

DRAFT REPORT TWO ANNEXURE

BANGLADESH: ADDRESSING INDOOR AIR POLLUTION

Submitted to

The World Bank

**Clean Energy Program
Environment Group
Winrock International
Arlington, Virginia, USA**

June 1, 2008

ANNEXURE

ANNEX A: Rapid Review of Household Energy Programs

ANNEX B: Survey Instrument for Detailed Review

ANNEX C: List of Stakeholders Consulted during Detailed Review

Annex D: Technology Designs

DRAFT

Rapid Review of Household Energy Programs

As part of the review of household/renewable energy programs, a rapid review of selected programs was undertaken in late 2007. The review process included consultations with Dhaka based project offices and literature review where available. Eight programs are discussed under the rapid review. The programs investigated in further detail under the detail review have not been included here. The programs have a wide range in terms of stove dissemination, from a few hundred to thousands. All the programs provided some form of subsidy, whether directly or by absorbing the cost of stove accessories. Enterprise development was not a key component of these projects, however, many programs trained local potters, interested women, and existing small businessmen, with the aim of motivating them to sell stoves. Although improved health from reduced indoor air pollution (IAP) was highlighted as one of the benefits of using improved stoves, the majority of programs focused on the fuel saving and environmental conservation aspect of stove use. In fact, only one of the initiatives focused specifically on IAP. However, what is interesting is that many of these programs engaged local government leaders and utilized existing networks such as health workers, cooperatives, and village development committees to raise awareness and monitor project activities.

Practical Action Bangladesh

Practical Action Bangladesh is the Bangladesh country office of Practical Action, a UK based non-profit organization which has worked in the field of household energy and health in a number of countries including Kenya, Nepal, Sudan and more recently, Bangladesh. In Bangladesh, the organization had conducted research on energy use by street vendors which also included the types of improved cookstoves used by these small businesses.

Practical Action implemented a greenhouse gas (GHG) emissions reduction project titled “Reduction of Greenhouse Gases through Dissemination of Improved Cookstoves in Bangladesh”. The project was funded by Climate Care, UK from 2003 – 2005. The project had a complementary objective of reducing biomass consumption, increased combustion efficiency, and, therefore, reducing carbon monoxide emissions and reducing costs. The project trained 60 beneficiaries and staff from 35 NGOs and 27 stove entrepreneurs from 8 districts¹. By the end of the project there were 27 entrepreneurs who were selling stoves. Entrepreneurs were primarily rural women and local entrepreneurs. Women started their own business with their own capitals and loans from NGOs, while existing small businessmen used the trainings as an networking opportunity to get orders for stoves and accessories. Participants received improved stoves accessories and moulds during training sessions. Later on, depending on the need of partner organization, Practical Action provided assistance to stove installation activities by subsidizing the cost of stove accessories. The BCSIR one pot portable stove model was promoted under the program with some modifications, including further lowering the position

¹ Progress and Impact Report on Reduction of Greenhouse Gas Emissions through the Dissemination of Improved Cookstoves in Bangladesh, Practical Action, Bangladesh, February 2006.

of the grate. Improved stoves with chimneys were not included for dissemination as it was found that chimneys increase GHG emissions.

This is one of the few projects which focused on stove performance. Two stoves were sent to the Aprovecho Research Laboratory in the USA for testing. Tests included water boiling test (WBT), and emissions tests for carbon monoxide and particulate matter. The adjacent box provides a summary of the test results². Although this stove model emitted slightly less carbon monoxide when compared to an open fire (8.3 vs. 10.5 g/L), the stove reduced approximately half the amount of particulate matter emitted when compared to an open fire (88.5 vs. 159.6 mg/L).

Over 6000 stoves were disseminated during the project period. An impact study conducted 3 months after the training sessions found that over 95% of the stoves were still in use. However, it is not clear if the stoves were used exclusively or in conjunction with traditional stoves. It was estimated that these stoves reduce 38,190 tons of carbon monoxide (CO₂) emissions during its lifetime (three years).

Awareness raising was a prominent component of the project and the national electronic broadcast media was used for disseminating information. In addition materials such as stickers were also developed.

Project staff coordinated with BCSIR for guidance on technology design and dissemination workshops.

ANSAR-VDP (Village Defense Party)

The ANSAR-VDP was one of the partner organizations under BCSIR's Improved Cookstove Dissemination (Phase II) program, implemented from 1999 – 2001. The project was implemented in 29 districts of Bangladesh. ANSAR VDP disseminated approximately 25,000 improved cookstoves during this project³. The stoves promoted were the same as those promoted under the BCSIR program (see main report for more details). The stoves were given

Practical Action One-Pot Portable Improved Cookstove

Test Results at a Glance

Date: April 26, 2005
Average of two tests
Time to boil 5 liters of water: 32.5 min
Approximate thermal efficiency: 24%

Firepower:

Boiling firepower: 4128 Watts
Simmering Firepower: 3089 Watts
Turn Down Ratio: 1.7

Fuel:

Fuel to boil 1 liter of water: 92.1 g/liter
Fuel to simmer 1 liter for 45 min: 100.0 g/liter
Fuel to cook 1L: 192.2 g/liter

Carbon Monoxide Emissions:

CO to boil 1 liter of water: 2.9 g/liter
CO to simmer 1 liter for 45 min: 5.4 g/liter
CO to cook 1 liter: 8.3 g/liter

Particulate Matter Emissions:

PM o boil 1 liter of water: 44.8 mg/liter
PM to simmer 1 liter for 45 min: 43.7 mg/liter
PM to cook 1 liter: 88.5 mg/liter

² Progress and Impact Report on Reduction of Greenhouse Gas Emissions through the Dissemination of Improved Cookstoves in Bangladesh, Practical Action, Bangladesh, February 2006.

³ Discussion with Mr. Shah Alam, Deputy Director, ANSAR-VDP, Dhaka, September 2007

to the households free of cost, with households providing the soil for construction. Field workers received the following “fees” for stoves constructed:

- One pot portable improved stove: Tk. 62⁴
- Two pot fixed improved stove with chimney: Tk. 125⁵
- Two pot fixed institutional improved stove with chimney: Tk. 500⁶

However, subsidies are no longer provided for any stoves constructed after the project period. Under the project, a supervisor was designated from the ANSAR-VDP staff present in each Union the project was implemented. The supervisor worked with three field workers to disseminate the improved stoves. At the Upazila or sub-district level, the team coordinated with the district level ANSAR-VDP staff and BCSIR staff for monitoring of project activities. Since the end of the project, ANSAR-VDP has continued promoting improved stoves through their training program.

Bangladesh Rural Development Board

Bangladesh Rural Development Board (BRDB) is established under the Ministry of Local Government, Rural Development and Cooperatives (LGRD & C). The organization focuses on rural development and poverty alleviation and works in 57 districts of the country. BRDB organizes small and marginal farmers, asset less men, women and destitute freedom fighters into cooperative societies and gives them short and long-term credit, technology for their socio-economic wellbeing and training. BRDB was established in 1982 and has mobilized 4.9 million beneficiaries into cooperative societies⁷.

The BRDB was one of BCSIR’s project partner for the second phase of Improved Cookstove Dissemination project, implemented from 1999 – 2001. BRDB worked in 29 districts under the project and disseminated approximately 15,000 – 16,000 improved cookstoves⁸. The program was implemented through BRDB’s extension program which also included installation of sanitary latrines, tree plantation etc. The stoves program was not channeled through BRDB’s credit program because the cost of the stoves was too low.

At the local level, BRDB’s credit program supervisors were responsible for the stove program and provided all necessary support to the program. Monitoring was carried out with the assistance of the Upazila Rural Development Officer.

⁴ USD 0.91

⁵ USD 1.84

⁶ USD 7.35

⁷ General Information, Bangladesh Rural Development Board, < http://www.brdb.gov.bd/general_Info.htm>

⁸ Discussion with Mr. Rafiqul Islam, Deputy Director, Bangladesh Rural Development Board, Dhaka, September 2007

Dhaka Ahsania Mission

Dhaka Ahsania Mission (DAM) is a voluntary organization which was founded in 1958 with the aim of developing social and spiritual life of the entire human community by focusing on poverty alleviation and socio-economic empowerment of the poor and disadvantaged.

DAM's improved cookstove program was implemented in conjunction with their education sector programs from 1992 – 2001. The program was implemented in seven districts with a focus on fuel savings and income generation. The BCSIR two pot improved stove with chimney was disseminated under the program. Public centers were established to raise awareness about the benefits of improved stoves amongst the target groups. Awareness raising activities included disseminating leaflets, posters, organizing courtyard meetings, and participating at local fairs such as annual tree fairs (Brikhkhro Mela)⁹. Project households were trained on improved stove construction. After the training, participants were given stove accessories such as chimneys free of cost. Later, a subsidy of 20-25% (total cost per stove was Tk. 150¹⁰) was also provided. The stoves promoted did not include grates because many households could not use residual fuel such dry leaves, straw etc. with grates. Moreover, it appeared that Mission staffs were not aware of the need for grates in improved stoves. Local potters were trained on stove accessory manufacture, such as earthen chimneys. The project activities were monitored by central level staffs based in Dhaka.

Koinonia

Koinonia is a non-profit organization which was formed in 1983 by the National Christian Fellowship of Bangladesh (NCFB) with the aim of serving the poor and the marginal people of the country.

Koinonia started its Improved Stove Seminar in 1987 with the aim of introducing fuel efficient stoves in rural areas, teaching people how to construct stoves, and raising awareness about environmental conservation amongst rural communities¹¹. The organization obtained information on improved cookstoves from BCSIR. Training on improved stove was a large component on this program and training programs were organized through local churches and partner organizations. The partners were responsible for selecting trainees and providing logistical support including organizing the training venue and providing soil for stove construction. The trainees were predominantly rural women. Each trainee also received a printed pictorial of an improved stove which included technical measurements for the stove promoted, instructions on stove construction, etc. Trainees also received all the materials for constructing an improved stove free of cost. Improved stoves promoted included the one pot portable stove, two pot fixed stove with chimney and the institutional stove. The training included lectures as well as practical sessions on stove construction. Follow up and monitoring

⁹ Discussion with Mr. Mokhlesur Rahman, Senior Program Office, Dhaka Ahsania Mission, Dhaka, September 2007.

¹⁰ USD 2.20

¹¹ Annual Report 2000, Koinonia, Tejgaon, Dhaka

was carried out by the respective partner organizations. A total of 120 training sessions were organized during the project period (1987 – 2000) and over 2400 participants were trained¹².

All the seminars or training sessions were organized in coordination with local government leaders, including Union Parishad Chairmen, Upazila Nirbahi Officer (UNO) etc. These representatives also presided over the certificate giving ceremonies held at the end the training sessions.

The project was implemented through Dutch funding, however was discontinued when funding ended. Koinonia remains interested to resume their stove trainings in the future. Many of their partner organizations continue to promote improved stoves through their activities.

World Vision Bangladesh

World Vision is a Christian humanitarian relief and development organization working in around 100 countries across the globe. For us children come first. The organization has been working in Bangladesh since the early 1970s and its programs are in the areas of children's education and health, water and sanitation, nutrition and food security, HIV-AIDS, disaster preparedness, child rights and participation and micro-enterprise development.

World Vision started its improved stove activities in Bangladesh in 1985, with a specific focus on Garo communities in Netrokona, Jamalpur and Mymensingh districts. Some of the main objectives of this program were to reduce fuel consumption, improve the health of rural women and conserve the environment.

Information on improved stoves was obtained from BCSIR. At the initial stage of the project, World Vision staff was trained by BCSIR. World Vision formed women's groups and trained the group members on improved stove construction. Posters and leaflets were disseminated during events and fairs organized for Environment Day, and other relevant occasions.

Initially the stoves were disseminated free of cost, to poor households. Later on about 10-15% of the cost, (cost of the BCSIR two pot fixed model stove with chimney was Tk. 450¹³). World Vision trained their local staffs on improved stove construction and these staff persons monitored stove construction and use in households. The coordinators for the Area Development Programs also provide monitoring support. Many of the trainees are selling improved cookstoves to earn an income.

Swanirvar Bangladesh

Swanirvar Bangladesh was established in 1975 as a non-profit organization¹⁴. The organization focuses on socio economic development of the rural people by making them self-reliant. It works in the areas of literacy and skill development, health care, nutrition and general family

¹² Discussion with Mr. Nelson N. Sarker, Director, Koinonia, Dhaka, September 2007

¹³ USD 6.61

¹⁴ About Swanirvar; <<http://swanirvarbangladesh.org/about.php>>

welfare, micro-enterprise development, income generation and poverty alleviation, and environmental improvements.

Swanirvar Bangladesh implemented its improved stove program from 1989 – 1990 and disseminated approximately 85,000 improved stoves¹⁵. Typically, the organization formed cooperatives including those for farmers, youth, women, etc. A village development committee is then formed, comprising of members of these committees including village leaders. These village committees were then used as a form to disseminate information about improved cookstoves and organize trainings and monitor stove construction activities.

BCSIR provided training on improved cookstoves to Swanirvar staff and the one pot portable stove and two pot fixed stove were promoted. Stove accessories such as grates were obtained from BCSIR while local sanitation entrepreneurs were identified for production of cement chimneys.

Bangladesh Rural Advancement Committee

One of the largest NGOs in the world, Bangladesh Rural Advancement Committee (BRAC) has been promoting improved cookstoves since the 1980s. In early 2000, BRAC promoted improved cookstoves through their health program. BRAC health workers are trained on stove construction and also encouraged to sell stoves for a nominal amount. BRAC subsidized the cost of stoves by supplying the accessories. More recently, in collaboration with Stanford University in the US, BRAC has embarked on a study which attempts to assess the health impact of improved cookstoves. To date, a brief survey of improved cookstoves in Bangladesh and associated disease patterns have been completed. Based on this survey, a number of improved cookstove models are being tested for carbon monoxide and particulate matter emissions. The program plans to disseminate stoves to 300 households¹⁶.

¹⁵ Discussion with Ms. Shebika Swarkar, Assistant Director, Swanirvar Bangladesh, Dhaka, September 2007

¹⁶ Discussion with Mr. M. A. Quaiyum Sarker, Research & Evaluation Division, Bangladesh Rural Advancement Committee, Dhaka, September 2007

Survey Instrument for Detailed Review

Topical Outline of Detailed Review of Renewable/Household Energy and Watsan Projects

Background Information

KEY ASPECT	SOURCE	METHODS
<p>Context condition of village: Changes in the community in the last 10 years; natural resources, diseases, health care. Infrastructure & facilities; clinic , markets, Demographics; number of households (HH), size of population, mortalities & migration. New technologies introduced in area in last 10 years</p>	Community, secondary information	FGD
<p>Policy: What benefit/support is the community getting from Union Parishad? What benefit/support is the community getting from local government on health and sanitation service? Government subsidies and opportunities in renewable energy sector</p>	Community, UP members, Local level health authority	FGD, KII-Up member, LGED personnel
<p>Access to natural resources: Are there any common properties like forest or pasture lands? If there is, do all the community members have access to it?</p>	Community	FGD
<p>Socio Economic & Political: What is the relation of community to the local authority? Who holds leadership and authority in the community? Level of vulnerability (vague, need to define more), natural disaster, flood , river erosion , cyclone , drought , cold , Livelihood coping strategies IGA options and sources of income Off farm income Employment Livelihood</p>	Community, secondary information	FGD, Case study with HH, KII-CBO

<p>Environmental and Health – will be merged w/ another aspect Factors affecting indoor air quality Indoor Air pollution Who are most vulnerable to IAP? Common illness, seasonal pattern of illness IAP effects on women and children Ventilation in cooking and living areas</p>	<p>Community, health workers, local health authority, secondary information</p>	<p>FGD, KII- NGO staff</p>
<p>Gender Understanding gender dynamics Division of labor Access to institutions Control over resources Decision making & power relation Women’s contribution to households Access to goods and services Any improvement in gender relations? Key influencing factors?</p>	<p>Community, Household, Secondary information</p>	<p>FGD, Case study with HH,</p>

Aspect specific information

KEY ASPECT	SOURCE	METHODS
<p>Technology</p> <p><i>This section will collect information on the type of renewable technology(ies) promoted by the project, effectiveness of the technology, and issues including operation and maintenance, ease of use, cost after sales services available and process of technology dissemination.</i></p> <p>Process of technology identification Technology validation (what does this mean?) How is the technology introduced to the community and what is their perception about the technology? Incorporation of user preference/local needs Health perspectives Economic, fuel consumption, cost, types of fuel Environmental; pollution, smoke Social acceptance</p>	<p>Community, Household, concerned institutions</p>	<p>FGD, Case study with HH, KII-NGO staff</p>

<p>Technical ; Feasibility, Trouble shooting Availability of raw materials Monitoring mechanism Capacity building; Human resource development, training & skill development Cost of technology Ease of operation and maintenance</p>		
<p>Scaling up and Replicability</p> <p><i>This section will collect information on key catalytic elements in project, role of key stakeholders and key challenges faced during scale-up of project activities.</i></p> <p>Sustainability; Capacity building of community Quality service delivery Affordability Challenges and barriers of scale-up Key catalytic elements in project Key actors for scale up Role of LGI, CBOs in scale up Experience overcoming challenges for scale up</p>	<p>Community, Field staff, implementing institutions</p>	<p>FGD, Case study with HH, KII-NGO staff</p>
<p>Financing and Enterprise Development</p> <p><i>This section will collect information on the enterprise development mechanism including entrepreneur selection, training needs, and financing mechanism.</i></p> <p>Market development component Entrepreneur selection criteria Entrepreneur training needs Access to financing Loans and product quality Loan repayment Monitoring mechanism for loan disbursement and utilization</p>	<p>Entrepreneurs, field staff, micro-credit staff, households taking loans</p>	<p>KII, FGD</p>
<p>Community Engagement</p> <p><i>This section will collect information on the process of community mobilization, implementation and monitoring arrangements, impact of this activity and exit strategy.</i></p> <p>Ignition point for change in behavior/technology adoption</p>	<p>Community, CBOs, field staff, households</p>	<p>FGD</p>

<p>What is the process for community mobilization? Process of CBO formation Resource mobilization at community level Implementation arrangement Monitoring arrangement Role of CBO after project support is withdrawn Incentive for CBO to function after project support is withdrawn Support mechanism for CBO after project ends</p>		
<p>Institutional Arrangement</p> <p><i>This section will collect information on the service delivery mechanism, incentives and barriers to service delivery, key actors, access for the hard core poor and linkages with other institutions.</i></p> <p>Which organizations are working in the community? Which organization is very important to you and why? How interventions are helping the local communities to help themselves? How service-providing institutions can be more effective? Institutional arrangements of organizations concerned Incentives and barriers for key actors to provide services Services for hard core poor Service delivery after project support has been withdrawn</p>	<p>Community, Secondary information</p>	<p>FGD ,KII-CBO</p>

Focus Group Discussion (FGD)

Key notes for Facilitator:

1. Ideal number of participants in the each FGD 10 to 15 for better participation
2. Selecting suitable venue access for all
3. Creating of enabling environment so that the participants can freely participate in the discussion
4. Introducing each other
5. The objective of FGD to be clarified to the participants
6. Respect the time of participants
7. Asking clear open ended questions for better participation in discussion
8. Visualizing PRA tools for better sharing

Key aspects & leading questions

Institutional Arrangement

Beneficiary selection

How did you become participant?

Why did you choose to participate in the project?

How were you motivated as a user?

How did you get services from local institutions or organizations?

Are you happy with the services and conditions?

Socio Economic

Are you benefiting from the project? How?

What type of benefit do you get? Please specify?

How do you utilize your benefit?

What about livelihood? What about it?

What are the social benefits of the project?

What are the economic benefits of the project?

Do you think you will keep on getting these benefits once the project ends?

Technology

How was the decision taken to install/adopt the technology?

Did you face any difficulties to be a user?

- Purchasing the technology
- Operating the equipment(s)
- Maintaining the equipment (s)

What types of support did you get to install the technology? Which are most important support and why?

Was there training on skill transfer in the community for sustainability

Tell us about the performance of the technology?

Performance of fuel

Type of fuel

Problem of fuel collection

How do you manage trouble shooting?

Indoor Air Pollution

What do you like and dislike about your current stove/biogas included?

Do you think cooking smoke is a problem of health and how?

What are the health impacts of exposure to smoke for you and your children? (*after probe*)

Is there access for treatment?

Is there any cost involvement for treatment?

What do you do/can you do to reduce exposure?

Scaling up and Replicability

How do your neighbors know about improved technology?

Do you have any suggestion to promote it by the community?

What are the processes of awareness raising campaign and mechanisms transfer of information?

Demand Creation and Marketing

How is demand created? Marketing approach

CBO's role in demand creation and marketing

Consumer preference
Marketing materials
Marketing and promotion after project support is withdrawn
Impact of demand creation and marketing activities

NB: For KII (Key Informant Interview) using semi structure questioner to collect the information. For case study using semi structure questioner to gather information from HHs of project participants (success and absentee) and non project participants.

Semi-Structured Questions for Key Information Interviews

Questions for Entrepreneurs

General background questions

Hints:

1. What did you do before you started this business? How did you earn a living?
2. Why did you become a [technology] entrepreneur?
3. How did you start your business in [improved technology?]

Institutional Arrangement

Hints:

1. What type of support did/do you get from the project? From local government officials? From other organizations in the area?
2. Did you receive any type of training? What was important topics & why?
3. If so, can you describe these trainings and what you learnt?
4. Is there any mechanisms to transfer skill to others and how?
5. Do you have any suggestion on training?

Enterprise Development and Financing

Hints:

1. Have you taken any loans offered through the project or separately for your business?
2. If you have, how are you repaying the loan?
3. Is your business profitable? If not, how do you plan to make it profitable?
4. Do you have any idea to promote enterprise as new innovation?

Demand Creation and Marketing

Hints:

1. How is your business running? How many products have you sold?
2. How do you promote your product(s)?
3. Do you use any marketing materials to promote your products?
4. If yes, how do you use these materials and where did you get them?
5. What information do you share with the customers about the benefits of your product?
6. Do you provide any after sales service or warranty to your customers?
7. How do you ensure the quality of your products?
8. What are the challenges in demand creation and marketing ?

Scaling up and Replicability

Hints:

1. Is there any monitoring from the project or local government?
2. How has this business affected your life?
3. What are your plans for expansion?
4. How do you think your business can be further strengthened?
5. What are the key factors/issues to be considered to scale up your business?

Questions for Technicians

General Background Questions

Hints:

1. What did you do before you became a technician?
2. How did you become a [technology] technician?
3. What is your role as a [technology] technician? What type of services do you provide?

Institutional Arrangements

Hints:

1. Did/do you receive any support from the project/local government/other organizations in the area?
2. Did you receive any training to become a technician?
3. Is there any provision for refresher trainings?
4. How do you liaise with the entrepreneurs?

Technology

Hints:

1. In your experience, what are the top 3 use and maintenance/trouble-shooting issues with this technology?
2. What do customers like best about it?
3. What do customers like least about it?

Demand Creation and Marketing

Hints:

1. What use and maintenance information do you share with the customers?

Scaling up and Replicability

Hints:

1. Is there any monitoring done by the project/local government?
2. What, if any, is your role in monitoring?
3. What is your future plan as a technician?
4. How can your work be further strengthened?

Questions for LGI

General Background questions

Hints:

1. What do you know about this project?
2. How have you participated in this project?
3. Do you have any comments or suggestions on the overall objective and design of the project?
4. How has this project impacted or benefited the households in this area?

5. What do you see as the potential benefits of this project?
6. Do you have any concerns?
7. Do you think this project is addressing the poorest sections of the community Are access to the poor?
 - a. If yes, how?
 - b. If no, what should be changed to include the poor?

Scaling-up and Replicability

Hints:

1. Do you think there is a need to sustain key activities such as ...*[mention project specific activities here]* beyond the project?
2. How can the local government help to sustain these activities?
3. Does the local government have a role in monitoring project activities?
4. Is there any suggestion regarding monitoring or any other aspect?

LGED Engineers

General Background Questions

Hints:

1. What are your responsibilities support services to the project as an engineer?
2. What is your role in this project?
3. Do you have any suggestion or recommendation as you feel?

Institutional Arrangements

Hints:

1. Please describe the institutional arrangement of the LGED and the linkages with other organizations at the Thana level.
2. Are you involved in the local water and sanitation initiative? Thana level watsan committee for example.
3. If yes, what is your role?
4. If no, should there be a role?
5. Is there any potential for linking the improved stove monitoring activities with the watsan activities? *[question only for projects promoting improved stoves]*
6. Do you think there is any benefit to LGED engineers engaging more actively in similar projects?
7. If yes, what are the benefits?
8. How do you think LGED engineers can participate further in similar projects? In which area?

Scaling-up and Replicability

Hints:

1. Do you have a role in monitoring project activities?
2. Is the local government involved in quality control of technologies manufactured under the project? *[Question for Executive Engineer]*
3. Do you have any suggestion on diffusion and sustainability of technology?

Questions for CBOs

General Background Questions

Hints:

1. What are the objectives and activities of this CBO? [*If CBO has not been formed under the project*]
2. What do you know about this project?
3. What is the role of the CBO under this project ?
4. How CBO can contribute to the project on demand creation, awareness building, monitoring and sustainability?
5. Is there any suggestion how to link the IAP with the sanitation and hygiene program?

Community Engagement

Hints:

1. What was the CBO's role in community mobilization activities?
2. What was the CBO's role in facilitating interactions between households/beneficiaries, implementing organizations and LGI?
3. How community engaged in the development programs which are running well in your area, may be sanitation, health, irrigation, crop production explain the process and outcomes of community engagement ?

Scaling-up and Replicability

Hints:

1. Is the CBO involved in any monitoring activities?
2. Is the CBO involved in any quality control activities?
3. What role will the CBO have after the project?
4. What do you think about the project overall?
5. How can the role of CBOs be strengthened further? For better outcomes good governance & accountability and sustainability of project initiatives.

List of Stakeholders Consulted during Detailed Review

<p>A M M Nasir Uddin Member Physical Infrastructure & Energy Division, Planning Commission Ministry of planning , Government of People’s Republic of Bangladesh, Sher-E-Bangla Nagar, Dhaka, Bangladesh Tel: +88.02.8115119; Fax:+ 88.02.8111496 E-mail: ammnasir@yahoo.com</p>	<p>Md. Nurul Islam Fellow IEB, Member IRC, Member ASCE Additional Chief Engineer (Planning) LGED Headquarters, LGED Bhaban (Level-8), Agargaon, Sher-E-Bangla Nagar, Dhaka 1207, Bangladesh Tel:+88.02.8158626; Fax: +88.02.8116390 E-mail: nislam@hotmail.com</p>
<p>A.K.M. Sahadat Hossain Deputy Director (Executive Engineer) Urban Management Support Unit Local Government Engineering Department RDEC Bhaban (Level-7), LGED Agargaon, Sher-E-Bangla Nagar, Dhaka 1207, Bangladesh Tel: +88.02.8117935; Fax: +88.02.9120476 E-mail: sahadat@lged.org</p>	<p>Mirza Shawkat Ali Deputy Director (International Convention) Bangladesh Department of Environment Paribesh Bhaban Room # 402,E-16, Agargaon Dhaka-1207, Bangladesh Tel: + 88.02.8121821; Fax: +88.02.9118682 E-mail: mirza@doe-bd.org</p>
<p>Engr. Shah Md. Sazzad Hossain Chief Operating Officer Rahimafrooz Renewable Energy Limited, 260-B Tejgaon Industrial Area, 1st Floor , Dhaka 1208, Bangladesh Tel: +88.02.8832206-8; Fax: +88.02.8832209; E-mail: sazzad@raimafrooz.com;</p>	<p>Chitta Ranjan Chaki Deputy General Manager Grameen Shakti Grameen Bank Bhaban (19th Floor), Mirpur-2, Dhaka1216, Bangladesh Tel: +88.02.9004314,9004081 Ext. 112; E-mail: g_shakti@grameen.net; gs_chaki@yahoo.com</p>
<p>Erich Otto Gomm Program Coordinator Sustainable Energy for Development (SED) German Technical Cooperation P.O. Box 6090, Road 90, House 10/C, Gulshan 2 Dhaka 1212, Bangladesh Tel: +88.02. 8823070 Ext. 511; Fax: +88.02. 9885298; E-mail : otto.gomm@gtz.de</p>	<p>Engr. Hasan Mahmud Khan Manager, Marketing and Sale, Rahimafrooz Renewable Energy Limited, 260-B Tejgaon Industrial Area, 1st Floor , Dhaka 1208, Bangladesh Tel: +88.02.8832206-8; Fax: +88.02.8832209; E-mail: sazzad@raimafrooz.com</p>
<p>Golam Mokthadir Assistant Engineer Government DFID and UNICEF Project, Department of Public Health Engineering, DPHE Bhaban, Kakrail, Romna , Dhaka, Bangladesh</p>	<p>A.K.M. Nuruzzaman Manager Operation PKSF Bhaban, Plot: E-4/B, Agargaon Administrative Area Sher- e- Bangla Nagar, Dhaka -1207, Bangladesh</p>
<p>Habibur Rahman Manager, Agriculture and Bio-technology Practical Action Bangladesh</p>	<p>Jasim Uddin Chowdhury Chief Scientific Officer BCSIR Laboratories</p>

<p>House 32, Road 13/A, Dhanmondi R/A Dhaka 1209, Bangladesh Tel: +88.02.8111934,9123671, 8111855 Ext. 125; Fax: +88.02. 8113134 E-mail: habib@practical.org.bd</p>	<p>105(Block-A), Sasulbagh,R/A, Bakalia Government High School Road, West Bakalia, Chittagong-4220, Bangladesh Tel: +88.031.681761, 681763 Ext. 36; E-mail: chowdhury_jasim@yahoo.com; ctglab@spnetctg.com</p>
<p>M. Fokhrul Islam National Domestic Biogas and Manure Program SNV, Netherlands Development Organization UTC Building (Level-16), 8, Panthapath, Kawran Bazar, Dhaka-1215, G.P.O. Box 619, Bangladesh Tel: +88.02.9114385,8111235,8117526,914315, Ext. 26; Fax:+88.02.8116663; E-mail: fokhrul.islam@idcol.org</p>	<p>Dipal Barua Managing Director Grameen Shakti Grameen Bank Bhaban , Mirpur 2, Dhaka-1216, Bangladesh Tel:+88.02.8011222; Fax:+88.02.8013559, 8011138; E-mail: g_shakti@grameen.net</p>
<p>Md. Ashrafuzzaman Manager, National Domestic Biogas and Manure Program, Infrastructure Development Company Limited, UTC Building (Level-16), 8, Panthapath, Kawran Bazar, Dhaka-1215, G.P.O. Box 619, Bangladesh Tel: +88.02.9114385,8111235,8117526,914315, Ext. 26; Fax:+88.02.8116663; E-mail: azamman@idcol.org</p>	<p>Hirak Al-Hammad Officer (Electrical) Infrastructure Development Company Limited, UTC Building (Level-16), 8, Panthapath, Kawran Bazar, Dhaka-1215, G.P.O. Box 619, Bangladesh Tel: +88.02.9114385,8111235,8117526,914315, Ext. 26; Fax:+88.02.8116663; E-mail: hirak@idcol.org</p>
<p>Mirza Shawkat Ali Deputy Director (International Convention) Department of Environment, Paribesh Bhaban Room # 402, E-16A, Agargoan, Dhaka 1207 Phone: +88.02.8121821 ; Fax:+ 88.02.9118682; E-mail: mirza@doe-bd.org</p>	<p>Kazi Aktaruzzaman Director, BCSIR Laboratories, Bangladesh Council of Scientific & Industrial Research (BCSIR), Dr. Qudurat-E-Khoda Road, Dhanmondi, Dhaka-1205, Bangladesh Tel: +88.02. 8621741,8617924 ; Fax: +88.02.8613022; E-mail: bcsir@bangla.net</p>
<p>Mokthadir Harun Sociologist Government DFID and UNICEF Project, Department of Public Health Engineering, DPHE Bhaban, Kakrail, Romna , Dhaka, Bangladesh</p>	<p>M. A. Quaiyum Sarker Senior Research Associate Environmental Research Unit, Research & Evaluation Division, Bangladesh Rural Advancement Committee, BRAC Center, 75 Mohakhali, Dhaka 1212, Bangladesh Tel: +88.02. 9881265, 8824180, Ext. 2709; Fax: +88.02.8823542; E- mail: maqs1965@yahoo.com</p>
<p>S.M. Formanul Islam Director (Legal) and Company Secretary Infrastructure Development Company Limited,</p>	<p>Nasir Uddin Director of Monitoring Air Quality Department of Environment,</p>

<p>UTC Building (Level-16), 8, Panthapath, Kawran Bazar, Dhaka-1215, G.P.O. Box 619, Bangladesh Tel: +88.02.9114385,8111235,8117526,914315, Ext. 26; Fax:+88.02.8116663; E-mail: fislam@idcol.org</p>	<p>Paribesh Bhaban, Agargaon, Dhaka 1207, Bangladesh Tel: +88.02.8121821; Fax: +88.02.9118682;</p>
<p>Sunder Bajgain Senior Biogas Advisor National Domestic Biogas and Manure Program SNV, Netherlands Development Organization National Domestic Biogas and Manure Programme UTC Building (Level-16), 8, Panthapath, Kawran Bazar, Dhaka-1215, G.P.O. Box 619, Bangladesh Tel: +88.02.9114385,8111235,8117526,914315, Ext. 26; Fax:+88.02.8116663; E-mail: sbajgain@snvworld.org</p>	

DRAFT

BCSIR ICS Project

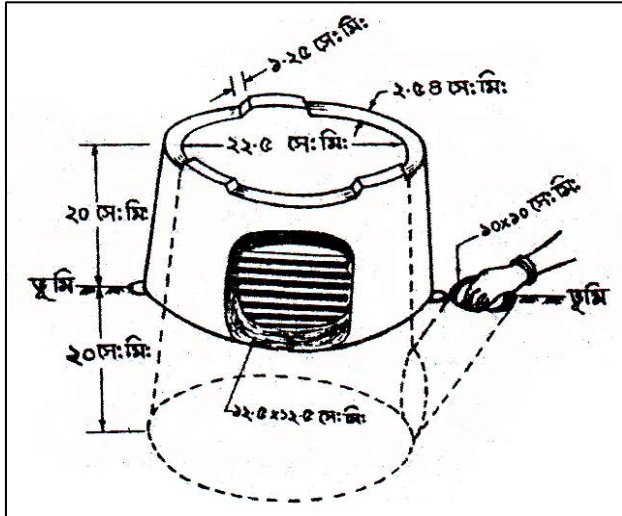


Figure 2 BCSIR One Pot Semi-Submerged Improved Stove

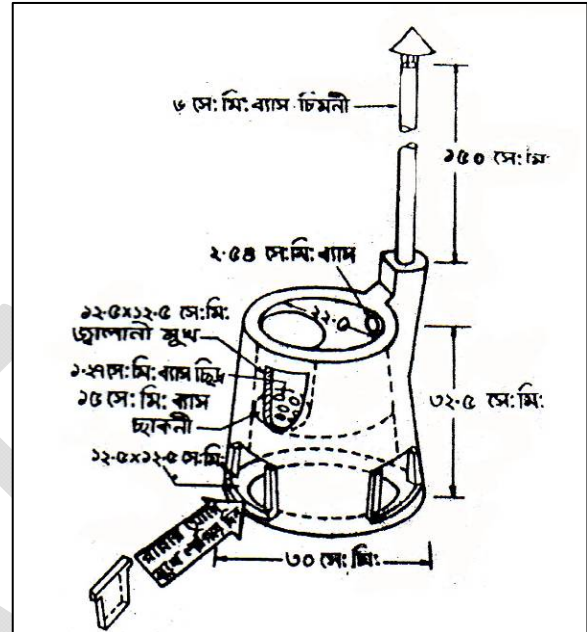


Figure 1 BCSIR One Pot Improved Stove with Chimney

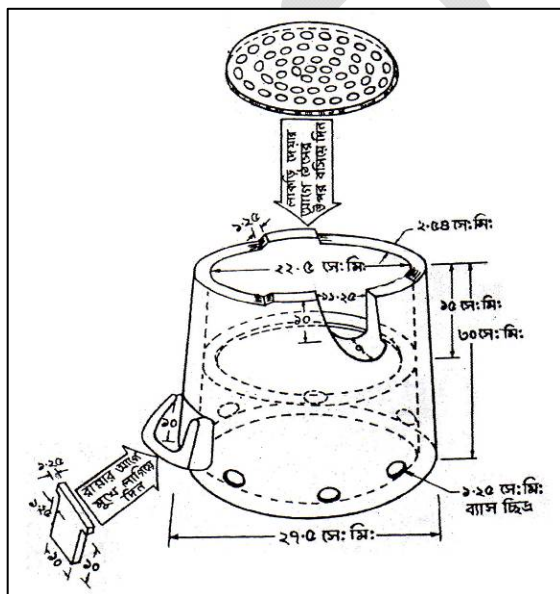


Figure 3 BCSIR One Pot Portable Improved Stove

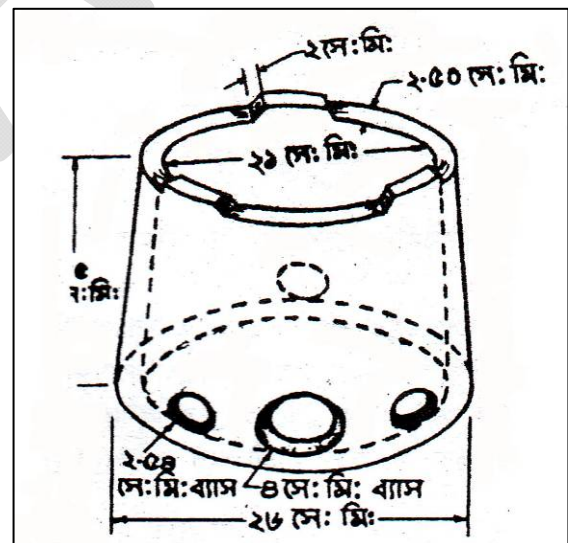


Figure 4 BCSIR One Pot Improved Stove for Sawdust

Source: Improved Cookstove, Improved Cookstove Dissemination (Phase II) Project, Institute of Fuel Research and Development, Bangladesh Council for Scientific and Industrial Research, Dhaka.

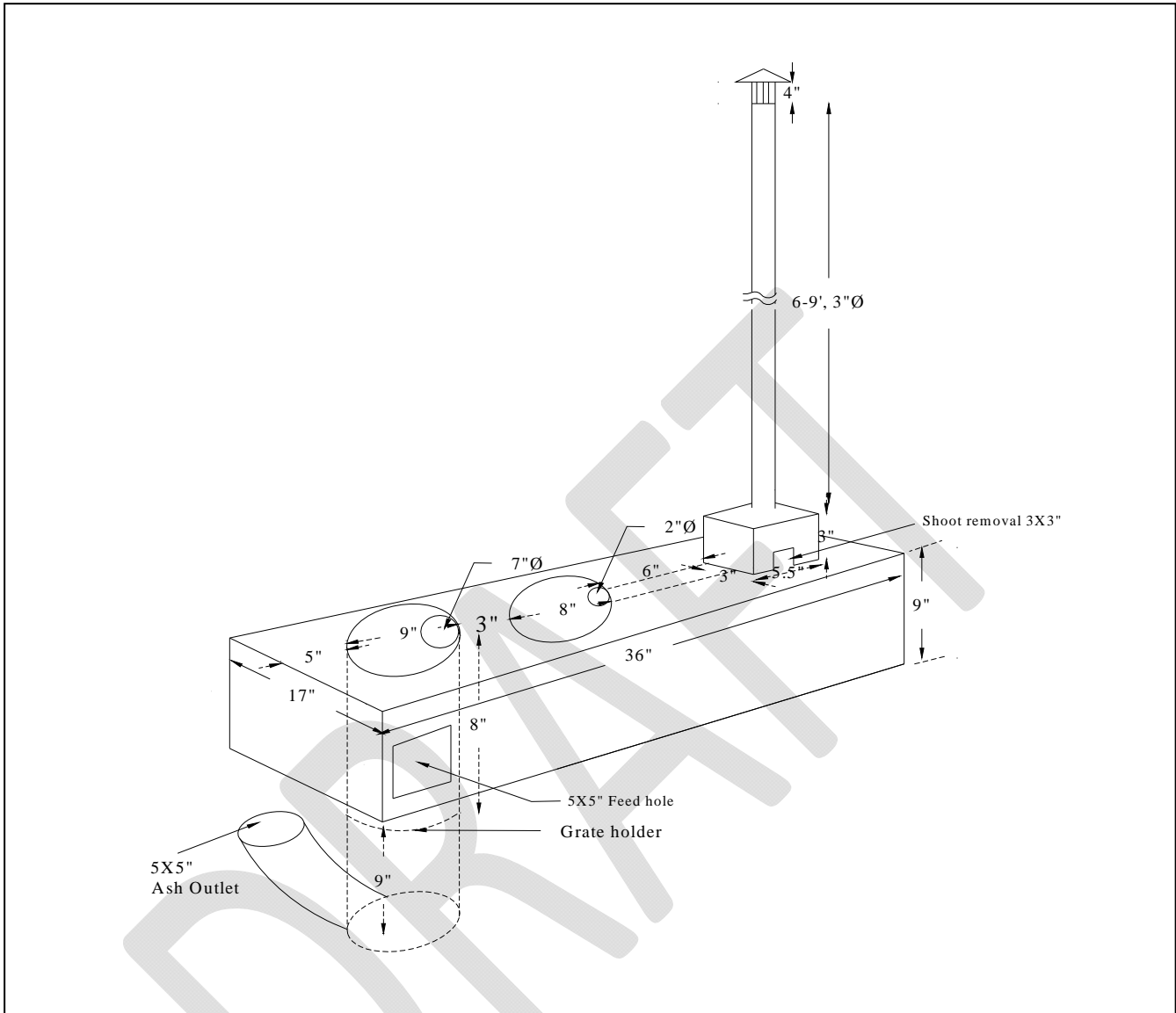


Figure 5 2-pot Stove with Chimney (half underground)

Source: Technical Manual on Improved Cookstoves (draft), Village Education Resource Center, Dhaka, Bangladesh.

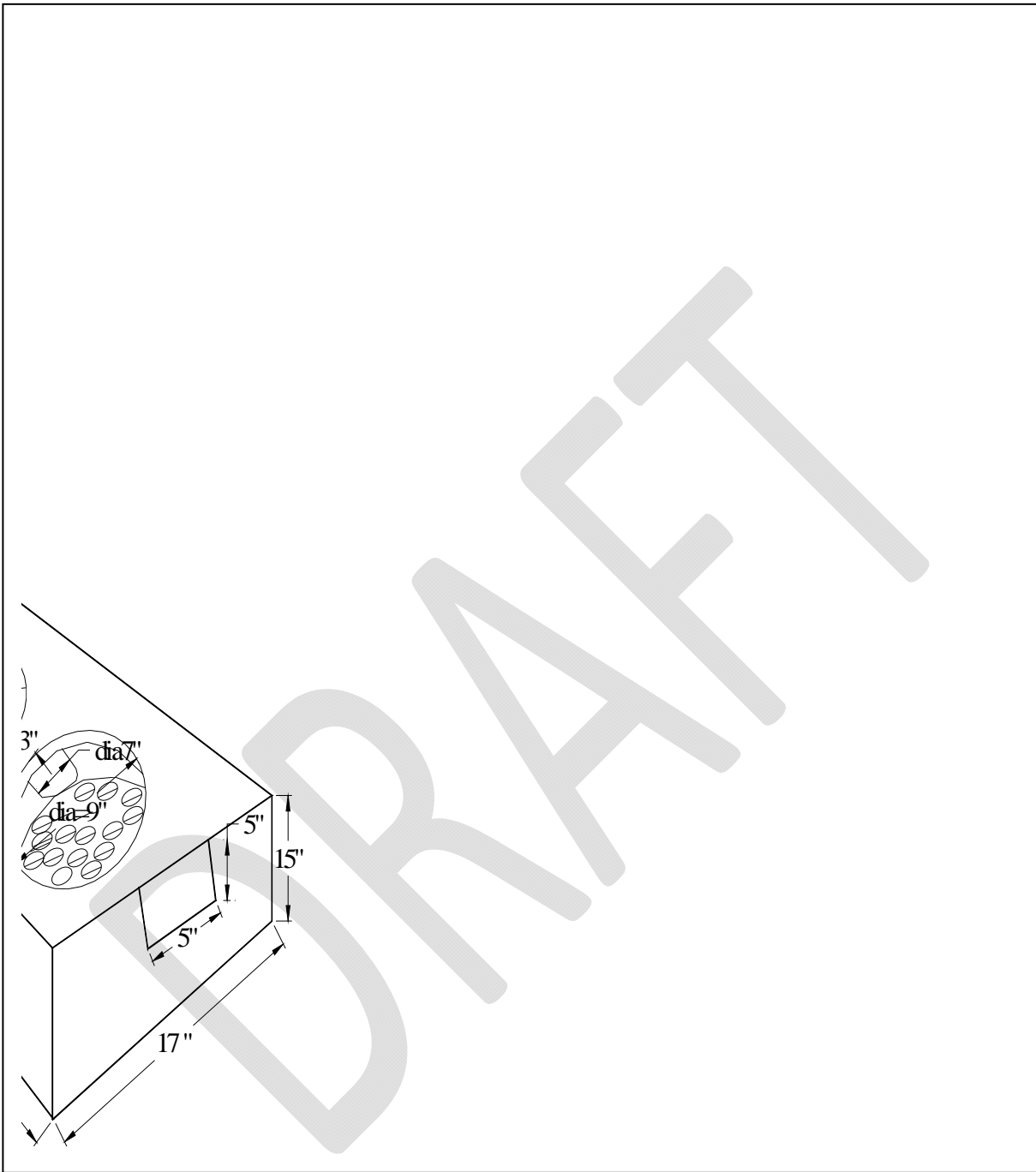


Figure 6 Improved 2-pot Stove with Chimney

Source: Technical Manual on Improved Cookstoves (draft), Village Education Resource Center, Dhaka, Bangladesh.

IAP Project

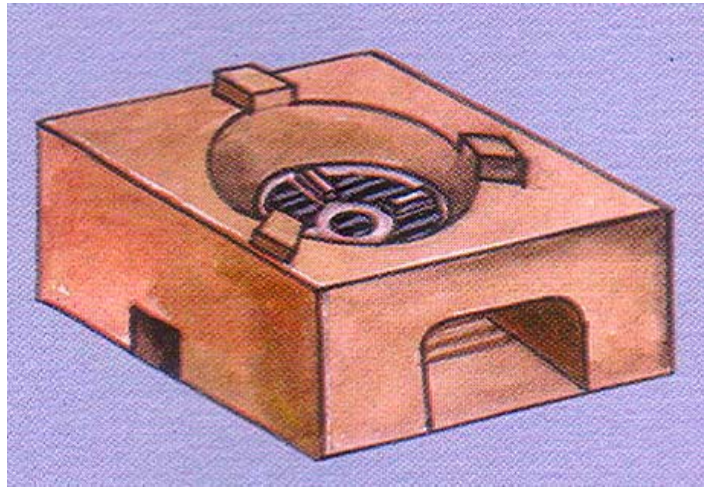


Figure 8 VERC Grihalaxmi

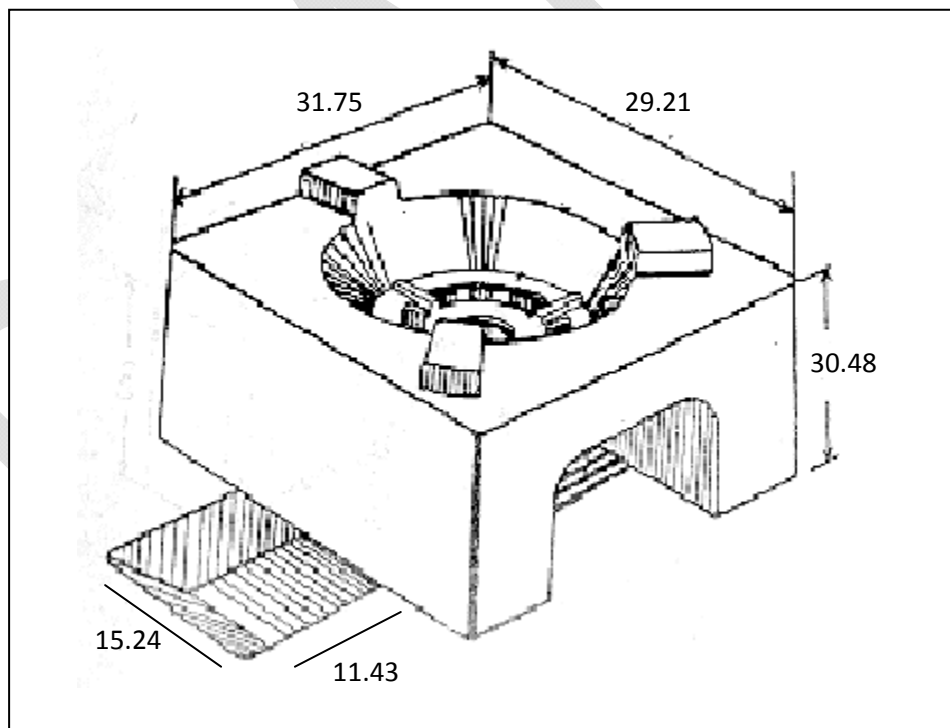


Figure 9 Technical Diagram of VERC Grihalaxmi

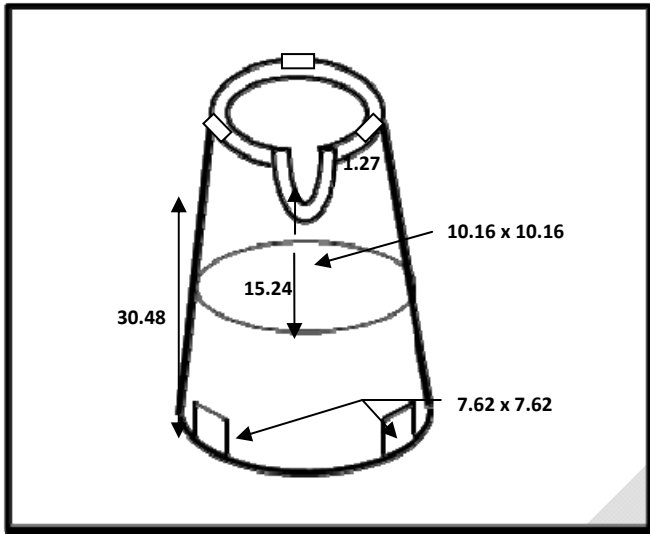


Figure 10 Technical Design of Portable One Pot Improved Cookstove (WI-VERC/Practical Action model) (in cm)

GTZ SED Project

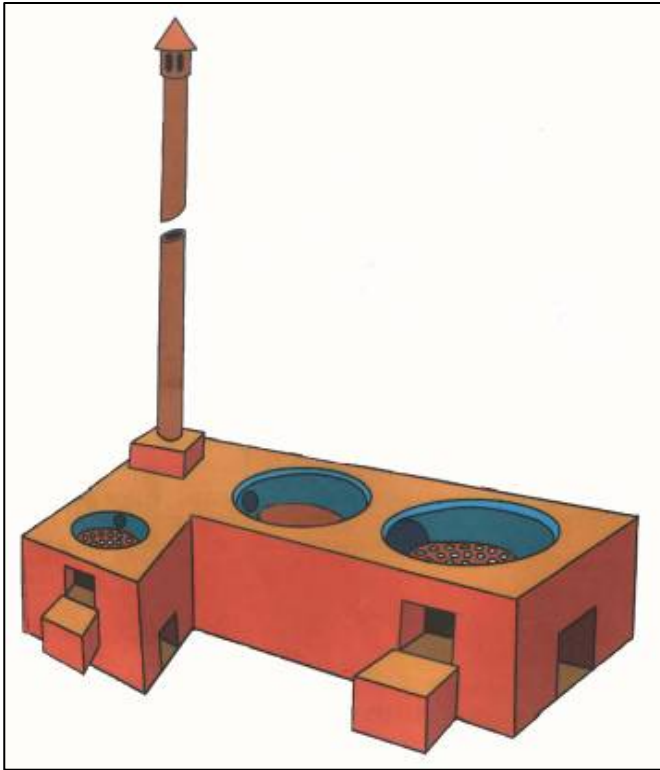


Figure 11 GTZ Three Pot Fixed Improved Stove with Chimney

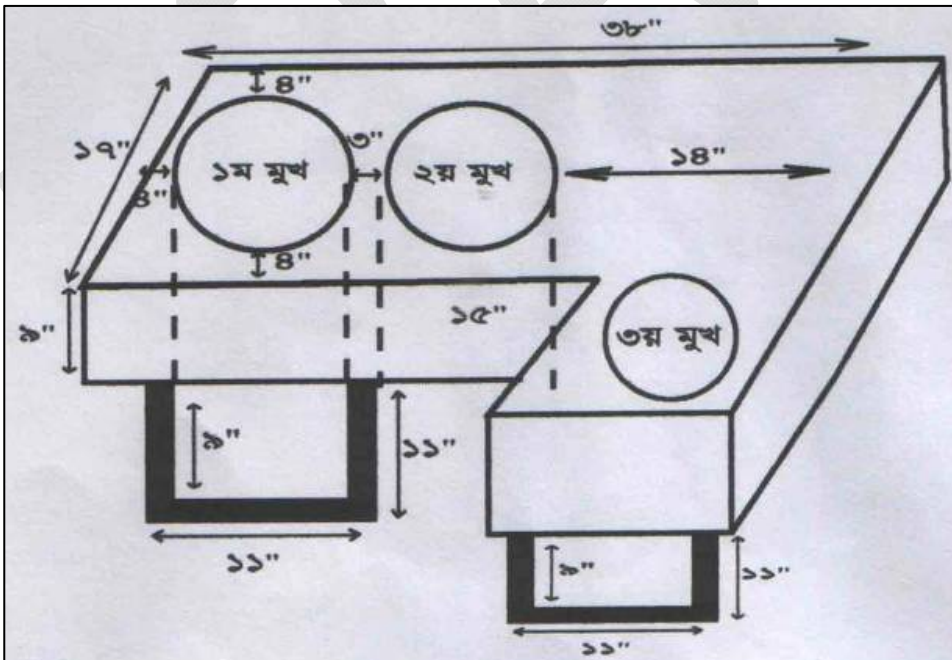


Figure 12 Technical Diagram of GTZ Three Pot Fixed Improved Stove with Chimney

Source: GTZ ICS Training Manual

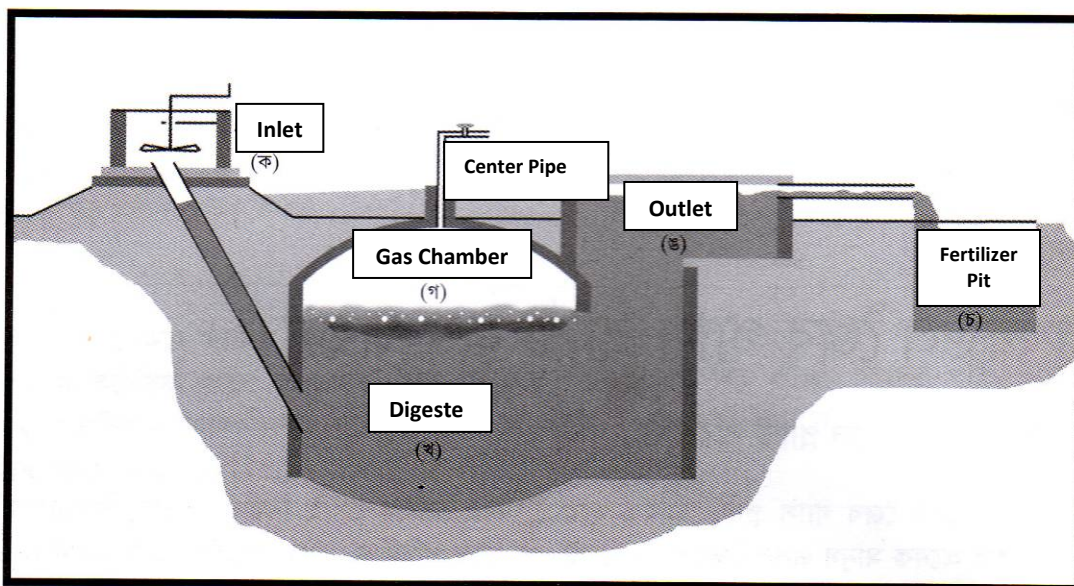


Figure 14 Six Main Components of a Biogas Plant

Source: IDCOL Model Biogas Plant Construction Manual, National Domestic Biogas and Manure Program, IDCOL/SNV, April 2007