Environment

Water & Environmental Sanitation Network (WES-Net India)

Solution Exchange for WES-Net India
Consolidated Reply

Query: Popularizing treatment technologies for kitchen wastes, from Samruddhi, New Delhi (Experiences).

Compiled by Jyotsna Bapat, Resource Person and Moderator; additional research provided by Ramya Gopalan, Research Associate
12 April 2006

Original Query: Gopal Sane, Samruddhi, New Delhi

Posted: 22 March 2006

I have been working with bio sanitizers used in septic tanks and wet kitchen waste treatment and I found that the odors and pests like mosquitoes and cockroaches disappeared. I want to take this idea to densely populated slums in cities like Delhi, where wet kitchen waste and open sewage creating odor and pests is a common problem, but I have found much resistance in getting ready acceptance from communities, even in spite of the obvious benefits.

What I would like to request the members, is to share the experiences and lessons learned about adopting ecologically friendly treatment technologies for kitchen (or household bio-) wastes within communities in slums in urban or rural areas.

- How long did it take them to accept and cooperate in shorting wastes or connecting up to a common septic tank?
- How much of money, time and effort was involved?

Look forward to your responses

Responses received with thanks from:

1. **Lalit Bhandari, ERM India Pvt. Ltd, New Delhi**
2. **A K Paikaray, Mahavir Yubak Sangh, Bhubaneswar**
3. **Jyotsna Bapat, UNDP, New Delhi**
4. **K.J. Joy, SOPPECOM, Pune**
5. **Suchi Pande, Kabir, New Delhi**
6. **H.P. Deshmukh, Yuva Gram Vikas Mandal, Kaij, Maharashtra**
7. **Kishor Moghe, Gramin Samassya Mukti Trust, Yavatmal, Maharashtra**

Further contributions are welcome!

Summary of Responses

The members provided a broad range of experiences and lessons learned by trying to promote adoption of ecologically friendly technologies and related innovations into communities, with particular reference to their work in peri-urban and rural areas. The respondents argued that the amount of money, time and effort required to gain community level acceptance and adoption of new practices varies depending on the situation. However, regardless of the time or money involved, sustained effort to bring about persistent behavior change is necessary.

Generating Acceptance and Cooperation

The first step, members stated is getting communities to accept the new technology or innovation. The respondents noted that the acceptance of a practice is dependant a number of factors, including:

- Benefits (perceived or actual) to the community or individual- value additions
- Anthropological feasibility (human behavioral aspect and cultural aspect)
- Ecological context
- Socio-economic framework
- Types of extension and entry point activities (awareness generation, health implications)
- Cost implications for community and/or individual members
- Complexity of the technology
- Specific nature of the issue/idea/concept/technology
- Maintenance expenses/process once the technology is adopted
- Existing government (at various levels, depending on the situation) involvement and cooperation

Several members mentioned that even after communities and/or individuals are convinced that new technology is advantageous; it generally takes a lot of time and effort to bring about the necessary behavior change and ensure the change is sustainable. At least three years of sustained effort are required, one member said.

Experiences and Strategy

The members' knowledge of the topic highlighted a number of aspects to the overall context. One member recounted the experience of working in **Delhi** slums, on the issue of garbage collection and segregation indicated reluctance of communities to engage in negotiations with government agencies and further the difficulty in popularizing innovations in urban structures even with government cooperation. In establishing Water Users Associations (WUAs) in **Maharashtra,** difficulties arose mainly because of structural reasons such as labor costs and current irrigation practices. The experience particularly of **changing sand mining practices** in Maharashtra highlighted that for any idea to gain genuine acceptance, it is largely dependant on the socio economic and ecological situation, as well as the nature of the new issue/idea/technology.

The incident of vermi composting in **Wagrap Gaon**, Maharashtra highlighted the need for linkages to markets as essential to promoting a new idea. In addition, once the value addition is obvious the process becomes self-duplicating. The **Karnataka** experience in estimating the adoption of agriculture and environmental innovations by households points to the fact that it takes a substantial amount of time and effort even after people are convinced about benefits for a new technology to take root. Additionally while promoting hygiene habits in **Yavatmal District,** Maharashtra experience indicates that in order to bring about behavioral change, gaining the confidence of the community requires routine face-to-face interactions. Additionally, is necessary to spend effort, time and money on a sustained basis. Finally a project's experiences

in **Orissa**, demonstrated the need to introduce innovations and changes gradually, building on the awareness and understanding garnered in the first step in order to take the next.

The specific strategy required to gain acceptance and bring about behavior change is contingent on the target group and nature of innovation. Members provided several examples of successful strategies, including:

- Using **self-help groups (SHGs)** has proved very successful in Andhra Pradesh, Tamil Nadu, and Karnataka. The strategy was productive because it identified the appropriate target group and the relevant issues for that group.
- The partial success of the **Joint Forest Management** in Madhya Pradesh is attributable to the human factor involved and the kind of entry point used. The project achieved the desired results because it correctly identified the benefits involved in adopting the new practice.
- In Madhya Pradesh, the **World Bank Rural Livelihood Project** tapped into existing demand based on common interest groups.
- The **hand washing campaign** promoting personal hygiene in Maharashtra, strove to bring about behavioral change, by gaining the confidence of the community through routine face-to-face contact.
- In contrast, however, while the efficiency of **pit method of sugarcane cultivation** in terms of saving water was demonstrated and experimented with a few farmers in Maharashtra, it did not spread due to structural increase in labor cost and absence of any proper mechanization.

The specific experiences are shared by the members are listed below.

Comparative Experiences

Maharashtra

From K.J. Joy, SOPPECOM, Pune

Changing Sand Mining Practices
In the 1980s, the project addressed the problem of indiscriminate sand mining from riverbeds, stressing its negative impact on the environment and local livelihoods. However, it took nearly two years of working with the community and doing some studies and surveys for the people to link the receding well water levels to haphazard sand mining. Once convinced, the community took up the issue and forced the government to put a stop to the practice.

Water Users' Association (WUA)
In it took the project nearly two years to form the first cooperative WUA. The project worked with the community to convince them of the benefits of managing their water. It took a year to prepare the necessary registration documentation and another two years to get all the functional rules and procedures in place. In order to increase the number of WUAs, the project had to work with the Government of Maharashtra, on certain incentives.

Starting Vermi Composting *(from H.P. Deshmukh, Yuva Gram Vikas Mandal, Kaij, Maharashtra)*
The project began work six years ago to promote low cost toilets and waste treatment. In 2002, the project started by building toilets and forming a women's SHG to start vermi composting. It took one year for the members accept the idea and another year to develop the compost. Two

years later, the vermi compost was ready and market linkages made. Now, 70% of the households are vermi composting and the process has become self sustainable.

Promoting Personal Hygiene Habits in Rural/Tribal Areas *(from Kishor Moghe, Gramin Samassya Mukti Trust, Yavatmal, Maharashtra)*
This project, implemented in 12 predominantly tribal villages, worked to change personal hygiene habits. The project emphasized change in knowledge, attitudes, and behavior though community level activities. A survey established the baseline behavior related to wastewater, kitchen, and household garbage disposal and personal hygiene. The project monitored changes annually over four years. The findings indicated 40% of the households positively changed their behavior.

New Delhi

Garbage Collection in an Urban Slum *(from Suchi Pande, Kabir, New Delhi)*
The respondent highlighted the problem of garbage collection and segregation in urban areas- a playground located next to a slum cluster in use as a garbage dump. The slum residents approached their MC and subsequently the MCD Commissioner to get the garbage cleared and the park restored. The community pressed the issue with concerned authorities and fought a series of obstacles, finally getting the entire garbage dump cleared after two years of efforts.

Orissa

Promoting Use of Composting and Garbage Pits *(from A K Paikaray, Mahavir Yubak Sangh, Bhubaneswar)*
In 2002, the project conducted a pilot study. Although near an urban area, the villagers were unaware of personal hygiene and required sensitization. To take stock of the kitchen waste in the village, the project established four dumping yards. People were unaware of making a compost pit in their gardens using kitchen waste. Six months later, the project added low cost pits to maintain wastewater for kitchen gardens and compost as fertilizer.

Karnataka

Trends in Acceptance of Environmental and Agricultural Innovations *(from Jyotsna Bapat, UNDP, New Delhi)*
The results from a project survey of environmental and agriculture related innovations revealed acceptance trends. The study found 14% of the households within 1 year and by 33% within the 2nd year adopted an innovation introduced. The results from the 3rd year showed different trends for different innovations. Sixty-six to 85% of the households accepted innovations with economic benefits. Nevertheless, certain households never adopted any of the innovations.

Related Resources

Recommended Organizations

SOPPECOM, Pune *(from K.J. Joy)*
16, Kale Park, Someshwarwadi Road, Pashan, Pune-411008, Maharashtra
Email: soppecom@pn3.vsnl.net.in or soppecom@vsnl.com
Recommended for its experience in the setting up of Water Users Associations (WUAs) in Maharashtra

Yuva Gram Vikas Mandal, Kaij *(from H.P. Deshmukh)*
Akshay Niwas, Dharpur Road, Kaij. TA. Kail Dist., Beed – 431123, Maharashtra
E-mail: yuvagram100@rediffmail.com Tel: 02445 / 252134, 251527 Fax: 02445 / 251527

Recommended for its experience with vermi composting, providing technical help and market linkages etc.

Gramin Samassya Mukti Trust, Yavatmal *(from Kishor Moghe)*
A/P Jalka, Maregaon, Yavatmal - 445303
Tel: 07239 25974

Recommended for its experience in promoting personal hygiene habits related to the 'hand washing' campaign in rural/tribal context of Maharashtra

Mahavir Yubak Sangh, Bhubaneswar *(from A.K. Paikaray)*
1020/8 Mahatab Road, Old Town, Bhubaneswar – 751002, Orissa
Tel: 91-0674-3091294, Fax: 91-0674-2585988

Recommended for its involvement in the Total Sanitation Campaign in Orissa

Recommended Contacts

Suchi Pande, Kabir, Delhi
E-169 Shanti Marg, West Vinod Nagar Delhi 110092

Recommended for her work with the slum clusters in Delhi on the issue of garbage collection and segregation

Jyotsna Bapat, UNDP, Delhi
55 Lodhi Estate, P.O. Box 3059, New Delhi 110 003

Recommended for her review of the diffusion of environment and agriculture related innovations (social forestry prog. biogas plants, HYV adoption, pesticides) in Karnataka

Recommended Documentation

From Ramya Gopalan, Research Associate

Urban Solid Waste Management
Report of the High Power Committee, Planning Commission, Government of India, 1995
http://planningcommission.nic.in/reports/publications/pub95_hghpwr.pdf (Size: 896 KB)

Provides a framework for identification & solution of urban solid waste management problems at all levels, also recommending use of Microsystems.

Environmental Technologies
North American Journalists Tour, October 2003, Switzerland
http://www.investorideas.com/companies/Nanotechnology/Articles/JudithLightFeather.pdf (Size: 1262 KB)

Report describing a modern fermentation system, of separate waste handling developed by KOMPOGAS plants, which is in operation in Germany, Austria, Japan & Switzerland

Water for Two Worlds: Designing Terrestrial Applications for Exploration-Class Sanitation Systems
Constance Adams et al, SAE International, 2004
http://www.humanityandspace.org/downloads/water2worlds.pdf (Size: 604 KB)

Summarizes issues & results of first "Water for Two Worlds" summit, describes status of & fundamental strategies for widespread adaptation of sustainable sanitation systems

Responses in Full

Lalit Bhandari, ERM India Pvt. Ltd, New Delhi

Acceptance and repulsion to a novel idea / technology depends on various things, obvious benefits being one of them. The other major factor that contributes in real sense is the cultural background of the target population. The case referred here is that of Delhi. Delhi being a cosmopolitan city has a mix of various cultural backdrops and hence it doesn't have a culture of its own.

Your idea needs to be restructured a little since there can't be a mathematical formula of calculating the amount of money, time and effort involved when we deal with human factor. Sometimes it may cost colossal amounts while at other times it may cost nothing.

The self help group formula is very successful in some cases in Andhra Pradesh, Tamil Nadu and Karnataka. These models are successful, because they identify the appropriate target group and the issue of relevance which is internal to the target population.

Similarly if we can consider social forestry or joint forest management as an example, then it is also benefit driven. At some places it has been very successful (e.g. Midnapore, where it started from and Harda in madhya pradesh) but it also failed utterly at some other places. The reason being human factor and the kind of extension activity/entry point activity which is imposed.

Similar in line to this can we consider the World Bank funded Rural Livelihood Project (RLP) which is going on in 3-4 states in the country. Madhya Pradesh is one of them. MP-RLP or for that matter the RLP is a demand driven project where they make common interest groups and give them small loans after appraising their projects. The projects /proposals made by common interest groups are internal.

Smokeless chulahs can be another example to consider. Models have found success and failure in equal measures.

Biogas in some states initially didn't get much success because of the social and cultural construct.

What you might need to do is recalculate the strategy for dealing with the

1. Anthropological feasibility (human behavioral aspect and cultural aspect)
2. The kind of extension and entry point activity (awareness generation, health implications etc)
3. Cost implications
4. Complexity of the technology
5. Maintenance expenses /process once the technology is adopted

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A K Paikaray, Mahavir Yubak Sangh, Bhubaneswar

I have involved with the water and sanitation activities in Orissa since 2002 after launching Total Sanitation Campaign. Prior to launching we have with technical support from UNICEF Orissa conducted a Pilot Project in village Totapada in Khordha Block in Khordha district. In this village we find all groups/religion of people living with oneness.

We as facilitator sensitized village about the water and sanitation. Though the village is very near to Khordha town people are unaware about their personal hygiene.

The village consists of four Hamlets where we initially made four dumping yards to take stock of the kitchen waste. Previously this kitchen waste was not in use. People were aware of making a compost pit in their garden. But care should be taken while doing this. The pit should not be more than a maximum depth of 5 feet; greater depth may cause water contamination.

There is very low cost to construct a garbage pit and it should be covered with a manhole/cover.

I have seen the success of this waste water used in kitchen garden and the compost as manure after six months

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Jyotsna Bapat, UNDP, New Delhi

My experience on diffusion of environment and agriculture related innovations would prove to be a good comparative experience. I reviewed a total of 8 environmental and agriculture related innovations such as social forestry program, bio gas plants, adoption of HYV, pesticides and fertilizers etc. The community on which the data was collected was, located in Sirsi taluka of Uttar-Kannad District, in Karnataka state. A sample of 200 households was collected through stratified random sampling technique to ensure representativeness. The community was literate and highly educated having Brahmin community, which is socio culturally and economically homogenous.

In this community it was found that any innovation introduced would be adopted by 14% of the households within one year of its introduction. There were 15 families who always adopted the innovation irrespective of its nature. By second year 33% would adopt the innovation. But then by year three different trends were seen in different innovations. Those innovations that ensured economic benefits through saving of cost or making of profits were adopted by upto 66 to 85% of the population. There were 8 households that never adopted any of the innovations which I looked at. Individual household level cost of adopting each of these innovations ranged from six thousand to 10 thousand rupees and a variable cost of a few hundred rupees per anum per innovation. This was over seven year period.

Thus it takes a lot of time and efforts even after people are convinced about the benefits of the new technology.

K.J. Joy, SOPPECOM, Pune

I think your focus has more of an urban context and things are slightly different in the rural context. Introduction of an innovative idea/concept/technology is contingent on so many factors and so it may be difficult to give a simple, straightforward answer. For example in the early eighties we in my organization, tried to take up the issue of indiscriminate sand mining from river beds and especially the negative ecological and livelihood impacts. But it took nearly two years of working with the people and also doing some studies and surveys along with the people for the people to link up the receding levels of water in the wells (in the river bed as wells as near the banks) to indiscriminate sand mining. Once they were convinced then they took up the issue and forced the government to put a stop to indiscriminate sand mining.

Also when we formed the first cooperative water users' association in Maharashtra it took nearly two years of working with the community to convince them about the benefits of taking over the water management. It took another year or so to put all the documentation together for registration and another two-year of hand holding to set all the functional rules and procedures are in place. We also had to work out certain incentives along with the Government of Maharashtra for the spread of the Water Users Associations (WUAs). Though we did demonstrate the efficiency of pit method of sugarcane cultivation in terms of saving water (we could save water to the tune of two-thirds) and did experiment with a few farmers on their lands on this, it did not spread. There were structural reasons like the way irrigation water is managed today, increase in labor cost in the initial phases of cultivation because pits have to be dug and absence of any proper mechanization for making pits, etc.

In Osmanabad district we had helped one village to form a WUA and we negotiated with them to share a part of their water with the landless and women in the village. It took nearly two years of discussions and negotiations for them to share about 15% of the water with the landless and women. It took another 3 years or so to create conditions for the landless and women to use part of this water.

So the point that I am making is that it depends on the socio-economic and ecological contexts as well as the nature of the issue/idea/concept/technology to say anything definite about how much time it takes for an idea to get rooted or how much efforts are required including money.

Suchi Pande, Kabir, New Delhi

I worked with a slum cluster in Delhi on the issue of garbage collection and segregation between 2003-2005. The problem (in brief) was that a playground located right next to the slum cluster was being used as a garbage dump.

The slum residents had approached their elected representative the Municipal Councilor (MC) to get the garbage cleared and to get the park restored to its original use. The Councilor always agreed to look into the matter and then gave the excuse of non-availability of financial resources and equipment.

Eventually the matter was taken up with the MCD Commissioner, who directed the Joint Director of the Sanitation Wing CSE to identify the problem and seek solutions. It took us a whole three months to get part of the garbage cleared from the park and over one year from the time I started work on this issue. The problems were:

1. On visiting the site the Asst. Engineer from the Sanitation Wing informed us that the site being identified to place big dumpsters to collect the garbage did not belong to the MCD and that they did not want to take up any kind of hassles with other land owning agencies.

2. The garbage loaders are very sparsely available and as a result after the process of clearing out the entire park was stalled several times and each time we had to go back to the Joint Director to press for further action.

2. Eventually after running around for three months and writing to the MCD, 2 small bins were placed which were extremely inadequate. When we asked why bigger dumpsters could not be placed, the officers told us that the request for dumpsters was lying with the store and on their directions would the funds we released and dumpsters bought and placed on the site.

4. The slum dwellers were willing to involve only at the level where the Councilor was

approached. In fact, they approached the Councilor on several occasions but got the same response from her.

5. Eventually after another meeting was organized with the then Additional Commissioner, the entire garbage dump was cleared after a two years of pressing on the issue with the concerned authorities, there were talks of building a 'dhallao' (garbage collection point), however, the councilor to date says the tendering and awarding of contract for the 'dhallao' is underway. At the same meeting were also informed that any kind of permanent structure can not be built in JJ clusters because these clusters are neither notified nor regularized and therefore can be evicted as and when required.

What I am illustrating is that the problems at the level of the community are mainly that of getting directly involved in the negotiation process with the government agencies. With the elected represntatives their relationship is already established and functional, however with the concerned government agent or agency the community relies heavily on the NGO to initiate and undertake processes related to the welfare of the cluster. The involvement within the cluster and on site is quite active but the process undertaken before the govt. agent or agency is brought on the site is one that the community does not very wilingly participate in due to various issues directly related to their survival in the city.

Given this background popularizing the innovation you have suggested in urban slum clusters will be an uphill task even if the government agencies agree to co operate. NGO involvement in such project will be almost a must and a sustained effort over at least three years is what I envisage.

H.P. Deshmukh, Yuva Gram Vikas Mandal, Kaij, Maharashtra

We are an Yuva Gram from Maharashtra and work in Latur Osmanabad and Bid districts as support organization under Jal Swaraj Program. Our experience with vermi composting in Wagrap Gaon village in Maharashtra will be relevant to share with you. We began work with Water Aid Indian six years ago promoting low cost toilets, promoting solid waste and Waste water treatment. In this village our point of entry was by creating toilets, we had formed a group of 20 Women living in the same lane of the village, under a self help group and they started Vermi composting in 2002. They got a loan, mainly for toilet construction, of Rs. 25,000/- for SHG from the Gramin Bank each one got Rs. 2000/- as loan put some of their money to ensure there was no open defecation in the village. We from Yuva Gram provided the masons and technical help.

It took one year for the idea to be acceptable to the members, mobilizing to form the compost took another year. At the end of the two years, when the compost was ready the SHG felt that the men from the village were not ready to buy it, so they asked us to find a market. We identified another village in Chincoli where the Savitri Bai Phule, (SBP) Co operative society bought it for organic farming. We were able to get a loan of Rs. 80 000/- to SBP- Cooperative from OBC Finance Corporation and two and a half year old cooperative is in organic vegetable farming. Since then today in 2006, 70% of households in Wagrap Gaon are replicating the vermi composting and the process has become self sustainable.

Thus you can see if there are linkages to marketing and value addition to the vermi compost are identified the efforts to vermi composting are well worth it and the process becomes self duplicating.

Kishor Moghe, Gramin Samassya Mukti Trust, Yavatmal, Maharashtra

Our experience in the rural /tribal context of Maharashtra will provide a good insight to the question you have raised. We worked for four long years, in a total of 12 villages in Malegaon taluka of the Yavatmal District, in Maharashtra. The focus of the project was to promote personal hygiene habits particularly related to 'hand washing' campaign.

These are predominantly tribal villages where more than 50% of households are tribal. We emphasized on change in knowledge attitude ad behavior though community contact and demonstration methods.

We prepared a questionnaire to monitor the 'soft component' related to behavior change. The questionnaire was used to establish a base line related to waste water disposal, kitchen and garbage waste disposal and behavior change related to personal hygiene. These variables were monitored annually over four years.

Our findings are: 40 % of the households actually brought about the necessary behavior change to make their environment clean, which is very good compared to achievements in tribal belts of other states. The over all cost of the project over four years was Rs. 12 lakhs.

Thus to bring about behavior change, requires gaining the confidence of the community through face to face contact with the community on a routine basis as a first step. Secondly it takes a lot of efforts, time, and money on a sustained basis.

Many thanks to all who contributed to this query!

If you have further information to share on this topic, please send it to Solution Exchange for WES-Net at se-wes@solutionexchange-un.net.in with the subject heading "Re: [se-wes] Query: Popularizing treatment technologies for kitchen wastes, from Samruddhi,New Delhi (Experiences) Additional Response."

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