WATER COLLECTION IN RURAL AREAS OF INDONESIA

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ABSTRAK

Pada tahun 1982, Badan Penelitian dan Pengembangan Kesehatan mengadakan suatu sampel survai guna memperoleh data mengenai pola penggunaan sarana air minum dan jamban di daerah pedesaan Indonesia. Survai ini selain mempelajari pola penggunaan sarana, mempelajari pula beberapa aspek dari pengadaan air minum di daerah pedesaan. Pengumpulan data dilakukan dengan menggunakan kuesioner dan observasi, dan sebagai responden ditentukan kepala rumah tangga.

Dari 5465 rumah tangga, ternyata 76,1% harus menempuh 0-249 meter untuk mencapai sumber air minumnya. Sedangkan 10,9% harus menempuh 250-499 meter dan 6,3% harus menempuh 500-999 meter, serta sisanya (6,7%) harus menempuh > 1000 meter.

Waktu yang diperlukan untuk mencapai sumber air tersebut adalah masing-masing 0-14 menit bagi 70,5% rumah tangga dan 15-29 menit bagi 16,8% rumah tangga. Sedangkan 8,8% rumah tangga harus menempuh perjalanan selama 30-59 menit dan 3,9% harus menempuh > 60 menit.

Jenis kelamin pengangkut air kebanyakan perempuan. Hal ini berlaku pada 73,4% rumah tangga.

Sejumlah 70,7% rumah tangga mengangkut 0-49 liter air, 22,2/ rumah tangga mengangkut 50-99 liter air, 4,0% rumah tangga mengangkut 100-149 liter air dan sisanya (3,1%) mengangkut > 150 liter air setiap harinya. Menurut data yang ada, penggunaan air yang diangkut hanyalah untuk minum dan masak, sedangkan untuk keperluan lainnya tidak tercakup dalam survai ini.

Dari hasil survai dapat disimpulkan bahwa sebagian penduduk desa di Indonesia masih memerlukan waktu dan tenaga yang cukup banyak untuk memenuhi kebutuhan air sehari-harinya.

Introduction

The purpose of rural water supply and sanitation program in Indonesia is to provide safe water supply and adequate sanitation facilities for the rural population. The main objective of this program, however, is to reduce the incidence of cholera, dysentry, typhoid, diarrheal diseases, and other water-borne diseases. (Dep. Kes., 1975).

Reduction in water-borne diseases due to safe water supply is considered as a primary benefit. Nevertheless, economic and social benefits that may infouence health should also be taken into account. These include reduced walking distance to the water source that saves time and energy, and gives the rural people more time for productive activities. Moreover, they will have more time to spend with their children and families. These benefits,

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as a result of water supply provision, may also improve health indirectly.

This paper discusses the situation of water supply with respect to water collection aspects in rural areas of Indonesia, such as water source distance, journey time, and collected water quantity.

Materials and Methods

Data from the national sample survey carried out by the National Institute of Health Research and Development were re-evaluated and analyzed. Nine provinces were included in the survey i.e. West, Central, and East Java, Bali, North and West Sumatra, Lampung, West Kalimantan, and South Sulawesi.

A total of 5465 households were identified for water collection activites. These including sex of water collectors, distance of water source, journey time to the water source and quantity of collected water.

The distance was classified into 5 categories using an interval of 250 meters, and the travel time was classified into 4 categories using 15 minutes and 30 minutes interval. Furthermore, the quantity of collected water was classified into 4 categories using an interval of 50 liters.

Frequency distribution and arithmatic mean were presented to describe the situation of water collection activities in rural areas of Indonesia.

Results

Of the 5465 households, 76.1% got their drinking water from sources ranged from 0 to 249 meters distance from their houses. The arithmatic mean of the distance was 254 meters, however, 365 households should walk more than 1000 meters to reach the water sources *(table 1)*. Some surveyors also reported that people in certain areas should climb a hill or ride a horse to get the water.

Most of the respondents stated that journey time to the water source was less than 15 minutes (70.5%). However, 3.9% of them spent more than 60 minutes to reach the water sources *(table 2)*. The average journey time was 15.4 minutes.

The number of women who carried home the water from the sources were 3963 (73.4%). Meanwhile, the number of men who did the same activities were only 1433 or 26.6% *(table 3)*. Most of these activities were done by family members such as wife, husband, son and daughter, and only a few were done by hired labour.

The quantity of water collected by the households ranged from 0 to 49 litres (70.7%), from 50 to 99 litres (22.2%), and from 100 to 149 litres (4%). The remainder (3.1%) collected more than 150 litres of water per day *(table 4)*. The mean of the collected water quantity was 44.25 litres.

They were using the collected water especially for drinking and cooking, eventhough some of them were using it for bathing and washing. It was regretted that the survey did not obtain data on the quantity of collected water which was used for other domestic purposes. Besides, there were no data on how many times a day the rural people collected water.

The quality of water represented a physical characteristics that were colour, taste, smell and cleanliness. The result showed that 34.8% of the households

Table 1: Distance of the water sources

Distance (m)	Households	%
0 – 249	4160	76.1
250 – 499	597	10.9
500 – 749	266	4.9
750 – 999	77	1.4
>1000	365	6.7
Total	5465	100.0

had access to clean water sources, and 54.4% of them had access to fairly clean water sources. The rest (10.8%) took water from dirty water sources. (Sutomo, S., 1986)

Discussion

The result of the survey indicated that most of the rural people spent up to 30 minutes per day collecting water, even in some communities the time was up to 120 minutes or more per day.

From an economic view point, a water collection journey can be expressed in monetary value. Feachem, an investigator on rural water supply, has placed the value on water collection by costing the amount of staple food required to produce the number of calories which are needed to collect water. Another approach expressing the time and energy spent in water collection as a percentage of total available daytime time and energy.

In relation to the number of calories needed, Cairncross reported that collecting water can use up over 30% of a woman's daily calorie intake. It was regretted that data on the daily calorie intake of rural Indonesian people could not be found.

Rural Indonesian women have major role in collecting water, since 73.4% of these activities were done by women. Frequently, they spent more than an hour per day collecting water. The woman's role was suited to those described by other investigators. Sajogyo, who studied rural woman in West Java, indicated that woman in the study area spent more time for household chores than the man did. These including collecting water, washing clothes, preparing food, caring children, and cleaning the house. However, upper class woman could pay other person for these task . In addition, Sajogyo reported that most of the rural woman should also work as a labourer in

Table 2: Journey time to the water sources

Time (minutes)	Households	%
0 – 14	3801	70.5
15 – 29	903	16.8
30 – 59	474	8.8
> 60	210	3.9
Total	5388	100.0

Note: To collect water, the time was doubled (no queue).

Table 3: Water collectors by sex

Sex	Households	%
Male	1433	26.6
Female	3963	73.4
Total	5396	100.0

Table 4: Quantity of collected water for drinking & cooking (litres/day/household)

Litres	Households	%
0 – 49	3821	70.7
50 – 99	1199	22.2
100 – 149	214	4.0
> 150	169	3.1
Total	5403	100.0

Note: The average number of household members was 5.

order to increase their family income. Meanwhile, Cairncross stated that in most poor communities water collection is a woman's chore, which perhaps explain why male planners often forget the benefit of shorter distance to the water source. She also indicated that if the water source is less than an hour away, most of those women will make several journeys each day.

Some investigators indicated that saving time and energy, and even saving money for the water carrier, if any, are some benefits of the water source distance reduction. Besides, the woman would have more time to spend with her family and for her leisure (Cairncross, 1987; Carruthers, 1978; Feachem, 1978).

In addition, rural Indonesian woman would also have more time to raise their skill and education by attending a non-formal education class such as PKK (pembinaan kesejahteraan keluarga = family welfare program). Meanwhile, they would be able to spend the time in productive activities to increase earnings and economic output. It is clear, therefore, that reducing distance to the water source would help the rural woman in Indonesia.

This survey measured the quantity of collected water for drinking and cooking purposes only. In reality, some of those rural people used it not only for drinking and cooking, but also for bathing and washing. Data on the total quantity of collected water -if there were several journey to collect water– as well as data on the use of the water would be more useful.

The WHO indicated that the minimum quantity of water necessary to sustain life is 5 litres/capita/day, and the average daily consumption for rural areas of developing countries in Southeast Asia was 30 - 70 litres/capita/day (Saunders and Warford, 1976). A study in Klaten regency, Central of Java, showed that water consumption for drinking and cooking –including washing dishes ranged from 44 to 61 litres/household/day. The average number of household members in this area was 5.2 (Universitas Satya Wacana, 1980).

The NIHRD established a range from 30 to 60 l/c/d as a standard design for rural water supply in Indonesia (Sri Soewasti, 1973). Therefore, as shown in table 4, it seemed that in some cases the quantity of water for drinking and cooking was quite high. On the contrary, households which collected water more than 100 l/day would have more water to maintain their personal hygiene. If people have very little water, Bradley concluded (1978), then it may be impossible to maintain reasonable personal hygiene. There may be too little water for washing oneself, and kitchen utensils. It allows skin infections to develop unchecked, and makes intestinal infections to spread from one person to another on dirty fingers. These groups of diseases, called water-washed infections, can be prevented by availability, acces to, and adequate quantity of domestic water rather than its quality. In the national sample survey, Sutomo (1986) indicated that the quantity of water did not influence the occurence of diarrheal diseases, but the quality did influence the occurence of the diseases.

Type of the diarheal diseases, however, was not specified. Moreover, this study did not measure the bacteriological quality of the water.

From this short illustration, it does become evident that rural Indonesian women play an important role in collecting water. Even if their "economic value as labour" is considered low if not zero, the women may get "some benefits" from closer water source.

It can be expected that the closer the water source is, the higher the quantity of water consumption. "In general", Cairncross reported, "as the water source becomes closer and journey time decreases, water consumption tends to increase; but a plateau is reached when the return journey takes less than half an hour".

In relation to "health benefits" of water supply program, Carruthers stated that reducing water-borne diseases will be realized if people consume an improved quality water throughout the year. The allevation of water-washed diseases, however, will be realized by increasing the quantity of water use.

More evaluation studies on rural water supply program were still required, especially on its economic and social aspects. To achieve potential health benefits, the program should consider the quality of water as well as the distance of the water source. Finally, health education would likely very useful as a complement of water supply program.

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