



The average daily demand to assume for your community will vary depending on the type of access (community or household) and the intended use of the water (consumption only or for all uses including bathing, laundry, flush toilets, etc.). In general, the range should be somewhere from 20 to 100+liters per person per day (lppd). Here recommendations on how to narrow in on a specific value in this range:

- The minimum daily demand per person may be based on country-specific regulations or guidelines, which are oftentimes set by national water authorities. For example, the Honduran Water Authority (SANAA) has established a guideline of 25 gallons per person per day for small rural communities (as documented in the “Honduras: Rules of Design for Rural Aqueducts” available on the EWB-USA website –<http://my.ewb-usa.org/project-resources/technical-resources>). Such standards are not uncommon in many of the countries where we work. If a country has no guidelines or regulations use the latest minimum standards set by the WHO, “Domestic Water Quantity, Service and Health, 2003,” which is 50 lppd to provide for an assured amount for consumption, and for basic personal and food hygiene, laundry and bathing. A lower value for demand may be used if it is demonstrated that bathing and laundry can be done year-round at a convenient safe source.
- For household domestic use, spend time on the assessment trip observing water use practices in the home. Ask community members (especially women) where they get their water and how much they use for the various uses (drinking, cooking, bathing, laundry, cleaning, watering household plants and animals, etc.). In addition to asking these questions, it is important to spend time with women as they are collecting and using water to gain a better understanding of the quantities and the methods that they follow. The attached questionnaire is one method for determining existing usage and to help gather data for design of an improved system.
- For other uses of water, it is best to consult with the users of that water. For example, in a school setting, talk to the headmaster, some students, and some teachers, in what they would like to use the water for and how much and at what rate. To irrigate crops, talk to the farmers if available to see what their wants and needs are. In all of these, ask what their plans for expansion may be, and in what timeline. Keep in mind that these may be over-optimistic but should still have some small weight in the design process. Also remember potential improvements to efficiency by changing water use habits and technology. These may be beneficial, but it may take time to adopt these, if at all, especially if these may not be the designer’s choice.

It is also helpful to compare your community-specific analysis with standards that can be found in various references. The following is a list of common reference materials that chapter may find to be helpful. This is not meant to be an exhaustive list.

- World Health Organization. Domestic Water Quantity Service Level and Health - [http://www.who.int/water\\_sanitation\\_health/diseases/WSH03.02.pdf](http://www.who.int/water_sanitation_health/diseases/WSH03.02.pdf).



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- Mihelcic, J.R., Fry, L.M., Myre, E.A., Phillips, L.D, Barkdoll, B.D., Field Guide to Environmental Engineering for Development Workers – Water, Sanitation, and Air, ASCE Press, 2009.
- Santiago Arnalich Castañeda. Gravity Flow Water Supply" and "How to Design a Gravity Flow Water System with Worked Through" See <http://www.arnalich.com/en/books.html> or also Google Books for an on line version. The author also has a couple of books on EPAnet and one on boreholes.
- Sandford, P, Gorter, AC, Orozco, J.G. and Pauw, J.P , “Determinants of Domestic Water Use in Rural Nicaragua”, Journal of Tropical Medicine, 1990: 93:383-389
- Rural water demand: The Case of Eastern Africa – Lessons from the Drawers of Water II Study  
[http://webworld.unesco.org/water/wwap/pccp/cd/pdf/educational\\_tools/course\\_modules/reference\\_documents/water/ruralwaterdemand.pdf](http://webworld.unesco.org/water/wwap/pccp/cd/pdf/educational_tools/course_modules/reference_documents/water/ruralwaterdemand.pdf)
- Peter H. Gleick, Pacific Institute for Studies in Development, Environment, and Security. Basic Water Requirements for Human Activities: Meeting Basic Needs. 1996.
- Water for the World, Designing Community Distribution Systems, Technical Note No. RWS. 4.D.R4, USAID. <http://www.lifewater.org/technical-library>. *(Note: This document not only provides methods of estimating demands but also provides guidance for reduction in unit demands with increasing community populations.)*

Your team will have to use your best judgment to come up with a reasonably conservative estimate based on your research. Keep in mind that the main purpose of estimating the average daily demand at the initial assessment phase is to start the process of identifying potential source options. After a source has been identified and your team is further into the design process, it will be important to re-visit the appropriateness of your originally assumed value and then make a decision on how it will be used in your design. Also keep in mind that the average daily demand should consider potential allowances for unforeseen losses due to design miscalculations, poor construction practices, operation and maintenance lapses and leakage in the system. Your system storage volume and conveyance properties should also reflect level of service, daily demand cycles (temporal demand distribution), and spatial demand distribution.



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## Questionnaire for people at water board to determine service area, number and location of people

Take scaled aerial photos with grid ticks for answering where questions.

**Introduce ourselves, advise the interviewee of the purpose and confidentiality of our interviews.**

**Ask permission to conduct the interview and if interviewee is over 18 years of age**

0	Informed consent granted and over 18. Yes (1); Not over 18 (2); No consent (3)									
00	Audio recording consent granted: Yes (1); No (2); Not requested (3)									
000	Personal photograph consent granted: Yes (1); No (2); Not requested (3)									
Question No.	Interview Number (1)	Date (2)	Time (3)	Location (4)	Name of interviewer (5)					
1 to 5										
6	What is your name?									
7,8	Where does your family live most of the time?			Northing (7)	Easting (8)					
9,10	Where do family members live other times?									
11	How many people are there in your family?									
12	How many children under the age of five?									
13	How many children between five and fifteen?									
14	How many people in family over fifteen?									
15, 16	Where (location on the map) does your family get water for drinking, and cooking?			Northing (15)	Easting (16)					
17	Describe the source:									
	pila or Faucet (1)	Open tank (2)	Well (3) Spring (4)	Pond (5) Creek or river (6)	Other (7)					
18	How many days last month did the source have insufficient water?									
	days:	1	2	3	4	5	6	7	>7	
19	How clean is the water?									
	Always clear (1)	Sometimes cloudy (2)	Often cloudy (3)	Sometimes muddy (4)	Often dirty (5)					
20,21	Where does your family use water for washing clothes?			Northing (20)	Easting (21)					
22	How many hours does it take to go to the water source and return to your home?									
23,24	Who in the family brings water to where you live <b>most of the time</b> ? Describe age category and gender for these persons?			<5 (1)	5 to 15 (2)	>15 (3)	M (4)	F (5)		
24,25	Who else in the family brings water to where you live <b>most of the time</b> ?									
26	Do you have a family vegetable garden? Yes (1) No (2)									
26,28	Where does your family get water for animals			Northing (27)	Easting (28)					
	How many family animals need water?									
29-38	Dogs (29)	Chickens (30)	Qui (31)	Sheep (32)	Goats (33)	Llamas (34)	Alpaca (35)	Cows (36)	Horses (37)	Other (38)
39	Do you want improvements to the water system? Yes (1), Depends (2) No (3):									
40	What improvements would you like to have for the water system?									