

## VOLUNTEER SERVICE GRANT # 61804

### CITIES OF TORREON - OAXACA

#### ROTARY CLUBS OF FRESNO AND TORREON CENTENARIO

**EXECUTIVE SUMMARY** Torreon's workshop of building rocket stoves (Integrated Cooking method) began with 25 students - the venue being Instituto Tecnologico de Torreón, a college that offers Bachelor degrees in Agronomy, Computer Science, and Administration located in the state of Coahuila where poor families without fathers live. The local market in Torreon was first visited, and 5 gallon used metal buckets were bought to frame the outside structure of the future portable rocket stoves. An Institutional 55 gallon rocket stove for large pots was made by using tiles cut and wired together for the combustion-chimney chamber. Insulation for this rocket stove uses a mixture of 5 volumes of sawdust, 1 volume cement, and 3 volumes of Bentonite clay collected from the marketplace. Inexpensive one inch tile brick were bought for combustion and chimney chambers- measuring, cutting, and wiring final bricks for the chambers. . A simple monolithic lightweight adobe rocket stove using 50 % organic matter (sawdust) with 50% clay-cement is least costly except for a danger of developing cracks in the combustion chamber. Students quickly adapted to the use of saws, cement instruments, and pliers. All rocket stoves built by students and class instructors were lit and functioned well- students cooking stews, vegetables, beans, rice, potatoes, meats, and Tortillas were baked on a comal which is a flat steel plate laying directly over the combustion chamber of the rocket stove. Integrated Cooking methods and water pasteurization using the wapi will be added to the course studies by the Rotary Club of Torreon Centenario. As part of their course the students are required to complete social services in their communities- this class chose the introduction of fuel efficient stoves in the rural communities.

The last function of the class was to assess the instructors, material learned, and the workshop in general. Here were student's answers

- ✓ Teaching a community introduces new concepts of uniting for a cleaner environment and protects natural resources
- ✓ Class was a good mix of theory and hands-on learning with many benefits of saving time and household costs.
- ✓ This kind of workshop promotes sustainable development and unites communities because human activities impacts the environment
- ✓ :Benefits new communities which lack wood, and solar energy is free
- ✓ Materials to build rocket stoves and solar cookers are plentiful, cheap, and locally available- thus protecting the natural resources
- ✓ Technology is easy to learn and employs the unemployed
- ✓ Class was a good mix of theory and practical teaching with hands-on learning

## **DIF- A FEDERAL FAMILY DEVELOPMENT AGENCY- OAXACA WORKSHOP**

DR BRICIA CRUZ MATUS- ROTARY CLUB MEMBER CO HOST

**EXECUTIVE SUMMARY** The State of Oaxaca suffers from a local government wage crisis where millions of dollars have been lost, and those who are poor have swelled in numbers in spite of it being the most colorful and historically welcomed State in Mexico. Grants helping marginal communities and working directly with indigenous communities through technical assistance is helping. The workshop with employees from DIF was an excellent display of learning the Integrated Cooking methods from the Rotary Clubs of Torreon Centenario and Salina Cruz. The appearance of the Governor's wife at 1 PM, seeing and tasting an array of foods cooked from solar energy and rocket stoves using twigs surprised her, and convinced everyone that she, the Governor, Rotary Clubs of Oaxaca and Fresno, DIF would fully support a program of assisting poor families without fathers or husbands in rural communities of Oaxaca State lacking firewood and clean water (water pasteurization using the WAPI). A Rotary Matching Grant application is being prepared for acceptance by Rotary International- we shall return to commence the Matching Grant program and observe which material, stoves, and cooking methods were accepted by their communities.

**Fuel efficient stoves** (rocket stoves) were introduced by Dr. Larry Winiarski because wood is scarce and local stoves are wasteful in energy use, and gross air polluters. Dry, light weight bricks awaited Larry's arrival at DIF in Oaxaca- so he quickly assembled those bricks into a rocket stove, and proved it effective by cooking local dishes. To complete instructions on making rocket stoves with other materials from the local market square 5 gallon metal tins, various sizes of rustic clay roofing tiles and flat thin brick pieces were purchased- class was shown several ways of combining such materials into rocket stoves. Carbide hand saws were presented to staff for cutting and trimming tiles and bricks into combustion chambers and chimneys.

An outstanding display of comparative **solar cookers** was displayed at DIF. **The Cookit** is manufactured locally from cardboard, aluminum foil, and cooks with a black pot enclosed in a heat resistant plastic bag, portable, and economical. **The HotPot cooks** with a ceramic glass pot with black metal enclosure and aluminum reflector, and manufactured in Mexico. The **Ulog insulated box cooker** cooks several pots of food simultaneously- good in windy areas. **MasterTrainers** for solar cooking were Rotary members from the Rotary Club of Torreon Centenario with much experience having taught students and adults in schools and communities.

**Heat Retained Cookers** (Haybaskets, Thermos) are a vital part of Integrated Cooking Methods. Various names describe them because of how they are built. A wicker basket or cardboard box may be the container while the contents may be straw, crushed newspaper, acrylic cloth, and dry grass, pillows filled with string or cloth. At our workshop beans were cooked for 30 minutes, and completed cooking 4 hrs later in a haybasket. We had two examples of heat retained cookers- one cardboard box filled with three pillows filled

with crushed newspaper while the other was a wicker basket filled simply with dry grass. Families save 60% wood and time by such devices- a very effective thermos for hot or cold foods and drinks. Master Trainers were spouses of Rotary Members from Rotary Club of Salina Cruz with several years experience teaching in schools, communities, and Rotary Clubs.

Participants (employees) in the 5 day workshop at DIF received their evaluations by transporting the class to church grounds in a community called Guadalupe fifteen miles from Oaxaca. The workshop class had the responsibility of cooking food by solar energy and rocket stoves. Local people, the Major, and secondary students from a local school were to arrive at 1PM for the taste test. Solar cookers with the sun's energy and rocket stoves using twigs provided the source of fuelwood for cooking all foods- Chicken, beef, vegetables, potatoes, pastel, corn, rice, and beans. Hot pots (a solar cooker) were especially unique at baking breads and cakes as shown by one table at lunch time where we featured various desserts here on church grounds. A Ulog insulated box solar cooker was brought to demonstrate a third type of solar cooker which is excellent in windy weather, cooks several pots of food, and is an excellent retainer of heat- stores hot or cold foods since it is insulated with 8 lbs of wool.

**SUMMARY** The Rotary Club of Torreon Centennial after teaching in neighborhoods, churches, primary and secondary schools, and communities decided to add teaching at a technical college and establish an on going college course for solar cooking, rocket stoves, haybaskets, and water pasteurization.

The Adobe brick formulation for quick construction of rocket stoves:  
 Half organic- examples are sawdust, coffee husks, rice husks, manure  
 Half Clay- cement mixed with clay-soil. One must thoroughly mix the mass. Pumice is a great insulator for rocket stoves since it's readily available in Mexico.

**CooKits** are economical, portable, easy to make, teach, and repair. Cost \$ 5.00. Black pot and plastic cooking bag extra.

**HotPots** are effective cookers, resistant to wind, good-looking, and \$ 73.00.

**Ulog cooker** is a good effective insulated box cooker costing \$ 80.00.

Wapis were tested- wax melted at a higher temperature because of 5,000ft elevation.

**Rocket stoves cost:** \$ 10.00 parts are found in market. Subsidies by the government may be in order for the poor- a form of social peace through Technical Assistance can happen with Rotary Matching Grants. Dr. Bricia Cruz today, 11/18/07, says DIF, our Federal Host in Mexico, has already performed 3 three workshops teaching the Integrated Cooking Methods in the rural suburbs of Oaxaca

**Volunteer Service Grant # 61804 provided transport for Wilfred and Marie Pimentel, and Lorna Milligan to Mexico- Rotary members assisted in teaching**

PHOTOS TAKEN AT TECHNICAL COLLEGE-TORREON AND DIF IN OAXACA



**Rocket stove chimney.**



**Cutting and binding tiles.**



**Using wire to bind tiles.**



**Completing combustion chamber.**



**Metal snips used to cut wind skirt.**



**Pumice used to insulate rocket stove.**



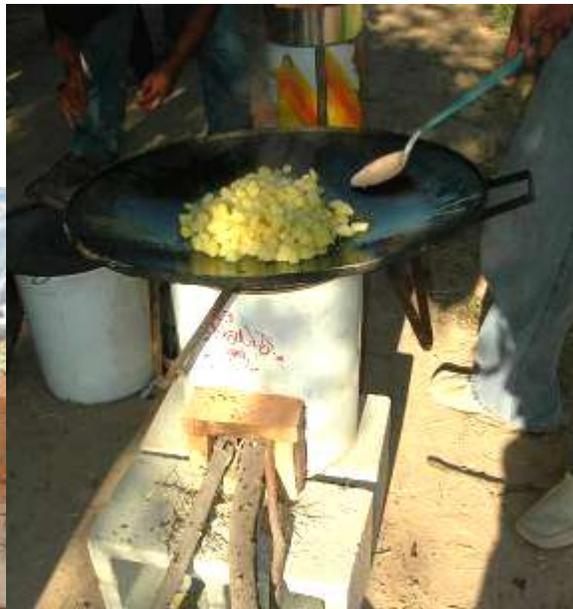
**Adding pumice for insulation.**



**Completed rocket stove with wind skirt.**



Firing new rocket stove.



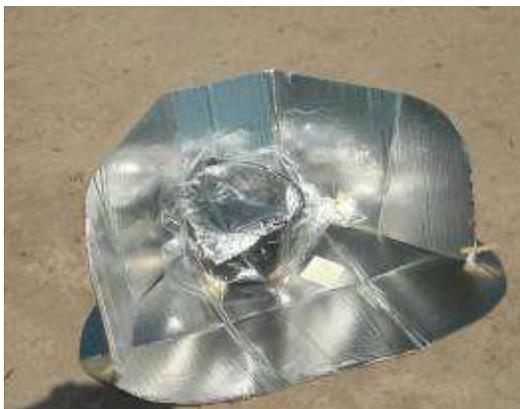
Cooking on rocket stove using a comal.



Monolithic adobe stove.



NGO sponsoring integrated cooking workshop.



Solar CookKit



HotPot Solar cooker.



**Ulog solar cooker.**



**WAPI Pasteurization indicator**



**Hard boiled eggs from colored plastic.**



**Solar cooked meal.**



**Hay basket (straw exposed)**



**Hay basket (straw bagged)**



**Insulating a heat-retained cooker with newspaper.**



**Solar cooking instructors.**



**Torreon integrated cooking class.**



Governor's wife congratulating graduates.



Larry Winiarski insulating a rocket stove with adobe, sawdust, and cement.