

**REPORT ON THE INDIAN TECHNICAL ECONOMIC COOPERATION COURSE**  
**(3rd Course from September 2009 to March 2010)**

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## **1. EXECUTIVE SUMMARY**

**In the Third Course 21 illiterate rural mothers and grandmothers attended the course from the 3-3 ITEC & SCAAP Countries- 1.Niger, 2.Guinea Bissau and 3.Mauritania and 1.Kenya, 2.Ghana and 3.Cameroon. They have arrived safe back in their respective countries.**

**The 21 women came from 17 villages from 6 African Countries. Eventually by end 2010 they will have solar electrified their villages and directly benefited over 1000 families.**

**The Profiles of the 21 women Barefoot Solar Engineers are enclosed. (Appendix-I)**

**It is encouraging to Report to the ITEC Division of the Ministry of External Affairs that by the time the Fourth Course by September 2010 course will have concluded the Barefoot College will have received over 100 women trainees from the Least Developed Countries of the whole Continent of Africa.**

**An Evaluation Chart of how much they have benefited, technically, from the hands on approach on fabrication, installation, repair and maintenance of fixed solar units and solar lanterns is enclosed. (Appendix-II)**

**The Barefoot College has received grants from French, Dutch and US Foundations so that after the training carried out under ITEC it was possible to send Indian hardware(solar panels and batteries) to solar electrify the whole villages where the women came from in different countries. The women will first establish Rural Electronic Workshops in each village and then proceed to solar electrify every house in the villages.**

**A Global Agreement with GEF Small Grants Programme (SGP) monitored by the UNDP in several Least Developed Countries in Africa has enabled the Barefoot College to procure hardware like solar panels and deep cycle batteries manufactured in India to be installed in remote rural villages all over the continent of Africa.**

**Because the Indian solar equipment has been seen and received in these African countries as a “donation” this has generated enormous goodwill for India.**

**In order to ensure that the selection of the remote inaccessible villages in all these countries is genuine and the selection of the women to be sent to India is carried out in a transparent open process following a strict criteria, the Director of the Barefoot College has personally visited each one these Africa countries and been present at all the village meetings.**

## **2. SUPPORT FROM ITEC DIVISION**

**It is worth placing on record and commending the administrative and logistic support the Barefoot College has received from the ITEC Division in the following areas:-**

**i) Obtaining visas from different African Embassies and High Commissions:**

- ii) **Constantly clarifying to the Indian Missions abroad the details of this unusual training programme directly focused on illiterate rural women in Africa. As a result it has generated a great deal of interest in African Missions in New Delhi.**
- iii) **Facilitating the spreading of this demystified barefoot approach in national and international forums through the showing of films at meetings called by CII and ASSOCHAM**
- iv) **Approving candidates at very short notice for the course and being flexible in allowing more candidates to be accepted than the approved quota.**
- v) **Supporting the request officially to route the arrival of all women candidates from Africa through Addis Ababa to New Delhi thus drastically minimizing the real dangers of illiterate women candidates in Africa flying for the first time in their lives from getting lost in transit.**

**The Barefoot College believes this is cooperation and collaboration at its best and we wish to place this appreciation on record.**

**Changes requested from ITEC:**

- i) **Request ITEC to write letters to all the African Missions informing them that women have come from their countries to be trained as solar engineers and to visit them at least once in 6 months. In the 2nd Group in spite of sensitizing African Missions only officials from the Embassy of Djibouti managed to visit the Barefoot College.**

**3. FUTURE PLANS**

**PRESENT IMPACT**

**Demonstration Effect:**

**Going by the calculations after the Third Course costing Rs 32 lakhs the Barefoot College has managed to solar electrify 18 villages and 900 individual houses and establish 20 Rural Electronic Workshops to carry out instant repair and maintenance in 6 African countries at a total cost of Rs 50 lakhs . This has been possible with funds raised from Private Foundations.**

**Replicability**

**By the end of the 4th ITEC Course after having trained over 100 illiterate rural mothers and grandmothers from 25 African countries 8,000 houses in 85 villages will have been solar electrified with Indian Technology.**

**Millenium Development Goals**

**It has been calculated that it costs \$ 1.5 million in one year to solar electrify 17 villages in 6 Africa Countries including training under ITEC. This is LESS than what is spent on One Millenium Village by the UNDP over 5 years. There are 14 Millenium Villages in Africa.**

**FUTURE IMPACT-GLOBAL**

**It is hoped that once the entire Continent of Africa will have been covered it will be possible through the ITEC Programme to cover the whole of Latin and South America as well.**

**It will require 4 more ITEC Training Programmes covering the Financial Year 2010-2011 and 2011-2012 to complete the coverage of the Latin, South American and African Continents.**

#### **4. DETAILED REPORT:**

##### **a. Name of Course**

**Training Illiterate/semi-literate Rural Women on Solar Electrification and Rooftop Rain Water Harvesting.**

##### **b. Period**

**Third Course: 16<sup>th</sup> September'2009 to 15<sup>th</sup> March 2010**

##### **c. Number of Participants**

**21 women from 6 African Countries**

##### **d. Criteria of Villages/Women selected for the Course**

- 1) The villages must be small, inaccessible and away from the main roads.**
- 2) It must have an income generating activity (agriculture, animal husbandry, handicrafts, artisans)**
- 3) Each village should have between 35 to 40 individual houses. It does not matter if the roof is flat/sloping or made out of stone, thatch or Tin.**
- 4) The village must NOT have a TV set or a Diesel Generating Set providing light to the village.**
- 5) For lighting each family in the village should be purchasing candles, Torch batteries, kerosene or using wood for lighting.**
- 6) Each member of the village must agree in writing to pay for the use of the solar unit. They do not have to pay for the solar unit BUT for the repair and maintenance each month.**
- 7) The village must donate a building where a Rural Electronic Workshop (REW) will be established. Here all major and minor repair and maintenance will be carried out.**
- 8) They must agree to select a woman between 35 and 50 years old to be trained as a barefoot solar engineer. She should agree to go for training to India for 6 months.**

##### **e. CRITERIA FOR SELECTION WOMEN**

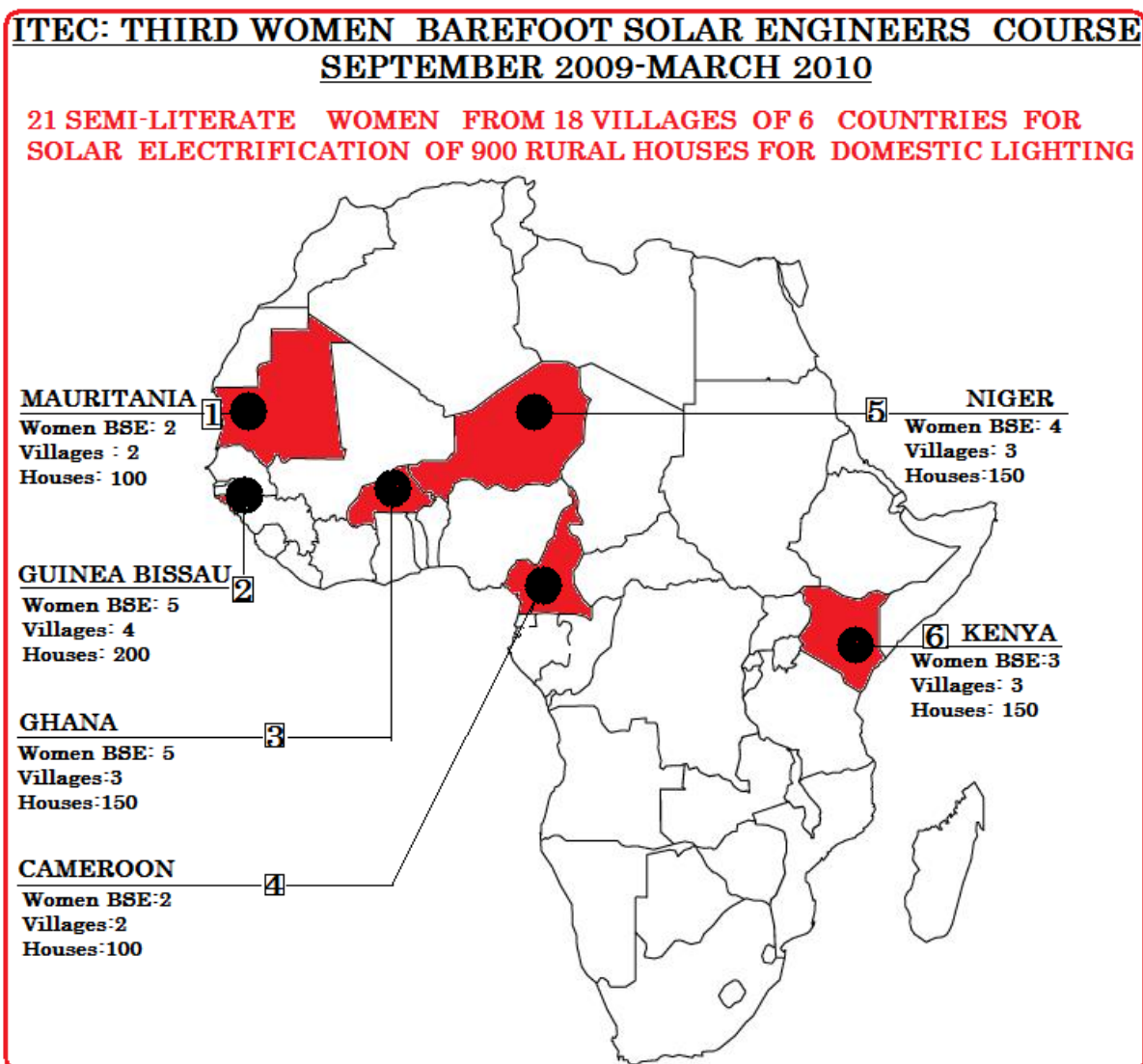
- 1) She must be between 35 to 50 years old.**
- 2) She must have been born in the village have roots in the village. Which means have a house, a husband(could also be a widow),children, land, animals, and NO plans to leave the village**
- 3) She must have studied but not more than 6 years of primary schooling.**
- 4) She must have some leadership qualities and be respected in the village.**
- 5) People recognize her as being strong and determined.**

## 5. BREAKDOWN OF SELECTION FROM DIFFERENT COUNTRIES

### ITEC/SCAAP Third Course (September'2009- March'2010)

|    | ITEC Countries | SCAAP Countries | Women BSE | No. Villages | of No. of Families |
|----|----------------|-----------------|-----------|--------------|--------------------|
| 1. | Niger          |                 | 4         | 3            | 200                |
| 2. | Guinea Bissau  |                 | 5         | 4            | 200                |
| 3. | Mauritania     |                 | 2         | 2            | 100                |
| 4. | 0              | Kenya           | 3         | 3            | 150                |
| 5. | 0              | Ghana           | 5         | 3            | 200                |
| 6. | 0              | Cameroon        | 2         | 2            | 150                |
|    | 3              | 3               | 21        | 17           | 1000               |

## 6. MAP SHOWING WHERE THE WOMEN CAME FROM



**7. VISITS OF BAREFOOT SOLAR ENGINEERS' TRAINING:**

**a) INDIA:**

**1. Shri Farooq Abdullah, the Minister of MNRE, Govt. of India on 8<sup>th</sup> March 2010**



**2. Ms. Dipali Khanna, Additional Secretary & FA, Ministry of Information and Broadcasting, Government of India on 9<sup>th</sup> November 2009.**



**b) MALAWI:**

**1. Mr. Alfred Vili, Counselor, High Commission of the Republic of Malawi**

**2. Mr. Roy Kachale Banda, Managing Director, Joyce Banda Foundation, Limbe Malawi on 5<sup>th</sup> February 2010**

**PROFILES OF 21 WOMEN BAREFOOT SOLAR ENGINEERS**

**a) 3-ITEC Countries – 1.Niger, 2. Guinea Bissau and 3. Mauritania**

**1. NIGER**

**Country:** Niger

**Region:** Tillabery

**District:** Say

**Villages:** 1. Moli Haoussa( 100) 2. Baniguetti (50)

**Total Houses:** 150

**Contact Person:** Naandi Mamane Tahir

**Organisation:** Contribution A La Gestion Des Zones Humides (COGEZOH)

**Place:** Niamey (Niger)

**Phone:** 00227 21 765249/ 96876708

**Email:** ong\_cogezoh@yahoo.fr

**Port:** Cotonou(Benin) West Africa



**(1) NAMATA RAMATOU** (35 years old divorced) of Tanda Village is primary school pass. Total Population of village is 60 households. She has 3 children and her main livelihood source is agriculture and goat rearing.  
Dialect spoken: Jagmasani



**(2) TONDI FATI** (46 Years) of Baniguetti village is illiterate. Total population of Baniguetti village is 50 households. Fati has 9 children. Main income source of her family is agriculture. She has a flock 40 goats.

Dialect Spoken : Phulanki



**(3) KONDJA AISSA** ( 41 Years ) of Baniguetti Moli Haoussa village is middle school pass. Total population of Baniguetti village is 100 households. Aissa has 7 children. Main occupation is domestic work , agriculture and goat rearing. She has 9 goats.

Dialect Spoken: Hausa



**(4) DAMBIRI ABOU** (46 Years) of Tonoga village is primary school pass. Total population of Tonoga village is 60 households. Abou has 5 children. Main occupation is agriculture and animals. She has 2 cows.

Dialect Spoken: Hausa

## 2. GUINEA BISSAU



**(5) AISSATO JAU (42 Years)** of Kambaju village is primary pass. Total Population of Kambaju village is 90 households. She has 4 children. Main occupation is agriculture and animals. She has 50 goats.

Dialect Spoken: Krione and Portuguese



**(6) ASSANATU BALDE (50 Years)** of Kambaju village is illiterate. Total Population of Kambaju village is 90 households. She has 9 children. Main occupation is agriculture.

Dialect Spoken: Krione and Portuguese



**(7) FATIMA SEIDI (41Years)** of Mambomkom Village is illiterate. Total Population of Mambomkom village is 65 households. She has 10 children. Main occupation is agriculture and animals. She has 2 goats.

Dialect Spoken: Krione



**(8) CADIJATO BALDE ( 39 Years)** of Sinchamboche Village is illiterate. Total Population of Sinchamboche village is 80 households. She has 7 children. Main occupation is agriculture and animals. She has 70 goats.

Dialect Spoken: PHULA



**(9) AUA MANE (58 Years)** of Sinchamboche Village is illiterate. Total Population of Sinchamboche village is 80 households. She has 12 children. Main occupation is agriculture.

Dialect Spoken: MOUNIKA

## 3. MAURITANIA



**(10) MINT SIDI MOHAMED (30 Years)** is illiterate coming from Kussen Village of Mauritania. Total population of Kussen Village is 120 Households. She has 4 children. Main occupation of the family is agriculture.

Dialect spoken : Arabic



**(11) HAINA MINT BABANA (34 Years)** is literate coming from the Kussen Village of Mint Sidi. Total population of Kussen Village is 120 Households. She has 4 children. Main occupation of the family is agriculture.

Dialect spoken : Arabic



## b) 3 SCAAP Countries- 1. Kenya, 2. Ghana and 3. Cameroon

### 5. KENYA

**Country:** Kenya

**Region:** East Africa

**District:** Suba

**Villages:** Gwasssi

1. Olando (296) : BSE- Phoebe Akinyi Belle And Joyce Adoyo Matunga

2. God Liech (162): BSE- Phoebe Awur Jondiko

**Total Houses:** 450

**Contact Person:** Manases Owade Nyanjom

**Organisation:** Green Forest Social Investment Trust (GFSIT)

**Place:** Magunga, Gwasssi Division Suba District

**Phone:** 00254 733870343/ 715042319

**Email:** manases.owade@subagreenforest.org

**Port:** Kenya Ports Authority- Mombasa Port



**(1) PHOEBE AKINTI BELE (46Years)** secondary school education comes from Olando village of Kenya. She has 7 children. Family owns agricultural land. Main Occupation is agricultural and domestic work. Total population of village is 150 households.

**Language spoken: Kiswahili and English**



**(2) JOYCE ADOYO MATUNGA (51 Years)** secondary school education comes from the same Olando village of Phoebe Akinti. She has 9 children. Family owns agricultural land. Main Occupation is agricultural, cows and domestic work. Total population of village is 150 households.

**Language spoken: Kiswahili and English**



**(3) PHOEBE AWOUR JONDIKO (42Years)** secondary school education comes from Godtech village of Kenya. She has 8 children. Family owns agricultural land. Main Occupation is agricultural and domestic work. Total population of village is 150 households.

**Language spoken: Kiswahili and English**

## 2. GHANA

**Country:** Ghana

**Region:** Upper West

**District:** Nadowli & Wa West

**Villages:**

1. Zukpiri (24) : BSE- Bonueje Nuzagla

2. Sirru (26): BSE- Effia Dakora

3. Mantar (25): BSE- Nierema

4. Gilang (22): BSE-Memunatur

5. Dupare(23): BSE- Salamatu

**Total Houses:** 70

**Contact Person:** Mohammed Nurdeen Ali

**Organisation:** Green Solar Energy Association

**Place:** Accra

**Phone:** 00233 24 3076729

**Email:** [zintangb@yahoo.co.uk](mailto:zintangb@yahoo.co.uk)

**Port:** Cotonou(Benin) West Africa



**(4) BONUBIA DIRA** ( 39 Years) of Zukpiri Village is illiterate. Total Population of Rupeer village is 24 households. She has 6 children. Main occupation is agriculture and animals. She has 2 goats.

Dialect Spoken: GLAN



**(5) MEMUNATA SADARI** (45 Years widow) of Gilang Village is illiterate. Total Population of Rupeer village is 22 households. She has 7 children. Main occupation is agriculture and animals. She has 2 goats.

Dialect Spoken: GLAN



**(6) VEINAKUBA KAABEU** (46 years widow) of Mantar Village is illiterate. Total Population of Meguwo village is 25 households. She has 5 children. Main occupation is agriculture and animals. She has 10 goats.

Dialect Spoken: DAGARE



**(7) SALAMATU OSMAN** (39 Years) of Dupare Village is illiterate. Total Population of Dupare village is 23 households. She has 9 children. Main occupation is agriculture and animals. She has 3 goats.

Dialect Spoken: DUPAR



**(9) AFIA KANZA** ( 50 Years) of Sirru Village is illiterate. Total Population of Wa village is 26 households. She has 9 children. Main occupation is agriculture and animals. She has 5 goats.

Dialect Spoken: KABE

### **3. CAMEROON:**



**(20) FRANSICA MOKI (44 Years)** is primary school pass coming from Munitegae village of Cameroon. Total population of Munitage village is 150 households. Fransica has 5 children. She has a small agricultural farm. Main occupation is domestic work and agriculture. Dialect spoken in her area is Engtian.



**(21) HELEN ETENG (39 Years)** is primary school pass woman coming from Munitegae village of Cameroon. Total population of Munitage village is 150 households. Helen has 4 children. She has a small agricultural farm. Main occupation is agriculture. Dialect spoken in her area is Engtian.

**TRAINING OBERVATIONS: ITEC THIRD COURSE (September'09 – March'10 )**

| Name of BSE / Country  |                                     | Learning and Communication | Identification and spotting of | Fabrication skill of circuits | Testing efficiency of circuits | Installation of solar units | Establishment REW & Maintenance of solar | Personal Performance | Overall Performance No. of circuits fabricated |
|------------------------|-------------------------------------|----------------------------|--------------------------------|-------------------------------|--------------------------------|-----------------------------|--|----------------------|--|
| <b>ITEC Countries</b>  |                                     |                            |                                |                               |                                |                             |  |                      |  |
| 1.                     | <b>Namata Ramatou Niger</b>         | Good                       | Fast                           | Good                          | Good                           | Independently               | Help needed                              | Support needed       | Very Good<br>160 circuits                      |
| 2.                     | <b>Tondi Fati Niger</b>             | Fast                       | Fast                           | Good                          | Good                           | Help needed                 | Help needed                              | Support needed       | Good<br>80 circuits                            |
| 3.                     | <b>Kondja Aissa Niger</b>           | Fast                       | Quick                          | Very Good                     | Very Good                      | Independently               | Independently                            | Fully confident      | Very good<br>110 Circuits                      |
| 4.                     | <b>Dambiri Abou Niger</b>           | Good                       | Fast                           | Good                          | Good                           | Help needed                 | Help needed                              | Support needed       | Good<br>115 circuits                           |
| 5.                     | <b>Aissato Jau Guinea Bissau</b>    | Fast                       | Fast                           | Very Good                     | Very Good                      | Independently               | Independently                            | Confident            | Very good<br>145 circuits                      |
| 6.                     | <b>Assanatu Balde Guinea Bissau</b> | Fast                       | Fast                           | Very Good                     | Very Good                      | Independently               | Independently                            | Confident            | Very good<br>160 circuits                      |
| 7.                     | <b>Fatima Seidi Guinea Bissau</b>   | Good                       | Fast                           | Good                          | Good                           | Help needed                 | Help needed                              | Confident            | Good<br>140 circuits                           |
| 8.                     | <b>Cadjato Balde Guinea Bissau</b>  | Quick                      | Quick                          | Very Good                     | Very Good                      | Independently               | Independently                            | Confident            | Very good<br>155 ciircuits                     |
| 9.                     | <b>Aua Mane Guinea Bissau</b>       | Quick                      | Quick                          | Very Good                     | Very Good                      | Independently               | Independently                            | Fully Confident      | Very good<br>160 circuits                      |
| 10.                    | <b>Mint Sidi Mohamed Mauritania</b> | Fast                       | Quick                          | Good                          | Good                           | Independently               | Independently                            | Fully Confident      | Very good<br>153 circuits                      |
| 11.                    | <b>Haina Mint Babana Mauritania</b> | Fast                       | Quick                          | Good                          | Good                           | Independently               | Help sought                              | Hesitation           | Very Good<br>145 circuits                      |
| <b>SCAAP Countries</b> |                                     |                            |                                |                               |                                |                             |  |                      |  |
| 1.                     | <b>Phoebe Akinti Bele Kenya</b>     | Good                       | Quick                          | Good                          | Good                           | Independently               | Help sought                              | Support needed       | Very good<br>160 circuits                      |
| 2.                     | <b>Joyce Adoyo Matunga, Kenya</b>   | Good                       | Quick                          | Good                          | Good                           | Independently               | Help sought                              | Support needed       | Very Good<br>165 circuits                      |
| 3.                     | <b>Phoebe Awour Jondiko, Kenya</b>  | Qick                       | Quick                          | Very Good                     | Very Good                      | Independently               | Independently                            | Fully confident      | Very good<br>145 circuits                      |
| 4.                     | <b>Bonubia Dira Ghana</b>           | Quick                      | Quick                          | Very Good                     | Very Good                      | Independently               | Independently                            | Confident            | Good<br>125 circuits                           |
| 5.                     | <b>Memunata Sadari Ghana</b>        | Fast                       | Quick                          | Very Good                     | Good                           | Independently               | Independently                            | Confident            | Good<br>115 circuits                           |
| 6.                     | <b>Veinakuba Kaabeu Ghana</b>       | Fast                       | Fast                           | Good                          | Good                           | Help needed                 | Help sought                              | Support needed       | Good<br>120 circuits                           |
| 7.                     | <b>Salamatu Osman Ghana</b>         | Quick                      | Quick                          | Very Good                     | Good                           | Independently               | Independently                            | Confident            | Good<br>115 circuits                           |
| 8.                     | <b>Afia Kanza Ghana</b>             | Fast                       | Fast                           | Good                          | Good                           | Help needed                 | Help sought                              | Hesitation           | Good<br>130 circuits                           |
| 9.                     | <b>Fransica Moki Cameroon</b>       | Fast                       | Fast                           | Good                          | Good                           | Help needed                 | Help sought                              | Support needed       | Very Good<br>153 circuits                      |
| 10.                    | <b>Helen Eteng Cameroon</b>         | Fast                       | Fast                           | Good                          | Good                           | Help needed                 | Help sought                              | Support needed       | Very Good<br>155 circuits                      |

**PROFORMA FOR ITEC/SCAAP COURSES:2008-09**

|   |   |
|---|---|
| <p><b>Name of the Institute:</b><br/>Barefoot College</p> <p><b>Full Address (with PIN CODE):</b><br/>Tilonia 305816<br/>Via- Madanganj<br/>District- Ajmer<br/>Rajasthan</p> <p><b>Telephone Numbers:</b> 01463 288210</p> <p><b>Fax Numbers:</b> 01463 288206</p> <p><b>Email:</b> barefootcollege@gmail.com</p> <p>Website: <a href="http://www.barefootcollege.org">www.barefootcollege.org</a></p> | <p><b>Head of the Institute:</b><br/>Name : Bunker Roy<br/>Tel. No. : 01463 288205/288212<br/>Fax: No. : 01463 288206<br/>Email : bunker_roy@yahoo.com</p> <hr/> <p><b>ITEC Course Coordinator:</b><br/>Name : Laxman Singh<br/>Tel. No. : +91 9414253025<br/>Fax: No. : +91 1463 288206<br/>Email : <a href="mailto:barefootcollege@gmail.com">barefootcollege@gmail.com</a><br/>Mobile No.: 09414007446/09414253025</p> |
| <p><b>24 hrs Emergency /After Office/Holidays Contact Nos.</b></p> <p>Name: : Bhagwat Nandan<br/>Tel. No. : 0091 1463 288211<br/>Mobile No. : 09414766993</p>   |   |

**Name and details of courses proposed along with duration and dates of the course**

| Sl. No | Name of the course   | Qualification required     | Duration (months) | Period      |             | Maximum number of seats | Minimum number of seat |
|--------|--|----------------------------|-------------------|-------------|-------------|-------------------------|------------------------|
|        |  |                            |                   | From        | To          |                         |                        |
| 1      | Training Illiterate/semi-literate Rural Women on Solar Electrification and Rooftop Rainwater Harvesting. | Illiterate/ Semi-literate  | 6 months          | 15/09/ 2008 | 14/03/ 2009 | 35                      | 34                     |
| 2.     | Training Illiterate /semi literate Rural Women on Solar Electrification and Roof Top Harvesting          | Illiterate / semi-literate | 6 months          | 15/03/ 2009 | 14/09/ 2009 | 35                      | 34                     |
| 3.     | Training Illiterate /semi literate Rural Women on Solar Electrification and Roof Top Harvesting          | Illiterate / semi-literate | 6 months          | 15/9/2009   | 14/03/2010  | 35                      | 21                     |

**Appendix-IV****INDIVIDUAL COURSE DETAILS**

|  |   |
|--|---|
| A. Name of the Institute   | <b>The Barefoot College Tilonia Rajasthan</b>   |
| B. Name/title of the Course  | <b>Training Illiterate/semi-literate Rural Women on Solar Electrification and Rooftop Rainwater Harvesting.</b> |
| C. Proposed Dates and Duration of the Course in weeks / months   | <b>Third Course: 16.9.2009 to 15.3.2010<br/>24 weeks / 6 months each course</b>                                 |
| D. Eligibility Criteria for Participants<br>1. Educational Qualification<br>2. Work Experience<br>3. Age Limit | <b>Illiterate or semiliterate rural poor women<br/>Mothers/grandmothers<br/>Age: + 40 years</b>                 |
| E. Aims & Objectives of the Course   | <b>Attached Appendix-I</b>  |
| F. Details of Content of the Course<br>(please attached detailed course profile)                               | <b>Attached Appendix-II</b>   |
| G. Mode of Evaluation of Performance of the ITEC Participant   | <b>To be decided in consultation with ITEC and Barefoot College</b>   |

**Appendix-V****FINANCIAL PROPOSAL**

|  |   |  |   |
|--|---|--|---|
| 1. Name of Institute   | <b>Barefoot College (Social Work and Research Centre)<br/>Tilonia Ajmer</b> |  |   |
| 2. Year of Empanelment of Institute under ITC/SCAAP  | <b>2008-2009</b>  |  |   |
| 3. Course Fee (where it is on 'per week basis' please also indicate the total Course Fee per person)   | At the time of empanelment<br><br><b>As approved by MEA</b>                 | Existing Fee with date of last revision<br><br><b>As approved by MEA</b> | Proposed Fee for 2009-10<br><br><b>As approved by MEA</b> |
| 4. Detailed Justifications for change in Course Fee  | <b>No change</b>  |  |   |
| 5. Charges from Indian / other Trainees for Same or Similar course   | <b>Similar</b>  |  |   |
| 7. Type of Accommodation<br>a) Campus/Hostel – Single/Double (please indicate)<br>b) Hired Accommodation _ Hotel/Guest House – Single/double (please indicate) | <b>Organisation's Campus sharing</b>  |  |   |
| 8. Accommodation Charges (per day / month per person)  | <b>Rs. 1000/head/month</b>  |  |   |

|   |  |                           |
|---|--|---------------------------|
| 9. Charges for Study Tour (if proposed)   | <b>Existing Rate and Effective Date</b>                      | <b>Proposed 2009-10</b>   |
|   | <b>As approved by MEA</b>                                    | <b>As approved by MEA</b> |
| 10. Detailed Justification for the change in Study Tour. <i>(Please give reasons and detailed break-up)</i>                   | <b>Not applicable</b>  |                           |
| 11. Details of Study Tour   | <b>Details</b>   | <b>Costs</b>              |
| (a) No. of Days<br>(b) Place(s) to visit<br>(c) Mode of Transport<br>(d) Accommodation charges, if overnight stay is involved | <b>One Week</b><br><b>Rajasthan/Agra/Delhi</b><br><b>Bus</b> | <b>As approved by MEA</b> |

**Supplementary Information:**

(a) Accommodation : Room size(s), facilities provided:

**(15 ft. x 9 ft.)**

(b) Food – Canteen or Own Cooking (with type of cuisine / menu):

**Common Mess/dining hall/ Solar cookers for cooking food and boiling drinking water**

(c) Facilities provided in the accommodation (Telephone/Internet/Refrigerator/Washing Machine, etc.):

**Telephone Booth/Internet/ Solar Water Heaters/Medical check up regularly**

(d) Recreation available in campus/with accommodation:

**Films/Puppet**

(e) Cleanliness/ Hygiene: Who supervises cleanliness? Is it up to the International Standard? Frequency or Cleaning / Inspection.:

**Daily cleaning of toilets/bathrooms/rooms/training hall. Self cleaning of plates/cups/glasses after using. The Barefoot Gandhian pattern of self service**

### **AIMS AND OBJECTIVES OF THE COURSE**

**a) AIMS:** Extreme poverty in rural areas is related to the lack of income opportunities. Productive use of electricity would help reduce poverty by providing alternative sources of livelihood. The power infrastructure comprises mainly three isolated power systems. Electricity networks are located around major urban centres. The remoteness of the rural locations and the topography of the country would make the expansion of electricity supply in these areas through a centralized grid system difficult, and may not be economically feasible. There is, therefore, an urgent need to explore renewable, sustainable alternative energy sources that can be maintained at a decentralized level and afforded by the poor.

1. Solar energy is considered the most important RE source. Consequently, there is a huge potential for solar energy development, not only solar water heaters for homes, hospitals and buildings, but also for generating electricity.
2. In the current international climate of awareness of global warming and other environmental detriment caused by imprudent energy use, the time is right to develop a cohesive program to extend RE to rural communities that have little or no prospect of grid electrification.
3. Solar energy technologies have been demonstrated successfully. There are, however, few examples where the provision of alternative energy has directly resulted in tangible and measurable improvement in the income of poor communities in any significant scale. Some of the apparent reasons for this are: (i) high initial costs of technology that is not affordable by the poor; (ii) limited number of locally relevant productive applications suitable for alternative energy; (iii) limited or no access of the poor communities to the supply markets; (iv) absence of efficient technology service providers and suitable projects in remote areas that could be bankable through financial institutions; and (v) lack of support from the central energy ministries, as their mandate is energy provision and not income generation for the poor. In view of this, it would be appropriate to develop innovative and decentralized approaches to poverty reduction through harnessing solar energy.
4. Such an innovative community-based approach has been successfully tried in India since 1986. Under this approach, a community-based nongovernment organization (NGO) called the barefoot college has demonstrated the effective application of solar energy particularly in the rural areas. This NGO has also pioneered the concept of barefoot solar engineers working as energy entrepreneurs in remote villages. This approach would involve community level capacity building in installation and maintenance of RE systems through a network of rural electricity workshops and trained barefoot engineers at the grass roots level. They provide community based expertise, and train poor villagers in assembling complete solar photovoltaic (PV) systems. Their products come with a 10 year service warranty. The work of this community-based NGO is funded by the United Nations Development Programme, the European Union and the Indian Government. The Indian experience has shown that community managed solar energy systems could be the only sustainable solution to solar electrification of the rural villages.
5. This successful barefoot approach experience in India could be replicated in rural areas around the world. However, for community managed systems to work and be effective, the specific roles and responsibilities of the stakeholders have to be clearly identified. Such a pilot project will demonstrate the role of non-conventional, RE as a vital means for poverty reduction and creation of sustainable livelihoods among low income communities in remote rural areas..
6. A pilot project would demonstrate how solar energy could be used to enhance the quality of life for low-income communities living in remote villages with no likelihood of grid electricity, and how a community-based approach could lead to the success of such programs. Sustainable human development will be achieved by building local capacities within the community to set up, operate, repair and maintain solar PV generating systems to meet local needs. Solar energy not only provides an appropriate solution for heating, cooking and lighting in rural areas, but also contributes significantly to progress in education, health, agriculture, rural industry and other income-generation activities that would result in poverty reduction. The opportunity for lighting provided by solar energy can be used to run literacy and other courses in the evening that would benefit children and adults working in the fields during the day. Solar powered pumps could provide irrigation for agricultural production. This is important for increasing incomes as well as food security for vulnerable families.
7. Solar energy programs will also promote the empowerment of women by training illiterate and semi-literate women to become barefoot technicians who could install, operate, maintain and repair solar energy systems, and by freeing them from walking long distances to collect fuelwood and reduced health hazards associated with indoor burning of firewood. The use of solar energy will also be instrumental in reducing environmental pollution and degradation by reducing the use of fuelwood, diesel and coal. Community based ownership and management of the solar energy systems will ensure full participation of local people in all aspects of decision making including design and implementation. In particular, disabled persons who are generally marginalized could be associated with the initiative.

### **b) OBJECTIVES:**

1. To implement the 'barefoot' approach of demystifying and decentralising solar technology down to the rural communities
2. To form Village Committees to implement the entire solar lighting project through women Barefoot Solar Engineers ( BSEs) in their village.



3. To organise village meetings to collectively identify semi-literate women from the non-electrified villages and send them for 6 months training to India
4. To train semi-literate rural women to fabricate, install and maintain the solar lighting systems in their village. They will be trained in the installation of solar lighting systems in remote, small, inaccessible, tribal, disturbed villages in their country.
5. To organise the community to sustain the project through collecting monthly users' contribution and barefoot solar engineers( BSEs
6. To put the fabrication, installation, repair and maintenance of solar technology in the management, supervision and control of rural communities

## **Appendix-VII**

### **TRAINING CURRICULUM:**

A six month Solar Energy Curriculum of solar electrification of poor remote households for Domestic Lighting in remote inaccessible rural areas.

The trainees and trainers are being self taught each other at the Barefoot College. The following a six month solar electrification practical syllabus is to be learned by the rural semiliterate women in the World:

**1st Month:** Introduction of Solar Panel (SPV) lighting system, solar electronic workshop tools and equipment.

General concept of SPV Panel- generates electricity for lighting when it is exposed to sun light and maintenance of the battery is a essential component of Solar Unit to accumulate solar power for lighting in the night.

Proper Connections of SPV to Battery and electronic charge controllers. (Parallel & Series)

Knowledge of Printed Circuit Boards (PCB) for lamp inverter to change Direct Current (DC to Alternate Current ( AC) for CFL tubes and charge controller for controlling under and above current supply to battery and lighting units.

Fabrication of the lamp Inverter Name and function of the various components of the lamp

Winding transformer coil, fixing electronic components on the inverter PCB, solder pcb connection and its efficiency testing of required flow of current in the circuit for blowing CFL tube.

Setting-up of a Solar Power Supply Unit of 300 W for Rural Electronic Workshop and its general regular repair and maintenance..

Functioning and use of the Multimeter and Circuit Testing Unit

Familiarization with the maintenance of the Solar Power Plant- cleaning the solar panels and battery, measuring gravity of the battery.

### **2nd Month:**

Training on the Solar Lantern-

Knowledge of the components in the Solar Lantern

Understanding of the Colour coding scheme for finding resistance Circuit in the Solar Lantern

Testing the circuit in the Solar Lamp and the Solar Lantern

Repair and maintenance of the Solar Lantern in the field

The trainees fabricated a total of 100 circuits for the solar lanterns

### **3rd Month:**

Training on Solar Fixed Unit-

Panel, Battery, Lamp

Understanding of Volts and Ampere and how to measure it

Recap of how to put panels in parallel and series connection

The trainees fabricated a total of 100 circuits for the solar lanterns

### **4th Month :**

Fabrication of the circuit for the Solar Lantern

Familiarization with the fault-finding process of the Solar Lantern

Charging of the battery

The trainees fabricated a total of 50 circuits for the solar lanterns

### **5th Month:**

Fabrication of Charge Controller of 12V 8Ampere

Assembling and testing the Charge Controller

Familiarization with the fault-finding process of the Charge Controller

### **6th Month:**

Practical installation of the solar panels and connections to the battery

Practical training in connecting charge controllers and invertors

How to establish a Rural Electronic Workshop(REW)

Note: **No CERTIFICATE will be issued to the trained BSE.**