/roof catchment					
Protected well/ spring					
Unprotected well/spring					
River, stream, lake, pond, dam					
Irrigation canals					
Irrigation sprinklers/pipes					
Other (specify)					

	No. of trips per day	Total time spent on water collection per day in minutes	Quantity of water collected per trip in litres	Total amount of water collected per day	How were you using the water collected from each of the selected sources?	Were you purifying the water from these sources? If so, how and how long did the process take?

Question 6: What was the situation in the household regarding water collection during the dry season **before** the current water Investments?

Notes to the interviewer: Refer to the table of question 2 to inform the relevant water sources identified. Also include water used for agriculture (crop, livestock).

Dry season					
What type of water sources were you using in the dry season before the present water investment(s)?	**Who used to collect water from each source?**	**How long did it take to collect water from this source?**			
		Distance to water source in km and mode of transport	Travel time to water source in minutes	Travel time from water source in minutes	Waiting time at water source in minutes
Private tap					
Public tap					
Boreholes					
Vendor, tanker truck					
Gravity flow scheme					
Rainwater/roof catchment					
Protected well/ spring					
Unprotected well/spring					
River, stream, lake, pond, dam					
Irrigation canals					
Irrigation sprinklers/pipes					
Other (specify)					

			Quantity of water collected per trip in litres	Total amount of water collected per day	How were you using the water collected from each of the selected sources?	Were you purifying the water from these sources? If so, how and how long did the process take?
	No. of trips per day	Total time spent on water collection per day in minutes				

SECTION 3: IMPACT OF WATER INVESTMENTS ON TIME USE

Question 7: Has the investment in the water source(s) reduced the amount of time that household members spend on water collection, including waiting time and purification time? What do household members do with the extra time? Specify how much time has been saved or lost by each member from each of the new or improved sources that they are using (i.e. the four priority sources)

Family member	Total time spent on water collection per day (see section 2)		Calculate time saved/lost	How is the time saved from water collection used?
	Before the investment	After the investment		
Wet season				
Mother	1 2 3 4			
Father	1 2 3 4			
Female youths	1 2 3 4			
Male youths	1 2 3 4			
Female children	1 2 3 4			
Male children	1 2 3 4			
Others (female)				
Others (male)				

Dry season				
Mother	1 2 3 4			
Father	1 2 3 4			
Female youths	1 2 3 4			
Male youths	1 2 3 4			
Female children	1 2 3 4			
Male children	1 2 3 4			
Others (female)				
Others (male)				

Question 8: : Have household members used the time saved from water collection to engage in income-generating activities? This question must be completed by each household member individually in order to capture the various views between sexes and across ages.

YES ☐

NO ☐

If yes, who and what activity are they doing? Please elaborate in the box below.

If not, why? Please elaborate in the box below.

Question 8: *Are there any benefits or disadvantages associated with the water collection process?
Social, cultural, economic, etc.
Do you socialize on the way or do other activities?

Note for the interviewer: Compare the current process to the past process of water collection.
Ask the question to several household members.

Specify household member(s)	Advantages	Disadvantages
Before the water investment(s)		
After the water investment(s)		

SECTION 4: HOUSEHOLD WEALTH

Question 10: What kind of material is the dwelling house made of?

Type of material	Roofing	Main structure	Doors	Windows	Floor
Earth					
Dung					
Wood planks					
Palm/bamboo					
Polished wood					
Vinyl or asphalt					
strips					
Ceramic tiles					
Cement					
Carpet					
Other					

Question 11: What assets does the household possess? (Tick all applicable and indicate the quantity.)

Asset	Quantity	Asset	Quantity
Chopper, machete		Boat/canoe	
Hoe, shovel, spade		Vehicle	
Plough/draught animal		Bicycle	
2/4 wheel tractor		Motorcycle	
Mill		Horse	
Sickle		Camel	
Weaving equipment		Mule/donkey	
Bed(s)		Cows	
Chairs/bench		Pigs	
Cooker		Goats/sheep	
Radio		Jewellery/gold/wristwa	
Television		tches	
Kitchen utensils		Mobile phone(s)	
Table		Other	
Chairs			
Solar panels			

Question 12: What are the sources of income for the adult members in the household? Rank the main sources from 1 (lowest) to 5 (highest).

Specify household member (mother, father, etc.)	Sources of income

This is because water is a survival requirement; households need to dedicate time to securing household needs/activities, which are necessary for survival purposes, including water, food and sleeping. Then only can they be able to dedicate time to other activities that may not be necessary for survival reasons, but which may lead to a better quality of life – i.e. discretionary time. This could be economic activities such as paid work or trade; personal care or even leisure. Individuals who lack or have insufficient discretionary time are said to be "time poor".[1] Rural households – and especially female members – suffer from time poverty owing to laborious activities that they have to engage in every day, including water collection.

1 Today, the definition of poverty has evolved significantly. It is seen as "multidimensional, encompassing both income/consumption and other dimensions relating to human development outcomes, insecurity, vulnerability, powerlessness and exclusion". This has led to the view that there is a need to include a time lens to these dimensions - i.e. "time poverty". See Blackden and Wodon, 2006; Kes and Swaminathan, 2006; Charmes, 2006; Hirway, 2006.

Annex 2
Summary table of results

Country	Peru	India	Bangladesh
Water sources before investment*	*Private taps* *Surface sources* *Public tap* *Unprotected well* *HH rainwater* *hrvt syst* *Irrigation canals, sprinklers*	*Surface sources* *Unprotected spring* *Borehole* *Irrigation canals*	*Small and big ponds* *Canals* *River* *2 DTWs*
Water sources after investment* ***	***Private taps*** *Surface sources* *HH rainwater* *hrvt syst* ***Irrigation canals*** *Irrigation sprinklers*	***Private taps*** *Surface sources* *Irrigation canals* ***Irrigation pipes***	***20 DTWs*** ***Small and big ponds*** *River*
Responsibility for water collection	Women for domestic, men for productive. Exception: single-sex hh where head collects both types of water. Youths collect when they live on their own or in a single-parent hh. No change with invest'nt	Mainly women (50%) and 50% shared among other family members. No change with invest'nt	Women, female youths and female children. No change with invest'nt
Amount of time saved by whom Average time saved per person per day in wet & dry season (to nearest 5 mins.)	21/24 hh Women: 2h20 & 1h Men: 1h30 & 1hr FY: 30min MY: 15min	15/17 hh Women: 1h35 & 2h15 Men: 30min & 40min FY: 50min & 45min MY: 30min & 25min FC: 25min & 45min MC: 25min & 40min	At DTW Women, FY and FC 30min in wet season only *Partial data available for ponds and river suggests time also saved at these sources*
Use of time saved, by whom	Women: farming, livestock Men: farming, livestock, IGA 1 woman & 1 man teach Youths: farming, livestock, IGA, study	Women: NTFP coll, mango coll & processing, rice processing, SHG meetings, farming, wage labour, family, domestic tasks Men: farming, wage labour, petty business, domestic tasks 1MY: vegetable gardening, wage labour 3FY: study, personal care, domestic, relax/leisure	Women: 30% on livestock, farming, backyard gardening, fish drying, net making & repairing; 16% on domestic tasks; 54% on resting, leisure, socializing FY: domestic tasks, net making & repairing, livestock FC: school and study

Yemen	Gambia	Malawi	Uganda
Unprotected well *Vendor/tanker truck* *Surface sources* *Protected well* *Gravity flow scheme* *Borehole*	*Unprotected well* *HH rainwater* *hrvt syst* *Surface sources*	*Unprotected well* *Protected well* *HH rainwater* *hrvt syst* *Surface sources* *Irrigation canals*	*Protected well* *HH rainwater* *hrvt syst* *Unprotected well* *Surface sources*
HH rainwater ***hrvt syst*** *Unprotected well* *Surface sources* *Vendor/tanker truck* *Protected well* *Gravity flow scheme* *Borehole*	***Protected well*** *Unprotected well* *HH rainwater* *hrvt syst* *Surface sources*	***Public tap*** ***Borehole*** ***Rehab'd unprotected and protected well*** *HH rainwater* *hrvt syst* *Surface sources* ***Rehab'd irrigation canals***	***Public tap*** *HH rainwater* *hrvt syst*
Mainly women with support from FY. A few hhs have support from male youths, and female and male children. No change with invest'nt	Women with support from FYs. Slight increase in youths collecting in wet season (assuming from 38% to 48% of responsibility)	Women with main support from FY. Men and male youths collect after invest'nt and decrease in duration of water collection trip. In 2/4 hh with rainwater hrvt syst, all members collect	Women, men, FY, MY and children. (In descending order of responsibility, but with a relatively even distribution.) No change with invest'nt
23/31 hh in wet season 31/31 hh in dry season Women: 1h15 & 2h45 FY: 1h45 & 2h15 MY: 1h30 dry season only FC: 3h & 1h MC: 2h & 1h	5/24 women	4/7 hh in wet season Women: 3h50 & 2h45	12/13 hh 2h & 1h45
Women: livestock, farming, backyard gardening, bee-keeping, life skills & IGAs training, literacy, teaching, handicrafts, domestic tasks, resting, leisure. FY: livestock, handicrafts, training, literacy, school, study, family care, domestic tasks, socializing, resting, leisure	Women: cooking, farming, making soap, backyard gardening. Water used to water food crops (10 to 13 hh), water cash crops (1 to 3 hh) and for domestic livestock- rearing (10 to 14 hh).	Women: backyard gardening, selling goods in market, farming, domestic tasks Men: wage labour, farming FC: study MY&MC: study, farming	Women and men: farming, livestock, backyard gardening, meetings, wage labour, resting Women (only): basket-making, selling goods in market, domestic tasks MY&FY: resting, school, leisure, farming, backyard gardening, livestock, age labour (MY only), domestic tasks

Country	Peru	India	Bangladesh
Reasons given why productive activities are not undertaken	Time spent with families (3 hh) No change to water collection habits, so no time saved (3 hh)	No access to private taps, no change to water collection habits, so no time saved (2 hh) Old age and limited time (2 hh)	Information not available
Impact on health	16/24 hh complain of too much chlorine in water	3/17 hh refer to "more hygienic" situation – could mean better quality and/or more quantity	Less risk of accident. Less mental stress & physical fatigue. Fewer skin complaints and diarrhoeal diseases in children, fewer post-natal infections, and improved reproductive health for women
Effect on water quantity Approx. average volume in litres per person per day	*Data insufficient*	*Data insufficient*	At DTW increase by 4 l/p/d in wet season to av of 8 l/p/d Increase by 10 l/p/d in dry season to av of 13 l/p/d After investment, wet ssn, from DTWs & ponds: 23 l/p/d low- & mid-income hh, 28 l/p/d high-income hh
Issue(s) related to sustainability	Too much chlorine (16 hh) Water more scarce (3 hh) Population grown (3 hh)	*No issues raised*	*No issues raised*
Relationships between household type and water collection habits and times	11/14 hh with private taps and 6/7 hh using irrigation canals before investment are low income. 7/7 hh with rainwater hrvst syst and 3/3 hh using irrigation sprinklers are low income. 3/3 hh that use time saved for family time are low income	4/5 hh with no direct access to the gravity flow water scheme are low income 5/7 hh with access to irrigation infrastructure (pipes and canals) are married man-headed.	The lower the income group, the lower the av. hh size and the higher the percentage of females & children < 5 in hh. The higher the income group, the larger the water volume/p/d from DTWs. *See report for more trends*

Key: * Main water sources listed from most to least used (sources reported by one or two households excluded). Domestic water sources listed before productive water sources.
** Bold text denotes the pertinent water investment(s) made.
Abbreviations: HH/hh – household(s); MY – Male youth; FY – Female youth; MC – Male children; FC – Female children; IGA – Income-generating activity; α – level of significance;
hrvt syst – harvesting system; av – average; l/p/d – litres per person per day; l/hh/d – litres per household per day; NTFP – non-timber forest products; coll – collection

Yemen	Gambia	Malawi	Uganda
7 hh do not save time in wet season: no reasons given; may be because in 6 hh rainwater hrvt syst used in dry season, so still collect from distant sources in wet season; 1 hh chooses to collect more water	More water is collected in most hh for domestic needs, backyard gardening and livestock, so more time spent on water collection; Queues at protected well	(i) No change in water collection patterns; (ii) A longer distance to the new source and the use of two, instead of one, water sources; (iii) Spending more time irrigating crops with the rehab'd irrig. system	No time saved because of increased waiting times at public tap compared with unprotected well, from 2mins to 25mins (av.) and to more trips per day from 2 to 3 in wet season and from 3 to 4 in dry season
Less physical pressure & discomfort. Access to clean water	12/24 hh report safer water available	2/7 hh report safer water and lower incidence of water-related diseases	12/13 hh report safer water available
Slight decrease in av. l/hh/d: 257 to 247 in wet season; 265 to 247 in dry. Large variation in l/hh/d between hhs before & after investments suggests some hhs had/have more potential for productive activities than others	More water available per hh. Change in quantity per person not known. Av. 31 and 38 l/p/d in wet & dry season, respectively. Mainly used for domestic needs, but slightly more hhs also use water for small productive activities	With the rehab'ed irrigation canals, a woman from 1 hh (no longer relying solely on rainfed agriculture) spends 30 mins more each day in the dry season to irrigate crops, resulting in increased production and income.	Small decrease from 16 to 15 l/p/d and from 18 to 16 l/p/d in wet & dry seasons, respectively. Perhaps because hh may now pay for water from public tap and/or water quantity data for rainwater hrvt syst missing from 6 hh
Opportunities to communicate with other women decreased, leading to fewer exchanges of gifts and local produce, to less access to news and events	*No issues raised*	Boreholes are "easily" broken (1 hh)	Public tap misused, or not adequately maintained and cleaned (7 hh)
Analysis not possible	*None observed*	*None observed*	Correlation between number of people collecting water/hh and who heads up hh (α=0.05): Single man-headed hhs have 1 person collecting, while female and married man-headed hhs have 2 or 3 people

Annex 3
Lessons learned, limitations and recommendations for improvement

1. The study was supported and well received by most of the partners within and outside of IFAD (i.e. individuals and institutions working in the field of gender and water, as well as country programme managers, country programme officers, project officials and community members who were interviewed). In general, it was thought that the outcomes would contribute to knowledge in the fields of gender, water, time poverty and drudgery.

2. More than 20 country programme managers were contacted, while only 7 conducted the survey. This can be attributed to a number of reasons: some of the programmes that were identified were not suitable for the study; others were in countries suffering from natural calamities such as floods; some country programme managers and programme officers were otherwise engaged with evaluations that were a greater priority, while others were of the view that it was necessary to first provide training to the enumerators; and lastly, others requested translations, but ran out of time and could not conduct or conclude the survey in time.

3. Data analysis would be quicker and easier if data are inputted into an Excel workbook designed for data entry and subsequent analysis, developed at the same time as the household questionnaires. Using other data entry and statistical applications adds complexity when work is undertaken by more than one person and/or revisited in the future.

4. Although the household questionnaire aimed to find out about the impact of all types of water investments, respondents focused on the type and impact of domestic rather than productive water investments. If used in the future, the questionnaire could be adapted to ensure that the objective of capturing information about all types of water investments is made more explicit.

5. The fact that mainly men completed the household questionnaires even though women, female youths and girls are the main collectors of domestic water may have limited the reliability or completeness of the data given.

6. Understanding the impact of one type of water source or of only IFAD-funded water sources is challenging because the water collection patterns of households in any given community vary considerably. Furthermore, water investments do not generally result in a direct shift from an old source to an improved source. Households may shift completely or they may use both sources for different purposes. This becomes more complex when there are three or four existing and/or improved sources, perhaps funded by different initiatives and when other complementary investments have an impact on water collection patterns.

7. It would have been interesting to analyse the use of the rainwater harvesting systems used in The Gambia, Malawi, Peru, Uganda and Yemen. Yet, for some reason, very limited data were given on distances, times, quantities, uses and treatment, which therefore prevented analysis.

8. Data on the volume of water drawn daily from different water sources were more often than not incomplete or extremely variable and offered without explanation, preventing more systematic analysis. In theory, it would be useful to ask roughly how much water is used for the different types of water uses (e.g. drinking, other domestic purposes, livestock, watering crops); however, in practice, this would add to the questionnaire's complexity, and it is more important to focus on getting basic data on water volumes.

9. The relatively small sample sizes, coupled with often incomplete data, prevented finding statistically significant relationships between household type and water collection habits and times. Nevertheless, useful observations could be made in a few samples.

10. Comprehension of sample data and the appropriateness of data analysis and interpretation would be improved by reviewing the completed questionnaires when they are delivered and immediately asking any questions to project staff and the interviewers.

11. The household questionnaire could be improved by:
    - including a question on household size. The way Question 1 is currently structured does not ensure that respondents specify the number of household members;
    - including a question on how often each person collects water (e.g. every day, alternate days);
    - including a question on whether and how much respondents pay for water from water sources;
    - removing Section 4 (i.e. Questions 10 to 12) on household wealth, unless such detailed data on household wealth are going to be used in the analysis.

12. The community questionnaires were relatively incomplete with a minimum of data and general information provided. In the future, it would also be valuable to include:
    - confirmation of what water sources were available *before* the water investment(s);
    - the primary objectives of the water investment(s) (in order of priority);
    - the software element of the water investments(s) (e.g. who is in the water management committee and how it works, information on water tariff amounts and collection, any training in management, finance, operation or maintenance). This is necessary because the quality, quantity, accessibility, reliability and sustainability of water services are determined by software as well as hardware (i.e. infrastructure/technology); and
    - complementary investments to the water investment(s), such as other labour-saving technologies or training; for instance, on income-generating activities, backyard gardening or improved animal husbandry.

13. In the future, it would be useful to train/remind enumerators to:
    - encourage replies that go beyond covering domestic water use to include productive water use;
    - confirm with respondents what is understood by *"before"* and *"after"* investment(s). If respondents disagree with this, the interviewer can document why this is so;
    - ensure that all data are gender disaggregated. In a few countries, it was not always specified whether "youths" were male or female, which limited analysis; and
    - look for any conflicting responses within a questionnaire, and clarify with the respondent what is correct.

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