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IMPLICATION OF INFRASTRUCTURE DEVELOPMENT ON RURAL WOMEN'S WELFARE: CASE OF UZBEKISTAN

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Abstract:

Background. Lack of water supply and sanitation infrastructure in rural areas affects people's health, welfare and living conditions, negatively impacts the rural environment, and can stall rural development and prosperity. Improving equitable and sustainable access to safe and improved water supply and sanitation in rural areas is therefore an important national development objective. This article presents to what extent the welfare level of the rural women in Uzbekistan correlates with socio-economic factors such as access to water supply and sanitation services in Uzbekistan.

Methods. This article is based on comparative analysis of the gender aspects of welfare of rural women in Bukhara region. The gender aspects assessment of the water supply and sanitation sector identifies that rural women experience the unequal access to infrastructure in comparison with urban population and urban women. The utilizing of the concept of analysis based on identification of inequalities by going "beyond income, beyond averages and beyond today" demonstrates that there is no direct impact of the socio-economic factors on poverty rate of the family [1;6].

Results. The survey revealed that the poor access to affordable and reliable potable water and sanitation services negatively impact on household budget of their families and sustainable development of communities. The significant expenditures for water supply services are revealing unequal opportunities of the rural women to healthcare, education and business development. However, the results of the surveys conducted in the frame of the international projects in the rural areas of Bukhara region of Uzbekistan identified strong interconnections of the rural women's welfare at the micro level with their access to water supply and sanitation services. The research conducted in 2019 in the Bukhara region presents what is going "beyond incomes, beyond averages and beyond today" [2;5].

Conclusion. The improvement of the water and sewerage systems in Bukhara region will positively impact on gender issues of rural women by reducing their time for housing services and taking care for family members infected by water born diseases.

Keywords: rural women, welfare, infrastructure, socio-economic factors, gender, water supply and sanitation, Uzbekistan.

Introduction. Nowadays government of Uzbekistan has been focused on development and implementation of the infrastructure investments programs in the fields of water supply and sanitation services specifically in remote areas. This policy is going in compliance with realization the Sustainable Development Goals (SDGs) which enshrined the principles of gender equality and inclusion as essential for long-term and people-centered development. Many of the SDGs address the situation of rural women, particularly the goals relevant to ending poverty (Goal 1), achieving food security, improving nutrition and promoting sustainable agriculture (Goal 2) and achieving gender equality and empowering women (Goal 5). Thus, The Government of Uzbekistan (GoU) integrates and mainstreams “a gender perspective in all agricultural and rural development policies, strategies identified in the National Action Plan. The objective of such gender mainstreaming is to enable rural women “to act and be visible as stakeholders, decision-makers, and beneficiaries” [3;13].

The Government of Uzbekistan (GoU) has a long-term program to increase the provision of high-quality water supply sanitation services, and transport in Bukhara strengthen the institutional base and physical infrastructure of operating organizations, improve the sanitary and environmental situation in the regions of the Republic. The existing water supply and sewage systems in Uzbekistan requires extensive reconstruction since it suffers from a worn-out infrastructure, unstable financial condition and weak institutional capacity. The coverage of water supply services to the population of Uzbekistan is about 68 % and of Bukhara region is about 52 % [4;59]. The pipes in the distribution system have been damaged by corrosion because of being used over a long period of time. The outdated equipment is sometimes filled with water, a situation that again leads to corrosion of the pipes and valves and their rapid collapse. Water is supplied to the network 3-4 times a week for several hours per day. As a result, the population experiences difficulties with the access to water, especially in the summer. Lack of funds, high cost of electricity and high costs of repair, maintenance and materials are among the typical problems for Bukhara region water supply organizations.

Wastewater treatment plants in the region were built mainly in 1970-1980 and are currently worn out and mostly do not work. The existing equipment is outdated and operates with low efficiency if at all. Because of lack of financial resources, adequate and timely reconstruction of the water supply and sewerage systems has not been carried out. Only about 57 % of the Bukhara city population and about 9 % of the Bukhara region are provided with the water and sewerage services. Wastewater treatment plants in the region were built mainly in 1970-1980 and are currently worn out and mostly do not work. The existing equipment is outdated and operates with low efficiency if at all. To address these issues, the water supply and sewage systems in Bukhara region require extensive reconstruction, modern and efficient equipment, stable financial condition and strong institutional capacity. The Government of Uzbekistan (GoU) through the Ministry of Housing and Communal Services (MHCS) plans to initiate the Bukhara Region Water Supply and Sewerage Project (BRWSSP) and seeks financial assistance from the Asian Infrastructure Investment Bank (AIIB) for this purpose. In line with the GoU regulatory and AIIB policy requirements, MHCS has commissioned a study to address the environmental and social impacts of this project. The proposed project has been conceived to address the above-mentioned problems and aims to modernize water supply and sewerage systems for improving living standards and wellbeing of the population of Bukhara region. The water supply sub-projects include mainly construction and rehabilitation of well fields and intakes, main water lines, distribution networks, power transmission lines and pumping stations.

Methods of the survey. Both quantitative and qualitative methods of data collection were used for the socio-economic survey. This included a review and analysis of available information about the sub-project area (using official statistics in the first instance), findings from the extensive household survey, in-depth interviews with key informants and focus group discussions. It was planned to conduct 12 FGDs in the nine districts of the Bukhara region of the Project’s first priority phase. Two out of the 12 FGDs were conducted in the Bukhara and Kagan cities which are covered with centralized water supply systems. Six female and four mixed FGDs were organized for

population in rural districts of the Bukhara region. In average 12 women (two elderly, four middle aged, four young mothers, two adolescents) participated in the each female FGD. The representatives of the healthcare, education, small business and local authorities participated in the mixed FGDs as well. In addition, face-to-face interviews have been taken from the officials of project stakeholders and Bukhara region Suvoqava department.

In compliance with the goals and objectives of the socio-economic survey, in December 2019, 300 households were interviewed within nine districts of the Bukhara region, including Bukhara, Kagan, Peshku, Rometan, Qorovulbozor, Jondor, Karakul, Olot, Gijduvon and also Bukhara and Kagan cities. Selection of makhallas for social assessment was conducted based on the problems associated with water supply and sewerage systems and their location. Local makhallas located in the central parts of the Karakul, Olot, and Gijduvon districts were chosen for the identification their challenges with water supply and sewerage systems. In the rest of the districts makhallas located in the central and remote areas were chosen. Because Bukhara and Kagan cities are covered by water supply for almost 100%, 15 respondents in each city were selected for the interviews (**Table 1**).

Table 1

The number of respondents by districts

| | District/City | Population | Number of Respondents |
|-----|---------------|------------------|-----------------------|
| 1. | Bukhara | 163,000 | 40 |
| 2. | Jondor | 170,158 | 42 |
| 3. | Rometan | 138637 | 34 |
| 4. | Qorovulbozor | 18000 | 24 |
| 5. | Peshku | 120190 | 30 |
| 6. | Kagan | 81472 | 20 |
| 7. | Karakul | 25,830 | 30 |
| 8. | Olot | 13,790 | 30 |
| 9. | Gijduvon | 45,490 | 30 |
| 10. | Bukhara city | 278500 | 15 |
| 11. | Kagan city | 60700 | 15 |
| | Total | 1,389,374 | 300 |

Source: Feasibility Study of the Design Institute, 2019.

Findings of the survey. The population of the region was about 1.9 million residents by October 1, 2018. Representatives of more than 100 ethnic groups live in the region. The majority of the population is Uzbek, with a large group of ethnic Russians and Kyrgyzs. The average population density is 47,1 people per km². According to preliminary data, as of January 1, 2019, the number of permanent populations of Bukhara region was 1899,5 thousand people (5.7 % of the Republic's total population). Thus, the number of urban population was 706,1 thousand people (37.1 % of the total population), rural population (as of January 1, 2019). The priority sectors of the economy in the region are agriculture and sectors such as oil production and refining, as well as textile and clothing production. The share of small business in the Bukhara region was about 41 % (of the total industrial volume). About 2,600 registered and 545 newly established enterprises exist in the region. Bukhara region occupies the 4th position in the Republic by the volume of investments in fixed resources per person for January-December 2018 - 4162,9 thousand sums (or 49,7 % of the corresponding period of the previous year).

The Table 2 presents the share of population covered by the centralized water supply by districts. The majority of the population is connected to the inter-regional Damkhoja and Bukhara Kuyumozar systems, while another part of the population uses alternative sources of water supply, mainly wells, where water does not always meet the requirements of the State Standard for drinking water (FS 2019).

Table 2

Population covered by water supply

| District/City | Population size | Number of local makhallas | Population with water supply, persons | The share of population, % |
|---------------|-----------------|---------------------------|---------------------------------------|----------------------------|
| Bukhara | 163000 | 15 | 101875 | 62.5 |
| Jondor | 170158 | 51 | 11328 | 6.6 |
| Kagan | 76079 | 24 | 34768 | 45.7 |
| Qorovulbozor | 18596 | 5 | 14738 | 79.3 |
| Peshku | 120190 | 10 | 54362 | 45.2 |
| Rometan | 138637 | 7 | 47063 | 33.9 |
| Bukhara city | 278500 | 65 | 277580 | 99.6 |
| Kagan city | 60700 | 20 | 60700 | 100 |

Source: Book1.1 Technical feasibility study by PIU «O'zbekkommunalloyihaqurilish», 2019

Although number of people in rural areas is more than in urban areas, they have less access to potable water and their water consumption is much less in comparison with urban residents. This factor negatively impacts on incomes prevalence of water borne diseases among remote population. The FS presents that the highest rate of the per person water consumption observed in Bukhara city (117.7 liters/day/person) and Kagan city (114.7 liters /day/person), and the lowest consumption in Jondor (18.2 liters /day/person) and Peshku (18.9 liters /day/person) (Table 3).

Table 3

Water consumption per person by districts (2018)

| | Description | Water consumption (liters/day/person) |
|---|-----------------------|---------------------------------------|
| 1 | Bukhara Region | 62,7 |
| 2 | Bukhara city | 117,7 |
| 3 | Kagan city | 114,7 |
| 4 | Bukhara district | 45,4 |
| 5 | Jondor district | 18,2 |
| 6 | Kagan district | 101,4 |
| 7 | Qorovulbozor district | 99,5 |
| 8 | Peshku district | 18,9 |
| 9 | Rometan district | 20,2 |

Source: Book1.1 Technical feasibility study by PIU O'zbekkommunalloyihaqurilish, 2019.

The survey revealed that in 2019, there was a significant increase in acute intestinal diseases and Hepatitis A in the Jondor and Olot regions, where people have more challenges regarding access to centralized water supply and sanitation services. In 2019, the incidence of acute intestinal diseases in the Jondor region increased by 20 % and 30 % for Hepatitis A in the Olot district, compared to 2018 (Table 4). According to the number of treated patients with infectious diseases Bukhara region is on the 4th place out of the 13 regions in the Republic.

Table 4

Water Borne Diseases in Bukhara region (2018 and 2019)

| Description | Intestinal diseases | | Viral hepatitis A | | Dysentery | |
|-----------------------|---------------------|------|-------------------|------|-----------|------|
| | 2018 | 2019 | 2018 | 2019 | 2018 | 2019 |
| Bukhara city | 438 | 398 | 163 | 172 | 0 | 0 |
| Kagan city | 22 | 23 | 9 | 11 | 0 | 1 |
| Olot district | 105 | 110 | 44 | 113 | 0 | 0 |
| Bukhara district | 70 | 56 | 80 | 58 | 0 | 1 |
| Vobkent district | 45 | 29 | 47 | 32 | 4 | 0 |
| Gijduvon district | 211 | 90 | 80 | 58 | 0 | 1 |
| Jondor district | 171 | 214 | 44 | 61 | 0 | 0 |
| Kagan district | 64 | 73 | 20 | 20 | 1 | 2 |
| Qorakoldistrict | 137 | 77 | 47 | 52 | 1 | 0 |
| Qorovulbozor district | 15 | 16 | 36 | 16 | 2 | 1 |
| Peshku district | 86 | 55 | 23 | 23 | 0 | 0 |
| Rometan district | 146 | 135 | 20 | 28 | 4 | 2 |
| Shofirkon district | 97 | 73 | 108 | 59 | 3 | 3 |
| Bukhara region | 1607 | 1349 | 721 | 685 | 15 | 10 |

Source: State Statistics of Bukhara Regional Center of the State Sanitary Epidemiological Center, 2019.

According to the State Statistics Committee of the Republic of Uzbekistan, despite the fact that in 2018, the number of children under 5 first-time infectious and parasitic diseases in the Republic remained the same as in 2017, but the data on the same diseases in Bukhara region increased by 80 % respectively (Table 5).

Table 5

Incidence of infectious and parasitic diseases in children under 5 for the first time in their lives

| Area | Absolute number | | children under 5 (per 1000) | |
|------------------------|-----------------|-------|-----------------------------|------|
| | 2017 | 2018 | 2017 | 2018 |
| Republic of Uzbekistan | 71564 | 71432 | 20,8 | 20,6 |
| Bukhara region | 1440 | 7012 | 7,8 | 37,7 |

Source: State Statistics Committee of the Republic of Uzbekistan, 2019.

Discussion of the survey results. The household survey covered 300 respondents (households) with about 1636 inhabitants living in their households. From the total number of respondents, 65 % were men and 35 % werewomen. Almost 53 % of households have a family size between four and six members, whereas about 3 % are families have 10 or more members. These data coincide with the results of FGD, where the family size in urban areas is smaller than in rural households. It should be noted that out of the total number of the population in households (1636), children under 19 years old make up about 30%, the same general structure of the population in demographic indicators is confirmed by the general republican statistical indicators. According to the survey results, the percentage of women who retired is slightly higher than that of men, which is 41.9 and 58.1 % respectively.

In total, 18 FGD (two FGDs in each district) as well as face-to-face interviews have been undertaken from the officials of project stakeholders and Bukhara region Suvoqava department in the nine districts of the Bukhara region and Bukhara and Kagan cities.

More than 300 participants took active part in the FGDs in December 2019 within nine districts of the Bukhara region, 241 of them were women [5] (Table 6).

Table 6

Number of Focus Group Discussion Participants

| City/districts | Date | Total participants | Women participants |
|--------------------|------------|--------------------|--------------------|
| Peshku | 30.11.2019 | 48 | 36 |
| Jondor | 30.11.2019 | 34 | 24 |
| Qorovulbozor | 31.11.2019 | 24 | 13 |
| Karakul | 31.11.2019 | 31 | 23 |
| Bukhara district | 01.12.2019 | 31 | 27 |
| Bukhara city | 01.12.2019 | 34 | 31 |
| Kagan city | 02.12.2019 | 20 | 18 |
| Kagan district | 03.12.2019 | 22 | 22 |
| Olot | 03.12.2019 | 20 | 16 |
| Rometan | 04.12.2019 | 22 | 12 |
| Gijduvon | 04.12.2019 | 19 | 19 |
| Total participants | | 305 | 241 |

Source: Socio-economic Survey in Bukhara Province, 2019.

Occupational details. According to the survey results, the percentage of women who retired is slightly higher than that of men, which is 58.1 % and 41.9 %, respectively. The survey revealed that majority of female and male respondents are employed in the public sector and constitutes around 48 % and 39 % respectively. The share of men who have their own business/or self - employed (10 % /13 %) is two times more than females (5 %/ 7 %). The number of unemployed women is significantly higher than men and composed 23 % and 6% respectively. This is explained by the reason that women mostly occupy professions of teachers and nurses. Because the number of vacancies in the healthcare and education sector are limited, specifically in rural areas, the number of unemployment among women is significantly higher than men. That is why the share of men (23 %) in transport, construction, communication services is relatively higher than women (10 %). (Table 7).

Table 7

Number of employed women and men

| | Women | | Men | |
|---|-------|------|-------|------|
| | Total | % | Total | % |
| Agriculture | 20 | 5,1 | 31 | 7,8 |
| Non-Agricultural Sector (transport, construction, industry, communications, trade, services, etc.) | 40 | 10,3 | 92 | 23,3 |
| Public Sector (health care, education, management, law enforcement agencies, etc.) | 186 | 47,7 | 153 | 38,7 |
| Have their own business / business / private enterprise | 18 | 4,6 | 39 | 9,9 |
| Self-employed | 29 | 7,4 | 52 | 13,2 |
| Unemployed | 91 | 23,3 | 22 | 5,6 |
| Others | 6 | 1,5 | 6 | |

Source: Socio-economic Survey in Bukhara Province, 2019.

The survey revealed that type of water and sanitation challenges have strong correlation with type of accommodation. According to the survey results, 88 % of respondents live in detached houses and 12 % in the apartments of the multi-story houses. The section on Income and Expenditure should come here; In this section we need to define “Poor” and “vulnerable”. The residents of the detached houses have problems with access to potable water, its saving, high cost of the water delivery services whereas respondents from apartments encounter with 2-4 hours access to the water, have no additional space for its saving, and low water pressure in the tubes. The vast majority of the both group respondents stated that the quality of the water in the entire region is very poor. The survey revealed that, in average, each household used 54 liters/per person/per day including watering gardens and livestock. This figure is lightly lower than official data of Suvokova provided in the FS by Institute in 2019. (Table 8). Participants of the Kagan district FGDs stated that, in average, a family of five people consumes 50-80 liters of water per day. Depending on the area, the cost of daily water consumption varies from 5,000 to 24,000 sums per day. The monthly expenditure on water consumption ranges from 150,000 to 700,000 sums. In the case that household is located far from the Water delivery service unit the cost has been proportionally increased.

Table 8

Average daily water consumption by household (Liters per Day)

| | |
|--|------|
| Drinking, cooking | 6.4 |
| Household needs (cleaning, bathing, washing, washing machines) | 16.7 |
| For flushing | 5.6 |
| Watering the yard/plot | 18.3 |
| For feeding the livestock | 6.9 |
| Total | 54.2 |

Source: Socio-economic Survey in Bukhara Province, 2019.

Challenges of the water supply

The survey examined that respondents have major problems with access to water supply as well as encountered with poor quality of water. For example, from those who have access to the centralized water supply 38% are suffering from frequent water interruptions, 47 % from low water pressure and 21% answered that have no access to water supply for more than a week. The vast majority of respondents (100%) stressed that the water quality is unsatisfactory because of the specific smell (29%), salty taste (29%), external substances (29%) and cloudy tint (29%) of the water. This data correlates with high number of Water Borne Diseases (WBD) in the Bukhara region and particularly in the rural areas. (Table 9).

Table 9

Status of Water Supply Problems

| Description | Total Respondents | % |
|---|-------------------|------|
| There were no problems | 28 | 9,3 |
| Frequent water supply interruptions | 114 | 38 |
| Water supply stopped for more than a week | 62 | 20,7 |
| Low water pressure | 142 | 47,3 |

Source: Socio-economic Survey in Bukhara Province, 2019.

In addition, this survey revealed that centralized water supply system operates mostly 2-4 hours per day. Heads of the local WSS systems shared that cannot provide the 24/7 water supply because of worn out pipes and equipment at the WTP, WWTP, WDU and WIU. Almost 40 % from those who have an access to centralized water shared that water is available for 2-4 hours per day whereas only 26 % (mostly live in Bukhara and Kagan cities) have permanent water supply. (Table 10).

Table 10

Hours of water supply (hours/ per day)

| Hours | Total | % |
|-----------|-------|------|
| 1-2 hours | 15 | 5,0 |
| 2-4 hours | 118 | 39,3 |
| Half day | 20 | 6,7 |
| 24 hours | 77 | 25,7 |
| 0 hours | 70 | 23,3 |

Source: Socio-economic Survey in Bukhara Province, 2019.

Water quality is one of the main concerns of the respondents, participants of the FGDs as well as of staff of regional departments of Suvokova. During FGD in Peshku district residents noted that the district Water Distribution Unit "Sadir" is located in Dehdaroz mahalla, and is the main source of drinking water for district's residents. Due to lack of finance for maintenance, repair and old technical equipment the quality of water is unsatisfactory. There are external algae in the buildings and reservoirs, and chlorination is practically not carried out. This does not meet the sanitary hygiene requirements of the storage facility, therefore, various herbs and weeds appear in the water. The data obtained from the survey correlates with results of the Feasibility Study conducted by the Design Institute in 2019 which stressed the quality of the potable water does not satisfied to the state sanitary norms.

During FGDs, participants expressed different opinions about water quality. For example, in Karakul, Olot, Peshku and Korovulbazar districts , potable water supplied by tank trucks is satisfactory and suitable for drinking, cooking and so on. However, the water quality of tanker trucks in Jondor and Kagan districts is very poor and not suitable for cooking and drinking. For this reason, people buy drinking water in gallons from private providers. However, this water is also characterized as poor quality. Residents of Bukhara, Kagan cities and visited districts emphasized that the centralized water supply system by 80-90 % is provided through iron pipes 30-35 years old which is also one of the reasons of the poor water quality. Because of poor water quality respondents stated that they need provide additional time and resources for cleaning water which negatively impact on economic status of the family. For example, in average 53 % from interviewed stressed that they boiled and 20 % filtered for cooking and drinking water. The same water is using for bath purposes too. As result the households will spend additional amount for the power and gas supply. See Table 11 for details.

Water Treatment

| | Cooking | | Drinking | | Bathing | |
|--------------|---------|------|----------|----|---------|------|
| | Total | % | Total | % | Total | % |
| Chlorination | 0 | 0 | 0 | 0 | 0 | 0 |
| Boiling | 158 | 52,7 | 177 | 59 | 146 | 48,7 |
| Filtering | 60 | 20 | 60 | 20 | 62 | 20,7 |
| No | 82 | 27,3 | 63 | 21 | 92 | 30,7 |

Source: Socio-economic Survey in Bukhara Province, 2019.

The survey explored that the residents of the detached houses have more opportunities for collecting and saving big volume of water. Almost 77 % of respondents who is living in the detached houses answered that they regularly storage the potable water for their household consumption. About 23% of surveyed answered that they have no opportunities for water storage. This data was confirmed by the participants of the FGDs in the rural and urban settlements. Mostly residents from of the apartments and detached houses stated that they have no financial opportunities for construction of the storage water tanks.

Conclusion. The modernization of the water and sewerage systems in Bukhara region has been conceived to address the above-mentioned problems of water supply and sewerage systems with aim of for improving living standards and wellbeing of the population of Bukhara region. In addition, the improvement of the water and sewerage systems in Bukhara region will positively impact on gender issues of rural women by reducing their time for housing services and taking care for family members infected by water born diseases. In overall, the results of the big scoping project in Bukhara region will increase the welfare of the whole population including rural women.

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