



Sustainable Sanitation and Energy for Improved Living Conditions in Rural Areas of Kyrgyzstan



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INTRODUCTION

64 % of the population of the Kyrgyz Republic resides in rural areas. Rural inhabitants face many problems in daily life: lack of safe sanitation, limited access to safe drinking water and low nutritional status. Consequently, villagers are confronted to related health issues: waterborne diarrhoeal diseases are the main drivers of child mortality, causing 35 deaths per 100,000 children under five and placing Kyrgyzstan at the bottom of the ranking with regards to this statistic across the pan-European Region [1]. The project *Home Comfort* has been creating local capacities for improved rural living standards through affordable and sustainable energy and sanitation in Issyk Kul and Naryn oblasts, which belong to the poorest of the country. Introduced technologies included urine diverting dry toilets (UDDT) and solar water heaters (SWH). The technologies were adapted to local conditions and capacity was built for institutions and masters. By means of demonstration centres awareness among the population was raised. The project was supported by the EU and implemented by Women of Europe for Common Future (WECF), Kyrgyz Alliance for Water and Sanitation (KAWS), CAMP Ala-Too (CAMP) and Rural women's association "Alga". The poster investigates the opportunities for upscaling UDDTs and SWHs, especially addressing SDG 5 and 6 [2]. Innovative sustainable technologies using local materials have been introduced in rural Kyrgyzstan during the last 6 years [3].



Figure 1 - UDDT

METHODS

The feasibility study is based on a survey comprising a questionnaire, informal interviews, and reviews of guest books at the demonstration centres. Data for the cost-benefit assessment were gathered from project managers, a couple of villagers and prices in local markets.

Current sanitary situation in the households and its gender aspects

The field survey was conducted among 407 villagers (161 women and 246 men) from 9 villages in Issyk Kul and Naryn oblast at the start of the project. To get a cross-section of the communities, males and females from different social and age groups were surveyed. The questionnaire comprised open and closed-ended questions on

- the current situation in households regarding energy, sanitation and personal hygiene
- the demand and willingness to invest a UDDT and a SWH

Guest books were reviewed at 8 demonstration centres in the project area.

Quantitative and qualitative assessment of costs and benefits of a UDDT and a SWH

A time period of 10 years with an annual discount rate of 10% is used for the cost benefit analysis. Qualitative data on soft indicators in terms of health benefits and improved living conditions brought about by a UDDT and a SWH were gathered by means of the open-ended questions in the questionnaire.

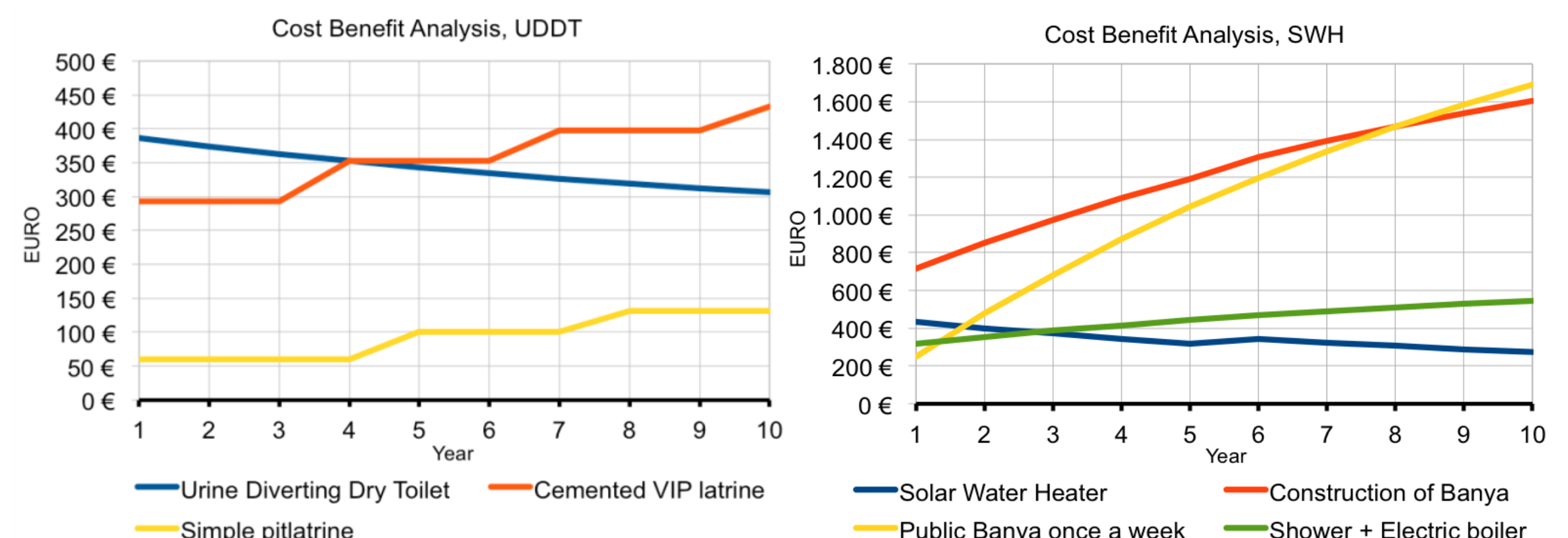


Figure 6 - A UDDT is cheaper than a VIP latrine after 4 years. Since the pit latrine has to be replaced, the cash saved on relocation by using UDDT accumulates over the years, while the fertilizer adds to its financial benefit. Using a shower instead of a banya over a period of 10 years allows households to save up to €1400. A SWH saves €273 over 10 years compared to an electrical boiler, which cuts the costs of personal hygiene by half.

Soft indicators in terms of health benefits and improved living conditions play a crucial role for householders when it comes to deciding whether to invest in a technology or not. In case of the SWH the soft indicators are very evident: All family members benefit from the comfort and time-saving aspects of a SWH for washing up and private hygiene, yet women derive even more benefit from the SWH as they usually run the household. The relevant health benefits of a UDDT are not necessarily self-evident. Due to the improved sanitation conditions, the rate of water borne diseases decreases resulting in better nutrition.

Scaling up opportunities and barriers

Villagers recognised the importance of investments in improved rural living standards through sustainable sanitation, however they reported that they faced the problem of lack of financial resources. Graph 8 presents the willingness of respondents to invest their own money in a UDDT. About 14% respective 31% of the respondents indicated that they would take a low-interest (5%) microcredit for a UDDT respective a SWH.

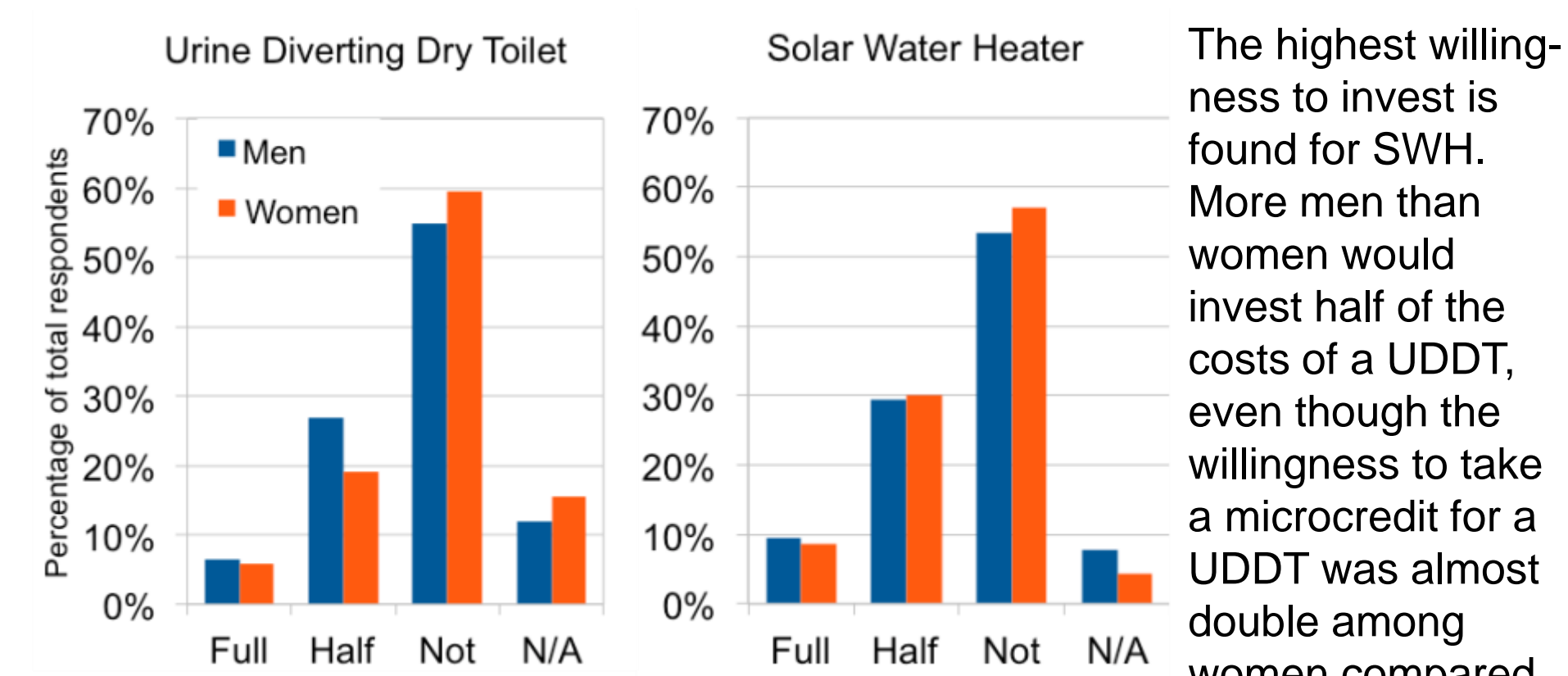


Figure 8 - Willingness to cover the cost of a UDDT and a SWH with own money



Figure 7 - UDDT in Issyk Kul oblast



Figure 9 - Vegetables fertilized with UDDT products

RESULTS AND DISCUSSION

Current sanitary situation in the households and its gender aspects

Rural women are estimated to be two times busier with household-activities than men, hence they suffer more from the lack of adequate infrastructure (running water, sanitation and hygiene). 98% of the respondents have a traditional pit latrine at home and most of the toilets are located far from the house (figure 3). Pit latrines are constructed from poor quality materials, mostly being relocated when they are full. The task of cleaning is usually accomplished by women or girls once a week to once a month depending on the season.



Figure 2 - Pit Latrine

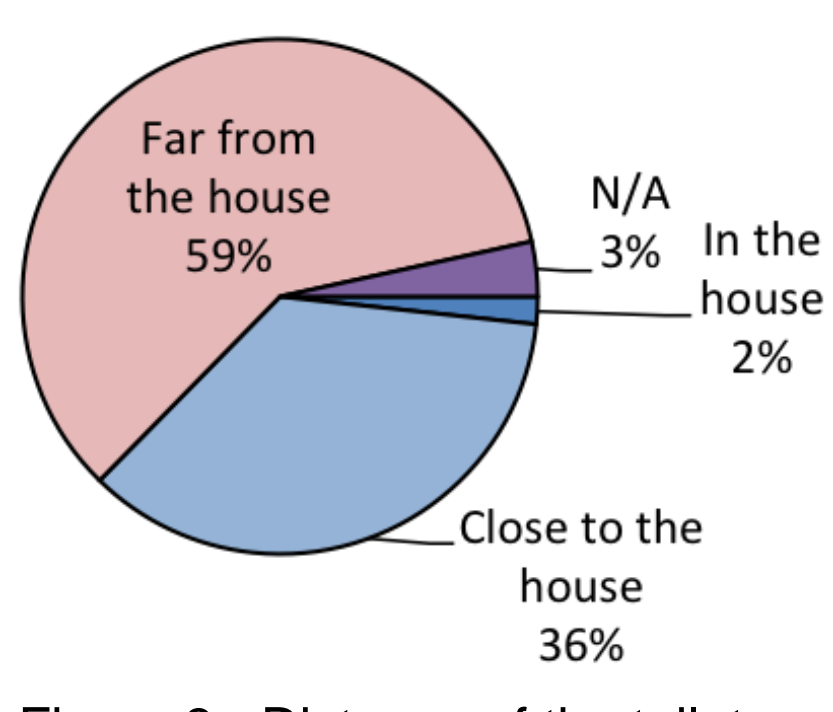


Figure 3 - Distance of the toilet to the house



Figure 4 - SWH with indoor shower

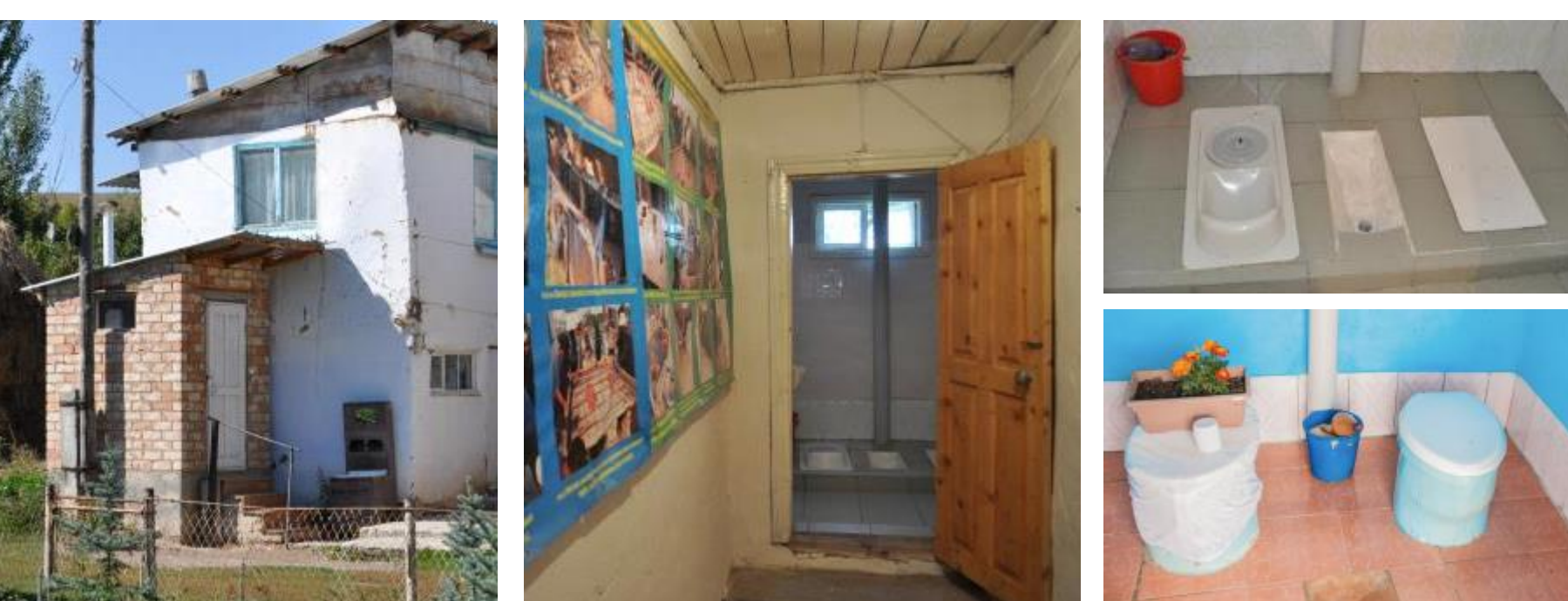


Figure 5 - Attached (A) and indoor UDDT (B), a squatting (C) and a sitting interface (D)

UDDTs can be implemented inside or attached to the house [4]. They do not require water nor do they smell or attract flies. Via separating toilet seats urine and faeces are collected and stored separately. The toilet products, urine and faecal compost, can be used as organic fertilisers (see figure 9) [5].

Cold temperatures and the absence of light exacerbate the use of the toilets, which brings about complications, especially for children and women, who often report to suffer from associated health problems. Most villagers have an aversion to pit latrines, due to their smell and poor hygienic conditions. Sanitary conditions were evaluated by the majority of respondents as poor to moderate. 64% of respondents are not satisfied with their living conditions. Such evaluation closely relates to the limited sanitation and hygienic conditions observed in rural Kyrgyzstan.

Most people take a 'banya' ("bath") 4 - 10 times a month. 30 to 40% of the respondents also take a shower 4 to 10 times a month, especially in summer. A simple shower facilities with water tanks of 10 to 15 l is used. Informal interviews revealed that women make less use of these showers due to warm water limitations and the lack of privacy of garden showers (52%). Heating the water on open fire is usually men's responsibility.

Quantitative and qualitative assessment of costs and benefits of the technologies

The UDDT has an initial investment cost of €427 and an estimated maintenance cost of €26 starting in the second year. It produces fertilizers equivalent to about €40/year. In contrast, a Ventilated Improved Pit latrine (VIP) of the same quality costs €293, yet the VIP needs to be emptied every 3 years for €80. A simple pit latrine costs €60 and needs to be relocated every 3 years. The SWH has an investment cost of €293, plus €177 for the shower. After 5 years, it needs to be maintained for €77. The SWH saves €36 in fuels and electricity costs from water heating. Constructing a new banya costs €565 with maintenance cost of €40 after 5 years. Running the banya costs around €150/year. Some people choose to go to a public banya where they pay approximately €250/year.

CONCLUSIONS

SWHs and UDDTs are suitable technologies to improve the living conditions in the villages in Issyk Kul and Naryn oblasts, as they are much appreciated by the villagers, and more specifically by women, whose empowerment is a crucial component of development. However, the decision to buy an innovative technology for householders is perceived as a risk, as its investment often represents several months of income for the family. Given the economic benefit and improvement of comfort, SWHs have good potential in the rural areas of Kyrgyzstan. However, the model has known some major technical difficulties and people have an awaiting attitude. The economical pay-off of the UDDT compared to a traditional pit latrine is limited, which indicates that people are willing to invest in comfort and hygiene improvement. The UDDT has a barrier concerning the use of urine in agriculture. A significant behavioural change and appropriate operation and maintenance, cleaning and management of toilet products are needed to insure its success. Hence, this technology requires more time to be implemented compared to the SWH. Upscaling the energy and sanitation technologies can play an important role in developing a new perspective with regards to gender roles. UDDTs and SWHs can contribute to improve health, create opportunities to save resource and increase level of income in families. As traditionally women take care of housekeeping, in many cases, women would be responsible for the effective functioning of the facilities. This new role of women can potentially increase their position in families, as they will get opportunities to control resources within the household. Men can benefit from new employment opportunities related to the implementation and construction of the products. In this view, the technologies can improve living conditions, and stimulate local economies in Kyrgyz rural areas. They contribute to the sustainable development goals SDG 5 and 6 and can efficiently reach also the neglected rural population – leaving no-one behind.

[1] WHO 2015 Atlas on Water and Health <http://www.waterandhealth.eu/> (accessed on 20 Dec 2015).

[2] UN 2015 Transforming our world: the 2030 Agenda for Sustainable Development, Resolution adopted by the General Assembly on 25 September 2015, 17th session

[3] Jorritsma, F., Fedtke, G. and Ergünel, A. 2009 Introducing Sustainable Sanitation in Kyrgyzstan Case Study: An analysis of success factors and barriers <http://www.wecf.eu/english/publications/2009/sanitation-kyrgyzstan.php> (accessed on 20 Dec 2015)

[4] WECF 2015 Urine diverting dry toilets – principles, operation and construction. Revised manual http://www.wecf.eu/download/2015/November/Web_2015UDDTManual.pdf (accessed on 20 Dec 2015)

[5] Winblad U & Simpson-Hébert M (editors) 2004 Ecological sanitation – revised and enlarged edition. SEI, Stockholm, Sweden, http://www.ecosanres.org/pdf_files/Ecological_Sanitation_2004.pdf (accessed on 20 Dec 2015)