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Sulabh Shauchalaya: Low-cost sanitation

1. GENERAL INFORMATION

1.1 Title of practice or experience

Sulabh Shauchalaya: Low-cost sanitation

1.2 Category of practice/experience and brief description

The Sulabh Shauchalaya (SS) is one of the most interesting and successful social innovations of modern India. It deals with a fundamental necessity of life in the developing world: the construction of toilets and their maintenance. Translated, the term “Sulabh Shauchalaya” literally means “easy access to sanitation”. The Sulabh revolution is also significant because all in all, it is a success story masterminded entirely by a non-governmental organisation (NGO) (Sulabh International), and that too one hailing from India’s poorest state, the state of Bihar. Though there are some criticisms levelled against the organisation, there is widespread agreement that it has masterminded a veritable revolution in low-cost sanitation.

Among the difficult problems faced by people in the less advanced countries are the issues of housing, water supply and sanitation, prioritised also in that order. People begin to think of sanitation only after they are assured of the first two. Hence, it is a dispensable item at worst. Where the problem is acute, as in urban areas, due to the pressure for rising standards, there is also a problem concerning the space required for raising sanitation facilities: sometimes, there is simply no space to construct toilets.

Sulabh International initiated an innovative programme based on fabricating a new design for low-cost water-seal toilets and pushed these through an imaginative self-financing scheme not just in the state of Bihar, where the organisation’s work was started, but in other parts of the country and the world as well. Today, the low-cost toilets designed by the organisation are being used by the upper classes as well because though they are low-cost they are

not, for that reason, low-tech and they are far better than conventional toilets based on septic tanks. Even more significant has been the impact of the Sulabh revolution on the community of human scavengers. Traditionally, one of the systems of sanitation in India has been the dry latrine or bucket system which is cleaned by people from the scavenger community, who are looked down upon due to their profession, which is seen as particularly degrading. The installation of the Sulabh has led everywhere to the liberation of scavengers and their relocation to other, socially acceptable vocations. In India, this impact of the Sulabh would probably be seen to be far more critical for society than the installation of toilets and the elimination of open-air defecation. Environmentalists too are happy because, in addition to meeting a sanitation need, the SS toilet produces good manure as well.

1.3 Name of person or institution responsible for the practice or experience

Sulabh International Social Service Organisation

1.4 Name and position of key or relevant persons or officials involved

Dr Bindeshwar Pathak, President and principal motivator

1.5 Details of institution

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1.6 Name of person and/or institution conducting the research

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2. THE PROBLEM OR SITUATION BEING ADDRESSED BY THE PRACTICE/INNOVATIVE EXPERIENCE

Sanitation and the provision of sanitation services or infrastructure is a major problem in India. As per available figures, less than 1% of the rural population in India have access to sanitary facilities. Most of the population still continue to make use of open spaces in the countryside. In the cities, the situation is only marginally better, with only 20% of households having flush toilets connected to sewerage systems and 14% with flush toilets connected to individual septic tanks. 33% had only dry toilets and the remaining 33% had no toilet facilities whatsoever. They too thus used the open environment as "toilets". Unsanitary environments create havoc with infant mortality rates and can lead to widespread disease related to both fly and mosquito vectors. Over 50 different types of infections, including hookworm, roundworm and dysentery, can be transferred by direct or indirect contact with human excreta. It is estimated that India loses around Rs.500 crores (one crore = 10 million) annually in terms of medical treatment and loss of production due to sanitation-related diseases. The situation is similar in other countries in South Asia and Africa. Though possession of a flush toilet is considered satisfactory sanitation, water used in the flush system is generally potable water of which there is a general scarcity in the country. Municipal authorities have no facility for provision of low-grade water separately for such use. It is ironic that most planners do not see the use of large quantities of good potable water to flush out human wastes as a practice that needs to be discouraged and changed. The use of the dry bucket or dry latrine system is declining but the system is still functioning in several small towns. It is undesirable because it involves heavy reliance on human scavengers for disposal of the night-soil, a job which is seen as degrading. In China, there has been a centuries-old tradition of using night-soil as manure directly in the fields. This is not the case in India, which has, for a similar number of centuries, refused to treat night-soil as a resource and viewed it and the scavengers dealing with it as a source of unwanted and undesirable pollution instead. The government of India has long since taken a policy decision to eliminate the practice of human scavenging in the country and legally, all scavenging was supposed to have been terminated by 1995! The date has now been extended to the year 2000.

Sanitation systems adopted in India are of three kinds:

- (a) urban-specific sewerage systems;
- (b) individual septic tanks; and
- (c) water-seal compost latrines, popularly called Sulabh Shauchalayas, popularised by Sulabh International.

The first option, (a), is the declared goal of all urban authorities within the

country. Despite the fact that sewerage was introduced in India 130 years ago, and that most of the funds allocated in the five-year plans for urban sanitation have been allocated primarily to the construction of such sewerage systems, only about 250 towns and cities (out of a total of nearly 5,000) have such facilities. In many of these cities, even though sewers have been constructed, individual sewage pipes are still to be connected to the sewers.

Hence, the construction of such systems as a universal solution cannot even be entertained as a realistic solution. As it is, provision of such a facility in urban areas is turning out to be near impossible in view of continued large-scale migration to the cities. Most institutions, including municipalities, just do not have the funds for such systems which involve construction of sewers using concrete. Merely having constructed the sewage system does not constitute the end of the problem: large quantities of water are needed for purposes of flushing. As it stands, most municipalities, even those managing huge cities like Mumbai, can only supply water for two hours a day (or less) for their residents' total water needs, including flushing. Organised sewerage systems also require sewage treatment facilities prior to the waste being discharged into the environment, particularly the sea. These are also expensive and need heavy recurring expenditure.

The second sanitation option, (b), is the septic tank, introduced into India some 150 years ago. Septic tanks are touted as a solution for those areas in towns yet to be reached by the sewerage system or where there are no sewerage systems at all. Yet even today, less than 20% of most houses in urban areas have such septic tanks. The septic-tank technology is not only expensive, it provides, as public health officials have discovered to their dismay, an excellent environment for the breeding of mosquitoes and the spread of malaria. This is not a problem connected with all septic tanks, but with those systems which use flush toilets in conjunction with such tanks.

Excess water in the tank is unable to drain and thereby creates an ideal stagnant environment for breeding of mosquitoes. These mosquitoes invariably escape into the general environment either through small cracks in the tank or through the vent pipe maintained to allow obnoxious gases from the tank to escape. A sanitation solution which can potentially create a serious health hazard like the spread of malaria should be discouraged. The other major problem with septic tanks is that they must be cleaned out after every two to three years. Since the tank would have been in use till the date of evacuation, it is unpleasant to excavate since it is wet, has raw human sewage still undecomposed on top and gives off bad fumes. Besides, the toilet cannot be used while the tank is being cleaned. The overflow from soak pits connected to septic tanks is also extremely hazardous in those areas with high water tables since it can contaminate potable groundwater aquifers.

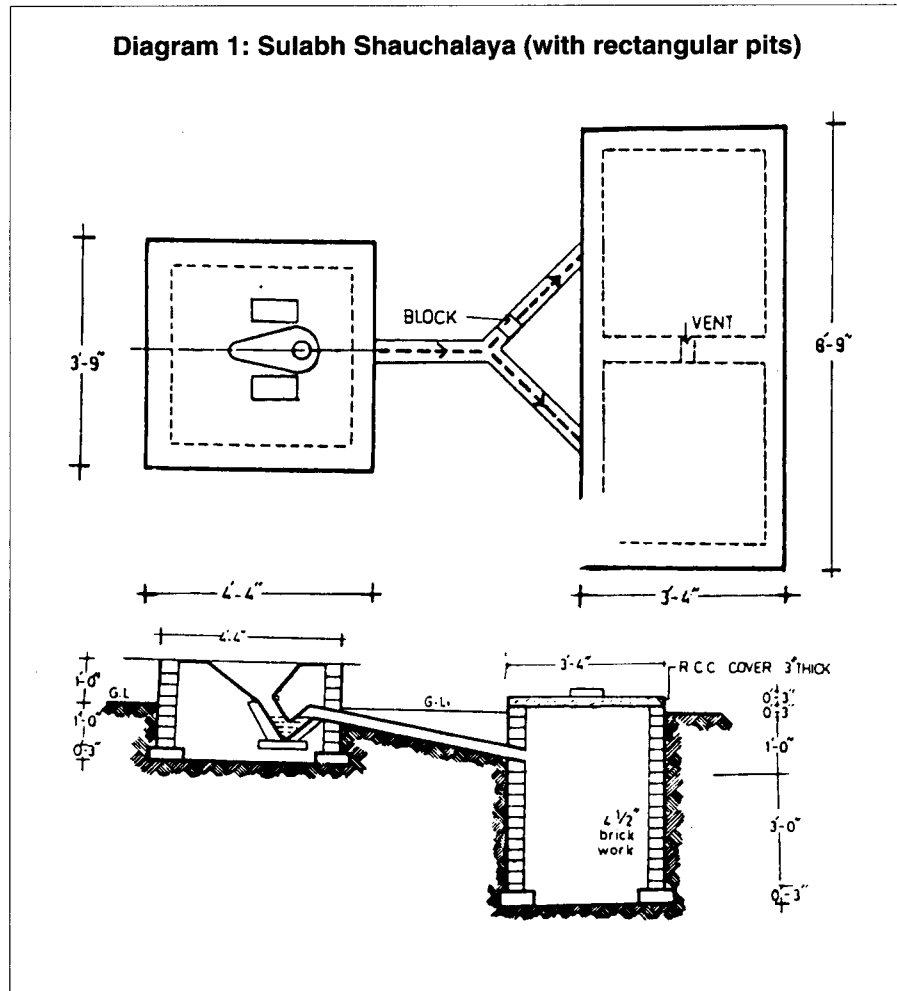
In contrast, Sulabh Shauchalayas, the third option, are cheap to construct, and can be easily installed in most soil conditions and even in densely populated areas. If a sewerage system is later constructed in the area, the Sulabh Shauchalaya can be connected to it without great difficulty. This option also has none of the environmental problems associated with either large-scale sewerage systems or individual septic tanks. On the contrary, the Sulabh Shauchalaya generates neither pollutants nor mosquitoes. Instead, it produces good and safe manure.

One of the most positive aspects of the Sulabh Shauchalaya revolution, in fact, is that it eliminates the need for human scavengers, a declared social welfare objective. Wherever Sulabh Shauchalayas have been constructed, scavengers have been liberated and relocated to other jobs after suitable training.

3. DESCRIPTION OF THE PRACTICE/INNOVATIVE EXPERIENCE AND ITS MAIN FEATURES

The main design of a Sulabh Shauchalaya comprises a few simple components which can be successfully constructed by village-level, trained masons. The first component is the toilet pan, which must have a steep slope and a trap with a water seal which would require not more than 1.5 to 2 litres of water for manual flushing purposes. Such pans are specially manufactured by Sulabh International so that the proper steepness is maintained, but are now routinely available in commercial outfits as well. (The use of conventional designs available in the market is not encouraged though they can still be used as they would require more water for flushing and this would create problems with the composting section of the system as well.) The second major element of the Sulabh system is that it requires that two leach pits be constructed outside (and usually behind) the toilet. Both leach pits are connected to the toilet through pipes or covered drains.

However, at any given time, only one pit must be open to the waste discharged from the toilet. Waste materials coming from the toilet lead into the leach pit: the water disperses into the soil through holes in the pit lining (the leach pit tank has a honeycomb pattern) and this leaves the solid waste dry so that it can be later used as manure. When one pit is full, the pipe leading to the second pit is opened and the first one blocked. After 18 months, the contents of the first pit are considered to be fully digested and safe for handling as good-quality compost. The pit can then be conveniently emptied and kept ready for use once the second pit is filled. The cost of the entire system is very low, compared to the others. Very little water is required (2 litres) for flushing the pan. Very little space is required for construction (a 6 ft x 6 ft area inside a house). The cost of construction is around Rs.2,000.



Based on the same technology, Sulabh International has also constructed hundreds of pay-and-use public toilet complexes which include bath cabins in addition to toilets. Some of these larger complexes are connected to bio-gas plants used to fuel cooking stoves and street lighting. These Sulabh Shauchalayas are to be found at bus stands, railway stations, slum areas, in critical spots of cities and on beaches.

They have been designed and constructed with two purposes in mind:

- (a) to provide common services to groups of people who may not have the space to install individual toilets; and
- (b) for non-resident users, including tourists in towns, pedestrians and so on.

Diagram 2: Sulabh Shauchalaya (with circular pits)

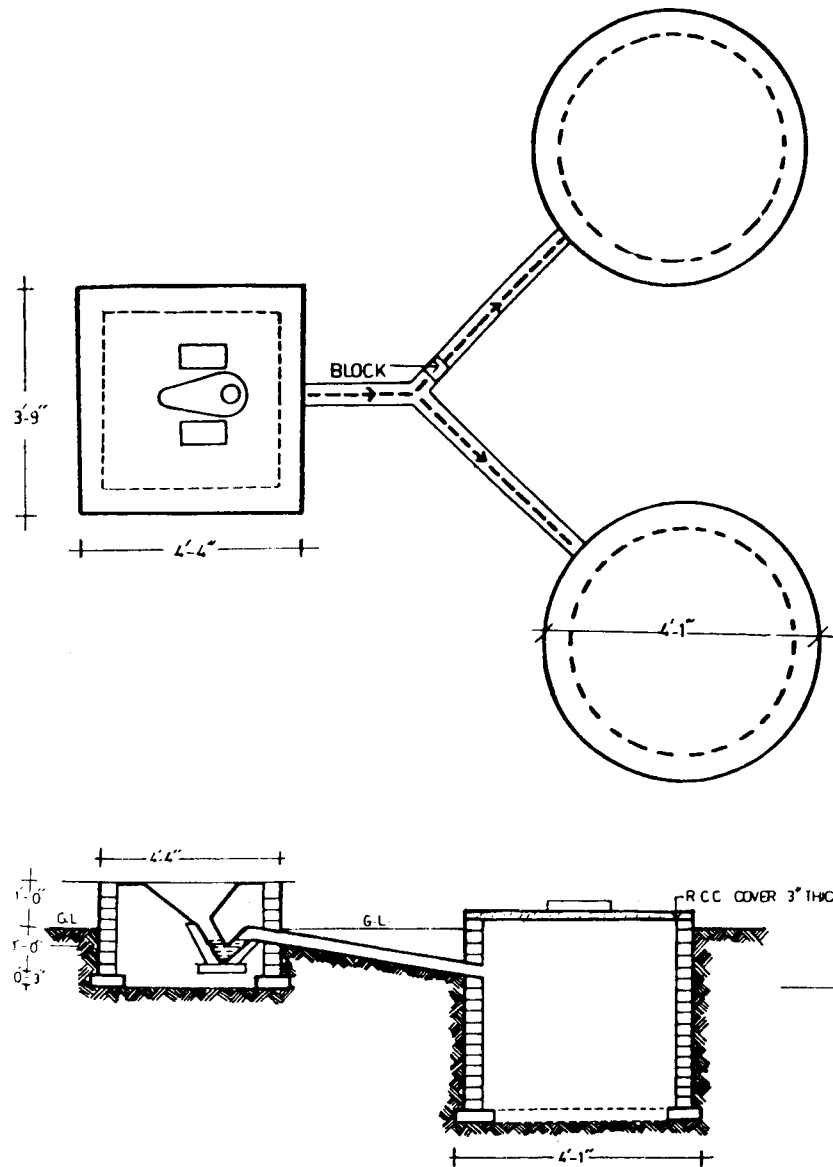
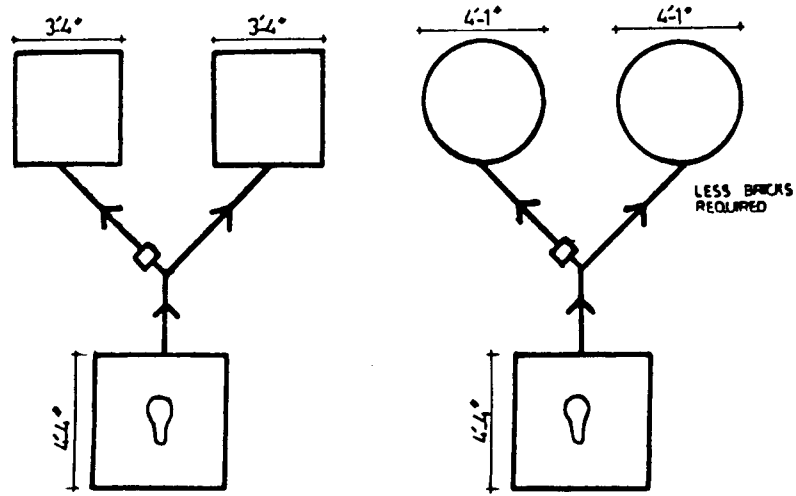
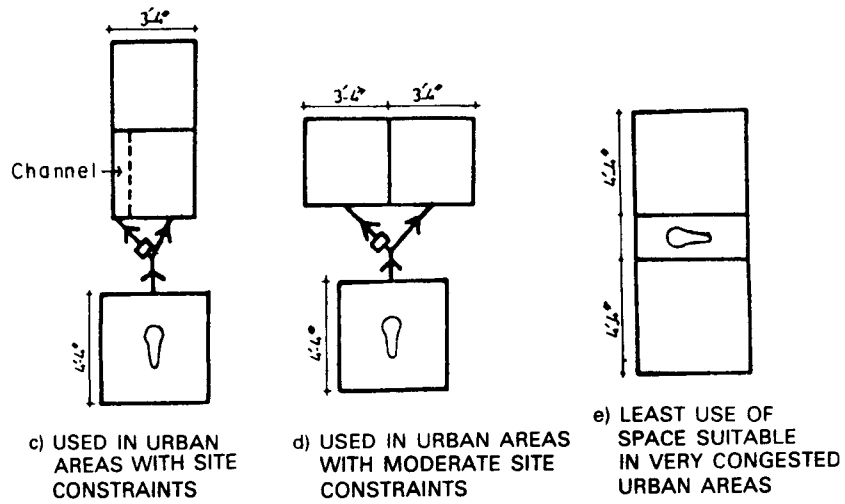


Diagram 3: Alternative arrangements of Sulabh Shauchalyas



a) MOST POPULAR IN URBAN AREAS b) POPULAR IN RURAL AREAS



c) USED IN URBAN AREAS WITH SITE CONSTRAINTS d) USED IN URBAN AREAS WITH MODERATE SITE CONSTRAINTS e) LEAST USE OF SPACE SUITABLE IN VERY CONGESTED URBAN AREAS

4. DESCRIPTION OF THE INSTITUTION RESPONSIBLE AND ITS ORGANISATIONAL ASPECTS

Sulabh International was founded by Dr Bindeshwar Pathak in 1970 in Bihar to provide toilet facilities on a turnkey basis. Dr Pathak, an activist and a trained sociologist, found that though the government was committed to a policy of changeover of toilets from dry to hand-flush latrines, it would never be able to actually carry out the task. Only an NGO could meet the challenge. Accordingly, Sulabh International was formed. Dr Pathak worked with Mr R.L. Das from Bihar to perfect the design of what has today come to be called the Sulabh Shauchalaya. Armed with the technology, Dr Pathak concentrated on building the organisation and took almost three years before making any impact on the authorities. By 1978, Dr Pathak's organisation had constructed approximately 10,000 privies. When the World Health Organisation (WHO) heard of his work, it conducted an appraisal process and communicated its opinion to the Indian government.

Based on the WHO findings, the government of India asked the United Nations Development Programme (UNDP) to prepare a feasibility study for the installation of low-cost latrines in 110 towns scattered over seven Indian states. The entire task was eventually handed over to Sulabh International, which completed the assignment successfully. From that time, Sulabh International has moved gradually to both national and international acclaim.

Today the organisation has a well-established, professionally run delivery system which provides toilets not just to public institutions but to individual householders as well. Sulabh International guarantees its construction work from any defects for a period of five years (30 years for public toilets). Its officers are available to provide services and solve problems and difficulties once construction is over. Though the toilet system designs are simple enough and can be implemented by village-level masons, Sulabh International conducts its own training courses. It has also set up an institution which specialises in providing such services either at the government level or at the NGO level. All over India, as at the time of writing, Sulabh International has successfully constructed three-quarters of a million water-seal toilets. It has also constructed and maintained 5,000 public toilets with baths attached. It has rehabilitated more than 36,000 scavengers. Interestingly, the organisation raises its resources through commissions on construction of toilets and not through grants. In Delhi's Mahavir Enclave, it has set up its own industry for the manufacture of latrine pans and a considerable number of people are engaged in the production of the pans.

5. PROBLEMS OR OBSTACLES ENCOUNTERED AND HOW THEY WERE OVERCOME

The principal obstacle to the propagation of Sulabh Shauchalaya toilets remains the cost. For the urban poor who most need the toilets, the low-cost Sulabh toilet still involves money and is therefore still out of reach. To some extent, this problem has been addressed by constructing a certain number of public toilets and having these maintained free of charge. However, most public toilets constructed by Sulabh International are pay-toilets and users must pay for their use on every occasion. This invariably means that people will continue to use open spaces for defecation.

The second problem is public education. The Sulabh technology cannot be installed in a vacuum, divorced from education on the need for sanitation technology and its impact on public health. In certain slums, there may be a demand expressed for such toilets and people willing to invest in them. In others, people have to be persuaded to use the technology and, more importantly, to see to it that it is properly maintained. This kind of education is a little more difficult to diffuse, considering decades of lack of sanitation facilities and the pressure on existing facilities.

6. EFFECTS OF THE PRACTICE/INNOVATIVE EXPERIENCE

Wherever Sulabh technology has been introduced, it has led to a remarkable reduction in environmental degradation associated normally with slums. The availability of sanitary facilities dramatically reduces the threat of water-borne and other diseases and has direct impacts on public health. Such toilets improve the general environment considerably. They improve the quality of life, as women particularly need no longer have to face the humiliation of having to defecate in public. This is the fairly obvious and undisputed impact of programmes based on the Sulabh and does not require any further emphasis.

The direct impact on the lives of scavengers is even more significant. Sulabh is committed to a complete elimination of the practice and to the rehabilitation and retraining of former scavengers. Wherever the new latrines have been introduced, scavengers have been rehabilitated and given new vocations. Even when scavengers have been retrained to maintain the new sanitary latrines, they find they are in a considerably more respectable and humane position.

7. SUITABILITY AND POSSIBILITY OF UPSCALING

The nature of the technology involved in the Sulabh Shauchalaya is ideally suited for upscaling. Sulabh International itself has a number of ready designs for its toilets. These include toilets with walls of mat, mud and cowdung, brick or cement, all easily available. The technology is the same, whether applied in individual latrines or for larger public toilet complexes. It can be erected with the aid of village-level masons who can be trained for the purpose.

8. SIGNIFICANCE FOR (AND IMPACT ON) POLICY-MAKING

The significance of the Sulabh Shauchalaya technology of low-cost water-seal latrines has already been recognised in its ready adoption not only by government (central and state) in India but also by governments in several countries of the South and by several international development agencies like the World Bank, the United Nations Centre for Human Settlements and the WHO. The acceptance of the system by the government is important if subsidies are to be made available for construction of toilets among the economically deprived sections of society in the form of either grants or loans. In the present scenario, Sulabh International undertakes the administration of financing to ensure that citizens do not have to deal with the bureaucracy. Public latrines have also to be constructed at government expense, though the municipalities may donate the land free of charge. Government support for the idea is therefore essential.

9. POSSIBILITY AND SCOPE OF TRANSFERRING TO OTHER COMMUNITIES OR COUNTRIES

Since the technology is simple and can be fabricated at the village level through trained artisans and masons, there is ample scope for replication in other countries of the South. The Sulabh revolution originated in Bihar, but has now spread to practically all the states of the Indian Union and abroad. For these reasons, it can confidently be asserted that the Sulabh Shauchalaya has long since passed the test of replicability.

16.

Protecting diversity in rice: Rapid clonal multiplication of rice seed

1. GENERAL INFORMATION

1.1 Title of practice or experience

Protecting diversity in rice: Rapid clonal multiplication of rice seed

1.2 Category of practice/experience and brief description

Rice is the most important foodgrain crop of Asia. It is also the most threatened by germplasm loss. Thousands of rice varieties and cultivars have been forever lost to humankind in the wake of the uncritical and rushed introduction of a few short-stemmed (dwarf) hybrid varieties over the last three decades. The spread of the few hybrid varieties, largely from the International Rice Research Institute (IRRI), has also resulted in an alarming situation of genetic uniformity in rice paddies all over Asia.

One rice scientist who saw the emerging threat to biodiversity was the late Dr. R.H. Richharia. He set out to provide a remarkable solution to conserving endangered rice cultivars: a seed multiplication technique that is not only effective but is so simple it can be easily acquired by rice farmers. The technique of rapid clonal multiplication of rice seed enables any farmer to effectively proliferate even a single seed of rice into thousands within the space of a single season. The technique is particularly useful for rapid multiplication of endangered varieties of which only a few seeds may be available. The method will work even if one has a single healthy grain of rice. Using the method, groups and communities working with traditional varieties can multiply these for propagation at no extra expense and without having to rely upon centralised research institutes.

1.3 Name of person or institution responsible for the practice or experience

The late Dr. R.H. Richharia
Kaluram Khandu Bhagat