

Title of proposed action	Raising awareness & training rural Sudanese women and men in domestic biogas technology.	
Applicant	Agricultural Technologies Transfer Society (ATTS)	
Website	<a href="http://www.SudanATTS.org">www.SudanATTS.org</a>	
Geographical location	Sudan	
Legal status	ATTS is a non-governmental organization (NGO) that has been approved by the Registrar of NGOs in Sudan since the 12 <sup>th</sup> of February 2009.	
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Duration of project	18 months	
Required Budget (\$)	198,860	
Partners	Directorates of Forestry. Agriculture & Animal Resources in Western, Central & Northern Sudan.	
	Unions of Pastoralists, Farmers, Youth & Women in Western, Central & Northern Sudan.	
	Skills Building Training Centre in Food Animal Technologies.	
Banking instructions	Account holder	Agricultural Technologies Transfer Society
	Account number	8029
	Bank	Faisal Islamic Bank-University of Khartoum Branch

## **1. Background & rationale**

### **1.1. Previous work or activities done related to this request**

The Agricultural Technology Transfer Society (ATTS) organized and offered several presentations to improve public awareness with current environmental issues. The list included the following titles:

- a. A power point presentation on the use of crop residues to generate biogas: <http://www.sudanatts.org/biogas%20presentation.ppt>
- b. A power point presentation on Clean Development carried out Kordofan (western Sudan) for public consultation before the application of biogas technology in the area (2011) <http://www.sudanatts.org/ATTS%20Niroj.ppt>
- c. A power point presentation on biological waste management: <http://www.sudanatts.org/Bokhari.ppt>
- d. Other related activities ATTS could manage to register a biogas project as a CDM within the UNFCCC within the following link: [https://cdm.unfccc.int/ProgrammeOfActivities/poa\\_db/QZXS7GO3PIY5U0J84F1NK9A6ELVBMC/view](https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/QZXS7GO3PIY5U0J84F1NK9A6ELVBMC/view)

The project is targeting 26,000 biogas units in all states of Sudan to replace the current usage of fuel wood in rural households of Sudan and hence, it will help in reducing the consumption of non-renewable biomass.

- e. ATTS built and operated in 2016 (50 units) fixed biogas units for the **World Food Program** in the five states of Darfur. The units were established in schools so as to provide free meals and to minimize deforestation in the states.

### **1.2. Other relevant activities:**

- a. ATTS carried out field intervention to improve rain water harvesting and rain fed cropping undertaken by women in North Kordofan in 2014-2015. The work was funded by Concern Worldwide to improve small scale farmers crop yields using smart agriculture).
- b. ATTS, in collaboration with the Dutch Embassy in Khartoum, offered training on Rain Water Harvesting for 22 participants from different governmental and academic institutions in February 2016.

## **2. Importance of the proposed action to the implementation of the strategic directions of the African Development Bank.**

Livelihoods of rural communities in Sudan rely mainly on crop production and livestock keeping. These communities face strong pressure with regard to energy access which undermines the success of plans to alleviate poverty. Almost all rural households rely on firewood for cooking purposes but deforestation makes collection of firewood a difficult job. On the other hand, livestock are raised on rangelands under an extensive system of production and that is considered less efficient than the intensive system in terms of climate change mitigation.

The potential environmental benefits of domestic bio-digesters include

reduction of local pollutants, reduced deforestation due to logging for fuel, and increased sequestration of carbon in soils amended with the digested organic waste. Moreover, it lessens physical effort and time spent by women and children in the collection of firewood for cooking and reduces health risks associated with their exposure to smoke during cooking at home. Utilization of dung and crop residues for biogas production improves sanitation in and around the household.

This action fulfills the strategic directions of the ADB<sup>1</sup> calling for protection of the environment, poverty reduction, and sustainable rural development, creation of domestic industry and employment opportunities in addition to improvement in health conditions of the rural populations.

### **3. Rationale for the proposed activity**

Rural communities rely explicitly on firewood (collected from trees and shrubs), crop residues and cow dung for cooking food in their homes. Such activities have negative impacts on the environment and human health. Production of biogas from organic wastes (crop residues & cow dung) at home & its utilization for cooking has far reaching positive impact on human health and the environment .It reduces indoor pollution with smoke ,improves sanitation at home, preserve trees leading to conservation of the environment, shorten time and lessen efforts by family members to collect firewood. Moreover, the resultant by-product of waste fermentation (bio-slurry) is valuable organic fertilizer that could be used to grow vegetables at home for family use. This has far reaching positive impact on the health of rural populations whose diet is notably deficient in fresh green vegetables (important source of vitamins and minerals).

### **4. Objectives, activities and expected outcome of the action**

#### **4.1. Objectives**

The objective of this action is to raise awareness & train rural women and men in rural areas of Sudan on the technology of bio-gas production from organic waste and the utilization of the resultant biogas for cooking and bio-slurry for fertilizing home garden to grow vegetables for family use and possibly selling extra produce.

#### **4.2. Planned activities of the action**

##### **4.2.1. Selection of portable bio- digesters for demonstration & training**

Although the potential need for bio-digesters is very high in Sudan, the use of the technology in rural areas is at its earlier stages. The intention of this action is to increase awareness of farmers and livestock owners, across rural areas of Sudan, with the biogas technology and utilization of biogas for cooking at home. In order to expose the largest possible number of

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<sup>1</sup> <http://www.afdb.org/en/about-us/mission-strategy/>

trainees, in rural areas of Sudan, to the biogas technology in a short time, prefabricated portable biogas units (in contrast to constructed fixed biogas facilities) will be used for demonstration & training.

The suitability for this action of various commercial types of prefabricated home bio-digesters produced by international suppliers is evaluated using information from the internet. Technical factors that are considered in comparing and sorting out the most appropriate types of prefabricated portable home biogas units for this action included : material (plastic is preferred to units made of metal as plastic does not rust), shape (a vertical digester is preferred to a horizontal one because it occupies less space) , digester capacity ( digesters that consume daily 2-4 Kg of organic waste to produce daily enough gas to allow two hours of cooking are preferred to digesters with greater or lesser gas producing capacities ), water requirements (because water may be scarce in some rural areas of Sudan digesters that use little volume of water are preferred), ability to digest many sources of organic wastes, tightness of the kit (parts of the digester should be tightly connected) ,easy discharge of scum, ease of installation and operation , cheap operational costs and short time to initiate gas production after feeding organic waste and water. Some international suppliers include tubes and stove in their offers and this is quite useful as such accessories are not readily available in rural areas of Sudan.

Table 1 shows the results of the internet search on portable home biogas units. The brands of portable home biogas units are presented in a decreasing order of suitability for use in the proposed training program. All brands, except one, are developed in India.

Table 1. Portable prefabricated home bio-digesters from different international suppliers sorted in a descending order of suitability to the training program.

Order	Brand	Country of supplier
1	Portable biogas plant DBG	India
2	BRITT-biogas system	India
3	Synod Bioscience	India
4	Sunrise mini-bio-digesters	China
5	B-SUSTAIN	India
6	Eco Care	India
7	SINTEX	India
8	SICO BIO1003 (India)	India

#### **4.2.2. Delivery and storage of imported portable biogas units**

The imported portable home biogas units will be delivered by a local supplier (selected on basis of a transparent bidding process) to the co-coordinator of the action at ATTS head office in Khartoum North, Sudan. Here the units will be stored until they are disposed for demonstration & training in rural areas.

### **4.2.3. Selection of the action's team members**

Table 2 shows composition of the action's workforce, required qualifications, designated tasks & duration of tasks. Trainers and facilitators should be carefully selected. Trainers and facilitators should be sorted out from the state in which training will be conducted. This has the advantage that attendees will be able to communicate, in future, with trainers on issues pertinent to biogas technology and utilization. For that purpose at least one trainer will be nominated from each state to attend training of trainers in ATTS head office. However, only six candidates will be selected on basis of their tested knowledge and skills in biogas technology to join the team of trainers in the action

**Table 2. Composition of the staff of the action.**

Post	Qualification	No.	Tasks	Task duration
Action co-coordinator	PhD	1	-Prepare , publish in local press calls to render services to the action and pick up winners - Administer & supervise all operations of the action - Prepare & publish progress and final reports. -Administer procurement of supplies -Administer with the aid of the accountant dispatch of all imbursements in the action	18 months
Trainer of trainers	PhD	1	-Train trainers in biogas technology, uses of biogas and bio-slurry. -Prepare handouts for trainers in the field	2 weeks
Trainer	B.Sc. or equivalent	3	- Attend training on biogas at ATTS head office. -Train rural men and women on use of biogas units , utilization of biogas and bio-slurry. - Prepare & submit written report (with photographs, names & number of attendees and highlights of achievements and shortcomings) to the co-ordinator.	8 months for each trainer.
Facilitators	Read and write	18	-Help in the identification of trainees with the aid of local congregations of youth ,women, pastoralists and farmers. -Carry out contacts with local authorities to secure a room or hall for carrying out training .	3 months for each facilitator
Secretary	Skilled in computer use	1	-Carry out all secretarial work (e.g, typing , photocopying and contacts).	18 months
Workers	Physically fit	4	-To tend to all kinds of physical jobs allocated to them	18 months
Technician	Experience in gas cookers	1	-To assist with the use of biogas for cooking -Assist with the purchase of accessories for the biogas units	10 days
Storekeeper	From officially recognized security firm	1	To guard stored imported biogas units	6 months

### **4.2. 4. Selection & training of trainers**

Table 2 shows that 3 trainers will be needed to conduct training in all states

and regions of Sudan .Trainers (males & females) should be graduates of colleges of Agriculture, Veterinary Science, Animal Production, Chemical Engineering, Environmental Sciences or Range and Forestry. They will receive 40 hours of theoretical and practical training in environmental sciences, operation of portable home biogas kits and utilization of the resultant biogas for cooking and bio-slurry for fertilizing house gardens to grow vegetables. One consultant will undertake training of trainers. The contents of the training course are given in Annex 1.

#### **4.2.5. Selection of other staff members in the action**

All other job vacancies in the action will be advertised in the local newspapers. Only applicants who attend and pass an interview will be chosen for the advertised posts.

#### **4.2.6. Visits of the Coordinator of the action to capital cities of states**

The coordinator of the action will visit capitals of all states in Sudan to meet stakeholders (governmental and non-governmental organizations and associations of Youth, Women, Pastoralists and Farmers) to brief them on the action and ask their assistance in identifying and nominating names of individuals from local communities to be hired as facilitators in the action; and also to help with the identification and nomination of rural men and women who will attend training in biogas technology and uses in their own localities.

The coordinator will meet the proposed facilitators in capital cities of the states to sign contracts and to be briefed on their tasks and identify ,with their assistance, the specific locations in rural areas to conduct training of trainees. Facilitators are expected to notify selected attendees and local authorities in the training place to help with the preparation of the training site for training. Each gender will be trained separately.

#### **4.2.7. Distribution of biogas units for demonstration & training**

Following the termination of the training course portable prefabricated biogas units will be distributed (Table 2) to the states according to the density of rural populations .The states of Greater Dar Fur and Greater Kordofan regions accommodate the largest population of domestic ruminants in Sudan and are largely dominated by rural populations of pastoralists and agro-pastoralists. Rural areas in the two regions are under-privileged with regard to the provision of electricity and cooking gas services. Rural populations of these two regions rely almost entirely on firewood, crop residues and dung as sources of energy for cooking. Introduction of biogas technology into these two regions is a priority. Therefore, this action will devote half of its entire duration and 62% of the imported biogas kits for demonstration and training in Greater Dar Fur and Greater Kordofan regions of Sudan.

The central region of Sudan accommodates large areas of arable land that are cultivated to produce rain-fed and irrigated crops. It also supports large numbers of domestic livestock. The region has been subjected to considerable

deforestation to expand rain fed and irrigated crop production in addition to charcoal production for domestic use. Large volumes of crop residues and dung are generated annually and can be utilized to produce biogas for family use at very low costs.

Natural resources in the Eastern region (especially Red Sea and Kassala states) have been subjected to considerable degradation due to mis-use of resources by humans and recurrent droughts. Introduction of biogas technology, using crop residues and organic waste, can help reduce the negative impact of natural and man-caused disasters

Table 2. Distribution of imported biogas plants over the states & regions of Sudan for training with number of attendees, training sessions, trainers and length of training.

State	No. of plants	♀ attendees	♂ attendees	Total attendees	No .of Training sessions	Days of training	No. of trainers
North Dar Fur	3	60	60	120	6	24	
South Dar Fur	3	80	80	160	8	32	
West Dar Fur	3	60	60	120	6	24	
East Dar Fur	3	60	60	120	6	24	
Central Dar Fur	3	60	60	120	6	24	
Dar Fur region <sup>2</sup>	15	320	320	640	32	128	3
South Kordofan	4	80	80	160	8	32	
West Kordofan	3	60	60	120	6	24	
North Kordofan	4	80	80	160	8	32	
Kordofan region <sup>2</sup>	11	200	200	400	22	88	
White Nile	1	60	60	120	6	24	
Geziera	2	60	60	120	6	24	
Khartoum	1	40	40	80	4	16	
Blue Nile	1	60	60	120	6	24	
Sinnar	2	60	60	120	6	24	
Central region	7	280	280	560	28	112	3
Gedarif	2	60	60	120	6	24	
Kassala	1	60	60	120	6	24	
Red Sea	1	40	40	80	4	16	
Eastern region	4	160	160	320	16	64	1
River Nile	1	40	40	80	4	16	1
Northern	1	40	40	80	4	16	
Northern region	2	80	80	160	8	32	1
Total	39	1060	1060	2120	106 <sup>1</sup>	424	

<sup>1</sup> The length of each training session is 4 days including one day for travel.

<sup>2</sup> Training will commence concurrently in Greater Dar Fur (using 3 trainers ) and Greater Kordofan (using 2 trainers) regions utilizing 2 bought in pickups for travel .At the end of training the trainers will move using pickups to other states in the central ,eastern and northern regions to conduct training.

Both the Northern and River Nile states have small numbers of rural inhabitants and enjoy better electricity services than most rural areas of Sudan. The two states, however, are famous for growing horticultural and field crops under irrigation and have huge volumes of crop residues that can be used to generate biogas for home use and bio-slurry to fertilize crop fields to produce organic vegetables and fruits for export.

## **5. Expected outcomes & impacts of the action**

Even though the idea of this action is simple yet it has far reaching environmental, health, socio-economical and financial repercussions on the

Sudan and welfare of its rural populations. Table (3) summarizes expected outcomes & impacts of the action.

**Table (3): Expected outcomes & impact of the action**

Process evaluation (outcome)	Outcome evaluation (impact)
<ul style="list-style-type: none"> <li>● 2120 individuals equally representing women and men from 2120 families in 18 Sudanese states and five regions will be trained in the operation of portable home biogas units, utilization of the resultant biogas for cooking at home and the resultant organic fertilizer (bio-slurry) for improving fertility of home garden to grow vegetables.</li> </ul>	<ul style="list-style-type: none"> <li>● It is anticipated 50% of the families of trainees (1060 families) will opt for the use of portable biogas units for cooking at home. Assuming an average family size of 5 about 5300 individuals will enjoy eating food cooked under hygienic conditions with the least possible negative impact on their health and sanitation of their homes. In addition, each family will be able to save daily half of the time (4 hours on the average) and half of the physical effort spent by members of the family to collect firewood for cooking purposes.</li> <li>● The diet of rural populations in Western Sudan is deficient in green vegetables. Growing <i>Erucca Sativa</i> (locally known as Jirjeer) in the family garden (2 x 3 meters) will provide each family with 6 Kg of fresh Jirjeer every month. This vegetable has important nutritional effects being rich in vitamins A and C, minerals and antioxidants. Regular consumption of Jirjeer will have far reaching positive impact on the health of families in rural areas of Western Sudan.</li> </ul>
<ul style="list-style-type: none"> <li>● This action will produce 20 trainers in the use of domestic biogas units for home cooking and gardening.</li> </ul>	<ul style="list-style-type: none"> <li>● These 20 trainers can offer training in the operation of domestic biogas units to 2000 trainees (and families) annually, across Sudan. This results into a rapid spread of home biogas technology in rural areas of Sudan and will continue over time and transferred across locations. This brings more positive impacts on the environment and human health.</li> <li>● Increasing public interest in use of biogas, at home, will create jobs for suppliers of home biogas units, technicians and trainers.</li> <li>● There is growing international market for bio-slurry as fertilizers as they are considered superior to conventional organic fertilizers. Expansion in the use of domestic bio-digesters results in the production of more bio-slurry that can find its way to export markets resulting into financial returns to producers and the country at large.</li> </ul>
<ul style="list-style-type: none"> <li>● The coordinator of the action will meet and talk to 50 individuals (representing youth, women, pastoralists, farmers and traders associations) in 18 states to improve their awareness with the biogas technology and its use at home for cooking &amp; its impact on the environment.</li> </ul>	<ul style="list-style-type: none"> <li>● The support and backing for the home biogas action from 900 individuals affiliated to five important associations in 18 states will lead to even greater endorsement for the biogas technology by beneficiaries in rural areas for home use.</li> </ul>



## **6. Beneficiaries**

The beneficiaries in this action include families of pastoralists, agro-pastoralists, farmers, sedentary livestock keepers in rural areas of the Sudan. The list includes providers of services (e.g. importers of domestic bio-digesters , sellers of biogas stoves , tubing and fittings, chemical engineers , biogas technicians, consultants and trainers in biogas ,shipping agents etc.) .Other stakeholders include policy makers (in the ministries of Agriculture and Forestry, Environment, Animal Resources, Rangeland & Fisheries, Foreign Affairs ,Interior and Water Resources and Electricity) and academic institutes (Colleges of Agriculture, Animal Production, Veterinary Sciences, Forestry ,Environmental Studies , Economics and Business Administration ) and associations of women, pastoralists, farmers and the youth .

## **7. Action & implementation plan**

As mentioned earlier the objective of this action is to raise awareness and build capacities of rural populations in Sudan in domestic (home) biogas technology (production and use of biogas units for cooking and bio-slurry for improving fertility of home garden to grow vegetables). The most important milestones of the implementation plan after receiving funds are:

- i. Importation of the proposed brands of home bio-digesters for use in the action through a local supplier who is selected under the highest degree of transparency.
- iii. Store imported kits and other supplies in the store of ATTS.
- iv. Select & recruit the staff of the action under the highest degree of transparency.
- v. Purchase vehicles, equipment, training aids, tools and other supplies needed for the action via tenders & approved suppliers.
- vi. Prepare and secure training documents (both for trainers in ATTS head office & for attendees in rural areas) with the guidance of the consultant who will train trainers.
- vii. Conduct training of trainers in ATTS head office in Khartoum North. (This is expected to take place after the visits of the coordinator to the capitals of the states in which nomination of trainers & attendees at local level shall take place in consultation with stakeholders in each state). The trainer (consultant) is expected to hand over a report on training of trainers to the coordinator after the completion of the training. The report is expected to include assessment of the performance and attendance of each individual enrolled in the training course presented in a descending order of excellence.
- viii. The coordinator shall visit capital cities of the states to meet and talk to stakeholders about the action and seek their assistance with regard to the nomination of individuals to act as facilitators in places where training will be carried out. Similarly stakeholders are expected to help with the nomination of male and female attendees for training in their own localities.
- ix. The coordinator shall meet facilitators in the capital of each state to sign contracts and to brief them with their role and the services they are expected to offer to the action.
- x. Trainers shall train attendees in their local areas according to the plan and

curriculum handed to them in the training of trainers program held at ATTS head office. Each trainer should prepare & submit written report to the coordinator of the action at end of each training session .The report must be documented with photographs and should include names & number of attendees together with highlights of achievements and shortcomings.

xi. Preparation and submission of the final report by the coordinator of the action.

### **7.1. Time frame**

Annex (2) provides detailed time frame for the implementation of the various components of the action. The action is expected to last for 18 months. Timings of some actions overlap especially at earlier stages. Although every effort will be made to implement activities as planned but exceptions could happen due to unforeseen factors. Friday is important day for Muslims and no training will be conducted on Fridays & also in official holidays. The action shall start and continue in the long dry season (between November and June) in the states of greater Dar Fur and greater Kordofan ;and between December and May in the remaining states in central ,eastern and northern Sudan.

### **7.2. Important milestones**

The activities of the action will last for 18 months. The most important milestones of the action will be realized gradually with the progress of time. The activity begins with the approval & deposition of the fund in the account of ATTS and terminates with the preparation and submission of the final report. Training of attendees is the most important milestone in the action and will take 12 months to accomplish. The sequence of accomplishing the important milestones of the action begins with reception of funds and ends up with preparation and submission of the final report as shown below:

1. Receive funds
2. Advertise , select & appoint staff
3. Receive pick up cars
4. Visit states , meet stakeholders - select facilitators, trainees & attendees
5. Receive imported biogas units
6. Train trainers in ATTS head office
7. Train attendees of Dar Fur states
8. Train attendees of Kordofan states
9. Train attendees of Central states
10. Train attendees of Eastern states
11. Train attendees of Northern states
12. Prepare and submit final report

### **8. Indicators for measuring results**

The attendees of training in this action are males and females living in families within rural areas. The resources, owned by each family, which can be utilized for biogas production, could be only dung (from livestock they keep), only crop residues from their own crop fields or both dung and crop residues (if they own both livestock and crop field). Both sources of organic

waste are collected from the field and burned at home to release energy for cooking food. These activities impact negatively on family health and sanitation at home. In addition collection of these organic wastes results into loss of time and efforts. As a result of attending this training course men and women in rural areas of Sudan will realize the great value of these organic wastes and consequently will pursue in future an entirely different and positive approach to manage and control these valuable resources.

### **9. Resource requirements/budget estimate**

Table (4) shows the various costs of the action .Travel is the most costly item. It is important to be able to reach attendee in the fixed times and also it is important to restrict travel to the dry season especially in Greater Dar fur and Greater Kordofan regions. .

**Table (4):Resource requirements and budget estimates in thousand US \$.**

Item	Unit	Units no.	Unit cost	Total
<b>A. Direct costs</b>				
Coordinator fee	Month	18	2000	36000
Consultant fee	Day	14	100	1400
Fee of 3 trainers	Month	18	1000	18000
Fee of 18 facilitators	Month	36	500	9000
Secretary fee	Month	18	300	5400
Accountant fee	Month	18	400	7200
Four workers fee	Month	18	200	3600
Storekeeper fee	Month	6	250	1500
20 trainers fee for five days	Day	5	200	1000
Technician fee	Day	10	20	200
Cost of biogas units	One	39	800	31200
Travel to training areas	One	30	1850	55500
Total direct costs				170000
<b>B. Indirect costs</b>				
Coordinator travel allowance/day	Day	50	50	2500
3 trainers travel allowance /day	Day	300	15	4500
Total indirect costs				7000
Total direct +indirect costs (A)				177000
Contingency (5% of A)				8850
Total (2)=A +contingency				185850
Office fees (7% of total 2)				13010
Total requested project budget				198860

## Annex 1.Contents of training program in domestic bio-gas technology & uses

<p><b>Title of training program: Training of rural Sudanese women and men in domestic biogas production &amp; utilization</b></p>
<p><b>Objective of the training program:</b> Households in rural areas of Sudan face strong pressure with regard to energy access for cooking because they rely on firewood but deforestation has made collection of firewood a difficult job. On the other hand, they are alternative abundant energy sources (e.g. crop residues &amp; livestock dung) that have not been tapped yet. The latter organic wastes could be utilized to produce energy (biogas) for cooking and the resultant by-product (bio-slurry) for improving fertility of home garden to grow vegetables. The objective of this training course is to raise awareness and build skills of rural women and men in the technology of bio-gas production from organic wastes and the utilization of the resultant products at home.</p>
<p>Contents of the training program:</p> <ul style="list-style-type: none"> <li>• Sources of energy used by rural populations for cooking at home : their relative costs and social ,economical , environmental and health impacts.</li> <li>• What is biogas? how and where is it formed -examples of biogas in nature- uses of biogas and bio-slurry -wastes used in biogas production</li> <li>• Introduction to technologies of bio-gas production ,storage and utilization</li> <li>• Home bio-digesters</li> <li>• Group questions &amp; discussion</li> <li>• Problems facing implementation of biogas technology in rural areas of Sudan.</li> <li>• How can beneficiaries pay the cost of bio-digesters?.</li> <li>• Use of bio-slurry to grow vegetables for family use.</li> <li>• Hand-on work training on the operation of portable domestic bio-gas plant.</li> <li>• Advantages of domestic biogas production</li> <li>• Technical operational , economical and social aspects .</li> </ul>
<p><b>Note: Biogas generations require 1-2 months. To demonstrate for trainees and attendees biogas release and use for cooking in class organic waste will be deposited in 3 bio-digesters 2 months before the beginning of training of trainers or attendees in rural areas.</b></p>
<p>Outcome of the training course:</p> <ul style="list-style-type: none"> <li>• Improve awareness of rural women and men with biogas uses and utilization.</li> <li>• Improve awareness of rural men and women with negative impacts of deforestation on the environment</li> </ul>

