

INCEPTION REPORT

BANGLADESH:

Addressing Indoor Air Pollution

A PROJECT UNDERTAKING JOINTLY BY:

Village Education Research Center (*VERC*)
& Winrock International (*WI*)

TECHNICAL SUPPORT BY:

Local Government Engineering Department (LGED)

SPONSORED BY:

The World Bank, Dhaka, Bangladesh

DATE: August 16, 2007

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1. INTRODUCTION:

Indoor air quality is well known to be a major health issue in areas of the least developed countries of the world. In fact, both the largest indoor concentration of many dangerous pollutants and the greatest exposure to these pollutants are found in rural areas of the developing world. Since indoor pollution occurs inside of small homes in the developing world there is a great risk to children who are both consistently around the home and whose immune systems are not as strong as their adult counterparts .

Recently, the World Bank, in collaboration of GOB, has completed a Bangladesh Country Environment Analysis (CEA) .A major finding of the study focuses on the high risk associated with poor indoor air quality due to traditional cooking practices, which directly affect children's and mothers responsible for cooking. These results coupled with current epidemiological understanding suggest that a significant portion of premature death among children under five is attributable to indoor air pollution (IAP), with the respective disease burden following closely the well-recognized water and sanitation related disease burden in Bangladesh. These risk assessments ranks IAP as an environmental health priority, which if addressed will significantly strengthen Bangladesh efforts to reach the health -related Millennium Development Goals (MDG) targets. (*The World Bank TR for VERC*)

A number of epidemiological studies have reported higher incidences of chronic Obstructive Pulmonary Disease (CODP) and Acute Respiratory Infections (ARI), low birth rate babies, cataract among women and children who are exposed to biomass combustion. The current scientific studies also showed that most respiratory health damage comes from inhalation of respirable particles whose diameter is less than 10 microns (PM₁₀) and recent attention has focused particularly on fine particles (PM_{2.5}). In Bangladesh some rural women are exposed to fine air particle (PM_{2.5}) level that are 70 times that the country's outdoor , health based standard. Besides, its immediate health effect, indoor air pollution causes damage to housing materials, affect visibility and causes odor and visual problems.

Indoor air pollution is mainly caused by domestic cooking by traditional stoves with biomass fuels. This problem can be easily controlled by replacing traditional stoves by improved cooking stoves coupled with chimney and cooking with bio-gas. Some research finding (*World Bank's Studies*) also suggest that common variation in certain household characteristics viz. construction materials, space configurations, cooking locations, fuel choice and use of doors and windows have reduced considerable amount of indoor air pollution.

BCSIR has developed a series of different models of improved cooking stove (ICS) suitable from domestic cooking to industrial heating purposes.

The dissemination of ICS has been chosen by training courses. The government organizations and different NGOs have been undertaken a number of projects for dissemination of ICS but desire success was not achieved due to lack of proper strategies for implementation of these projects. Some other modified models of ICS are also being promoted by NGOs. Detail information will be collected during the development of ICS manual.

VERC innovated the dynamic and effective WatSan approach entitled "***The People Initiated 100% Sanitation Approach***". The approach follows community participation at all stages of implementing WatSan program starting with situation analysis and continues in stages of planning for improvement of the situation, identification of needed resources, assigning tasks, monitoring and evaluation. The process starts with entry PRA through participatory mapping

of over all WatSan situation of a community of 50 to 125 households. During the session the participants define a hygienic latrine. Also they define sanitation as a situation where no open defecation, hand washing after defecation and before handling food with four other basic occasions, clean courtyard and neighborhood, personal hygiene/cleanliness. They take into account the socio-economic stratification and affordability into account while planning activities.

During the analysis of situation, community people visits defecation sites, hanging latrines that are contaminating the environment, polluted water bodies and calculates daily/weekly/monthly and annual turn-up of feces. The amount gives an estimate of contamination and its corresponding affect on health. This calculation and assessment ignites their conscience and instantly they agree to have a community initiative to overcome the situation. They form a committee for the purpose. First of all they prepare a list of families not having hygienic latrine and draws an action plan for latrine installation coverage with available resources. VERC staff organizes orientation session for the committee members and interested individuals on different sanitation technology options. Problems arise with the poorest of the poor families and they are supported by well off families in the drive as total coverage is essential to have benefit out of existing and going to be installed latrines. After achieving total coverage in the area they try to ensure the same in adjoining areas. At this stage, the elected local government body actively joins with the community to scale up the initiative though they are strategically involved in the process from the very beginning. This initiative also involves local institutions, public place management bodies in promoting hygiene in a more visible and vigorous manner.

Simultaneously with latrine and water point installation activities, the committee also undertakes hygiene behavior change activities for promotion of good practice for a sustainable change in the community. Main focus is on women and children with involvement of catalysts as promoters. The strategy of VERC facilitated session is introducing a change of hygiene behavior in the community through effective participatory hygiene behavior monitoring by learners themselves.

The reduction of IAP is some what similar to that of rural sanitation, where financial cost to a household is evident but the public health and other social benefits are less apparent without an effective knowledge, awareness and social mobilization campaign. However, impressive progress has been recently as achieved in Bangladesh with the Total Sanitation Campaign (TSC), ownership by communities that build and maintain the latrines without heavy subsidies and involvement of Union Parishads and NGOs as key facilitators in the process.

Some NGOs working in rural areas on TSC and health initiatives suggested that if cleaner cooking technologies viz. ICS and biogas and improved housing options are include in the kitchen, there will be considerable reduction of IAP.

LGED plans to design and implement a “new generation” pilot project aimed at reducing IAP in rural settings. The focus is proposed to be on area where the Total Sanitation Campaign (TSC) has successfully implemented. So, TSC serves as a vehicle of opportunity to ignite behavioral change among household members and in the community at large with the respect to IAP. The main of this task is to develop a project profile “Bangladesh: Addressing Indoor Air Pollution” on demand-based approaches, similar to sanitation programs, to reduce IAP emission. Local Union Parishads will be also included in the project to raise their awareness and build commitment for an IAP program.

2. TRADITIONAL STOVES:

More than a third of humanity, use biomass for cooking and heating purposes. Biomass comprises of wood such as fuel wood, charcoal, twinges and leaves, agricultural, residues such as plant residues, paddy husk and bran, bagasse, jute sticks and animal dung such as cattle dung & buffalo dung. The total amount of bio-mass fuel consumed in the country is about 39 million tons (*GOB, 1991*). Biomass fuel accounts for 67.97 % of the total energy consumption of the country, the remaining 32.03% are being made by commercial fuels viz. gas, oil, electricity. LPG, coal etc.

The common devices use for cooking and heating purposes with biomass fuel is called traditional stove. In Bangladesh, it is usually a mud-built cylinder with three raised points on which cooking utensils rest. One space in between these raised points is used as fuel feeding port and the other two for flue-gases exits. The stove may be built under or over ground. In some case, two potholes are joined together laterally using a single fuel-feeding port. The stoves perform sub-optimally due to loss of heat and the following reasons:-

1. Because of too large distance between the pot and fuel bed, depth ranging from 30-60 cms., heat transfer to the cooking pot is considerably reduced.
2. Because of large size of the flue-gases exits between the cooking pots and the stoves, much of hot flue-gases get out of the stove without coming in contact with the cooking pot and lowering convecting heat transfer.
3. Since air cannot reach the bottom of the stove, considerable amount of cooking fuel accumulate at the bottom as charcoal.

The main problems of traditional stoves are following:

- a) The efficiencies of these stoves vary from 5-15% depending on the depth and diameter of the stove and size of the flue-gas exits.
- b) In the *traditional* stoves because of incomplete combustion of biomass fuels appreciable quantities of *irritants*, *toxins* and *carcinogens* are released in the Kitchen environment and these pose a major threat to the respiratory system of the users.

In general, the combustion products of wood are *carbon dioxide*, *water vapour* and *carbon monoxide*, *particulates* and *polycyclic organic matters*. The last three are known to be pollutants hazardous to human health.

3. OBJECTIVES:

- To design suitable service delivery model for IAP mitigation
- To mobilize villages to become “smoke free”
- To formulate a viable strategy to integrate IAP prevention and sanitation program for improved health outcomes

- To improve awareness among a range of stakeholders groups viz. communities, NGOs, and Local Government for their commitment to indoor air pollution and its mitigation options
- To identify best practices in the country for mitigation of IAP
- To Identify institution arrangement and support mechanism to be tested in a pilot project with a view to subsequence scaling up, paying particular attention to the local government (Union Parishad)

4. APPROACH:

VERC will form a review and documentation team comprising technology expert, approach and program specialist, institutional development specialist, financial analyst, and potential frontline organizers for reviewing and assessing the related interventions, implementation strategies, methods, tools and techniques of CLTS and IAP to put the relevant/appropriate ones into practice for promoting ICS, bio gas and solid and liquid wastage management. Some vocal, dedicated and potential catalysts will be selected before the above mentioned review for providing all kinds of support to review assess and documentation of the best practices. Then VERC will arrange local level workshop for information dissemination on the best practices of piloting experience. In the whole process LGI leaders will play a vital role as key informer of the process.

For effective execution of the pilot project the following methodologies will be used.

5. METHODOLOGY FOR RELEVANT COMPONENTS:

Methodology:

Our methodology closely follows the Scope of Work laid down in the TOR. In accordance with the detailed and specific activities and sub-activities given in the RFP our method for conducting the work will be as follows:

5.1. Step 1: Conduct an Inception Review (this report is part of the inception review) and holding Inception Workshop

▪ Inception Review

Both conventional and participatory methods will be used for reviewing the best practices, discussion and interviewing the following stakeholders

- Project stakeholders, including the separate consultant identified for Component 3 tasks;
- Background information and reports;
- Former and current relevant projects;
- Important project issues regarding the timing of outputs and scheduling of workshops; and;
- Case histories showing important lessons.

Using these resources the team will carry out research important to the planning, policy and scheduling of the project within the budget and time frame. To assist in this task we will develop a research format to ensure that all the required information is gathered consistently. Regular team meetings will ensure that information targets are established and met.

With this project background we will prepare a Draft Project Inception Report providing:

- A detailed approach and methodology;
- A plan for stakeholder engagement, capacity development/building and awareness raising;
- A plan for the identification and evaluation of sustainable IAP reducing programs, encompassing a range of technologies and identifying suitable institutional arrangements;
- Allocation of project team roles and responsibilities, with emphasis on task deliverables;
- Institutional partners, linkages and working arrangements, outlining their responsibilities (if any) in the timely completion of project objectives; and
- Project schedule.

The Inception Report will be presented in Draft in a roundtable meeting of World Bank, LGED and other key stakeholders for comment and recommendations. These will be incorporated into the Final Inception Report.

▪ **Inception Workshop**

VERC will lead both the tasks under Step -1, under the guidance of the project manager, specialists, advisors and support staff as required. VERC will be heavily engaged in the drafting of the inception report and finalize it with the proper assistance of WI. VERC will lead the inception workshop and Winrock will provide necessary back up support.

5.2. Step 2: Component 1 - Development of a Detailed Conceptual Design for a Pilot Project

With the approval of the Inception Report, our team will move to its second step of conducting Component 1 of the project. As the TOR suggests, Component 1 will be split into 3 sub-activities:

- **Research and analysis of service delivery models for use in and/or adaptation to IAP reduction programs**
- **Design of a model for pilot IAP reduction program**
- **Organization of a national workshop with key stakeholders**

To conduct **Research and analysis of service delivery models for use in and/or adaptation to IAP reduction programs** our team of researchers will be divided into three sub-teams:

Sub-Team A: Community-based Approaches:

This sub-team, led by the Community Development Specialist (VERC), will review the performance of the Community Led Total Sanitation (CLTS) with respect to IAP using key

indicators such as coverage and sustainability, key agency involvement, participatory methodologies applied and behavior change messages developed, ability and willingness to pay and to assess the best practices in relation to reduction of IAP and Community Led Total Sanitation (CLTS) using participatory approaches like the Methodology for Participatory Assessment (MPA) and ignition PRA. Sub-Team A will receive support from the Project Manager who will also coordinate with the activities undertaken by ICDDR,B for the development of guidelines for integrating community-based surveillance into IAP programs.

Sub-Team B: Household Energy Programs:

This sub-team will be led by the Rural Energy Specialist (Winrock) to review the lessons learned from relevant Bangladeshi rural/household energy programs on technologies effective in reducing IAP. Many of the key research indicators will be parallel to the works of Sub-Team A, in that Sub-Team B will also look at coverage and sustainability, key agency involvement, willingness to pay and so on.

Sub-Team C: Institutional Arrangements:

This sub-team will be led by the Project Manager cum Institutions Specialist (VERC) to investigate the lessons learned and good practice of IAP institutional models for service delivery by researching relevant programs implemented by the Government of Bangladesh (GoB), with an emphasis on those funded by the World Bank and other key multilateral organizations. Sub-Team C will confer with the other sub-teams to agree on a range of viable institutional models to enable dissemination of viable IAP-mitigating technologies.

A common methodological framework will be developed for the assessment and integration of the findings of sub-teams A, B, and C. Each sub-team will commence review with a standard format to ensure consistency of results. Research for all areas will consist of desk studies, site visits and stakeholder interviews. The site visits will employ Rapid Rural Appraisal and participatory techniques for situation analysis, interviews and focus group discussion. Desk studies will be made of programs in Bangladesh that provide lessons and good practice institutional models for service delivery of IAP programs. These will include the following: Bank-supported GoB programs, in the areas of poverty alleviation, local governance and water supply; Community-Led Total Sanitation (CLTS); improved cookstove, renewable energy, rural electrification, solar home and biogas programs of the Infrastructure Development Company Limited (IDCOL); and Grameen Shakti's Solar Home and improved stove programs. Specific World Bank programs to be reviewed may include the Solar Home Program, Rural Electrification Program, and Health and Population Program, and information will be collected on upcoming projects, such as the Water and Sanitation Sector Improvement Project; the Rural Electrification: Grid and off-Grid Development Project; and the Rural Infrastructure Improvement Project. Winrock will lead the review and evaluation of service delivery models for possible use in a adaptation to IAP reduction programs, while VERC will lead the development of a design and institutional model for a pilot IAP program.

The research undertaken in this activity will form the basis for the Manuals for IAP reduction to be prepared in Step 3 by VERC. Research will therefore give emphasis to documentation of participatory methods, planning and action on IAP, as well as of improved cookstove technologies.

5.3 Design of a Model for Pilot IAP Reduction Program:

This program is focused on developing a pilot IAP program incorporating the elements of sustainability and local participation. The project team will meet in Dhaka to draw together the lessons of Research and analysis of service delivery models for use in and/or adaptation to IAP reduction programs. Once the core concepts of the program are decided, team members will be allocated responsibilities in elaborating elements of the program design. The team will begin by developing an annotated framework for the report to help guide and allocate tasks in writing. The framework will be reviewed with LGED before proceeding. We anticipate the program design pilot will be prepared with the following elements:

- Approach and program elements;
- Beneficiaries – program market characteristics;
- Rationale;
- Institutional arrangements – roles and responsibilities and management relationships;
- Geographic location – area selection criteria;
- Capacity building, with focus on developing in-country IAP and stove monitoring expertise;
- Cost inputs for each program element and allocation of costs;
- Outputs – expected results of interventions in short and medium term;
- Assumptions and risks; and
- Monitoring and evaluation framework as outlined by the RFP.

VERC will lead Design of a model for pilot IAP reduction program with the Project Manager spearheading the integration of the research findings and the development of the IAP reduction pilot model. Winrock will be heavily engaged in this process, supporting the Project Manager with content development and review of the model. The draft pilot program report will be presented in a Workshop for LGED and other stakeholder comment and recommendations.

Organization of a national workshop with key stakeholders is the organizing and conducting of a National Workshop. The purpose of the workshop is to provide focus on practical solutions to IAP through knowledge sharing, influencing policy change as well as modelling programs. The workshop will be widely promoted through the website as well as through other information and outreach methods. The conceptual design for the IAP reducing pilot project will be presented at the National Workshop along with materials developed during this assignment. The workshop will also include thematic round tables to discuss areas such as:

- Policy and institutional issues regarding IAP and renewable energy in Bangladesh;
- Capacity building for air pollution monitoring;
- Development of improved cooking technology;
- Lessons learned from the health sector;
- Market development for improved cooking technologies;
- Lessons learned from other renewable energy programs; and
- Other relevant topics.

The project team will draw from the extensive stakeholder network they establish to provide input and participation in the Workshop. Participants will likely include representatives from the Department of Environment, Ministry of Power, Energy and Mineral Resources, Ministry of Health, Ministry of Women and Children Affairs, LGED, LGIs (Local Government Institutions), World Bank-Bangladesh, World Health Organization, relevant UN agencies, respective national and international NGOs involved in improved stoves and renewable energy, and representatives from the media.

Winrock will lead sub-activity 1.3 by developing the agenda, participant list and moderating the workshop. VERC will provide the necessary logistical support for organizing the workshop.

5.4 Step 3: Component 2 – Consolidation of Practical Methods for IAP Mitigation

This Component encompasses 2 sub-activities:

2.1 Production of practical manuals for IAP reduction

2.2 Widespread awareness raising

Sub-activity 2.1 entails the production of two practical manuals related to IAP reduction. The first requires the documentation of Participatory Tools and Methods for Community Planning and Action on IAP. The second requires the development of a Manual for Improved Cookstove Technologies. Sub-Team A established will be responsible for the production of the Participatory Tools and the Project Manager will lead the development of the Improved Cookstove manuals. Research undertaken in Step 2 will therefore be formatted and extended to account for these information needs.

Before beginning to write the manuals each sub-team will produce an annotated table of contents as a framework for the manual content. For example, the ICS Manual may include sections devoted to performance manufacturing, operation & maintenance, average cost, repair, and comparative advantage and disadvantage. The ICS manual will also identify areas in which further capacity building, particularly for stove performance monitoring, is required and will incorporate proposed activities for stove monitoring in the pilot project design. The two frameworks for the manuals will be discussed with LGED and other stakeholders for their comments and recommendations. The manuals will be produced in both Bengali and English. Illustrative photos and diagrams will be included. Winrock will provide technical feedback on the manuals.

Sub-activity 2.2 entails **awareness raising** and **capacity building** through two or three District-level workshops and two or three exchange visits. The target audiences for these activities are local governments, NGO and community representatives. For awareness raising VERC follows two participatory and action oriented approaches: Ignition PRA; and; Methodology for Participatory Assessment (MPA). The Ignition PRA process is primarily applied through community led total sanitation, community led sustainable health projects where the community leads the planning, implementation, monitoring and evaluation of project activities. The MPA has been applied for an improved stove and IAP reduction pilot project where the communities including key stakeholders are sensitized to adopt improved stoves. VERC's training programs aim to facilitate development of local partners, such as CBOs, and government organizations. VERC believes that training plays a vital role in enhancing knowledge and skill levels and changing the behavioral pattern of development actors for effective implementation of programs. With several years experience in the field of

sustainable development VERC effectively guides its staff members and beneficiaries as well as other NGOs and line agencies of the government by offering participatory training courses. To date, VERC has trained 4973 staff and stakeholders in 50 different training courses. The organization has established an effective relationship with its partner organizations working with local government on implementation of development activities. Under the DAM / DANIDA project, VERC has provided training for implementation of WatSan activities in a collaborative manner for effective management of water and sanitation programs. VERC's pioneering Community Led Total Sanitation (CLTS) Approach has enabled Upazila Parishads to gain experience of initiating development interventions with the participation of the community, and at the same time, ensuring involvement of NGOs and the other stakeholder support. Under the HYSAWA project, VERC plans to implement, monitor and evaluate People Initiated Total Sanitation Program by the Union Parishads. VERC is also responsible for increasing the management capacity of elected local government leaders. VERC has developed various manuals for CLTS orientation and management capacity development training and arranged orientation sessions and training courses effectively.

The Team's Community Development Specialist (VERC) will have responsibility for planning and executing these awareness raising and capacity building activities. If possible, community exchange visits will be organized first so that the on-the-ground experience can be documented and relayed to the District-level workshops. The research of Sub-activity 1.1 will further inform the content of the workshops. The cooperation of VERC on the consultant team will be particularly useful in arranging targeted exchange visits in the WatSan and ICS program areas.

6. DEVELOPMENT OF A DETAILED CONCEPTUAL DESIGN FOR A PILOT PROJECT:

Sub-activity 1.1 Review and evaluation of service delivery models for possible use in and adaptation to IAP reduction program

Before, designing a pilot project for IAP, it is necessary to review some programs relevant to rural energy and sanitation which were implemented in the country. After carefully studying these programs, recommendation will be made for some viable institutional models to strengthen dissemination of ICS and biogas technologies, which will play an important role in mitigation IAP, in a sustainable manner. It is worth mentioning that, BCSIR, Grameen Shakti, LGED, IDCOL, VERC, Practical Action & others NGOs had already completed some projects on rural energy and sanitation while some of these are presently implementing. Major emphasis will be given on the evaluation of the potential to build upon the CLTS program as a vehicle of promoting IAP-reduction within a broader household hygiene frame work. As part of this exercise, "a rapid rural appraisal" of the performance of CLTS with respect to coverage and sustainability, participation and effectiveness of local governments and other agencies, consumer demand for a range of products/services, user satisfaction, health impacts, enterprise development etc. will be studied and some of these relevant approaches will be applied for IAP pilot project.

6.1 Development of Manual for Improved Stove Technologies:

The Institute of Fuel Research & Development (IFRD), Bangladesh Council of Scientific & Industrial Research (BCSIR) has been working with biomass stove project since 1977. IFRD has developed a series project of improved stove models to give fuel saving to the extent of 50-65% when compared with the unmodified ones. All the models were developed through user's opinions to suit the requirements in respect of biomass fuel types, shape of cooking pots and cooking habits.

These models may be grouped into 3 categories:

- 1) Improved cooking stove without chimney for domestic cooking
- 2) Improved cooking stove with chimney for domestic cooking
- 3) Improved cooking stove with chimney coupled with waste heat utilization.

Example: Improved Single Mouth Cooking Stove (portable)

This model is just our age-old traditional stove with three modifications: Firstly, the exhaust gap or flue gas exit has been reduced to 1.25 cms, so that convective heat loss, consistent with good burning, is at a minimum. Secondly, a gate has been placed inside the stove at a depth of 15-18 cms. below the stove rim. Thirdly, considering the size of firewood used, 6-7 holes of 1.25 cm. in diameter are made on the wall of the stove just below the grate for primary air entry. This stove saves 50-55% fuel when compared with a traditional stove of the same internal diameter. However this stove is suitable for fuel-wood, twinges and branches.

In order to make the stoves suitable for any kind of fuels including straws, leaves, dung etc. the stove, **Improved Single Mouth Cooking Stove (half underground fixed)** is built by digging or building a cylindrical shape stove in the ground or above it and the grates are either at the level of the ground or below it is so that the fuels can be conveniently pushed. Holes for primary air inlets and ash outlets are made either on one side or both sides of the stove.

Example: Improved Double Mouth Cooking Stove with Chimney (on the floor)

For non-chimney stoves, flue-gases coming out from the stove remain in the kitchen thus making the users uncomfortable with heat and smoke. To overcome this, a single/double-mouth stove with chimney were introduced.

A major version of chimney stove is the multi-ports stove where cooking of more than one item is done simultaneously. In this case, fuel is burnt in the first combustion chamber over a grate and cooking in other pot is done through the hot flue gases coming from the front chamber. The stoves are so designed to maximize heat transfer to cooking utensils. Fuel savings of this model, as compared with a traditional one pot stove, is about 60-65%. This model decreases the time of cooking and also makes the kitchen free of smoke and hot air. It can be easily made with mud. A grate is placed 18-20 cms. below the stove rim. On both sides of the stove, just below the grate, two small holes are made for primary air entry and ash removal.

To accommodate bulky loose fuels such as straws, leaves and dung, the primary air/ash is the ground and the grate is placed at the ground level so these fluffy fuels can be pushed into the hearth. Further improvements of these models are being made.

Multiple stoves can be made in large sized to suit cooking needs in hostels, hospitals, community centers etc. Industrial stoves built for streaming twisted years in the textile mill is another variation of this design.

*** Dissemination:**

To popularize the improved stove technology IFRD has developed 2 (two) training courses manuals on “Improved Stoves Technology” one for one week and other for four days duration. Scientists of IFRD so far conducted over 222 nos. training courses on improved stove technology and trained large number of men and women from different Government, Semi-Government, and NGOs etc. of the country. Most of the trained personnel are now being engaged in dissemination of improved stoves in different parts of the country.

During the training course participants built most of the models mentioned above. After the training course trainees built some selected models of ICS in their respective areas. They install ICS in the user’s premise according to the choice of beneficiaries.

VERC and other NGOs have been undertaken a number of projects for dissemination of ICS in he country. It is worth mentioning that in different parts of the country people are using ICS and getting benefits.

Therefore, a intensive survey is necessary in the field to select a range of well proven ICS used satisfactorily by different communities in the country for pilot IAP project. After selection ICS models a practical stove manual on ICS will be developed. Each model will be explained as below:

- a photograph of the model, to have an idea, how the stove looks like
- a drawing indicating its different dimension
- different parts of the model
- building procedure, step by step
- operation and maintenance
- trouble shootings
- advantages & disadvantages of model
- average cost of the model

*** Advantages of Improved Stoves:**

The improved stoves have many advantages over traditional stoves. Some of the Advantages are given below:

- i) Keeps the kitchen environment pollution free and thereby check health hazards of the users. (reduction of IAP).
- ii) Reduces CO₂ emissions in the atmosphere, thereby reduce the green house effects.
- iii) Saves 50-65% traditional fuels
- iv) Save cooking times 40-50%
- v) Maintaining proper nutritive values of the cooked food
- vi) Less blacking of the cooking utensils
- vii) Check the fire hazards.

The manual will be published in both Bengali and English version.

6.2 Documentation of Participatory Tools and Methodologies for Community Planning and Action Plan on IAP:

VERC will review best approaches like Ignition PRA, MPA, PLA and other participatory initiatives and documentation of the same properly. Then an expert team of participatory practices will sit together and develop best approach for scaling up IAP program for promoting mother and child health in Bangladesh. In the mean time VERC has adapted and using ignition PRA and Methodology for Participatory Assessment (MPA) in a combined manner in its Community Led Sustainable Health Program effectively. Since 2000 VERC has been using ignition PRA approach in its CLTS program properly and effectively. After that we have been using MPA in its Improved Cook Stove (ICS) and Reduction of Exposure to Indoor Air Pollution program in different parts of Bangladesh. On the basis of these project experiences VERC will develop a manual on Participatory Tools and Methodologies for community mobilization and action planning on IAP reduction.

Under the pilot project on MPA four ICS net work member organisations has been implementing a pilot project titled “Popularization of ICS by using methodology for participatory assessment (MPA) methods in four different parts of Bangladesh. Name of the four organisations are as follows:

- i) Village Education Resource Center (VERC)
- ii) Social Development Efforts (SDE)
- iii) Unnayan Dhara (UD)
- iv) Integrated Development and Education Assistance (IDEA)

7. MONITORING

As a participatory development organisation, VERC will follow both the participatory and conventional methods for monitoring all kinds of activities under component no. 1 and 2 of the pilot project. Md. Yakub Hossain, Chief of the Advisory Team will be responsible for overall monitoring of the progress and process of the whole task. The Project Manager will be the focal point to continuously monitor the performance of all the three teams during the implementation of component 1 and 2. Team leaders of the said three teams will be responsible for monitoring and follow up of the process and progress of specific activities and ensure the quality of the program.

8. INSTITUTIONAL ARRANGEMENT (INCLUDING COLLABORATION AND COMMUNICATION STRATEGIES WITH PARTNERSHIP ORGANIZATIONS)

The implementing organization of this project are VERC, WI & ICDDR. So the partner organizations will work in close collaboration with each other. The implementing organizations also work in close coordination with the LGED and other counterpart agencies viz. Local governments, BCSIR, Grameen Shakti, GTZ, IDCOL and other NGOs, who mainly work with rural energy and sanitation programs.

9. AWARENESS PLAN

9.1) Workshop:

Objective of the workshop: To share and exchange views on -

- Community Led Total Sanitation (CLTS) Program
- Indoor Air Pollution (IAP) Program
- Health hazards due to smoke and hot gases in the kitchen
- Checking the rapid deforestation in the country
- Changing eco-system of the country
- Awareness about clean energy technologies viz. ICS & biogas technology and lead healthy and better life.
- Economic benefits of the users by using clean energy technologies.
- Employment generation in rural area by commercialization of clean energies technologies.

Awareness plays an important role to popularization a new technology among the common people of the country. In Bangladesh about 90% families use traditional stoves for cooking and other heating purposes. But it has two main defects viz. low efficiency (5-15%) and its smokes/flue gases cause health hazards to the users and also other members of the family. To over come these problems scientists of the country have developed clean energy technologies viz. improved cooking stove (ICS), biogas, solar devices etc., which are environment friendly. So, the people of the country should familiar with these clean energy technologies and also know the possible health and other benefits by using them.

To generate awareness regarding benefits of these clean energy technologies in a community, some workshops cum exhibition/display/demonstration will be arranged in divisional head quarters of the country. District and upazila level government officials, NGOs representatives, local community leaders, some housewives will present as audiences.

Experts of the clean energy technologies will present the technologies in a very simple way to the audiences. They will concentrated their deliberations mainly on technologies installation, costs, benefits and uses. They also suggest them who will help them for installation of the technologies in their premises.

Once awareness has been created among the local population, the next step is obviously to expose them to the technologies through training courses, demonstration and display/exhibition. So, after the workshop the participants will see the clean energy technologies viz. ICS, biogas and solar devices in a exhibition. The exhibition can be arranged in the same day of the workshop. The exhibition venue should be very close to the workshop venue. A model kitchen with ICS can be made in the exhibition ground to demonstrate IAP in a typical house. Some water in utensils can be boiled to make tea in a improved cooking stove. These activities will impress the people to have desired clean energy technologies in their own premises.

9.2) Exposure Visits:

Some exchange visits will be arranged in certain project areas to ignite communities towards adapting best practices on clean energy technologies and bringing behavioral change in IAP reduction and household hygiene, similar to sanitation program.

To identify the best practices on clean energy technologies using in the country, arrangement will be made to contract with some organizations/institutions, who implementing these technologies.

The following organizations/institution will be consulted to identify the best practices on clean energy technologies adapted by the users:

- i) Grameen Shakti
- ii) German Technical Cooperation (GTZ)
- iii) Infrastructure Development Company Ltd. (IDCOL)
- iv) Bangladesh Council of Scientific and Industrial Research (BCSIR)
- v) Bangladesh Rural Development Board (BRDB)
- vi) Answar- Village Defense Party (VDP)
- vii) Practical Action
- viii) Some other NGOs

By consulting with above mentioned institution/organization, some areas will be selected, for 2-3 exposure visits, where clean energy technologies viz. ICS, biogas & solar devices are implementing under certain projects.

A list of local government officials, NGOs and community representatives and exposure visits schedule will be prepared. After that according to schedule, project personnel along with some selected person from the list will visit the selected places where clean energy technologies were implemented. Some visits will also undertaken in WatSan project areas also.

The findings of these visits will be documented and shared at the district level workshop. These visits will make a positive impression of the visiting team members to raise awareness and develop commitment for participation in IAP reduction program.







10. NATIONAL WORKSHOP AND THEMATIC ROUNDTABLES

A national workshop will be held after completion of the proposed project in addition to thematic discussion forums (e.g., on health issues) help to share knowledge and trigger policy level change, as created in the case of sanitation in Bangladesh, among the key decision makers, health experts and other professionals.

11. SCHEDULE OF ACTIVITIES

WORK PLAN FOR THE PROJECT “BANGLADESH: ADDRESSING INDOOR AIR POLLUTION”

Activities	Months									Lead by	
	17Jul/07	Aug/07	Sep/07	Oct/07	Nov/07	Dec/07	Jan/08	Feb/08	Mar/08	VERC	WINROCK
1. Inception Report											
1.1 Preparation and production of Inception report		↔									
1.2 Submission of draft Inception Report		17Aug									
1.3 Submission of final inception report		—									
2. Inception workshop											
2.1 Completion of Preparatory work		↔									
2.2 Development or workshop design		↔									
2.3 Arrange Inception workshop		↔									
2.4 Inception workshop		28 Aug									

3. Addressing the sub-activity 1.1 under the component 1: Development of a conceptual design for the Pilot project (Review and evaluation of service delivery models for possible use in and adaptation to IAP reduction programs)											
3.1 Consultation with different stakeholder in CLTS, IAP, Biogas and other related field											
3.2 Field visit for reviewing the best practices											
3.3 Exposure Visit											
3.3 National Level Workshop and thematic roundtable											
3.4 Documentation of											

field findings, feedback and suggestions and recommendations												
3.5 Development of first draft report				↔								
3.6 Submission of 1 st draft Report				17 July 2007								
3.7. Preparation of 2 nd draft report					←	→						
3.8. Submission of 2 nd draft report							17 Jan/07					
4. Addressing the sub-activity 2.1												
4.1 Development the documentation of participatory tools and methodologies							↔					
4.2 Development of ICS technologies development manual					←	→						
4.3 Submission of the documents								↔				
5 Addressing the sub-activity 1.2												
5.1 Development of a design a model	←	→										

for a pilot IAP Program												
5.2 Consultation with World bank, LGED, ICDDR'B, WINROC and other related stakeholders												
5.3 Submission of Final model of IAP program to WB												
5.4 Submission of Final model of IAP program to WB									17 march'07			
5.4. Preparatory activities for arranging final dissemination workshop												
5.5 Development and submission of final report.												