

Filters for Families

2007 in Review

VOLUME 4, ISSUE 1

JUNE 24 2008

INSIDE THIS ISSUE:

Letter from Director	1
Hello & Goodbye	2
Workshops	2
Volunteers	3
Trip to Bangladesh	3
Field Experience Stu-	4
Research Topics	4
SONO FILTER	5
Three Year Goals	5
Contact Information	5
Notes on Famine	6

Letter from the Director

Nepal is a country of festivals and mostly agricultural livelihoods that are tied to a seasonal clock. The paddy (rice) planting festival, held for centuries in early June, has always marked the onset of the monsoon. Although the festival date remains the same, the monsoon arrives closer and closer to mid July each year. This delay in precipitation for young rice plant shoots often produces a smaller harvest in October. A reduced crop yield is a disaster for most Terai villagers who rely on the fall harvest to provide the majority of their annual income. When the arrival of the monsoon rains came very late in 2007, farmers worried the harvest would be small. Although two months late, the December harvest has been plentiful.

In mid December we drove to Haku, a village in Nawalparasi, the roads were full of local farmers carrying burlap sacks full of paddy (rice) to the wholesale market. These bursting sacks are transported along dirt roads and trails by men, women and children who work in the fields. Some-times the sacks are carried on their backs, other times they are tied to handlebars and seats of bicycles, or piled on ox carts, rickshaws, or tractors. Once the grain arrives at the dealers, they are measured on huge scales, then the

dealer provides money to each farmer.

Thankfully, this year through their diligent efforts during monsoon rains, floods, strikes, droughts, and dry season harvesting their



Above: Mustard plants ready for harvest. Top right: sacks of rice waiting to be weighted.

Bottom right: woman carrying straw.

efforts are rewarded

FFF maintenance teams spend five days a week in the villages mending broken filters and teaching villagers how to clean filters. The monthly maintenance records help us identify villages where there is a problem with using filters, filter breakage, and keep us connected to the communities.

Weekly sanitation, nutrition, and hygiene workshops began in December in three villages. Shes Narayan, a Certified Medical Assistant with the help of a local Female Health Volunteer from each village, leads the workshops.

This year our volunteer program hosted seven short-time international students who contributed their special skills to the communities. Their activities ranged from First Aid Workshops to Female Health Volunteers, Nutrition and Sanitation programs for local schools and village women to writing a Manual for Health Sur-

veys and data analysis, fund raising for FFF and conducted projects in the villages.

The Arsenic Research Team (ART) continues to expand with more partners: FFF, Nepali professors and students, and USA professors students. The Parasi field office is the base for our field work in social science, microbiology, nutrition, geochemistry and hydrogeology.

In February '07 the Civil Forum Nepal presented Dr. Smith with a second award, a Token of Love, for FFF's dedicated work with Terai communities.



FFF is partnering with MSUK from Bangladesh, the group who designed and implemented an arsenic removal filter called the SONO filter. This amazing filter will remove pathogens, 23 metals, and has a life time of at least 11.5 years. In 2008 we will construct the SONO filters in our Field Office.

We've seen big changes in our communities this year. As villagers reap the harvest of good health through arsenic free water and better nutrition, they're realizing the need to improve their living conditions in other ways, such as better sanitation habits including installing toilets. As food prices rise maintaining better diets is difficult, we hope the kitchen gardens will provide more food at lower cost.

A heartfelt thanks to all of you for supporting Filters for Families.

Linda



FFF is
Alleviating Poverty
and fostering
Community Development
through
Safe Water Programs
Health, Sanitation, &
Nutrition Workshops
and Literacy Programs



Rajan performing his role as the Iron Scrap dealer who gives bananas for filter nails in a Nadawa Village Work-



Linda talking to the real Indian Iron Scrap Dealer after a workshop.

Goodbyes and Hellos

Tai Chyi Shei



Co-Founder and Treasurer of FFF, Tai Chyi Shei and Hope completed their doctorates in Hydrogeology and Music in August 07. The Shei family moved to Canada to begin their new professional careers. Tai Chyi was our financial master mind and provided encouraging emails and thoughtful suggestions. Although he's in Canada we look forward to his continued commitment to FFF.

Shashilla Neku, our Kathmandu Office Manager



her husband in Dallas at the University of Texas at Dallas. We will miss her smile and excellent managing skills.

Suman Singh



is pursuing further study. She managed our Field Office and conducted many other duties. Her thoughtfulness will be appreciated in her new pursuits.

Sunil Dhakal



Worked with us part time while finishing his BS in Business. In Sept. 07 he became the Kathmandu Office Manager.

We welcome **Wayne Hamit and Valerie Anderson** of Mountain Movers International. They're the



new "keepers" of our USA accounting matters. A big welcome to both of you, we look forward to a long relationship with them. **Sushil Tuladhar** joined FFF in March as a part time Lab Techni-



cian and part time Office Assistant. His BS is from the Dept. of Environmental Science at Kathmandu University. He is also enrolled in a MS program in Environmental Management.

Shes Narayan is a Certified Medical Assistant, he will be with FFF leading the Health and Sanita-



Workshops

Arsenic and Sanitation workshops, filter trainings, nutrition modules, and school dramas are our main tools to bring arsenic awareness and new health practices to villagers. FFF continues to expand the type of workshops given to communities. This year we started weekly sanitation and nutrition workshops in three villages. Nine NGO's, CBO's, and clubs were trained to make filters this year.

Training a local NGO, SRDC to make filters and conduct maintenance.



Meeting with community leaders from Kunwar and members of the Parasi Women's Club NMS.



ABF filter training to women's group in Pachgaon



Pratapour School workshop participants

Rajan, FFF Field Coordinator teaching in Banakatti village, Sunwal.



Amar teaching the new batch of Students Partnership Worldwide (SPW) volunteers about arsenic.



Volunteers

This year FFF hosted seven international volunteers from five countries: Burma, Canada, Japan, UK and the USA.

Kyle from Canada is a Fire Jumper who developed and presented a workshop on First Aid to our Staff and 16 Female Health Volunteers.



In March, three ladies from The Woman's College, University of Denver, **Jessica, Robyn and**

Sarah visited for two weeks, conducting projects in teaching English, exploring the topic of IT in a developing country, and a short documentary on their experience in Nepal. Check out their interview on the DU website <http://www.du.edu/features/stories/nepal.html>



Ben, a nutrition student from Leeds Uni-

versity UK, joined us for a second year. Together with **Roman**, a third time volunteer, and **Shes Narayan** they conducted nutrition workshops and health assessments of children in several of our villages. They also taught the Female Health Volunteers several Nutrition Modules.

Anna is a graduate student attending the GSIS program at DU. She was a great help in our Kathmandu office analyzing data, developing a Health Survey Manual, and collecting health papers.



If you desire a life-changing experience, join FFF as a short-term volunteer. Please contact us at least 3 months prior to your trip.

A Trip to Bangladesh: Water Everywhere



AGNI pond reservoir

David explaining the Chulli

Village Chulli setup

Small dug wells

Director Linda journeyed to Bangladesh in May 07 to investigate several Bangladesh solutions to the arsenic problem. David Nunley, from Wagtech, arranged visits to their Research and Training center, on-site visits to implementation villages, and introduced FFF to the Wagtech Arsenic Test Kit. They are experimenting with low cost arsenic mitigation solutions such as pond water, rainwater harvesting, chulli filter (see article on FFF website), cooked sand filters, small community dug wells, and school rainwater harvesting projects. Their project sites are in Sylhet Division located in far NW Bangladesh.

Unlike Nepal, Bangladesh has abundant surface water year around. Their river, wetland, and flood waters are highly contaminated with bacteria but little to no arsenic. Thus the chulli is an excellent option for surface water and dug well water purification. We plan to work with AGNI to develop some of these technologies in villages without arsenic contamination in Nepal. The Chulli is frequently used in Bangladesh to provide clean water during floods since the aluminum coil is easily transferred to a metal drum.

The trip also included a drive to Kushtia, South Central Bangladesh, to visit the developers of the SONO Filter. The SONO filter won the American National Academy of Engineering's Grainger Challenge (2006) for the best arsenic and bacterial removal household filter. The filter is built in a local factory and transported to villages all over Bangladesh. The filter was designed and implemented by Dr. Munir, a Bengali medical doctor and his brother Dr. Hussam, an American Professor at George Mason University. More about the SONO on page five.



Research: Spotlight on Student's First Field Visit



University under supervision of Mrs. Sangita Shakya (K U) and co- supervision of Dr. Linda Smith.

Also, I am associated with Filters for Families for my MS research work on "Biological Monitoring of Arsenic Toxicity among the Pregnant Women Population in Ramgram Municipality of Nawalparasi District, Nepal". During my field visit to Ramgram Municipality, I found people cooperative and willing to give feedback to my survey questions and willing to give hair samples.. The research site is mainly a Bhojpuri community. The villages that I surveyed have arsenic levels more than the national standard of 50 ppb, but many people did not have the symptoms of Arsenicosis. I only surveyed pregnant women exposed to arsenic. During my survey, I encountered one interesting event. I met with one woman at Baikunthapur village who is seven months pregnant. Her name is Nummi Kurmi and she is residing in the village for more than seven years. She has three daughters and is now pregnant for the fourth time. The main problem is that

she is not getting proper nutrition. First when I asked her questions she was not willing to give proper answer. But later as we continued to talk she suddenly told me that she is not well because of dizziness and she is not getting enough food to eat. I asked the reason for not getting enough food and she replied that her mother-in-law is very strict. She says that if pregnant women take more food, then the baby will get fat and it would be a difficult delivery. Also, her mother in law makes her work more on household activities so that she will loose more of her weight. She personally told me to write a letter to her mother-in-law. I was really confused to write a letter because I am not a health professional just a student. So, I wrote a letter addressed to the Female Health Volunteer in the village about her health problem. I suggested that Munni's family give her better nutrition for the health of mother as well as the baby.

I shared the incident with Dr. Linda Smith and she suggested to give her Vitamins. So, FFF and I bought Vitamins for her. When I visited her home several days later, she was very excited and she told that she is getting enough food now to eat. She gave the letter to her mother-in-law and as she read it she was conscious about the health. So, from next day her mother-in-law bought green vegetables, meat and milk. She was very thankful to me.

This experience made me realized the social status of women in that community. As she had

already three daughters, her family was not concerned because they were sure she would deliver a baby girl again. If she had delivered a baby boy before she would have been given good care..

Lastly, I would like to give my sincere gratitude to Dr. Linda Smith for her suggestions and the opportunity to carry out the study.

Thank you, Junu



Arsenic Research Team Topics

Arsenic Mobilization by Indigenous Arsenic Tolerant Microbes

Future Microbial Arsenic Removal System

Plasma Isolation of Arsenic Tolerant Microbes

Pathogen and arsenic removal performance of the Kanchan Filter

Sponsor: International Foundation of Science (IFS), Dr. Anjana Singh Head Microbiology Dept. Tribhuvan University

Dr. Linda Smith Director FFF

S.K. Shrestha, MS student at TU

N. Maden, MS student at TU

Biological Toxicity on Pregnant Women from High Arsenic Areas, Nawalpar

Sponsor: World Health Organization (WHO) Junu Shrestha, MS student,

Dept. of Environmental Science and Engineering, Kathmandu University

Dr. Linda Smith, Director FFF

Socio-economic Impact of Arsenic on Ramgram MC, Nawalparasi

Dhykshi Devkota, MS, Tribhuvan University

Hydrological Controls and Geochemistry of Arsenic Aquifers in Nawalparasi

Sponsors: Geological Society of America, Water Aid, UNICEF, WHO, FFF, Amar Neku, PhD, Candidate UT at Dallas

Dr. Tom Brikowski, University of Texas at Dallas

Dr. Linda Smith, Director FFF

An Ecological Approach to Understanding Arsenic Contamination in Nepal

Sponsor: UNDP GEF SGP

Dr Linda Smith, Director FFF

SONO Filter Comes to Nepal



These photos were taken during the SONO installation in Kunwar. Seema is examining the new filter in her home. After one week Seema was so excited



about the good taste of the filter water's taste and the families improved health, and the great taste of the filter water and her

families improved health, she asked her mother to buy a scarf to cover the top of the filter. This is a common way of giving honor in Nepal. This must be the first "honored" filter in Nepal.

To bring new technology into Nepal there is an approval

In November Dr. Munir came to Nepal with two SONO filters. It was a rough journey for the filters, curious custom officers turned the inside of the filters completely upside down and crosswise. After two days of re-assembling the filters, we drove to FFF's field location in Nawalparasi District, a long 7 hour drive from Kathmandu.

The filter was installed in Kunwar where the tube-well water contains 876 ppb arsenic and 10 times the WHO guideline for lead.

System from the National Arsenic Steering Committee (NASC). The first step toward this goal is to give a presentation to the NASC Technology Task Force and other INGO's in Nepal. After this



Dr. Smith gave a talk to the entire NASC group, discussing the maintenance records of the ABF (Kanchan Filter) and the poor arsenic removal after a year in the high arsenic villages. She then presented the specifications of the SONO, the test results from the Grainger Challenge which included extensive geochemical tests, and the implementation and maintenance history over the last six years. All these data supported the superior performance of the SONO over the Kanchan Filter. The group decided to support a pilot study in Nepal of 1200 filters, the program is sponsored by FFF, UNICEF and the Dept. of Water and Sewage, Nepal.

Three Year Goals

FFF's first target is to have the worse arsenic contaminated district completely arsenic free in two years. This is Nawalparasi district. An estimated 3,600 households, and 150 schools, hospitals, and health posts across the district **are still in need of arsenic free water**. These households will receive the SONO filter. All households and VDC's with lead and arsenic in Rautahat District will have safe water.

Our second target is to provide workshops and monthly programs in sanitation, health, and nutrition to our partner villages in Nawalparasi.

The third target is to assist pregnant women in these villages with vitamins, and nutrition and parenting training.

Please join us in alleviating poverty through safe drinking water, hygiene, sanitation, nutrition, and literacy.

Nawalparasi District Including Schools Completely Arsenic & Lead Free using the SONO Filter

Rautahat District all VDC's with lead and arsenic have safe water

Sanitation, Hygiene, & Nutrition Workshops in all FFF villages

Pregnant women in all FFF villages in Nawalparasi & Kapilvastu receive nutrition, health, and parenting training



KUNGL.
VETENSKAPSAKADEMIEN
THE ROYAL SWEDISH ACADEMY OF SCIENCES

Excerpt taken from the press release announcing Amartya Sen's Nobel Prize in Economic Sciences. The entire article is available at http://nobelprize.org/nobel_prizes/economics/laureates/1998/press.html

Welfare of the Poorest

In his very first articles Sen analyzed the choice of production technology in developing countries. Indeed, almost all of Sen's works deal with development economics, as they are often devoted to the welfare of the poorest people in society. He has also studied actual famines, in a way quite in line with his theoretical approach to welfare measurement.

Analysis of famine

Sen's best-known work in this area is his book from 1981: *Poverty and Famines: An Essay on Entitlement and Deprivation*. Here, he challenges the common view that a shortage of food is the most important (sometimes the only) explanation for famine. On the basis of a careful study of a number of such catastrophes in India, Bangladesh, and Saharan countries, from the 1940s onwards, he found other explanatory factors. He argues that several observed phenomena cannot in fact be explained by a shortage of food alone, e.g. that famines have occurred even when the supply of food was not significantly lower than during previous years (without famines), or that famine stricken areas have sometimes exported food.

Sen shows that a **profound understanding of famine requires a thorough analysis of how various social and economic factors influence different groups in society and determine their actual opportunities**. For example, part of his explanation for the Bangladesh famine of 1974 is that flooding throughout the country that year significantly raised food prices, while work opportunities for agricultural workers declined drastically as one of the crops could not be harvested. Due to these factors, the real incomes of agricultural workers declined so much that this group was disproportionately stricken by starvation.

Later works by Sen (summarized in a book from 1989 with Jean Drèze) discuss - in a similar spirit - how to prevent famine, or how to limit the effects of famine once it has occurred. Even though a few critics have questioned the validity of some empirical results in *Poverty and Famines*, the book is undoubtedly a key contribution to development economics. With its emphasis on distributional issues and poverty, the book rhymes well with the common theme in Amartya Sen's research.

Professor Amartya Sen, Trinity College, Cambridge, U.K. (citizen of India) awarded the 1998 Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel for his contributions to welfare economics.



Women heading to a workshop on Arsenic Awareness, August 2007

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