# Resume


Name : Dr. Pawan Kumar Jha

Date of Birth : 2 May 1957

Present position: Chairman, Foundation for Environment and Sanitation

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**Web:** **http://in.linkedin.com/in/drpkjha/**

Qualification : M. Sc.; PhD-(Microbial Biochemistry), Patna University, Patna, Bihar, India 1987


## 1. Membership of Professional Societies:

- Member of the Internal Monitoring Committee (IMC) of India –EU project entitled "Supporting consolidation, replication and up-scaling of sustainable wastewater treatment and technologies for India – "Saraswati", funded by Department of Science & Technology (DST), Government of India under the Framework of India –European Union Science and Technology Co-operation Agreement.
- Member of the Technology Advisory Group ( TAG) for the " Reinvent the Toilet Challenge (RTCC)- India", a collaborative project of the Department of Biotechnology (DBT), Govt. of India, and the Bill & Melinda Gates Foundation, USA.
- Founder Trustee of the India WASH Forum, supported by the Global Sanitation Fund (GSF) and Water Supply and Sanitation Collaborative Council ( WSSCC), Geneva
- Member of IOBB (International Organization of Biotechnology and Bioengineering) Australia, for its Working Group for Bioenergy.
- Worked as an expert for evaluating R&D proposals submitted to the Ministry of New &Renewable Energy, Government of India in the field of biogas.
- Member expert committee of Ministry of Science & Technology, Government of India, for assisting independent innovators of India as Technology Angel under Technopreneur Promotion Program of the Ministry.
- Working as a Reviewer for the International Journal Bioresource Technology, Elsevier Publication, USA.

## 2. Profile at a Glance

- I have over 28 years extensive experience and expertise in developing sustainable technologies, preparation of proposals, their implementation, monitoring &evaluation, policy research, training and capacity building, in the fields of sanitation, septage management, biogas from human wastes and other wastes, decentralized waste water treatment, solid wastes management, in urban and rural areas in India and abroad.

- Worked as a Consultant (Sanitation and Waste Management) with the National Resource Centre, Ministry of Drinking Water and Sanitation, Govt. of India, New Delhi from 8th February 2011 to 7th February 2014.
- While working with the MoDWS my assignments included preparation/ modification of various guidelines on sanitation & waste management; evaluation of R&D proposals on sanitation submitted to this Ministry; preparation of various reports as and when required; monitoring and evaluation of the programmes of NBA of the Ministry in different states; visiting different states for review and technical guidance to the states.
- Provided consultancy to WASTE Netherlands for sustainable technologies for toilets for high water table/ water logged, flood affected and saline areas for southwest region of Bangladesh. Based on the local socio-economic and hydro-geological conditions, affordable toilet technologies with drawings and bill of quantity were provided to WASTE.
- Provided constancy on Status of Septage Management in India and prepared a sustainable business plan for its financial and technical management in urban areas in India, to the Emergent Ventures Pvt ltd, New Delhi funded by the Bill & Melinda Gates Foundation.
- Provided Consultancy to CMS, Bangalore, India and Research for Development, Washington, to conduct a feasibility analysis and market sizing study for innovative technologies in faecal sludge management in India with especial reference to Omni Ingestor and Omni Processor technologies and develop road maps for launch and scale –up of such technologies in India. The project is supported by the Bill and Melinda Gates Foundation.
- Prepared manuscript for the Handbook on Technical options for on-site sanitation for rural areas, that was released by the Ministry of Drinking Water and Sanitation in May 2012, link- http://www.indiawaterportal.org/sites/indiawaterportal.org/files/handbook-on-_technical-options-for-on-site-sanitation-modws-2012_0.pdf
- Prepared manuscript for the Handbook on Technical options for Solid and Liquid Waste Management in Rural Areas in India. The book is in the process of release by the Ministry of DWS. Draft copy is available at http://zpbelgaum.kar.nic.in/ALL_FILES/circulars_guidlines/Solid_Liquid_Waste_Management_April2013.pdf
- Wrote some chapters of the book Social Marketing of Sanitation, published by Sulabh / UNHABITAT, available at link - http://www.unwac.org/new_unwac/pdf/WATSAN_Normative_Pubs/Social_Marketing_of_Sanitation.pdf
- Wrote some chapters of the book **Sanitation and Energy**- funded by UNHABITATE under its Water for Asian Cities program. Book is available at link- http://www.sulabhacademy.org/download/Sanitation-and-Energy.pdf
- Worked with Sulabh International Academy of Environmental Sanitation and Public Health, New Delhi- for over 24 years and hold the posts of Scientist, Director, Advisor and Director General. During my long tenure with the organization, developed and implemented technologies on sanitation, decentralized wastewater treatment, biogas linked with public toilets, thermophilic composting of wastes and worked effectively to liaison with different state governments and international agencies to promote environment sanitation and different social aspects related to sanitation.

- Improved the design of household flush toilets suitable for different hydro geological conditions and implemented thousands of such toilets in different states in India.
- Developed / improved design of public toilet linked biogas plant that was approved by the Ministry of New and Renweabe Energy Surces, Govt of India under its Central Financial Assistance Programme. Hundreds of such biogas plants were implemented through the Ministry.
- Under another project funded by the Ministry of New and Renewable Energy Sources, GOI worked as the Principal Investigator a simple and sustainable method was developed to treat on-site, effluent of public toilet linked biogas plant to make it free from any odour, colour and pathogen and lowering its Biochemical Oxygen Demand (BOD ) to < 10 mg/l to make its safe reuse for agricultural purposes. Over 100 such tratment units have been implemented in different states
- Based on the design developed 5 nos. of public toilets linked with biogas plants were also implemented in Kabul, Afghanistan where I provided complete technical and management support. The plants worked satisafactorily even when atmospheric temperature dipped down to sub zero.
- Developed a technology of composting of organic wastes suitable even at low temperature. The technology does not require handling of waste during composting. It is based on thermophilic aerobic condition, requiring only 2 weeks for degrading any biodegradable wastes. It works satisfactorily even at low temperature of $4^0$C. I got patented this sustainable technology through Patent Office , Govt. of India, having Patent No. 230563, date of grant 27/02/2009.
- Provided Consultancy to the **WASTE, the Netherlands**, for preparing guidelines on sanitation and biogas technology in rural areas, conversion of single pit toilets in two pit toilets, preparing Training Manual on sanitation and other aspects as per the TOR.
- Provided Consultancy to **the WSP-SA** for preparing the **Handbook on Sanitary Toilet Complexes in Rural Areas.** It contained designs, drawings of different Sanitary Toilet Complexes, and options for sustainable technologies for safe reuse or disposal of human wastes.
- Worked as Coordinator for the project **Clean Yamuna Munch,** of the National River Conservation Directorate, Ministry of Environment and Forests, Government of India and funded by the JBIC, Japan.
- Worked as Principal Investigator/ Project Directgor for the project on waste water treatment through Duckweed with economic return in term of piciculture, funded by the Ministry of Environment and Forests, Govt. Of India. Based on the results, the Central Pollution Control Board, Govt. of India made a guideline on use of duckweed technology for treatment of wastewater. Several such projects based on duckweed have been implemented in India.
- Worked as the Project Director for the project Decentralised waste water treatment system for developing countries, in collaboration with the BORDA (Bremen Overseas Research and Development Associatin), Germany. The technology known as DEWATS ( Decentralised Wastewater Treatment Solutions) developed under the project has been widely accepted and disseminated throughout India by the consortium of NGOs.
- Provided consultancy to CRISIL for preparing JICA- funded City Sanitation Plans for Lucknow.
- Provided consultancy to ICEF (India Canada Environment Facility), New Delhi for Midterm Evaluation of the ICEF funded Duckweed based waste water and pisciculture project in Orissa, implemented by Xaviers Institute of Management, Bhuvneshwar.

- Implemented several projects related to waste management and envirnmental sectors and provided consutancies in India and internatinal agencies outside India during my earlier assignments working in different organisation
- Travelled over 35 countries for providing consultancy, presentation of papers in different conferences and meetings on related topics.

**3. International Consultancy Assignments completed-**

i. Provided consultancy to WASTE Netherlands for sustainable technologies for high water table/ water logged areas, flood areas and saline affected areas in Bangladesh.

ii. Provided consultancy to WASTE, The Netherlands for conversion of single pit latrines to double pit, design of biogas based on human waste ( toilet linked) and animal wastes.

**iii.** Invited by the Ambassador and Permanent Representative of Madagascar, in the United Nations, visited Antananarivo to provide technical support to improve sanitation through safe recycling of human wastes for different useful purposes (2008).

iv. Invited by the Government of South Africa through the Indian High Commission, South Africa, visited Limpopo, Natal and Bloemfontein provinces to present papers and discussed with the Premiers ( State Chief Ministers) and different Mayors regarding implementation of sustainable technologies on sanitation, waste water treatment, biogas from human wastes, solid waste management (2007).

v. Invited by the UN HABITAT, Nairobi visited Addis Ababa (Ethiopia) for technical review and verification of the draft design of innovative public sanitation complexes to be constructed in Addis Ababa to facilitate sanitation access to the poor in area (2006).

**vi.** Invited as an UN-HABITAT Sanitation Expert to visit Ethiopia to finalize design/ technologies for sanitation and waste water treatment mission**.**

**4. Earlier post/ assignment held**

I. **National Resource Centre, Ministry of Drinking Water and Sanitation,** Government of India, Block11, Floor 6, CGO Complex, New Delhi
Consultant ( Sanitation and Waste Management)
From February 8, 2011 to February 7, 2014

**II. Consultant for WSP, SA, and WASTE Netherland**
From November 2010 to January 2011

III. Sulabh International Academy of Environmental Sanitation and Public Health,
Mahavir Enclave, Palam Dabri Road, New Delhi- 110045
(Worked for the following posts with this organisation during March 1986 to October 2010)

a) Director General (July 2005 to October 2010)
b) Advisor Technical & Quality Manager (July 1998-June2005)
c) Director (June 1995-July 1998)

**5. Projects/ Consultancies undertaken the Best illustrates**

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| 1 | **Name of the assignment:** Sanitation technologies for high water table/ water logged/flood affected and saline affected southwestern region in Bangladesh- under the project Sanitation Technologies for Enterprises (SANTE) or "BRAC WASH Low cost Sanitation"<br>**Client: WASTE** from Gouda, The Netherlands**, Funding agency:** IRC, The Netherlands. |

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| | **Year-** 2014<br>**Total cost of the project:** Euro **3,23,728/**<br>**Responsibility:**<br>**Description of tasks/ highlights of the project:**<br>i. Investigation of the difficulties encountered in the current construction of sanitation systems in saline conditions in the South West part of Bangladesh.<br>ii. Together with local partners Utturan and entrepreneurs selected by Uttaran, investigated the causes of the difficulties encountered in saline conditions.<br>ii. Together with counterparts made detailed suggestions for improvements. These improvements included, use of different quality of water, different concrete mixtures, different types of cement used, off-site production of rings with transportation of these to the entrepreneurs' site etc.<br>v. Submitted affordable designs of toilets for high water table/ flood affected areas with drawings and bills of quantity. Recommendations are for household toilets as well as for school toilets and community toilets.<br>v. Analysis of problems and recommended solutions will be presented in a small report which will be placed on the SANTE wikipedia.<br>vi. Investigate types of flood (Height and frequency) and make detailed recommendations for affordable and appropriate sanitation solutions for flood prone conditions.<br>ii. For each recommendation the maximum flood height has been mentioned. |
| 2 | **Name of the assignment:** Market sizing and feasibility study of two kinds of technologies- Omni Ingestor (OI) and Omni Processor (OP) for Fecal Sludge Management in India.<br>**Client and Funding agency**: Catalyst Management Services Private Limited, Bangalore, India funded by Bill and Malinda Gates Foundation, USA<br>**Year** – 2013<br>**Total cost by the project:** Not disclosed by the client<br>**Cost of my consultancy** Rs 300,000 /<br>**Responsibility**: worked as a consultant with the following scope of works:<br>i. Analyze the business case for OI and OP technologies in urban India and assess the size of the market for OI and op technologies.<br>ii. Assess the size for OI and OP technologies in urban India to potentially determine how much of the market each product could serve.<br>iii. Feasibility analysis for each OI and OP technology types.<br>iv. Providing information about the sanitation system in India<br>v. Identifying stakeholders for the interviews, key interviews with national and state stakeholders<br>vi. Inputs to the information procurement plan and tools.<br>Participation along with the team in analysis of the feasibility studies, as well as city, State, and national scale up plans. |
| 3 | **Name of the assignment**: Study on Faecal Sludge to Energy- Technical and Financial Analysis, in India<br>**Client and Funding Agency :** Emergent Ventures India Pvt. Ltd, Gurgaon, Haryana, India; Bill and Malinda Gates Foundation, USA<br>**Year- 2013**<br>Total cost of the project: Not disclosed by the client<br>Cost of my consultancy: Rs 300,000/<br>**Responsibility: Worked as a consultant with the following highlights of the works:** |

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| | i. Summarized the faecal sludge management status in urban India together with policy of the Government of India for faecal sludge management including bio-energy generation.<br>ii. Recommended the most effective technology solution for processing of faecal sludge. The experts will focus on maximizing resource recovery.<br>iii. Provided access to the technical and financial model of at least one successfully working fecal sludge to energy plant.<br>iv. Summarized the technological pros/cons associated with the different process options, associated requirements for pre and post processing, and identify specific obstacles or "pain points" associated with each process that merit additional research.<br>v. Provided an assessment of the potential market for waste-derived energy products in urban India, including an analysis of the value chains and market prices of various relevant energy products, including: Biogas, bio-fertilizer, compressed natural gas, biodiesel, and electricity.<br>vi. Provided process of biomethanation and design and drawing of a faecal management plant of a particular and capacity with approximate cost and economic return in term of bio-energy.<br>vii. Provided technology matrix for management of faecal sludge.<br>viii. Provided process of biomethanation and design and drawing of a faecal management plant of a particular and capacity with approximate cost and economic return in term of bio-energy. |
| 4 | **Name of the assignment:** Generation and utilization of biogas from human wastes and animal wastes in rural villages in Gujarat State, India and providing training on sanitation and biogas to entrepreneurs in Bhubneshwar state, India<br>Year- 2010-11<br>**Name of the client and funding agency:** WASTE, The Netherlands<br>Total cost of the consultancy: Euro 3000<br>**Responsibility:** Worked as consultant with the following scope of works:<br>a) Investigate the feasibility of household biogas plants based on human wastes mixed with animal wastes in villages under Anand District, Gujarat, India.<br>b) Developed suitable design of such biogas plant with bill of quantity and cost estimates for different capacity of biogas plants.<br>c) Provide information on availability of funds from different programmes of the Ministry of Non-Conventional Energy Sources and State Government , for implementation of biogas plants.<br>d) Be a technical resource person in training of FINISH implementers (in December at BISWA, Orissa) focusing on The technical part of the training focuses on pour flush double pit system including distances between toilet and the pits, between the pits, how to convert a single pit to a double pit, water seals, pans.<br>e) The training should focus on the philosophy behind the double pit, materials of construction, difficulties one may encounter in the field (e.g. limited space), advantages and disadvantages of double pit, how to convert a single pit into a double pit. The use of digested materials in agriculture etc.<br>f) The technical resource person will prepare A-4 sized handouts (printed on both sides) - these describe main elements of the double pits on the one side and on the other side drawings of the double pit. The same applies for hand-out of rural pan and water seal. The same applies for conversion of single to a double pit. |
| 5 | Name of Assignment: Faecal Sludge Management through Vacutug in low settlement areas.<br>**Client and funding agency**: UNHABITAT, Nairobi , Kenya<br>**Location**: New Delhi<br>**Cost of the project**: Rs 300,000. |

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| | **Year :** 2005-2006<br>**Key position held:** Project Director<br>**Highlight of the Project:**<br>UNHABITAT, Nairobi has developed a simple device known as Vacutug to clean faecal matter from pits and septic tanks in slums and small communities. It is small tank fitted on wheels, with sludge pump, and pulled manually to transport sludge to disposal point.<br>**Activities performed:**<br>Evaluated the performance of Vacutug in slums and small communities in some sums in Delhi. It was found suitable where big sludge tanker can't operate to remove septage, due to lack of required space and facility of safe disposal of sludge is available nearby, like manhole of sewer. Submitted a report to the UNHABITAT and presented a detail paper on the functioning of the system in a symposium of UNHABITAT held in Dakar on 8th May 2006. |
| 6 | **Name of the Assignment:** Evaluation of Balmoral Tanks for Sewage Treatment<br><br>Client and funding Agency: Reliance Industries, New Delhi and Aquaplast Industries (Sheetal Group) New Delhi.<br>Locations: New Delhi<br>Cost of the Project: Rs 2 million<br>Year: April 2008 to December 2009<br>Key position held : Technical Advisor<br>**Highlight of the project:**<br>Balmoral Tanks for sewage treatment has been developed and marketed by Ms Balmoral Company, Sweden. Reliance Industries procured one such plant to evaluate its performance under Indian conditions.<br>**Activities performed:**<br>I worked as the expert to provide guidance for proper installation, attachment with toilets, analyzing its working, Validation/Evaluation of performance claimed by manufacturers and testing of sewage parameters like BOD, COD, TSS, pH, nitrogen, phosphorus and Feacal Coliforms on weekly basis for over a period of 18 months and also provide suitable modification to suite Indian condition for operation, maintenance, treatment and cost of the system. A detail performance evaluation of the Balmoral Tank was submitted to the clients. |
| 7 | **Name of the Assignment: Implementation of public toilets linked biogas plants in Kabul , Afghanistan**<br>Client Name along with Funding agency: **Kabul Municipality, Kabul and Ministry of External Affairs, Government of India.**<br>**Location**: Kabul, Afghanistan<br>**Year:** 2006-207<br>**Cost of the project:** Rs 25 million<br>**Key Position held: Technical Advisor**<br>**Highlight of the project:**<br>In Kabul 5 nos.of Public toilets were implemented. All these toilets were linked with modified design of biogas plant. In Kabul atmospheric temperature during winter goes down to sub zero. Design of biogas plant was suitably modified to have minimum effect of atmospheric low temperature on biogas generation. Biogas production remained more or less constant even in such winter season. Produced biogas was used for cooking, lighting and even for electricity generation. This was a unique achievement with the project. Effluent of biogas plant was treated on-site for its safe reuse.<br>**Activities Performed:**<br>I was responsible for designing and execution of biogas plants with on-site effluent treatment system |
| 8 | **Name of the Assignment:** Demonstration and Evaluation of treatment of effluent from night soil based biogas plant for reuse and / safe disposal |

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| | Client Name and Funding Agency: **Ministry of Non-conventional Energy Sources, Govt. of India**<br>**Location: New Delhi**<br>Year: 2003-2006<br>Project cost; Rs 2 million<br>**Position held: Principal Investigator**<br>**Highlight of the project:**<br>Under the project a sustainable method has been developed to treat effluent of human wastes biogas plant on-site to make it free from any odour, colour and pathogen and lowering its Biochemical Oxygen Demand less than 10 mg/ l, for its safe reuse for agriculture, horticulture and other washing purposes without any health and environment risk.<br>Based on the design a number of projects on on-site treatment of effluent of biogas plant based on human wastes, have been implemented in different states.<br>**Responsibility:**<br>As the Principal Investigator I was responsible for proposal writing to its execution.<br>(My one paper on this topic, presented in a workshop of ADB at Manila , is available on the site of ADB) |
| 9 | **Name of assignment: Formulation of City Sanitation Plan for Lucknow, U.P.**<br>**Client and Funding Agency:** CRISIL Risk &Infrastructure Solution Ltd, New Delhi, Lucknow Nagar Nigam assisted by Japan International Cooperation Agency- India office<br>Year- December2010-May 2011<br>**Key position held**- Consultant ( Technical Advisor)<br>**Highlight of the project-**<br>It provided assessment of the sewage and sanitation conditions in Lucknow and formulated a plan which shall help in achieving the objectives of National Urban Sanitation Policy in Lucknow.<br>**Responsibility and work done**<br>i. Review and collect available data on sanitation including sewerage coverage, sewer treatment facility, public toilets, and access to sanitation for the urban poor, and solid waste management with special emphasis on slums<br>ii. Data on future proposed schemes for the city on public sanitation, sewerage collection/treatment and SWM<br>iii. Report on coverage of sewer network and zone wise STP capacity utilization, status of public toilets, disposal of night soil where sewer connection does not exist, disposal of domestic waste water/s storm water/ solid waste, industrial wastes .<br>iv. List of technological options available in respect of collection, treatment and disposal of domestic sewage, waste water , solid wastes and storm water<br>v. Feasibility of selected options including analysis of different options, including their impact on institutional and financial status of the ULB |
| 10 | **Name of assignment: Clean Yamuna Project, Agra**<br>Client: and Funding Agency<br>**National River Conservation Directorate, Ministry of Environment and Forests, JBIC, Japan funded project.**<br>**Location**: Agra, U.P.<br>**Year** – 2006-2007<br>**Total Cost** – Rs 6 million<br>**Key position held: Coordinator**<br>**Highlight of the project.**<br>Under the project a detail survey for different sources of pollution for Yamuna River was carried out |

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| | and analyzed. Technical intervention for treatment of waste water and solid waste management were highlighted. Social mobilization and awareness on Yamuna river pollution were spread in local community. **There were 3 NGOs** working for the project.<br>**Highlight of work**<br>Worked as Coordinator for the project. A detail survey report along with technical inputs required to make Yamuna pollution free were submitted to the client,<br>**Responsibility:**<br>My responsibility was to Coordinate among NGO partners, local municipality, Jal Nigam Agra, NRCD, Ministry of Environment and Forests and PMC of the JBIC. |
| 11 | **Name of the Assignment:** Low maintenance Decentralised Waste Water Treatment System in Developing Countries.<br>**Client and Funding Agency:** It was an R&D cum demonstration project in collaboration with BORDA ( Bremen Overseas Research and Development Association) Germany, **funded by the European Union Commission.**<br>**Location: Delhi and Haryana**<br>**Year: 1995-1999**<br>**Project Cost**- Rs 3.9 million<br>**Key position held- Project Director and Technical Advisor**<br>Under the project different designs for Decentralised Waste water treatment have been developed. A total of 8 projects were implemented under the project. The technology based on biological method, is suitable for sewage and agro-industries wastes. The developed technology known as DEWATS is being widely replicated in different states through a consortium of NGOs established by BORDA in India. The technology is more suitable for towns /cities having no sewer system or affordable waste water treatment system. For institutions like hostels, and restaurants, hotels this is perhaps the best affordable technology for on- site treatment of waste water. Several DEWATS have been implemented in different states based on the technology developed during the project.<br>**My responsibility:**<br>Being the Project Director and later Technical Advisor of the project, I was responsible for planning designing, execution and monitoring of effluent quality as per the requirement. I was overall responsible for the project. |
| 12 | **Name of the Assignment:** Duckweed based waste water treatment system and assessment of nutritive value and economic return.<br>**Client and Funding Agency:** Central Pollution Control Board, Ministry of Environment and Forests, Govt. of India.<br>**Locations**: Wazirabad ( Delhi ) and Halishahar ( West Bengal)<br>Year: 1995-99; **Project cost** – Rs 4 million<br>**Key position held- Principal Investigator**<br>**Highlight of the project outcome**:<br>Under the project a detail design, operation, maintenance and cost analysis for Wastewater treatment through duckweed and its economic return in term of pisciculture. It is only waste water treatment system having economic return out of it.<br>Based on the results of the project, the **Central Pollution Control Bard, Govt. of India published a guideline** for waste water treatment through duckweed, in the year 2001. Based on the guideline several projects have been implemented in India.<br>**Activities Performed**: Being the Principal Investigator, I was overall responsible for the project. It included from writing a proposal to implement it through preparing design, analyzing different |

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| | chemical and bacteriological parameters for waste water treatment. |
| 13 | **Name of the assignment:** Employment generation and economic development of rural communities through duckweed based pisciculture in ponds in rural areas in Gurgaon and Faridabad districts in Haryana. Research Development cum demonstration Project<br>Client: Ministry of Rural Areas and Employment , Government of India<br>Location: Faridabad, Gurgaon<br>Cost of the project: Rs 12.46 lakh<br>Year- 1995-98<br>Responsibility; Worked as Principal Investigator of the project<br>Outcome of the project: A detail methodology of treating waste water through duckweed and use of this weed for pisciculture was developed and demonstrated to rural communities. Economic return through pisciculture and employment avenue through the system was explained to the community. |
| 14 | **Name of the assignment:** Improvement of village sanitation and economic return through duckweed production and fish farming in existing ponds in four villages in Orissa- A demonstration project.<br>Client: Royal Danish Embassy , New Delhi<br>Cost of the project: Rs19.43 Lakh<br>Year- 1995-98<br>Responsibility: Worked as the Principal Investigator of the project<br>Outcome: There was significant improvement of sanitation in the targeted community through collection of black water and its treatment through duckweeds and economic return in term of pisciculture. |
| 15 | **Name of assignment:** Organic Solid Waste : Recycling and Reuse through Thermophilic Aerobic Method<br>Client: **Ministry of Environment and Forests, Govt. of India**<br>Location : Delhi<br>Year 1995-1998<br>Cost of the project- Rs 1.5 million<br>**Responsibility – Principal Investigator**<br>**Outcome of the project:**<br>A new and convenient technology for rapid composting of Organic wastes has been developed. The system works even at low temperature and requires only 2 weeks to make compost from any organic wastes, in cold and hilly areas. In normal condition it takes only 10 days to degrade organic waste into compost.<br>T**he technology is patented in my name.**<br>**My responsibility:**<br>As the Principal Investigator, I was responsible from proposal writing to its execution and getting the technology patented. |
| 16 | **Name of assignment:** Sanitation Component of Conservation and Management Plan for Dal – Nagin Lake<br>**Client and funding agency**: Ministry of Environment and Forests, Govt. of India<br>**Year:** 2000-2001<br>**Cost:** Rs. 1.7million<br>**Key position held: Technical Advisor**<br>**Highlight of the project:**<br>Preparation of Detailed Project Report of Low Cost Sanitation Component for prevention of pollution of Dal - Nagin Lake, Srinagar, Jammu & Kashmir and suggest for technology options for human |

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| | waste disposal in lake.<br>Assessment of status of sanitation, survey of polluting sources, interacting with stakeholders, framing of proposals, designing, estimation and preparation of Detailed Project Report for measures to prevent pollution of Lakes.<br>**Responsibility:**<br>Worked as the Technical Advisor under the consultancy assignment and provided technical inputs in designing a suitable method for human waste management in houseboats and hamlets in the lake. |
| 17 | **Name of the Assignment:** Formulation and execution of several projects related to household on-site sanitation, public toilets, biogas plant linked with public toilets, decentralized waste water treatment and on-site effluent treatment of biogas plants, in different states through Department of Urban Development Government of India and Municipalities in different states.<br>These were on-going activities of Sulabh International in almost all states of the Country<br>**Client Name along with Funding agency:**<br>Department of Urban Developments, Municipalities/Municipal Corporations, different States , India<br>Location: Different States ( 24 States)<br>**Year: 1995- 2010**<br>**Key Position held: Director, Advisor Technical and Director General during different time periods with Sulabh International Academy of Environmental Sanitation.**<br>**Highlight of the projects**:<br>Implementation, operation and maintenance of Public toilets, biogas plant linked with public toilet, decentralized waste water treatment and household toilet implementation in different states are the main objectives of Sulabh International. These are on-going activities of the organization. Total cost of the project is difficult to calculate during my association with the organization. Total cost may be a few thousand crores rupees.<br>A few thousand of public toilets were implemented out of which about 200 were linked with biogas plant during the period. Hundreds of thousands of on-site household toilets were implemented during the period.<br>**Activities Performed:** Providing technical support particularly for biogas plant attached with public toilets, and waste water disposal system from public toilets and design for on-site household sanitation system for different hydro geological areas. |
| 18 | **Name of assignment:** Techno-economic evaluation of human excreta based biogas plants for community purposes and evaluation of plant design, process control and pre-treatment of feedstock for optimization of and standardization for mixed feed.<br>Client and funding agency : **Ministry of Non Conventional Energy Sources( MNES), Govt. of India**<br>**Year:** 1986-1989<br>**Location:** Patna, Bihar<br>**Outcome:**<br>An improved design of public toilet linked biogas plant was developed, that was approved by the MNES under its Central Financial Assistance Programme for implementation allover country through its State Nodal Agencies. The gas production capacities ( per day) of biogas plants are of 35, 45 and 60 cum .<br>**My responsibility.**<br>Worked as a Scientist under the project. My responsibility was to make several experiments to optimize the design of biogas plant and analyze biogas production and physico-chemical analyses of influent and effluent of biogas plant at different HRTs and organic loading rates. |

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| 19 | **Name of the assignment:** Programme for Training , capacity building and research development , conducted by Sulabh for 9 African Countries<br>Client: UNHABITAT, Nairobi<br>Cost of the project: Rs 50 lakhs<br>Responsibility: Worked as coordinator of the programme<br>Place: New Delhi<br>Outcome: 41 professionals from 9 African countries in two batches were provided training and capacity building programmes on sanitation technologies |
| 20 | **Name of assignment:** Training on Low cost sanitation technologies in Ethiopia- The Ministry of Health Promotion and Disease Prevention, Etiopia.<br>Client: UNICEF, Ethiopia<br>Cost of the programme: Rs 2.67 Lakhs<br>Responsibility : Worked as a Expert of the Team<br>Outcome: Organised training programme for field level functionaries and senior level technical persons from all the regions of Ethopia, as selected by the local Government. |

**6. Research Publications-**

i. P.K. Jha. 2009, Safe reuse of human wastes from public toilets through biogas generation: A sustainable way to provide bio-energy and improve sanitation, in Technologies and Management for Sustainable Biosystems ISBN: 978-1-60876-104-3 © 2009 Nova Science Publishers, Inc

ii. P.K. Jha, 2003, Health and Social benefits from improved hygiene and sanitation, International Journal of Environmental Research, April 2003.

iii. P.K. Jha 2005, "Sustainable Technologies for on-site Human Waste and Wastewater Management: Sulabh Experience" paper presented in the workshop on Sanitation and Wastewater Management (Sept. 2005) organized by the ADB Headquarters, is available on its website: www.adb.org/Documents/Events/2005/Sanitation-Wastewater-Management/paper-jha.pdf

iv. P K Jha, 2004, Sustainable technologies for Environmental Sanitation. Journal of AIHDA,

v. P K Jha, 2008, wrote 3 nos. of chapters namely: Waste, Health and sanitation; Energy from Human Waste and Sanitation; and Utilization of Energy from Wastes, for the book "Sanitation and Energy" published by the UN HABITAT, New Delhi.

vi. P.K. Jha, Night soil based biogas generation system, prospects and problems. International Conference on Biomass Energy Systems, Feb 26-27, 1996, New Delhi.

vii. P.K. Jha, Utilization of Sewage Gas for Cogeneration Application. International Cogeneration Conference, 18-20 February, 1996, New Delhi.

viii. B. Pathak and P.K.Jha, Biogas from human excreta of public toilet complex and mixed feed. Proceedings of the International Association of Energy Economics, Indonesia. Vol.3 pp 12-211993.

ix. B.K. Behera, Mukti Arora, P.K. Jha & D.K. Sharma (1995) A review on Bio-fuel conversion technology for microbial transformation of C. profera latex to get value added fuel. In 2nd International symposium on Chemistry and utilization of Tree Extracts, China. pp. 192-194.

x. P.K. Jha & U. Sinha 1988. Visualization of ATPases on polyacrylamide gel electrophoresis by lead nitrate. Curr.Sci.58; 228-230.

**7. Presented papers/ attended meetings in international conferences abroad (partial list)**

i. Invitee speaker at the Oxford University, U.K. for presentation of a paper at the symposium on Urbanization, Health and Human Security to be held on 14-16th January 2011 at Oxford U.K.

ii. Presented a paper on “Sustainable technical options for effective decentralized waste water treatment system”, at the International Conference on Decentralized Wastewater Treatment Solution in Developing Countries, organized by BORDA and IWA at Surabaya, Indonesia (2010)

iii. Presented a paper in the Follow-up Conference of the International Year of Sanitation (IYS) organized by the United Nations University, Tokyo, Japan (2010)

iv. Presented two papers at the Think tank Convergence meeting on Sustainable Places and Communities and at Health and Economic Convergence Think Tank 2009, organized by the Mc Gill World Platform, Mc Gill University, Montreal, Canada, (2009).

v. Presented a paper in the World Water Week organized by the Stockholm International Water Institute, Stockholm, Sweden (2009)

vi. Presented a paper on “Socio-economic up gradation Through Sustainable Sanitation Technologies for Developing Countries” in the International Conference organized by IWA at Hanoi, Vietnam, (2008)

vii. Presented a paper on “Decentralized treatment of waste water through duckweed & its economic return in terms of pisciculture", at the World Toilet Summit, Macau (2008).

viii. Presented a paper titled “Institutional Changes for Sanitation in the Framework of Sulabh International”, in a workshop organized by UNESCAP and ADB during the World Toilet Summit (2008), at Macau.

ix. Presented a paper on “Recycling & reuse of human wastes from public toilets for biogas generation: A sustainable way to provide energy, improve sanitation and environment”, at an International Conference organized by the International Organization for Bioengineering & Biotechnology (IOBB) at Murdoch University, Perth, Australia, (2008).

x. Participated and presented a paper in a Symposium on Sanitation, organized by the American Society of Engineers of India origin, Los Angel, USA, (2008).

xi. Invited by the UN HABITAT, Nairobi participated and presented a paper in the International conference on Faecal Sludge Management at Dakar, Senegal (2006).

xii. Presented a paper on "Recycling and reuse of human excreta from public toilets through biogas generation to improve sanitation, community health, and environment" in the International Seminar on Biogas Technology for Poverty Reduction and Sustainable Development organized by the Asian and Pacific Centre for Agricultural Engineering and Machinery (APCAEM) and Department of Science, Technology and Education of Ministry of Agriculture, Government of People’s Republic of China, at Beijing, China (2005).

xiii. Presented a paper on “Sustainable Technologies for on-site human waste and waste water management: Sulabh Experience”, in the workshop on Sanitation and wastewater management: the way forward, organized by ADB Headquarters, at Manila, Philippines during (2005)

xiv. Presented a paper in the conference on Ecological Sanitation at Durban, South Africa organized by the CSIR, South Africa, (2005)

xv. Presented a paper at the 30th International Conference of the WEDC, at Laos, Lao PDR, (2004).

xvi. Participated in the World Urban Forum held at Barcelona, September 13-17, 2004

xvii. Participated in an International Seminar organized by All India Housing Development Association at Colombo, Sri Lanka during 20-24 August, 2004.

xviii. Visited Ethiopia on the invitation of the UN-HABITAT as Sanitation Expert to UN-HABITAT mission from August 3-7, 2004 and provided technical designs and drawings of sanitation systems.

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