Spring 2010

CSWM Communicator

Welcome to the 110th ASM General Meeting

CSWM Events at a Glance...

Events at the General Meeting

Special Interest Session

Tuesday, May 25 at 8:15 am
San Diego Convention Center
Room 6F
The Human Microbiome Across a Lifespan: Microbiology is Lifespan Destiny.

Open Forum Meeting

Tuesday, May 25th at 3:00 PM
Hilton San Diego Bayfront Aqua 313
Come discuss issues related to the role played by women in microbiology, both in the workplace and academia. Share thoughts, ideas, problems and solutions. The open forum is for all interested ASM members

Reception

Tuesday, May 25th at 4:00PM
Hilton San Diego Bayfront
Indigo West Foyer and Terrace
Join us for food, talk and help us recognize this year's Roche Diagnostics Alive C. Evans Award Recipient

Women, water and development

By Isha Ray

A speaker at last years CSWM's special session, Dr. Ray is an Associate Professor in the Energy and Resources Group at the University of California, Berkeley

International agencies have made water for women a cornerstone of their development and humanitarian efforts. In 1992 the international water community adopted the Dublin Principles – the four key principles of water provision and management. The third of these principles is: Women play a central part in the provision, management, and safeguarding of water. But what does this principle mean? How do we come closer to achieving the goals that this statement supposedly embodies? In a world where the WHO estimates that women and girls still spend 10 million person-years annually in fetching water from far-away sources, this 'gender gap' and its development consequences surely deserve the attention of all of us whose work concerns water or gender or development.

Water and development

I'm going to frame the issue of development through the eight Millennium Development Goals (MDGs). Whether these do or do not adequately capture what we all understand as "development" is a legitimate question, but these are the ubiquitous indicators of today. So what are the MDGs? They are eight time-bound goals that were agreed to by 189 nations at the Millennium Development Summit of 2000. Each of these goals has a number of specific indicators and targets, i.e. number or proportion of people to be reached, to track progress towards the goal (or lack thereof). Briefly expressed, the goals are as follows:

1. Eradicate extreme poverty & hunger
2. Achieve universal primary education
3. Promote gender equality, empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria & other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

How very unobjectionable, you are no doubt thinking, but where is "water" in this list? The MDGs say: That's Goal 7 -- ensure environmental sustainability. But we water people know that water was ever uncontrollable, and water has seeped and flowed into every one of these goals. I want to argue today that none of the MDGs (except maybe MDG 8) is achievable without access to safe water and sanitation for all, that Goal 7 is intimately tied to every other. I also want to connect these goals specifically to women's well being to show that women, water and development are inextricably linked. Let's look at just a few examples – I won't cover all the MDGs and their multiple targets because of space constraints.

MDG1: Target 1a – Halve the proportion of people living on less than $1 a day.

The United Nations Human Development Report (2006) has compellingly shown that access to water and sanitation promotes poverty alleviation both through better health (because healthier people have greater capacity to work) and through more productive use of time (because of reduced walking and waiting while fetching water). Yet today billions of girl- and women-hours a year are devoted just to fetching, treating and storing

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water across Asia and Africa. Women are not simply domestic water-carriers, they are also farmers. Poor rural women have always worked in fields and farms and factories – they've had to. The UN Food and Agriculture Organization estimates that over 70% of staple food-grains in Africa and Asia is grown with women's labor. Indeed, significant numbers of small farm households – those farming 2 hectares or less – are female-headed, as men migrate to urban centers in search of work. Access to water for small farmers is essential for poverty (and hunger) alleviation. Sandra Postel has estimated that, of the 800 million chronically hungry people in the world, the majority is from small-farmer households.

> ...women play a central part in the provision, management, and safeguarding of water. But what does this principle mean?

MDG2: Target 2a – all boys and girls complete primary school.

Here, too, we see water as an essential component of education. How so? The UN HDR has argued that there is a "straight trade-off" between completing school and fetching water and fuel; they have shown through numerous examples that this burden disproportionately falls on girls. Access to safe sanitation facilities is especially important for girls as they reach their middle school years; we have no hard numbers but the lack of toilet and washing facilities appears to be at least one important cause of girls dropping out of school as they approach puberty.

MDG3: Target 3a – eliminate gender disparity in primary and secondary schooling (original target: 2005); and at all levels (original target: 2015).

But we've already seen that millions of women and girls in Africa and Asia are walking 1 km or more, especially during the dry season, just to collect water. When do they go to school? Let's think harder about what this means in terms of health, not only of time. The health-related impacts of unsafe and inadequate water are traditionally split into water-borne, water-washed and water-related diseases. But the impacts for water-carriers go well beyond these. The WHO says that 20 liters per person per day is the minimum acceptable water requirement. OK, in a family of five, that would be a requirement of 100 liters per day. That weighs 100 kg, or 220 lbs. Providing that water would take a woman and her daughters several trips to the water source and back – carrying water daily, especially if you start young, causes the early ageing of the vertebral column, and damages the lower back and neck. Let us further understand that many of these women already suffer chronic malnourishment and iron deficiency – what gender equality is possible under such circumstances?

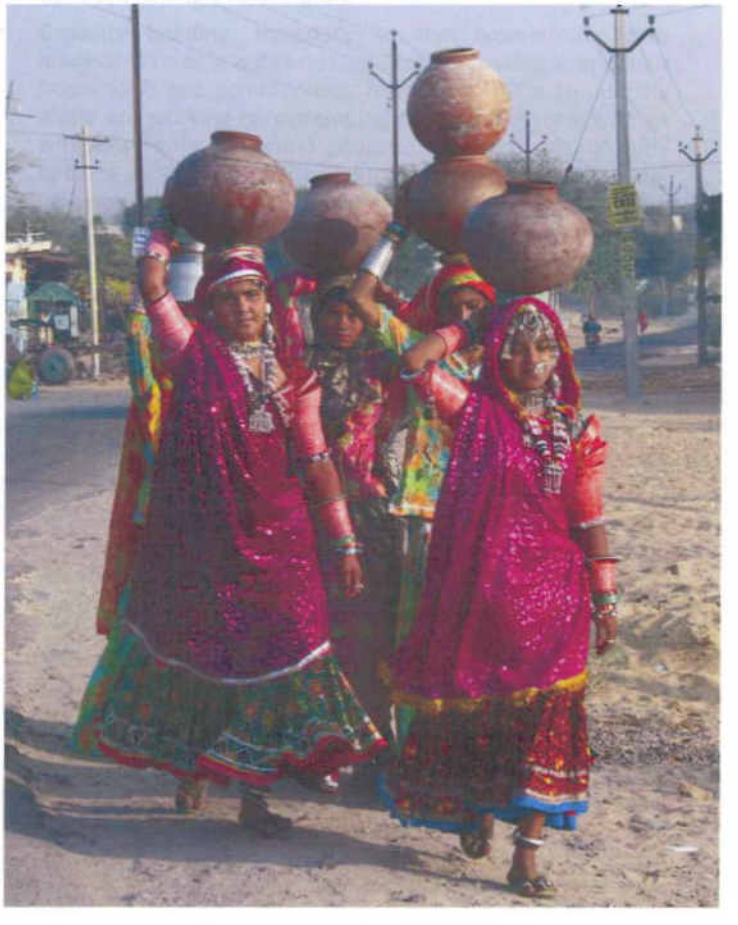
MDG4: Target 4a – reduce by 2/3 the rate of under-five infant mortality (U5IM).

I don't need to linger here, we all know the tragedy of over 1.5 million child deaths per year from entirely preventable diarrheal diseases, largely brought about by poor water and poor sanitation. Constant diarrhea debilitates even when it does not kill. Children with diarrhea can't absorb the nutrients in their food, and this increases their vulnerability to a host of other diseases. The luckier ones will grow into adults, but often into unhealthy and vulnerable adults.

MDG7: This is officially the "water MDG" (not that I buy that, as you know...)

Target 7a – reduce by half the proportion of people without sustainable access safe drinking water. To estimate this, we look at the population currently being served through what the UN calls "improved" sources. Improved sources include protected springs, protected wells, municipal tap water, and harvested rainwater. Unimproved sources are unprotected wells, (probably contaminated) rivers and open ponds, and vendor-supplied water (since this is often expensive and there is almost never any quality control). I note that "improved" sources may not be safe by WHO standards – no one in my home town of Kolkata, for instance, will offer you a glass of water straight from the tap. Much "improved" water is microbially contaminated – some of it also has a range of undesirable chemicals but I'm focusing on microbial contamination because it's more common and will kill you faster. Our reality today is that 1 billion people do not have access even to such "improved" sources – they make do with highly contaminated sources or very expensive vended water, which they can only afford to consume in small amounts.

Target 7d – significant improvement in the lives of 100 million slum dwellers by 2020. As many UN reports have shown, poor



water and poor sanitation (probably the latter even more than the former in crowded slum conditions) are leading causes of disease and loss of dignity in mega-city slums. Piped water, only intermittently available, is often contaminated from raw sewage having leaked into water pipes; un-piped water is collected from drains and ditches or purchased from vendors; open defecation, especially among children, is quite normal in the absence of latrines. Of course the lack of sanitation is an additional burden for women and growing girls who have a greater need for privacy.

So what is my main message thus far? Access to safe water is the bedrock upon which sustainable development rests. Women stand to gain the most from water and sanitation improvements, because worldwide, they're the providers of care in the home, water for the family, and often for the farm. "Gender-sensitive" development policies must be accompanied by the effort to provide better access to better water -- in other words, if you want to educate girls in rural and peri-urban areas, first make sure there is a source of water in the village, and that the toilets in the schools will be emptied. Many different solutions have proven promising at many different scales, and I now turn to some of these.

> If community-led development development is on our agenda, if women's empowerment and quality of life is on our agenda, if child health and education is on our agenda, it is to the everyday that we must return.

Multiple challenges, multiple solutions

I once heard a great talk by the eminent epidemiologist, Dr Steven Luby, who said: we know what works. It's not that we don't. Piped, centrally treated drinking water pumped into every home totally works. A toilet that removes the waste from your home, and carries it into a functioning sewage system, works. Canals and wells that bring water to even the smallest pieces of land work. But such infrastructure is not cheap. Nor is it always sustainable. So we have started to look at scaled-down solutions, in part because they cost governments and donors less, and in part because they (may) have smaller ecological footprints. These solutions are varied, depending on the socio-economic circumstances of the population and the country, on whether drinking water or water for food is the more acute problem, on whether the issue is water quality or access to some water in the first place. Let's look at some promising options that are being worked on all over the developing world.

- More productive rainfed agriculture. This is one of the solutions being championed by the UN's Food and Agriculture Organization. Un-irrigated, often small, farms produce close to 60% of the world's basic food supply – they can be made more productive through strategic investments in efficient spate irrigation, crop intermixing, application of manures and mulches, and breeding of water-thrifty plant varieties. Little additional water would be required for such improvements.
- Low-cost irrigation technologies that are well-suited to small plots. Examples of these include the now-famous treadle pump or simple drip systems pioneered by NGOs such as International Development Enterprises or Practical Action. The foot-powered treadle pump, for instance, is affordable for even the smallest farms, the capital costs are recoverable in one year or so, and simultaneously serves domestic and agricultural needs. Well over a million of these have been sold in South Asia.
- Low-cost supply augmentation technologies. Many of these, such as rainwater harvesting, are ancient techniques of water storage and aquifer recharge that have been "modernized" with today's materials and financing techniques. Well-managed rainwater harvesting structures can provide water at under $0.25 for 1000 liters.
- Low-cost water disinfection techniques are also being developed and used. Chlorination is the cheapest and most ubiquitous, but chlorine has a distinctive smell that many communities do not care for, and maintaining the right dose of chlorination from community to community is challenging. Other technologies that do not alter the taste of the water, such as UV disinfection are also in use; these are cheapest per unit of water served at village-scales, but also cost effective at institutional scales such as in schools and clinics.
- Innovative financing. This is critical for low-income communities with low cash reserves. Both micro-credit organizations and innovative utilities (e.g. Manila Water) are experimenting with small loans for water and sanitation infrastructure; long payback periods for the initial connection fee (high connection fees, by the way, are also a problem in the rural South of the USA); and cost recovery through metering clusters of households as opposed to single households.
- Capacity building, especially so that women can take leadership roles in water-related decision making within their households and communities. Numerous NGOs around the world are working on developing skills among rural women with low levels of formal education – these skills include banking practices, health education, leadership training, lobbying for gender-centered funding priorities...the main purpose is not only to impart relevant information but to ensure that women are empowered to act on their own behalf. Indeed that women (do and should) play a central role in the management and safeguarding of water supplies has been enshrined as a key principle in the international community, but the implementation of this principle has been highly uneven. From my own experiences I would argue that water agencies and local governments need capacity building at least as much as rural communities do – field level technicians are trained to deliver water, not empowerment.
- And, of course, political pressure. Ultimately, governments must play a key role in sustainable, scalable access to water and sanitation, and must be pushed, all the time and everywhere, to raise the profile of water and sanitation, especially for the poor, in their regional and national budgets. I have noticed a tendency among water professionals, be they economists or engineers or community activists, to "give up" on governments and look "instead" to donors or the private sector. But no country has provided universal access through non-state actors alone – and it is for this reason that I consider political pressure a tool of access, right up there with innovative technologies and innovative financing.

Our challenges

I'd like to close with the major challenges that researchers in the field of water and sanitation for the poor have to face every day. Despite much progress and much promise, our task remains enormous.

First, the scale of the problem is immense. As I said, 1 billion people lack access to "improved" water – many millions more don't have water that is actually safe to drink. Many millions, a significant fraction of them women, struggle to survive on small dry plots of farmland. Yet we have seen that diverse solutions may be necessary and feasible in diverse conditions, which makes it hard to come up with "solutions" that scale and work everywhere. Providing water for all is not like providing polio vaccines for all. This diversity is inevitable in today's economic and political climate, yet it is also frustrating to the scientific establishment ("What? Your solution doesn't generalize?") and to donors ("Can we reach 50 million if we do as you say?").

Second, this diversity calls for, indeed it demands, true collaboration among the disciplines. This is a field where progress must be made with civil and environmental engineers, economists, social scientists, public health scholars, and gender scholars working in good faith and cooperatively. That's very rare. There are many hurdles, even today, to meaningful collaboration in academia. And, as a researcher, where do you publish your multi-disciplinary multi-authored papers? Differences in domain knowledge and even epistemologies make the writing process challenging and the review process downright painful ("The problem, of course, is of the utmost importance, but it is not clear to what field the researchers are contributing...").

And third, this is a not a "glamorous" research area, especially in developing countries where the problems are most severe. Cutting edge rather than seemingly everyday challenges appear to attract students of science and engineering in particular – new information and communication technologies, new stem-cell or emerging disease research, new climate change challenges. Poop in water and the problems it causes are so, well, everyday. But diarrhea deaths are everyday matters, girls walking to water rather than to school is an everyday matter, community capacity-building to take charge of health, water and sanitation is an everyday challenge that is still ongoing. If community-led development is on our agenda, if women's empowerment and quality of life is on our agenda, if child health and education is on our agenda, it is to the everyday that we must return. Thank you.

ASM announces mBio™ Call for Papers

On January 25th, ASM announced the release of the mBio™ Call for Papers. mBio™ is ASM's first broad-scope, online-only, open access journal. The new journal will offer rapid review and publication of top-tier research in microbiology and allied fields. Dr. Arturo Casadevall will serve as the Editor in Chief. Currently, the mBio™ Board of Editors includes 15 women.

mBio™ will complement ASM's 9 primary research journals, which serve specific disciplines and are well known for their excellence, rigor, and fairness. The scope of the journal will span across all major areas of the microbiological sciences, including virology, bacteriology, parasitology, mycology, and allied fields, which may include immunology, ecology, geology, population biology, computational biology, anti-infectives and vaccines, public health, etc. For more information, please visit the official mBio website at http://mbio.asm.org/index.shtml

mBio™ is on track for an online launch in May 2010. Papers that are accepted from now through April 2010 will appear in the Inaugural Issue of mBio™ (Volume 1, Number 1, April 2010), which will be published on the new mBio HighWire site. Manuscripts accepted for the April 2010 Inaugural Issue of mBio™ will be posted online within a few days of acceptance as unedited "Published Ahead of Launch" author PDFs, much like ASM's current "published ahead of print" articles. Manuscripts accepted after the Inaugural Issue closes will be copyedited and typeset, and final articles will be posted each week to the mBio HighWire site. Articles will be collected and released as a new issue at the end of each month.

Print copies of the mBio™ Inaugural Issue will be distributed at conferences, beginning with the 2010 ASM General Meeting, May 23-27, in San Diego. In addition, the corresponding author of each article in the Inaugural Issue will receive a copy of the printed issue (and may request additional copies). A "Print on Demand" option also will be available through the HighWire site.

mBio™ will publish the following types of articles: Research Articles, Observations, Minireviews, Opinions and Hypotheses, Commentaries, Perspectives, Editorials, and Letters to the Editor. For more details on each of these manuscript types, please visit http://mbio.asm.org/about.shtml.

This promises to be an exciting venture for all of us. We urge you to consider submitting your best work to mBio™ in the coming months.

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What is CSWM?

The Committee on the Status of Women in Microbiology (CSWM) periodically collects data on the training and employment of women microbiologists; studies legislation affecting women microbiologists; interacts and cooperates with similar committees in other scientific organizations; encourages women microbiologists to participate in ASM activities; and advises ASM on matters concerning the status of women microbiologists.

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