

## Questions and Answers (3<sup>rd</sup> JWF Webinar)

### **Question No.1**

What are your thoughts on policy differences between Japan and Southeast Asia? I sense that radical legislation changes such as in the 80's in Japan, are not as easily applicable to Thailand for example. Any recommendations to revolutionize sewage management from a policy perspective?

### **Mr. Hashimoto's Answer**

Since the current situations of on-site sanitation in Asian developing countries are similar to the chaotic situation in Japan in the 1960s-1970s, I believe that Japan's experience is applicable to Asian developing countries. I consider the special feature of the On-site System Act (Johkasou Act) promulgated in 1983 was that it made crystal clear who shall do what. This is essential for any legislation in sanitation sector which is often characterized by the existence of multiple stakeholders and the fragmentation of the administrations.

### **Question No.2**

What is the way is effective that ordinary people and politicians mindset to shift the way to your path?

### **Mr. Hashimoto's Answer**

In any country, there exists installation vendors/workers and desludging vendors/workers for on-site systems such as septic tanks and pit latrines. If commercial users are already using an advanced on-site system such as the Johkasou, there must be operators as well. I recommend you to start talking with them. In Japan, the On-site System Act (Johkasou Act) in 1983 was drafted by the parliamentarians based on the discussions with various stakeholders including desludging vendors, since the main job of parliamentarians is to talk to the people.

**Question No.3**

Do you think the willingness of Japan government ignited the great development of wastewater management?

**Mr. Hashimoto's Answer**

I believe that it was ignited by the Japanese nationals' aspiration to improve wastewater management, as indicated by the fact that the On-site System Act (Johkasou Act) was drafted by the parliamentarians who are the representative of the nationals, not by the line ministry, which was unusual in the context of Japan's legislation system.

**Question No.4**

How much net amount home owner need to pay for the installation of a Johkasou system?

**Mr. Hashimoto's Answer**

The CAPEX of a Johkasou system for a household inclusive of the equipment and construction (installation) costs is about US\$ 8,000 in Japan. In developing countries, it will be about US\$ 2,000, since the major portion of the CAPEX is the labor cost for the construction (installation) works which is very expensive in Japan and much cheaper in developing countries.

In Japan, there is a scheme – the Johkasou Installation Promotion Program – in which 40% of the CAPEX of Johkasou for household use is covered by the government while the household covers the remaining 60% (about US\$ 4,800).

**Question No.5**

After installation, does home owner needs to pay maintenance fee? If yes, how much?

**Mr. Hashimoto's Answer**

In Japan, the household is responsible for the maintenance of its Johkasou, including desludging, and is required to pay the electricity

cost to the Power Company, the maintenance fee to the Maintenance Vendor, the desludging fee to the Desludging Vendor and the inspection fee to the Designated Inspection Agency, which amounts US\$ 600 annually (US\$ 50 monthly) in total. It may look expensive. Please be reminded that, the major portion of the maintenance cost, excluding the electricity cost, is the labor cost which is very expensive in Japan. In developing countries where labor cost is much cheaper than in Japan, the maintenance cost would be much cheaper. Assuming that the same level of maintenance service is provided as in Japan and that the labor cost prevailing in developing countries, a very rough calculation indicates that the maintenance cost of a Johkasou for household use may be US\$ 10 per month. It may be expensive for ordinary residential users in developing countries but may be affordable for commercial users.

**Question No.6**

What's the total cost of having a Johkasou at a residential place and what is the maintenance cost involved? Doesn't it become expensive in the long run if the owner is paying professionals to maintain the on-site system?

**Mr. Hashimoto's Answer**

Good maintenance by professionals can prolong the life of on-site systems and can ensure conformance with the environmental standards for a life time. An example is the Johkasou, which was installed to a housing complex built in the 1960s–1970s and is considered to have been operating for more than 40 years, and maintaining good effluent water quality of BOD 20mg/l or less. You can find the story in Page 13 of ADBI Working Paper Series No. 1001 September 2019 'Institutional Mechanisms for Sustainable Sanitation: Lessons from Japan for Other Asian Countries' by Kazushi Hashimoto

<https://www.adb.org/sites/default/files/publication/524116/adbi-wp1001.pdf> .

**Question No.7**

How many years can each on-site system (Johkasou) be used after it is installed?

**Mr. Hashimoto's Answer**

In Japan, legally speaking, the service life of Johkasou is 20-30 years under a good maintenance. But it is proven that Johkasou can be used for more than 30 years if well maintained. An example is the case of a Johkasou which was installed in a housing complex more than 40 years ago and is still performing perfectly well as mentioned above.

**Question No.8**

People in developing countries normally use conventional ways to treat/manage wastewater or black water such as septic tanks, cesspools, pit latrines, whereas the legal system and its enforcement are not stringent. What should be the priority action for local and central governments?

**Mr. Hashimoto's Answer**

I believe, based on Japan's experience of eradicating waterborne diseases by building sludge treatment facilities throughout the country by 1970, before the diffusion of sewerage system nationwide and before the diffusion of the Johkasou system, that on-site systems currently prevailing in developing countries such as septic tanks, cesspools and pit latrines can improve sanitation if the sludge they generate is properly managed. In this context, I welcome the recent focus on Citywide Inclusive Sanitation (CWIS) and Fecal Sludge Management (FSM) put by development partners such as the World Bank, other International Financial Institutions and BMGF. I believe that many elements of Japan's institutional framework for on-site wastewater management system, such as the proper installation, proper desludging and human resource development, would be applicable for septic tanks and other existing on-site systems.

**Question No.9**

Who pay for the CAPEX and OPEX of Johkasou?

**Mr. Hashimoto's Answer**

Except in the case of the Municipal Johkasou Installation Program, in Japan, homeowners or commercial users pay the CAPEX and OPEX.

**Question No.10**

What type of biological process is normally used in the Johkasou system?

What is the effluent standard for BOD and other parameters for the Johkasou system in Japan?

How wastewater is treated in the Johkasou system?

**Mr. Hashimoto's Answer**

Separation-contact aeration process, Anaerobic filter-contact aeration process, etc. For more details, please see P.11 of Night Soil Treatment and Decentralized Wastewater Treatment Systems in Japan (hereinafter referred to as 'NST')

[http://www.env.go.jp/recycle/jokaso/basic/pamph/wastewater\\_treatment\\_systems.html](http://www.env.go.jp/recycle/jokaso/basic/pamph/wastewater_treatment_systems.html)

The standard treatment performance of a Johkasou enables a BOD removal rate of more than 90% and an effluent quality of BOD  $\leq$  20mg/l. For more details, please see P.11 of 'NST' .

**Question No.11**

My suggestion is that in developing countries the cost of installation must be paid by the government. This is because the centralized system is mostly funded by the government, while the operating cost is paid by the home owner through the sewerage services fee.

**Mr. Hashimoto's Answer**

In Japan, there is such a scheme as the Municipal Johkasou Installation Program, in which Johkasou is installed on the homeowner's land and maintained by the municipal government, and 90% of the cost of installation is paid by the government while the homeowner pays the remaining 10%. Under this scheme, the homeowners pay the user charge in the same way as the sewerage system users who pay the sewerage user charge. For more details, please see Page. 14 of 'NST'.

**Question No.12**

How developing countries could manage the resources for maintenance even when Japan was struggling?

**Mr. Hashimoto's Answer**

Japan suffered from the deficient management of on-site systems 40 years ago, but Japan succeeded to improve it after the promulgation of the On-site System Act (Johkasou Act) in 1983. Since then, Japan has no longer been struggling for the maintenance of on-site systems. If what you mean by 'resources' is the high maintenance cost of Johkasou in Japan, please be reminded that, US\$ 600 per household per annum, which is the typical household expenditure for the maintenance of a Johkasou in Japan, is within the range of permissible limit of a household expenditure for water in the household income (3%) set by OECD. Japan's median household income is about US\$ 40,000 per annum.

A foreign expert, who met a household who uses Johkasou in Japan, expressed disbelief on the fact that he/she is actually paying US\$ 600 annually for the maintenance of the Johkasou without complaining. My explanation on this would be that people would pay for the service if the service quality is guaranteed, supported by a well-established monitoring structure.

**Question No.13**

What happens when a Johkasou system does not meet the effluent standard?

**Mr. Hashimoto's Answer**

Under the On-site System Act (Johkasou Act), the head of a local government, upon the report of the Designated Inspection Agency, may give advice or order to the owner/user of a Johkasou, Technical Supervisor, Maintenance Vendor and Desludging Vendor to improve the maintenance including desludging. In case of large scale Johkasou ( $\geq 501$  PE), under the Water Pollution Control Law, the head of a local government may order to change the structure or the way of use of large scale Johkasou.

**Question No.14**

How often desludging is being carried out for each Johkasou system?

**Mr. Hashimoto's Answer**

In Japan, once a year desludging is mandatory for most of the types of Johkasou (large and small) and this frequency is actually observed by most of the users.

**Question No.15**

What is the duration for or intervals needed for maintenance?

**Mr. Hashimoto's Answer**

As mentioned in my slide 14, once in every 4 months for small scale Johkasou; more frequent intervals (every 2 weeks, etc. depending on the type of Johkasou) for medium and large scale on-site systems for commercial buildings.

**Question No.16**

What do you do with dewatered solid sludge of STP in Japan?

**Mr. Hashimoto's Answer**

There is a national statistic on this subject. 16% of the sludge from Sludge Treatment Plants (STP) is recycled for agricultural use and 69% is incinerated in STP or in Waste Treatment Facilities (WTF) and the rest is disposed of in other ways. On 2000, the government changed its policy so that only the WTF with recycling facilities were eligible for the government subsidy. But, in Japan, the majority of WTFs were built before 2000.

**Question No.17**

How should sludge be collected in poor countries?

**Mr. Hashimoto's Answer**

The World Bank, other International Financial Institutions and the Bill & Melinda Gates Foundation (BMGF) are promoting Fecal Sludge Management (FSM) which is primarily the improvement of sludge management in developing countries by creating and strengthening the sanitation service chain from the containment, removal and transportation of the sludge as well as its treatment and recycling. You can find out many materials on FSM on the internet. I would like to point out that their approach is not very different from the sludge management system already established in Japan.

**Question No.18**

What is the coverage target for the Johkasou System in Japan?

What is the percentage of the population covered by sewerage systems, Johkasou, septic tanks and other wastewater systems in Japan?

**Mr. Hashimoto's Answer**

In Japan, about 75% of population is already covered by the public sewerage system and 15% is using the Johkasou system. The remaining 10% is using either the old type Johkasou or a vault toilet for the treatment/containment of black water but not gray water,



which is discharged without treatment. The Japanese government's target is to connect these 10% population either to the public sewerage system or to the Johkasou system.

**Question No.19**

Based on the experiences in using Johkasou for decades, what are the remaining "key challenges" in the design, operation and maintenance?

**Mr. Hashimoto's Answer**

I consider that the technology of Johkasou including design and maintenance is already in a complete form. The challenge Japan is facing is the replacement of the old type Johkasou, treating only black water, by the Johkasou, which treats both black water and grey water and is essential for the improvement of the water quality of water bodies – particularly closed water bodies such as lakes and inland bays of which the water quality has not been improved to the level meeting the environmental standards. This transition of Johkasou is not progressing smoothly, since it is difficult to enforce such replacement to ordinary citizens who would normally do that only when they build a new house.

**Question No.20**

Does Japan already have experience in sharing/implementing the Johkasou system in developing countries?

Has there been any progress of introducing Johkasou in Viet Nam please?

**Mr. Hashimoto's Answer**

Johkasou is one of the targets of the Japanese government's "Infrastructure System Export Strategy".

Some of the Johkasou manufacturers are exporting Johkasou to developing countries and some of them have their factory in such countries as China, Indonesia, India and Thailand. As far as I know, most of their current customers in developing countries are commercial users such as hotels, office buildings, shopping malls, hospitals, factories, etc., except in China where the Johkasou technology is widely used for the improvement of wastewater management of peri-urban areas.

I have heard that the Johkasou system has been introduced to some hospitals in Vietnam.

**Question No.21**

Can this technology be made available to some local cities in developing countries? If so, what will be the requirements?

**Mr. Hashimoto's Answer**

I believe it is possible to introduce the Johkasou technology in any place. But it is not possible to operate and maintain it properly without a proper operation and monitoring structure as the one explained in my presentation.

**Question No.22**

Who are the registered Johkasou manufacturers?

**Mr. Hashimoto's Answer**

You can search for 'Johkasou manufacturer' on the internet. In Japan, any manufacturer who wants to manufacture and sell Johkasou can do that only after having obtained the Japanese government's approval on the type of Johkasou which they intend to manufacture. Therefore, as far as Japanese Johkasou manufacturers on the internet are concerned, you can consider that their products are the approved ones by the Japanese government after rigorous performance tests.

**Question No.23**

How do you solve the "Competition problem" among Johkasou companies (installation or O&M) in the same location? And, is there any competition between Johkasou (on-site wastewater treatment) and Centralized wastewater system? Thank you!

**Mr. Hashimoto's Answer**

Installation business and maintenance business of Johkasou is on free competition basis, except that only the type of Johkasou approved the government can be installed and only the O/M vendors who are registered to the relevant local government can do the business in the area. Desludging business is not a free market. The entry to the local market is controlled by the municipality under the approval system.

Municipalities have to introduce the "Domestic Wastewater Treatment Basic Plan" according to the Waste Management and Public Cleansing Act. In this plan, developing target of centralized area and Johkasou area are divided respectively, therefore, there are no competition between sewerage system and Johkasou system.

**Question No.24**

Can you please share the presentation and related regulations to the audience? It may be very helpful to frame systems in our countries.

**Mr. Hashimoto's Answer**

Most of the contents of the presentation is included in ADBI Development Case Study No. 2021-1 (June) 'Institutional Frameworks for Onsite Sanitation Management Systems' by Kazushi Hashimoto <https://www.adb.org/sites/default/files/publication/711441/adbi-cs2021-01.pdf> . You can also find an English translation of Japanese laws and regulations such as the Johkasou Act (Japan's 'On-site System Act') in <http://www.env.go.jp/recycle/jokaso/en/act.html> .

**Question No.25**

How Japan has overcome stigmatization? For example, the caste system forced particular people as workers and increase stigmatization.

**Mr. Hashimoto's Answer**

In Japan, the municipal mayor's approval system of the desludging business introduced by the promulgation of the On-site System Act (Johkasou Act) in 1983 played an important role to overcome stigmatization. I consider that the formal recognition of this profession is the first steps to be taken. In this context, it is also important to make on-site sanitation a public matter.

**Question No.26**

How does Japan avoid corruption by government and public sector in this field?

**Mr. Hashimoto's Answer**

I believe that, in Japan, the standardization and rigorous monitoring system to ensure the conformance to the standards for the equipment and installation, certification/examination system for both installation and O/M including desludging, as well as the legal inspection of the system performance by a third-party institution, works for avoiding corruptions. And these elements will work in other countries.

**Question No.27**

What kind of disaster management/reduction system does Japan immanent to on-site systems have?

**Mr. Hashimoto's Answer**

In the incident of Great East Japan Earthquake and Tsunami, the Johkasou proved to be resilient to the earthquake and was widely used for the sanitation of temporary housings for the affected people or temporarily installed in areas where the sewer network was damaged to provide safe sanitation services (wastewater treatment) for the residents. Immediately after the earthquake, many desludging vendors from outside of the affected areas voluntarily sent their teams to the affected areas for desludging operation of the temporary toilets installed in the evacuation centers.

**Question No.28**

What was the key the work on the training as enough capacity building and the certificate leads guaranteed future salary? Not always the training, certificate wouldn't lead enough skill and future salary.

**Mr. Hashimoto's Answer**

I believe it works in Japan because there is a system in which the residents are enforced to get services such as the proper installation, proper O/M and proper desludging which are required for the management of the entire on-site sanitation system and for which only the certified personnel can engage in such works. Without such system, it will not work.

**Question No.29**

Are there any challenge for Japan's on-site systems such as climate change?

**Mr. Hashimoto's Answer**

Climate change would not affect the on-site system in Japan. Only the challenge in Japan is the decrease of population, particularly in rural areas where on-site systems are mainly used. Very small sized and aged households need to maintain their on-site system. It may be a challenge.

**Question No.30**

Hi! I have a question about on-site sanitation system. What tool/ software do you use in Japan and what do you recommend for Asian countries like Pakistan?

**Mr. Hashimoto's Answer**

The main tools/software for the improvement of on-site sanitation used in Japan were explained in my presentation. You may also see them in ADBI Development Case Study No. 2021-1 (June) 'Institutional Frameworks for Onsite Sanitation Management Systems' by Kazushi Hashimoto <https://www.adb.org/sites/default/files/publication/711441/adbi-cs2021-01.pdf> and in Night Soil Treatment and Decentralized Wastewater Treatment Systems in Japan [http://www.env.go.jp/recycle/jokaso/basic/pamph/wastewater\\_treatment\\_systems.html](http://www.env.go.jp/recycle/jokaso/basic/pamph/wastewater_treatment_systems.html) .

**Question No.31**

Where do you get the most benefit when introducing a Japanese septic tank system in the Asian region?

**Mr. Hashimoto's Answer**

Johkasou is not a septic tank. Septic tanks use anaerobic technology, whereas Johkasou use a combination of anaerobic and aerobic technology. The benefit of the Johkasou system is that the effluent is clean enough for a direct discharge to the surface water without causing health risks. This can greatly contribute to the improvement of the living environment of the people in Asian countries.