

令和 5 年度
インドジャル・シャクティ省との協力覚書に係る
第 1 回会議体会合及びセミナー開催業務
報 告 書

令和 6 年 3 月

環境省廃棄物適正処理推進課浄化槽推進室
公益財団法人日本環境整備教育センター

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第 1 章 業務概要

1.1. 目的

令和元年 12 月にインド・デリーにて浄化槽海外セミナーが開催され、その際にジャル・シャクティ省から浄化槽に関する協力覚書締結に関する要望が出された。それ以降、在インド日本大使館と連携してジャル・シャクティ省と協議を重ね、令和 4 年 3 月に日本国環境省とジャル・シャクティ省との間で公共水域の水環境保全と公衆衛生の向上を目的とした浄化槽を活用した分散型生活排水管理に関する協力覚書を締結した（本協力覚書に基づき、日本国環境省とインド共和国ジャル・シャクティ省について、以下、個別に「日本側」、「インド側」といい、総称して「両側」という）。

それ以降、インド側と日本側は協議を重ね、協力覚書に基づく推進母体である会議体構成メンバー表、今後の協力実施内容を記載した共同作業計画書、共同作業計画書の添付資料として、初回の共同作業となるセミナーのプログラム案等のドラフトを作成したところである。

そこで本業務では、これら関連書類を完成させ、第 1 回会議体会合を開催して会議体構成メンバーからこれら書類の承認を得る。次いで、セミナーの議事次第の詳細を詰め、それに基づいたセミナーを開催することを目的とする。

1.2. 実施事項

1.2.1. 第 1 回会議体会合の開催

- (ア) 会議体メンバーと協賛メンバーが記載された会議体構成メンバー表の日本側メンバー部分と共同作業計画書を日本側とインド側に協議の上、最終版を作成した。
- (イ) 開催日時、開催方法、司会者、詳細議事次第等の項目を含む第 1 回会議体会合のプログラムを日本側とインド側との協議を踏まえて作成した。
- (ウ) プログラムに基づき第 1 回会議体会合をオンライン開催した。今後の協力実施内容を記載した共同作業計画書の承認を得て次の推進項目であるセミナー開催に繋げた。

1.2.2. セミナーの開催

- (ア) 開催日時、開催方法、司会者、発表テーマ、発表者等の詳細を含む詳細プログラムを、日本側とインド側との協議を踏まえて作成した。
- (イ) 第 1 回会議体会合で承認された共同作業計画書及びセミナーのプログラム案を基にセミナーをオンライン開催した。

1.2.3. 来期の共同作業に関する調整

来期の共同作業に関し、環境省担当官との協議を踏まえつつ、あらためてインド側の意向確認、開催に当たっての方向性や実施内容等に関してインド側との確認や調整を行った。

1.2.4. 打合せ

上記 1.2.1～1.2.3 の業務の実施にあたり、環境省担当官との打合を 4 回実施した。

1.3. 実施体制

本業務の実施体制を図 1 に示す。

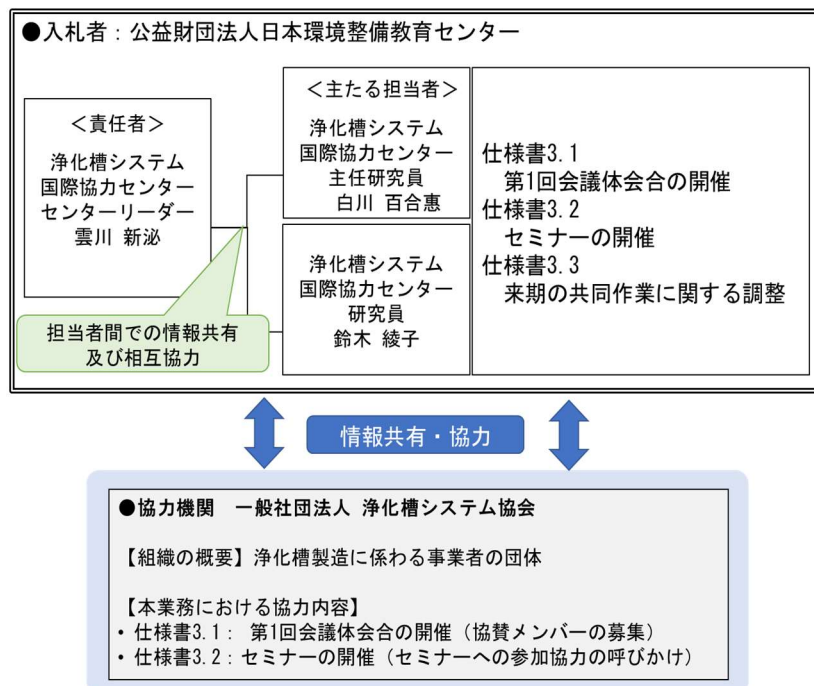


図 1 インドジャル・シャクティ省との協力覚書に係る第 1 回会議体会合及びセミナー開催業務の実施体制

1.4. 業務実施スケジュール

本業務の実施スケジュールを表 1 に示す。

表 1 業務実施スケジュール

| 業務内容 | 2023年(令和5年) | | | | | | | | | | | | 2024年(令和6年) | | |
|----------------------------|-------------|----|----|----|--------------|----|-------|-----------------|-----|-------------------------|----|----|-------------|--|--|
| | 4月 | 5月 | 6月 | 7月 | 8月 | 9月 | 10月 | 11月 | 12月 | 1月 | 2月 | 3月 | | | |
| 1. 第1回会議体会合の開催 | | | | | | | | | | | | | | | |
| (1) 会議体構成メンバー表及び共同作業計画書の作成 | | | | | ●作成 | | | ●修正 | | | | | | | |
| (2) 第1回会議体会合のプログラムの作成 | | | | | ●作成 | | | ●修正 | | | | | | | |
| (3) 第1回会議体会合の開催 | | | | | ← 開催に向けた準備 → | ● | 11/28 | 第1回会議体 会合の開催 | | | | | | | |
| 2. セミナーの開催 | | | | | | | | | | | | | | | |
| (1) セミナーの詳細プログラムの作成 | | | | | ●作成 | | | ●修正 | | | | | | | |
| (2) セミナーの開催 | | | | | ← 開催に向けた準備 → | ● | 12/19 | セミナー の開催 | | | | | | | |
| 3. 来期の共同作業に関する調整 | | | | | | | | | | | | | | | |
| (2) インド側の意向確認・調整 | | | | | | | | | | ← 来期に向けた 確認・調整 → | | | | | |
| 4. 環境省担当官との打合せ | | | | | | | | | | | | | | | |
| 5. 報告書の作成及び印刷 | | | | | | | | | | | | | | | |
| | | | | | | | | | | ← 報告書の 作成 → 納品(3/22) | | | | | |

第 2 章 第 1 回会議体会合の開催

2.1. 会議体構成メンバー表及び共同作業計画書の作成

第 1 回会議体会合の開催に先立ち、会議体メンバーと協賛メンバーが記載された会議体構成メンバー表の日本側メンバーと共同作業計画書を、環境省担当官とインド側に協議の上、作成した。環境省担当官と協議の上、次の 3 名の有識者に対して、日本側会議体メンバーへの就任を依頼し、承諾を得た。

有識者である河村氏は衛生工学及び浄化槽分野の専門家であり、これまで環境省浄化槽推進室の海外案件に座長やパネリストとして参画するなど、アジアの公衆衛生問題と浄化槽事情に精通している。同じく有識者である春日氏は、環境工学分野を専門とし、特に環境微生物学をテーマとした研究を多く手掛けているほか、日越大学への赴任経験など海外での研究実績も多く有する。また同じく蛭江氏は、途上国での分散型污水处理装置の国際規格化の推進、アジア共通の分散型污水处理装置の性能試験法の実現に向けた研究プログラムなど、浄化槽の国際展開に係る研究の中心メンバーとして活動実績が多い。

日本側協賛メンバーについては、(一社) 浄化槽システム協会を通して浄化槽メーカー各社に周知を行い、4 社が参画することになった。このほか、海外展開の実績等を考慮のうえ、インドで分散型污水处理施設の維持管理実績を有する株式会社日吉に日本側協賛メンバーへの就任を依頼し、了承を得た。日本側会議体メンバー及び日本側協賛メンバーについて表 2 及び表 3 に示す。

なお、共同作業計画書 (Joint Working Program) については、環境省担当官やインド側と協議のうえ最終案を作成し、2023 年 11 月 29 日に開催された第 1 回会議体会合において審議したところ、一部修正があった。この修正を反映した最終版の共同作業計画書については資料編 6.1. に示した。

表 2 日本側会議体メンバー

| 所属 | | 氏名 | 備考 |
|--|---------|------------|-----|
| 環境省 浄化槽推進室 | 室長 | 沼田 正樹 | 環境省 |
| | 指導普及係長 | 佐藤 亮真 | 環境省 |
| | 環境専門調査員 | ホワン ティー マイ | 環境省 |
| 教授 (元埼玉大学教授) | | 河村 清史 | 有識者 |
| 准教授 (東京大学先端科学技術研究センター) | | 春日 郁朗 | 有識者 |
| 研究者 (国立研究開発法人国立環境研究所資源循環領域 廃棄物処理処分技術研究室主幹研究員) | | 蛭江 美孝 | 有識者 |
| 在インド日本国大使館 一等書記官 | | 永井 弥穂子 | 大使館 |

表 3 日本側協賛メンバー

| 所属 | 氏名 | 所属先の海外展開状況 |
|----------------|-------|---|
| 株式会社ハウステック | 塚本 幸二 | ハンガリー国において浄化槽普及に向けた調査 (環境省業務) を実施した。 |
| 株式会社日吉 | 松井 和彦 | インドにおいて生活排水処理施設の総合維持管理に関する JICA 事業を実施した。 |
| 株式会社ダイキアクシス | 佐伯 和男 | インド、インドネシアで浄化槽の生産・販売を行い、アジア諸国、アフリカにも事業展開している。 |
| クボタ浄化槽システム株式会社 | 北井 良人 | 中国、ベトナム、ミャンマーなど海外で多くの浄化槽販売実績を持つ。 |
| フジクリーン工業株式会社 | 田畑 洋輔 | 主にアメリカ、オーストラリア、欧州を中心に浄化槽の販売事業を展開している。 |

2.2. 第 1 回会議体会合のプログラムの作成

開催日時、開催方法、司会者、詳細議事次第等の項目を含む第 1 回会議体会合のプログラムを環境省担当官及びインド側との協議を踏まえて作成した。また、仕様書 3.2. (1)に示されているセミナーのプログラム案について、環境省担当官やインド側との協議を踏まえ修正し、第 1 回会議体会合の際に議事の 1 つとして取り上げ、両側が協議を行った。

第 1 回会議体会合のプログラムについて資料編 6.2. に示す。

2.3. 第 1 回会議体会合の開催

2.3.1. 開催概要

第 1 回会議体会合を 2023 年 11 月 29 日にオンラインにて開催した。開催概要を表 4 に示す。

表 4 第 1 回会議体会合の開催概要

| | |
|-----|--|
| 日 時 | 2023 年 11 月 29 日 日本時間 16 : 00～18:00 (インド時間 12 : 30～14 : 30) |
| 場 所 | インド側 : NMCG 会議室 (National Mission for Clean Ganga, Ministry of Jal Shakti) 日本側 : 日本環境整備教育センター (JECES) 4F 会議室 Zoom (Web 会議システム) の Webinar を使用しインド側会場と日本側会場を接続した。 |
| 議 題 | 1. Introduction on Both sides of Management Council members cum Approval of Associate members (両側の第 1 回会議体メンバー紹介及び協賛メンバーの承認) 2. Keynote Speeches (from both sides) 基調演説 (両側) 3. Approve the Joint Working Program and the 1st Seminar program (共同作業計画書及び第 1 回セミナーのプログラムの承認) 4. Presentation from the Associate members of both the sides (両側の協賛メンバーによる発表) |

先ず初めに議題 1 として、ジャル・シャクティ省 国家ガンジス川浄化ミッション (National Mission for Clean Ganga, Ministry of Jal Shakti, 以下、NMCG) の Deputy Secretary (課長¹) である Shri Dheeraj Joshi (シュリ ディーラジュ ジョシ) 氏、そして環境省 環境再生・資源循環局 廃棄物適正処理推進課 浄化槽推進室 指導普及係長の佐藤 亮真 氏より、インド側、日本側のそれぞれの会議体メンバー及び協賛メンバーの紹介があった。

続いて、議題 2 として両側を代表し、環境省 環境再生・資源循環局 廃棄物適正処理推進課 浄化槽推進室長の沼田 正樹 氏と、ジャル・シャクティ省国家河川保全局 (National River Conservation Directorate, Ministry of Jal Shakti, 以下、NRCD) の Joint Secretary (次官補¹) である Shri Pradeep Kumar Agarwal (シュリ プレディープ クマール アガールワル) 氏より基調演説があった。なお、議題に記載はないが、インド側からの基調演説では、ジャル・シャクティ省の設立経緯や役割、組織の紹介が行われた。このインド側を紹介する発表資料については資料編 6.3.1. に示す。

議題 3 では、共同作業計画書及び第 1 回セミナープログラムについて審議が行われた。共同作業計

¹ インド側出席者の役職の日本語訳については「文部科学省スポーツ庁の在り方に関する調査研究事業(平成 24 年度)第 6 章インド(https://www.mext.go.jp/a_menu/sports/chousa/detail/1333391.htm)」の図表-6-9(インド行政職(IAS)職員 役職の類型)を参考にした。

画書についてはインド側より、Annexure II のパイロットプロジェクトのプロモーターについて「National Mission for Clean Ganga, Ministry of Jal Shakti (Department of Water Resources, River Development & Ganga Rejuvenation) Government of India」となっているところを、National Mission for Clean Ganga（国家ガンジス川浄化ミッション）も包含する「Ministry of Jal Shakti, Government of India」のみの記載にしてはどうか、との提案があり、両側がこの変更に合意した。また、セミナーのプログラムについても 2023 年 12 月 19 日に開催することを含め両側が合意した（セミナープログラムについては資料編 6.4. に記載）。

議題 4 として、両側の協賛メンバーも自社の取り組みや自社製品・技術に関し紹介する発表を行った。しかし、インド側協賛メンバーである Arvind Envisol Ltd. はインターネット回線が不安定であるため発表をすることが出来なかった。同じく日本側協賛メンバーである株式会社ハウステック及び株式会社日吉についても、日程が合わなかったために第 1 回会議体会合を欠席し、発表は行っていない。議題 4 に係る両側の協賛メンバーによる発表資料については、資料編 6.3.2. ～6.3.7. に示す。

2.3.2. 有識者への謝金の支払い・同時通訳者の備上

会議開催に当たっては、日本語・英語の同時通訳者を備上し、前述の「2.1. 会議体構成メンバー表及び共同作業計画書の作成」において決定した日本側会議体メンバーのうち有識者に対し、請負者より謝金（1 人 1 日につき 17,700 円）及び国家公務員等の旅費に関する法律に基づく旅費（6～3 級相当）を支給した。

2.3.3. 第 1 回会議体会合議事要旨

第 1 回会議体会合開催後、受託者で議事要旨案を作成しインド側とメールで協議を重ね議事内容の確認を行った。最終版の第 1 回会議体会合議事要旨について以下に示す。

なお、資料編 6.2. 第 1 回会議体会合プログラムではインド側会議体メンバーの一人として在日本インド国大使館の Ms. Madhuri Gaddam（マドゥリ ガダム）氏が記載されているが、異動により後任の Mr. Shishir Kothari（シシル コタリ）氏が出席した。



**Minutes of the First Meeting of the Management Council under India-Japan
Memorandum of Cooperation (MoC)**

| | |
|-------------------------------|--|
| Date | 29 th November, 2023 |
| Time | 12:30-14:30 in Indian time 16:00-18:00 in Japanese time |
| Agenda | <ol style="list-style-type: none"> 1. Introduction on Both sides of Management Council members cum Approval of Associate members 2. Key note Speeches (from both sides) 3. Approve the Joint Working Program and the 1st Seminar program 4. Presentation from the Associate members of both the sides |
| Venue of Indian side | Conference Room, NMCG and Video Conference |
| Venue of Japanese side | Meeting room, Japan Education Center of Environmental Sanitation (JECES) |

A Memorandum of Cooperation (MoC) was signed on 19th March, 2022 between Ministry of the Environment, Government of Japan and The Ministry of Jal Shakti Government of India, in the areas of '**De-centralized Domestic Wastewater Management and Effective Reuse of Treated Wastewater**'. This cooperation seeks to provide solutions to various water related issues, encourage and facilitate cooperation in the areas of mutual interest, through exchanging information and expertise, organizing seminars, conferences and meetings, and capacity building through trainings and workshops.

The First Meeting of the Management Council (MCM) was organized on 29th November 2023. This meeting was organized under the Chairmanship of Joint Secretary, National River Conservation Directorate, Ministry of Jal Shakti, Government of India, from the Indian side and Director of Office for Promotion of Johkasou, Waste Management Division, Environmental Regeneration and Material Cycles Bureau, Ministry of the Environment, Government of Japan, from the Japanese side.

A total of 29 participants attended the meeting, out of which 14 attended in person from the Conference Hall at National Mission for Clean Ganga (NMCG) and the Meeting room, Japan Education Center of Environmental Sanitation (JECES) (Please refer Annexure-I for the name of participants) and 15 participants attended through video conference (Please refer Annexure-II for the name of participants). The participants included Permanent Members and Associate Members from both India and Japan side. The meeting was coordinated by National Mission for Clean Ganga from India side, and by Office for Promotion of Johkasou, Waste Management Division, Environmental Regeneration and Material Cycles Bureau, Ministry of the Environment, Government of Japan, from the

Japanese side. The proceedings of the meeting are as under:

1. Shri Dheeraj Joshi, Deputy Secretary, NMCG and Mr. Ryoma Sato, Section Chief, Office for Promotion of Johkasou welcomed the members to the session and introduced the agenda of the First Meeting of the Management Council.
2. Keynote address was delivered by Shri Pradeep Kumar Agarwal, Joint Secretary, National River Conservation Directorate, Ministry of Jal Shakti, Government of India, and Mr. Masaki Numata, Director, Office for Promotion of Johkasou, Waste Management Division, Ministry of the Environment, Government of Japan.
3. Shri Agarwal introduced the Key Government Schemes in Indian water sector. He also introduced core activities of the Ministry of Jal Shakti, and major departments of the government dealing with water under its aegis. Further, he introduced the Namami Gange Projects that the Ministry of Jal Shakti is working on.
4. Ms. Thi Mai Hoang, Senior Environment Expert Office for Promotion of Johkasou, Waste Management Division, Environmental Regeneration and Material Cycles Bureau, Ministry of the Environment Government of Japan, explained the Joint Working Program and the draft Seminar program.

Both Shri Agarwal and Mr. Numata expressed the importance of De- centralized Domestic Wastewater Management and the role of technology in addressing the same.

5. After deliberations, both sides agreed to the following-

- (i) Draft Joint Working Program was accepted by both sides with few amendments as below:

Name of the promoter of pilot projects in Annexure II of the draft Joint Working Program was '*National Mission for Clean Ganga, Ministry of Jal Shakti (Department of Water Resources, River Development & Ganga Rejuvenation) Government of India*', which is amended to '*Ministry of Jal Shakti, Government of India*'.

- (ii) To proceed with preparations to hold the 1st Seminar on 19th December, 2023 after this first MCM.
- (iii) To discuss again on holding the 2nd MCM after the 1st seminar is held on 19th December, 2023, if necessary.
- (iv) Management Council members and Associate Members nominated from the Indian as well as Japanese side (Names of the Associate Members are mentioned at Annexure-III).

6. A total of 7 Associate Members were present- 4 from India side and 3 from Japanese side. Brief presentations were made by following 5 Associate Members on the technologies and the work being done in De-centralized Domestic Wastewater Management and effective reuse of treated wastewater.:

- a. Sintex BAPL Ltd.
- b. Daiki Axis India Pvt. Ltd.
- c. Kubota Johkasou System Co., Ltd.
- d. FujiClean Co., Ltd.
- e. Daiki Axis Co., Ltd.

Arvind Envisol Ltd., another Associate member of the Indian side, was unable to make presentation due to the internet environment. In addition, Housetec Inc. and Hiyoshi Corporation, the other Associate members of Japanese side were absent from this 1st Management Council Meeting (MCM) because of their schedule issue.

7. The meeting was concluded with a vote of thanks by Shri Dheeraj Joshi, Deputy Secretary, National Mission for Clean Ganga, Ministry of Jal Shakti, and by Mr. Ryoma Sato, Section Chief, Office for Promotion of Johkasou, Waste Management Division, Ministry of the Environment, Government of Japan.

Annexure-I

List of participants who attended the meeting in person at the conference hall, NMCG

| S.No. | Name | Designation |
|--------------|----------------------------|---|
| 1. | Shri Pradeep Kumar Agarwal | Joint Secretary, National River Conservation Directorate, Government of India |
| 2. | Shri Dheeraj Joshi | Deputy Secretary, National Mission for Clean Ganga |
| 3. | Dr. Pravin Kumar | Director (Technical), National Mission for Clean Ganga |
| 4. | Ms. Diva Pandey | Institutional Associate, National Mission for Clean Ganga |
| 5. | Mr. Vishal Garg | Institutional Associate, National Mission for Clean Ganga |
| 6. | Mr. Ashwini Dubey | Support Architect, RFD and URMP, National Mission for Clean Ganga |
| 7. | Mr. Kamal Tiwari | CEO, Daiki Axis India Pvt. Ltd. India |
| 8. | Mr. Rio Waza | Managing Director, Daiki Axis India Pvt. Ltd., Japan |

List of participants who attended the meeting in person at the Meeting room, Japan Education Center of Environmental Sanitation (JECES)

| S.No. | Name | Designation |
|--------------|----------------------|--|
| 1. | Mr. Ryoma Sato | Section Chief, Office for Promotion of Johkasou, Waste Management Division, Ministry of the Environment |
| 2. | Dr. Kiyoshi Kawamura | Former Professor, Saitama University |
| 3. | Dr. Yoshitaka Ebie | Manager, Planning Division (International Coordination Office), National Institute for Environmental Studies (NIES) |
| 4. | Dr. Shinhi Kumokawa | Director, Center for International Cooperation of Johkasou System Japan Education Center of Environmental Sanitation (JECES) |
| 5. | Dr. Yurie Shirakawa | Senior Researcher, Center for International Cooperation of Johkasou System Japan Education Center of Environmental Sanitation (JECES) |
| 6. | Ms. Ayako Suzuki | Researcher, Center for International Cooperation of Johkasou System Japan Education Center of Environmental Sanitation (JECES) |

Annexure-II

List of participants who attended the meeting through video conference

| S. No | Name | Designation |
|--------------|----------------------------|---|
| 1. | Shri Anup Kumar Srivastava | Executive Director (Technical) |
| 2. | Mr. Masaki Numata | Director, Office for Promotion of Johkasou, Waste Management Division, Ministry of the Environment |
| 3. | Ms. Thi Mai Hoang | Senior Environment Expert of Office for Promotion of Johkasou, Waste Management Division, Ministry of the Environment |
| 4. | Mr. Ikuro Kasuga | Professor, Research Center for Advanced Science and Technology, The University of Tokyo |
| 5. | Dr. Mihoko Nagai | First Secretary, Embassy of Japan in India |
| 6. | Prof. A. A. Kazmi | Professor, Indian Institute of Technology Roorkee |
| 7. | Dr. Ram Avtar | Associate Professor/Director, Hokkaido University/Global Land Programme |
| 8. | Mr. Shishir Kothari | First Secretary, Political, Press & Information, Thematic Cooperation, Head of Chancery, Embassy of India in Tokyo |
| 9. | Mr. Shubham Tiwari | Co-lead Institutional Associate |
| 10. | Mr. Amit Shah | Head Global, Arvind Envisol Ltd. |
| 11. | Mr. Naveena Nand Upadhyay | Deputy General Manager-R&D, Design, Sintex BAPL Ltd |
| 12. | Mr. Yoshito Kitai | Deputy Manager, Kubota Johkasou System Co., Ltd |
| 13. | Mr. Yosuke Tabata | Executive Officer, Overseas Business Group, FujiClean Co., Ltd |
| 14. | Mr. Kazuo Saeki | Manager, Daiki Axis Co., Ltd |

Annexure-III

List of Associate Members (Temporary members) nominated for both sides is presented in the tables below.

Indian side of Associate Members (Temporary members)

| No | Designation | Organization/ Institution | Name |
|----|--------------------------------------|---|---------------------------|
| 1 | Head Global | Arvind Envisol Ltd. | Mr. Amit Shah |
| 2 | Deputy General Manager - R&D, Design | Sintex BAPL Ltd. | Mr. Naveena Nand Upadhyay |
| 3 | CEO | Daiki Axis India Pvt. Ltd. | Mr. Kamal Tiwari |
| 4 | Associate Professor/Director | Hokkaido University/ Global and Programme | Dr. Ram Avtar |

Japanese side of Associate Members (Temporary members)

| No | Designation | Organization/Institution | Name |
|----|---|----------------------------------|---------------------------|
| 1 | Manager | Daiki Axis Co., Ltd. | Mr. Kazuo Saeki, Ph.D. |
| 2 | Executive Officer, Overseas Business Group | FujiClean Co., Ltd | Mr. Yosuke Tabata, Ph. D. |
| 3 | Manager | Housetec Inc. | Mr. Koji Tsukamoto |
| 4 | Deputy Manager | Kubota Johkasou System Co., Ltd. | Mr. Yoshito Kitai |
| 5 | Chief, Research and Development Planning Office | Hiyoshi Corporation | Mr. Kazuhiko Matsui |



インド側会場



日本側会場



Shri Pradeep Kumar Agarwal
(シュリ プレディープ クマール アガルワル氏)
Joint Secretary, NRCD



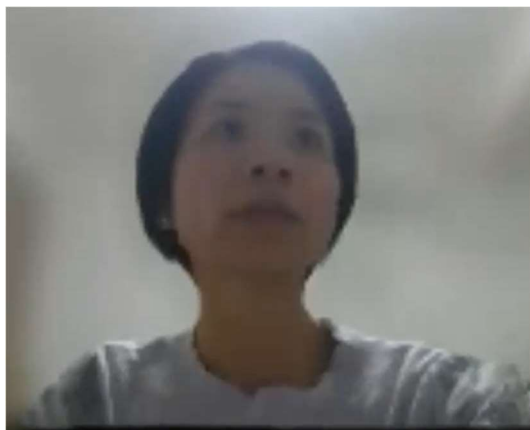
沼田 正樹 氏
環境省 環境再生・資源循環局 廃棄物適正
処理推進課 浄化槽推進室 室長



Shri Dheeraj Joshi
(シュリ ディーラジュ ジョシ 氏)
Deputy Secretary, NMCG



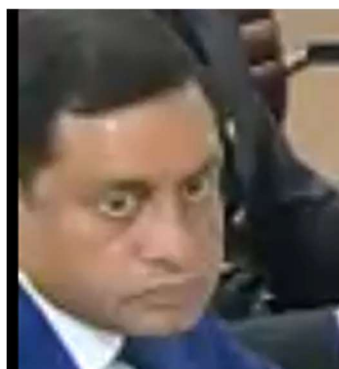
佐藤 亮真 氏
環境省 環境再生・資源循環局 廃棄物適正
処理推進課 浄化槽推進室 指導普及係長



ホワン ティー マイ 氏
環境省 環境再生・資源循環局 廃棄物適正
処理推進課 浄化槽推進室 環境専門調査員



Mr. Naveena Nand Upadhyay
(ナヴィーナ ナンデュ ウッパードゥヤイ 氏)
シンテックス BAPL 社
研究開発設計部 部長代理



Mr. Kamal Tiwari
(カマル ティワリ 氏)
株式会社ダイキアクシス インド法人 CEO



北井 良人 氏
クボタ浄化槽システム株式会社 四国営業所
営業技術担当



田畑 洋輔 氏
フジクリーン工業株式会社 海外事業部 執行役員



佐伯 和男 氏
株式会社ダイキアクシス 海外事業統括本部
海外営業統括部 海外営業部 海外営業推進課
課長

図 3 第1回会議体会合発表者

第3章 セミナーの開催

3.1. セミナーの詳細プログラムの作成

第1回会議体会合で承認されたセミナーのプログラムに沿って発表者を選定し、開催日時、開催方法、司会者について環境省担当官及びインド側と協議の上、セミナーの詳細プログラムを作成した。第1回会議体会合で既に提供された情報と重複が無いよう、且つ、日本で浄化槽がどのように普及して利用されているのかをインド側に効果的に伝えることが出来るよう、プログラムを作成した。

完成したプログラムを資料編 6.4. に示す。

3.2. セミナーの開催

3.2.1. 開催概要

2023年12月19日にセミナーをオンラインで開催した。開催概要を表5に示す。

表5 セミナーの開催概要

| | |
|-----|---|
| 日 時 | 2023年12月19日 日本時間 15:00~17:00 (インド時間 11:30~13:30) |
| 会 場 | インド側: NMCG 会議室 日本側: 日本環境整備教育センター 4F 会議室 Zoom (Web 会議システム) の Webinar を使用しインド側会場と日本側会場を接続した |
| 内 容 | 1. Opening remarks from both side (両側からの開催挨拶) 2. Presentation (発表) 3. Closing (閉会) |

はじめに両側を代表し環境省 環境再生・資源循環局 廃棄物適正処理推進課 浄化槽推進室長の沼田正樹氏と、NMCG の Director General (総局長¹) である Shri Asok Kumar (シュリ アショク クマール) 氏より開会挨拶があった。

続いてインド側からは1件、日本側からは6件の情報提供及び発表があった。

インド側からは、NMCG の Deputy Secretary (課長) である Shri Dheeraj Joshi (シュリ ディーラジュ ジョシ) 氏から、インドにおける生活排水処理状況について発表があった。インド側がガンジス川流域で展開する環境改善事業における実施内容 (下水道施設の整備、河川敷の整備、固形廃棄物の処理、など) や、地方州における生活排水処理施設の整備状況、リアルタイムでの水質モニタリングシステム、水質改善状況の紹介が行われた。また、現在のインド国内の汚水管理状況を向上させるため、浄化槽などの分散型汚水管理も積極的に推進していく計画であるとの紹介も行われた。

日本側からは、環境省 資源循環局 廃棄物適正処理推進課 浄化槽推進室の佐藤 亮真 氏より、日本の生活排水処理の現状と集中・分散処理システムの管理について、そして、浄化槽法をはじめとする日本における生活排水の分散管理に関する法制度に関して発表があった。

続いて日本環境整備教育センターの雲川 新泌 氏からは、日本で浄化槽の保守点検、清掃、検査がどのように行われているか、また、資格者制度と汚泥管理について紹介があった。

また、日本側協賛メンバーであるフジクリーン工業株式会社 海外事業部 執行役員の田畑 洋輔 氏からは、分散型污水处理施設に関する性能評価試験制度の必要性について、株式会社クボタ浄化槽シ

システムの担当部長である北井 良人 氏からは、日本の浄化槽の人員算定基準について、株式会社ダイキアクシスの課長である佐伯 和男 氏からは、浄化槽の国内外における施工事例について、それぞれ発表があった。

その後、発表内容に関して質疑応答が行われ、両側から積極的に質問やコメントがなされた。発表資料については資料編 6.5. に、質疑応答の記録については資料編に 6.6. に示す。なお、セミナー開催後に日本側会議体メンバーから追加で挙げられた質問については資料編 6.7. に整理している。

セミナーの最後に、環境省 環境再生・資源循環局 廃棄物適正処理推進課 浄化槽推進室 指導普及係長の佐藤亮真氏と、NRCD の Director (局長¹) である Mr. Nelapatla Ashok Babu (ネラパトラ アショク バブ) 氏よりそれぞれ閉会挨拶があった。



インド側会場の様子



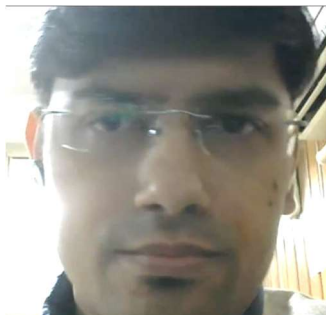
日本側会場の様子



沼田 正樹 氏
環境省 環境再生・資源循環局 廃棄物適正処理
推進課 浄化槽推進室 室長



Shri Asok Kumar
(シュリ アショク クマール 氏)
NMCG, Director General



Shri Dheeraj Joshi
(シュリ ディーラジュ ジョシ 氏)
Deputy Secretary, NMCG



佐藤 亮真 氏
環境省 環境再生・資源循環局 廃棄物適正処理
推進課 浄化槽推進室 指導普及係長



Mr. Nelapatla Ashok Babu
(ネラパトラ アショク バブ 氏)
Director, NRCD



雲川 新泌 氏
公益財団法人日本環境整備教育センター
浄化槽システム国際協力センターリーダー



田畑 洋輔 氏
フジクリーン工業株式会社 海外事業部
執行役員



北井 良人 氏
クボタ浄化槽システム株式会社 四国営業所
営業技術担当



佐伯 和男 氏
株式会社ダイキアクシス 海外事業統括本部
海外営業統括部 海外営業部 海外営業推進課
課長

図 4 第1回セミナー発表者

3.2.2. 有識者への謝金の支払い・同時通訳者の備上

請負者はセミナーの開催に当たって日本語・英語の同時通訳者を備上し、前述の「2.1. 会議体構成メンバー表及び共同作業計画書の作成」において決定した日本側会議体メンバーのうち有識者に対して、請負者より謝金（1人1日につき17,700円）及び国家公務員等の旅費に関する法律に基づく旅費（6～3級相当）を支給した。

3.2.3. セミナーにおける質疑応答

セミナー開催後、セミナーの中で行われた質疑応答と、後日、日本側会議体メンバーから挙げられた追加質問について一覧的に整理した。資料編 6.6. 及び 6.7. に示す。なお、インド側の回答は報告書作成時点で受領できていない。

第 4 章 来期の共同作業に関する調整

2022 年 3 月 19 日に締結された日本側とインド側との間の分散型生活排水管理分野における協力覚書（MOC）に依れば、その活動期間は 2 年間とされており、2024 年 3 月に期限を迎えるが、MOC の第 10 項には両側の同意により MOC を延長することが出来るとされている。

そこで、インド側に MOC の延長の意思確認を行ったところ、2024 年 2 月 7 日にインド側担当官から連絡があり、2 年間の MOC 延長（2026 年 3 月 19 日まで）についてインド側大臣の承認が得られた旨の連絡があった。

なお、延長後の MOC に基づく活動はインド側が主体となり進めていくことになっており、MOC 延長の意思を確認する際、併せて MOC 延長後の活動計画等についてインド側に提供を求め、2024 年 3 月 6 日に資料を受領した。

第 5 章 環境省担当官との打合せ

5.1. 第 1 回打合せ

| | |
|-------|--|
| 日 時 | 2023 年 8 月 16 日（水）13：40～14：45 |
| 場 所 | 環境省 23 階会議室 |
| 出 席 者 | 環境省浄化槽推進室：佐藤係長、ホワン様 在インド国日本大使館：永井様（オンライン参加） 日本環境整備教育センター(JECES)：雲川、白川、鈴木 |

1. 本年度業務の実施方針の確認

環境省担当官より提供があったキックオフミーティング資料と受託者が用意した業務実施計画書（案）及び業務工程表に沿って令和 5 年度業務の実施方針を確認した。

1.1 協力覚書（MOC）についての留意事項

- 環境省担当官より、本 MOC において日本側が提供できるものは日本の浄化槽に係るもののみに留まることをインド側にも確認済みである旨の報告を受けた。
- 本 MOC の有効期限は 2 年間であり、延長に関しては本セミナー開催後に決定となる可能性が高い。セミナー終了後に JECES よりインド側に確認し、要望があれば受けることを共有した。確認する際、業務遂行における主体はインド側であると明確に伝えるようにとの環境省からの指示があった。今後のセミナー等の発表データを協議する際、日本の浄化槽以外の分散型排水処理設備は対象外であることを留意すること。

1.2 第 1 回会議体合会及びセミナーについて

- 開催時期：会議体合会は 9 月に開催するのが理想だが、どうしても難しい場合にあっては 10 月になることも差し支えない。インド側の都合も考慮して年内にセミナーまで終えるよう調整することを共有した。
- 開催形式：JECES より、第 1 回会議体合会及びセミナーへの協賛メンバーの参加について、可能な限り対面に参加するようにとあるが難しい場合はウェブでの参加でもよいかと確認し、環境省より了承を得た。
- また、環境省担当官より、会議体合会及びセミナーでは、日本側だけでなくインド側協賛メンバーから発表していただくことも検討するよう提案を受けた。ただし、インド側に知見をもった会社がない場合には日本側のみの発表でも差し支えない。加えて、会議体合会では、セミナープログラム案や共同作業計画書の内容について議論するというより、承認を得ることを目的とし、第 1 回会議体合会の開催前に両側で内容を十分つめておくよう指示があった。
- JECES はセミナーのプログラム案について、環境省担当官からの指示に基づき主に以下の点を修正する；①ビデオの放映時間は 12 分程度を見込む、②協賛メンバーによる発表件数が多くなる場合は全体の時間を調整する、③両側代表の基調講演の時間を短縮する。
- 永井様より、第 1 回会議体合会及びセミナーの円滑な開催に向け、以下 3 点を同時にインド側に照会したほうが良いとの助言があった；①第 1 回会議体合会の次第案の確認、②第 1 回会議体合会及びセミナー開催に向けた日程調整、③日本側協賛メンバーは 5 社になった旨の伝達。

1.3 会議体構成メンバーについて

- 環境省担当官より、春日教授はインドもしくは分散型污水处理に関する実績及び研究をされているかという質問を受けた。JECES から、インドについては不明であるものの、途上国の排水処理に関して幅広くコメントを頂けるであろうことを回答した。
- インド側メンバー表に関して、S.No6 の IIT-Roorkee はインドにおける分散型污水处理の第

1 人者である Kazmi 教授、S.No5 はチャーリー教授である可能性が高い旨を JECES より報告した。

1.4 協賛メンバーについて

■ 日本側の協賛メンバー

- 日本側の協賛メンバーとして、昨年浄化槽システム協会が協会メンバーに参加意向を確認していただいた際、ダイキアクシス、フジクリーン工業、ハウステックとニッコー4社の意向が確認出来たが、先月再度確認していただいたところ、ダイキアクシス、フジクリーン工業、ハウステックとクボタ4社は参加意向があり、また、JECES が声をかけた日吉を入れて5社となった。JECES は今後の業務を推進する際は、協賛メンバー内にて優劣はつけず、また、5社全てから発表いただけるとの回答を得られた場合は、その方向でプログラムの時間等を調整すること。
- 永井様より、ダイキアクシス社は MOC を締結する発端となった企業であるが、他の協賛メンバーと同等の位置づけで特別な配慮は必要ないとの提案があり、JECES も同意した。ただし、特別な配慮が必要ない点は同意したうえで、同社はインド側の状況に精通している企業であることから、意見を求めるなど同社の知見を基に協力いただく場合は問題ないのでは、と環境省担当官より言及があった。

■ インド側の協賛メンバー

- 在インド国日本大使館の永井様より、人事異動によって新たに Mathuria 課長の部下となられた担当の Dubey 様から、インド側の協賛メンバーとしてインドの民間企業の中から分散型排水処理に知見のある企業を選定したいが情報がないため難しい、もし日本側に知見があればインド側の企業を選定していただきたい、という趣旨のメールが送られてきた旨、情報共有があった。2023 年 3 月の時点で日本と同数の民間企業を参加させたい、という話を Mathuria 課長がされていた旨も共有があった。これに対し JECES は、インド企業に関して知見がないと回答した。
- JECES は Kazmi 教授にインド側協賛メンバーとなりうる分散型污水处理関連企業の紹介を依頼することになった。

1.5 共同作業計画書の内容について

- 環境省担当官から永井様に、共同作業計画書の 3.Forms of Cooperation の Note for Indian side は最新版では削除されているが、理由があればご教示願いたいとの照会があった。永井様から、Note は注釈のため最終的に削除されるものという認識にて削除したと回答があった。
- 永井様から、共同作業計画書の「4.Cooperating Partner」でインド側にも事務局を設置し、「5.Beneficiaries」で SDG6.3 に寄与する、といったように内容を変更せず修辞上の修正を日本側で行い、インド側に確認を求めているが返答がない状況である、との共有があった。
- 共同作業計画書について環境省担当官は最終確認のうえ JECES と共有し、JECES よりインド側に改めて確認を依頼すること。また、永井様より、インド側から提供された初稿版を JECES と共有いただけることとなった。

1.6 インド側との連絡について

- 永井様より、Tiwari 様は秘書部門の方であり、オンライン会議の設定や日程調整等のロジを担当されていると思われる、との情報共有があった。人事異動の関係で、担当である Dubey 様は本件の詳細を把握していないため、メールの送信時は Tiwari 様含め局長以下全員を宛先に入れること、特に重要な事項の場合は Mathuria 課長に電話したほうが良いとの助言も頂戴した。
- また、永井様より、インドは反応が遅いため、メールは1度ではなく複数回送付し、かつ電話でフォローアップすることが必要である旨、助言を頂戴した。後日、永井様から Mathuria 課長の名刺をデータで共有いただくことになった（8月17日に永井様から環境省経由で JECES に情報共有済み）。

2. 業務ロジ

- 再委任等承諾申請書は予定がないため提出が不要。契約書は JECES から環境省の担当部門へ提出し、担当部門から浄化槽推進室に共有されることと承知しており、浄化槽推進室へ直接契約書の写しを提出することは不要。情報セキュリティ対策資料は他業務同様に印刷物で準備のうえ、対面にて提出すること。
- JECES は本打合せを踏まえて業務実施計画書を修正し、再度提出すること。
- JECES は業務工程表をより詳細な作業項目を抽出するよう修正し、再度提出すること。

3. その他

特になし

5.2. 第 2 回打合せ

| | |
|-----|--|
| 日 時 | 2023 年 11 月 27 日（月）13：30～ |
| 場 所 | 環境省 23 階会議室 |
| 出席者 | 環境省浄化槽推進室：沼田室長、佐藤係長、ホワン様 日本環境整備教育センター(JECES)：雲川、白川、鈴木 |

1. 第 1 回会議体会合プログラム

- JECES より第 1 回会議体会合のプログラムについて説明を行った。
- 環境省担当官より、インド側は所定の時間が延長する前提でプログラムを約 1 時間 30 分で組んでいるとのことだが、Agenda のどこで延長が発生するとインド側が考えているのか、質問があった。JECES より、どの部分が延長するのかはインド側に確認していないので分からないが、インドと会議をする際の特徴として、全体的に発言内容が冗長的で長くなる傾向があることを報告した。
- 環境省担当官より、会議の議事進行役は誰が行うのか質問があった。JECES より、日本側で会議を進行させて欲しいと伝えたが、インド側も司会者を立てたいとの要望があり担当者の Mr. Shubham Tiwari 氏がインド側の司会を務める予定であることを回答した。
- 環境省担当官より、最近、インド側が会議開催に向けて積極的な姿勢を見せるようになったが、第 2 回会議体会合の開催をインド側は前向きに検討しているということか、との照会があった。JECES より、インド側は 8 人目の会議体メンバーの追加について結局断念していることもあり、現状ではよくわからないと回答した。環境省より、セミナーを開催した後に正式にインド側に確認することになると思うが、第 1 回会議体会合の流れ次第では、その場で第 2 回会議体会合の開催についてお尋ねしても良いかと思う、とのコメントがあった。インド側が、12 月中に第 1 回会議体会合とセミナーを終わらせ、次年度のパイロットプロジェクトや第 2 回会議体会合を早めに計画したいという考えを持っている可能性について言及があった。
- JECES より、インド側の組織改編によって Mr. Shri Davendra Pratap Mathuria 課長が異動し、Mr. Shri Anup Kumar Srivastava が後任となり、会議体メンバーにもノミネートされていることを報告した。
- 環境省担当官より、パイロットプロジェクトの時期や規模、実施地域等、具体的情報を持っているか照会があった。JECES より、過去に前任の環境省担当官から伺った話によると、Jal Shakti 省で独自に予算を確保して浄化槽を面的に整備したいとのことであったが、最新情報を得ていないので現状の詳細は承知していないことを回答した。
- 環境省担当官より、第 1 回会議体会合を欠席する日本側メンバーはいるのか質問があった。

JECES より、会議体メンバー3名とも出席すること、協賛メンバーのうちハウステックと日吉は欠席することを報告した。JECES は、在インド日本大使館の永井様にも第1回会議体合会に出席いただけるか確認しておくこと。

- 環境省担当官より、第1回会議体合会のプログラム内に誤字があるので修正しておくこと、また永井様の Designation として FIST Secretary 記載しておくよう指示があった。
- 環境省担当官より、インド側協賛メンバーの Arvind Envisol Ltd. についてどういう会社か確認しておくよう指示があった。JECES より、インターネットで調べてみるが、第1回会議体合会の際に先方から発表資料をもらうことで情報が得られる可能性があることを回答した。
- 環境省担当官より、協賛メンバーの紹介が長くならないようインド側に事前に申し入れておくよう指示があった。
- 環境省担当官より、第1回会議体合会の冒頭で佐藤係長が日本側会議体メンバーを紹介する際の紹介文は JECES が提案書に記載した内容で問題ないか照会があり、JECES より、問題ない旨回答した。

2. セミナープログラム

- 環境省担当官より、第1回会議体合会でこのセミナーのプログラムが確定するのではないのか、との質問があった。JECES より、セミナーのプログラム案はインド側に共有しているが、インド側からは未だレスポンスがないので第1回会議体合会で確定できるかは見通せないことを回答した。
- 環境省担当官より、セミナーの発表者にも発表を依頼しなければならないので、なるべくなら第1回会議体合会で確定させること、もし第1回会議体合会で確定できなかった場合は、インド側と調整し11月中にプログラムを確定させるよう指示があった。
- 会議体メンバーの出欠について確認し、改めて環境省に報告する。

5.3. 第3回打合せ

| | |
|-----|---|
| 日 時 | 2023 年 12 月 6 日（水）10：50～11：30 |
| 場 所 | 環境省 23 階会議室 |
| 出席者 | 環境省浄化槽推進室：沼田室長、佐藤係長、ホワン様 日本環境整備教育センター(JECES)：雲川、武田、白川、鈴木 |

1. セミナー開催にあたって

(1) プログラムに関して

- JECES より、プログラムに記載されている日本側の協賛メンバーの発表者全員から発表に係る了承を頂いている旨を報告した。
- JECES より環境省が担当する2つのテーマの発表者について尋ねたところ、環境省担当官が2つのテーマ両方について発表すると回答があった。また、環境省担当官より、2つのテーマを連続して発表するため、10分及び8分の合計18分の持ち時間を合計15分にまとめるが、プログラムは変更しなくても良い旨、指示があった。

加えて環境省担当官より、浄化槽法に関する内容である2つ目のテーマについてはより重点的に解説を行ったほうが良いため、1つ目を7分とする予定であるとの共有があった。

- JECES より、環境省の閉会挨拶は誰が実施するのか質問し、環境省担当官より佐藤係長が行うと回答があった。

- 環境省担当官より、技術面に関する質問が多く出ることが想定されるため、環境省担当官による発表時間が3分短縮されることから、2回目の質疑応答を16分から3分延ばして19分としたほうが良いのではと提案があり、JECESは同意した。
- 環境省担当官より、現状のプログラムでは時間に余裕がないため、発表準備等で予定の時間から遅延するのを想定し、1回目の質疑応答の後に休憩時間を5分間設け、遅延した場合は休憩を挟まずに進行するのはどうかと提案を受け、JECESは同意した。
- 当日の司会進行担当は白川氏の予定。

(2) Zoomの事前登録に関して

- 環境省担当官より、セミナーは事前登録制か照会があり、JECESより、事前登録制にしていた別業務で開催した第11回ワークショップでは、メールアドレスの入力ミス等で参加用のZoomアドレスが届かないとの連絡を複数名の参加者から受けたため、事前登録制にすると円滑に参加が出来ないのではないかと考え、セミナーは事前登録制にしていないと回答した。
- 環境省担当官より、Zoomのアドレスは公開するのか照会があり、JECESよりHPに掲載して公開予定であることを回答した。環境省担当官より、Zoom会議参加用URLアドレスを知っていれば誰でも参加可能な状況は避けたほうが良い、参加者の属性等の情報も把握できないということか、と質問があり、JECESはご認識の通りであると回答した。
- 環境省担当官より、インド側で参加者の情報を取りまとめてもらえるのであれば事前登録制にしたりZoomアドレスを公開したりする必要はない、ジャル・シャクティ省にのみZoomアドレスを送付し、ジャル・シャクティ省からインド側の参加者に配布してもらえばいいのではと提案を受け、JECESは了承した。
併せて、属性情報を記載するフォーマットをJECESが作成しインド側に送付するよう環境省担当官より指示があり、JECESは了承した。

(3) セミナーの案内に関して

ジャル・シャクティ省以外にも本セミナーの案内をするかは環境省担当官が改めて検討し、追ってJECESに指示することとなった。

(4) 参加後のアンケートに関して

環境省担当官より、セミナーの評価と今後の参考のため、参加後の感想を求めるアンケートを作成するよう指示があり、JECESは了承した。アンケート機能を使うため、Webinarの形式で実施する予定。

2. その他

JECESより、セミナー開催前に打合せ（第4回業務打合せ）を行いたい旨を伝え、環境省担当官は了承した。追って開催に向けて日程調整を行うことに合意した。

5.4. 第4回打合せ

| | |
|-----|--|
| 日 時 | 2023年12月18日（月）15：00～16：00 |
| 場 所 | 環境省 23階会議室 |
| 出席者 | 環境省浄化槽推進室：沼田室長、佐藤係長、ホワン様 日本環境整備教育センター(JECES)：雲川、白川、鈴木 |

(1) 第1回会議体合議事要旨

- 第1回会議体合議事録にインド側会議体メンバーとして記録されていた在日本インド大使館のMr. Shishir Kothariについて、正式な会議体メンバーであるか、また、なぜ変更になっ

たのか、JECES はインド側に確認すること。併せて、JECES は、第 1 回会議体会合の録音を聞き返して確認すること。

- JECES は、共同作業計画書に記載があるパイロットプロジェクトの実施主体について、第 1 回会議体会合議事録においてインド側が記載した通りに修正のうえ、インド側に確認を求めること。

(2) セミナー

- JECES より 12 月 18 日時点で受領している発表資料について共有した。環境省担当官より、スライド番号が無い資料については JECES で番号を付したうえでウェブサイトに掲載すること。
- 日英同時通訳の質を高めるため、発表者からはなるべく読み原稿を受領すること。
- 12 月 19 日のセミナーでは発表者に時間厳守の旨周知を図り、司会を担当する JECES は、万一割り当てられた時間を超過した発表者がいた場合は強制的に次の発表に移行する。
- QA セッションについても同様に時間厳守の徹底を基本とするが、メーカー各社の発表の後に設けられた質疑応答セッションは多少延長しても問題ない。
- インド側から提供された出席者リストの人数が少なかったことから、Webinar 参加者向けのアンケートは実施せず、セミナー終了後にインド側、日本側が双方で質問やコメントを QA リストに取りまとめて両者がそれぞれ回答を作成すること。
- 第 1 回会議体会合の際はインド側で音声聞こえないという訴えがあったことから、今般のセミナー開催に当たっては、インド側に言語選択ボタンの操作をセミナーの冒頭でアナウンスすること。Zoom 会議のホストである JECES は、Webinar 参加者全員のステイタスをパネリストに変更し、発言及び画面の共有ができるようにすること。
- 万一、セミナーの中でインド側から第 2 回会議体会合の開催について言及があり何らか日本側の発言を促すような場面になった際は、佐藤係長に対応いただく。

(3) その他

- 2024 年 1 月 10 日から 21 日にかけて海外出張（ADBI 業務のインド現地調査）のため、JECES はメールへの返信等レスポンスが遅くなることを共有した。

第 6 章 資料編

6.1. 最終版の共同作業計画書

JOINT WORKING PROGRAM

The Ministry of the Environment of Japan and the Ministry of Jal Shakti of the Republic of India (hereinafter referred to as individually as a "Side" and collectively as "Both Sides") hereby describe this Joint Working Program in accordance with the "MEMORANDUM OF COOPERATION BETWEEN THE MINISTRY OF THE ENVIRONMENT OF JAPAN AND THE MINISTRY OF JAL SHAKTI OF THE REPUBLIC OF INDIA IN THE AREAS OF DECENTRALIZED DOMESTIC WASTEWATER MANAGEMENT" (hereinafter referred to as "the signed MOC"), which was signed on March 19, 2022.

This Joint Working Program describes the details for the implementation of the joint work which is carried out based on this Joint Working Program (hereinafter referred to as "Joint Work") and, if approved by the first annual meeting of the Management Council, a detailed document with a specific and detailed program table, etc. mentioned in the signed MOC (hereinafter referred to as "Detailed Document") will be prepared. After Both Sides agree to adopt a Detailed Document submitted to Management Council, the first Joint Work will be implemented based on the adopted Detailed Document. If Both Sides have the wish to initiate the second Joint Work, Both Sides will discuss and adopt an additional Detailed Document. Detailed Documents will be treated as Appendix to this Joint Working Program.

1. Objectives

Based on the signed MOC, Both Sides will pursue the collaboration by utilizing Japanese Johkasou Technology for the purpose of improving Indian water environment in the categories such as operation, maintenance, desludging and inspection, as well as the registration and licensing system for the above-mentioned categories, the performance testing evaluation system for Johkasou, and treatment and disposal of Johkasou sludge. The collaboration also includes information sharing on technologies and business models by Japanese Johkasou Manufactures, while bearing in mind that the capacity building of the private sector is also important, as Johkasou needs a periodic maintenance, in order to function properly.

2. Overview

Acknowledging the importance of proper treatment of wastewater generated in the rural area or specific buildings and facilities in the urban area which may cause adverse impacts on the water environment, as well as considering the fact that the Johkasou Technology has had advantages in improving water quality in Japan, and Japan has abundant experiences in managing wastewater especially in the rural area by utilizing Johkasou Technology, Both Sides see Johkasou Technology as fitting to be the center theme of the Joint Work, and seek to adopt Johkasou Technology to Indian buildings in as many areas as possible.

For the effective implementation of Joint Work, Both Sides will consult with each other to understand each side's circumstances in order to explore possible solutions. For that purpose, Both Sides will start holding a seminar as the first step of this Joint Work by communicating Both Side's situation relevant to the signed MOC, such as national policies and strategies, legal system for decentralized domestic wastewater

management, current status on domestic wastewater generation as well as its treatment and management, major problems or obstacles, and other information pertaining to water pollution. The seminar topics may include water quality monitoring system and its obtained data, etc., when appropriate.

3. Forms of Cooperation

(1) Seminars

- The first seminar will be held in virtual mode to share basic and wide-ranging information on decentralized domestic wastewater management and Johkasou, with presentations by experts to understand each activity in their own countries for further cooperation.
- After the successful completion of the first seminar, Both Sides proceed to the next step to hold seminars, the scope of which includes more specific theme raised by Both Sides.
- All the cost of the seminars will be borne by Japanese side, except for what is accrued internally in Indian side. It may include the cost for preparation of virtual format and coordination of the Indian speakers recommended from Both Sides.
- A seminar is expected to be held for 2 – 3 (two to three) hours. Due to the time difference between Both Sides, the Seminars will start in the morning in Indian time and in the afternoon in Japan time.

(2) Capacity building (Training, Workshop and the other mode of such cooperation)

- If one Side wishes to organize some training, workshop or other mode of cooperation for the capacity building, it will be well coordinated by Both Sides and adopted on mutually agreed basis.

(3) Pilot Project

- The details of pilot project are highlighted in Annexure II

(4) Other forms of cooperation

- If one Side wishes to organize other mode of cooperation, it will be well coordinated by Both Sides and adopted on mutually agreed basis.

4. Cooperating Partner

Each Side may designate a Cooperating Partner for supporting the implementation of each activity in various ways as mentioned in para 3 above.

The organization designated from the Indian side serves as the secretariat in implementing the activities carried out under this Joint Working Program, by putting a cell exclusively (hereinafter referred to as “Indian Secretariat”). The organization designated from the Japanese side also serves as the secretariat in implementing the activities carried out under this Joint Working Program, by commissioning from the Japanese side (hereinafter referred to as “Japanese Secretariat”).

5. Beneficiaries

The implementation of the objectives of MOC, which is specified in this Joint Working Program, will help India achieve Sustainable Development Goals 6, target 6.3, while Japan will be benefited by way of helping India achieve the above-mentioned goal and target in this clause.

6. Role of Both Sides

Both Sides will bear an equally shared responsibility to manage and execute the Joint Work, which leads to Both Sides' necessity in obtaining the other side's consent if one Side wishes to initiate the Joint Work.

However, each Side has the right to propose and lead the Joint Work if it wishes so, after the concurrence of the other side. The latter will cooperate accordingly.

Both Sides will manage each side's participants represented by each government, and the venues if necessary, for the smooth implementation of the Joint Work.

7. Role of the Secretariat

The Secretariat will share draft Detailed Documents received from drafting Side to the other Side, after necessary clarification or adjustments of the text of the draft Detailed Documents in coordination with the drafting Side, subsequently further coordinate with the drafting Side by taking into consideration the comments received from the other Side, and then finalize the draft Detailed Documents for approval by Management Council. The Secretariat will undertake other necessary coordination in implementing the Joint Work.

7. Miscellaneous

Other terms and conditions are conformed to the signed MOC.

Annexure I

This Annexure I, describing the contents of the Joint Work in the form of a seminar, is treated as Detailed Document with the adoption by the Management Council, which was held on XX, XX, 2023. Subsequently, the Secretariat considers and finalizes the presenters and details such as title/contents/duration of each designated presentation.

< Contents for the Seminar >

- a) Introduction of current status of domestic wastewater treatment and its management for centralized and decentralized treatment system, presented by Both Sides.
- b) Video presentation on Johkasou (general overview and maintenance), presented by Japanese Side.
- c) Introduction of structure, function and performance evaluation testing system for the Johkasou, presented by Japanese Side.
- d) Introduction of legal system for decentralized domestic wastewater management in Japan including the Johkasou Act, presented by Japanese Side.
- e) Introduction of operation and maintenance, cleaning, inspection, license and sludge management for Johkasou, presented by Japanese Side.
- f) Introduction of technology and overseas business by Johkasou Manufactures, presented by Japanese Side.

Annexure II

This Annexure II, describing the contents of Joint Work in the form of a Johkasou pilot project. The scope of work of pilot project is not be administered by Management Council. However, as per point 4 of Paragraph IV of the signed MOC, Management Council may provide advice and support for Johkasou pilot project to be implemented by the Ministry of Jal Shakti.

In this regard, details of pilot project have been highlighted below:

- a) Name of the Promoter of pilot project: Ministry of Jal Shakti Government of India
- b) Technology of the pilot project: Johkasou
- c) Management Council consists of Both Sides, provides advice, and provides support only without incurring any cost for implementation.

6.2. 第 1 回会議体会合プログラム



1st Management Council Meeting Agenda

| | |
|-------------------------|---|
| Date | November 29, 2023 |
| Time | 12:30-14:30 IST in Indian time (16:00 ~ 18:00 in Japan time) |
| Venue | Online via Zoom https://zoom.us/j/91966917597 |
| Participants | Both sides of Management Council members and Associate members |
| Language | Simultaneous interpretation (English / Japanese) |
| Agenda Items | <ol style="list-style-type: none">1. Introduction on Both sides of Management Council members cum Approval of Associate members2. Keynote Speeches (from both sides)3. Approve the Joint Working Program and the 1st Seminar program4. Presentation from the Associate members of both the sides <p><i>(Detailed Agenda is outlined on the subsequent page)</i></p> |

Detailed Agenda

| Agenda Item | Personnel | Time (IST) | Time(JST) |
|--|--|------------|-----------|
| <i>Agenda Item 1 - Introduction on Both sides of Management Council members cum Approval of Associate members</i> | | | |
| Welcome address and brief introduction of the members from the Indian side | Shri Dheeraj Joshi Deputy Secretary, NMCG | 12.30 p.m. | 16.00 |
| Welcome address and brief introduction of the members from the Japanese side | Mr. Ryoma Sato Section Chief, Office for Promotion of Johkasou | 12.32 p.m. | 16.02 |
| Introducing the Agenda for 1 st MOC Meeting | Both sides | 12.35 p.m. | 16.05 |
| <i>Agenda Item 2 - Keynote Speeches from both sides</i> | | | |
| Keynote Address – Indian side | Shri Pradeep Kumar Agarwal Joint Secretary (NRCD) | 12.40 p.m. | 16.10 |
| Keynote Address – Japanese side | Mr. Masaki Numata Director, Office for Promotion of Johkasou | 12.50 p.m. | 16.20 |
| <i>Agenda Item 3 - Approve on the Joint Working Program and the 1st Seminar program</i> | | | |
| Introduce the Joint Working Program and the 1st Seminar program | Ms. Thi Mai Hoang Senior Environment Expert of Office for Promotion of Johkasou | 01.00 p.m. | 16.30 |
| Discussions between MOC members from both sides | | 01.02 p.m. | 16.32 |
| <i>Agenda Item 4 - Presentation from the Associate members of both sides</i> | | | |
| Presentation from Arvind Envisol Ltd. (Temporary Member) | Mr. Amit Shah Head Global, Arvind Envisol Ltd. | 01.15 p.m. | 16.45 |
| Presentation from Sintex BAPL Ltd. (Temporary Member) | Mr. Naveena Nand Upadhyay Deputy General Manager-R&D, Design, Sintex BAPL Ltd. | 01.20 p.m. | 16.50 |
| Presentation from Daiki Axis India Pvt. Ltd. (Temporary Member) | Mr. Kamal Tiwari CEO, Daiki Axis India Pvt. Ltd. | 01.25 p.m. | 16.55 |
| Presentation from Kubota Johkasou System Co., Ltd. (Temporary Member) | Mr. Yoshito Kitai, Deputy Manager, Kubota Johkasou System Co., Ltd. | 01.30 p.m. | 17.00 |
| Presentation from FujiClean Co.,Ltd (Temporary Member) | Mr. Yosuke Tabata, Ph. D., Executive Officer, Overseas Business Group, FujiClean Co.,Ltd | 01.35 p.m. | 17.05 |
| Presentation from Daiki Axis Co., Ltd. (Temporary Member) | Mr. Kazuo Saeki, Ph. D., Manager, Daiki Axis Co., Ltd. | 01.40 p.m. | 17.10 |
| Presentation from Housettec Inc. (Temporary Member) | Video broad cast | 01.45 p.m. | 17.15 |
| Presentation from Hiyoshi Corporation (Temporary Member) | JECES will introduce the website of the company briefly | 01.50 p.m. | 17.20 |
| <i>Announcement from the secretariat</i> | | | |
| Confirmation items and future steps ♦ Schedule for the Seminar ♦ Schedule for the 2 nd MCM | Secretariat of Japan side | 01.55 p.m. | 17.25 |
| <i>Vote of Thanks</i> | | | |
| Vote of Thanks, Indian Side | Deputy Secretary, NMCG | 02.00 p.m. | 17.30 |
| Vote of Thanks, Japanese Side | Mr. Ryoma Sato Section Chief, Office for Promotion of Johkasou | 02.03 p.m. | 17.33 |

Objectives of the Management Council

The Management Council (MC) is established as per provision of the Memorandum of Cooperation signed between The Ministry of the Environment of Japan and The Ministry of Jal Shakti of the Republic of India (MOC) to implement this MoC by formulating detailed activities of collaboration and the monitoring of its progress.

Indian side of Management Council Members

| No | Designation | Organization / Institution | Name |
|----|--------------------------------------|---|----------------------------|
| 1 | Joint Secretary | National River Conservation Directorate | Shri Pradeep Kumar Agarwal |
| 2 | Executive Director (Technical) | National Mission for Clean Ganga | Shri Anup Kumar Srivastava |
| 3 | Deputy Secretary | National Mission for Clean Ganga | Shri Dheeraj Joshi |
| 4 | Director (Technical) | National Mission for Clean Ganga | Dr. Pravin Kumar |
| 5 | Director, Swachh Bharat Mission (G) | Swachh Bharat Mission | Dr. Anupama |
| 6 | Professor | Indian Institute of Technology Roorkee | Prof. A. A. Kazmi |
| 7 | Head of Chancery & Political Officer | Embassy of India, Tokyo | Ms. Madhuri Gaddam |

Japanese side of Management Council Members

| No | Designation | Organization / Institution | Name |
|----|--|---|-----------------------------|
| 1 | Director of Office for Promotion of Johkasou (Leader –Japanese side) | Office for Promotion of Johkasou, Waste Management Division, Environmental Regeneration and Material Cycles Bureau, Ministry of the Environment Government of Japan | Mr. Masaki Numata |
| 2 | Section Chief of Office for Promotion of Johkasou (Sub Leader – Japanese side) | Office for Promotion of Johkasou, Waste Management Division, Environmental Regeneration and Material Cycles Bureau, Ministry of the Environment Government of Japan | Mr. Ryoma Sato |
| 3 | Professor Knowledge Partner | Former Professor, Saitama University | Mr. Kiyoshi Kawamura, Ph. D |
| 4 | Professor Knowledge Partner | Assoc. Prof, Research Center for Advanced Science and Technology, The University of Tokyo | Mr. Ikuro Kasuga, Ph. D |
| 5 | Researcher Knowledge Partner | Manager, Planning Division (International Coordination Office), National Institute for Environmental Studies (NIES) | Mr. Yoshitaka Ebie, Ph. D |
| 6 | Senior Environment Expert of Office for Promotion of Johkasou | Office for Promotion of Johkasou, Waste Management Division, Environmental Regeneration and Material Cycles Bureau, Ministry of the Environment Government of Japan | Ms. Thi Mai Hoang |
| 7 | First Secretary | Embassy of Japan in India | Ms. Mihoko Nagai |

Indian side of Associate Members (Temporary members)

| No | Designation | Organization / Institution | Name |
|----|--|---|---------------------------|
| 1 | Head Global | Arvind Envisol Ltd. | Mr. Amit Shah |
| 2 | Deputy General Manager- R&D, Design | Sintex BAPL Ltd. | Mr. Naveena Nand Upadhyay |
| 3 | CEO | Daiki Axis India Pvt. Ltd. | Kamal Tiwari |
| 4 | Associate Professor/Director | Hokkaido University/ Global Land Programme | Dr. Ram Avtar |

Japanese side of Associate Members (Temporary members)

| No | Designation | Organization / Institution | Name |
|----|---|----------------------------------|-----------------------------|
| 1 | Manager | Daiki Axis Co., Ltd. | Mr. Kazuo Saeki, Ph. D |
| 2 | Executive Officer, Overseas Business Group | FujiClean Co.,Ltd | Mr. Yosuke Tabata, Ph. D |
| 3 | Manager | Housetec Inc. | Mr. Koji Tsukamoto |
| 4 | Deputy Manager | Kubota Johkasou System Co., Ltd. | Mr. Yoshito Kitai |
| 5 | Chief, Research and Development Planning Office | Hiyoshi Corporation | Mr. Kazuhiko Matsui |

6.3. 第 1 回会議体会合における発表資料

6.3.1. ジャル・シャクティ省の紹介



First Management Council Meeting

Ministry of Jal Shakti,
Government of India and Ministry
of The Environment, Government
of Japan

Cooperation for Decentralized Domestic Wastewater Management

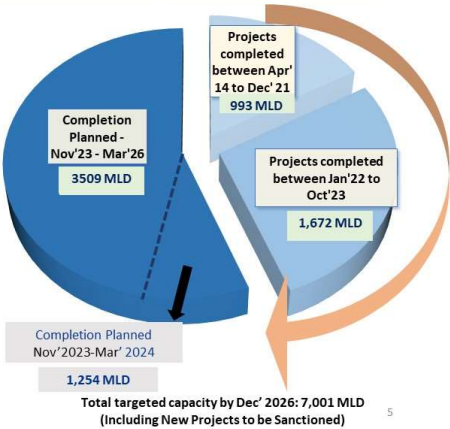
Under Namami Gange Programme three project with a total capacity of 1.92 MLD on Jhokhasou Technology has been sanctioned in Udham Singh Nagar, Rudraprayag and Rishikesh district of Uttarakhand

| S. No. | State | Town | No. of STPs | Capacity (MLD) | AA&ES Cost Rs. In (Cr) |
|--------|-------------|-------------------------|-------------|----------------|------------------------|
| 1 | Uttarakhand | Udham Singh Nagar | 3 | 1.3 | 199.36 |
| 2 | | Gaurikund & Tilwada | 5 | 0.32 | 23.37 |
| 3 | | Muni Ki Reti, Rishikesh | 1 | 0.3 | 94.06 |
| | | Total | 09 | 1.92 | 316.79 |

Namami Gange Projects

Total capacity of 6,174 MLD (195 projects) is sanctioned under Namami Ganga up to October 2023

| Time Period | Sewage Capacity Created/ to be Created (MLD) |
|---|--|
| Completed April 2014 – December 2021 | 993 |
| Completed January 2022 – October 2023 | 1,672 |
| Completion Planned November 2023 – March 2026 | 3,509 |
| Total | 6,174 |

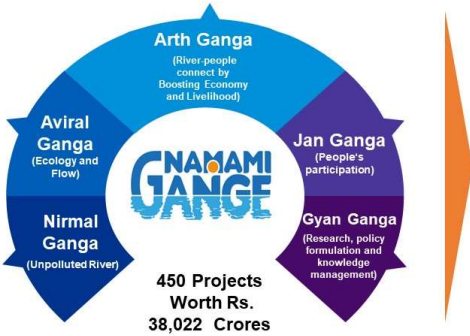


Namami Gange at a Glance

An integrated river rejuvenation mission for the Ganga River Basin

VISION: The Vision for Ganga Rejuvenation constitutes restoring the wholesomeness of the river defined in terms of ensuring "Aviral Dhara" (Continuous Flow), "Nirmal Dhara" ("Unpolluted Flow"), Geologic and ecological integrity

Five pillars of Namami Gange



Components of the programme

| Component | No of projects | Sanctioned Cost (Rs Cr) |
|-----------------------------------|----------------|-------------------------|
| Sewerage Infrastructure | 195 | 31,344 |
| Ghats and River front development | 104 | 1,734 |
| Solid waste management | 12 | 295 |
| Institutional Development | 29 | 1,764 |
| Research and public outreach | 37 | 260 |
| Biodiversity and Afforestation | 51 | 764 |
| Bioremediation | 15 | 239 |
| Rural sanitation | 1 | 1,421 |
| Others | 6 | 200 |
| Total | 450 | 38,021 |

Key Government Schemes in Indian Water Sector

Historical moment for water management in India
Formation of Ministry of Jal Shakti in 2019,
 bringing all Major departments of the government dealing with water under the aegis of one Ministry



| Implementation period | 2014 - ongoing | 2015 - 2020 | 2019 - 2024 | 2020 - 2026 | 2021-2026 | 2021 - 2026 |
|-----------------------------------|----------------|-------------|-------------|-------------|-----------|-------------|
| Estimated budget (USD in Million) | 4,000 | 3,000 | 50,000 | 790 | 17,000 | 8,000 |

Union Budget FY 2023-24, approx. **USD 12 Billion** allocated to Ministry of Jal Shakti

CATCH THE RAIN campaign in 2021 saw **4.8 million RWHS** created/ maintained at **USD 9 Bn**

Key schemes in sewage treatment – Namami Gange, SBM(G), AMRUT



Key Funding Sources

Central government

- Ministry of Jal Shakti
- Ministry of Housing and Urban Affairs
- Ministry of Environment, Forest and Climate Change; others

State governments

- State Urban development
- Rural water and sanitation departments
- PHED/ Municipal Corporations/ ULBs

International Financial Institutions

- JICA
- The World Bank Group
- Asian Development Bank
- DFID; others

1st Management Council Meeting

| | |
|---------------------|---|
| Date | November 29, 2023 |
| Time | 12:30-14:30 IST in Indian time (16:00 ~ 18:00 in Japan time) |
| Agenda Items | <ol style="list-style-type: none"> 1. Introduction on Both sides of Management Council members cum Approval of Associate members 2. Keynote Speeches (from both sides) 3. Approve the Joint Working Program and the 1st Seminar program 4. Presentation from the Associate members of both the sides |



6.3.2. インド側協賛メンバー Arvind Envisol Ltd.による発表



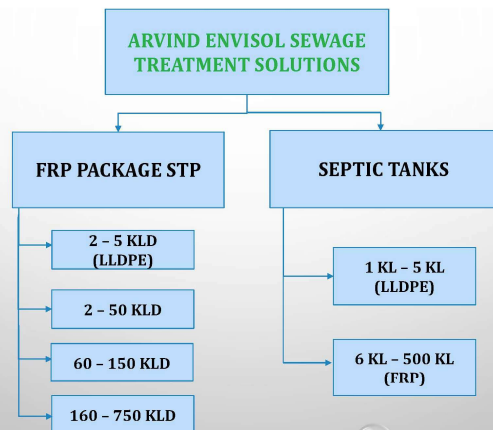
ABOUT US ENVISOL - A PART OF ARVIND LIMITED (LALBHAI GROUP)



Arvind Limited, a part of The \$1.8 billion Lalbhai Group was incorporated in 1931 and is in the businesses of Textiles - fabric & garment manufacturing , Branded apparel & Retail , Environment Solutions, Agriculture, Engineering and Real Estate.

Established in 2011, Arvind Envisol is a world class water management company providing end to end solutions for water treatment, industrial waste water treatment, sewage treatment, zero liquid discharge solutions at minimal costs.

SOLUTIONS OFFERED BY ARVIND ENVISOL LTD.



WHY 'FRP?'



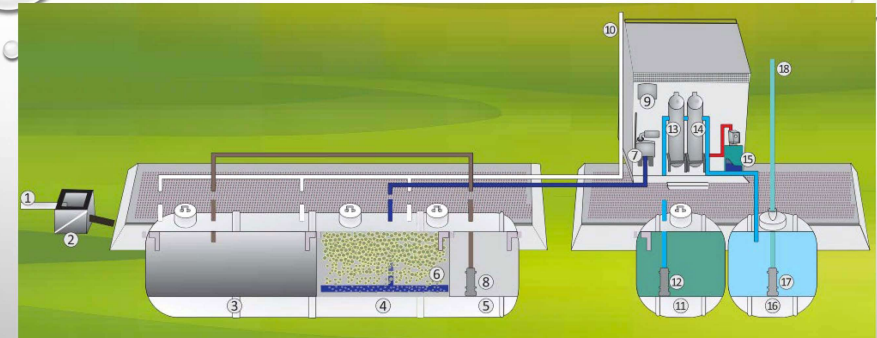
- Arvind STP & Septic Tanks are housed in specially designed highly durable FRP(Fiber Reinforced Plastic) Tanks, which are best suited for Sewage Applications.
- Arvind FRP Tanks are made by using suitable polyester resin (Isophthalic Unsaturated Resin) and glass fiber.
- The tanks are specially designed for Under Ground applications have hollow ribbing of polymeric material encased on the outside of the tank with suitable polyester resin and fiberglass, to give lateral strength and extra protection. The tanks have shell thickness of 9.0 ± 0.5 mm to make them capable to sustain an overburden of 2.30 meter of soil on top.
- Each Tank is Leak Proof & Corrosion Proof which makes it highly durable & best suited for making Septic Tank/STP/Collection Tank esp. for Underground Applications, with no chance for ground water contamination.
- Each Tank is Air-Tight making it suitable for maintaining Anaerobic conditions in Septic Tank & Package STP even if the above temperature is in sub- zero.
- Each tank is factory made and necessary tests are conducted before dispatch, so quality is ensured.

CII/IGBC GREEN PRODUCT CERTIFICATION



Envisol
POWERED BY ARVIND

SCHEMATIC DIAGRAM OF PACKAGE STP



1 - INFLUENT

2 - BAR SCREEN CHAMBER

3 - ANAEROBIC & ANOXIC ZONE

4 - AEROBIC MBBR ZONE

5 - SEDIMENTATION ZONE

6 - MBBR MEDIA

7 - AIR BLOWERS

8 - SLUDGE RECYCLE PUMP

9 - CONTROL PANEL

10 - AIR VENT

11 - FILTER FEED TANK

12 - FILTER FEED PUMP

13 - MULTI GRADE FILTER

14 - ACTIVATED CARBON FILTER

15 - DISINFECTION

16 - TREATED WATER TANK

17 - TREATED WATER PUMP

18 - REUSE

Envisol
POWERED BY ARVIND

Envisol
POWERED BY ARVIND

Process Principle of PSTP

Envisol
POWERED BY ARVIND

Primary treatment:

Pre-treatment removes materials that can be easily collected from the raw sewage before they damage or clog the pumps and sewage lines of primary treatment clarifiers (trash, tree limbs, leaves, branches etc.).

The influent sewage water passes through a bar screen to remove all large objects like cans, rags, sticks, plastic packets etc. carried in the sewage stream.

First stage transforms the solids in raw sewage to settled solids while allowing scum to float on the surface. It is a zone in which settled sludge is stabilized by anaerobic digestion wherein the F/M Ratio is maintained by returning activated sludge from the final sedimentation zone to the anaerobic zone. Due to anaerobic digestion the BOD reduction is around 30-40%.

Water then enters anoxic zone and denitrification of the wastewater stream is accomplished. In the denitrification process, anoxic microbes break down existing nitrates, which results in the release of inert nitrogen gas into the atmosphere. Due to anoxic treatment free ammonia is achieved as per CPCB norms.

Secondary Treatment:

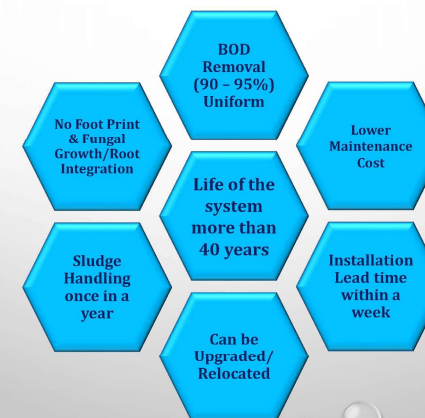
The sewage from the solid separation zone flows to the aeration zone. Air is diffused with help of air blowers which will encourage the growth of bacteria cultures in and around the Floating plastic media inside the aeration zone. The MBBR media provides extended surface area for growth of microorganisms. Due to aerobic digestion the BOD reduction is around 60-65%.

The next step of treatment involves the sedimentation where organic wastes are settled in the zone. The settled waste in the bottom of the tank is pumped back to the anaerobic zone as a return sludge, to ensure that quality of effluent would pass the stipulated sewage parameters.

Tertiary treatment:

The secondary treated sewage is then passed through Pressure Sand Filter where in suspended solid is removed around 90-95% & Activated Carbon Filter helps in further removal of color & Odor. The treated water is then disinfected using Sodium Hypochlorite dosing system which is an oxidation process, which in turn supports in further reduction of BOD levels before reuse.

MAIN FEATURES OF ARVIND PACKAGE STP SYSTEM



Envisol
POWERED BY ARVIND

COMPARISON OF ARVIND PACKAGE STP VS. CONVENTIONAL STP

Envisol
POWERED BY ARVIND

| Sr. No. | Properties | Prefabricated Arvind FRP-STP | Conventional STP in MSFRP/RCC |
|---------|---------------------------------------|--|--|
| 1 | Technology | 3rd Generation MBBR/Johkasou Technology | 1 st Generation MBBR Technology |
| 2 | MOC | Fiber Reinforced Plastic Tanks (FRP) | Conventional method of construction in RCC/MSFRP. |
| 3 | Shell Thickness of Tank (Body) | 9.5-10.5 mm (Tank can sustain more Overburden Capacity of Soil & indirectly can work at comparatively more Invert Level) | No standardization followed, Varies from contractor to contractor. Manipulation possible. |
| 4 | Application | Can be installed both above-ground & underground. No leakages as factory made and the MOC characteristics. | Can be installed on ground or below ground, however, leakages are very common in these tanks due to various reasons. |
| 5 | Partitions | Strong dish end curved partitions with stiffener | No standardization followed, Varies from contractor to contractor. Manipulation possible. |
| 6 | Minimum Load/Sewage flow | Works from no load to peak load. It is designed to take shock load for 4 hours in the morning & evening respectively | 30 -40% minimum load required. Can take shock load of maximum 2 hours only |

COMPARISON OF ARVIND PACKAGE STP VS. CONVENTIONAL STP

Envisol
POWERED BY ARVIND

| Sr. No. | Properties | Prefabricated Arvind FRP-STP | Conventional STP in MSFRP/RCC |
|---------|---------------------------------|--|---|
| 7 | Anoxic Zone | Additional Anoxic Zone facilitates Nitrogen & Phosphorous removal achieved in treated sewage parameters is as per PCB/NGT Norms | Denitrification process is very slow and not as effective required as per the requirement Govt. guidelines |
| 8 | Sludge Recycling | Activated sludge is pumped back in anaerobic zone every 2 hours for 2 minutes from final sedimentation zone. This helps in increasing the effectiveness of the system by reducing sludge & O&M | Sludge removal varies from 15 days to 12 months. Sludge treatment, chemicals and units are must. |
| 9 | Hydraulic Retention Time | Tank capacity is more. HRT is 18-22 Hr, (BOD, COD & TSS removal efficiency increases) | Tank capacity is less. HRT is 8-16 Hours (BOD, COD & TSS Removal efficiency comparatively low) |
| 10 | Air Blower Type | Ring Blower (O2 stage) (Low maintenance cost consumes less electricity, no oiling & greasing required for these blowers, decibel is 40-50 dB) | Twin Lobe Blower (High Maintenance Cost along with regular oiling & greasing, consumes more electricity. So comparatively higher O&M costs) |

COMPARISON OF ARVIND PACKAGE STP VS. CONVENTIONAL STP

Envisol
POWERED BY ARVIND

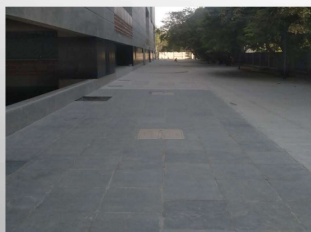
| Sr. No. | Properties | Prefabricated Arvind FRP-STP | Conventional STP in MSFRP/RCC |
|---------|------------------------------------|--|--|
| 11 | Yearly Treatment Efficiency | Consistent efficiency throughout the year. | Seasonal variation is observed |
| 12 | Monitoring | No monitoring of MLSS & F/M ratio | Constant monitoring of MLSS is required. |
| 13 | Sludge Handling | Sludge handling required once in year. | Sludge handling once in 15 - 30 days |
| 14 | Supervision | Skilled supervision not required. | Continuous skilled monitoring required. |
| 15 | Electrical Consumption | 50%-70% electrical saving compared to conventional STP | It consumes higher electricity than Arvind STP |
| 16 | MOC Depreciation | Leak proof, no root integration and no fungal growth | The Material of Construction causes fungal growth and leaks after 1 year |
| 17 | Project timeline | Installation lead time within a week to 15 days. | Construction work takes around four -six months |
| 18 | Upgradation | It can be upgraded and relocated. | No such scope available |
| 19 | Life | FRP tank life is more than 40 years. | Life of the system around 10 years |

IMAGES

Envisol
POWERED BY ARVIND



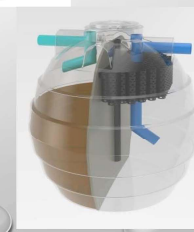
IMAGES



Envisol
POWERED BY ARVIND

ADVANCE SEPTIC TANKS

- Made of specially designed & durable LLDPE Tanks.
- Available in capacity range between 1200 Lit (1.2 KL) to 5000 Lit (5 KL).
- A special design which helps the solids in sewage to properly settle down by providing optimum retention time and in decomposition of organic matter due to optimum anaerobic conditions.
- The tank is divided in to 2 Zones:
 - First Zone: Accepts the wastewater from all domestic activities (bath area, toilets, kitchens etc.). Major role is separation of scum, solids & water by sedimentation and anaerobic decomposition.
 - Second Zone: Contains specially designed floating pall ring media which provide extended surface area for micro-organisms to grow, which enhances BOD removal
- Life Span of more than 25 years.
- Rust Proof and Leak Proof Completely
- water tight & air-tight
- Excellent performance through enhanced reduction of BOD
- Light Weight
- Easy to install
- Can be easily Relocated



Envisol
POWERED BY ARVIND

OUR CLIENTS

Infosys®
Navigate your next

Reliance
Industries Limited

ITC Limited

Alembic
Touching Lives over 100 years

Envisol
POWERED BY ARVIND
AUDA
ANANDRAJAN AMBANI DEVELOPMENT AUTHORITY

Ambuja Neotia

DECATHLON
SPORT FOR ALL - ALL FOR SPORT

DRDO
DEFENCE RESEARCH ORGANISATION
MINISTRY OF DEFENCE

Indian Oil tanking

Godrej agrovet
Smarter Farming

emami*

DEVELOPMENT AUTHORITY
RESEARCH

Radisson BLU

INDIA RAILWAYS
RAILWAY BOARD
RAILWAY ZONE

Haldiram's

UPL
OpenAg™

GATE
गति का गुरुद्वारं गुरुम्

MILACRON®
We Build Productivity

AND MANY MORE...

Envisol
POWERED BY ARVIND

Thank
you

Envisol
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6.3.3. インド側協賛メンバー Sintex BAPL Ltd.による発表

SINTEX ENVIRONMENTAL SOLUTIONS

Sintex
by Welspun®

PROFILE

Sintex is Pioneer in Plastics Technology Solutions
Provider Serving Multi Industries and Markets

- Trusted Brand by billions for 04 decades
- Providing innovative products and solutions
- 07 state-of-the-art manufacturing facilities in India
- In-house Research & Development facility
delivering critical applications in diversified Industry segments
- Largest distribution network having global footprints
- After sales service support

WELSPUN GROUP
Leading Tomorrow Together

Sintex

SINTEX PRODUCT RANGE



PE Overhead water storage tank
(capacity 0.1KL to 25 KL)



Loft tanks for indoor applications



SMC /GRP/FRP Tank for Water storage
(capacity Range 1KL to 1200 KL)



FRP Underground Water Storage
Tank
(capacity 10 KL to 50 KL)



Packaged STP Systems & Septic
Tanks
(capacity - 1.2KLD to 1000KLD)



Unitized Bio-Gas Systems
(capacity - 1 KL to 20KL)



UPVC Doors & Interiors products



Chemical Storage Tanks
made of PE



FRP Fuel Storage Tanks
(capacity -10 KL to 50KL)

WELSPUN GROUP
Leading Tomorrow Together

Sintex

PLASTIC PRODUCTS - DISTRIBUTION NETWORK AND OFFICES



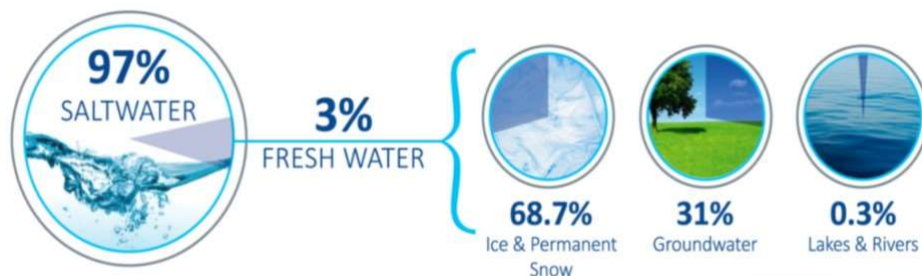
- ✓ 2000 + Distributors
- ✓ 25000 + retailers

WELSPUN GROUP
Leading Tomorrow Together

- HO Office
- Branch Office
- Manufacturing Unit
- Distribution network

Sintex

Usable water Availability



WELSPUN GROUP
Leading Tomorrow Together

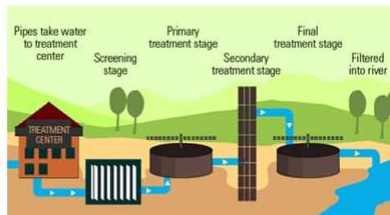
Sintex

WHY STP NEEDED ??

The main goal of a sewage treatment plant is to treat the Wastewater and make it safe for human and environmental contact. Physical processes can either treat the Wastewater like solid-liquid separation or biological functions like aerobic digestion.

A sewage treatment plant needs to meet several requirements, including withstanding environmental factors like weather and earthquake zones. It also needs to have the capacity to treat Wastewater, be energy efficient, and produce a minimal amount of waste.

It is a system that is used to clean and purify Wastewater that is discharged into the environment. The main goal of a sewage treatment plant is to protect the environment from water pollution by removing contaminants such as bacteria, nutrients, chemicals and particulates. Whether it is from a commercial building or industrial site, wastewater needs to be cleaned before it is discharged. A sewage treatment plant can help with this process.



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Water Crisis

India is the second most populous country in the world, with more than 1 billion citizens. The scale of safe water need in India is immense. Many locations in India face water scarcity, thus it becomes necessary to store the water.

About 26% of India's population practices open defecation, a critical factor contributing to water-borne illness, stunting, and death.

These factors have created unprecedented urgency to implement effective solutions, to increase access to safe water.

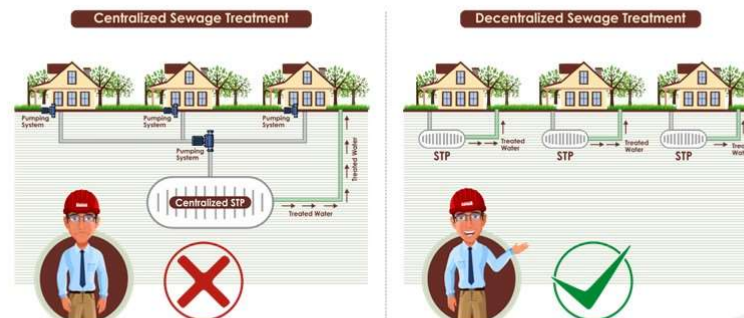


WE HAVE PLAYED A SIGNIFICANT ROLE IN INDIA'S PROGRESS TOWARD IMPROVED WATER AND SANITATION, EMPOWERING MILLIONS OF PEOPLE WITH ACCESS TO SAFE WATER.

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Merits of Decentralized STP



A decentralised Sewage Treatment approach ensures treatment of wastewater close to the point of generation thus saving **Power & Cost** as there is no need to Pump the Sewage to a distant centralised location.

A Centralised STP needs skilled manpower for operations unlike a Sintex STP which functions without the need of any operator.

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VARIOUS PACKAGED STP SOLUTIONS AVAILABLE WITH SINTEX

| With Material | With Technology |
|--|-------------------------------|
| ROTOMOULDING POLYETHYLENE TANKS -CAPACITY RANGES (1.2 KLD to 6 KLD) | Moving Bed Bio Reactor (MBBR) |
| FIBRE – REINFORCED PLASTIC- FRP (CHOP HOOP WINDING PROCESS) CAPACITY RANGES (10 KLD to >150 KLD) | |



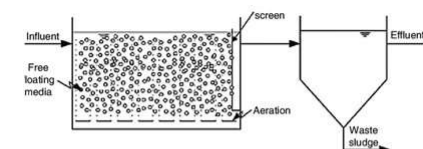
FEATURES OF SINTEX PACKAGED STP :

- **Process:** Dual filtration using aerobic and anaerobic water treatment process helps in achieving required level of output in terms of BOD, COD, STT etc.
- **Decentralized:** It is a better investment in terms of energy consumption and efficiency when compared to a centralized wastewater treatment.
- **Durability / Lifespan:** FRP based material that is durable (Rustproof, leak-proof, RIB design etc) and lightweight, combined with technology requiring little intervention in terms of maintenance provides the system with a long life span of 50 years.
- **Leadtime:** The system is composed of pre-fabricated components optimizing packaging, transportation and installation. The complete system can be installed within few days in compared to other alternate which might take months.
- **Relocation:** The option of relocation is available with Sintex PSTPs unlike other alternates.
- **Easy Operation at less cost:** The system works on gravity requiring less pumping, auto mode working of pumps and the sludge removal intervals are as high as 2 years making it less prone to maintenance. Also no special skills are required to operate the system.
- **Odorless:** Sub ground structure makes it less prone to odor, occupant friendly.
- **Zero foot print:** Our STPs are sub-round structures occupying almost no space on the ground other than small pump room at convenient location. Ground STP structures are mostly eyesore to the occupants.



Sintex PWTs is based on MBBR TECHNOLOGY similar to ZOHKASU TECHNOLOGY

This technology is essentially the same as activated sludge except that the media suspended in the reactor offers additional surfaces for the microbes to grow and this in turn maximizes the growth of microbes in a given volume of aeration tank compared to the conventional aeration without the media and to that extent, it does appear preferable. Diffused aeration is of course needed.



MBBR-MEDIA, SPECIAL MADE IN SINTEX HOUSE

With Bio Film



NBF Series-Packaged Sewage Treatment Plant

Compacts System designed in a Single FRP/LLDPE shell divided in compartment which converts Sewage to re-usable water

Based on Advanced MBBR Technology

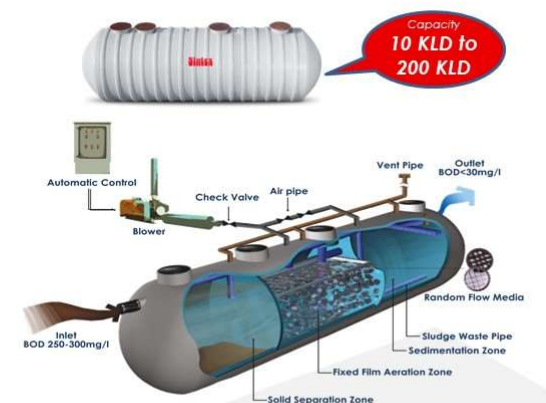
Reduces BOD (Biological Oxygen Demands) up to **95%**

No-Leakage in the tank: hence no soil pollution

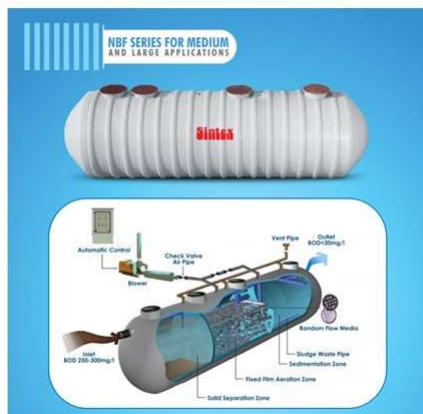
Completely **concealed system**, No-odor released directly to the environment

Easy to Install, operate and Easy to Relocate

Since it is installed underground hence **maximum utilization of ground Surface**



PSTP's- Operational Principle



OPERATION PRINCIPLE

1 Solid Separation Zone (Anarobic Zone)

First stage transforms the influent solids to settled solids while allowing scum to float on the surface. It is a primary sedimentation zone in which settled sludge is stabilized by anaerobic digestion. The treatment efficiency of the chamber is in the range of 30% BOD removal.

2 Aeration Zone (Aerobia Zone)

Second stage is the aerobic zone along with plastic media inside the tank which in turn increases the surface area and retains micro-organism long enough to digest the organic substance. Clear water overflows to the next treatment chamber. Air is provided through blowers and higher contact time with the Bio-film on the plastic media facilitates efficient digestion. BOD removal is around 60%.

3 Final Sedimentation Zone

Final stage involves sedimentation where organic waste are settles in the sedimentation zone. The settled waste in the bottom is pumped back to the solid separation zone as a return sludge having active biomass (MLSS) to increase the efficiency of the system. The output from this zone is effluent that meets the stipulated PCB's Standards.

4 Optional

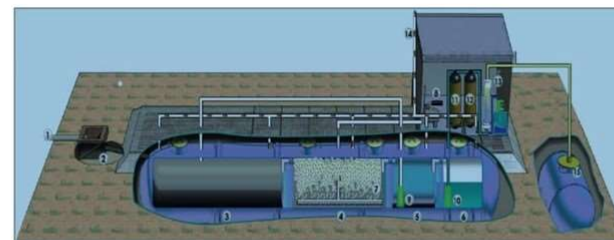
For more stringent effluent parameter, we also offer Tertiary Treatment Plant (TTP) addition to the system which does the job of filtration that further improves effluent.

Advantages

Sintex PSTP vs other STP

| Sr. No. | Prefabricated Sintex FRP-PSTP | R.C.C./ MSFRP - Conventional STP |
|---------|---|---|
| 1 | Aesthetic appearance. | Cleanliness is compromised due to foul smell and flies. |
| 2 | leak proof, no root integration and no fungal growth. | Possible in Conventional STP. |
| 3 | Installation lead time within a week. | Construction work takes around six months. |
| 4 | It can be upgraded and relocated. | No such scope available. |
| 5 | FRP tank life more than 30 years. | Life span is lesser than 20 year. |
| 6 | It can be an excellent solution, since it is a standalone process. | We may get some dead mass in clear supernatant which increases the filter load. |
| 7 | Uses High Porosity moving media for bacteria to grow. | Appropriate aeration and decanting is essential for the correct operations of these plants. |
| 8 | Useful for modification / capacity extension of existing STP. | Not applicable for any modification. |
| 9 | Increased SRT and hence well nitrified effluent and low sludge volumes. | No such scope available. |

Working Flow Diagram of PSTP's (NBF SERIES)



- | | | |
|----------------------------|-----------------------|-----------------------------|
| 1. INFLUENT | 6. FILTER FEED TANK | 11. PRESSURE SAND FILTER |
| 2. BAR SCREEN CHAMBER | 7. MBBR MEDIA | 12. ACTIVATED CARBON FILTER |
| 3. ANAEROBIC & ANOXIC ZONE | 8. AIR BLOWERS | 13. DISINFECTION |
| 4. AEROBIC MBBR ZONE | 9. RECIRCULATION PUMP | 14. AIR VENT |
| 5. FINAL SEDIMENTATION | 10. FILTER FEED PUMP | 15. TREATED WATER TANK |

Best Fit For

- Industrial
- PSU's
- Residential and Commercial Complexes
- Public buildings and Government offices
- Hospitals and Hotels and Motels
- Colleges and educational institutes
- Farm Houses Bungalows
- Holiday resorts & clubs
- Ware houses
- - Automobile sector

Results Delivered By Our System

1. W/O Tertiary Treatment Plant:

| Sr. No. | Parameters | If Inlet | Then Outlet |
|---------|------------|--------------|-------------|
| 1 | pH | 6.5 – 8.5 | 6.5 – 8.5 |
| 2 | BOD | 250-300 mg/l | < 30 mg/l |
| 3 | COD | 400-600 mg/l | < 150 mg/l |
| 4 | TSS | 200 mg/l | < 50 mg/l |
| 5 | FOG | 40-50 ppm | < 5 mg/l |

Treated Water Use - Irrigation & Gardening
Landscaping Purpose

2. W/O Tertiary Treatment Plant:

| Sr. No. | Parameters | If Inlet | Then Outlet |
|---------|------------|--------------|-------------|
| 1 | pH | 6.5 – 8.5 | 6.5 – 8.5 |
| 2 | BOD | 250-300 mg/l | < 10 mg/l |
| 3 | COD | 400-600 mg/l | < 50 mg/l |
| 4 | TSS | 200 mg/l | < 10 mg/l |
| 5 | FOG | 40-50 ppm | < 5 mg/l |

Raw Sewage After STP After TTP



Salient Features of PSTP-NBF System

RANGE & SPECIFICATIONS

| Specification | Model | | | | | | | | | | | | | | |
|------------------------------------|------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|
| | NBF-10 | NBF-15 | NBF-20 | NBF-25 | NBF-30 | NBF-35 | NBF-40 | NBF-45 | NBF-50 | NBF-60 | NBF-70 | NBF-80 | NBF-90 | NBF-100 | NBF-120 |
| No. of Users | | | | | | | | | | | | | | | |
| | Residential (150 lpcd) | 67 | 100 | 133 | 167 | 200 | 223 | 267 | 300 | 333 | 400 | 467 | 533 | 600 | 667 |
| | Office (80 lpcd) | 125 | 187 | 250 | 312 | 375 | 437 | 500 | 562 | 625 | 750 | 875 | 1000 | 1125 | 1250 |
| | Toilet (50 lpcd) | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 |
| Educational Institutions (80 lpcd) | | 125 | 187 | 250 | 312 | 375 | 437 | 500 | 562 | 625 | 750 | 875 | 1000 | 1125 | 1250 |

• LPCD: Litres per capita per day.

Salient Features of PWTS STBF System

| SR. NO | MODEL | NUMBER OF USERS | | | | | DIMENSIONS | | | |
|--------|-------------------|---------------------------|---------------------|--|------------------------|----------------------|------------------|----------------|------------------------------|--------------|
| | | RESIDENTIAL (150 IPCD) | OFFICE (80 IPCD) | EDUCATIONAL INSTITUTIONS (80 IPCD) | TOILET (50 IPCD) | CANTEEN (20 IPCD) | DIAMETER (MM) | HEIGHT (MM) | INLET/OUTLET PIPE (MM) | VENT (MM) |
| 1 | PWTS-STBF-0120-01 | 6 | 8 | 8 | 16 | 30 | 1300 | 1400 | 100 | 50 |
| 2 | PWTS-STBF-0160-01 | 10 | 13 | 13 | 22 | 50 | 1440 | 1560 | 100 | 50 |
| 3 | PWTS-STBF-0180-01 | 12 | 15 | 15 | 24 | 60 | 1490 | 1615 | 100 | 50 |
| 4 | PWTS-STBF-0200-01 | 14 | 18 | 18 | 28 | 70 | 1540 | 1640 | 100 | 50 |
| 5 | PWTS-STBF-0300-01 | 16 | 23 | 23 | 46 | 80 | 1830 | 1880 | 100 | 50 |
| 6 | PWTS-STBF-0400-01 | 20 | 26 | 26 | 52 | 100 | 1900 | 2020 | 100 | 50 |
| 7 | PWTS-STBF-0500-01 | 24 | 33 | 33 | 66 | 120 | 1970 | 2280 | 100 | 50 |
| 8 | PWTS-STBF-0600-01 | 32 | 40 | 40 | 80 | 160 | 2070 | 2330 | 100 | 50 |

Working Flow Diagram PSTP's (STBF-Series)



MATERIAL OF PACKAGED SEWAGE TREATMENT PLANT

| Material of Sintex PSTP's | | |
|---------------------------|--|--|
| Sr. | Description | Material |
| 1 | Sintex FRP base Tank/STBF | Fibre Reinforced Plastic/LDPE |
| 2 | Inlet Outlet Socket | U-PVC |
| 3 | Air vent , Aeration Socket , Pump Socket | U-PVC |
| 4 | Fastener of Manhole cover | S.S. |
| 5 | Manhole Cover (Dia.-550 & 750 mm) | M.S. with Epoxy Coating |
| 6 | Manhole with Hole | FRP |
| 7 | Deadman | RCC |
| 8 | Strap | FRP |
| 9 | Turn Buckle | G.I. |
| 10 | Clamp | G.I. |
| 11 | Ribbing | U-PVC |
| 12 | Fastener for Strapping | G.I. |
| 13 | Sludge Re-circulation Pump | - |
| 14 | Blower for Aeration | Low power Consumption/imported Quality |
| 15 | Header for Blower | M.S. with Epoxy Coating |

Production Facility & Process

- ❖ We have skilled team capable of producing both LLDPE and FRP tanks
- ❖ One of the Best Chop Hoop Winding Process for FRP Material which is limited in India.
- ❖ One of the largest rotomoulding process house



(A) THE FRP UG TANK PROCESS (CHOP HOOP WINDING PROCESS).

❖ The chop hoop process is a variation on the filament winding technology. Chop hoop is in fact a combination of a winding process and spray up.

❖ The Technique is used for the production of cylindrical storage tank.

(B) Rotomoulding process for producing vertical and horizontal LLDPE tanks for PSTP and water storage solutions



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Service Network

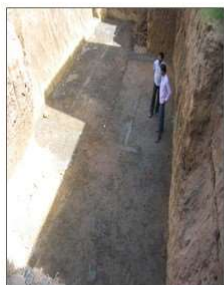
| ASC Name | LOCATION |
|-----------------------------------|----------------|
| B.S ENTERPRISES | PATNA |
| HOME SERVICE CO | RANCHI |
| MAA SANTOSH SERVICE CENTRE | BALASORE |
| KAMAKSHI ENTERPRISES | BERHAMPUR |
| EUMOTCH | KOLKATA |
| SAI TRADERS | BIRUBANDHARPUR |
| PRANALI SERVICES | JAIPUR |
| SHV INFOCOM | GANDHIDHAM |
| SMS COOL POINT | INMEDABAD |
| YASH ENTERPRISES | KODNUR |
| Ruch Solutions | Vadodra |
| JAY ENTERPRISE | MEDHANA |
| SM ENTERPRISE | PALANPUR |
| SAI CONSTRUCTION | VALSAD |
| NIDHI ENTERPRISES | JAPUR |
| VAISHALI ENTERPRISES | THANE |
| TECHNO VISION SERVICES | NAVY MUMBAI |
| E.B SERVICE | DWARKA |
| VEERA ENTERPRISES | PUNE |
| HIRA ENTERPRISES | KOLHAPUR |
| SEVA PLUMBING | CHALISSAGAN |
| NAV DURG ASSOCIATES | GORAKHPUR |
| RUDHIRA HDPE WORK | DELHI |
| SHREE RUDRA ENGINEERING INDIA | DELHI |
| DOON RO SERVICES | DEHRADUN |
| M.M.BROTHERS | PULWAMA |
| BADWAN BROTHERS HDPE WORK | MOHALI |
| DREAMS KITCHEN | CHENNAI |
| MODERN ENTERPRISES | COMBATORE |
| SVLOG ENTERPRISES PRIVATE LIMITED | COCHIN |
| VINAYAKA FACILITY SERVICES | HUBLI |
| ESHWAR SERVICE CENTRE | BENGALURU |



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Installation of PSTP - NBF System



150 mm PCC



Lowering of deadmen



Filling with gravel size 4.5 to 12.5 mm



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Contd.



Unloading of the System



Refilling of trench



Piping Work



Blowers in room

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Triple Benefits to clients



Land Saving: As the system goes underground above space can be used for gardening purpose or as parking lot.

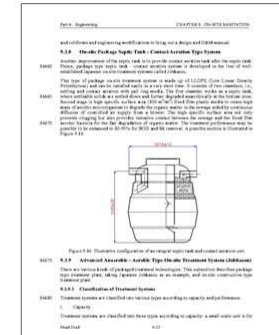
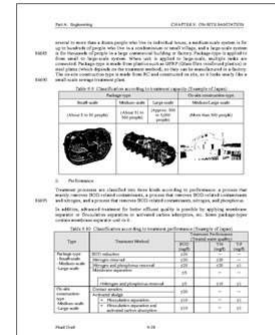
Beautification: As the system is odor free a children park can be there on top of the system.

Responsibility: Individual responsibilities can be easily given to the owners of the scheme.

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Central Pollution Enrollment Copy

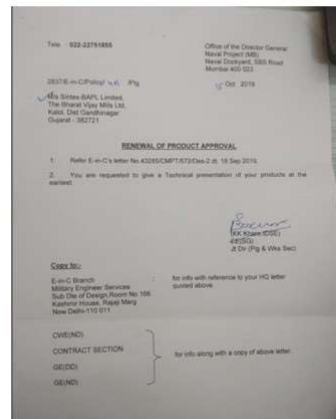


Sintex PSTP MBBR Technology in
CPHEEO Sewage Manual
Prepared By Central Ministry Of
Urban Development Since 2012

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Approval from Military Engineering Services



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List of Customers



LODHA

**Zydus
Cadila**



**Shree
Cement**



**torrent
POWER**

VOLTAS

Godrej | PROPERTIES



Cognizant



**TATA
PROJECTS**

**Mahindra
Rise.**

**JK TYRE
TOTAL CONTROL**

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Video Link for more Info....

Please click on below youtube link

UNDER GROUND WATER STORAGE SOLUTIONS: PRODUCT RANGE

| S. No. | Type of Water Storage Solutions | Tank | Model | Capacity Range |
|--------|---------------------------------|------------------------------------|-------|--------------------|
| 1 | Underground Water Storage | Roto Moulded Tank | UGWT | 1.00 KL to 6.00 KL |
| | | Fibreglass Reinforced Plastic Tank | CWUG | 10.00 KL to 50 KL |

Roto Moulded Tank FRP Tank

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THANK YOU!

Sintex BAPL Limited, Plastics Division, Kalol (N. Gujarat) 382 721 India

Sintex[®]



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6.3.4. インド側協賛メンバー Daiki Axis India Pvt. Ltd.による発表

Daiki-Axis -Johkasou

Onsite Used water management concept and Technology from Japan
and how it can contribute to Swachh Bharat

Treat Used water at site & Reuse at site

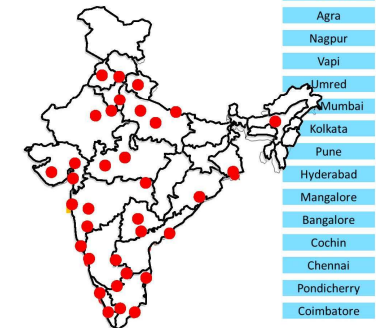


29th Nov 2023

STRICTLY PRIVATE AND CONFIDENTIAL

Progress made by Daiki Axis In India on Decentralized Wastewater Management..

- Daiki Axis India focuses purely on Johkasou business with Two 100% Local subsidiary companies working under MAKE IN INDIA
- Daiki Axis India is at the forefront in promoting of Decentralized Wastewater Management concept – Treat at Site , Reuse at Site
- Extensive Offline, online and personal promotion to key stakeholders
- Close working with IIT, BIS, FICCI, CII, IPA, SVSU and industries for development of market
- Over 700 projects in India covering
 - Residential- individual houses, villas, farm houses, communities, slum area
 - Schools& colleges, Hospitals
 - Offices, IT Parks
 - Hotels, restaurants, resorts
 - Public Parks, Drains dropping to river
- Customer coverage
 - Government, Industries, Commercial, Builders
- Geographical Coverage
 - J&K, Himanchal, UK, UP, Punjab, Haryana, Delhi, Rajasthan, MP, Gujarat, Maharashtra, Goa, Karnataka, Andhra, Telangana, Tamil Nadu, Kerala, West Bengal, Odisha, Jharkhand
- 26 Local partner companies supporting sales, construction and maintenance
- 2 Factories, 100+ employees and growing..



2

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Daiki Axis India has established business model for Decentralized Wastewater solution

- De-centralized used water management in India is still under nascent stage hence DAI is working on multiple fronts to support the customers and improve the industry skill and quality level in India

1. FIELD SURVEY, REQUIREMENT STUDY, DPR SUPPORT
2. TWO STAGE ENGINEERING SUPPORT FOR THE PROJECT
3. MANUFACTURING - MAKE IN INDIA AS PER JOHKASOU STANDARD & INDIAN REQUIREMENTS
4. CONSTRUCTION QUALITY AND SUPERVISION AS PER DAIKI STANDARD
5. O&M , USER TRAINING AND ASSET MANAGEMENT SUPPORT AS PER DAIKI STD.

Simultaneously work on Development of Indian Market for Awareness creation, product enhancement, cost reduction, standard formation, skill development



4

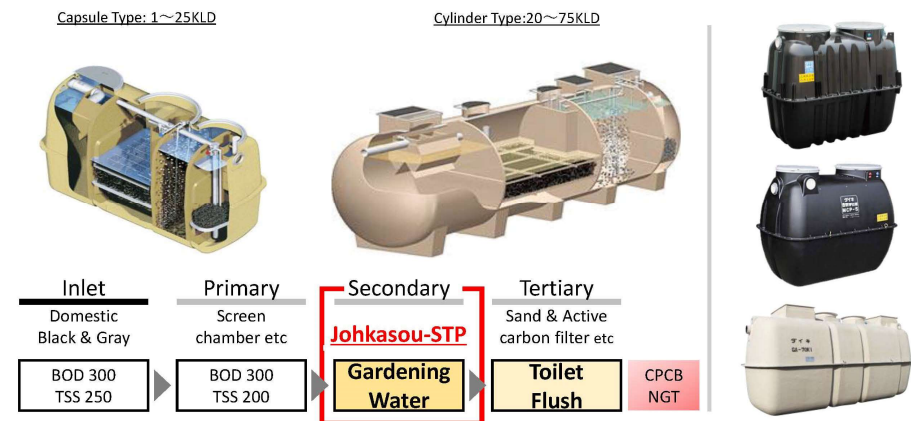
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Daiki Axis Contributing to Swachh Bharat



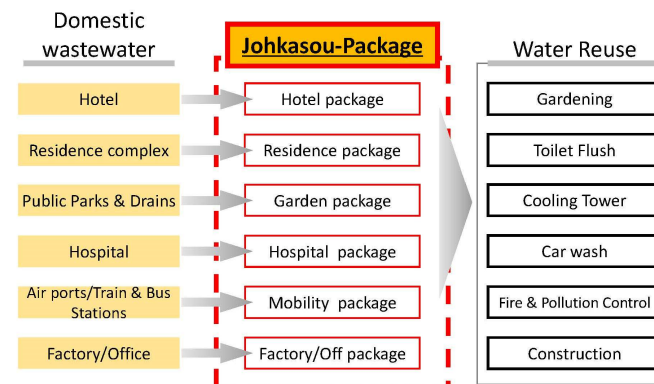
JOHKASOU-STP from Japan –MADE IN INDIA for INDIA



5

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Scheme designs for different type of users based on Johkasou technology



6

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Few Case Studies from India

NMCG UDHAM SINGH NAGAR 1300(500,300,500) KLD VILLAGE SANITATION RIVER CLEANING PROJECTS, UTTARAKHAND

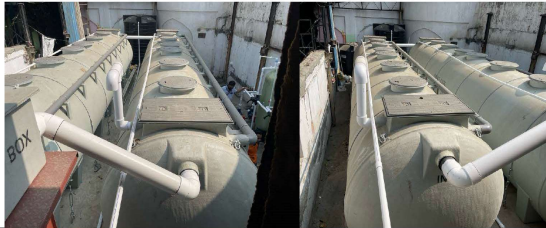


8

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100 KLD Johkasou Installation at Mumbai Central

- Project Details
 - Start Date : 18th June 2021
 - Completion Date: 28th Dec 2021
 - Contract Type : EPC& 5 AMC
- Outlet Water Quality
 - BOD- 18
 - TSS – 3
 - COD – 47
 - TN- 7.3
 - PH – 7.32
 - FC – Not detected



TEST REPORT

TEST REPORT No. N/A-001-001

TEST DATE: 18/12/2021

TEST LOCATION: Mumbai Central

TESTED BY: N/A-001-001

TESTED FOR: BOD, COD, TSS, TN, PH, FC

| Parameter | Unit | Result | Limit |
|-----------|------|--------------|--------------|
| BOD | mg/l | 18 | 18 |
| TSS | mg/l | 3 | 3 |
| COD | mg/l | 47 | 47 |
| TN | mg/l | 7.3 | 7.3 |
| PH | | 7.32 | 7.32 |
| FC | | Not detected | Not detected |

Dalke
AXIS

9

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REUSE OF TREATED WATER IN PARKS



Johkasou @ Delhi DDA Park

Sewage lifting from drainage line

- ✓ BOD : 200 >> 8
- ✓ COD : 350 >> 35
- ✓ TSS : 280 >> 12

- DDA have 50 plants installed working since 2021
- Impact:
 - Saving of 900 Million Litres of ground water every year.
 - 1000 Acres of Green Area covered in Delhi.
 - Revival of many water bodies
 - Reducing load of 900 million waste water flowing into river Yamuna
 - Execution Period Less than one year

Dalke
AXIS

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Nitin Gadkari @nitin_gadkari - Aug 15
Inaugurating Waste Water Treatment Plant, Nagpur



Devendra Fadnis @Dev_Fadnis - Aug 15
With these STPs more than 10 lakh litre of water will be treated daily. Around 80,00,000 litre will be used in watering trees in various gardens & rest will be used for other non-potable purposes. It will help in maintaining ground water level & also reduce pollution to a great extent.



NAGPUR - NMC

Devendra Fadnis @Dev_Fadnis - Aug 15
Dedicated 3 of the total 12 Mini STPs (Sewage Treatment Plants) by @ngpmc to Nagpurkar with our Hon Union Minister @nitin_gadkari ji & other leaders this evening. Mayor Dayashankar Tiwari & other public representatives were present on this occasion.

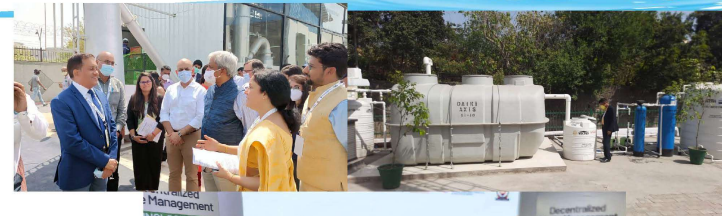


Narendra Nagar Garden

11

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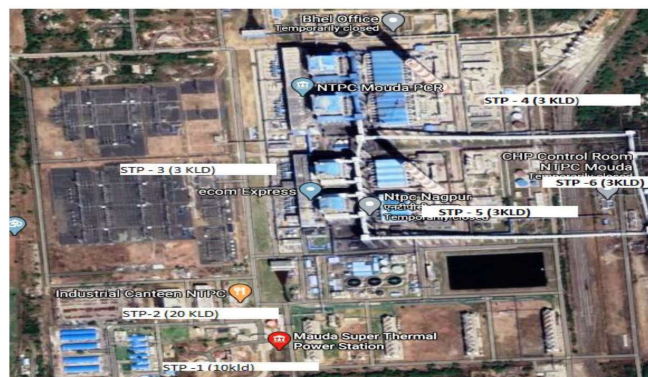
Demonstration Site for PSA office, Waste to Wealth Mission



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Decentralized wastewater management in a campus – NTPC, Mouda



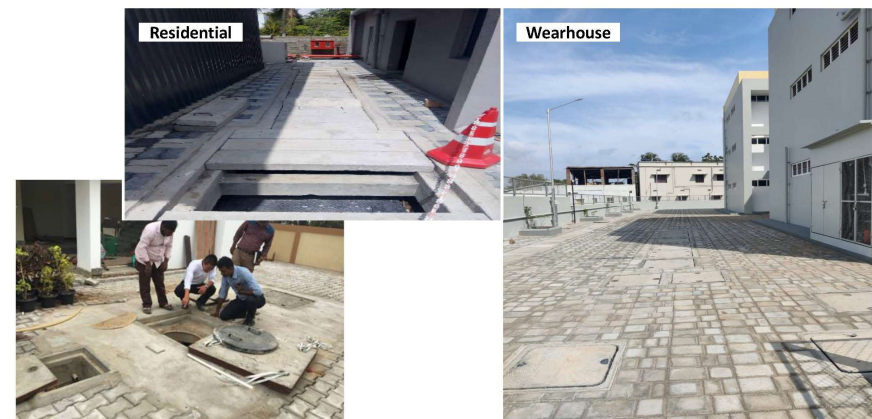
Centralized STP

Total CAPEX : 12crore
 • STP (1 Location)
 • Piping 2.5km
 OPEX :
 • 2 operators
 • Total 12.50kW

De-centralized STP

Total CAPEX : 3crore
 • STP (6 Location)
 • Piping 0.2km
 OPEX :
 • No operator
 • Total 1.75kW (Less transfer)

Site references _ under car parking



Site references _ under the Green area



Certification and Awards

■ Daiichi Axis India brought Johkasou concept in India and spread and educate it to India. Installed more than 700 Johkasou in India



JOHKASOU-STP factory in Vapi, Gujarat

- Johkasou-STP factory in Japan & India (Gujarat)



Daiki
AXIS

17

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Daiki Axis India started Johkasou Skill Development Program

- Daiki Axis follow Indian Government program in this important and growing area under Swachh Bharat, Skill development Program for STP Operators based on Japanese Johkasou skill development templated is already started ..



Daiki
AXIS

19

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Daiki Axis Johkasou Factory, Palwal, Haryana



Daiki
AXIS

18

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Key Challenges & Opportunities


- ❖ Error Products. – Johkasou need to compete in the market against poorly designed and made products available at very low prices.. - We are working with BIS to finalize Standard in next few months.
- ❖ Misuse of Johkasou Name- Me too.. – Several local companies selling copy or unauthorized Johkasou products.. - Need to consider how to stop misuse of Johkasou name in India..
- ❖ Lack of systematic eco-system development, low user awareness, standard and too many alternatives . – Johkasou type Act and integrated plan is needed in India to organize the area..
- ❖ Low market volume, and High Freight and Tax structure , 30-40% cost gets added by Freight and Taxes..
- ❖ Low enforcement of compliance - MC can suggest some policy incentive or methods to improve compliance as it will help in faster development and cost reduction.
- ❖ Quality and Skill level of construction and O&M. – MC can support to accelerate the training and skill development program already started by DAI & SVSU..

Daiki
AXIS

20

STRICTLY PRIVATE AND CONFIDENTIAL

6.3.5. 日本側協賛メンバー クボタ浄化槽システム株式会社による発表




For Earth, For Life
Kubota

ON YOUR SIDE

Who is KUBOTA?

Advanced on-site sewage treatment system
KUBOTA JOHKASOU SYSTEM

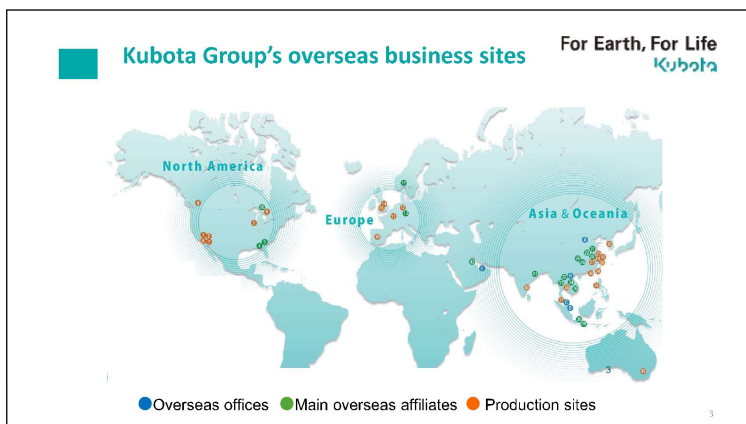


Who is Kubota?

For Earth, For Life
Kubota

- Established in 1890
- Consolidated Sales US \$20.0 billion in 2022
- Employee 42,000 Peoples (Dec.2022)
- Business Activity
 - Agricultural Machinery, Engines, Pipes, Pumps, Valves, Environmental Engineering

2



Kubota Group's overseas business sites

For Earth, For Life
Kubota

North America Europe Asia & Oceania

● Overseas offices ● Main overseas affiliates ● Production sites

3



Farm & Industrial Machinery

For Earth, For Life
Kubota

Tractor Combine

Residential/Commercial Mower Diesel Engines Construction Equipment

4

Infrastructure, Pipes

For Earth, For Life
Kubota



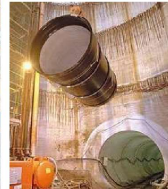
Cast Steel Columns



Steel Pipe



Butterfly Valves



Ductile Iron Pipe

5

Water, Wastewater, Environmental Engineering

For Earth, For Life
Kubota



Water & Wastewater
Engineering



Submerged Membrane Unit
(MBR)



Anaerobic MBR



Sludge Treatment
Plant



Johkaso

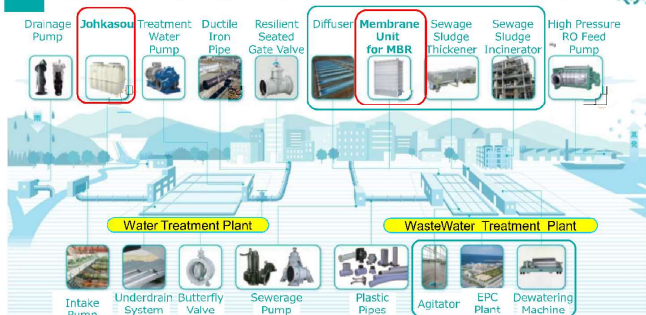


Pumps

6

Kubota's Water/Wastewater Related Products

For Earth, For Life
Kubota



- Wide range of Water and Wastewater related products. Equipment/system+Pump, Pipe and Valve.
- Serving for Water Environment from water resource to water resource.

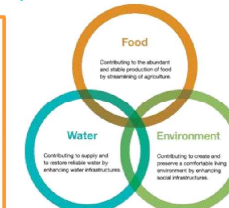
7

Kubota products and the SDGs

For Earth, For Life
Kubota



Tractor



Construction machinery



Sewage Treatment Plant



Membrane



Johkaso

8

Advantages of Kubota Johkasou

For Earth, For Life
Kubota

1. Kubota has a history of more than 50 years since it started manufacturing and selling Johkasou.
2. Quality of treated water by "Johkasou" is same as that of sewerage systems.
(BOD removal ratio $\geq 90\%$, Effluent BOD $\leq 20\text{mg/L}$)



9

Advantages of Kubota Johkasou

For Earth, For Life
Kubota

3. We Kubota exports the same models of Johkasou certified in Japan.

Structure and function Approval of Johkasou type in Japan

- Performance tests \times and approvals of the type (Minister of Land, infrastructure and Transport and Johkasou Law) are required for Johkasou.
- \times Tested by the authorized third party



10

Large-scale wastewater treatment tank

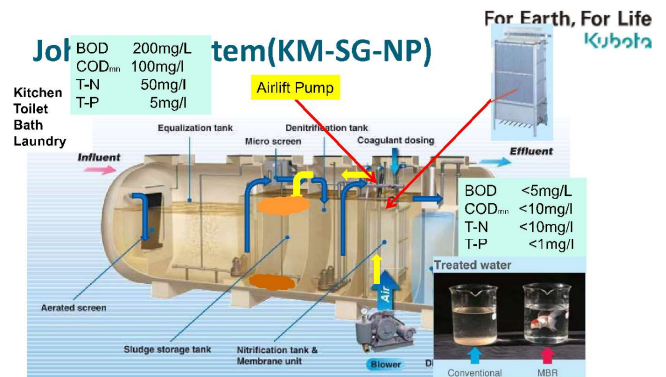
For Earth, For Life
Kubota



- Type : KM-SG-NP
- Flow rate: about Max 500m³/day
- Treatment process :
Membrane bioreactor(MBR) process
- Size
2,500 Φ X H2,800 mm

11

11



12

12

Manufacturing process

For Earth, For Life
Kubota

Small size
Press molding



Middle or Large size
Spray molding



Rotary Molding



13

13

Necessity of Maintenance and Desludging

For Earth, For Life
Kubota

- 1) Johkasou will continuously produce high quality of treated water during long time by performing regular maintenance.
- 2) Maintenance of Johkasou includes 2 main works (checking and desludging).
 - Checking: checking operation of Johkasou to acknowledge when it is necessary to do cleaning in early stage.
 - desludging: removing sludge and scum stored inside Johkasou to restore treatment ability.
- 3) Not performing maintenance regularly will lead to reduce treatment ability and fail to produce expected quality of treated water.

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Solution with Johkasou in Asia

For Earth, For Life
Kubota

Hospital, school, plant, hotel, etc., sewage in Vietnam



15

Solution with Johkasou in Asia

For Earth, For Life
Kubota

Factory, Building, etc., sewage in Myanmar



16

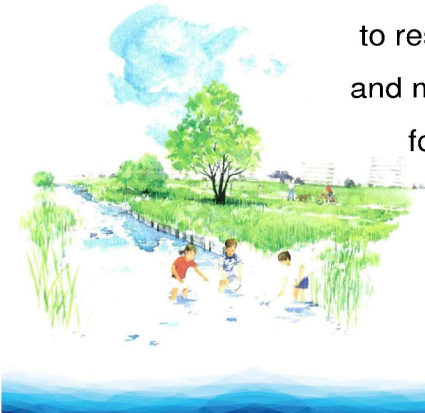
Introduction of FujiClean Overseas Business

Yosuke Tabata
FujiClean Co., Ltd.

1st Management Council Meeting
November 29, 2023

Our Mission

Our mission is
to restore natural waterways
and make them clean enough
for children to play in.



About us

Founded: 1961

Employees: 570 people

Annual Sales: 22 billion JPY

Main Business: Manufacture and Sales of
Onsite wastewater treatment systems



Awards



- 1 14th Environmental Awards in 1987
- 2 Wastec Award 2003
- 3 31th Environmental Awards in 2004
- 4 31th Environmental Awards in 2004
- 5 31th Excellent environmental equipment recognition in 2005
- 6 19th Chunichi Industrial Technology Award in 2006
- 7 Japan Water Award
- 8 JEC Innovation Awards
- 9 Aichi Environmental Award
- 10 38th Environmental Awards in 2011
- 11 Global Niche Top 100 Company 2020

- ...Excellent prize
- ...Committee Special Award
- ...Outstanding performance award
- ...Award of the minister of Environment
- ...Small and Medium Enterprise Agency Award
- ...Chunichi Industrial Technology Award
- ...Minister of Economy, Trade and Industry Award
- ...Environment & Recycling Division
- ...Silver prize
- ...Excellent prize
- ...Selected as one of Top 100 companies

FujiClean on world media



Our stories were featured in
Newsweek, Forbes and Bloomberg.



Newsweek Magazine
May 14, 2021 Issue



5

Compact Sewage Treatment Plant FujiClean

FGU System



Easy Installation & Less restrictions

FGU can be installed in areas sewerage is not installable due to geographic conditions.

Case 1.
Areas separated by the river



Case 2.
Areas separated by the mountain



Case Studies in Japan

Place : Tomamae town in Hokkaido
Hydraulic Load : 165 m³/Day
Usage start : From 2008



Place : Abira town in Hokkaido
Hydraulic Load : 209 m³/Day
Usage start : From 2011



Place : Hirosaki town in Aomori
Hydraulic Load : 80 m³/Day
Usage start : From 2020



7

Products for Overseas Market



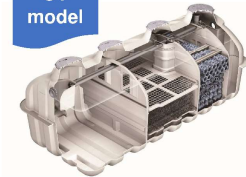
CE/CEN model



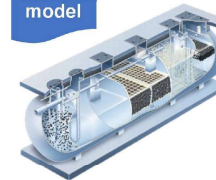
ACE model



CV model



PCN model



CRX II model



FujiMAC Blower



6

Overseas Business FujiClean Wastewater Treatment Systems



8

USA



FujiClean USA, LLC

41-2 Greenwood Road Brunswick, Maine 04011 U.S.A
Phone: +1 207 406 2927 Fax: +1 207 406 2929
www.fujicleanusa.com

- ◆ Founded in July 2013
- ◆ CE models; certified to NSF40
CEN models; certified to NSF40/245
- ◆ 1st Manufacturing location; Brunswick, Maine
2nd Manufacturing location; Augusta, Georgia



9

Europe



Ammermann Umwelttechnik GmbH

Am Dobben 4, 26639 Wiesmoor, Germany
Phone: +49 4944 6060 http://ammermann-gmbh.de

- ◆ Started business as FujiClean EU in 2017
CEN models; Certified to the EN 12566-3
- ◆ Manufacturing location; Wiesmoor, Niedersachsen



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Australia



FujiClean Australia Pty. Ltd.

2/176 Siganto Drive, Helensvale Queensland 4212
Phone: +61 7 5580 0927
www.fujiclean.com.au

- ◆ Founded in January 2008
- ◆ ACE1200, ACE3000; Advanced Secondary system
✓ Certified to the latest Australian Standard 1546.3
- ◆ FujiClean system is available in all states.
- ◆ 1st Manufacturing location; Near Gold Coast, QLD
2nd Manufacturing location; Near Melbourne, VIC



10

The Other Countries



12

Air Pumps



13

FujiClean's business Policy

FujiClean will keep striving to pursue clean water environment with the three core factors we set.



15

Air Pumps



- ◆ For wastewater treatment systems, Koi market, and aqua culture
- ◆ Product Line-up : 40L/min ~ 300L/min



Quiet

Energy Saving

Long-lasting

After-sales Services

14



FujiClean Co.,Ltd.
 Address: 4-1-4 Imaike, Chikusa, Nagoya, Aichi 464-0850 JAPAN
 Tel: +81-52-733-0863 (Overseas Business Division)
 Website: <https://fujicleanglobal.com>

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Introduction to Daiki Axis Johkasou

Japanese Domestic Wastewater Treatment System



Company Profile

3

Daiki Axis Co., Ltd.

Date Founded: 12th July, 1958

Employees: 1,052 (December 31, 2022)

Main business: Environmental equipment
Household equipment
Renewable energy

Environmental equipment

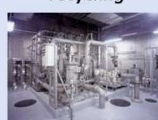
Johkasou



Industrial wastewater



Wastewater recycling



Groundwater drinkable system



• Company Profile

• Daiki Axis Johkasou

• Summary

Company Profile - Johkasou factories in Japan

4

Matsuyama Factory



Fukushima Factory



Tsushima Factory



Shinshu Factory



Company Profile – Overseas factories

5

2015 INDONESIA FACTORY

2022 Sri Lanka FACTORY

2018 CHINA FACTORY

2022 INDIA NCR FACTORY

2019 INDIA Vapi FACTORY



Daiki Axis Johkasou

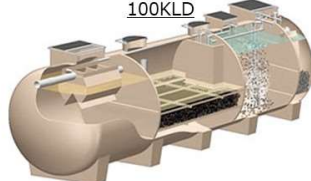
7

■ Johkasou is a de-centralized STP for domestic wastewater treatment, Daiki-Axis Manufacture, Sale, Install & Maintain it in Japan & All over the world

Capsule Type: 1KLD

Capsule Type: 1~25KLD

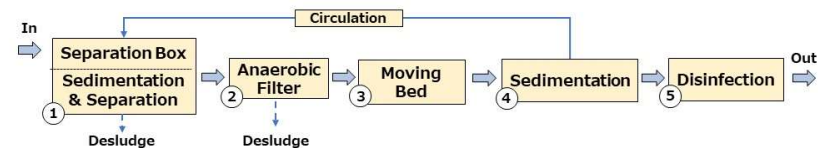
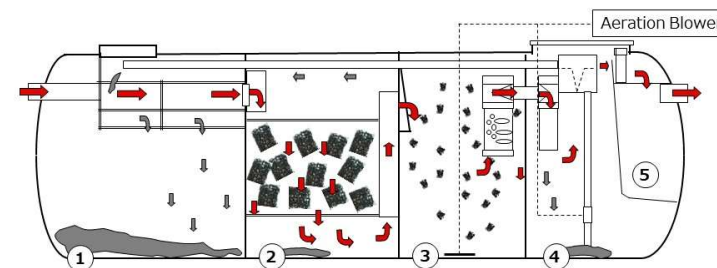
Cylinder Type: 20~100KLD



| Inlet Parameter | | A I Outflow | A I J Outflow | A I M Outflow |
|-----------------|-------|----------------|------------------|------------------|
| 6-8 | pH | 6-8 | 6-8 | 6-8 |
| 300 | BOD | 20 | 10 | 5 |
| 450 | COD | 100 | 50 | 10 |
| 240 | SS | 50 | 20 | 5 |
| 50 | O & G | 10 | 10 | 5 |
| 50 | T-N | 45 | 20 | 10 |

Daiki Axis Johkasou – Inside image and flow

8



Daiki Axis Johkasou – Project references

9

Under ground installation



Above ground installation



- Company Profile
- Daiki Axis Johkasou
- Summary

Summary

11

What Daiki Axis can provide...

- Technological capability based on 65 years experience
- Lower cost product compare than the product manufactured in Japan
- Total domestic wastewater treatment services

What Daiki Axis required...

- Reconsideration of effluent water standard for Johkasou
- Strengthen the monitoring system (application → approval → monitoring)

6.4. セミナープログラム



Joint Work in the form of a Seminar

| | |
|--------------------------|---|
| Date | Tuesday, 19 December, 2023 |
| Time | 11:30 AM ~ 1:30 PM in Indian time (3:00 PM ~ 5:00 PM in Japan time) |
| Venue | Online via Zoom Webinar |
| Language | Simultaneous interpretation (English / Japanese) |
| Program Items | 1. Opening remarks from both side 2. Presentation 3. Closing <i>(Detailed Program is outlined on the subsequent page)</i> |

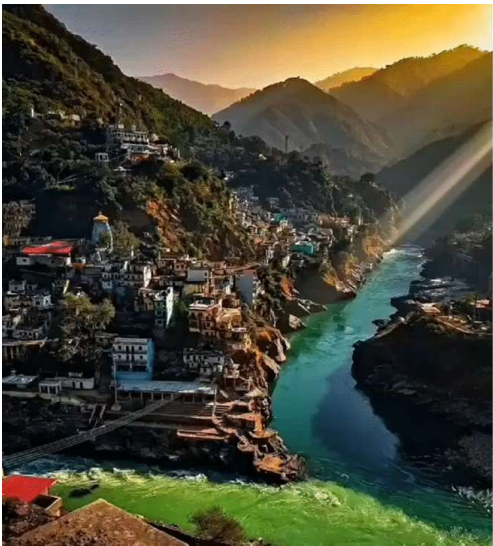
Detailed Program

| Program Item | Personnel | Time -IST (min.) | Time - IST |
|---|---|---------------------|---------------|
| Program Item 1 - Opening remarks from both side | | | |
| Opening remarks – Japan side | Mr. Masaki Numata Director of Office for Promotion of Johkasou | 11:30 a.m. (5) | 15:00 |
| Opening remarks – Indian side | Shri. Pradeep Kumar Agarwal Joint Secretary (NRCD), Jal Shakti | 11:35 a.m. (5) | 15:05 |
| Program Item 2 - Presentation | | | |
| Introduction of current status of domestic wastewater treatment and its management for centralized and decentralized treatment system in India | Shri Dheeraj Joshi Deputy Secretary, NMCG along with Shri Shubham Tiwarei , DTL-PMC, NMCG | 11:40 a.m. (10) | 15:10 |
| Introduction of current status of domestic wastewater treatment and its management for centralized and decentralized treatment system in Japan | Mr. Ryoma Sato Section Chief of Office for Promotion of Johkasou | 11:50 a.m. (7) | 15:20 |
| Introduction of legal system for decentralized domestic wastewater management in Japan including the Johkasou Act | Mr. Ryoma Sato Section Chief of Office for Promotion of Johkasou | 11:57 a.m. (8) | 15:27 |
| Introduction of operation and maintenance, cleaning, inspection, license and sludge management for Johkasou | Mr. Shinhi Kumokawa, Ph. D, Japan Education Center of Environmental Sanitation (JECES) | 12:05 p.m. (8) | 15:35 |
| Q&A | | 12:13 p.m. (14) | 15:43 |
| Break | | 12:27 p.m. (5) | 15:57 |
| Introduction of structure, function and performance evaluation testing system for the Johkasou ~e.g. case study from Japan, US, and Australia~ | Mr. Yosuke Tabata, Ph. D, Executive Officer, Overseas Business Group, FujiClean Co.,Ltd | 12:32 p.m. (8) | 16:02 |
| Introduction of estimation method of Population equivalent (PE) for decentralized wastewater treatment plants in Japan | Mr. Yoshito Kitai, Deputy Manager , Kubota Johkasou System Co., Ltd. | 12:40 p.m. (8) | 16:10 |
| Practice of installation work of Johkasou in Japan and overseas countries | Mr. Kazuo Saeki, Ph. D, Manager, Daiki Axis Co., Ltd. | 12:48 p.m. (8) | 16:18 |
| Q&A | | 12:56 p.m. (19) | 16:26 |
| Program Item 3 - Closing | | | |
| Closing remarks from Japan side | Mr. Ryoma Sato Section Chief of Office for Promotion of Johkasou | 1:15 p.m. (3) | 16:45 |
| Closing remarks from Indian side | Shri Anup Kumar Srivastava, Executive Director (Technical), NMCG | 1:18 p.m. (3) | 16:48 |
| End of the Seminar | | 1:21 p.m. | 16:51 |

Note - TBC- To be confirmed

6.5. セミナーにおける発表資料

6.5.1. インド側（NMCG）のセミナー発表資料（Current Status of Domestic Wastewater Treatment & Management (for centralized and decentralized treatment system) in India）



Current Status of Domestic Wastewater Treatment & Management (for centralized and decentralized treatment system) in India

19th December 2023

Key Government Schemes in Indian Water Sector

| | | | | | | |
|--|----------------|-------------|-------------|-------------|-----------|-------------|
| Historical moment for water management in India Formation of Ministry of Jal Shakti in 2019, bringing all Major departments of the government dealing with water under the aegis of one Ministry | | | | | | |
| | | | | | | |
| Implementation period | 2014 - ongoing | 2015 - 2020 | 2019 - 2024 | 2020 - 2026 | 2021-2026 | 2021 - 2026 |
| Estimated budget (USD in Million) | 4,000 | 3,000 | 50,000 | 790 | 17,000 | 8,000 |

Union Budget FY 2023-24, approx. USD 12 Billion allocated to Ministry of Jal Shakti

CATCH THE RAIN campaign in 2021 saw 4.8 million RWHS created/ maintained at USD 9 Bn

Key schemes in sewage treatment – Namami Gange, SBM(G), AMRUT

| | | | |
|------------------------------|--|---|--|
| Key Implementing Sources | Central government <ul style="list-style-type: none">Ministry of Jal ShaktiMinistry of Housing and Urban AffairsMinistry of Environment, Forest and Climate Change; others | State governments <ul style="list-style-type: none">State Urban developmentRural water and sanitation departmentsPHED/ Municipal Corporations/ ULBs | International Financial Institutions <ul style="list-style-type: none">JICAThe World Bank GroupAsian Development BankDFID; others |
| | | | |

Wastewater Generation & Wastewater Treatment Capacity in India

| | | | |
|--------------------|---|------------|---|
| Status | Sewage generation | 72,368 MLD | Treatment capacity gap 40,527 MLD |
| | Installed treatment capacity | 31,841 MLD | |
| | Operational Treatment Capacity | 26,869 MLD | Gap in actual Treatment 45,499 MLD |
| | Plants meeting environmental standards | 12,200 MLD | Gap in Treatment quality Divergence from standards |
| The increasing Gap | ➤ Treatment capacity has nearly doubled over the last 5-7 years, but the increase in urban population, industrialization and lack of adequate sewerage infrastructure in hilly regions has led to increase in gap between sewage generation and treatment capacity available. | | |
| | ➤ While significant capacity has been created, but, there is still more left to be created. | | |
| | ➤ Less than five percent (5%) of the treated wastewater is being reused. | | |

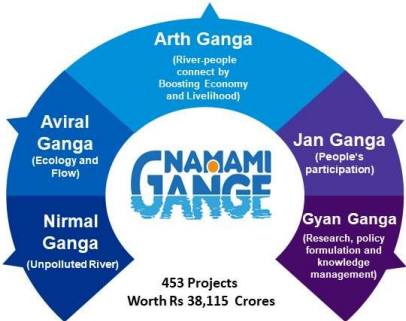
Source : Report on National Inventory of Sewage Treatment Plants in India by CPCB, 2021

Namami Gange Programme

An integrated river rejuvenation mission for the Ganga River Basin

VISION: The Vision for Ganga Rejuvenation constitutes restoring the wholesomeness of the river defined in terms of ensuring "Aviral Dhara" (Continuous Flow)", "Nirmal Dhara"("Unpolluted Flow"), Geologic and ecological integrity

Five pillars of Namami Gange



Components of the programme

| Component | No of projects | Sanctioned Cost (Rs Cr) |
|-----------------------------------|----------------|-------------------------|
| Sewerage Infrastructure | 197 | 31,444 |
| Ghats and River front development | 105 | 1,735 |
| Solid waste management | 12 | 295 |
| Institutional Development | 29 | 1,757 |
| Research and public outreach | 37 | 260 |
| Biodiversity and Afforestation | 51 | 763 |
| Bioremediation | 15 | 239 |
| Rural sanitation | 1 | 1,422 |
| Others | 7 | 200 |
| Total | 454 | 38,115 |

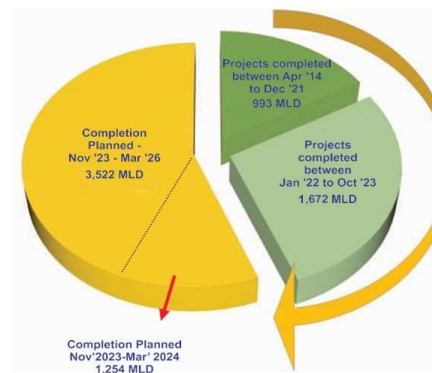
Namami Gange at a Glance

| | | | Sanctioned | | | | | Completed | | |
|--------|---------------------------|--|----------------|----------------|--------------|------------------|----------------------|----------------|---------------------------|--------------|
| S. No. | Type of Project | Name of State | No of Projects | Capacity (MLD) | Network (km) | Cost (in Rs. Cr) | Expenditure (Rs. Cr) | No of projects | MLD Created/Rehabilitated | Network (km) |
| 1 | Sewerage Projects | Uttarakhand | 42 | 244 | 208 | 1,717 | 767 | 36 | 165 | 175 |
| | | Uttar Pradesh | 69 | 2,388 | 1,896 | 14,097 | 5,345 | 37 | 945 | 1,799 |
| | | Bihar | 37 | 745 | 1,792 | 6,160 | 3,850 | 13 | 274 | 1,305 |
| | | Jharkhand | 5 | 262 | 151 | 1,310 | 186 | 2 | 16 | 88 |
| | | West Bengal | 28 | 899 | 982 | 4,834 | 1,742 | 11 | 379 | 859 |
| | | Haryana | 2 | 145 | 41 | 218 | 218 | 2 | 145 | 52 |
| | | Delhi | 9 | 1,268 | 37 | 1,951 | 1,812 | 7 | 704 | 36 |
| | | Himachal Pradesh | 1 | 2 | 0 | 12 | 4 | 1 | 2 | 0 |
| | | Rajasthan | 1 | 36 | 146 | 258 | 176 | 0 | 36 | 135 |
| | | Madhya Pradesh | 2 | 219 | 20 | 604 | 0 | 0 | 0 | 0 |
| | Modular STP Decentralized | 1 | 0 | 0 | 410 | 0 | 0 | 0 | 0 | |
| | | Total | 197 | 6,208 | 5,272 | 31,571 | 14,100 | 109 | 2,666 | 4,449 |
| 3 | | River front, Ghats and Crematoria | 105 | -- | -- | 1,735 | 1,212 | 79 | -- | -- |
| 4 | | Solid Waste Management | 12 | -- | -- | 295 | 192 | 9 | -- | -- |
| 5 | | Institutional Development (Non-Infrastructure) | 29 | -- | -- | 1,764 | 508 | 9 | -- | -- |
| 6 | | Project Implementation Support, Research and Study Projects, Public Relations and Outreach | 37 | -- | -- | 260 | 42 | 8 | -- | -- |
| 7 | | Biodiversity, Afforestation and Bioremediation | 66 | -- | -- | 1,003 | 477 | 40 | -- | -- |
| 8 | | Other Projects | 8 | -- | -- | 1,756 | 1,186 | 5 | -- | -- |
| | | Grand Total | 454 | 6,187 | 5,254 | 38,384 | 16,834 | 259 | 2,666 | 4,449 |

Ganga River Basin- Project Details

Total capacity of 6,187 MLD (197 projects) is sanctioned under Namami Ganga up to October 2023

| Time Period | Sewage Capacity Created/ to be Created (MLD) |
|---|--|
| Completed April 2014 – December 2021 | 993 |
| Completed January 2022 – November 2023 | 1,672 |
| Completion Planned December 2023 – March 2026 | 3,522 |
| Total | 6,187 |



Total targeted capacity by Dec' 2026: 7,001 MLD
(Including New Projects to be Sanctioned)

Transformational Initiatives Under Namami Gange

Governance for long-term sustainability of Sewerage Assets

Hybrid Annuity Based PPP model

- Used to undertake projects involving the construction of STPs and interception and diversion works, under the Namami Gange programme. A total of 33 projects in Ganga river basin towns/ cities have been sanctioned under HAM.



One city one operator model

- Shift towards a one-step solution for entire city
- Integration of new and existing sewerage treatment infrastructure under HAM model
- Single ownership and accountability for end-to-end operations
- Ensure continued performance for existing and new sewerage infrastructure



Photos of Operational Nirmal Jal Kendras (NJKs)/STPs in Uttarakhand



Photos of Operational Nirmal Jal Kendras (NJKs)/STPs in UP



Masani, Mathura 30 MLD NJK (STP)



Kodra, Prayagraj 25 MLD NJK (STP)



Rajapur, Prayagraj 90 MLD NJK (STP)



Ramanna, Varanasi 50 MLD NJK (STP)



Ramnagar, Varanasi 10 MLD NJK (STP)



Moradabad 58 MLD NJK (STP)

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Photos of Operational Nirmal Jal Kendras (NJKs)/STPs in Bihar



Beur, Patna 43MLD NJK (STP)



Karmalichak, Patna 37MLD NJK (STP)



Pahari, Patna 60MLD NJK (STP)



Maner, Patna 6.5MLD NJK (STP)



Chhapra 32MLD NJK (STP)

10

Photos of Operational Nirmal Jal Kendras (NJKs)/STPs in W.Bengal



Barrackpore 24 MLD NJK (STP)



Halishahar 16 MLD NJK (STP)



Budge Budge 9.3 MLD NJK (STP)



Kalyani 21 MLD NJK (STP)



Bhatpara 41 MLD NJK (STP)

PRAYAG: Monitoring Centre at NMCG

- Inaugurated on 20th April 2023 by Hon'ble Minister of Jal Shakti, Government of India
- PRAYAG (Platform for Real time Analysis of YamunA, Ganga and their tributaries) is a Real Time Monitoring Centre with on-line dashboards for planning and monitoring of project progress through real time feeds, river water quality, Performance of STPs, PMT Tool Dashboard, Ganga Districts Performance Monitoring System.



Major Achievements of Namami Gange Program Launched in 2014

Notable Improvement in River Water Quality, increase in numbers of Gangetic Dolphins and other biodiversity indicators

97 Manual and 76 Real Time Water Quality Monitoring Stations (RTQMS) are operational for monitoring water quality



| State | Polluted Stretches | Priority Category | | Priority | Criteria |
|---------------|----------------------------|------------------------------|--------------------------------|----------|-----------------------------------|
| | | 2014-15 | 2022 (Jan to Sept) | | |
| Uttarakhand | Haridwar to Sultanpur | V (4.2 - 5.8 mg/l BOD) | Not Polluted (< 3 mg/l BOD) | I II | BOD > 30 mg/l BOD : 20-30 mg/l |
| Uttar Pradesh | Kannauj to Varanasi | III (3.8 - 16.9 mg/l BOD) | V (2.5- 4.7 mg/l BOD) | III | BOD : 10-20 mg /l |
| Bihar | Buxar to Bhagalpur | II (7.8 - 27 mg/l BOD) | Not Polluted (< 3 mg/l BOD) | IV | BOD : 6-10 mg/l |
| West Bengal | Triveni to Diamond Harbour | V (3.1 - 5.8 mg/l BOD) | V (2.6 - 3.9 mg/l BOD) | V | BOD : 3-6 mg / l |

In 2022, No Stretches of River Ganga in Priority I to IV Categories of pollution

Achievements and Accolades

NAT-GEO Award



Meeting of EDs of World Bank in Agra



Meeting held in Agra on 5th August 2023:

As part of the visit of 12 Executive Directors (EDs) of World Bank, representing 100 countries, to see the transformational progress of India and some World Bank funded projects in India, a meeting was organized on 5 August, 2023 in Agra in which Director General, NMCG, Mr. G. Asok Kumar gave a detailed presentation. Mr. Auguste Kouame, Country Director, World Bank, India was also present on the occasion.

15

Achievements and Accolades



Namami Gange Mission: Recognized as one of the TOP TEN "World Restoration Flagship" by UN Decade



Recognized as one of the **top 10 World Restoration Flagship** initiatives on 13th December 2022 at Montreal, Canada during UN Conference Biological Diversity (COP 15)

- 2021 - 2030 declared as the **Decade on Ecosystem Restoration** by UNGA, positioning restoration of ecosystems as a major nature-based solution for achieving SDGs & national priorities
- World Restoration Flagships of the UN Decade are the first, best, or most promising examples of largescale and long-term ecosystem restoration in any country or region
- Led by UNEP and FAO, it embodies 10 Restoration Principles of the UN Decade

Participation in UN Water Conference - 2023



- The Only Indian entity to Organize a side event in the UN HQ during the UN Water conference- **Namami Gange** - "Namami Gange - An integrated & holistic approach towards Conservation & Rejuvenation of River Ganga and it's Ecosystem" was well attended
- **Bilateral meetings held with 13 countries** - Denmark, Egypt, European Union, France, Israel, Vietnam, Canada, Indonesia, United Kingdom, Singapore, UAE Japan and Bangladesh

14

Wastewater Generation & Wastewater Treatment Capacity in India

India's regulatory framework for wastewater treatment is evolving, with promising policies

Current Laws & Regulations covering WWT

| | |
|--|--|
| Environment (Protection) Act, 1986: | Water (Prevention & Control of Pollution) Act, 1974: |
| Environmental Impact Assessment Notification (2006): | Water Cess Act (1977): |
| Municipal Solid Waste (Management & Handling) Rules, 2000: | |

Existing Policies

| |
|--|
| National Water Policy (2012) mandates setting up of sewage treatment plants in all towns with a population exceeding 10,000 |
| Fecal Sludge and Septage Management FSSM (2017) : Recognizes synergies and potential for co-treatment options for sludge. |
| National Framework for Safe use Treated Wastewater Offers guidelines for the formulation of State reuse policy and intends to build appropriate market and economic models |
| Power Tariff Policy of 2016 mandates utilization of treated water from STPs at thermal power plants. |

Efforts to bridge Gaps and Challenges

| | |
|---------------|--|
| Coordination: | • Coordination challenges at various tiers causes uneven implementation which can be addressed by bringing together central and state level agencies |
| Integration: | • Untapped potential for wastewater reuse as a source for water bodies, groundwater recharge, and alternative water sources to be looked into |

Decentralised Wastewater Treatment in India: Towards a National Framework



Decentralized Wastewater Treatment (DWT) is gaining momentum across states

National Water Policy (2012) incentivizes

- Decentralised sewage treatment plants,
- Recycling and reuse of treated water
- through planned tariff systems, and subsidized treatment of industrial effluents.
- Scope for Decentralised Solutions
- The policy advocates Promotion of sanitation solutions that minimize water usage and treat wastewater at the source.

Several states including Karnataka, Kerala have taken steps towards adopting decentralised wastewater treatment solutions

Towards a National Framework

- NMCG's experience with the Ganga River basin fosters a comprehensive perspective that considers social, environmental, and economic aspects with expertise in implementing wastewater treatment infrastructure.
- The National Mission for Clean Ganga has promoted decentralized solutions such as Jhokasou for the Ganga River.

NMCG possesses the institutional knowledge and experience to craft a comprehensive national framework for decentralized wastewater treatment across India.

Few examples of Decentralised Treatment Technology Adopted Across India

Decentralized wastewater treatment systems (DEWATS) offer a promising alternative to traditional centralized systems in India, particularly for smaller communities and areas with limited infrastructure. Diversity of DEWATS systems in terms of industry sectors, cost structures, output quality is presented in the table below

| City | Location/Sector | Technology | Key Features |
|-------------------------|--------------------------|---|--|
| Koraput, Odisha | Hospital | Constructed Wetlands (CWs) | Treats wastewater for reuse in irrigation, low maintenance. |
| Puducherry, Tamil Nadu | College campus | CWs | High-quality effluent for reuse, eco-friendly and sustainable. |
| Mumbai, Maharashtra | Slum areas | Septic Tanks with Biofilters | Reduces BOD and COD levels, improves sanitation. |
| Bangalore, Karnataka | Gated communities | Decentralized Wastewater Treatment Plants with Biofilters | Non-potable water reuse, affordable and efficient. |
| Gurgaon, Haryana | Residential complex | Membrane Bioreactors (MBRs) | Stringent discharge standards, high-quality effluent for landscaping. |
| Chennai, Tamil Nadu | Hospital | MBRs | Meets stringent discharge standards, advanced technology for complex wastewater. |
| Gandhinagar, Gujarat | Dairy farm | Anaerobic Digestion (AD) | Biogas generation for energy, nutrient-rich digestate for agriculture. |
| Pune, Maharashtra | Food processing industry | AD | Biogas for cooking fuel, reduces environmental pollution. |
| Darjeeling, West Bengal | Hill resort | Community-Managed CWs | Reduces pollution, improves water quality, community ownership. |
| Kodagu, Karnataka | Rural communities | Decentralized Treatment Plants (community-managed) | Improved sanitation and hygiene, empowers communities. |

Jokhasou Technology and its adoption in certain NMCG projects

Under Namami Gange Programme three project with a total capacity of 1.92 MLD on Jhokhasou Technology have been sanctioned in Udham Singh Nagar, Rudraprayag and Rishikesh district of Uttarakhand

| S. No. | State | Town | No. of STPs | Capacity (MLD) | AA&ES Cost Rs. In (Cr) |
|--------|-------------|-------------------------|-------------|----------------|------------------------|
| 1 | Uttarakhand | Udham Singh Nagar | 3 | 1.3 | 199.36 |
| 2 | | Gaurikund & Tilwada | 5 | 0.32 | 23.37 |
| 3 | | Muni Ki Reti, Rishikesh | 1 | 0.3 | 94.06 |
| | | Total | 09 | 1.92 | 316.79 |



Current Status of Domestic Wastewater Treatment and its Management for Centralized and Decentralized Treatment System in Japan

19th December, 2023

Mr. Ryoma SATO
Section Chief, Office for Promotion of Johkasou

Office for Promotion of Johkasou
Waste Management Division
Environmental Regeneration and Material Cycles Bureau
Ministry of the Environment
Government of JAPAN

<https://www.env.go.jp/recycle/jokaso/>

Domestic Wastewater Treatment Systems in Japan

- Sewage Systems** : managed by the Ministry of Land, Infrastructure, Transport and Tourism
- Rural community sewerage facilities, etc.**: managed by the Ministry of Agriculture, Forestry and Fisheries
- Johkasou**: managed by the Ministry of the Environment

Trend of Johkasou's spread status by City size

Population of wastewater treatment 92.9% (End of FY2022)

| City Population | Sewage | Community plant | Rural community sewerage facilities, etc. | Johkasou |
|--------------------------|--------|-----------------|---|----------|
| More than 1.0 Million | 99.4% | 0.5% | 0.9% | 0.2% |
| 0.5 – 1 Million | 89.4% | 0.3% | 7.2% | 2.1% |
| 0.3-0.5 Million | 86.5% | 0.3% | 16.0% | 9.4% |
| 0.1-0.3 Million | 81.3% | 0.3% | 16.0% | 9.4% |
| 0.05-0.1 Million | 68.5% | 0.3% | 16.0% | 9.4% |
| Lesser than 0.05 Million | 54.3% | 0.3% | 16.0% | 9.4% |

Current situation of population served for treating domestic wastewater by different wastewater treatment facilities

| Type of treatment facility | Population served (x1,000 people) | |
|---|-----------------------------------|-----------------|
| | End of FY2022 | End of FY2021 |
| Sewage systems | 101,280 (81.0%) | 101,181 (80.6%) |
| Rural community sewerage facilities including Facilities for fishing villages, Facilities for forestry villages, Simple wastewater facilities | 3,018 (2.4%) | 3,103 (2.4%) |
| Johkasou | 11,784 (9.4%) | 11,758 (9.4%) |
| Municipal Johkasou Installation Program | 825 | 831 |
| Johkasou Installation and Maintenance Program | 6,229 | 6,203 |
| Other Johkasou | 4,730 | 4,725 |
| Community plants, etc. | 160 (0.1%) | 171 (0.1%) |
| Total population served | 116,242 | 116,213 |
| Percentage of population served | 92.9% | 92.6% |
| Total population | 125,065 | 125,540 |
| Total population not served | 8,823 | 9,327 |
| Un-installed rate | 7.1% | 7.4% |

Comparison of Sewage, Johkasou and Septic tank

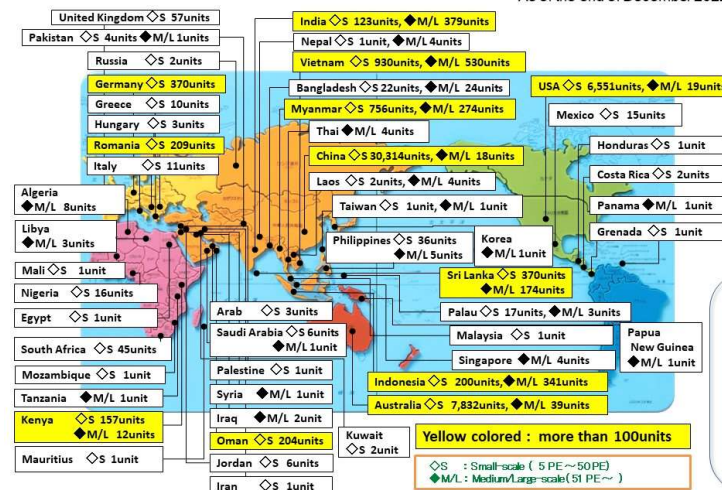
| | Sewage (STP) * | Johkasou | Septic tank |
|----------------------------------|--|--|---|
| Category | Centralized | Decentralized | Decentralized |
| Capacity(m3/day) | Large | Small to middle | Small |
| Application | City covering with pipeline network | For household, building, housing complex, community, hospital, school, public toilet, etc. | |
| Target | Black water & Gray water | Black water | Black water |
| Method | Aerobic (plus Anaerobic) | Anaerobic only | Anaerobic only |
| Treated water quality | - Good - BOD <20mg/L - Nitrogen & Phosphorous can be removed | - Poor, BOD = 100mg/L - Nitrogen and Phosphorous can't | - Poor, BOD = 100mg/L - Nitrogen and Phosphorous can't |
| Discharge | Clean discharge is discarded directly to the river, lake, sea and so-on. | - Dirty discharge is penetrated into ground - Gray water is discarded without treatment | |
| Main body | Civil structure constructed at site | FRP manufactured in factory | Civil structure constructed at site |
| Maintenance works | Checking and adjustment, desludging, inspection, changing spare parts | Desludging only (every 3 to 5 years) | |
| Total period for operation start | Long for planning, financing, construction | Short | |

*STP: Sewage treatment plant

Johkasou can be recognized as a "prefabricated small scale sewage treatment plant" in wastewater management

Installation records of Japanese Johkasou Overseas

As of the end of December 2022 (Total) by Johkasou System Association

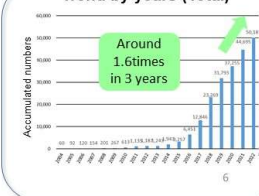


2022 recent (Total)

Small size 48,325units
 M/L size 1,856units
 Total 50,181units

Total 51 countries

Trend by years (Total)



(Reference) Information of Johkasou

- "Johkasou" is categorized as decentralized wastewater treatment system for domestic wastewater discharged by household, building and so-on.
- Johkasou have a combined purification structure capable of treating both night soil (black water) and miscellaneous wastewater (gray water)
- Johkasou attains high and stable performance as same as that of sewage treatment plant and it has been installed totally more than 3.9 million unit in Japan.

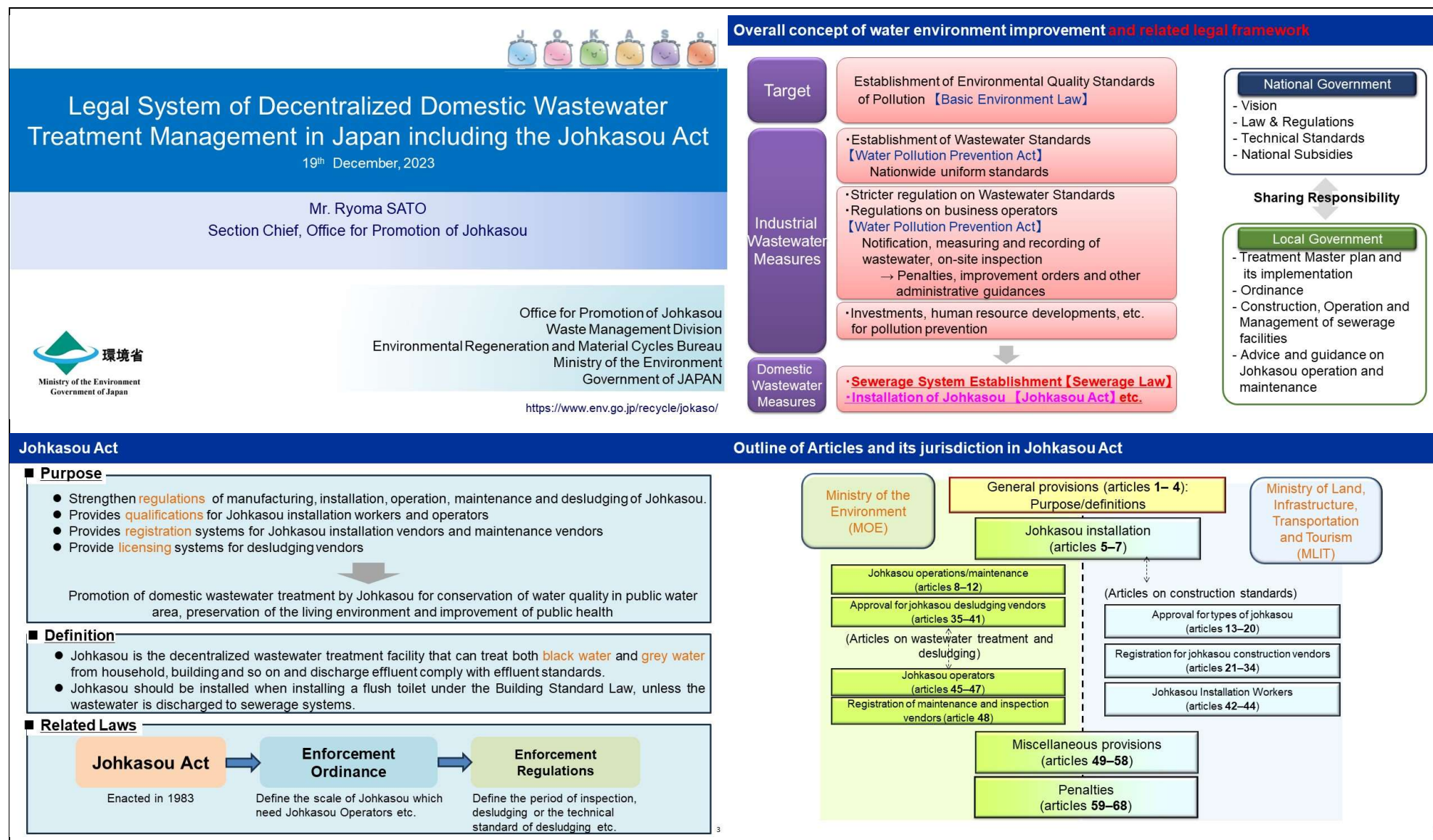


THANK YOU FOR YOUR KIND ATTENTION.

At Kikuchi Gorge, Kikuchi City, Kumamoto Prefecture

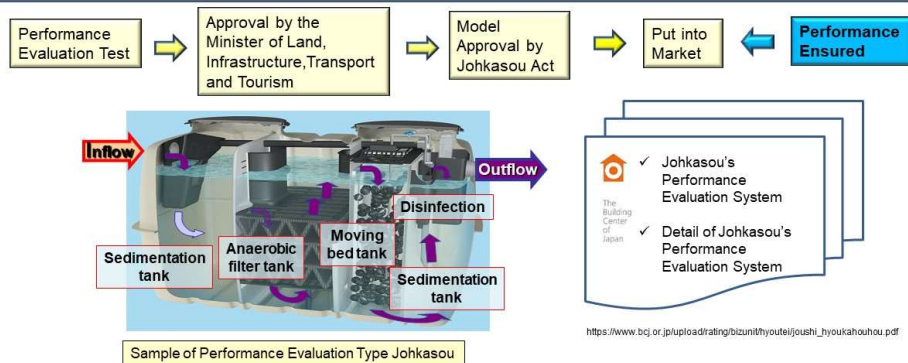


6.5.3. 日本側環境省のセミナー発表資料 (Legal System of Decentralized Domestic Wastewater Treatment Management in Japan including the Johkasou Act)



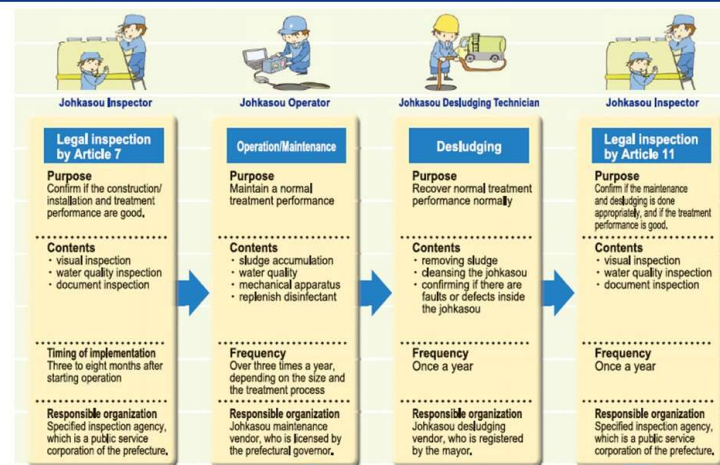
Approval process for types of Johkasou (Johkasou Act, Article 13)

- Parties intending to manufacture Johkasou in production plants shall obtain approval from the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) for the type of Johkasou to be manufactured (does apply to test manufacturing)
- This process is suitable to Performance Evaluation System



5

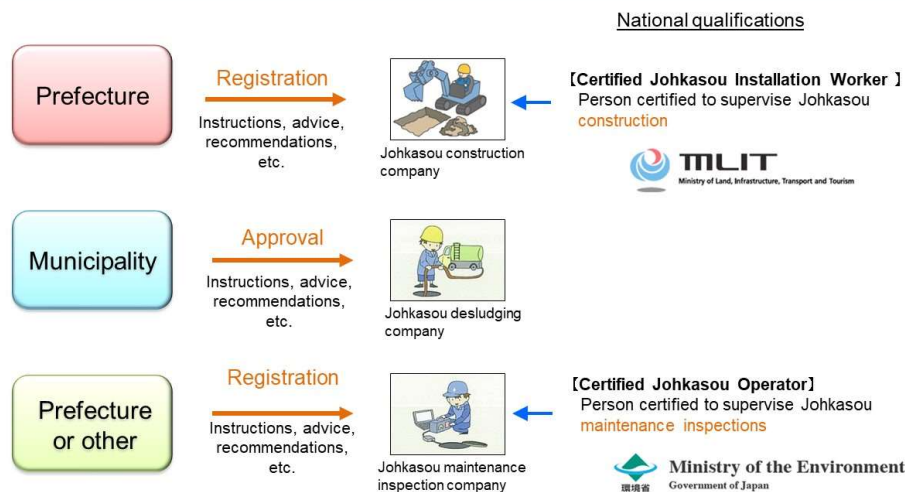
Inspection and Maintenance of Johkasou



MOEJ "Night Soil Treatment and Decentralized Wastewater Treatment System in Japan"

6

Registration process and qualifications system



7

Training courses for Johkasou technicians

- Johkasou technicians should acquire extensive knowledge on not only wastewater treatment/johkasou, but also water environment conservation and public health.
- Curriculums for johkasou operator and johkasou installation worker are as shown below.

| Johkasou Operator by Article 45 | Johkasou Installation Worker by Article 42 |
|---|---|
| <ul style="list-style-type: none"> Fundamental of johkasou 8 H Laws and regulations related with johkasou 4 H Structure and function of johkasou 22 H Introduction to installation of johkasou 4 H Operation and maintenance of johkasou 30 H Water quality management of johkasou 10 H Introduction to desludging of johkasou 2 H | <ul style="list-style-type: none"> Fundamental of johkasou 8 H Laws and regulations related with johkasou 3 H Structure and function of johkasou 15 H Management of johkasou installation 8 H Introduction to O&M and desludging of johkasou 3 H |
| Total 80 Hours | Total 37 Hours |
| (13 Days) | (5 Days) |
| +Test 2 Hours | +Test 2 Hours |

8

6.5.4. JECES のセミナー発表資料 (Operation and maintenance, cleaning, inspection, license and sludge management for Johkasou)

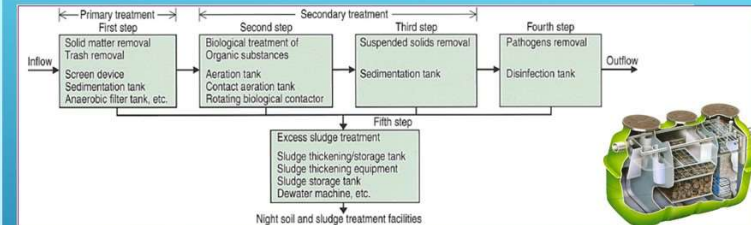
OPERATION AND MAINTENANCE OF JOHKASOU SYSTEM IN JAPAN

Shinhi Kumokawa Ph.D

Center for International Cooperation of Johkasou System
Japan Education Center of Environmental Sanitation (JECES)

1

WHY O&M INSPECTIONS OF JOHKASOU ARE NEEDED?



| | Device/equipment in johkasou |
|---|---|
| Primary treatment (1 st step) | Sedimentation tank, Anaerobic filter tank, Slit screen, Aerated screen, Grit chamber, Bar screen, Flow equalization tank, |
| Secondary treatment 2 nd step | Contact aeration tank, moving bed tank, aeration tank, |
| 3 rd step | Sedimentation tank |
| 4 th step | Disinfection tank |
| 5 th step | Sludge thickening/storage tank, sludge storage tank, |
| Mechanics | Electromagnetic blower, Control panel, mechanical blower, pump, |

2

DEFINITION OF JOHKASOU O&M

Operations concerning to inspecting, maintaining and repairing johkasou (Johkasou Act, Article 2-3)



- Prevent loss of unit function and device breakdown
- Maintain normal treatment performance
- Promote proper regular desludging



3

DEFINITION OF JOHKASOU DESLUDGING

Desludging involves extracting the generated sludge and scum from johkasou and conditioning sludge in the tank, as well as cleaning tanks and auxiliary equipment. (Johkasou Act, Article 2-4)



Recover/reset treatment performance of johkasou by removing sludge regularly

4

TECHNICAL STANDARDS FOR JOHKASOU O&M

- Technical standard for operation and maintenance (Article 2, Ordinance for Enforcement of Johkasou Act)
This standard stipulates maintenance items and adjustment/repair items that must be carried out during operation and maintenance for every johkasou and the auxiliary device.
- Technical standard for desludging (Article 3, Ordinance for Enforcement of Johkasou Act)
Desludging standards stipulate items to be carried out for each unit and auxiliary device during desludging (e.g. methods for drawing out sludge)
- Guidelines for johkasou operation and maintenance (Official notice)
These guidelines are issued by the Ministry of the Environment as specific policies for operations and maintenance technicians. They are designed to ensure that operation and maintenance as well as desludging are carried out optimally and in line with the specific characteristics of each treatment process.

5

GUIDELINES FOR JOHKASOU O&M

□ Technical standard for johkasou O&M, (1984, Johkasou Act)

- Guideline for O&M of Tandoku-shori johkasou (2000)
- Guideline for O&M of small-scale johkasou (1993)
- Guideline for O&M of medium/large-scale johkasou (2000)
- Guideline for O&M of N/P removal type johkasou (2000)
- Guideline for O&M of Membrane johkasou (2000)

□ Technical standard for johkasou desludging (1984, Johkasou Act)

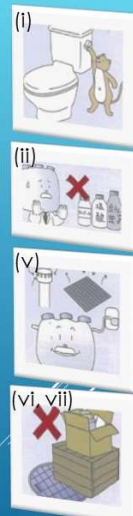


ORDINANCE FOR ENFORCEMENT OF JOHKASOU ACT

(Rule of Using)

Article 1 Rules of using johkasou under the provisions prescribed in Article 3 paragraph 3 of Johkasou Act (hereinafter referred to as "Act") shall be as follows.

- (i) Water amount for flushing toilet shall be appropriate.
- (ii) Materials like insecticide, detergent, deodorant, fatty, disposable diaper, sanitary goods etc. which interfering with the normal functioning of johkasou, shall not be flowed.
- (iii) abbr.
- (iv) Industrial wastewater, rain water and other special wastewaters shall not be flowed into johkasou.
- (v) Johkasou with electric equipment shall not be turned the power supply off.
- (vi) The top or around of johkasou shall has no structural object that may interfere with operation, maintenance and desludging of johkasou.
- (vii) The top of johkasou shall not be loaded which may interfere with its normal functioning.
- (viii) The opening part of aerator shall not be blocked.
- (ix) When the failure or malfunction is found in the johkasou, it should be notified to the johkasou manager immediately.



7

O&M FREQUENCY OF JOHKASOU

(Article 6-2, Ordinance for Enforcement of Johkasou Act)

| Treatment process | Type/size of johkasou | Frequency |
|--|---|-----------|
| <ul style="list-style-type: none"> ● Separation-contact aeration process ● Anaerobic filter-contact aeration process ● Denitrification type anaerobic filter-contact aeration process | 1. Johkasou with a size less than 20 PE | 4 month |
| | 2. Johkasou with a size more than 21 PE and less than 50 PE | 3 month |
| ● Activated sludge process | (> 100PE) | 1 week |
| <ul style="list-style-type: none"> ● Rotating biological contactor process ● Contact aeration process ● Trickling filter process | 1. Johkasou with sand filter device, activated carbon adsorption device or flocculation tank (> 50PE) | 1 week |
| | 2. Johkasou with screen and flow equalization chamber (> 50PE) | 2 week |
| | 3. Other Johkasou (> 50PE) (without screen equipment, etc.) | 3 month |

8



An Example of johkasou O&M



9



Measurement of residual chlorine

Check the water quality onsite
(pH, DO, NO₂, residual chlorine)

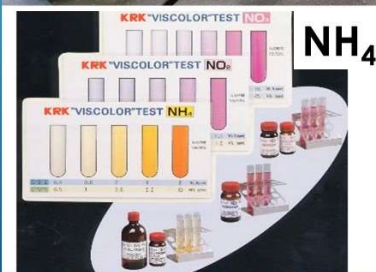
10



pH meter

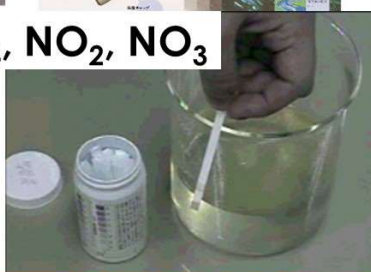


DO meter



NH₄, NO₂, NO₃ portable testing unit

NH₄, NO₂, NO₃



NH₄, NO₂, NO₃ test paper

11



An examples of johkasou desludging



Cleaning the tank

12

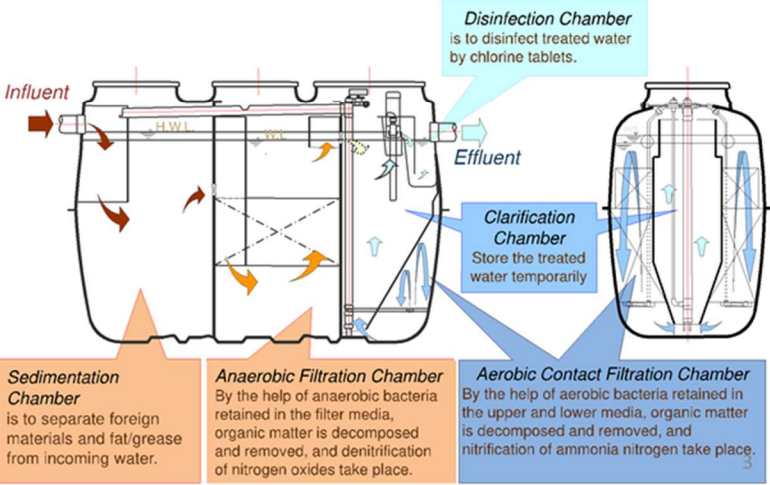
Structure and performance of FujiClean system

2023.12.19
Yosuke Tabata

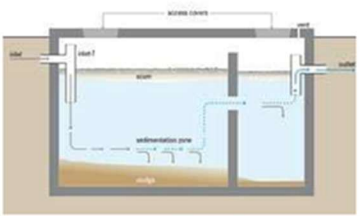


1

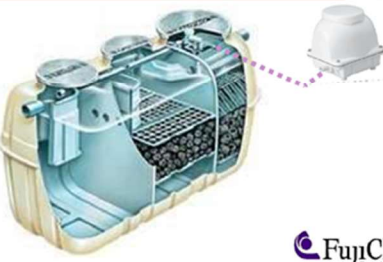
Structure & Function



Septic tanks or FujiClean systems



Septic tanks only have sedimentation chamber to remove some parts of organic matter.
Effluent BOD: 60-150 mg/L



FujiClean systems have anaerobic and aerobic biological treatment processes.
Effluent BOD: 10-20 mg/L



2

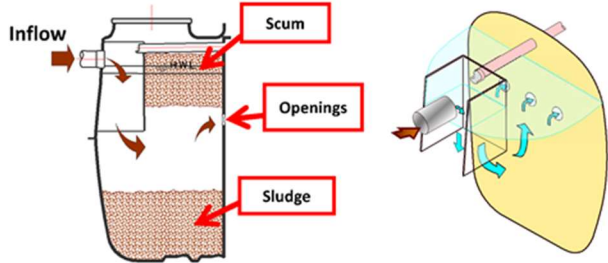
Sedimentation Chamber

Function

Separate and accumulate foreign materials, solids and oil/grease.

Feature

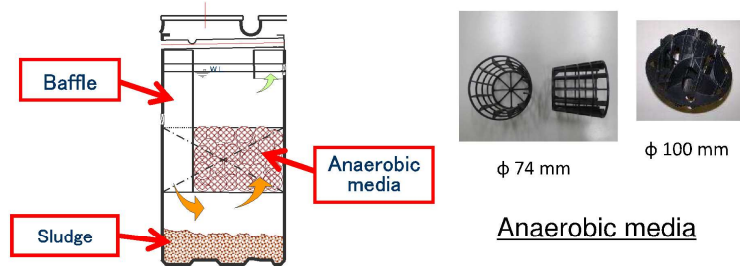
Horizontal water flow prevents flowing up of accumulated sludge.



4

Anaerobic Filtration Chamber

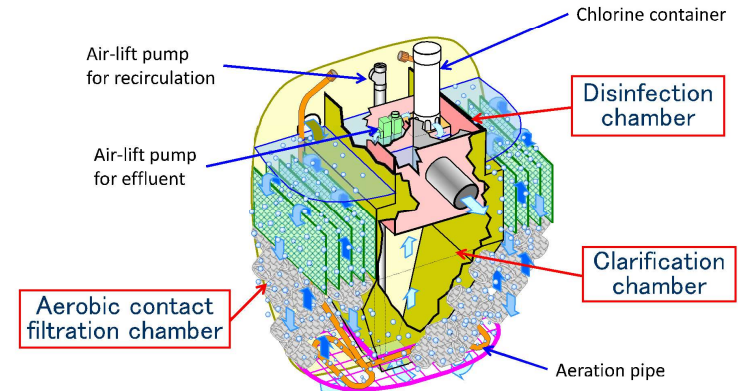
- Function** Separation and accumulation of solids, decompose of organic matter and denitrification take place.
- Feature** Anaerobic media is used to enhance and stabilize anaerobic treatment performance.



FujiClean
Toward Clean Water...

5

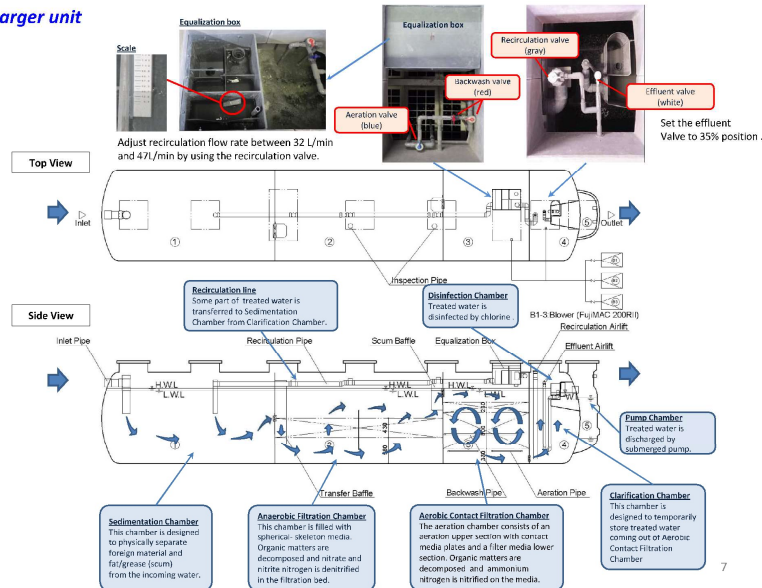
Secondary Treatment Process



FujiClean
Toward Clean Water...

6

Larger unit

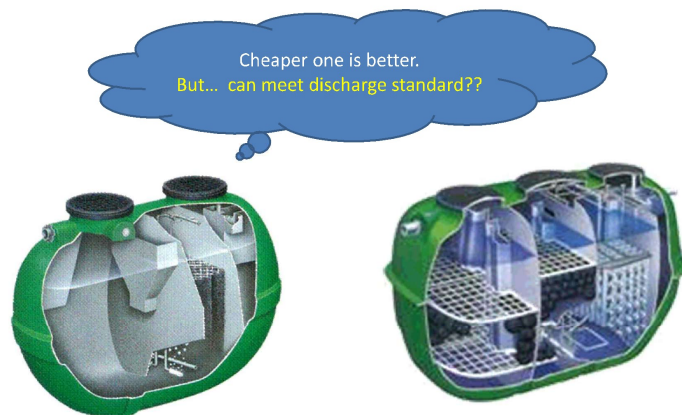


7

How to secure treatment performance at fields

8

Which system do you want to buy?



FujiClean
Toward Clean Water...

9

Influent and effluent criteria for the testing

| | | Japan | Australia | The U.S. | EU (Germany) |
|--------------------------|-----|--------------------------------------|----------------------------|--|--|
| Inflow quantity (L/day) | | 1,000 for 5 PE ~ (Person Equivalent) | 1,200 for 8 PE ~ | Decide by manufacturer | Decide by manufacturer |
| Inflow (mg/L) | BOD | 180~220 | 150~750 | 100~300 | Ave. 350 |
| | SS | 145~175 | 150~750 | 100~350 | Ave. 420 |
| | T-N | 40~50 | 20~150 | 35~70 | Ave. 70 |
| Effluent Criteria (mg/L) | BOD | 20, 15, 10, 5 | 20, 10 | <C-BOD> Monthly Ave: 25 Weekly Ave: 40 | The effluent quality resulted in the testing is certified. |
| | SS | 20, 15, 10, 5 | 30, 10 | Monthly Ave: 30 Weekly Ave: 45 | |
| | T-N | 20, 15, 10, 5 | 15 (Nutrient Removal Type) | Removal rate $\geq 50\%$ | |

FujiClean
Toward Clean Water...

11

Conditions for performance testing

| | | Japan | Australia | The U.S. | EU (Germany) |
|--------------------|-------------------|---------------------|-------------------------|--------------|-----------------------------|
| Testing Conditions | Number of sites | 6 (indoor) | (outdoor) | 10 (outdoor) | 50 (outdoor) |
| | Wastewater | Actual + Artificial | Actual | Actual | Actual |
| | Temp. control | 20°C, 13°C | No | No | No |
| | Start-up duration | Max. 8 weeks | Max. 8 weeks | Max. 3 weeks | Decide by |
| | Testing duration | Min. 8 weeks | 34 weeks | 26 weeks | 38 weeks |
| | Peak inflow | Every day | Yes (as stress testing) | No | Every week @ Normal Testing |
| | Stress testing | Yes | Yes | Yes | Yes |

FujiClean
Toward Clean Water...

10

Thank you!

12

JIS ESTIMATION OF POPULATION FOR JOHKASOU 浄化槽の人員算定(JIS A 3302-2000)

JSA(Johkasou System Association)
KJS(KUBOTA JOHKASOU SYSTEM)
Yoshito Kitai

2023/12/19

JIS A 3302-2000

Estimation of population for Johkasou

1 P.E. = 200L/day, 40g BOD/day, BOD 200mg/L

Large categories(Detail categories(No.of equation))

1. Public hall (Theater, etc. (3))
2. Residence (Apartment, etc. (6))
3. Accomodation(Hotel Motel, etc. (4))
4. Medical facility (Clinic, etc. (5))
5. Shop(Shop,Restaurant, Café etc. (6))
6. Amusement facilities (Disco, Amusement Park etc. (13))
7. Parking (Highway rest area, gas station etc. (7))
8. School (Elementary school, Collage,Library, etc. (3))
9. Office (with canteen, without canteen. (2))
10. Workshop (facity, Laboratory, etc. with canteen, without canteen(2))
- 11.Others (Public toilet, etc. (6))

Total 11 large categories, (Detail categories 57 equations)

JIS A 3302-2000

Estimation of population for Johkasou (Decentralized STP)

1. Prescribe standards for calculating the number of people of the Johkasou based on the purpose of the building.

(建築物の用途別による浄化槽の処理対象人員算定基準について規定する)

2. The criteria for calculating the number of people of the Johkasou are as shown on the table. Specified in total 11 large categories, 57 equations. Reference values for water volume per calculation unit and BOD and influent time is also shown. Discharging time is required for Eq. tank design. However, if the regulations clearly do not match the actual situation, the number of personnel may be increased or decreased. (建築物の用途別による浄化槽の処理対象人員算定基準は、表の通りとする。

Total 11 large categories, 57 equationsで規定する。算定単位当たり水量、BODそれから排水時間も参考値で示されています。排水時間は調整槽の大きさの設計が必要です。

ただし、規定が明らかに実情にそぐわない場合は、人員を増減できる。)

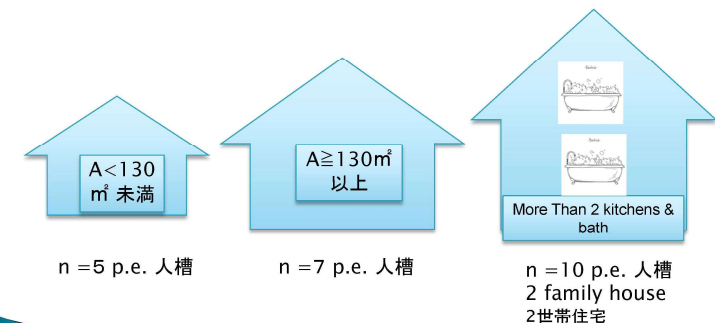
3. If the same building has two or more different uses, each calculated by adding the term for building use.

(同一の建築物に2つ以上の異なった建築用途がある場合は、それぞれの建築用途の項を加算して算定する。)

2. 1.Residence 住宅

[Equation]

If total floor area A (m2) <130m2 , Johkasou capacity (P.E.) shall be 5 P.E.



2.2. Apatment 共同住宅

▶ Apartment 共同住宅

【Equation】

Johkasou Capacity (P.E.) $n = 0.05 \times A$ (p.e.)
(A (m²) : total floor area)

Ex. If one house A=50 m² and 150 houses 戸

$n = 0.05 \times 50 = 2.5$ p.e. < 3.5 p.e

then $n = 3.5$ and

Total $n = 3.5 \times 150 = 525$ p.e. 人槽

◦ $Q = 0.2\text{m}^3/\text{p.e.}/\text{d} \times 525$ p.e.

◦ $= 105$ m³/d

◦ BOD=200mg/L



5

4. Medical Facilities 医療施設関係

Example

Large hospitals with commercial kitchens or laundry facilities

【Equation】

$B(\text{beds}) < 300$: $n = 8 \times B$ (p.e.)

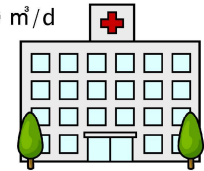
$B(\text{beds}) \geq 300$: $n = 11.43 \times (B - 300) + 2,400$ (p.e.)

Ex. If B=100 beds

$n = 8 \times 100 = 800$ p.e. 人槽

$Q = 0.125\text{m}^3/\text{p.e.}/\text{d} \times 800$ p.e. = 100 m³/d

BOD=320mg/L



6

5. Shop 店舗関連

① Shop/market 店舗、マーケット

【Equation】

Johkasou capacity (P.E.) $n = 0.075 \times A$
(A (m²) : total floor area)

② Restaurant(General) 飲食店(一般)

【Equation】

Johkasou capacity (P.E.) $n = 0.72 \times A$

Ex. 1,000m² Restaurant レストラン

$n = 0.72 \times 1000 = 720$ p.e 人槽

$Q = 0.18\text{m}^3/\text{p.e.}/\text{d} \times 720$ p.e. = 129.6 → 130m³/d

BOD = 220mg/L



7

9. Office 事務所関連

Office with kitchen 事務所

【Equation】

(With kitchen 厨房施設有り)

Johkasou capacity (P.E.) $n = 0.075 \times A$

(A (m²) : total floor area)

(Without kitchen 厨房施設無し)

Johkasou capacity (P.E.) $n = 0.06 \times A$

Ex. 400m² with kitchen

$n = 0.075 \times 400 = 30$ p.e. 人槽

$Q = 0.2\text{m}^3/\text{p.e.}/\text{d} \times 30$ p.e. = 6 m³/d

BOD=200mg/L



8

10. Workshop 作業場関係

Factory, laboratory 工場、研究所(厨房施設有り)

(With kitchen 厨房施設有り)

【Equation】

Johkasou capacity (P.E.) $n = 0.75 \times P$

(P : Full number (person)※定員)

(Without kitchen 厨房施設無し)

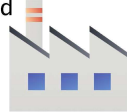
Johkasou capacity (P.E.) $n = 0.3 \times P$

Ex. P=100 persons with kitchen 厨房有

$n = 0.75 \times 100 = 75$ p.e. 人槽

$Q = 0.133 \text{ m}^3/\text{p.e.}/\text{d} \times 75 \text{ p.e.} = 10 \text{ m}^3/\text{d}$

BOD=300mg/L



9

11. Others その他施設

Ex. Public Toilet 公衆便所

【Equation】

Johkasou capacity (P.E.) $n = 16 \times C$

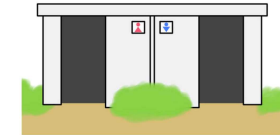
(C : Number of lavatory basin 総便器数)

Ex. C=10 Public toilet 便器10個の公衆便所

$n = 16 \times 10 = 160$ p.e. 人槽(24m³/日)

$Q = 2.4 \text{ m}^3/\text{set}/\text{d} \times 10 \text{ sets} = 24 \text{ m}^3/\text{d}$

BOD = 260mg/L



10

Application Overseas

海外での適応

●The JIS calculation standards are determined statistically based on survey (took several years for dozens of JSA companies) data such as drainage volume, number of population, and total floor area for actual construction purposes in Japan. It is reviewed and revised from time to time in response to changes in lifestyle.

JISの算定基準は、日本での実際の建築用途の排水量、使用人員、延べ床面積などの調査データ(JSA数十社で数年かかった)から統計的に定めているもの。時折生活様式の変化などに合わせ、見直し改定が行われている。

●When overseas, estimation of population should be done according to the lifestyle of the country.

海外では、その国の生活様式に合わせた算定を行うことが望ましい

11

Johkasou - Installation



Legal Framework for Johkasou Installation

3

The following items are listed in the Johkasou Act with regard to installation

Notification

Submit a notification of Johkasou installation to the competent authorities prior to construction

Installation

- Construction can only be performed by a business office registered in the prefecture that has jurisdiction over the area where the installation work is to be performed
- Installation or supervision by a national qualified Johkasou installer



OUTLINE

- Legal frame work of Johkasou installation
- Johkasou installation works

Johkasou Installation Flow

4

| | | |
|----|-------------------------------------|--|
| 1 | Prior On-Site Survey | Check installation location and delivery route |
| 2 | Application for installation | Submit notification of Johkasou installation |
| 3 | Temporay work | Site preparation |
| 4 | Excavation | Excavate to required depth |
| 5 | Foundation | Make a reinforced concrete slab |
| 6 | Installation | Install Johkasou on the base slab |
| 7 | Filling water | Fill the Johkasou with water |
| 8 | Backfilling | Backfill around Johkasou with sand |
| 9 | Piping work | Connect each piping |
| 10 | Electrical work | Install blower, pump, control panel and so on |
| 11 | Upper concrete work | Make a RC slab on Johkasou |
| 12 | Trial operation | Check Johkasou and equipment function |
| 13 | Cleaning & Handover | Explain Johkasou to users |



Johkasou Installation - Prior On-Site Survey

5

Purpose To check the site conditions prior to Johkasou installation and ensure smooth installation

Check Point

Sufficient area to install a Johkasou
Location and depth of inlet pipe
Treated water discharge point
Existing pipe and cable location
Ground water level
Special installation or not
Johkasou delivery route
Electricity and tap water availability
Blower and control panel location
Maintenance workability



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Johkasou Installation – Application for Installation

6

Purpose Ensure that Johkasou is properly install
Ensure Johkasou model, capacity, install date and builder

Documents

Notification of installation of a Johkasou
Notification of change of Johkasou
Johkasou card
Johkasou use start-up report
Johkasou owner change report
Notification of discontinued use of Johkasou
Notification of Johkasou out of use
Notification of Johkasou re-use start-up
Technical operator change report

浄化槽設置届書 (浄化槽設置届)

東京都知事 宛

設置者(法人名)
設置場所(東京都内)
電話番号

浄化槽設置届書(浄化槽設置届)は、浄化槽設置者(法人)が、浄化槽を設置するに当たって提出する届書です。

| | | | |
|--------------|--------------|--------------|---------------|
| 1. 設置場所(住所) | 2. 設置場所(地番) | 3. 設置場所(地目) | 4. 設置場所(用途) |
| 5. 設置場所(地番) | 6. 設置場所(地目) | 7. 設置場所(用途) | 8. 設置場所(用途) |
| 9. 設置場所(用途) | 10. 設置場所(用途) | 11. 設置場所(用途) | 12. 設置場所(用途) |
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| 97. 設置場所(用途) | 98. 設置場所(用途) | 99. 設置場所(用途) | 100. 設置場所(用途) |

設置者(法人)の代表者(代表取締役)の署名(捺印)と、設置場所(住所)の所在地(市町村)の長官(市長、町長、村長)の署名(捺印)が必要です。

設置者(法人)の代表者(代表取締役)の署名(捺印)と、設置場所(住所)の所在地(市町村)の長官(市長、町長、村長)の署名(捺印)が必要です。

https://www.kankyo.metro.tokyo.lg.jp/resource/general_waste/septic_tank/septic_tank_law.html

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Johkasou Installation – Temporay work

7

Purpose Prepare site for excavation can be done without problems
Measure and determine the area to be excavated

Description

Clearing the ground before installation
Decide where to install Johkasou
External inspection of the Johkasou



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Johkasou Installation – Excavation

8

Purpose For underground installation, excavate as per the drawing
Underground installation allows for effective use of space

Description

Excavate to the depth required in drawing
Use retaining walls if necessary
Use submersible pump if groundwater spring



Point

Excavate about 5 cm larger than the size of the bottom slab to make it easier to work on



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Johkasou Installation – Foundation 1

9

Purpose Use rubble stones to harden the foundation

Description

Make sure it has the necessary square footage
Place rubble stones of unequal size
Fill in the gaps with sand
Stamp them sufficiently with a rammer



Point

Thickness shall be in accordance to drawing
Usually 100 mm or 150 mm (T-0)



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Johkasou Installation – Installation

11

Purpose Install Johkasou on base slab

Description

Visual inspection of Johkasou
Clean base slab (small stones, etc.)
Lift Johkasou according to the manual
Place Johkasou in the center of base slab
Check Johkasou is installed horizontally
Install wire to prevent raising by groundwater



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Johkasou Installation – Foundation 2

10

Purpose To install Johkasou horizontally
Prevent Johkasou from being raised by groundwater

Description

Place concrete 50mm thick on the rubble stone according to the drawing
Make a temporary framework with the specific dimensions
Rebar arrangement according to the drawings
Install anchors according to the drawing
Cast concrete with surface tolerance of $\pm 2.5\text{mm}/1\text{m}$



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Johkasou Installation – Filling Water

12

Purpose To protect Johkasou from soil pressure
To prevent the Johkasou from shifting during backfilling

Description

Check Johkasou is secured with wires
Fill Johkasou with tap water
Make sure Johkasou is not leaking water



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Johkasou Installation – Backfilling

13

Purpose Protects Johkasou from UV light
Fill in gaps for easier maintenance

Description

Ensure Johkasou is filled with water
Ensure backfill sand is free of stones and gravel
Cover Johkasou to prevent sand from getting in
Backfill and water tightening in three steps



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Johkasou Installation – Electrical work

15

Purpose Install blower, pump, control panels...

Description

Install a blower in a well-ventilated place
Avoid direct sunlight on the blower
Blower should be installed on flat concrete
Provide grounding works as required



Point

Air piping should be kept as sand-free as possible
The platform for the blower should be about 200mm higher than the GL.
Use header pipes if there is more than one blower

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Johkasou Installation – Piping Work

14

Purpose Connect inflow pipe, effluent pipe
Connect blower and Johkasou

Description

Connect the inflow pipe and Johkasou
Connect the effluent pipe and Johkasou
Connect the blower and Johkasou with piping
Air pipes shall be 10m in length and within 5 bends
Install an exhaust pipe for surrounding area
Install pipe supports if necessary



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Point

Be careful not to allow sand to enter the piping
Check drawings for piping sizes and install

Johkasou Installation – Upper Concrete Work

16

Purpose To prevent rainwater from entering the tank
For easier maintenance works

Description

Cast upper slab in same procedure as base slab
Note that the reinforcement is different from the base slab



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Johkasou Installation – Trial Operation

17

Purpose Check for proper operation through a trial operation

Description

Check piping joint condition
Check for air leakage
Check if moving bed medias are moving well
Check there is no difference in water level
Check if the circulation volume can be set

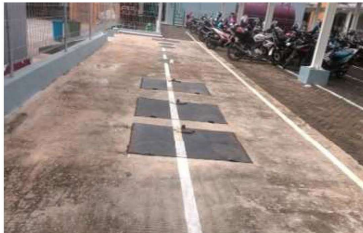


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Johkasou Installation Reference

19

Underground installation



Half underground installation



Above ground installation



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Johkasou Installation – Cleaning & Handover

18

Purpose Clean around Johkasou and
Hand over the Johkasou to its user

Description

Clean up sand and trash
Report to the user that the construction has been completed
Inform users about proper use of Johkasou and precautions to be taken



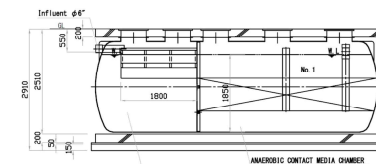
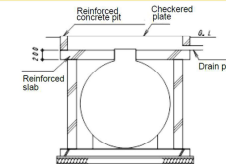
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References of Special Installation

20

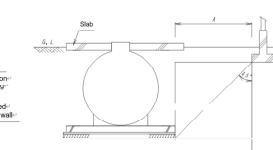
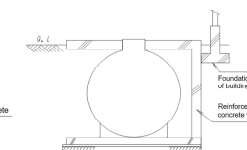
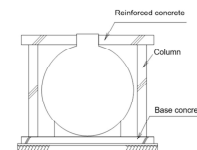
Under ground installation

Inlet pipe position is lower



Special installation

Load carrying capacity



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| Above ground | Under ground |
|------------------------------------|-----------------------|
| Short construction period | Easy maintenance |
| Save the cost of construction | Utilization of space |
| Possible to relocate in the future | Ultraviolet no effect |

We can chose some installation due to the site condition.

6.6. セミナーにおける質疑応答

| No. | Questioner | Question/Comment | Answerer | Answer |
|-----|---------------------------------------|---|----------|--|
| 1. | The University of Tokyo Dr. Kasuga | <p>NMCG の発表における Namami Gange Programme について、多くのプロジェクトが並行して進行しているかと思うが、どのようにして各プロジェクトを評価するのか聞きたい。河川のモデルがあるのか。Sewerage Treatment Plant(STP)の建設前後でどのように変化したのか。</p> <p>With respect to the Namami Gange Program in NMCG presentation;</p> <p>I believe that many projects are progressing in parallel, but I would like to know how you evaluate the effect of each project.</p> <p>Is there a water quality river model? How the situation has been changed before and after the Sewerage Treatment Plant (STP) was constructed?</p> | NMCG | <p>我々はリアルタイムで状況を把握できるオンラインのモニタリングシステムを所有している。現在 200 の Sewerage Treatment Plant (STP)に本システムが導入されている。更に、流域内の残り 200 の STP へ本システムの新規導入を検討している。本システムは事務所にてモニタリング可能である。15 分ごとに送られてくるデータによって現状を把握している。</p> <p>また、同様のシステムをガンジス川流域に 75、その他の場所に 110 導入する予定である。本システムにより下水の状況及び水質の関係をモニタリングしている。取得したデータの集計は、取得月の翌月に公表している。</p> <p>水質は 1-5 段階に分けられており、1 は非常に不良、5 は非常に良好というのを示す。結果については、13 枚目のスライドに記載した 2014-2015 年及び 2022 年の各年の状況を比較したデータを見てほしい。</p> <p>We have an online effluent quality monitoring system that allows us to understand the situation in real time. This system is currently installed in 200 Sewage Treatment Plants (STPs). We are also considering introducing this system to the rest 200 STPs in the basin. This system can be monitored at the office. The current situation is monitored by the data sent every 15 minutes.</p> <p>We also introduce the similar Real Time Water Quality Monitoring Stations to 75 locations of Ganga river basin and will introduce to other 110 locations of other rivers of the basin. This system monitors the relationship between sewage conditions and water quality of the Ganga river. The aggregated data is published in the month following the month in which it was obtained. Water quality is graded from Priority 1 to 5, with 1 being very high polluted and 5 being less polluted good. Regarding the outcome, please see the slide No.13 of comparison of data of each state in 2014-15 and 2022.</p> |
| 2. | The University of Tokyo Dr. Kasuga | <p>Q1 の回答によってモニタリングの方法は理解した。ガンジス川の水質のモデルを作成して水質の監視をより効率的に実施するのが良いと思う。</p> <p>追加の質問で、スライド P.16 にある国家水政策(National Water Policy)には、人口が 10,000 人以上の地域には STP を設置しなけ</p> | NMCG | <p>Swachh Bharat Mission - Gramin (SBM-G) という村単位の液体廃棄物のインフラを設置するというプログラムが別途あり、人口 10,000 人以下の小さな村などの排水管理もカバーすることになっている。</p> <p>しかし流域保全を目的とする Namami Gange Program (NMG)では、対象地域内に人口 10,000 人以下の小さな村が多く含まれている。このため、NMG によって導入された最小の汚水処理施設の容量は 10 m³/日で、最大の施設では 565,000 m³/日の下水処理場 (JICA による支援) である。2019 年に施行された SBM は、2012 年の国家水政策を補完することになっている。</p> |

| No. | Questioner | Question/Comment | Answerer | Answer |
|-----|------------|---|------------------|--|
| | | <p>ればならないとあるが、10,000人以下の地方や農村などについては言及されていない。国家水政策にはどの程度の人口が含まれないのか?</p> <p>Based on the answers to Q1, I understood the monitoring method.</p> <p>I think it would be a good idea to create a water quality model of the Ganges River and monitor water quality more efficiently.</p> <p>In an additional question, the National Water Policy on slide P.16 states that STPs must be installed in areas with a population of 10,000 or more, however, it does not mention to the rural area or small villages with a population less than 10,000. How much of the population is NOT included in national water policy?</p> | | <p>There is a separate program called Swachh Bharat Mission - Gramin (SBM-G) to set up village-based liquid waste infrastructure, which will also cover wastewater management in small villages with a population of less than 10,000. However, the Namami Gange Program (NMG), of which purpose is water environment conservation, includes many small villages with a population of less than 10,000 people within the target area. Therefore, the smallest sewage treatment facility installed by NMG has a capacity of 10 m³/day, and the largest facility is a 565,000 m³/day sewage treatment plant (supported by JICA). The SBM, which came into force in 2019, is supposed to complement the 2012 National Water Policy.</p> |
| 3. | NMCG | <p>現在、浄化槽の排水を貯留するというシステムは存在するのか。もし存在するのであれば、そのシステムは排水を何%貯留できるのか知りたい。</p> <p>Currently, is there any chances of saving the water in Johkasou technology (effluent storage system for Johkasou)? If so, I would like to know what the proportion is (the percentage of effluent the system can store)</p> | MOEJ Mr. Sato | <p>浄化槽の排水については基本河川に放流しているため、貯留しているという実績はないと思われる。</p> <p>浄化槽の処理水の再利用について、MOEJ 主催で 11 月 28 日にワークショップを開催した。JECES のホームページに発表資料を掲載しているため、後ほど URL を送付する。</p> <p>As wastewater from Johkasou is generally discharged into rivers, I think there would be no cases of it being stored.</p> <p>A workshop was held on 28th November, 2023 organized by MOEJ regarding the reuse of effluent from Johkasou. The presentation materials are posted on the JECES homepage and seems to be a reference for your question. JECES will send you the URL later.</p> |

| No. | Questioner | Question/Comment | Answerer | Answer |
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| 4. | NMCG | <p>ライフサイクルコスト(LCC)を教えてください。例えば耐用年数が15年の場合はどの程度費用がかかるか。</p> <p>I would like to know the life cycle cost (LCC) of the Johkasou . For example, if the service life is 15 years, how much will it cost?</p> | <p>DAIKI AXIS INDIA PVT.LTD. Mr. Kamal Tiwari</p> | <p>現時点での私の考えでは、BOD 20 mg/L かつ容量が 1t/day の場合、最初に発生する費用 (CAPEX) は 1.6Lakhs(ラーク、2024 年 2 月 7 日時点で約 284,800 円)であり、他に現場の状況に応じて追加費用 (15,000-22,000 ルピー) が必要になる。また、清掃、電気料金、消毒剤などメンテナンス費用 (OPEX) が年間約 7,000 ルピーで、利用者が負担する。維持管理契約では維持管理の頻度も決めており、付帯設備がある場合はその維持管理費用も利用者が負担している。</p> <p>My current thinking is that if the effluent BOD is 20 mg/L or less and the capacity is 1 t /day, the initial cost will be 1.6 Lakh , and in addition, maintenance costs will be incurred. Also, additional costs (20,000-25,000 rupees) will be required depending on the site situation. In addition, maintenance costs (OPEX) such as sludge cleaning (desludging), electricity charges, and disinfectants are approximately 7,800 rupees per year, which is to be paid by the users. The maintenance contract also determines the frequency of maintenance, and if there are incidental facilities, the user is also responsible for the maintenance costs.</p> |
| | | | <p>DAIKI AXIS INDIA PVT.LTD. Mr. Rio Waza</p> | <p>OPEX に関して特に電力消費量に差があり、Membrane Bioreactor(MBR;膜分離活性汚泥法)では膜交換費用も必要になるため、かなり高額になる。しかし、浄化槽で主に採用されている MBBR (Moving bed biofilm reactor) または FBBR (Fixed Bed Biological Reactor) システムでは担体を交換する必要が無いので、15 年間のライフサイクルコスト(LCC)も低くなることが想定される。使用開始から 4-5 年経過した際はポンプやブロワの交換が必要となり、それらが LCC に大きな影響を与えるのではないかと考えている。</p> <p>Regarding OPEX, there is a particular difference in power consumption, and Membrane Bioreactor (MBR; membrane separation activated sludge method) requires also membrane replacement costs, and making it quite expensive. However, in the MBBR (Moving bed biofilm reactor) or FBBR (Fixed Bed Biological Reactor) systems that are mainly adopted in Johkasou, there is no need to replace the media, so the 15-year life cycle cost (LCC) can be lower. The pumps and blowers will need to be replaced after 4-5 years of use, and we believe that these are main parts of LCC.</p> |

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| | | | Arvind Envisol ltd Mr. Amit Shah | <p>6年ほど本業務に従事し150基以上の浄化槽を導入した中で得た知見に基づく、処理容量が大きくなればなるほどO&M費用は相対的に下がると考えている。浄化槽をインドで利用すると、他の標準的なSTPの維持管理費の70-80%まで低減できている。</p> <p>また、CAPEXについても言及させていただく。例えば10 m³/日の浄化槽では7.5～8 Lakhs (2024年2月7日時点で約1,335,000円)、100 m³/日の浄化槽では35～40 Lakhs 程度である。更に、浄化槽内部で利用する担体の種類、処理容量、要求される処理水のレベル（インドでは放流水のBODが30-5mg/Lと幅がある）によっても変化してくる。また、浄化槽システムを設計する際、フィルターシステムや貯留槽を追加するか、どのようなタイプの制御盤を利用するか、どこから電源を引き込むか、等の条件によってもCAPEXは変化してくる。このように、例えば10 m³/日の浄化槽でも、OPEXは7.5 Lakhs から15 Lakhs と変動する。</p> <p>Based on the knowledge I've gained from working in this business for about 6 years, I believe that OPEX will decrease relatively as the treatment capacity increases. We believe that using Johkasou in India can reduce maintenance costs by 70-80% of other conventional STP system.</p> <p>I would also like to mention CAPEX. For example, a 10 m³/day Johkasou system costs 7.5 to 8 Lakhs, and a 100 m³/day Johkasou costs about 35 to 40 Lakhs. Furthermore, CAPEX also changes depending on the type of media used inside the Johkasou, the treatment capacity, and the required level of treated water (in India, the BOD of effluent water varies from 30 to 5 mg/L). And, when designing a Johkasou system, CAPEX will also change depending on conditions such as whether to add a filter system or storage tank, what type of control panel to use, where to draw power from, etc.</p> <p>Thus, for example, even for a Johkasou of 10 m³/day, the OPEX varies from 7.5 Lakhs to 15 Lakhs.</p> |
| 5. | NMCG | <p>浄化槽に係る費用と他の分散型汚水処理施設に係る費用を比較したいため、もし資料等の比較材料をどなたかお持ちであれば教えてほしい。</p> <p>I would like to compare the costs associated with Johkasou and other decentralized sewage</p> | Indian Institute of Technology- Roorkee Prof. Kazmi | <p>回答者のお話のとおり、集中型処理システムに係る費用と、浄化槽に係る費用を比較すると、浄化槽が割高になる。例えば1 m³当たりの処理単価は下水道では5ルピー、浄化槽では20ルピー程であると思う。しかし、浄化槽は集中型処理施設が設置できないようなケース、例えば、小さな集落やコロニーに、小規模下水道システムとして、または戸建て住宅に導入されることを考慮すべきである。一方、こういったケース以外では下水道など集合型処理の方が、CAPEX,OPEX 含め処理コストが安くなるのは明白である。よって集合処理が導入できない場合に浄化槽を導入すべきである。</p> |

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| | | treatment facilities, so if anyone has any materials for comparison, please let me know. | | As other respondents have said, if you compare the cost of centralized STP and the cost of a Johkasou, it seems that the Johkasou will be more expensive. For example, I think the treatment unit cost per cubic meter is about 5 rupees for sewers and 20 rupees for Johkasou. However, Johkasou should be considered for installation in cases where it is not possible to install centralized treatment facilities, for example in small settlements or colonies, as small-scale sewerage systems or in individual houses. On the other hand, in other than these cases, it is clear that the centralized treatment such as sewage is cheaper. If centralized treatment is not possible to install, Johkasou should be installed. |
| | | | DAIKI AXIS INDIA PVT.LTD. Mr. Kamal Tiwari | <p>分散型/集合型で公平な比較をする必要があると考えている。集合型処理施設を設置するとなった場合、大掛かりなパイプの敷設や近隣への影響を考慮しなければならない。我々は幸いにも分散処理/集合処理の専門家もあり、分散処理に関してはデータとして利用可能な実例を多く把握している。また、NMCG は分散処理/集合処理それぞれのデータを所有していると認識している。よってこれらデータを基に比較すればより深く探求することが出来ると思う。</p> <p>I think it is necessary to make a fair comparison between decentralized and centralized system. When installing a centralized treatment facility, consideration must be given to the installation of large-scale pipes and the impact on neighboring areas. Fortunately, we also have experts in decentralized and centralized system, and we have many examples of decentralized system that can be used as data. In addition, I think NMCG own data for both decentralized and centralized system. Therefore, I think it would be possible to study more deeply by comparing based on these data.</p> |
| | | | Arvind Envisol ltd Mr. Amit Shah | <p>Dr. Kazmi そして Mr. Kamal がお話しされたことに追加させていただく。</p> <p>同等の処理容量の分散型污水处理施設を比較することも重要であると考えている。Dr. Kazmi が述べたように、処理容量によって LCC も変化してくる。そこで、例えば、200 m³/日の施設を 1 つ例として挙げて、実際に分散型污水处理施設の市場で流通している技術、例えば MBR システム、標準活性汚泥法、他のシステムなどと 5 年間の運転費用を比較する、などである。単純に分散型/集合型污水处理施設を比較するのは困難である。Dr. Kazmi にはこういった比較研究をしていただきデータを共有していただきたい。</p> <p>I would like to add to what Dr. Kazmi and Mr. Kamal said.</p> <p>I also believe it is important to compare decentralized wastewater treatment facilities with equivalent treatment capacity. As Dr. Kazmi mentioned, LCC also changes depending on the treatment capacity. For example, I think it would be</p> |

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| | | | | <p>better to compare the facility with a treatment capacity of 200 m³/day as an example, on the operating costs for 5 years with different technologies such as the MBR system, conventional activated sludge method, and so on (technologies actually distributed in the market for decentralized wastewater treatment facilities).</p> <p>It is difficult to simply compare decentralized/centralized wastewater treatment facilities. I would like Dr. Kazmi to conduct this kind of comparative research and share the data.</p> |
| | | | The University of Tokyo Dr. Kasuga | <p>上記の議論にコメントさせていただく。集合処理と分散処理ではそれぞれメリット・デメリットがあるが、加えて、長期的な視点で両者を評価することも必要であると思われる。例えば、集合処理では、40年後、50年後、莫大なキャピタルが必要になり、修復工事などに多くの費用が必要になる。よって LCC 分析を行う際はインド国内または対象地域にどの設備が適しているか、長期的な視点で検討する必要があると思われる。</p> <p>I would like to comment on the above discussion.</p> <p>Centralized system and decentralized system each have different advantages and disadvantages, but it is also necessary to evaluate both from a long-term perspective. For example, centralized system will require a huge amount of capital 40 to 50 years later, due to for repair work. Therefore, when conducting LCC analysis, it is necessary to consider from a long-term perspective which facilities are suitable for India or the target region.</p> |
| | | | DAIKI AXIS INDIA PVT.LTD. Mr. Kamal Tiwari | <p>ジャル・シャクティが推進する処理水の再利用についてコメントさせていただく。</p> <p>飲用水以外の用途に処理水を再利用する場合、ポンプ等付帯設備が不要になるため、分散処理施設において再利用を行った方が、より利益が多いと思われる。インド国内では既に様々な STP で処理水の再利用が実施されており、そういった施設の実データを基に比較することができると考える。</p> <p>I would like to comment on the framework on reuse of treated water promoted by Jal Shakti. When reusing treated water for purposes other than drinking water, it might be more profitable to reuse it at a decentralized treatment facility, since there is no need for ancillary equipment such as pumps. Reuse of treated water is already being implemented at various Centralized and decentralized STPs in India, and we believe that comparisons can be made based on actual data from such facilities.</p> |

6.7. セミナー終了後に日本側会議体メンバーから受領した質問

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| 1. | MOEJ | <p>Shri Dheeraj Joshi のプレゼン P.18 には、NMCG プロジェクトとして浄化槽 3 件が設置されているとのことですが、稼働状況を教えていただきたい。処理水は再利用されていますか？また、NMCG はこの 3 件をどう評価していますか（良い点、良くない点を含めて教えていただければと存じます）？</p> <p>In the presentation from Shri Dheeraj Joshi, on page 18, it has introduced that 3 (three) Johkasous were installed as part of the NMCG project.</p> <p>I would like to know the operating status of these Johkasous.</p> <p>Is treated water (effluent) reused? Also, how would NMCG evaluate these three Johkasou (I would appreciate if you could tell me the good and bad points)?</p> |
| 2. | MOEJ | <p>Shri Dheeraj Joshi のプレゼン P.19 には、分散型処理技術が紹介されていますが、これらの施設の水質や機械等の稼働に関するトラブル等、もし困っていることがありましたら教えていただきたい。</p> <p>In the presentation from Shri Dheeraj Joshi, on page 19, decentralized treatment technology is introduced. If there is any trouble regarding effluent water quality or operation of machinery etc. at these facilities, please kindly let us know.</p> |
| 3. | MOEJ | <p>インド側として今回のセミナー開催の意義は何か。また、何が有益で、インドの水環境改善に今回の内容をどのように役立てるか、現時点での見解を伺いたい。</p> <p>For the Indian side, what was the significance of holding this time of seminar?</p> <p>Additionally, I would like to hear your current views on what is useful and how the contents of these presentation can be used to improve India's water environment.</p> |
| 4. | MOEJ | <p>今回のセミナーの内容をどう評価しましたか？もし改善点等がありましたら教えてください。</p> <p>How did you evaluate the content of this seminar?</p> <p>Please let us know if there are any improvements.</p> |
| 5. | Dr. Kawamura | <p>河川水質のモニタリングにおける水質項目を教えてください。</p> <p>BOD が含まれているとしたなら、15 分ごとのモニタリングはどのようにして行っているのか。</p> <p>Would you tell me the items for monitoring of the river water quality?</p> <p>In addition, if BOD is included in those items, how the monitoring is been conducted every 15 minutes?</p> |
| 6. | Dr. Kawamura | <p>浄化槽の処理水質に対して想定している項目と水質値はどのようなものか。また、管理主体は誰になるのか。どちらも下水道との対比で回答していただきたい。</p> <p>What items and the water quality values are assumed for the effluent quality of the Johkasou?</p> <p>Also, who will be the managing entity of Johkasou in India?</p> <p>Would you answer both questions by comparing them with sewage treatment plant?</p> |